



Oklahoma Carbon Reduction Strategy

Fall 2023 | Final

TABLE OF CONTENTS

INTRODUCTION	1
CARBON REDUCTION PROGRAM OVERVIEW	2
ODOT AND PARTNERS ROLES AND RESPONSIBILITIES	4
OKLAHOMA’S CARBON REDUCTION CONTEXT	9
CARBON REDUCTION IN TRANSPORTATION	9
CARBON REDUCTION STRATEGY DEVELOPMENT	21
OKLAHOMA PLAN REVIEW	21
CONSULTATION AND ENGAGEMENT	21
CRS FRAMEWORK & PROJECTS AND STRATEGIES	23
CRS GOALS AND OBJECTIVES	23
CRS IDENTIFIED PROJECTS AND STRATEGIES	27
IMPLEMENTATION	38
APPENDIX A: CARBON REDUCTION PROGRAM COMPLIANCE ..	39
APPENDIX B: STAKEHOLDER COORDINATION	40
STAKEHOLDER MEETING #1 - KEY QUESTIONS AND DISCUSSION TOPICS	41
STAKEHOLDER MEETING #2 - KEY QUESTIONS AND DISCUSSION TOPICS	46
APPENDIX C: PUBLIC COMMENT PERIOD SUMMARY	55
COMMENT PERIOD SUMMARY	55
FREQUENTLY ASKED QUESTIONS	55
MEDIA PROMOTIONS	58



FIGURES

- FIGURE 1:** OKLAHOMA’S URBAN AREAS 2
- FIGURE 2:** TRANSPORTATION MANAGEMENT AREAS AND METROPOLITAN PLANNING ORGANIZATIONS 6
- FIGURE 3:** ODOT’S ROLES AND ACTIONS IN TRANSPORTATION EMISSIONS... 8
- FIGURE 4:** U.S. AND OKLAHOMA CARBON EMISSIONS BY SECTOR 10
- FIGURE 5:** U.S. TRANSPORTATION EMISSIONS BY SOURCE 11
- FIGURE 6:** OKLAHOMA BY THE NUMBERS 13
- FIGURE 7:** TRANSPORTATION INFRASTRUCTURE IN OKLAHOMA..... 13
- FIGURE 8:** PASSENGER TRAVEL BY TRIP PURPOSE (PERCENTAGE OF ANNUAL PERSON TRIPS, 2017)..... 14
- FIGURE 9:** COMMUTING BY TRANSPORTATION MODE IN OKLAHOMA (% OF WORKERS OVER 16) 15
- FIGURE 10:** AVERAGE DAILY PERSON TRIPS (TRIPS PER PERSON PER DAY, 2017)..... 15
- FIGURE 11:** AVERAGE DAILY PERSON MILES (MILES PER PERSON PER DAY, 2017)..... 15
- FIGURE 12:** AMTRAK PASSENGER RAIL ROUTES IN OKLAHOMA..... 16
- FIGURE 13:** OKLAHOMA FREIGHT TONS BY MODE (2017) 17
- FIGURE 14:** AVERAGE CARBON DIOXIDE EMISSIONS PER TON-MILE OF FREIGHT, BY MODE OF TRANSPORTATION (2019) 18
- FIGURE 15:** CRS PROCESS TIMELINE..... 21
- FIGURE 16:** CRS PROJECT CATEGORIES 23
- FIGURE 17:** ODOT CRS GOALS AND OBJECTIVES 24
- FIGURE 18:** CURRENT AND PLANNED - PROJECTS AND STRATEGIES..... 27
- FIGURE 19:** NEW CONCEPTS: PROJECTS AND STRATEGIES..... 34



ACRONYMS

ACOG	Association of Central Oklahoma Governments
ARDOT	Arkansas Department of Transportation
ATMA	Autonomous Truck Mounted Attenuator
AV	Autonomous Vehicle
BDM	Balance Design Mix
BNSF	Burlington Northern and Santa Fe
BRT	Bus Rapid Transit
CAP	Comprehensive Action Plan
CCTV	Closed-Circuit Television
CMAQ	Congestion Mitigation and Air Quality Improvement Program
CNG	Compressed Natural Gas
CO2	Carbon Dioxide
CRP	Carbon Reduction Program
CRS	Carbon Reduction Strategy
CWP	Construction Work Plan
DC	Direct Current
DDI	Diverging Diamond Interchange
DEQ	Oklahoma Department of Environmental Quality
DMS	Dynamic Message Signs
EDC	Everyday Counts
EPA	Environmental Protection Agency
EV	Electric Vehicle
FHWA	Federal Highway Administration
FRONTIER	Fort Smith, Arkansas Metropolitan Planning Organization
FTA	Federal Transit Administration
FY	Fiscal Year
GHG	Greenhouse Gas
HOV	High Occupancy Vehicles
HSIP	Highway Safety Improvement Program
IIJA	Infrastructure Investment and Jobs Act
INCOG	Indian Nations Council of Governments
ITS	Intelligent Transportation Systems
LATS	Lawton Area Transit System
LCA	Life Cycle Assessment



LMPO	Lawton Metropolitan Planning Organization
L RTP	Long Range Transportation Plan
MKARNS	McClellan-Kerr Arkansas River Navigation System
MPO	Metropolitan Planning Organization
MTP	Metropolitan Transportation Plan
NHFP	National Highway Freight Program
NHPP	National Highway Performance Program
NORTPO	Northern Oklahoma Regional Transportation Planning Organization
ODOT	Oklahoma Department of Transportation
OFTP	Oklahoma Freight Transportation Plan
OMPA	Oklahoma Municipal Power Authority
OPTPP	Oklahoma Public Transit Policy Plan
PAP	Priority Action Plan
PROTECT	Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation
ROUTES	Rural Opportunities to Use Transportation for Economic Success
RTA	Regional Transportation Authority of Oklahoma
RTPO	Regional Transportation Planning Organization
RWIS	Road Weather Sensors
SHS	State Highway System
SORTPO	Southwest Oklahoma Regional Transportation Planning Organization
SPUI	Single-Point Urban Interchange
STBG	Surface Transportation Block Grant Program
STEP	Safe Transportation for Every Pedestrian
STIP	Statewide Transportation Improvement Program
TAMP	Transportation Asset Management Program
TAP	Transportation Alternatives Program
TIM	Traffic Incident Management
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TOC	Traffic Operations Center
TSMO	Transportation System Management and Operations
USDOT	United States Department of Transportation
VMT	Vehicle Miles Traveled
VSL	Variable Speed Limit
WMA	Warm-Mix Asphalt
ZEV	Zero Emissions Vehicle





INTRODUCTION

The Oklahoma Department of Transportation (ODOT) has developed a Carbon Reduction Strategy (CRS) to further improve air quality across the state by reducing carbon dioxide (CO₂) emissions from the transportation sector. The CRS was developed in consultation with Oklahoma’s Metropolitan Planning Organizations (MPOs) utilizing the federal requirements and guidance of the federal Carbon Reduction Program (CRP), established through the Infrastructure Investment and Jobs Act (IIJA)¹.

¹ Enacted as the Infrastructure Investment and Jobs Act, Pub. L. 117-58 (Nov. 15, 2021), § 11403; 23 U.S.C. 175 https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm



