



CARBON REDUCTION STRATEGY

November 2023

Chapter 4 Strategy Organization and Review

4.1 Strategy Organization

We have found 88 strategies that may be eligible for implementation under the Carbon Reduction Program. To facilitate selection of strategies that may be suitable for your project, this document organizes these strategies into three categories.



- **Sustainable infrastructure**—This includes use of more sustainable materials for infrastructure construction and maintenance, including sustainable pavements, alternative construction materials, and maintenance practices.
- **Operational efficiency improvements**—This includes strategies influencing how GDOT and MPOs plan and manage road operation and flow.
- **Alternative technologies and modes**—This category addresses consumer choice strategies, such as the purchase and use of alternative or lower-carbon fuels and alternative modes of transportation.



Exhibit 6 in Chapter 1 illustrated these categories. Chapter 5 describes these strategies in detail.





4.2 Scoring Elements

The rating scale used in the evaluation of strategies in Chapter 5 is described in Table 4. Strategies are rated on a three-tiered system, with a fourth tier to account for disbenefits.

EXHIBIT 16. STRATEGY EVALUATION CRITERIA AND RATING SCALE

Criterion	Evaluation	Impact Rating Scale
Safety 	Approximation of expected impact on user safety	<ul style="list-style-type: none">• No benefit: Strategy expected to have no benefit or negative benefits—indicated by a dash.• Low: Low or uncertain impact.• Medium: Strategy may reasonably be expected to directly improve the safety of vulnerable roadway users.• High: Strategy, such as known infrastructure modifications, has a history of directly improving the safety of vulnerable roadway users.
Equity 	Determined by the extent to which the strategy may serve or impact traditionally underserved populations	<ul style="list-style-type: none">• No benefit: Strategy expected to have no benefit or negative benefits—indicated by a dash.• Low: Minimal or uncertain direct impact on known disadvantaged populations.• Medium: Strategy may reasonably be expected to indirectly benefit disadvantaged populations.• High: Strategy is designed to directly benefit disadvantaged populations.

Criterion	Evaluation	Impact Rating Scale
Mobility 	Determined by the extent of the population served and significance of benefit (i.e., higher score for projects that provide additional transportation options, lower for those that make existing options faster)	<ul style="list-style-type: none"> • No benefit: Strategy expected to have no benefit or negative benefits—indicated by a dash. • Low: Strategy either indirectly improves mobility or has uncertain benefits. • Medium: Strategy increases the number of transportation options. • High: Strategy increases transportation options and improves overall travel performance (e.g., speeds, reliability).
Resilience 	Determined by assessment of the impact on supporting a more resilient transportation system ^a	<ul style="list-style-type: none"> • No benefit: Strategy expected to have no benefit or negative benefits—indicated by a dash. • Low: Strategy has low or uncertain impacts on resiliency factors to improve the ability of the transportation system's resiliency. • Medium: Strategy supports infrastructure resiliency only indirectly. • High: Strategy directly supports resiliency of existing or new infrastructure including through planning or initiatives.
Air quality co-benefits 	Determined by assessment of the strategy to provide neutral or positive air quality benefits	<ul style="list-style-type: none"> • No benefit: Strategy expected to have no benefit or negative benefits—indicated by a dash. • Low: Strategy is expected to have low or uncertain impacts on air quality. • Medium: Strategy may be expected to have indirect benefits to air quality. • High: Strategy directly leads to reduced emissions of traditional air pollutants.
Implementation factor 	Determined by estimation of the time to implement the strategy	<ul style="list-style-type: none"> • No benefit: Strategy expected to have no benefit or negative benefits—indicated by a dash. • Low: Strategy is uncertain, relies on or promotes unproven technology, or has no demonstrated path to implementation. • Medium: Strategy has been demonstrated successfully and specific projects can be implemented in the medium to long term. • High: Strategy is currently or recently used successfully in a similar area or projects including such strategies are feasible in the short term.
Potential to reduce carbon emissions 	Approximation of strategy effects on carbon reduction in the Georgia context	<ul style="list-style-type: none"> • No benefit: Strategy expected to have no benefit or negative benefits—indicated by a dash. • Low: Low or uncertain impact on CO₂ emissions from transportation over the lifecycle of a project it includes. • Medium: Strategy shows potential for CO₂ emissions reduction over the strategy's lifecycle with reasonable confidence or has been proven to reduce emissions but only in moderate amounts. • High: Strategy has been successfully demonstrated to result in substantial carbon emission reductions.

Criterion	Evaluation	Impact Rating Scale
Consumer saving 	Approximation of consumer savings	<ul style="list-style-type: none"> • No benefit: Cases expected to have no benefit or negative benefits are indicated by a dash. • Low: Low or uncertain direct cost savings for consumers, including fuel, capital costs, travel costs, etc. • Medium: Strategy may reasonably be expected to lead to only indirect cost savings, including reduced time. • High: Strategy has been demonstrated to lead to direct consumer cost savings that may be related to time, fuel, capital costs, travel cost, etc.
Economic or workforce development 	Approximation of the potential to advance high-quality job creation ^b	<ul style="list-style-type: none"> • No benefit: Cases expected to have no benefit or negative benefits are indicated by a dash. • Low: Strategy is unlikely to support job growth in Georgia or is uncertain. • Medium: Strategy may lead to small amounts of job growth, expected growth is of short duration, or job location is unknown. • High: Strategy implementation may be directly related to employment in Georgia.
Meets eligibility for Carbon Reduction Program funds 	Eligibility for CRS funds consistent with FHWA CRP Guidance	<ul style="list-style-type: none"> • When a strategy is listed as ineligible or when it may not reasonably be expected to be consistent with CRP guidelines, it is shown with a dash. • Low: Strategy may reasonably be expected to show carbon reductions over a project's lifecycle but is not addressed in guidance or is uncertain. • Medium: Strategy is listed as potentially eligible in FHWA guidance and is mentioned as relevant or encouraged in FHWA guidance. • High: Strategy is listed as "eligible" or consistent with "eligible" projects in FHWA guidance.
Geographical context 	Characteristics of an area or context that would make the strategy most effective	<ul style="list-style-type: none"> • Urban: Strategy may reasonably be expected to be effective in areas represented by MPOs and with a population of at least 50,000. • Rural: Strategy may reasonably be expected to be effective in areas with a population of less than 50,000. • All: Strategy may reasonably be expected to be effective in any area. • None or uncertain: Strategy is not expected to be effective in any area, or effectiveness is uncertain.




^a Resilience is defined as "the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions," in the Vulnerability Assessment and Adaptation Framework, Third Edition, FHWA Office of Planning, Environment, and Realty (FHWA-HEP-18-020)

^bConsistent with FHWA CRS Guidance, p. 8, and Information Memorandum "Carbon Reduction Program Implementation Guidance," by Gloria M. Shepherd, April 21, 2022.)

Table 5 summarizes how these ratings are presented. The "uncertain" category is grouped with "low." This will be when the impact of a project is unclear or depends strongly on the project type. For example, impact on equity will depend on the location of the project.

This evaluation is qualitative and necessarily subjective. Strategies are evaluated here, but results for actual projects will vary by project. These values are intended for guidance only.

EXHIBIT 17. EVALUATION SCALE

Symbol	Meaning
—	No, Negative, or Not Applicable
	Low or Uncertain
	Medium
	High

Chapter 5 Carbon Reduction Strategies

5.1 Introduction and Overview

This chapter provides 88 strategies that may be eligible for Carbon Reduction Program funding. The strategies are organized and evaluated using the categories and criteria discussed in Chapter 4. For each strategy, references are provided, where available, and the rating is based on the cumulative experiences of the preparers of this document.

Strategies are given by main category and subcategory; subcategories are provided to help users narrow down their search for strategies relevant for their projects. Exhibit 1 lists all strategies evaluated. Refer to Table 4 in Chapter 4 for a description of the evaluation metrics.

Section 5.2 presents the 28 strategies in the innovative technologies and modes category. Although not explicitly noted in the strategy evaluations, public health benefits may be created by implementing strategies in the multimodal travel choices and travel behavior subcategories. Section 5.3 presents the 52 strategies in the operational efficiency improvements category. Section 5.4 presents the 8 strategies in the sustainable infrastructure category.

EXHIBIT 18. SUMMARY OF STRATEGIES EVALUATED [\(EACH STRATEGY LISTED BELOW IS HYPERLINKED\)](#)

CATEGORY 1: ALTERNATIVE TECHNOLOGIES AND MODES

Clean Vehicle Technologies

Alternative Fuel Vehicles for Public Sector Fleets

Strategy 1. Electric or Alternative Fuel Purchases for Public Sector Fleet Vehicle Replacements (Transit Buses, School Buses, Public Fleets)

Strategy 2. Electric Vehicle/Zero-Emission Charging or Refueling Infrastructure for Public Sector Fleets

Freight-related Emissions Reduction

Strategy 3. Advanced Truck Stop Electrification Systems

Strategy 4. Diesel Replacements or Retrofits

Port, Industrial, and Other Electrification and Facilities Improvement

Strategy 5. Charging Infrastructure Upgrades

Strategy 6. Cold Ironing

Strategy 7. Electric Cargo Handling Equipment

Strategy 8. Drayage Trucks

Zero-Emission Vehicle Fueling Vehicle Infrastructure

Strategy 9. Electric Vehicle Charging Infrastructure

Strategy 10. Other Alternative Fuels

Strategy 11. Public Outreach and Marketing

Multimodal Travel Choices and Travel Behavior

Bicycle, Pedestrian, and Nonmotorized Transportation Facilities Improvements

Strategy 12. On-Road and Off-Road Multiuse Paths and Trails for Pedestrians, Bicyclists, and Other Nonmotorized Forms of Transportation

Strategy 13. On-Road Bicycle Lanes, Separated Lanes

Strategy 14. Addition of Sidewalks and Crosswalks

Strategy 15. Bicycle/Pedestrian Safety Enhancements

Transit Infrastructure Improvements

Strategy 16. Transit Stops Enhancements

Strategy 17. Park-and-Ride Facilities

Transit Service Improvements / Expansions

Strategy 18. Expanding Coverage/Adding New Bus Transit Services

Strategy 19. Expanding Coverage/Adding New Rail Transit Services

Strategy 20. Add New Express Bus Services

Strategy 21. Increasing Frequency of Transit Services

Strategy 22. Transit Reliability Improvements
Strategy 23. Dynamic Transit/ Demand-Response Transit
Transit Access Improvements
Strategy 24. Improving Nonmotorized Access to Transit
Strategy 25. Microtransit/Commuter Shuttles
Strategy 26. Multimodal Transportation Centers/Mobility Hubs

Land Use and Community Design

Strategy 27. Transit-Oriented Development
Strategy 28. Infill Development

CATEGORY 2: OPERATIONAL EFFICIENCY IMPROVEMENTS

Event Management

Traffic Incident and Work Zone Management

Strategy 1. Incident Detection and Verification
Strategy 2. Traffic Incident Management Coordination
Strategy 3. Towing Programs
Strategy 4. Work Zone Traffic/Pedestrian Control and Alerts
Strategy 5. Work Zone Demand Management
Strategy 6. Work Zone Speed Management

Facility Management

Arterial Management

Strategy 7. Traffic Signal Improvements
Strategy 8. Traffic Signal Coordination
Strategy 9. Adaptive Traffic Signals / Smart Signals and Intersections
Strategy 10. Access Management
Strategy 11. Curb Space Management
Strategy 12. Signal Alternatives or Removal
Strategy 13. Dynamic Lane Reversal or Contraflow Lane Reversal
Strategy 14. Intersection Improvements

Freeway Management

Strategy 15. Adaptive Ramp Metering (Ramp Control)
Strategy 16. Dynamic Junction Control
Strategy 17. Variable Lane Use Control
Strategy 18. Queue Warning
Strategy 19. Variable Speed Limits
Strategy 20. Temporary Shoulder Use
Strategy 21. Managed Lanes
Strategy 22. Road Weather Advisory Strategies
Strategy 23. Road Weather Control Strategies

Public Transportation Operational Improvements (improvements to the speed and efficiency of bus operations)

Strategy 24. Transit Signal Priority
Strategy 25. Bus Only Lanes
Strategy 26. Transit Queue Jump Lanes at Signalized Intersections
Strategy 27. First-mile/Last-mile Connectivity Strategies

Multimodal Support and Demand Management

Active Transportation and Demand Management (ATDM)

Strategy 28. Bicycle/Pedestrian Traffic Signals and Signal Timing
Strategy 29. Traffic Calming/Operations to Support Bicycle/Pedestrian Activity
Strategy 30. Micromobility

Parking Management

Strategy 31. Dynamic Wayfinding
Strategy 32. Dynamic Parking Reservation
Strategy 33. Dynamic Overflow Transit Parking
Strategy 34. Preferential Parking for Carpools/Vanpools

Real-time Traveler Information Improvements (travel information and advisories)

Strategy 35. Real-Time System Monitoring/Management Information
Strategy 36. Real-Time Traveler Information
Strategy 37. Variable Message Signs
Strategy 38. Transportation Management Centers
Strategy 39. Freight Advanced Traveler Information System

Transportation Demand Management

Strategy 40. Rideshare Support / Commuter Programs Support
Strategy 41. Car Sharing
Strategy 42. Priced Vehicle Sharing and Dynamic Ridesharing
Strategy 43. Dynamic Rerouting
Strategy 44. Employer Incentives and Support
Strategy 45. Telecommuting and Flexible Work Arrangements
Strategy 46. Public Outreach and Marketing

Congestion Pricing

Strategy 47. Express Toll Lanes
Strategy 48. Pay as You Drive

Freight Management

Strategy 49. Real-Time Truck Routing/Parking Information (Freight-Specific Dynamic Travel Planning)
Strategy 50. Freight Signal Priority
Strategy 51. Truck Lane Management/Restrictions
Strategy 52. Truck Parking

CATEGORY 3: SUSTAINABLE INFRASTRUCTURE**Sustainable Infrastructure****Environmentally Sustainable Construction Practices**

Strategy 1. Green Construction Materials
Strategy 2. Sustainable Pavements

Renewable Energy Development

Strategy 3. Use of Highway Right-of-Way for Renewable Energy
Strategy 4. Installation of Solar Power on Transit Stations, Parking, Buildings

Reduction in Operation and Maintenance Energy Consumption

Strategy 5. Retrofit Street Lighting with LED
Strategy 6. Replace Street Lighting and Traffic Control Devices with Energy-Efficient Alternatives
Strategy 7. Low-Carbon Construction Equipment and Fuels
Strategy 8. Alternative Vegetation Management

5.2 Category 1: Alternative Technologies and Modes

This set of strategies generally addresses consumer choice, including choices related to vehicle purchases and travel choices. There are two approaches in this category of strategies: (1) adoption of vehicle technologies, such as use of alternative and low-carbon fuels vehicles (e.g., electric vehicles), which could include investments that incentivize purchases of cleaner vehicles, as well as direct purchases of low-carbon fuel vehicles for public fleets (e.g., transit buses, school buses); and (2) increasing multimodal travel choices, such as choices to use transit, ridesharing, bicycling, or walking, as well as reducing vehicle trip lengths or avoiding trip-making (such as through telecommuting). While these strategies relate to the behavior of the traveler, public transportation projects and investments play a key role in making these options viable.