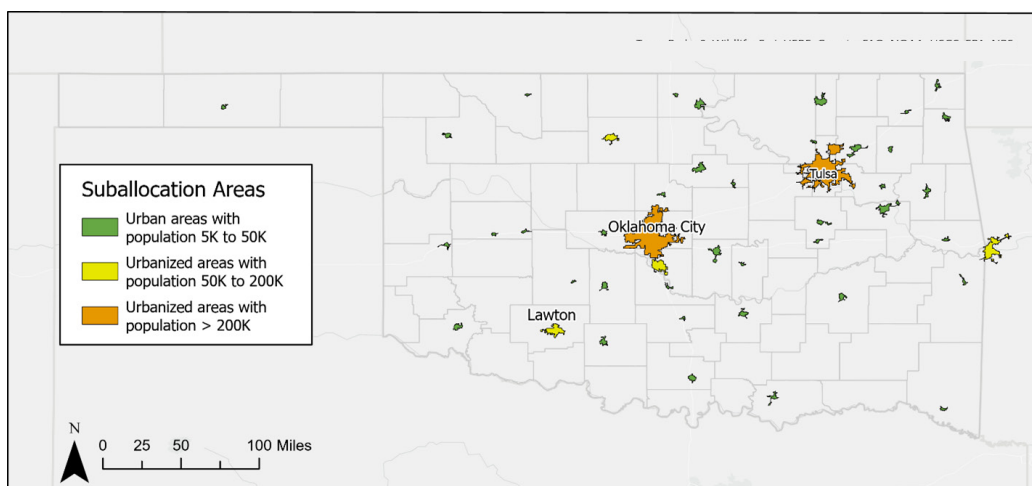
CARBON REDUCTION PROGRAM OVERVIEW

CARBON REDUCTION PROGRAM

The CRP provides funding for eligible projects identified to reduce transportation emissions. Transportation emissions are defined as CO₂ emissions for on-road highway sources². Oklahoma will receive approximately \$106 million over five years from the CRP³. ODOT is required by the United States Department of Transportation (USDOT) to allocate 65% of the CRP funds to urbanized areas in proportion to their relative share of the state population. The remaining 35% of funds will be allocated at ODOT's discretion in any area of the state. **Figure 1** shows suballocation information for the estimated Fiscal Year (FY) 2024-2026 apportionment based on Oklahoma's urban areas as identified in the 2020 U.S. Census⁴. Of the 44 urban areas in the state, two have a population that exceeds 200,000 (Tulsa and Oklahoma City), three have a population between 50,000 and 200,000 (Lawton, Norman, and Enid), and 39 have a population between 5,000 and 50,000. Suballocations for FY 2022 and 2023 were based on 2010 Census population data⁵.

Additionally, Oklahoma may transfer up to 50% of CRP funds made available each fiscal year to any other apportionment of the State, including the National Highway Performance Program (NHPP), Surface Transportation Block Grant Program (STBG), Highway Safety Improvement Program (HSIP), Congestion Mitigation and Air Quality Improvement (CMAQ) Program, National Highway Freight Program (NHFP), and the Promoting Resilient Operations for Transformative, Efficient, and Cost-saving Transportation (PROTECT) Formula Program.

Figure 1: Oklahoma's Urban Areas



Source: U.S. Census, USDOT

2 23 U.S.C. 175(a)(2)

3 <https://www.fhwa.dot.gov/bipartisan-infrastructure-law/funding.cfm>, FY 2022-2026 Estimated Highway Apportionments under the Bipartisan Infrastructure Law, PDF (access May 2023)

4 To qualify as an Urban Area, the territory must encompass at least 2,000 housing units or have a population of at least 5,000.

5 2010 census criteria identified urbanized areas using a 50,000-population threshold

CARBON REDUCTION STRATEGY REQUIREMENTS

The CRP requires each state to develop a CRS in consultation with MPOs by November 15th, 2023. Additional requirements⁶ of the CRS include:

- Update the CRS at least once every four years.
- Supports efforts to reduce transportation emissions in the state comprehensively, as well as by state agencies.
- Identifies projects and strategies to reduce transportation emissions, which may include projects and strategies for safe, reliable, and cost-effective options:
 - To reduce traffic congestion by facilitating the use of alternatives to single-occupant vehicle trips, including public transportation facilities, pedestrian facilities, bicycle facilities, and shared or pooled vehicle trips.
 - To leverage the use of vehicles or modes of travel that result in lower transportation emissions per person-mile traveled as compared to existing vehicles and modes.
 - To facilitate approaches to the construction of transportation assets that result in lower transportation emissions as compared to existing approaches.
 - At the discretion of the state, quantify the total carbon emissions produced from the transportation of and use of materials used in the construction of transportation facilities.
 - Be appropriate to the population density and context of the state and the state's metropolitan planning organizations.

Further information regarding compliance with the CRP is located in **Appendix A**.

HOW THIS STRATEGY WILL BE USED

The purpose of this CRS is to document relevant information related to ODOT's carbon reduction efforts and serve as a guide for future ODOT transportation system investments. The CRS is organized to provide a foundational catalyst for the new CRP requirements while detailing engagement efforts, describing carbon reduction in transportation, providing a list of existing, planned, and new concepts for carbon reduction projects, and strategizing for ODOT's commitment to reducing transportation emissions.

CARBON REDUCTION POLICY IN OKLAHOMA

Oklahoma has not enacted legislation with intent of regulating transportation emissions. This CRS documents the alignment of ODOT's programmatic priorities and strategic plans that address the reduction of transportation carbon emissions.

⁶ 23 U.S.C 175(d)(2)



Supplemental to this CRS, the Oklahoma Department of Environmental Quality (DEQ) was recently awarded a Phase 1 Planning Grant as a part of the Climate Pollution Reduction Grant from the Environmental Protection Agency (EPA). This grant will allow the DEQ to quantify the state's greenhouse gas (GHG) reduction potential by developing a current GHG inventory, emissions projections, and GHG reduction targets and goals. The DEQ will also develop a statewide Priority Action Plan (PAP) and Comprehensive Action Plan (CAP) to reduce statewide emissions. The DEQ is coordinating with Tribal nations, MPOs, universities, and other partners on this plan. ODOT is a collaborating entity on the grant and will stay engaged throughout the process. This CRS will be a complementary strategy to the Climate Pollution Reduction Grant, produce a baseline for future CRS planning, and support overall emissions reduction in the state.

ODOT AND PARTNERS ROLES AND RESPONSIBILITIES

This section discusses the general roles of ODOT and the MPOs in Oklahoma.

ODOT

ODOT is responsible for the planning, design, construction, and maintenance of the state highway system (SHS) and associated assets along the SHS. The state-owned highway system includes 12,234 centerline miles of state highway and over 6,797 bridges. Additionally, ODOT oversees other state and federal programs directed to the county and city transportation systems. ODOT's responsibilities (planning, design, construction, and maintenance) provide opportunities for the reduction of transportation emissions. Specific examples of how ODOT can reduce transportation emissions are summarized in the *CRS FRAMEWORK & PROJECTS AND STRATEGIES* section.

Along with the creation of the 2045 Long Range Transportation Plan (LRTP), ODOT develops the Family of Plans. The Family of Plans includes documents such as the Eight-Year Construction Work Plan (CWP), the State Rail Plan, the Freight Transportation Plan, the Statewide Transportation Improvement Program (STIP), Transportation Asset Management Plan (TAMP), and regional long range transportation plans which provide a framework for agency decision making and project selection. The STIP identifies transportation projects expected to receive full funding and to take place over the four years following the STIP's release. The program identifies highway and transit projects planned for various areas of the state and is updated every two years. The STIP includes projects listed in the first four years of the CWP, as well as anticipated Transportation Improvement Projects (TIP) selected by MPOs in their respective regions.

While ODOT is primarily responsible for Oklahoma's highway systems and assists with a variety of other modal programs, ODOT does not act alone in statewide transportation planning. Governmental entities – including federal and state agencies, metropolitan and regional transportation planning organizations (MPO



and RTPO), transit agencies, tribal governments, and local jurisdictions partner with ODOT in the planning process. ODOT coordinates with local governments and applicable MPOs in considering infrastructure options and facilitates inclusion of these features on projects when appropriate. Further, advocacy groups and industry organizations also contribute to the planning process.

ODOT serves various roles related to railroads as well. ODOT administers the Federal Highway Administration's (FHWA) Grade Crossing Safety Program, manages Oklahoma's Heartland Flyer passenger rail service, serves as a liaison between ODOT and rail companies and reviews federal funding opportunities to improve Oklahoma's rail systems. ODOT administers state and federal public transportation financial assistance programs for areas with a population under 50,000 as well as federal programs for transit programs for the elderly and disabled. ODOT is also responsible for administering the Transportation Alternatives Program (TAP) funding. TAP funds are federal funds designated for smaller-scale transportation projects such as pedestrian and bicycle facilities, recreational trails, and safe routes to school projects. In FY 2022, ODOT administered approximately \$3 million of TAP funds to cities for bike and pedestrian improvements, including sidewalks and bike and walking trails and administered approximately \$3 million to statewide recreational trail improvements. ODOT's collaboration with other agencies is an opportunity to support, partner, or create public-private partnerships for projects that reduce transportation emissions.

In FY 2022 ODOT administered:

\$3 million to cities for bike and pedestrian improvements and \$3 million to statewide recreational trail improvements

MPOs

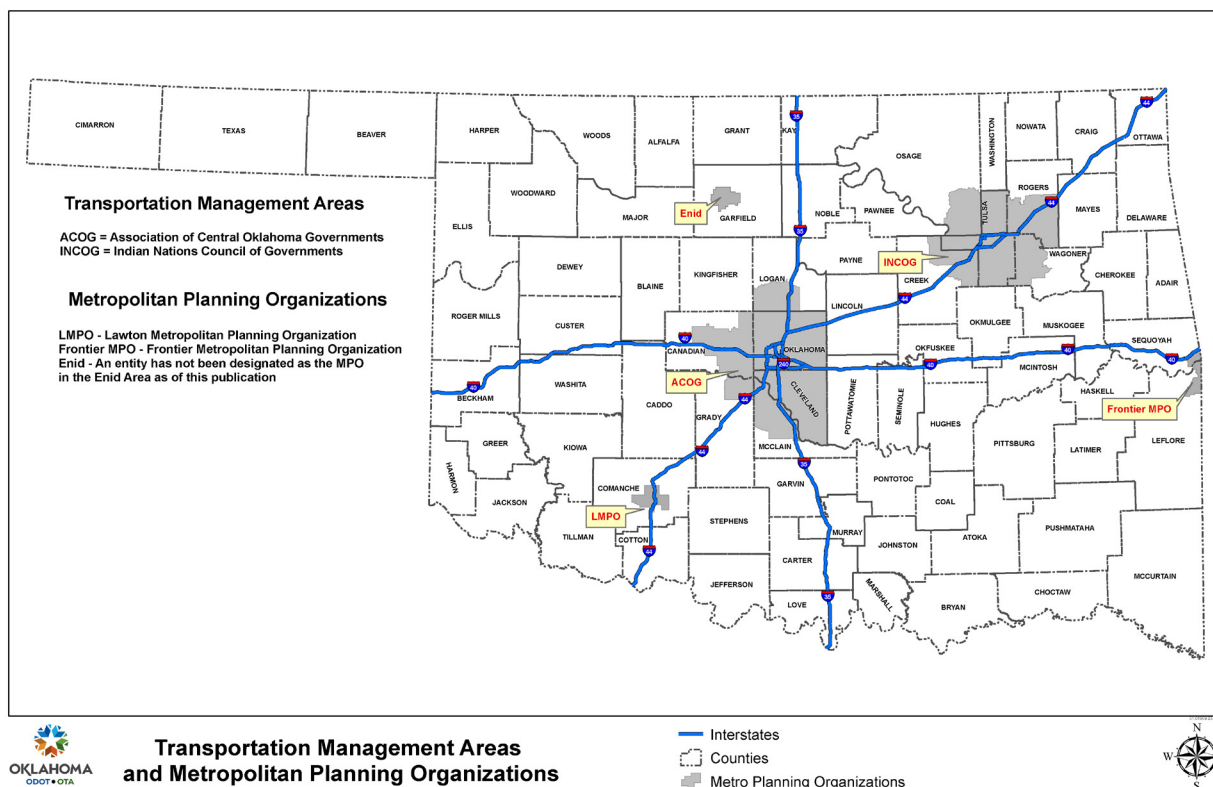
MPOs are transportation policymaking organizations made up of elected and appointed representatives from local governments and transportation authorities and are responsible for all transportation planning activities in their metropolitan planning area. ODOT is the governor's designee to administer the transportation planning process for each of the state's MPOs.

ODOT partners with MPOs to ensure consistency between the TIPs and the STIP. The MPO for Oklahoma City is the Association of Central Oklahoma Governments (ACOG). Tulsa's MPO is the Indian Nations Council of Governments (INCOG) and Lawton's MPO is the Lawton MPO (LMPO). INCOG and ACOG are defined as Transportation Management Areas (TMAs) as they are urbanized areas with a population over 200,000. TMAs are designated by the U.S. Secretary of Transportation and are subject to special transportation planning and programming requirements as there is greater complexity in the transportation issues in large urban areas. ODOT also coordinates with the Frontier MPO (FRONTIER) and the Arkansas DOT (ARDOT) in maintaining the planning process for the Fort Smith area. As of the 2020 census, the Enid area is required by the



FHWA to be designated as an MPO. The Enid area is currently undergoing designation to create an MPO. ACOG and INCOG each include a city that is part of the Clean Cities Coalition Network. The coalitions work with vehicle fleets, fuel providers, community leaders, and other stakeholders to save energy and promote the use of alternative fuels and advance vehicle technologies in transportation. A map of the MPOs in Oklahoma is shown in **Figure 2**.

Figure 2: Transportation Management Areas and Metropolitan Planning Organizations



Source: ODOT

Each MPO must prepare a Metropolitan Transportation Plan (MTP) to accomplish objectives that are outlined by the MPO, the state, and the public transportation providers in accordance with the development of the metro area’s transportation network. The plan is required to include a framework that identifies how the metro area will manage and operate a multi-modal transportation system to help meet the region’s transportation, economic, development, and sustainability goals, as well as other goals. If an area is considered a non-attainment or maintenance area in regard to air quality designation⁷, the MTP must also address air quality issues and follow goals that seek to improve overall air quality. A project must be consistent with the MPO’s MTP and must be included in the MPOs list of federally funded projects, the TIP.

⁷ The EPA determines the air quality designation, which is based on if an area meets or does not meet the National Ambient Air Quality Standards (NAAQS) for one or more of the six common criteria area pollutants. The six common criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), sulfur dioxide (SO₂), lead (Pb), and particulate matter (PM).



Federal regulations require MPO's to implement transportation planning processes to include the development of a TIP in cooperation with the state and public transit operators. TIPs, which are developed by MPOs, are designed to meet specific MPO transportation needs and dictate priorities for each individual metropolitan area. The TIPs are included in the STIP without modification.

ROLES IN TRANSPORTATION CARBON REDUCTION

In order to reduce emissions from the transportation system, it is crucial to recognize the various entities involved. ODOT provides oversight for all USDOT CRP funding leveraged in the state. When appropriate, ODOT will collaborate with MPOs to designate funding levels of these resources which enable implementation of projects aimed at decreasing on-road transportation emissions. These projects are led by ODOT or MPO designated local jurisdictions. Coordinating and collaborating with local jurisdictions is vital because ODOT is a system operator as well as a partner to other agencies and stakeholders. Therefore, it is necessary to consider the broader context of the layers of policies, funding, and users of the transportation system, as all these have an impact on emission reduction goals. The roles ODOT plays are defined in **Figure 3**, which provides a better understanding of what ODOT can and cannot do.



Figure 3: ODOT’s Roles and Actions in Transportation Emissions

Actions under ODOT Direct Responsibility	Examples
<p>ODOT is responsible for planning, constructing, operating, and maintaining the 12,234 centerline miles of SHS as well as making decisions on agency-owned facilities, fleet vehicles, and equipment.</p>	<p>Example 1: ODOT’s capital programs and projects in ODOT’s right of way</p> <p>Example 2: Programs that directly influence emissions from agency fleet vehicles</p>
Actions ODOT Can Influence	Examples
<p>ODOT can collaborate with planning agencies, roadway authorities, local governments, and transportation system users on projects and strategies to reduce transportation emissions.</p>	<p>Example 1: Partnerships and projects with public agency partners, including MPOs, RTPOs, municipalities, transit agencies (e.g., transportation facilities and related transportation infrastructure and services)</p> <p>Example 2: Partnerships and options for state employees (e.g., employee choices on travel to work)</p> <p>Example 3: ODOT in coordination with its partners influences general traveler choices (by offering a seamless multimodal transportation system)</p>
Beyond ODOT Influence and Action	Examples
<p>Public and private sector actions have the ability to influence the production and reduction of transportation emissions.</p>	<p>Example 1: State energy choices</p> <p>Example 2: Consumer vehicle purchases</p> <p>Example 3: State legislative actions such as tax incentives, funding availability, etc.</p>

Source: HNTB



OKLAHOMA'S CARBON REDUCTION CONTEXT

The incorporation and increased use of alternative fuels and alternative transportation modes will help alleviate transportation emissions throughout the state, resulting in cleaner, better-quality air. Oklahoma has two major metropolitan areas, Oklahoma City and Tulsa, with significant transportation needs and challenges. Transportation connections and the promotion of non-single-occupant or shared-use vehicles alleviates the adverse effects of emissions in the region and reduces overall congestion. Better air quality and reduced congestion improve the quality of life, reduce harms to human health, improve mobility efficiency, and boost economic productivity. For example, toxic emissions from on-road and non-road vehicles and engines are dropping due to the requirements for cleaner fuel and engines. These emissions are projected to be reduced by 80% by 2030 from the 1990 levels. On-road and non-road diesel particulate matter emissions have also decreased by around 27% from 1990 to 2005 and are projected to be reduced an additional 90% from 2005 to 2030. Airborne levels of benzene, which is a carcinogen found in gasoline, declined by 66% from 1994 to 2009, based on available air quality monitoring information⁸.