5.2.1 Clean Vehicle Technologies

A. Alternative Fuel Vehicles for Public Sector Fleets

Strategy 1. Electric or Alternative Fuel Purchases for Public Sector Fleet Vehicle Replacements (Transit Buses, School Buses, Public Fleets)

This strategy describes the acquisition of electric and alternative fuel vehicles to replace fossil fuel burning vehicles owned by public agencies such as state and local agencies, transit providers, and school districts. The use of alternative fuel vehicles has been demonstrated to result in substantial reductions in carbon emission for public sector fleets. Many public sector fleets, such as transit agencies, are implementing this strategy to curb transportation-source emissions. According to FHWA CRP guidance, projects supporting the deployment of alternative vehicles, including electric vehicles, are eligible under Section (G)(3)(J).



Photo Courtesy GDOT Flickr

Learn more: FTA promotes the Transportation Research Board's (TRB) Guidebook for Deploying Zero-Emission Transit Buses: <https://nap.nationalacademies.org/catalog/25842/guidebook-for-deploying-zero-emission-transit-buses>

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating	—	—	—		  	 	  		 	  	All

Strategy 2. Electric Vehicle/Zero-Emission Charging or Refueling Infrastructure for Public Sector Fleets

Supporting electric and/or alternative fuel vehicle purchases, this strategy advances the charging infrastructure and equipment necessary to supply power or fuel to vehicles owned by public agencies or organizations. By investing in supportive infrastructure for ZEVs, emission reductions of traditional air pollutants can be realized.

Over time, this strategy can lead to further job growth related to low-carbon or EV equipment, construction, and maintenance. By incorporating complementary energy resilience infrastructure such as microgrids this strategy can improve the overall performance of various public sector agencies (e.g., transit agencies, etc.,) during disruptive events.

According to FHWA CRP guidance, projects supporting the deployment of alternative vehicles, including electric vehicles, are eligible under Section (G)(3)(J).

Learn more: The FTA provides guidance on developing a Zero-Emission Transition Plan:

<https://www.transit.dot.gov/funding/grants/zero-emission-fleet-transition-plan>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—	—									All

B. Freight-related Emissions Reduction

Strategy 3. Advanced Truck Stop Electrification Systems

To reduce tailpipe emissions from freight trucks while hoteling, this strategy leverages the use of off-board power and equipment to support truck drivers' rest-period needs such as heating, air conditioning, electricity, or communications. It is reported that this technology can save about a gallon of diesel per hour caused during engine idling at rest stops.⁵⁰

This strategy is eligible for CRP funds and has optimal potential to create air quality co-benefits as well as reduce carbon emissions over time. Electrifying truck stops may spur economic development by creating new job opportunities that advance the state's ambitions to become the electric mobility capital of America.

Advanced truck electric systems are explicitly described to be eligible for CRP funds under Section (G)(3)(A) in the FHWA CRP guidance document.

Learn more: Examples of truck stop electrification projects can be found on FHWA's Freight Management and Operations webpage:

https://ops.fhwa.dot.gov/freight/infrastructure/truck_parking/workinggroups/funding_finance_reg/product/grant_programs.htm. Discussion of benefits and technical details are provided by the U.S.

Environmental Protection Agency (EPA) in [Technical Bulletin EPA420-F-03-020](#), June 2003.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—	—	—								All

Strategy 4. Diesel Replacements or Retrofits

The enhancement of the diesel engine of a vehicle to reduce toxic and other emissions into the atmosphere (e.g., adding a diesel particulate filter) is not specifically a carbon reduction strategy, as it focuses instead on diesel exhaust, especially particulate matter, but is explicitly eligible under the Carbon Reduction Program.

This strategy may include nonroad engines, such as Locomotive and Marine Engine Retrofit, so long as they meet the requirements of 23 USC 149(b)(8) for a diesel engine retrofit. This strategy offers air quality co-benefits and is being implemented by many heavy-duty owners around the country, including the Georgia Diesel Emissions Reduction (GaDER) program

⁵⁰⁵⁰ <https://carbonfund.org/project/truck-stop-electrification/>

administered by the state's Environmental Protection Division.⁵¹ When equipment is in use near EJ communities, this strategy has strong potential for air quality and equity benefits.

Referenced in FHWA CRP guidance, projects described under 23 USC (149)(b)(8) are eligible under Section (G)(3)(K).

Learn more: FHWA publication highlighting successful diesel retrofit projects is at https://www.fhwa.dot.gov/ENVIRonment/air_quality/cmaq/reference/cmaq_diesel_retrofits/cmaqdiesel.pdf

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—		—		  	  			 	  	All

C. Port, Industrial, and Other Electrification and Facilities Improvement

Strategy 5. Charging Infrastructure Upgrades

This strategy coincides with enhancements to technology and equipment used to supply electricity to electric vehicles and further supports travel performance for ports, industrial, and other facilities' adoption of electric vehicles. Equity can be incorporated into this strategy by ensuring that adequate investments are made in underserved communities.

Energy resilience may be enhanced through this strategy by coupling charging infrastructure upgrades with microgrids, for example, to ensure that there is continuity in service during disruptive or emergency events. Similar to the strategy focused on public sector fleets, charging infrastructure projects can produce air quality co-benefits, supports emission reduction, and advances the state's goals of creating jobs in the electric mobility industry.

Strategies that result in projects that reduce transportation emissions at port facilities, including through the advancement of port electrification, are eligible as described in Section (G)(3)(M) of the FHWA CRP guidance document. Private companies such as industrial corporations are not eligible for CRP funding unless their operations are publicly accessible.

Learn more: The U.S. DOT's Maritime Administration Office published a case study that focuses on the macroeconomic and environmental impacts of port electrification <https://www.maritime.dot.gov/innovation/meta/port-electrification-marad-final-report>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—		—	  	  	  	  	—	  	  	All

Strategy 6. Cold Ironing

This strategy consists of utilizing shoreside electrical power for power while a vessel is at berth. In most cases the main engines are turned off and vessel power comes from auxiliary engines

⁵¹ <https://epd.georgia.gov/air-protection-branch/air-branch-programs/georgia-diesel-emissions-reduction>

(although this varies by vessel types). Under shore power, shoreside electricity is used instead of the on-board auxiliary engines. Cold ironing has a high potential to generate significant air quality co-benefits and likely to reduce carbon emissions depending on the source of the electricity. The EPA concluded that shore power has the potential to significantly reduce emissions⁵². As port and intermodal facilities are often located near EJ communities, this strategy has strong potential for air quality and equity benefits.

Like other infrastructure-related strategies, cold ironing projects can create jobs by increasing the number of employment opportunities available to upgrade and maintain shoreside electrical power statewide. Strategies that result in projects that reduce transportation emissions at port facilities, including through the advancement of port electrification, are eligible as described in Section (G)(3)(M) of the FHWA CRP guidance document. As a major infrastructure upgrade, shore power installation is likely to be combined with other infrastructure improvements that also increase resilience.

Learn more: The USDOT Volpe Center describes how new CMAQ improvement tools can be applied to incorporate electrification strategies including cold ironing at port and intermodal facilities: <https://www.volpe.dot.gov/news/new-congestion-mitigation-and-air-quality-improvement-tools-estimating-emissions-benefits>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—		—					—			All

Strategy 7. Electric Cargo Handling Equipment

Electrifying the various off-road equipment used to move cargo from another vehicle or perform maintenance and repair activities at ports, rail, and other facilities is an effective strategy for reducing carbon emissions and operational expenses over time. This strategy is being implemented by various port, rail, and freight operators across the country, such as the Georgia Port Authority.⁵³ Like other electrification infrastructure projects, this strategy can directly support existing or new infrastructure resiliency initiatives by ensuring that the energy source can withstand uncontrollable events such as widespread power outages or climate emergencies. As port and intermodal facilities are often located near EJ communities, this strategy has strong potential for air quality and equity benefits.

Strategies that result in projects that reduce transportation emissions at port facilities, including through the advancement of port electrification, are eligible as described in Section (G)(3)(M) of the FHWA CRP guidance document.

Learn more: The US EPA awarded the Northwest Seaport Alliance with funding to install a fleet of electric cargo handling equipment: <https://www.epa.gov/newsreleases/epa-and-tacoma-power-grants-help-northwest-seaport-alliance-install-first-permanent>

⁵² <https://www.epa.gov/ports-initiative/shore-power-technology-assessment-us-ports>

⁵³ <https://gaports.com/blog/port-of-savannah-receives-five-new-electric-rubber-tired-gantry-cranes/>

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating	—		—					—			All

Strategy 8. Drayage Trucks

This strategy features the replacement of traditional heavy-duty vehicles used to move goods and containers short distances between ports, railyards, and warehouses with zero-emitting alternatives. Upgrading drayage trucks with electrified or alternative fuel options can contribute to reduced transportation-source emissions from the port sector. This strategy is eligible for CRP funding and may eventually lead to operational savings for operators, however the upfront cost is substantial. However, as drayage trucks often traverse EJ neighborhoods around intermodal facilities, there may be an opportunity for substantial air quality and equity benefits.

According to FHWA CRP guidance, projects reducing the environmental and community impacts of freight movement or supporting the deployment of alternative vehicles, including electric vehicles, are eligible under Section (G)(3)(I)) or (G)(3)(J).

Learn more: The California Air Resource Board published a fact sheet outlining their approach to transitioning medium and heavy-duty fleets to ZEV alternatives:

<https://ww2.arb.ca.gov/resources/fact-sheets/advanced-clean-fleets-regulation-summary>

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating	—		—					—			All

D. Zero-Emission Vehicle Fueling Vehicle Infrastructure

Strategy 9. Electric Vehicle Charging Infrastructure

This strategy focuses on privately owned vehicles (rather than public sector fleets) and consists of installing equipment used to supply power or alternative fuels to vehicles. This strategy is essential to reduce carbon emissions statewide as personal vehicle trips contribute to a significant portion of transportation-source emissions.

The implementation of an EV Charging and Fueling infrastructure network statewide has a high potential to improve air quality, reduce carbon emissions, and provide consumer savings. To this point, in 2022, Georgia DOT received a federal designation to add two new Alternative Fuel Corridors (AFC) from the FHWA⁵⁴. Equity can also be addressed by this strategy by leveraging the investment of funding in areas that are historically underserved and by reducing the pollution burden in areas that historically bare an undue share, such as near-road communities.

⁵⁴ <http://metroatlantaceo.com/news/2022/07/georgia-expands-electric-vehicle-charging-network-federal-alternative-fuel-corridor-designations/>

According to FHWA CRP guidance, projects supporting the deployment of alternative vehicles, including electric vehicles, are eligible under Section (G)(3)(J).

Learn more: FHWA has resources on electric vehicles and supportive infrastructure:

<https://www.transportation.gov/tags/electric-vehicles>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—										All

Strategy 10. Other Alternative Fuels

This strategy supports the fueling supply of hydrogen, biodiesel, ethanol, or other fuels used in alternative-fuel vehicles, either internal combustion or fuel cell, as appropriate. Like other carbon emission reduction strategies targeting personal vehicles, this strategy can be implemented in an equitable framework. Both mobility and economic development can also be advanced through this strategy by supporting the adoption of alternative vehicles and creating supportive jobs. Alternative fuel vehicles can play a significant role in producing air quality co-benefits and generating consumer savings. As of August 2023, the governor's office has directed GDOT to identify the best approach for the deployment of hydrogen fueling stations for commercial vehicles in the state (see Appendix C).