Transportation connections and the promotion of non-single-occupant or shared-use vehicles alleviates the adverse effects of emissions in the region and reduces overall congestion

CARBON REDUCTION IN TRANSPORTATION

This section discusses key factors that can assist in carbon reduction and identifies elements that influence production and reduction of transportation emissions, including relevant trends and existing conditions in Oklahoma in comparison to the U.S.

TRANSPORTATION EMISSIONS

The CRP defines transportation emissions as CO₂ emissions from on-road highway emissions. On-road transportation produces two categories of emissions: tailpipe and life-cycle emissions. **Tailpipe Emissions** result from the direct combustion of fuel (i.e., gasoline or diesel) in vehicle engines that cause direct emissions through the vehicle exhaust system or the tailpipe of the vehicle. **Life-Cycle Emissions** result from the extraction (or cultivation), production, transport, distribution, and use of goods and materials, including fuel. The concept of life-cycle transportation emissions is extended beyond

⁸ Progress Cleaning the Air and Improving People's Health | US EPA [Progress Cleaning the Air and Improving People's Health | US EPA <https://www.epa.gov/clean-air-act-overview/progress-cleaning-air-and-improving-peoples-health#breathe>](https://www.epa.gov/clean-air-act-overview/progress-cleaning-air-and-improving-peoples-health#breathe)



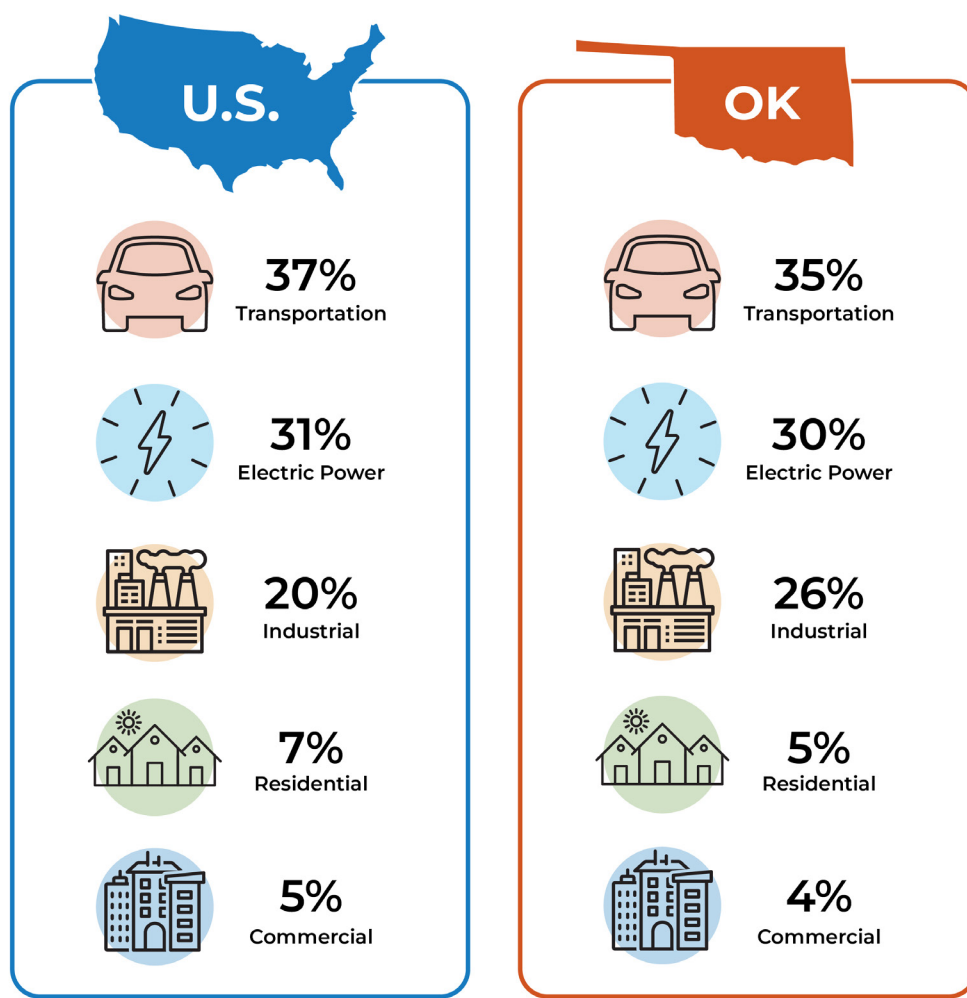
vehicles themselves to include the production and use of construction materials for transportation infrastructure such as asphalt and concrete.

Combustible transportation fuels like gasoline, diesel, natural gas, and propane contribute to both tailpipe emissions and life-cycle emissions. Contrary to combustible fuel powered vehicles, electric vehicles (EVs) and hydrogen powered vehicles have no tailpipe emissions and are identified as Zero Emission Vehicles (ZEVs). However, electric and hydrogen powered vehicles do produce lifecycle emissions because of the emissions from the production and distribution of electric and hydrogen energy sources in the current energy generation systems.

TRANSPORTATION EMISSIONS DATA

In the U.S. and Oklahoma, the transportation sector is a significant source of the total carbon emissions by sector on the national and state level, as shown in **Figure 4**.

Figure 4: U.S. and Oklahoma Carbon Emissions by Sector

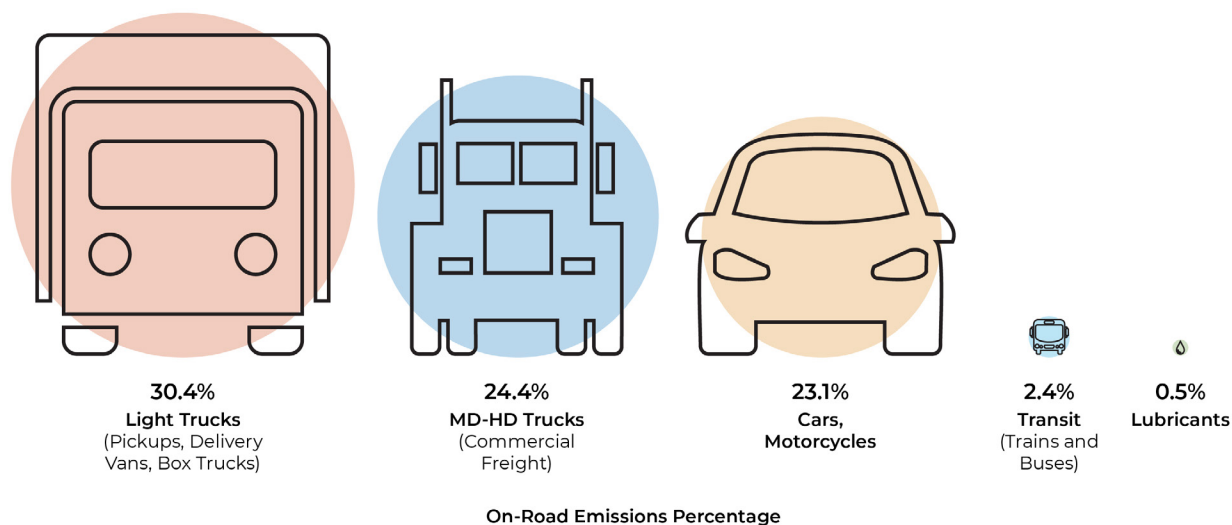


Source: U.S. Energy Information Administration, estimates for 2021



In the U.S., the transportation sector is responsible for 37% of carbon emissions. Approximately 55% of the transportation sector emissions are from light, medium and heavy-duty freight. Passenger vehicles are responsible for approximately 23% of on-road emissions. On-road emissions sources from transit and lubricants make up a significantly smaller portion of emissions (approximately 2.9%), see **Figure 5**.

Figure 5: U.S. Transportation Emissions by Source



Source: U.S. Energy Information Administration, Annual Energy Outlook 2022, Reference case, Table 35, estimates for 2021

As shown in **Figure 4**, in Oklahoma, the transportation sector is the largest emitter of emissions (approximately 35% of state carbon emissions).



OKLAHOMA POPULATION AND TRAVEL TRENDS

The following sections summarize various travel trends, statistics, and data on Oklahoma's transportation system. This section will provide information summarizing the existing population and demographic data, passenger travel data, passenger rail data, and freight data. Using relevant existing and future transportation plans and trends, this section will also discuss projections for the future based on the proposed shift to a more efficient, safe, and environmentally friendly transportation infrastructure system, which helps to reduce transportation emissions.

POPULATION

The State of Oklahoma is home to around 4 million people and is the 28th most populated state in the U.S., according to the 2020 U.S. Census. Oklahoma's population increased from 3,751,351 in 2010 to 3,959,353 in 2020, an increase of just over 5%. Urban areas in the state are increasingly more populated while rural areas are becoming less populated. Census data shows that approximately 66% of Oklahoma counties witnessed a decline in population over the last ten years. While the remaining counties, primarily consisting of urban and suburban areas, experienced a population increase of roughly 277,000 individuals. Despite the state's overall net growth of around 208,000 residents during this period, almost 50% of Oklahoma's population resides in four urban or suburban counties: Canadian, Cleveland, Oklahoma, and Tulsa. The consistent shift of people from rural to urban and suburban regions within Oklahoma reflects an ongoing nationwide pattern.

Oklahoma City is the capital and largest city in Oklahoma. As of the 2020 Census, Oklahoma City had a population of 681,054, a 17% increase from the population of 579,999 in 2010. Tulsa, which is in the northeastern part of the state, is the second largest city in Oklahoma. As of the 2020 Census, Tulsa had a population of 413,066, which is a 5% increase from the population of 391,906 in 2010. As discussed earlier, Enid and Lawton have a population over 50,000 but less than 200,000.

If population growth continues in urban areas without changes to current transportation patterns then transportation emissions are likely to rise.

Oklahoma City is the 20th largest city in the United States

Tulsa is the 47th largest city in the United States

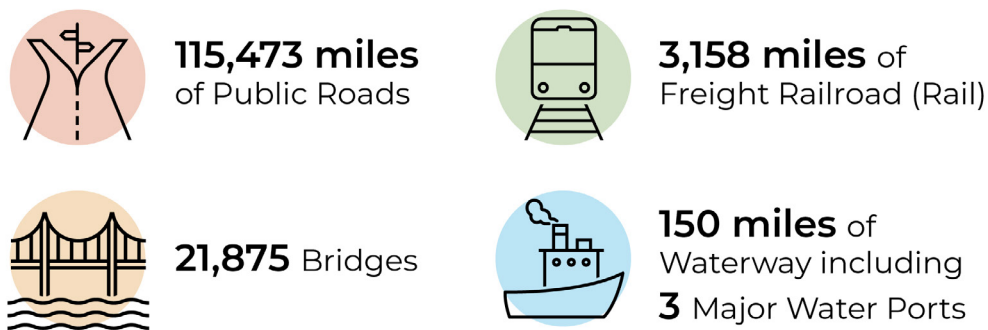


EXISTING TRANSPORTATION INFRASTRUCTURE

Oklahoma's existing transportation infrastructure is the backbone of the movement of people and goods across the state. Demographics, along with travel trends, are two of the main influences on transportation infrastructure in Oklahoma, which are attributed to transportation emissions.

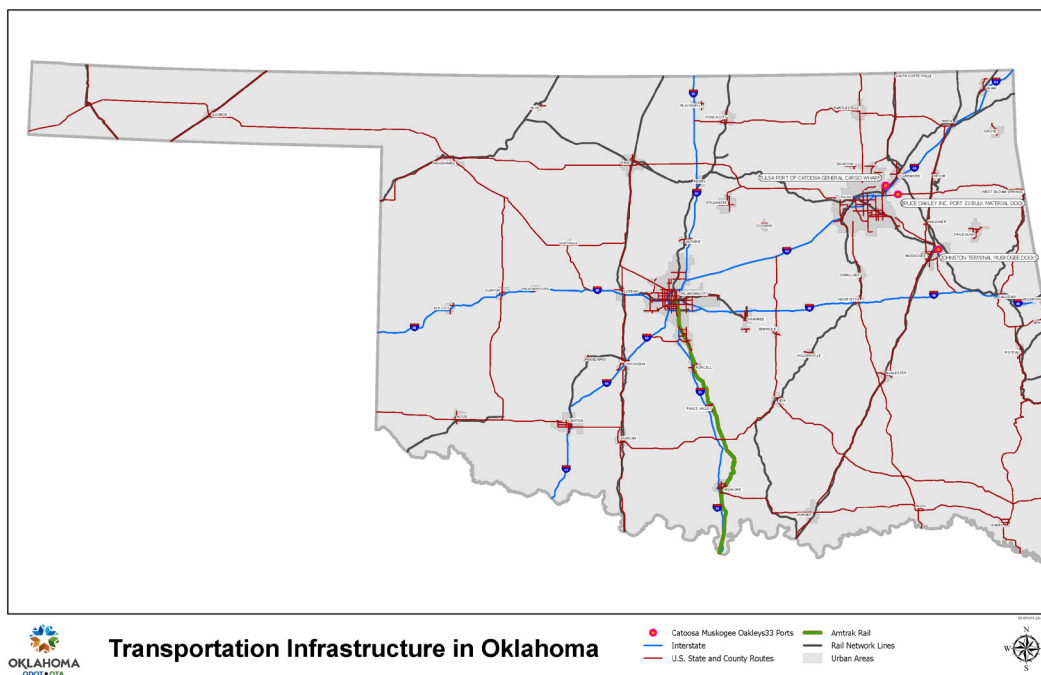
The existing transportation infrastructure in Oklahoma as of 2022 includes 115,473 miles of public roads, 21,875 bridges, 3,158 miles of freight railroad, and three major water ports along the 150 miles of waterway as shown in **Figure 6** and **7** below. The major water ports include the Tulsa Port of Catoosa and Port Muskogee, and the privately owned Oakley's Port 33.

Figure 6: Oklahoma by the Numbers



Source: U.S. Department of Transportation, Bureau of Transportation Statistics, estimates for 2020 & ODOT

Figure 7: Transportation Infrastructure in Oklahoma

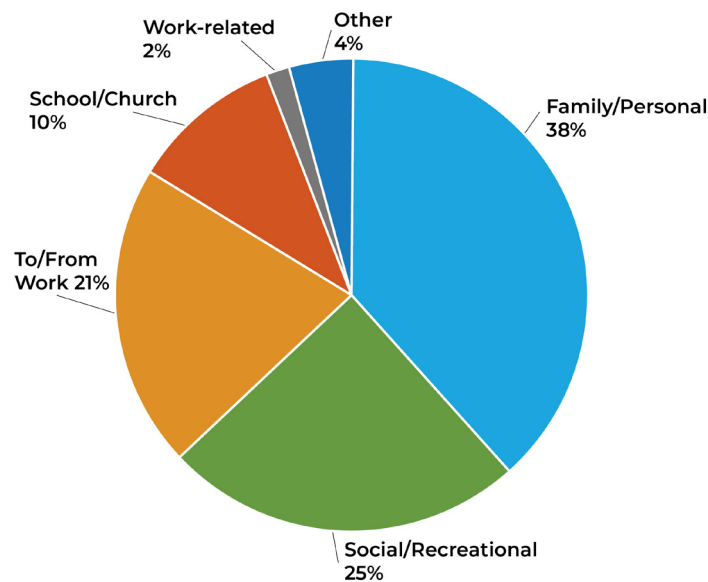


Source: ODOT

TRAVEL TRENDS

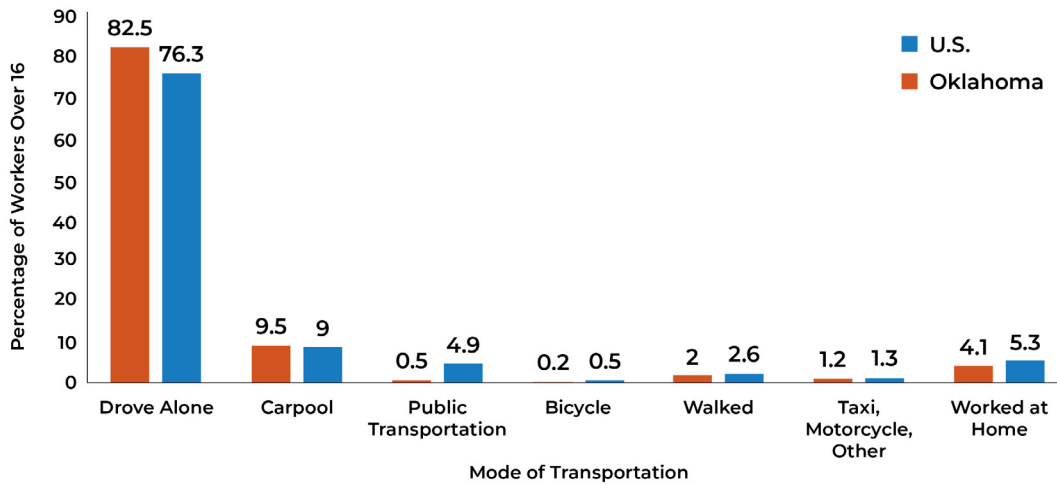
Between the years 2018 and 2022, total VMT on Oklahoma’s highway system stayed relatively the same. The relatively constant VMT across the state, while population grew, is beneficial to reduction in transportation emissions. This is not typical across the country where VMT usually increases faster than population. In Oklahoma, it could be attributed to a number of factors, such as an increase in transit ridership (which increased by about 10% from 2008 to 2018), increased access to broadband internet and work from home support, increased carpooling, more dense urban development, and an increase in active modes (walking, biking, and rolling). Family/personal business was the most common passenger travel by trip purpose in the state for the same time (**Figure 8**).