According to FHWA CRP guidance, projects supporting the deployment of alternative vehicles are eligible under Section (G)(3)(J).

Learn more: FHWA has resources on alternative fuels and vehicles

<https://highways.dot.gov/public-roads/spring-2020/resources-alternative-fuels-and-vehicles#:~:text=These%20fuel%20types%20include%20biodiesel,and%20liquefied%2C%20and%20propane.>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—										All

Strategy 11. Public Outreach and Marketing

Public outreach and marketing are effective programming strategies designed to educate the public on alternative fuel infrastructure to encourage its use. In tandem with infrastructure investments, the widespread adoption of alternative fuel vehicles will rely heavily on positive information sharing that is promoted through public outreach and marketing. Equity can also be incorporated into public outreach and marketing by ensuring that marginalized and underserved communities are targeted.

Public outreach strategies may be eligible depending on the content. According to FHWA CRP guidance, projects supporting the deployment of alternative vehicles are eligible under Section

(G)(3)(J), which may include outreach and marketing initiatives. GDOT has also confirmed that such strategies would be eligible.

Learn more: Georgia Commute Options is the state's TDM program, and its services can be leveraged for outreach and marketing services: <https://gacommuteoptions.com/>

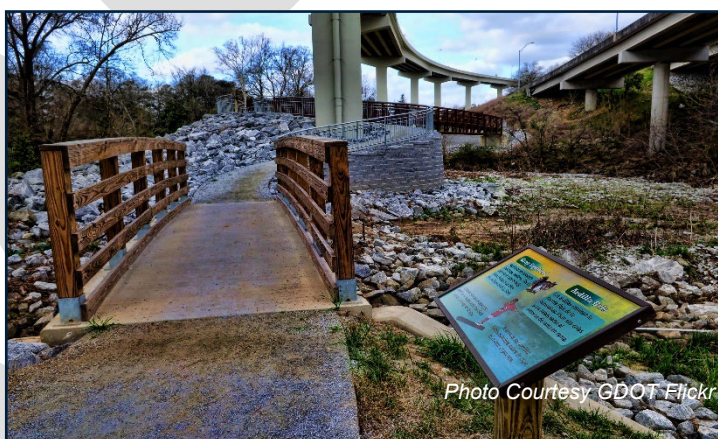
											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—										All

5.2.2 Multimodal Travel Choices and Travel Behavior

A. Bicycle, Pedestrian, and Nonmotorized Transportation Facilities Improvements

Strategy 12. On-Road and Off-Road Multiuse Paths and Trails for Pedestrians, Bicyclists, and Other Nonmotorized Forms of Transportation

This strategy focuses on the enhancements to pathways dedicated to nonmotorized use, which could include connectivity to an extended network, longer sight distances, and better pavement/ground grades and conditions. Vulnerable roadway users include pedestrians, cyclists, and other users of nonmotorized transportation; thus, creating these exclusive pathways can offer moderate to high safety benefits depending on other factors of the implementing the project such as adding live surveillance or installing lighting to maximize safety benefits.



Traditionally, investments to support nonmotorized traffic such as pedestrians and cyclists are prioritized lower than vehicles thus advancing active transportation infrastructure can indirectly support both transit-dependent communities as well as vulnerable roadway users more equitably. Additionally, equity can also be incorporated by ensuring a significant proportion of public investments that support nonmotorized forms of transportation are made in areas that are historically underserved. Air quality co-benefits, the potential to reduce carbon emissions, and consumer savings related to travel expenses may vary depending on the project because encouraging mode shifts and influencing travel behaviors often rely on other strategies such as outreach and adjacent land uses. While potential climate and air quality benefits are high for these zero-emitting transit modes, the impact is set by the number of vehicle trips offset.

Transportation alternative projects, including on-road and off-road facilities for vulnerable roadway users, are eligible for CRP funding as described under Section (G)(3)(C) of FHWA's CRP guidance memorandum.

Learn more: Guidance on the transportation alternatives program administered by the FHWA can be reviewed by visiting:

https://www.fhwa.dot.gov/environment/transportation_alternatives/guidance/ta_guidance_2022.pdf

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

Strategy 13. On-Road Bicycle Lanes, Separated Lanes

This strategy describes constructing an exclusive facility for bicyclists that is located in or directly adjacent to the roadway and that is physically separated from motor vehicles traffic with a vertical element; improvements could include connectivity to an extended network, longer sight distances, better pavement conditions, better roadway crossing and lower vehicle lower speeds.

Safety can be dramatically improved for cyclists as they are recognized as vulnerable roadway users, especially in areas with higher-than-average incident or fatality rates, especially if the separated lanes are buffered or protected with parking or flexible posts and bollards. Constructing on-road separated bicycle lanes is demonstrated in research to attract more users than those that are not separated from vehicular traffic. Similar to off-road nonmotorized pathways, the effectiveness of on-road separated bike lanes may rely on other factors such as outreach, vehicular speed limits along the roadway, bike network connectivity, and more.

Transportation alternative (TA) projects, including separated bike lane projects, are eligible for CRP funding as described under Section (G)(3)(C) of FHWA's CRP guidance memorandum.

Learn more: FHWA developed planning and design guidance for separated bike lanes

<https://highways.dot.gov/safety/pedestrian-bicyclist/safety-tools/pg-89-101-separated-bike-lane-planning-and-design-guide>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

Strategy 14. Addition of Sidewalks and Crosswalks

The construction of new pedestrian sidewalks and street crossings for pedestrians to utilize is a strategy that can bolster a region's active transportation network throughout the state. Adding sidewalks and crosswalks enhances the safety and mobility of nonmotorized traffic and other vulnerable roadway users.

Safety can be maximized in projects that consist of new sidewalks or crosswalks construction with additional investments in pedestrian crossing detection technology to further prevent incidents or collisions with motorized traffic. In areas that need improved first/last-mile connectivity, air quality co-benefits and reduced carbon emissions may be realized by supporting walkability, transit-oriented development, or advancing Complete Streets design principles.

Transportation alternative projects, including pedestrian facilities and Complete Streets, are eligible for CRP funding as described under Section (G)(3)(C) of FHWA's CRP guidance memorandum. As with other bike/pedestrian strategies, although moving to zero emission alternatives, the number of vehicle miles offset determines the overall carbon emissions and air quality impact.

Learn more: FHWA created a fact sheet focusing on crosswalk visibility enhancement projects: https://highways.dot.gov/sites/fhwa.dot.gov/files/2022-06/techSheet_VizEnhancemt2018.pdf

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

Strategy 15. Bicycle/Pedestrian Safety Enhancements

In conjunction with nonmotorized infrastructure, this strategy consists of improvements to bicycle and pedestrian conditions that prevent or mitigate the risk of injury. These strategic improvements could include traffic calming, lighting, lane markings, etc. Safety enhancements that support cyclists and pedestrians can complement many projects focused on active transportation to increase safety benefits and indirectly create air quality co-benefits and consumer travel savings by supporting mode shift from vehicles for shorter trips and may encourage transit ridership.

Transportation alternative projects, including safety enhancements, are eligible for CRP funding as described under Section (G)(3)(C) of FHWA's CRP guidance memorandum.

Learn more: FHWA has a landing page that features resources on planning and implementing safety projects: <https://highways.dot.gov/safety/pedestrian-bicyclist>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

B. Transit Infrastructure Improvements

Strategy 16. Transit Stops Enhancements

Improvements to the amenities located at transit stops, such as transit stop shelters and lighting, to increase access and/or comfort for customers can be an effective strategy for

boosting transit ridership. A sheltered bus stop increases comfort for transit riders in the event of adverse weather events and hot sunny days. Shelters at bus stops in transit-dependent or underserved communities can advance transportation equity goals.

Transit mobility may also be enhanced indirectly by integrating transit stop enhancements. Transit-centric strategies may foster air quality co-benefits and emission reductions by reducing trips that may have otherwise occurred with vehicles.

Transit stop enhancements are a capital project that may be eligible for CRP funding as described under Section (G)(3)(B) of FHWA's CRP guidance memorandum. Transit capital projects such as this may be eligible for CRP funding under the Transit Flex option for FTA projects as described under Section (C)(3) of FHWA's CRP guidance memorandum. As such projects are consistent with Administration priorities including those outlined in (G)(1) and strategies listed in section (C)(3) of the guidance memorandum, such projects are considered to be likely eligible.

Learn more: FHWA's pedestrian safety for transit page,
https://safety.fhwa.dot.gov/ped_bike/ped_transit/ped_transguide/ch1.cfm.

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating											All

Strategy 17. Park-and-Ride Facilities

Park-and-ride lots allow commuters to park their individual vehicles and then take transit or shared-mobility options. Park-and-ride lots can help reduce single occupancy vehicles on the road, provide travel alternatives, increase the size of a transit collection area, and improve time management for passengers.

This strategy consists of promoting and constructing specialized parking lots that are in strategically placed areas away from heavy congestion corridors to facilitate easy access to alternative modes of transportation including fixed transit routes, express bus service, carpool, and vanpool parking. Park-and-ride facilities support mobility by essentially creating a hub that supports alternative and multimodal modes of transportation.

Air quality co-benefits and the potential to reduce emission benefits are moderate because park-and-ride users may still be traveling from relatively long distances to utilize the facilities. Despite this, consumer savings can be generated by further reducing the need for drivers to generate additional travel expenses such as fuel by carpooling or riding transit. Park and ride facilities already exist throughout the state of Georgia, however, expanding the number of facilities available will further advance mode shift opportunities.⁵⁵ The implementation of park and ride facilities may range from simply designating paved parking lots to parking garages, which can cost millions of dollars.

⁵⁵ <https://www.dot.ga.gov/InvestSmart/Transit/Documents/Statewide%20Park%20and%20Ride%20Lots.pdf>

Park and ride facilities are eligible for CRP funding as described under Section (G)(3)(B) of FHWA's CRP guidance memorandum. Additionally, transit infrastructure projects are likely eligible for FTA funding, which can be flexed with CRP funding as described under Section (C)(3) of FHWA's CRP guidance memorandum.

Learn more: see Caltrans' Park and Ride Program Resource Guide at <https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/managed-lanes/f0019533-park-and-ride-program-resource-guide.pdf>.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—					—		All

C. Transit Service Improvements / Expansions

Strategy 18. Expanding Coverage/Adding New Bus Transit Services

The addition of bus service on existing or new routes to better serve customers can be an effective strategy to reduce emissions by improving the overall transit system for both rural and urban communities. When combined with electric and other alternatively fueled fleets, air quality co-benefits and carbon emission reductions may be increased. Moreover, increasing transit ridership is essential to reach maximum emission reductions and air quality benefits that can be produced by these strategies.

Depending on transit routes selected for expansion or new service, equity can also be enhanced if they are serving underserved or marginalized communities. Expanding or adding new bus services can also contribute to both consumer savings for new transit riders and even promote economic development by increasing the need for more transit bus drivers. Transit expansions have been documented to be a safer mode of travel than private vehicles.⁵⁶

Public transportation projects are eligible for CRP funding as described under Section (G)(3)(B) of FHWA's CRP guidance memorandum. The air quality and carbon emission impacts will be determined by the amount of vehicle miles reduced and, to some extent, the fuel used in the new transit system.

Learn more: The Georgia DOT Statewide Transit Plan discusses the need for regional coordination among transit agencies to improve transit access and coverage: <https://www.dot.ga.gov/InvestSmart/Transit/Documents/TransitPlan/2020%20SWTRP%20Plan/2%20Statewide%20Transit%20Plan%20Final%20Report.pdf>

⁵⁶ <https://www.modeshift.com/is-public-transportation-safer-than-individual-transport/#:~:text=Furthermore%2C%20he%20adds%20that%20using,when%20compared%20to%20personal%20transportation.>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—							All

Strategy 19: Expanding Coverage/Adding New Rail Transit Services

This strategy consists of adding rail service on existing or new routes to customers. Similar to the expansion and new bus transit services strategy, rail services that are not being developed with additional carbon reduction emissions in mind, such as upgrading fuel rail trains to utilize alternative fuels, have limited potential to produce air quality co-benefits and reduce emissions derived from their operations. Nevertheless, rail ridership reflects reduced vehicular trips which does contribute to reduced vehicular emissions. Mobility is also positively impacted whenever rail transit services are expanded or added.

Additionally, public outreach and marketing strategies will play an essential role in attracting new transit rail riders. By riding rail, users are also subjected to safety and mobility benefits through the reduction of vehicular trips. Safety benefits are incurred for rail riders by avoiding roadway traffic as statistics highlight driving to be more dangerous than riding rail. Jobs can also be created by expanding coverage by increasing the demand for maintenance and conductors to support rail operations.

Public transportation projects are eligible for CRP funding as described under Section (G)(3)(B) of FHWA's CRP guidance memorandum.

Learn more: The Georgia DOT Statewide Transit Plan prioritizes the expansion of rail transit services:

<https://www.dot.ga.gov/InvestSmart/Transit/Documents/TransitPlan/2020%20SWTRP%20Plan/2%20Statewide%20Transit%20Plan%20Final%20Report.pdf>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—							All

Strategy 20. Add New Express Bus Services

This strategy coincides with quicker transit options, such as bus rapid transit to new express bus routes, through the addition of new bus service to customers that provides faster than normal bus services between destinations with some express routes oriented around expressways⁵⁷. This strategy has similar limitations and benefits as other transit-focused strategies listed throughout this document but has a higher potential to increase mobility as these faster transit services may attract new transit riders to shift from driving to their destination.

⁵⁷ <https://www.transit.dot.gov/research-innovation/bus-expressway>

New transit services are eligible for CRP funding as described under Section (G)(3)(B) of FHWA's CRP guidance memorandum.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—							All

Strategy 21. Increasing Frequency of Transit Services

This strategy differs from express bus transit services because it solely focuses on the decrease in bus arrival time between destinations, which can be accomplished by increasing the number of buses being operated on a single transit route. Increasing the frequency of transit services offers similar benefits to other transit-related strategies as it may also require additional public outreach and marketing strategies to attract new riders. Safety benefits are well documented with the implementation of this strategy.⁵⁸

Public transportation projects are eligible for CRP funding as described under Section (G)(3)(B) of FHWA's CRP guidance memorandum. Transit service improvement projects are potentially eligible for CRP funding as they maximize the potential for mode shift from personal vehicles according to FHWA's CRP guidance memorandum. Additionally, transit service improvements may be eligible for FTA funding, which can be flexed with CRP funding as described under Section (C)(3) of FHWA's CRP guidance memorandum.

Learn more: The Washington State Department of Transportation conducted a transit frequency study to develop recommendations for service improvements:

<https://wsdot.wa.gov/sites/default/files/2022-12/Frequent-Transit-Service-Study-Initial-Report-Dec2022.pdf>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—			—							All

Strategy 22. Transit Reliability Improvements

Transit reliability improvements may be realized by installing live bus tracking to communicate with drivers on whether they are running on time, late, or too fast in real-time. Additionally, real-time bus tracking technology also improves customer's experiences by providing users with information on whether their bus is delayed or already passed, which can thereby increase the reliability of the transit system. New transit riders may be attracted to the system by marketing and educating the public about transit reliability enhancements. Implementing fixed-route intelligent transportation systems (ITS) that supports real-time bus tracking is increasing among transit agencies statewide, however, readiness factors are dependent on funding and technical expertise to install and maintain such technology.

⁵⁸ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9759415/>

Transit service improvement projects are potentially eligible for CRP funding as they maximize the potential for mode shift from personal vehicles according to FHWA's CRP guidance memorandum. Additionally, transit service improvements may be eligible for FTA funding, which can be flexed with CRP funding as described under Section €(3) of FHWA's CRP guidance memorandum.

Learn more: The Pennsylvania Department of Transportation is implementing a Fixed-Route Intelligent Transportation Systems (FRITS) program to deploy modernized transit technology on all its public transit fleets statewide : <https://www.penndot.pa.gov/Doing-Business/Transit/InformationandReports/Documents/PennDOT%20Group%20TAM%20Plan%209.2022.pdf>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—			—							All

Strategy 23. Dynamic Transit/ Demand-Response Transit

Dynamic transit and demand-response transit services are a non-fixed-route, flexible transit service. Demand-response transit provides curb-to-curb or door-to-door pickups and drop-offs on customers' request and usually requires advanced scheduling by the customer. These transit services often serve customers that are disabled, elderly, or individuals in areas with inadequate fixed-route services. As a result, the availability of dynamic and demand-response transit services directly advances transportation equity. However, these trips usually cost the rider and the transit system more than fixed-route services. With that being said, equity is further demonstrated in this strategy because trips are often heavily subsidized for this particular group of transit riders. Implementing dynamic transit and demand-response system that is efficient requires advanced reservation, scheduling, and dispatch technology that can be costly to operate.

Transit service projects such as demand-response transit are potentially eligible for CRP funding as they maximize the potential for mode shift from personal vehicles according to FHWA's CRP guidance memorandum. Additionally, demand-response transit projects are eligible for FTA funding, which can be flexed with CRP funding as described under Section €(C)(3) of FHWA's CRP guidance memorandum.

Learn more: A thorough description of demand-response transit services is provided by the FTA: <https://www.transit.dot.gov/regulations-and-guidance/access/charter-bus-service/demand-response-service-explained>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—			—							All

D. Transit Access Improvements

Strategy 24. Improving Nonmotorized Access to Transit

This strategy consists of enhancements to amenities that would encourage transit to be more accessible by walking and bicycling and removing barriers to transit access for individuals. Planning for proximate bike parking and bike/walk connectivity to transit can lead to increased ridership and demand for transit services. Depending on the project's implementation plan, safety benefits are uncertain due to whether complimentary strategies that emphasize safety are also leveraged. Implementing this strategy in rural areas may also be more difficult because those communities may have less existing pedestrian or cycling amenities and transit services.

Transit access improvement projects are potentially eligible for CRP funding as they maximize the potential for mode shift from personal vehicles according to FHWA's CRP guidance memorandum. Additionally, transit access improvements may be eligible as a capital project for FTA funding, which can be flexed with CRP funding as described under Section (C)(3) of FHWA's CRP guidance memorandum.

Learn more: The FTA published a manual focusing pedestrian and bicycle connections to transit: <https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/64496/ftareportno0111.pdf>

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating				—							All

Strategy 25. Microtransit/Commuter Shuttles

Microtransit and commuter shuttles are a similar type of on-demand mobility service that can be dispatched directly to riders and is usually provided by a private entity. Since the private sector may need to be engaged to implement such services, the implementation process may require additional coordination to identify and contract a microtransit or commuter shuttle provider. Nonetheless, this strategy directly increases transportation mobility by offering mobility services to destinations that cannot be easily accommodated with changes to the existing fixed-route transit network. For example, commuter shuttles are common to airport agencies to ensure that guests and employees have increased mobility to get to, from, and around the airport to destinations such as nearby parking lots or rent-a-car facilities.

Microtransit services and commuter shuttles may be eligible for FTA funding, which can be flexed with CRP funding as described in section (C)(3) of FHWA's CRP guidance memorandum.⁵⁹

Learn more: Both microtransit and commuter shuttles are considered to be shared-mobility concepts by the FTA, more information can be found by visiting this online resource: <https://www.transit.dot.gov/shared-mobility>

⁵⁹ <https://www.transit.dot.gov/are-micro-transit-services-eligible>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—							All

Strategy 26. Multimodal Transportation Centers/Mobility Hubs

Multimodal transportation centers and mobility hubs are designated multimodal places in a community that bring together public transit, bike share, car share and other ways for people to get where they want to go without a private vehicle. Mobility hubs advance mobility by ensuring that riders have a centralized access point to multiple transportation alternatives. This strategy may consequentially contribute to air quality co-benefits and reduce emissions as well as generate consumer savings by riding transit and saving money on fuel costs associated with operating a personal vehicle.

Multimodal transportation centers and mobility hubs may be eligible for FTA funding, which can be flexed with CRP funding as described un€ Section (C)(3) of FHWA's CRP guidance memorandum. In 2018, the FTA approved the construction of two multimodal transportation center projects under the discretionary Buses and Bus Facilities Infrastructure Investment Program⁶⁰.

Learn more: The Broward MPO published a program interview describing the leveraging of FTA funding and implementation of its regional mobility hubs program:

https://www.browardmpo.org/images/MobilityHubs_ProgramOverview_Tier2.pdf

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—			—							All

E. Land Use and Community Design

Strategy 27. Transit-Oriented Development

Transit-oriented development refers to land use and development patterns that are designed to promote transit and mobility by strategically implementing a diverse mix of real estate development concentrated around a transit facility that provides access to reliable public transit and other mobility services. Equity may be woven into this strategy by mandating or incentivizing developers to provide affordable housing units. This strategy can conduce air quality co-benefits and reduce carbon emissions for residents living in transit-oriented communities because they will be able to live a car-free lifestyle by having increased transit and mobility options nearby. Consumer savings can be generated for residents in the community by reducing the need for them to own a personal vehicle to reach their jobs, eat, shop, and




















⁶⁰ <https://www.witn.com/content/news/Grant-allows-for-multimodal-transportation-center-in-Jacksonville-478931133.html>

complete many other daily activities. This strategy is applicable to urbanized communities due to the higher development density requirements of transit-oriented development.

Such a project is described as potentially eligible under Section (C)(3) of FHWA's CRP guidance memorandum, which notes that CRP funding recipients are encouraged to use funding flexibility for transit or multimodal-related projects that incorporate several strategies, including using equitable and sustainable practices while developing TOD.

By reducing the need for vehicle trips, land use strategies can be among the most effective at reducing vehicle miles traveled, but typically operate over a long time horizon.

Learn more: The FTA has a webpage that houses a plethora of resources on planning, designing, and implementing TOD projects: <https://www.transit.dot.gov/TOD>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—			—							Urban

Strategy 28. Infill Development

Infill development is a smart growth approach to adding new development on land that is vacant or undeveloped in urban communities to increase residential and/or commercial density thereby promoting walkability communities through increased pedestrian and connectivity. In projects with an existing or proposed cycling network, implementing this strategy with bike lanes can increase cycling connectivity for the neighborhood. Auto-dependency can be reduced by this strategy which can lead to air quality co-benefits, consumer savings, and transportation-source emission reductions. Infill developments that contribute to increased walkability and mobility have the potential to increase the livability and vibrancy of a community, which can further contribute to economic development over time. Equity can be incorporated into this strategy by ensuring affordable housing units are developed in the infill development process.

Such a project is described as potentially eligible under Section (C)(7) of FHWA's CRP guidance memorandum, which states that under the priorities of climate change and sustainable development, FHWA is encouraging recipients of CRP funds to support projects fiscally responsible land use and transportation efficient designs.

Learn more: See FHWA's Public Roads article published in July/August 2015 on Changing the Landscape of Livability, which provides an example of an infill development project: <https://highways.dot.gov/public-roads/julyaugust-2015/changing-landscape-livability>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—			—							Urban

5.3 Category 2: Operational Efficiency Improvements

This set of strategies addresses how GDOT, and other transportation agencies manage and operate the transportation system to optimize system performance, reduce unnecessary delay, and smooth traffic flow to reduce motor vehicle emissions. These strategies often rely on ITS technologies and coordination across different agencies operating services, as well as more advanced techniques, such as connected vehicle technologies.

Section (G)(3)(L) of FHWA's CRP guidance memorandum notes that certain types of projects to improve traffic flow that are eligible under CMAQ and do not involve construction of new capacity are eligible under CRP, citing 23 U.S.C. 149(b)(5). That section of Federal law states projects that, "improve traffic flow, including projects to improve signalization, construct high-occupancy vehicle lanes, improve intersections, add turning lanes, improve transportation systems management and operations that mitigate congestion and improve air quality, and implement intelligent transportation system strategies and such other projects", are eligible. Thus, strategies in this section are generally expected to be eligible, as discussed for each below.

5.3.1 Event Management

A. Traffic Incident and Work Zone Management

Strategy 1. Incident Detection and Verification

This strategy helps with determining if an incident of some type has occurred. Incidents may be detected in person by motorists or response personnel or automatically using crowdsourcing (i.e., electronic loop detectors and associated incident detection algorithms). Verification is the determination of the precise location and nature of the incident.

Accurate and detailed information about the incident can help to ensure that the most appropriate personnel and resources are dispatched to the scene. Verification can be accomplished in the field utilizing on-site response personnel or remotely using video detection. This strategy may be considered eligible for CRP funding under Sect€ (G)(3)(D), (G)(3)(E) or (L) of FHWA's CRP guidance memorandum.

Proper incident detection and verification can help transportation agencies alert roadway users quicker and reduce clearance time, which can prevent further congestion and delays. Since congestion from cars idling in traffic adds to carbon emissions, having an efficient incident detection process can help meet carbon reduction goals. This strategy also has a strong safety component to it by helping streamline emergency response and traffic management.

Learn more: FHWA's [Traffic Incident Management](#) page can provide further information on incident management, as well as FHWA's [Best Practices in Traffic Incident Management](#) report.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Develop-ment	Eligibility	Context
Rating		—									All

Strategy 2. Traffic Incident Management Coordination

This strategy focuses on the planning and coordination efforts between various stakeholders for traffic incident management. It requires active and ongoing coordination between law enforcement, transportation departments, and the responder community (e.g., fire, EMS, and towing), including after action reviews/debriefs to continually identify areas for improvement. This strategy is considered eligible for CRP funding under Section (G)(3)(A) or (L) of FHWA's CRP guidance memorandum. Resiliency benefits can incur through the implementation by mitigating the impacts of disruptive events such as accidents,

By helping make traffic incident management more efficient through thoughtful coordination, this strategy can help limit traffic delays and congestion from incidents, thus reducing motor vehicle emissions. With the end result being vehicle emissions reduction, traffic incident management coordination can contribute to carbon reduction. This strategy also has a strong safety component to it by helping streamline emergency response and traffic management.

Learn more: FHWA's [Traffic Incident Management](#) page can provide further information on incident management, as well as FHWA's [Best Practices in Traffic Incident Management](#) report.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 3. Towing Programs

Towing and recovery operations clear the roadway of disabled or damaged vehicles and their cargos, restoring the roadway to its full capacity. Timely dispatch of appropriate towing and recovery assets to an incident scene can be facilitated through towing and recovery companies who have been pre-approved and on-call. This strategy could be considered eligible for CRP funding under Section (G)(3)(A) or (L) of FHWA's CRP guidance memorandum.