Figure 8: Passenger Travel by Trip Purpose (Percentage of Annual Person Trips, 2017)



Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Personal Travel, 2017

**Figure 9: Commuting by Transportation Mode in Oklahoma
(% of Workers Over 16)**



Source: U.S. Department of Transportation, Bureau of Transportation Statistics, estimates for 2020

Passenger Travel

Social and recreational trips were the second highest passenger travel trip purpose in Oklahoma, with work following as the next highest. Total employment in the state was just over 1.346 million as of 2021. Driving alone to work is the most common commute type across the state. The other types of commuting in Oklahoma compared to the U.S. are shown in **Figure 9**. Compared to the U.S., the average daily trips per person in Oklahoma is quite similar at 3.37 and 3.39 daily person trips respectively (**Figure 10**). However, the average daily miles per person per day is higher in Oklahoma than in the U.S. by almost 25% more per day. In Oklahoma, the average person is taking approximately 3.39 trips per day for an average of 45 miles per day, compared to 3.37 trips per day and 36.1 miles per day in the U.S. (**Figure 11**). Oklahoma drivers average around the same amount of trips per day but drive further distances. Reducing the number of single occupancy/driving alone trips to work will reduce emissions. As shown in the figure above, commuting by driving alone is the major transportation mode in Oklahoma at 82.5%.

**Figure 10: Average Daily Person Trips
(Trips Per Person Per Day, 2017)**



Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Personal Travel, 2017

**Figure 11: Average Daily Person Miles
(Miles Per Person Per Day, 2017)**



Source: U.S. Department of Transportation, Bureau of Transportation Statistics, Personal Travel, 2017



Passenger Rail

Oklahoma is directly served by a one daily round-trip intercity passenger train, Amtrak's *Heartland Flyer*, which operates between the Santa Fe Depot in Oklahoma City and the Fort Worth Central Station in Fort Worth, Texas sharing tracks with the Burlington Northern and Santa Fe (BNSF) Railway. Within Oklahoma, the *Heartland Flyer* stops at stations in Norman, Purcell, Pauls Valley, and Ardmore. In Oklahoma City, Amtrak users are able to connect to the Oklahoma City Streetcar (OKC Streetcar) as well as local buses. The OKC Streetcar began in 2018 and provides service on two routes that have a combined length of 5.1 miles and 22 stops.

Amtrak's 2035 Plan identifies a new service line from Oklahoma City to Newton, Kansas, as shown in **Figure 12**. There is already a bus service that runs from Oklahoma City to Newton, but the proposal would add passenger rail service on the route, connecting the *Heartland Flyer* route from Fort Worth to Oklahoma City to the *Southwest Chief* route which connects to Los Angeles, Albuquerque, Kansas City, and Chicago. Also, the Fort Worth line connects to the *Texas Eagle* route.

Growth experienced from Wichita to Dallas has led to increased traffic congestion over time with Oklahoma City experiencing similar issues. The expansion of the *Heartland Flyer* route will help to provide some much-needed relief to the region and reduce transportation emissions if more people decide to commute by passenger train over personal vehicles.

Figure 12: Amtrak Passenger Rail Routes in Oklahoma



Source: Amtrak

Intercity Passenger Rail and Bus Rapid Transit (BRT)

Established in 2019 under laws of the State of Oklahoma, the Regional Transportation Authority of Central Oklahoma (RTA) is a regional, independent governmental agency that works to fund, construct, and operate transit projects within the boundaries of the district. In fall 2024 or spring 2025, Oklahoma City, Edmond, and Norman voters will use a ballot referendum to fund the intercity passenger rail. If approved, the proposed corridor would provide transit for commuters across Oklahoma City, Edmond, and Norman. Implementation of a



passenger rail system that would connect major population areas throughout central Oklahoma has the potential to decrease the use of passenger vehicles and reduce carbon emissions.

In addition to intercity passenger rail, Oklahoma City is implementing its first Bus Rapid Transit (BRT) line. Oklahoma City’s Transit Authority (EMBARK) is opening a 9.5-mile BRT route with 32 stops in the Fall 2023 called RAPID. RTA is planning for new routes as well, alternatives analysis are underway to identify two new BRT routes in Northeast and South Oklahoma city, helping create a more connected BRT network throughout OKC⁹.

Tulsa Transit lead the state into BRT corridor development, when they launched the Peoria AERO BRT in 2019, and became the Oklahoma’s first BRT route. The Peoria AERO BRT is an 18-mile north-south route with 52 stops connecting residents to jobs and major destinations along the route. Tulsa is currently designing their second BRT line, the Route 66 AERO BRT, expected to launch in 2025. Overall, new, and future BRT routes in the state’s two largest cities provide opportunities for residents to use an alternative mode of transit and reduce transportation emissions.

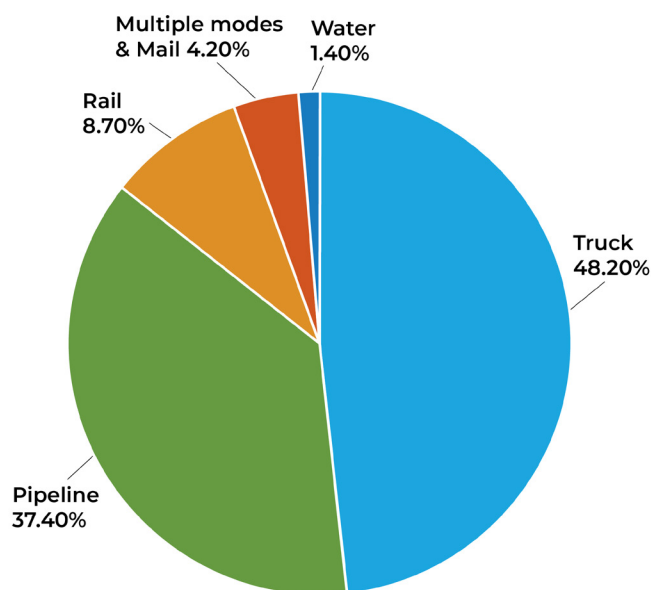
Freight

In Oklahoma, the cost, speed, safety, and resiliency of freight transportation is critical with an estimated 435.5 million tons of freight worth \$300.1 billion transported in 2017. The multimodal freight transportation network has supported several key commodities across the state, including food and agriculture products, fuels, building materials, motorized vehicles, electronics, machinery, pharmaceuticals, and other chemicals.

Oklahoma’s top domestic freight transportation mode by tonnage is truck (48.2%), followed by pipeline (37.4%), rail (8.7%), multiple modes and rail (which represents different combinations of modes, at 4.2%), and water (1.4%) (**Figure 13**). As shown, the modes that account for most of the state’s freight flow are trucks and pipelines (over 85%). The average transportation emissions that result from trucking per ton-mile is higher than both water, pipeline, and rail (**Figure 14**).

Oklahoma’s freight network supported 435.5 million tons of freight in 2017.