Efficient towing and recovery operations can decrease incident clearance times, leading to less roadway congestion and delays. This helps reduce vehicle emissions, thus contributing to carbon reductions. Similar to other traffic incident strategies, towing programs have a notable safety component to them by helping clear roadways quickly.

Georgia already has a successful [Towing and Recovery Incentive Program](#) (TRIP) that is currently being implemented in the metro Atlanta area, with plans to expand statewide. GDOT created an [online dashboard](#) that provides information on response times, activations, and more.

Learn more: FHWA's [Best Practices in Traffic Incident Management](#) report helps show how towing and recovery operations can fit into traffic incident management efforts.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 4. Work Zone Traffic/Pedestrian Control and Alerts

This strategy focuses on information, actions, and plans to address how vehicles will move safely through a work zone. Work zone traffic / pedestrian control and alerts involves both site traffic control and internal traffic control. Examples of site traffic control include incident management service patrols, portable changeable message signs, selective on-ramp closures, and temporary rumble strips. Internal traffic control can include designated entry and exit points, as well as buffer zones using cones, barriers, etc. to separate work zones from general traffic.

This strategy could be considered eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. Work zone traffic/pedestrian control and alerts help keep roadways running smoothly despite potential disruptions to lanes and traffic patterns due to construction. By helping optimize the available roadway space, proper implementation of this strategy can help limit congestion, reduce vehicle emissions, and contribute to carbon reductions.

Learn more: FHWA's Office of Operations [Traffic Control website](#) can provide further information on resources work zone traffic control. Pavement Interactive's [website on work zone traffic control](#) best practices provides more detail on examples of traffic control.

Criterion											
	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 5. Work Zone Demand Management

Work zone demand management focuses on actions to encourage people to avoid traveling on an affected route, to shift their time of travel, or use other modes. This strategy particularly works for large projects that have long-lasting impacts on road capacity. Examples of this strategy can include transit incentives, telecommuting and variable work hours, park and ride promotions, and more.



This strategy could be considered eligible for CRP funding under Section (G)(3)(H) of FHWA's CRP guidance memorandum. These methods help reduce travel on work zone roadways, which helps reduce vehicle emissions and contributes to carbon reduction. Although this strategy may be implemented for work zones specifically, many of the examples of work zone demand management (e.g., transit incentives) can have a larger impact on mode choices people make.

Learn more: A list of work zone demand management strategies can be found in [this document](#) from Minnesota DOT.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 6. Work Zone Speed Management

Work zone speed management includes a variety of methods and technologies that can be used to help manage and enforce speed limits in work zones. These methods include variable speed limit systems, automated enforcement, law enforcement, and speed advisory systems.

This strategy could be considered eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. Speed management in work zones improves the safety of roadways, which can help limit further incidents and ensure the flow of traffic stays consistent. This helps reduce vehicle emissions and contributes to carbon reduction.

Learn more: FHWA's [Work Zone Speed Management website](#) provides further information on examples and resources relates to this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

5.3.2 Facility Management

A. Arterial Management

Strategy 7. Traffic Signal Improvements

Traffic signal improvements can include a variety of methods that help improve traffic flow and minimize vehicle queues. Examples of improvements include traffic signal coordination, adaptive signals, and emergency vehicle preemption.

This strategy is eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. By helping maintain or improve traffic flow and limiting vehicle idling, this strategy reduces vehicle emissions and contributes to carbon reduction.

Learn more: Chapter 6 of FHWA's [Traffic Signal Timing Manual](#) provides more information on traffic signal coordination.





















											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 8. Traffic Signal Coordination

Traffic signal coordination focuses on synchronizing the timing of multiple intersections in order to improve traffic flow and minimize vehicle queues. This strategy can be considered a type of traffic signal improvement.

This strategy is considered eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. By helping maintain or improve traffic flow and limiting vehicle idling, this strategy reduces vehicle emissions and contributes to carbon reduction.

Learn more: Chapter 6 of FHWA's [Traffic Signal Timing Manual](#) provides more information on traffic signal coordination.

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating		—									Urban

Strategy 9. Adaptive Traffic Signals / Smart Signals and Intersections

This strategy involves equipment and software to make timing changes to traffic signals in response to traffic conditions with timing calculated in real-time based on traffic demand. This can adjust with each cycle using automated algorithms rather than predetermined timing plans.

This strategy is eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. By helping maintain or improve traffic flow and limiting vehicle idling, this strategy reduces vehicle emissions and contributes to carbon reduction.

Learn more: Washington State DOT's [webpage](#) on adaptive signals provides further information on strategy implementation.

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating		—									Urban

Strategy 10. Access Management

Access management involves street design techniques that control where vehicles enter and exit a roadway. Techniques can include access spacing, driveway spacing, safe turning lanes, median treatments, and right-of-way management. This strategy can improve traffic flow, reduce crashes, and minimize vehicle conflicts.

This strategy could be considered eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. Effective implementation of access management techniques can reduce travel delays and maximize efficiency, thus contributing to vehicle emissions and carbon reductions.

Learn more: FHWA's [Access Management website](#) provides further information on this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 11. Curb Space Management

Curb space management focuses on actions that promote organizing the use of curb space to optimize a variety of uses. This strategy can have a particular impact on efficient delivery in urban areas with methods like off-hours delivery program, a parking reservation system, urban delivery permits, loading/unloading goods, and color-coded loading zones. Other methods can include pickup/drop off for passengers, clearing the way for transit, and/or bicycle and pedestrian activity.

This strategy could be considered eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. By making more efficient use of curb space, this strategy can contribute to carbon reductions efforts. Proper curb space management can reduce the amount of waiting or circling, especially for freight drivers, and prevent unsafe staging.

Learn more: NACTO's [Curb Appeal guidance document](#) provides further information on this strategy, as well as [ARC's TSMO Local Agency Deployment Guide](#).

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											Urban

Strategy 12. Signal Alternatives or Removal

Signal alternatives or removal are tools for managing traffic at intersections. Common tools are roundabouts and stop signs. Roundabouts help allow for slow but continuous traffic flow, while stop signs provide a simple, low-cost option to manage low traffic volumes and improve bicycle/pedestrian safety. Signal removal may make sense for intersections with low traffic volumes that have been studied to show a signal may not be needed. Signal alternatives may help with any safety, congestion, or environmental concerns.

This strategy is eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. Correct signal choices can help reduce the number of start/stop conditions and vehicle idling in an area, which can contribute to carbon reduction efforts.

Learn more: Washington State DOT's [webpage](#) on signalization & signal alternatives or removal provides further guidance on this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 13. Dynamic Lane Reversal or Contraflow Lane Reversal

Dynamic lane reversal, also known as contraflow lane reversal, focuses on the reversal of lanes to temporarily increase the capacity of congested roads during rush hour and emergency evacuation. This dynamic strategy allows congested roadways to adjust capacity based on traffic demand throughout the day (off-peak versus peak hours). Bridges and tunnels are common places to implement dynamic lane reversal, however this strategy can be applied throughout freeways or arterials. This strategy can also be implemented for managed lanes (e.g., bus only lanes in a tunnel).

This strategy is eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. The ability to add capacity to a roadway during high-demand hours helps limit vehicle idling and congestion, which helps reduce emissions and contributes to carbon reduction.

Learn more: FHWA's [Active Traffic Management Feasibility and Screening Guide](#) includes information on dynamic lane reversal.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 14. Intersection Improvements

Intersection improvements focus on construction or improvement relating to intersections, often to improve safety or capacity. Improvement methods can include the construction, installation or upgrade of traffic control devices, turn lanes, raised medians, bicycle lanes, and roundabouts.

This strategy could be considered eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. For a relatively low cost, intersection improvements can help maximize capacity/reduce delays, allowing for less congestion and contributing to carbon reduction efforts. This strategy can also increase safety at intersections by reducing collisions.

Learn more: The Texas A&M Transportation Institute's [fact sheet](#) on intersection improvements provides further guidance on this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

B. Freeway Management

Strategy 15. Adaptive Ramp Metering (Ramp Control)

Adaptive ramp metering, also referred to as ramp control, utilizes traffic control devices such as signals at entrance ramps to limit the number of vehicles entering traffic. This is done to reduce

freeway congestion and make the merge of vehicles entering the freeway from an entrance ramp smoother. Adaptive ramp metering changes the level of control based on traffic.

This strategy could be considered eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. It limits on-ramp volumes and increases average speeds, which can result in reduced congestion and fewer incidents. All of this can help contribute to carbon reduction efforts.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 16. Dynamic Junction Control

Dynamic junction control involves the management of vehicle entry in a specific area using traffic signals to open or close traffic lanes based on traffic demand. The dynamic aspect of this strategy automatically manages vehicle entry to help with merging. Light-up signs can be utilized to open or close an extra lane at an exit or entrance ramp based on traffic demand.

This strategy could be considered eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. This strategy can help delay or stop congestion, improve safety, and increase throughput. By increasing capacity and reducing congestion, dynamic junction control can help achieve carbon reduction.

Learn more: The Texas A&M Transportation Institute's [fact sheet](#) on dynamic merge control provides further guidance on this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 17. Variable Lane Use Control

Variable lane use control involves the usage of variable message signs to indicate information about specific lane openings or closures. The lane may change during specific times of day or during traffic incidents to maximize road capacity or help prevent secondary incidents. This strategy can either be implemented through preset arrangements or dynamically. Preset arrangements will have lanes open at a set time of day (e.g., peak periods). Dynamic lane use control allows for opening or closing lanes based on specific needs (e.g., an accident).

This strategy could be considered eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. By helping maximize road capacity, this strategy can reduce congestion and contribute to carbon reduction efforts.

Learn more: Florida DOT's [TSMO Strategy Guide](#) provides further information on dynamic lane use control.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 18. Queue Warning

Queue warning systems utilize traffic signs, flashing lights, or portable changeable message signs to communicate to drivers about traffic conditions, such as delays. Information about conditions can help drivers navigate heavy traffic. This strategy can be particularly helpful in areas with low driver awareness (e.g., temporary lane closures or rural areas).

This strategy could be considered eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. Queue warning systems can help reduce crashes and severity of crashes, delay congestion, and decrease emissions, noise, and fuel consumption.

Learn more: More information on queue warning systems can be found in [ARC's TSMO Local Agency Deployment Guide](#), as well as Florida DOT's [TSMO Strategy Guide](#).

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 19. Variable Speed Limits



This strategy utilizes speed limit signs that can change when roadway sensors detect congestion or dangerous weather conditions. If something is detected, the speed limit will automatically lower to slow traffic evenly and delay congestion. Variable speed limits can also be especially helpful for reducing speeds when approaching work zones. For increased impact, speed limit signs can be used in conjunction with automated speed enforcement and real-time traveler information.



Photo Courtesy GDOT Flickr

This strategy could be considered eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. By helping keep traffic flowing smoothly, this strategy limits increased vehicle emissions from slowdowns, thus contributing to carbon reductions.

Learn more: More information on variable speed limits can be found in [ARC's TSMO Local Agency Deployment Guide](#).





											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 20. Temporary Shoulder Use

Temporary shoulder use involves allowing vehicles to drive on the shoulder of a road, typically at reduced speed limits, to make room for more traffic during peak periods. This strategy can be implemented in a variety of ways. The shoulder can be open during designated time periods, or it can be dynamic based on real-time conditions. The shoulder can also be open to all vehicles, or it can be open to transit vehicles only.

This strategy could be considered eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. Temporary shoulder use helps increase capacity, avoid congestion, and decrease crash rates through improved operating conditions.

Learn more: More information on temporary shoulder use can be found in Texas A&M Transportation Institute's temporary shoulder use [fact sheet](#).

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 21. Managed Lanes

Managed lanes involve the strategic operation of traffic lanes to provide special lane access to vehicles based on roadway conditions. Often managed lanes are executed through controlling pricing, vehicle eligibility, or access control. Example facilities include high-occupancy vehicle (HOV) lanes, high-occupancy toll (HOT) lanes, express toll lanes, truck-only lanes, and bus only lanes.

This strategy is eligible for CRP funding under Section (G)(3)(H) or (L) of FHWA's CRP guidance memorandum. By increasing speed, efficiency, and travel time reliability through additional travel options and capacity, this strategy helps limit vehicle emissions and contribute to carbon reduction.

Learn more: FHWA's [Integrated Corridor Management, Managed Lanes, and Congestion Pricing: A Primer](#) provides further information on this strategy, as well as Texas A&M Transportation Institute's managed lanes [fact sheet](#).

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									Urban

Strategy 22. Road Weather Advisory Strategies

Road weather advisory strategies focus on providing information on current or predicted conditions to roadway users and transportation managers. Information is often provided through dynamic message signs. To reduce the impacts of adverse weather conditions, weather-responsive strategies (WRMS) such as enhanced motorist alerts and advisories thereby improving the transportation system's safety and resiliency.⁶¹

This strategy could be considered eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. Similar to other road weather strategies, advisory strategies can help make roadways safer and limit weather related incidents. By improving roadway efficiency, this strategy helps limit vehicle emissions and contribute to carbon reductions.

Learn more: FHWA's [Road Weather Management page](#) provides further information on road weather strategies, as well as this [FHWA page](#).

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating		—							—		All

Strategy 23. Road Weather Control Strategies

Road weather control strategies help regulate traffic flow according to current weather

conditions by altering the state or use of the roadway. These strategies can help regulate roadway capacity due to hazardous conditions through methods like reducing speed limits with variable speed limit signs, opening shoulder lanes for additional capacity as an evacuation procedure, and modifying traffic signal timing based on pavement conditions, which may be impacted by current weather conditions including snow, rain, or ice. Communication mechanisms, sensor configurations, and software tools are deployed by over twenty (20) states around the country to generate and optimize the use of road weather data and information. ⁶¹

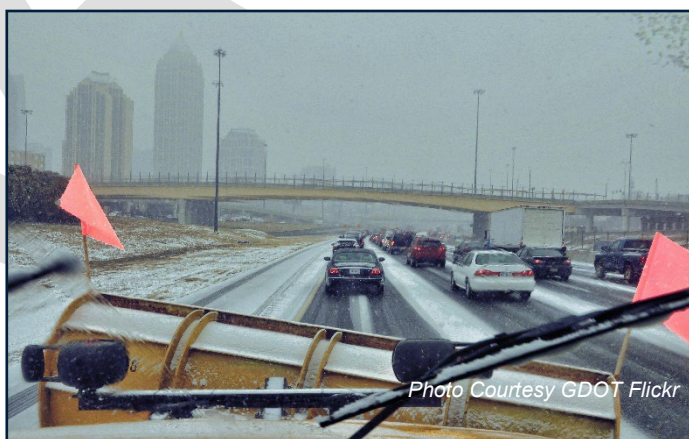


Photo Courtesy GDOT Flickr

This strategy could be considered eligible for CRP funding under Section (G)(3)(L) of FHWA's CRP guidance memorandum. Similar to other road weather strategies, advisory strategies can help make roadways safer and limit weather related incidents. By improving roadway efficiency, this strategy helps limit vehicle emissions and contribute to carbon reductions.

⁶¹ <https://ops.fhwa.dot.gov/publications/fhwahop20015/fhwahop20015.pdf>

Learn more: FHWA's [Road Weather Management page](#) provides further information on road weather strategies, as well as this [FHWA page](#).

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	Emissions	Savings	Development	Eligibility	Context
Rating		—							—		All

C. Public Transportation Operational Improvements (improvements to the speed and efficiency of bus operations)

Strategy 24. Transit Signal Priority

Transit signal priority uses technology (e.g., GPS, radios) to enable communication between transit vehicles and traffic signals. This communication reduces the amount of time transit vehicles (typically buses) wait at red lights by keeping lights green a little longer if a transit vehicle is detected, allowing transit to pass through the light without having to stop.

This strategy is eligible for CRP funding under Section (G)(3)(D) of FHWA's CRP guidance memorandum. This strategy helps improve the efficiency and reliability of transit in urban areas and limits transit vehicle idle times. For these reasons, transit signal priority contributes to carbon reduction efforts. Such strategies can magnify their air quality and carbon emission benefits by making transit more efficient and thus more desirable.

Learn more: The ITS Joint Office Program's [webpage](#) on TSP provides further information on this strategy.






















											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	Emissions	Savings	Development	Eligibility	Context
Rating											Urban

Strategy 25. Bus Only Lanes

Bus only lanes involve a portion of a street being designated for preferential or exclusive use by transit vehicles. These lanes are often separated by signs and markings. Bus only lanes can either always only be for transit, or they may permit limited use by other vehicles.

This strategy is considered eligible for CRP funding under Section (G)(3)(B) of FHWA's CRP guidance memorandum. Similar to other transit strategies in this section, bus only lanes help improve the efficiency and reliability of transit in urban areas and limits transit vehicle idle times. For these reasons, this strategy contributes to carbon reduction efforts.

Learn more: NACTO's [Transit Street Guide Design](#) provides further information on this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											Urban

Strategy 26. Transit Queue Jump Lanes at Signalized Intersections

Transit queue jump lanes involve the use of separate lanes and signals to allow only a bus to proceed through an intersection. This can be done through a leading bus interval or active signal priority to help a bus get into a priority position in the traffic flow. Through this process, the bus “jumps” past other vehicles.

This strategy is eligible for CRP funding under Section (G)(3)(D) or (L) of FHWA’s CRP guidance memorandum. Similar to other transit strategies in this section, transit queue jump lanes help improve the efficiency and reliability of transit in urban areas and limits transit vehicle idle times. For these reasons, this strategy contributes to carbon reduction efforts.

Learn more: NACTO’s [Transit Street Guide Design](#) provides further information on this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											Urban

Strategy 27. First-mile/Last-mile Connectivity Strategies

First-mile/last-mile connectivity strategies help bridge the gap between transit and a rider’s origin or final destination, such as home or work. There are a variety of methods that can be used to make this connection between origin and destination. Strategies include bicycle on transit accommodations, wayfinding and information, bicycle network improvements, access connections, pedestrian network improvements, crossing treatments, micromobility (e.g., bike and scooter sharing), car sharing, and rail/bus stop enhancements.

First-mile/last-mile strategies can help expand access to jobs and other essential destinations in Georgia, thus contributing to equity, mobility, and economic development efforts. These strategies can also have multiplicative effects as they can enhance the desirability of transit over driving, when drivers know they can connect easily to their final destination.

This strategy could be considered eligible for CRP funding under Section (G)(3)(H) of FHWA’s CRP guidance memorandum. By bridging the gap between transit and rider origins, first-mile/last-mile strategies help make transit more accessible and reduce the need for driving. More people utilizing transit means fewer SOVs on the road that are increasing vehicle emissions. For these reasons, this strategy contributes to carbon reduction efforts.

Learn more: UTA’s [First/Last Mile Strategies Study](#) provides further information on this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											Urban

5.3.3 Multimodal Support and Demand Management

A. Active Transportation and Demand Management (ATDM)⁶²

Strategy 28. Bicycle/Pedestrian Traffic Signals and Signal Timing

The following three strategies help provide better service and safety for pedestrians and cyclists to encourage these nonpolluting modes of travel. All are eligible for CRP funding under Section (G)(3)(C) of FHWA's CRP guidance memorandum.

This strategy provides dedicated traffic signals to provide service traffic coordination for pedestrians and bicyclists. Strategies include signal coordination, concurrent phasing, exclusive pedestrian phasing, split phasing, leading pedestrian interval, guidance for bicyclists at signalized intersections and left turn phasing. Pedestrian signal timing strategies can help provide better service and safety for pedestrians. Strategies include signal coordination, concurrent phasing, exclusive pedestrian phasing, split phasing, leading pedestrian interval, hot response, and left turn phasing.⁶³

Bicycle signals are a traffic control device that can be used along with a conventional traffic signal. They can "be installed at signalized intersections to indicate bicycle signal phases and other bicycle-specific timing strategies." Bicycle signals can be "used to improve identified safety or operational problems involving bicycle facilities or to provide guidance for bicyclists at intersections where they may have different needs from other road users."⁶⁴ See the Signal Improvements strategies (Category 2, Strategy 7) for more general information.

Learn more: NACTO and FHWA have provided information, see footnotes 63 and 64, respectively.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—							Urban

⁶² Note the similarity of strategies in this section to those of Category 1, Subset 2 (Multimodal Travel Choices and Travel Behavior).

⁶³ <https://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/bicycle-signal-heads/>

⁶⁴ http://pedbikesafe.org/PEDSAFE/countermeasures_detail.cfm?CM_NUM=47

Strategy 29. Traffic Calming/Operations to Support Bicycle/Pedestrian Activity

As with Strategy (2)(28), this strategy is intended to provide better service and safety for pedestrians and cyclists to encourage these nonpolluting modes of travel and are eligible under Section (G)(3)(C) of FHWA's CRP guidance memorandum.

Traffic calming is an approach to making streets safer and more conducive for bicycles and pedestrians by slowing down cars. Traffic calming strategies include speed bumps and humps that enables driver to slow down to cross over them, traffic diversion through designs like traffic circles and chicanes, and surface texture and visual devices like pavement markings. On-road and separated bicycle facilities, lane markings, wider sidewalks, median crossing islands, and other uses of the street corridor space also support bicycle/pedestrian safety and use.

Learn more: FHWA's traffic calming course on bicycle and pedestrian transportation:

https://safety.fhwa.dot.gov/ped_bike/univcourse/pdf/swless11.pdf

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—							Urban

Strategy 30. Micromobility

As with Strategy (2)(28), this strategy is intended to provide better service and safety for low-speed transportation, such as bikes and scooters. Encouraging these nonpolluting modes of travel are eligible under Section (G)(3)(C) of FHWA's CRP guidance memorandum.

Micromobility options include bicycles, scooters, and other low-speed devices that users can access on an as-needed basis. Micromobility options can be made available through a variety of service models, including station-based bike-sharing and dockless bike and scooter sharing. Micromobility devices are typically small (weighing less than 100 pounds), low speed (designed to travel at or below 20 mph), and may be motorized.

Learn more: See UC Berkeley's Shared Micromobility Policy Toolkit on Docked and Dockless Bike and Scooter Sharing at:

<https://escholarship.org/content/qt00k897b5/qt00k897b5.pdf?t=praizo#:~:text=SUMMARY-.Micromobility%20%E2%80%93%20the%20shared%20use%20of%20a%20bicycle%2C%20scooter%2C%20or,on%20an%20as%20needed%20basis.&text=Impact%20studies%20on%20micromobility%20are%20limited> and the Pedestrian and Bicycle Information Center's Info Brief on micromobility at: https://www.pedbikeinfo.org/cms/downloads/PBIC_Brief_MicromobilityTypology.pdf

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—							Urban

B. Parking Management

Strategy 31. Dynamic Wayfinding

This and the following three strategies are demand management strategies intended to use parking management to moderate travel demand. All would be eligible under Section (G)(3)(H) of FHWA's CRP guidance memorandum.

Dynamic wayfinding “is the practice of providing real-time parking-related information to travelers associated with space availability and location to optimize the use of parking facilities and minimize the time spent searching for available parking. In an ATDM approach, the parking availability is continuously monitored and routing information to the parking space is provided to the user.”

Learn more: See FHWA's Active Parking Management page at <https://ops.fhwa.dot.gov/atdm/approaches/apm.htm>.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—				—	—		Rural

Strategy 32: Dynamic Parking Reservation

This strategy is intended to use parking demand management to moderate travel demand and is eligible under Section (G)(3)(H) of FHWA's CRP guidance memorandum.

Dynamic parking reservation “provides travelers the ability to utilize technology to reserve a parking space at a destination facility on demand to ensure availability. In an ATDM approach, the parking availability is continuously monitored, and system users can reserve the parking space ahead of arriving at the parking location.” Parking reservations can be applied at destination locations and for park and ride lots. This strategy has the potential to influence travel demand and mode choice via pricing and potentially to reduce the number of parking spaces needed by encouraging more efficient use of available parking.

Learn more: See FHWA's Active Parking Management page at <https://ops.fhwa.dot.gov/atdm/approaches/apm.htm>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—				—	—		Urban

Strategy 33. Dynamic Overflow Transit Parking

This strategy is intended to use parking demand management to moderate travel demand and would be eligible under Section (G)(3)(H) of FHWA's CRP guidance memorandum.

Dynamic overflow transit parking “utilizes overflow parking facilities in the vicinity of transit stations and/or park-and-ride facilities when the existing parking facilities are at or near capacity.

The overflow parking [is] typically [parking constructed for another purpose but commonly] underutilized, such as large retail parking lots, and transit agencies could have agreements with these entities for occasional use of pre-designated, underutilized areas of the parking lots. In an ATDM approach, the parking demand and availability are continuously monitored, and real-time determinations are made if overflow parking is needed, and accompanying dynamic routing information would be provided to travelers.”

Learn more: See FHWA’s Active Parking Management page at <https://ops.fhwa.dot.gov/atdm/approaches/apm.htm>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—	 	  		—	—	  	Urban

Strategy 34. Preferential Parking for Carpools/Vanpools

This strategy is intended to use parking demand management to moderate travel demand and is eligible under Section (G)(3)(H) of FHWA’s CRP guidance memorandum.

This strategy involves prioritizing and reserving parking spaces for carpool or vanpool riders and typically includes reserving parking spots with the easiest access to a building entrance. This strategy may be applied at work sites, and also may be used in transit parking facilities, at major destinations, and on city streets.

Learn more: See the Washington State Department of Transportation’s Transportation Systems Management and Operations page on Parking designated for carpool or vanpool at: <https://tsmowa.org/category/transportation-demand-management/parking-designated-carpool-or-vanpool>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating			 	—		  		—	—	  	Urban

C. Real-time Traveler Information Improvements (travel information and advisories)

Strategy 35. Real-Time System Monitoring/Management Information

This traveler information strategy allows for the monitoring of real-time traffic and travel conditions of the major highways and corridors and may establish a stream of communication to share information and data collected with state and local governments as well as the traveling public. This strategy goes beyond real-time system information by ensuring information is shared between different jurisdictions. Real-time communication can contribute to safety benefits and improve mobility during unforeseen traffic events. This strategy can lead to an increased demand for traffic control technicians. The uncertainty of this strategy to reduce carbon emissions and create air quality co-benefits is due to the possibility that there may not be adequate alternatives for detouring during peak hours or heavy traffic.

Such a project could be eligible under Sections (G)(3)(A), (G)(3)(D) or (G)(3)(E) of FHWA's CRP guidance memorandum.