Figure 13: Oklahoma Freight Tons by Mode (2017)

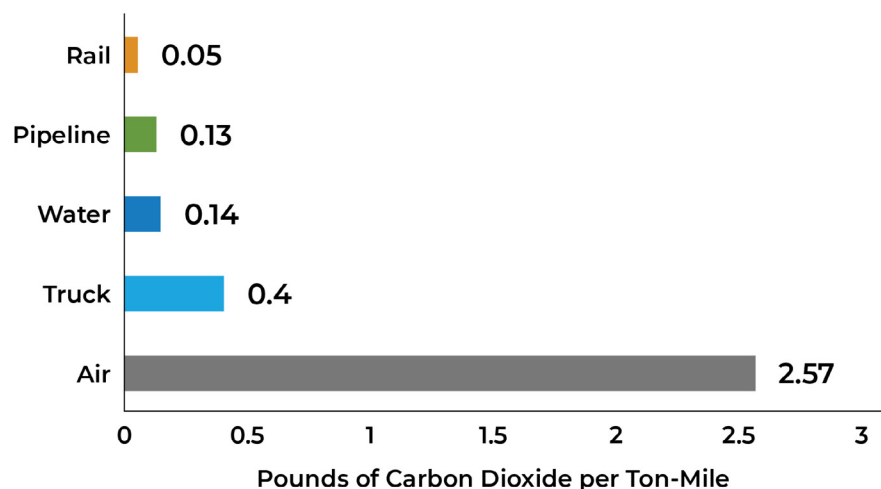


Source: Oklahoma Freight Transportation Plan (2023)

9 Bus RAPID Transit - EMBARK (embar-kok.com) <https://embarkok.com/brt>



Figure 14: Average Carbon Dioxide Emissions per Ton-Mile of Freight, by Mode of Transportation (2019)



Source: Emissions of Carbon Dioxide in the Transportation Sector, Congressional Budget Office, December 2022

Additionally, transitioning the movement of goods to other freight modes like water, pipeline, and rail reduces transportation emissions because the per ton-mile output is lower for water, pipeline, and rail.

Oklahoma's waterways are part of the McClellan-Kerr Arkansas River Navigation System (MKARNS), which connects Oklahoma to the Lower Mississippi River and provides access to the Mississippi/Missouri/Ohio river system, the Great Lakes, the Gulf of Mexico, the U.S. Intracoastal Waterway system, and deep-draft open-ocean shipping lanes, linking Oklahoma with global waterborne trading partners. In total, the MKARNS is a 445-mile navigation system that includes the Verdigris, Arkansas, and White Rivers and operates all year round. Encouraging the increased use of the MKARNS system as a significant mode for freight movement and reducing the total percentage of trucking freight for movement of goods would support transportation emissions reduction as the per ton-mile output is lower for water than trucking.



FACTORS INFLUENCING TRANSPORTATION EMISSIONS

There are many factors that influence transportation emissions, including 1) socioeconomics 2) policy 3) individual modal choice, and 4) freight transportation choices. These key factors are summarized below:

Socioeconomics

Growth, decline, and movement of populations across a state affect the way that passengers travel in each region and the amount of freight and goods movement that is needed to support those populations.

- **Employment activity** such as the location of businesses, number of workers employed, where workers originate from, and the time-of-day workers commute all have an impact on miles traveled and congestion on roadways.
- **Economic activity** such as shopping, dining, and entertainment also impact distance traveled and the number of trips taken.

Policy

- **Land use policies** impact where and what is built as a population grows within an area. Increased population density and mixed land use allows for closer proximity to services and encourages more active modes and public transit, reducing the need for longer distance trips in personal vehicles that produce more emissions.

Individual Modal Choice

- **Walking** and **biking** are the least carbon intensive modes of personal transportation.
- **Passenger rail** is the second least carbon intensive mode of passenger transportation (0.17-0.30 pounds per passenger mile vs. 0.30-0.47 pounds per passenger mile for passenger vehicles that are shared or driven alone).
- **Public bus transit** is the third least carbon intensive mode of passenger transportation (0.39 pounds per passenger mile).
- **Sharing** a personal vehicle (0.30-0.47 pounds per passenger mile) is less carbon intensive than driving alone a single occupancy personal vehicle, which is the most carbon intensive mode of passenger transport (0.47 pounds per passenger mile).



Freight transportation

- **Rail** transport of freight is the least carbon intensive mode of goods movement (0.05 pounds of carbon emissions per ton-mile).
- **Pipeline** transport (which is limited to only certain commodities) is the second least carbon intensive mode of goods movement (0.13 pounds of carbon emissions per ton-mile)
- **Water** or marine transport is the third least carbon intensive mode of goods movement (0.14 pounds of carbon emissions per ton-mile).
- On-road **trucks** are the most carbon intensive mode of goods movement (0.40 pounds of carbon emissions per ton-mile).

EQUITY CONSIDERATIONS

In the time prior to Federal Legislation, like the National Environmental Policy Act of 1969, as the highway systems were built, the approach to construction of transportation infrastructure produced documented harms including isolating and restricting access to communities. The lack of inclusive and well-developed access planning has disproportionately affected communities that have historically been underserved, overburdened, and disadvantaged. For example, the construction of major highways through low-income and minority neighborhoods led to the destruction of thriving communities and to an array of negative health effects. These communities often end up having limited accessibility and are subject to increased levels of transportation emissions due to their proximity to major highways. Reducing transportation emissions assists in addressing the inequitable consequences of past transportation policies.

OTHER BENEFITS TO REDUCING TRANSPORTATION EMISSIONS

Reducing transportation emissions has many additional benefits for Oklahomans. Utilizing alternative modes, such as biking or walking, encourages healthy, active lifestyles, as well as increases transportation choices for residents. Biking, walking, or using transit leads to fewer trips in passenger vehicles and therefore savings on vehicle maintenance, gas, tolls, and other associated transportation costs. Reducing the number of cars on the road will keep Oklahoma's air cleaner, helping create a healthier state.



CARBON REDUCTION STRATEGY DEVELOPMENT

Development of the CRS began in February 2023 and continued until November 2023, as shown in **Figure 15**. During this period, there were multiple internal and external stakeholder engagement opportunities, summarized below. The content of the CRS was developed as follows:

- A complete review of Oklahoma’s transportation planning documents
- Feedback from ODOT stakeholders
- Consultation with Oklahoma’s MPOs.

OKLAHOMA PLAN REVIEW

A complete review of Oklahoma’s transportation planning process was conducted to gain a better understanding of planning efforts around the state. Statewide plans, tribal plans, regional level MPO plans, and other relevant planning efforts were identified and documented to provide a basic understanding of how and whether existing planning documents align with the CRP.

Of the many planning documents that ODOT develops, Oklahoma’s LRTP, Freight Transportation Plan (OFTP), and the Public Transit Policy Plan (OPTPP) provide strong alignment with the objectives of the CRP and provided a foundation to develop ODOT’s CRS goals and objectives. The CRS Goals and Objectives are discussed further in this document.

CONSULTATION AND ENGAGEMENT

Throughout the process of developing the CRS, there were several consultation and engagement opportunities provided to stakeholders from ODOT and the MPOs across the state. A 21 day public comment period was offered in September 2023 to allow the public to consult and engage with this CRS and offer any comments or questions. All comments and questions provided by internal stakeholders, MPOs, and the public were taken into consideration, and if necessary, were incorporated into the final CRS.

Figure 15: CRS Process Timeline



ODOT

During the development of the CRS, an internal stakeholder meeting was held with ODOT Staff. The objective of the meeting was to provide information on the CRP and gather input for potential strategies and projects to support this CRS. ODOT staff who participated in the internal meetings included the following divisions: Planning & Policy, Local Government, Multimodal, Project Management, Maintenance, Environmental, Traffic Engineering, Innovation, and Strategic Communications. Feedback from internal stakeholders have been incorporated into the CRS.

MPOs

The Oklahoma CRS was developed in consultation with Oklahoma's MPOs (**Figure 15**). Consultation was completed through two virtual meetings and ongoing discussions throughout the process. The feedback provided from the MPO stakeholders was incorporated into the CRS. Summaries of the meetings can be found in **Appendix B**.

TRIBAL NATIONS

In addition to the above engagement efforts, the CRP and CRS was presented to the Oklahoma Transportation Tribal Advisory Board.