Learn more: FHWA provides an overview of Real-Time System Management Information systems: <https://ops.fhwa.dot.gov/1201/index.htm>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 36. Real-Time Traveler Information

This strategy involves traveler information systems that update drivers on current roadway conditions and other information important to their trips so they can make better travel choices either before making a trip or en route. This strategy is like the real-time monitoring and management information strategy except it does not necessarily ensure that monitoring and information is occurring between different agencies and jurisdictions. Most smartphones and other mobile devices have the capacity to receive real-time traffic alerts to help drivers be aware of traffic and possible travel alternatives.

Such a project could be eligible under Sections (G)(3)(A), (G)(3)(D) or (G)(3)(E) of FHWA's CRP guidance memorandum.

Learn more: FHWA provides examples of what types of projects can leverage real-time traveler information systems: <https://ops.fhwa.dot.gov/travelinfo/about/aboutus.htm>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 37. Variable Message Signs

Variable message signs, also referred to as Portable Changeable Message Signs (PCMS), may provide drivers with traveler information, detours, or directions, and help control the flow of traffic. LED message boards can be used to display variable message signs along highways and roadway corridors. The strategy difference between this strategy and real-time traveler information systems is that these signs can either be used in conjunction with or are not providing real-time traffic information as they may have to be manually updated on-site rather than remotely. Additionally, this strategy can also be implemented as part of installing vehicular-to-infrastructure communications equipment.

Such a project could be eligible under Sections (G)(3)(A), (G)(3)(D) or (G)(3)(E) of FHWA's CRP guidance memorandum.

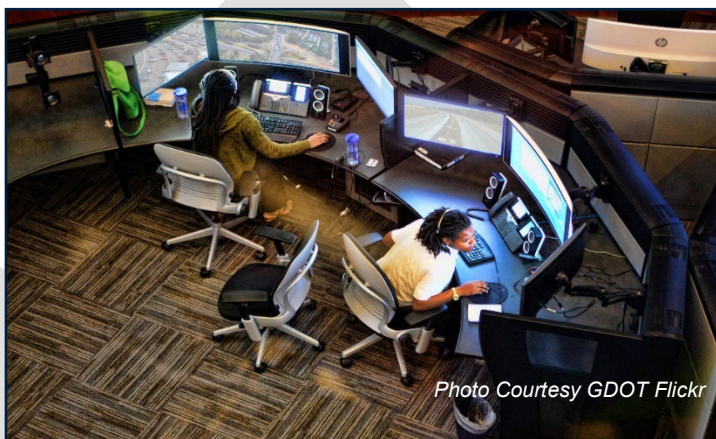
Learn more: FHWA developed a PCMS handbook for designing and implementing variable message signs:

<https://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltpa/reports/03066/>

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating		—									All

Strategy 38. Transportation Management Centers

The transportation management center (TMC) is the hub of most freeway management systems. This strategy revolves around the data about the freeway system that is collected and processed, combined with other operational and control data, and synthesized to produce information with the capacity to be distributed to stakeholders such as the media, other agencies, and the traveling public.



Like the other real-time strategies, TMCs may be implemented in both urban and rural areas to ensure that the transportation system is efficient statewide to support both personal travel and freight transportation. The implementation of the travel information systems is magnified in the existence of TMCs, but the deployment of these centers often requires institutional changes in decision-making and management across multiple traffic agencies statewide.

Such a project could be eligible under Sections (G)(3)(A) or (G)(3)(D) of FHWA's CRP guidance memorandum.

Learn more: See FHWA's TMC webpage: https://ops.fhwa.dot.gov/freewaymgmt/trans_mgmt.htm

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating		—									All

Strategy 39. Freight Advanced Traveler Information System

Freight Advanced Traveler Information Systems (FRATIS) is a bundle of technological applications that provide real-time information to freight drivers such as speeds, traffic volumes, incident reports, and route restrictions. This strategy is parallel to real-time travel information systems except that it focuses on enhancing freight travel throughout the state.

Such a project could be eligible under Sections (G)(3)(I) of FHWA's CRP guidance memorandum.

Learn more: The U.S. DOT Intelligent Transportation Systems Joint Program Office has an informative webpage discussing FRATIS

https://www.its.dot.gov/research_archives/dma/bundle/fratis_plan.htm

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

D. Transportation Demand Management⁶⁵

Strategy 40. Rideshare Support / Commuter Programs Support

Rideshare or commuter program support promotes carpooling and vanpooling by matching drivers and riders and helping them make connections. One way that public agencies can help with this support is by allowing commuters to create an account that the agency can use to match them. This helps make the formation of carpools and vanpools easier and more efficient, which can encourage participation.

This strategy could be eligible for CRP funding under Section (G)(3)(D) or (H) of FHWA's CRP guidance memorandum. By supporting the formation of carpools and vanpools, this strategy can help decrease SOV usage and vehicle emissions, thus contributing to carbon reduction efforts.

Learn more: More information on ridesharing can be found on FHWA's [congestion pricing website](#).

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

Strategy 41. Car Sharing

Car sharing involves individuals sharing one or more vehicles for traveling. Instead of investing and utilizing an SOV, individuals can share or rent a vehicle for a short period of time (e.g., hourly basis). The vehicles often have dedicated parking near destinations to encourage shared vehicle use. Air quality and carbon reduction benefits may be enhanced if the vehicle used for car sharing is an EV or ZEV.

This strategy might be eligible for CRP funding under the general priorities (G)(1) section if it were designed in a way to reduce overall emissions, for example by decreasing SOV usage by encouraging individuals to only use a car when necessary for short periods of time, by reducing demand by simplifying parking, by encouraging overall mode shift, etc. in a way that contributes to carbon reduction efforts.

⁶⁵ A.K.A. Advanced transportation and congestion management technologies



											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

Strategy 42. Priced Vehicle Sharing and Dynamic Ridesharing

Priced vehicle sharing is similar to standard ridesharing and enjoys the same benefits. Dynamic ridesharing involves advanced technology that assists travelers with arranging shared rides in real-time on short notice. Users typically pay on an hourly or daily charge and the process is typically completed through a smartphone or social network. The vehicle is available as needed but customers may avoid needing to own or reducing the number of cars owned. This strategy can be encouraged through apps, as well as signage and markings for pre-designated pickup locations near HOV facilities.

This strategy could be eligible for CRP funding under Section (G)(3)(D) or (G)(3)(H) of FHWA's CRP guidance memorandum. The real-time and dynamic aspect of this strategy helps reduce the number of vehicles/ vehicle trips occurring on often congested roadways. This reduction in vehicles and trips reduces vehicle emissions and contributes to carbon reduction efforts.

Learn more: FHWA's [webpage](#) on Active Demand Management provides further information on this strategy, as well as FHWA's [webinar](#) on dynamic ridesharing.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating				—							All

Strategy 43. Dynamic Rerouting

Dynamic rerouting provides real-time alternate driver directions/routes based on nearby traffic conditions. This allows drivers to take alternate routes when their typical route is blocked or congested. This strategy can be implemented through hybrid guide signs, dynamic message signs, broadcast media, and mobile communication.

This strategy could be eligible for CRP funding under Section (G)(3)(D) or (H) of FHWA's CRP guidance memorandum. This strategy helps reduce congestion, maximize capacity, and increase safety by providing alternate routes to roadway users. Reduced congestion and maximized capacity can contribute to carbon reduction efforts.

Learn more: Texas A&M Transportation Institute's [fact sheet](#) on dynamic rerouting provides further information on this strategy.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—									All

Strategy 44. Employer Incentives and Support

Employer incentives can be used by employers to encourage their employees to make travel changes, such as mode change, route alternatives, time of travel, and trip elimination. Common incentives to promote these changes include transit benefits, parking cash out programs, preferential parking for carpoolers/vanpoolers, organizing on-site ride matching, and awarding points and prizes. State or local agencies may also enact policies to provide employer incentives such as tax credits or matching funds.

This strategy could be eligible for CRP funding under Section (G)(3)(H) of FHWA's CRP guidance memorandum. Employer incentives motivate employees to take modes of transportation that differ from typical SOV commutes. By getting more people to shift their commute mode, this strategy helps decrease vehicle emissions and contribute to carbon reduction.

Learn more: Washington State DOT's [webpage](#) on employee incentives provides further information.

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Develop-ment	 Eligibility	 Context
Rating											All






















Strategy 45. Telecommuting and Flexible Work Arrangements

Telecommuting and flexible work arrangements involve having employees use technology solutions to work from home or another location, rather than commute by traditional means to a central place of work. Telecommuting can be implemented full-time or part-time (hybrid schedule) and can be set up formally or informally. An example of a flexible work arrangement can be a compressed work week (e.g., work four days per week for 10 hours per day) or customized work hours.

Allowing flexibility in employees' work schedules promotes a more equitable and enticing place to work for many individuals who have to manage work-life balance, thus making this strategy score higher on economic development and equity.

This strategy could be eligible for CRP funding under Section (G)(3)(H) of FHWA's CRP guidance memorandum. Telecommuting and flexible work arrangements promote reduced SOV commutes by employees. By getting more people to commute fewer days of the week, this strategy may help decrease vehicle emissions and contribute to carbon reduction from commute trips. However, recent evidence indicates this reduction in commute trips may be offset by other trips. A full consideration of the impacts should be considered.

Learn more: Washington State DOT's [webpage](#) on telecommuting provides further information.

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating											All

Strategy 46. Public Outreach and Marketing

Public outreach and marketing are designed to support ridesharing, transit, bicycling, and walking. Marketing and outreach methods may include a wide array of activities, including promotions, marketing campaigns, information sharing and assistance activities, and incentives. Outreach and marketing can also focus on specific events, such as “Try Transit Week.” TDM-related outreach and marketing activities may be designed to meet the community’s character by being adapted to the languages spoken to further equity goals. To increase the number of people utilizing nonmotorized transportation options, public outreach and marketing strategies are often deployed to bring awareness on available services, safety, and related issues. In tandem with related infrastructure investments, this strategy can generate consumer savings for travelers using transportation alternatives by saving on fuel costs and earning incentives. Combined with transit investments and service expansions, increasing transit ridership can be influenced by bringing awareness to these transit investments and alternatives through public outreach and marketing.

Public outreach and marketing can have a strong equity component to them when staff target outreach to disadvantaged populations and ensure the opinions of underrepresented populations are captured during these activities. Transportation equity and mobility is further advanced by this strategy by informing drivers and travelers on the wide array of transportation alternatives available in their area. Equity can also be incorporated into public outreach and marketing by ensuring that marginalized and underserved communities are targeted, including offering shared materials in different languages spoken in targeted areas. During the outreach and marketing process, equity can also be incorporated by reaching underserved and marginalized communities. Air quality co-benefits and emission reduction strategies can be realized by maximizing various outreach and marketing approaches to influence individual travel behaviors. By promoting public transportation and educating the public on alternative transit options, this strategy can help achieve higher transit ridership and lower SOV usage—thus, decreasing vehicle emissions.

Like the other public outreach and marketing strategies presented in this document, outreach and marketing are not listed as eligible projects under section (G)(3), but such activities, when consistent with administration priorities and the goals of the CRP as outlined in (G)(1), have been confirmed by the FHWA Georgia office⁶⁶ as eligible activities under the CRP depending on the subject.

Learn more: [Georgia Commute Options](#) serves as the state’s TDM program, and their services can be leveraged for outreach & marketing services.

⁶⁶ Confirmed by Habte Kassa, Asst. State Transportation Planning Administrator, 7/20/2023.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

E. Congestion Pricing

Strategy 47. Express Toll Lanes

All congestion pricing strategies use a fee system to shift traffic to off-peak periods or other transportation modes to reduce traffic congestion. As such, these projects are eligible for CRP funding under Section (G)(3)(H) of FHWA's CRP guidance memorandum. FHWA claims that congestion pricing "represents the single most viable and sustainable approach to reducing traffic congestion."⁶⁷ This and the next two strategies rely on tolls applied to different locations.

Express toll lanes use tolls (or partial facility pricing) on new or existing highway lanes to gain access to new capacity and reduce congestion. Drivers pay a fee to access the facility that has relatively lower congestion and proportionally higher speeds. This can be used to redistribute travel times, relieve congestion, and thus lower emissions.

This strategy can be considered a special pricing case of the Managed Lanes strategy (Strategy (2)(21)).

Learn more: See FHWA's Operations webpage at <https://ops.fhwa.dot.gov/congestionpricing/strategies/index.htm>.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—	—	—					—		All

Strategy 48. Pay as You Drive

This is also not a toll strategy but, as with the previous strategies, can be used to reduce vehicle travel or change periods of driving, thus affecting congestion. This suite of strategies making vehicle use costs, such as insurance, variable to provide drivers direct financial savings for reducing their driving. Some projects may use real-time data to price based on time and location of travel. The magnitude of air quality or carbon emission benefits would depend on the amount of VMT reduced.

Such projects are eligible under Section (G)(3)(H) of FHWA's CRP guidance memorandum.

Learn more: See FHWA's congestion Pricing page on this topic: https://ops.fhwa.dot.gov/congestionpricing/strategies/not_involving_tolls/pay_drive.htm.

⁶⁷ As defined by FHWA.

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating			—	—							All

F. Freight Management









Strategy 49. Real-Time Truck Routing/Parking Information (Freight-Specific Dynamic Travel Planning)

Truck routing and parking information (freight-specific dynamic travel planning) supports both pre-trip and en route travel planning, routing, and commercial vehicle travel information, including information on truck parking locations and parking space availability.⁶⁸ This strategy is important given limited truck parking availability and Hours of Service regulations that require rest breaks. Information management systems can be used to facilitate finding freight parking locations.

Such a project may be eligible under Section (G)(3)(I) of FHWA's CRP guidance memorandum, while truck parking projects are explicitly eligible under Section (C)(9). However, good practice would be to show that environmental and community impacts of freight will be improved through the plan, and specifically that emissions will be reduced due to implementation of the strategy. See Strategy 54 in this section for parking-specific projects.

Learn more: See Florida Department of Transportation's Transportation Systems Management & Operations Strategy Guide—User's Manual, available at:

<https://cflsmartroads.com/projects/PDE/TSMO%20Strategy%20Guide%20-%20User's%20Manual.pdf>

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating			—	—				—			Urban

Strategy 50. Freight Signal Priority

Freight signal priority, also called truck signal priority, involves modifying traffic signals to extend the timing of a green light “to allow an approaching truck to make it through an intersection without stopping.” This strategy increases “safety by reducing the potential for the truck to run a red light and cause a collision.” It also helps reduce delays and congestion caused by trucks taking a longer time to accelerate to the speed limit. Priority is given to heavy trucks that would have difficulty stopping at a yellow light. To implement this strategy, traffic signal controller software and detection equipment are needed. This strategy is a specific application of Traffic Signal Improvements in Category 2.

Such a project may be eligible under Section (G)(3)(I) of FHWA's CRP guidance memorandum. However, a good practice would be to show that environmental and community impacts of

⁶⁸ <https://local.iteris.com/arc-it/html/servicepackages/sp32.html#tab-3>

freight will be improved through the plan, and specifically that emissions will be reduced due to implementation of the strategy.

This strategy is likely to be most applicable in urban areas where signals impede freight flow and provide safety improvements. It is unlikely to have significant carbon emissions benefits but may have air quality and possibly equity co-benefits when freight congestion impacts air quality.

Learn more: See the Washington State Transportation Systems Management and Operations page, “Freight or truck signal priority”, at <https://tsmowa.org/category/signal-operations/freight-or-truck-signal-priority>.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating			—	—				—			Urban

Strategy 51. Truck Lane Management/Restrictions

This strategy is one of a series of managed lane strategies to reduce congestion. In this strategy, special use lanes are created with lane restrictions that allow trucks to exclusive or privileged use of certain lanes. Truck-only managed lanes separate heavy freight-carrying trucks from passenger vehicles on level-graded facilities, improving safety and congestion by eliminating mixing of the different vehicles. In one case, two or more designated lanes of a highway may be set aside to ensure at least one of the highway lanes is used only by passenger vehicles.

FHWA has noted that GDOT is planning a truck-only facility, the “I-75 Commercial Lanes” project which will provide a 38-mile facility parallel to the existing I-75 near southeastern Atlanta region to separate heavy vehicle freight traffic.

These restrictions can be implemented 24 hours a day or just during peak periods. Implementing these restrictions can “improve highway operations, reduce crashes, account for pavement and structural concerns, and complement construction work zone restrictions.”⁶⁹

Such a project is likely to be eligible under Section (G)(3)(I) of FHWA’s CRP guidance memorandum, however good practice would be to show that environmental and community impacts of freight will be improved through the plan, and specifically that emissions will be reduced due to implementation of the strategy.

Learn more: See FHWA’s Managed Lanes page: https://ops.fhwa.dot.gov/freewaymgmt/managed_lanes.htm, and National Inventory of Specialty Lanes and Highways: Technical Report, FHWA-HOP-20-043, February 2021 (<https://ops.fhwa.dot.gov/publications/fhwahop20043/fhwahop20043.pdf>) for more information.











⁶⁹ <https://static.tti.tamu.edu/tti.tamu.edu/documents/policy/congestion-mitigation/truck-lane-restrictions.pdf>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—	—	—							Urban

Strategy 52. Truck Parking

Truck Parking is a specific category of strategies in FHWA guidance (Section (C)(9)) given high priority. Shortage of truck parking affects the efficiency of U.S. supply chains and safety for truck drivers and other roadway users. Thus, CRP specifically includes truck parking projects as eligible for funding, “on an eligible facility that reduces transportation emissions,” because they may support, “improving infrastructure condition, safety, congestion reduction, system reliability, or freight movement on the NHS.”⁷⁰ As discussed in FHWA guidance, these projects may be combined with advanced truck stop electrification and projects that reduce transportation emissions at port facilities, both of which are also specifically eligible under federal statute.

Learn more: FHWA guidance memo and 23 U.S.C. 175(c)(1) provide further discussion.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating		—	—								All

5.4 Category 3: Sustainable Infrastructure

This set of strategies addresses infrastructure-side reductions, such as sustainable pavements, alternative construction, and maintenance practices.

5.4.1 Sustainable Infrastructure

A. Environmentally Sustainable Construction Practices

Strategy 1. Green Construction Materials

This strategy is the practice of using more sustainable buildings materials in construction and maintenance projects. Examples include using recycled and reclaimed materials, such as in-place roadway recycling, fly ash in cement ground granulated blast furnace slag, and other industrial waste products as substitutes for GHG- and energy-intensive portland cement in concrete mixes. At a plan level, the strategy could include use of Environmental Product

⁷⁰ Information Memorandum: Carbon Reduction Program (CRP) Implementation Guidance based on 23 U.S.C. 175, from Gloria M. Shepherd, Associate Administrator Office of Planning, Environment, and Realty to Division Administrators Directors of Field Services, April 21, 2022.

Declarations (EPDs) in bid decisions to ensure the most sustainable materials are procured. This strategy is listed as a potentially eligible strategy in FHWA's guidance memorandum.⁷¹

This strategy is based on a lifecycle approach for materials. It does not affect most categories in most applications, although project specific details may vary. It does not affect emissions from users of the system (tailpipe emissions).

Learn more: FHWA's Infrastructure Carbon Estimator tool has good information on lifecycle impacts and use of green construction materials for mitigation.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

Strategy 2. Sustainable Pavements

Sustainable pavement strategies are a subset of green construction materials (3.1) using lower impact materials specifically for roadway surfaces while maintaining a pavement's ability to serve its engineering goals. A variation of this strategy could be to employ additional pavement preservation techniques beyond standard practice that may extend the pavement's lifetime and reduce the need for energy-intensive maintenance. It is listed as a potentially eligible strategy in FHWA's guidance.

This strategy is based on a lifecycle approach for materials and does not affect most categories in most applications, although project specific details may vary. It does not affect emissions from users of the system (tailpipe emissions).

Learn more: See FHWA's Sustainable Pavements Program, <https://www.fhwa.dot.gov/pavement/sustainability/>, and FHWA's LCA Pave tool.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating											All

B. Renewable Energy Development

Strategy 3. Use of Highway Right-of-Way for Renewable Energy

This strategy emphasizes renewable energy development on lands already owned and operated by the State to benefit the public through mature use of the land such as electricity generation. For example, this could include solar photovoltaic fields in interchange cloverleafs or along an Interstate. Putting this land to use in generating renewable energy provides grid power

⁷¹ Information Memorandum: Carbon Reduction Program (CRP) Implementation Guidance based on 23 U.S.C. 175, from Gloria M. Shepherd, Associate Administrator Office of Planning, Environment, and Realty to Division Administrators Directors of Field Services, April 21, 2022.

without claiming other lands (a.k.a., greenfield) that could be put to other productive uses, such as forests or agriculture. It is listed as a potentially eligible strategy type in FHWA's guidance.

This strategy does not directly affect emissions from users of the system (tailpipe emissions). Instead, it provides clean energy that can be used supporting or displacing other power sources, supporting expansion of zero-emission (electric) transit, and reducing the full lifecycle of these vehicles. By placing such infrastructure in public right-of-way, it may create construction and maintenance jobs and avoid power production in other, more vulnerable or valuable locations. It also encourages resilience of the electric grid by providing additional resources in addition to the air quality and other co-benefits of renewable energy. It is most likely to be applicable in rural or suburban areas with more open space devoted to highway right-of-way.

Learn more: E.g., see FHWA's briefing: Renewable Energy Generation in the Highway Right-of-Way, Briefing. FHWA-HEP-16-052, May 2016, Updated January 2019:
<https://rosap.nhtl.bts.gov/view/dot/49020>

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—		—					—			Rural

Strategy 4. Installation of Solar Power on Transit Stations, Parking, Buildings

This strategy is intended to use existing infrastructure for renewable energy development. In this case, rooftops, parking lots, and other areas that receive direct sunlight and are suitable for the production for solar electricity are retrofitted with solar photovoltaic. The business case and benefits are similar to those of Strategy (3)(3) but in a different setting, likely on buildings already owned and operated by the State to benefit the public through additional uses of the buildings or land for electricity generation.

This strategy does not directly affect emissions from users of the system (tailpipe emissions). Instead, it provides clean energy that can be put to use supporting or displacing other power sources, supporting expansion of zero-emission (electric) transit, and reducing the full lifecycle of these vehicles. By placing such infrastructure on existing facilities, it may create construction and maintenance jobs and avoid power production in other, more vulnerable or valuable locations. It is applicable anywhere there are publicly owned facilities.

This strategy is likely to be eligible for funding. similar to strategy (3)(3) including repurposing existing development, although it is not explicitly listed by FHWA.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating	—		—					—			All

C. Reduction in Operation and Maintenance Energy Consumption

Strategy 5. Retrofit Street Lighting with LED

This strategy is intended to replace HPS or other lighting systems with highly efficient LED systems. This strategy is called out as an eligible activity in Section (G)(3)(F) of FHWA's Carbon Reduction Program guidance memo.

New lighting projects—that is, projects in locations without lighting or where lighting is added—may not qualify because additional infrastructure is unlikely to reduce energy consumption.

The benefits of such a strategy are enhanced lighting and less energy used to achieve the same amount of lighting. This can have safety, equity, and air pollution co-benefits depending on the specifics of the project.

Learn more: FHWA's lighting resource page has design guidelines and further information.

<https://highways.dot.gov/safety/other/visibility/roadway-lighting-resources>.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating								—			All

Strategy 6. Replace Street Lighting and Traffic Control Devices with Energy-Efficient Alternatives

Like in strategy (3)(5), other lighting devices, such as traffic signals, can be replaced with highly efficient LED alternatives. LED traffic signal lamps typically use 80 to 90 percent less energy than the incandescent lamps that they replace and offer longer life. The Energy Policy Act of 2005 requires all traffic signal fixtures to meet ENERGY STAR standards, effectively requiring the use of LED lamps in traffic signal heads if this is not already complete.⁷² This strategy is also called out as an eligible activity in Section (G)(3)(F) of FHWA's Carbon Reduction Program guidance.

Safety, reduced energy use, and cost savings (to the agency) are the primary benefits of this strategy. This strategy can be combined with other projects, such as those increasing resiliency, to compound benefits.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Development	Eligibility	Context
Rating								—			All

⁷² For example, see the Delaware Valley Regional Planning Commission's study, *Energy Efficient Traffic Signals and Streetlights*, 2010, at <https://www.dvrpc.org/reports/mit020.pdf>.

Strategy 7. Low-Carbon Construction Equipment and Fuels

This strategy uses alternative fuels, potentially coupled with alternative engine technology, such as hybrid technology, to replace traditional internal combustion engines in construction and maintenance equipment. The range of possible projects under this strategy is very large. For example, replacing gasoline-powered hand-held landscaping equipment with electric alternatives to the purchase and use of bio- or renewable diesel instead of petroleum diesel in construction and maintenance equipment, to purchase of advanced technology equipment using hybrid, electric, or other alternative fuels and the required fueling infrastructure. Depending on the scope of the project, it may be specifically eligible under Section (G)(3)(J)(ii) of FHWA's guidance. Other types of similar projects are likely to be eligible on the grounds of reducing lifecycle emissions.

As with the other strategies in this category, it does not directly affect emissions from users of the system, but reduces the overall energy required to build and maintain the transportation system. This strategy may have other co-benefits including supporting expansion of low emission fuels and engine technologies by incentivizing their purchase and lowering operating costs by increasing use of more efficient alternatives.

Criterion	 Safety	 Equity	 Mobility	 Resilience	 Air Quality	 Readiness	 C. Emissions	 Savings	 Development	 Eligibility	 Context
Rating	—	—	—					—			All



















Strategy 8. Alternative Vegetation Management

This set of strategies conserve energy by reducing the amount of fuel consumed for maintenance and thus reducing GHG emissions proportional to fuel reductions. Strategies can include use of native plants or other landscaping requiring less maintenance. Other strategies could include use of alternative herbicides to reduce energy-intensive maintenance activities. Furthermore, use of shade trees and other greenscaping could reduce urban heat island effects and have



Photo Courtesy GDOT Flickr

beneficial effects on energy used for cooling, for example. These are not addressed in FHWA's guidance and would need to demonstrate lifecycle emission reductions of the specific project to qualify. More information on qualifications could be obtained from the Georgia FHWA liaison.

											
Criterion	Safety	Equity	Mobility	Resilience	Air Quality	Readiness	C. Emissions	Savings	Develop- ment	Eligibility	Context
Rating	—	—	—		—	  		—			All