PUBLIC ENGAGEMENT

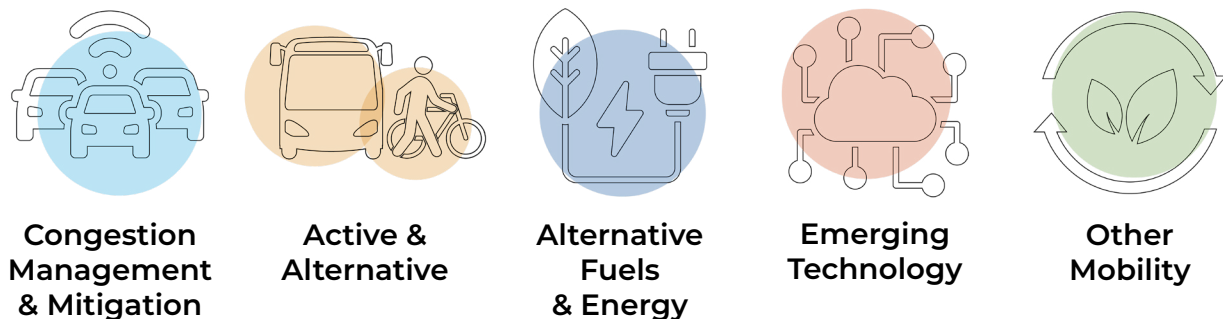
The Draft Carbon Reduction Strategy was released through the ODOT website in September 2023 for a 21-day public comment period. Notification of the public comment period was made through email distribution lists and promotion on social media. In addition, ODOT requested that MPO and RTPPO partners share the public comment period with their stakeholders, directing them to the website for review and comment. Additional public engagement related to carbon reduction will continue through the public and stakeholder engagement for the LRTP update process slated to begin in 2024. A summary of the public comment period can be found in **Appendix C**.



CRS FRAMEWORK & PROJECTS AND STRATEGIES

The identification of projects and strategies that support a reduction in transportation emissions must be included in the CRS to receive federal CRP funding. ODOT developed five broad categories to encompass a wide range of projects that will support carbon reduction in Oklahoma. The five categories presented in **Figure 16** help ODOT organize projects according to CRP eligibility and connect CRS goals and objectives to existing priorities that support efforts to reduce transportation emissions.








Figure 16: CRS Project Categories



CRS GOALS AND OBJECTIVES








ODOT developed goals and objectives in coordination with internal and external stakeholders, including the MPOs. Key elements from the OFTP and the OPTPP were also incorporated into the CRS goals and objectives because they provide a focus on the state's economy and alternative modes, respectively. **Figure 17** below shows the ODOT CRS Goals and Objectives, with the identified goal and or objective on the left side and the specific CRS project category in which that goal applies to on the right.

Figure 17: ODOT CRS Goals and Objectives

Goal Area 1: Safety and Security	
Ensure a safe and secure transportation system for all users and modes.	
Reduce traffic-related fatalities and serious injuries sustained on Oklahoma's multimodal transportation system to help create a safe environment for alternative modes of transportation that reduce transportation related carbon emissions.	
Improve the safety and efficiency of freight movement and its interaction with other vehicles, to reduce transportation related carbon emissions.	
Goal Area 2: Infrastructure Preservation	
Preserve and maintain the condition of Oklahoma's multimodal transportation system in a state of good repair through a process that considers lower emission construction practices.	
Move toward construction practices that result in reduced emissions when improving and maintaining pavement and bridge conditions on the state highway system.	
Improve and maintain the condition of the freight rail system and public transit vehicles, equipment, and facilities.	
Maintain existing and design new transportation infrastructure to meet travel needs in response to extreme weather events and other environmental conditions.	
Support the preservation of Oklahoma multimodal freight networks through appropriate policies and initiatives.	
Goal Area 3: Mobility and Accessibility	
Facilitate the movement of people and goods, improve connectivity between regions and activity centers, and increase travel mode choices.	
Improve access to the statewide multimodal transportation system, increasing connectivity throughout Oklahoma.	






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Enhance access to jobs and services by expanding transportation choices for people in both urban and rural regions.	
Foster a diverse portfolio of modal choices for Oklahoma's freight shippers and receivers in urban and rural areas.	 
Support public transit services through partnerships with transit agencies to increase operating hours of transit, service frequencies, and service areas.	 
Coordinate with transit agencies to accommodate across all active transportation modes.	 



Goal Area 4: Economic Vitality

Provide a reliable multimodal transportation system for people and goods that supports efficient land use and development practices, ensures livable communities, and supports a healthy and competitive Oklahoma economy.

Coordinate with MPOs, RTPOs, local governments, and non- governmental organizations on land use, regional, and multimodal planning to support Oklahoma's existing and future transportation system.	 
Improve transportation reliability and connectivity to Oklahoma's economic and regional centers, encouraging a variety of transportation options.	 
Direct freight-related transportation investments to support the state's economy.	

Goal Area 5: Environmental Responsibility

Minimize and mitigate transportation-related impacts to the natural and human environment, through increased investment in alternative modes.

Support initiatives that maintain air quality and prevent non- attainment.	
Support the growth of Oklahoma clean energy by promoting clean fuel use by the public, private entities, and by freight providers.	

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Minimize and mitigate surface and freight transportation related impacts to vulnerable ecosystems and community resources.	
Evaluate the implications of transportation funding policies, programs, and projects on underserved, historically disadvantaged populations.	
Support grant opportunities for alternative fuels and the development of alternative fuels and/or electric vehicle infrastructure.	

Goal Area 6: Efficient Intermodal System Management and Operation

Maximize system performance and operations through efficient practices that lower transportation related emissions.

Strategically design and adapt transportation infrastructure and technology for new or changing conditions that seek to lower transportation emissions.	
Promote use of innovation and advanced technology to enhance system performance.	
Encourage knowledge-sharing across transit agencies, to improve agencies' ability to deliver enhanced transit services.	

Goal Area 7: Fiscal Responsibility

Sustainably fund and efficiently deliver quality transportation projects that capitalize on alternative fuels and modes while continuing to leverage additional resources in coordination with ODOT's partners.



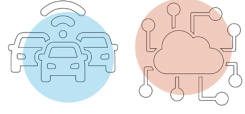

Maintain and improve partnerships and coordination with bordering states to leverage opportunities through strategic partnerships.	
Capitalize on federal funding and finance programs to aid investment in the freight transportation system.	
Coordinate freight corridor development programs with neighboring states.	



CRS IDENTIFIED PROJECTS AND STRATEGIES

ODOT and its MPO partners identified current and planned projects as well as new concepts and strategies that support the reduction of transportation emissions. All projects and new concepts align with the identified carbon reduction categories eligible for CRP funding. This illustrates ODOT’s existing and future commitment to implementing projects and strategies that reduce transportation emissions. Projects and strategies that reduce transportation emissions are included in **Figure 18** and **19**. These projects and strategies support the reduction of transportation emissions while also advancing one or more goals from **Figure 18**.

Figure 18: Current and Planned - Projects and Strategies

Goal Area 1: Safety and Security	
Ensure a safe and secure transportation system for all users and modes.	
Description	CRS Project Category
<p>ODOT has purchased an Autonomous Truck Mounted Attenuator (ATMA) truck and lead vehicle. ATMA's are a critical safety system deployed with highway maintenance operations which follow behind highway maintenance vehicles as an unmanned mobile crash barrier absorbing the impact of traffic accidentally entering the work zone. ATMA's support increased efficiency and safety for workers during road construction projects.</p>	
<p>Road Weather Sensors (RWIS) help motorists to know what the road conditions are on the freeways and not get caught in incidents or weather closures. ODOT utilizes 21 RWIS along I-35 across the state. Additionally, there are 16 RWIS being installed along I-40 across the state.</p>	
<p>ODOT utilizes Variable Speed Limit (VSL) signs on a temporary bases on construction projects. VSL allow speed limits to be changed in real time based on roadway conditions and help avoid creating congestion and increasing idle times.</p>	
<p>ODOT promotes bike and pedestrian safety by partnering with and supporting MPOs and other agencies across the state. The month of May is “Bike and Pedestrian Safety Awareness” month for ODOT, where they support bike and pedestrian safety awareness campaigns such as “Be a Roll Model” and ACOG’s bike to work day. ODOT has also developed a Safe Transportation for Every Pedestrian (STEP) Action Plan as part of an Everyday Counts (EDC) initiative.</p> <p>Additionally, ODOT encourages the bicycle/pedestrian community to coordinate with the state's bicycle and pedestrian coordinator before and during the public involvement process. Local communities can also seek technical support from the coordinator when planning or constructing new facilities.</p>	

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Goal Area 2: Infrastructure Preservation

Preserve and maintain the condition of Oklahoma’s multimodal transportation system in a state of good repair through a process that considers lower emission construction practices.

<p>Fair Miles Pilot: ODOT is implementing a pilot pay-per-mile pilot program (Fair Miles Oklahoma) to explore an alternative funding mechanism to the State’s fuel tax revenue. This will ensure that as fuel tax revenue declines due to increased fuel efficiency, Oklahoma will maintain funding for road and bridge maintenance and construction.</p>	
<p>Energy efficiency light projects are ongoing across the state in McClain, Kay, Tulsa, Payne, Oklahoma, Beckham, Texas, Custer, and Tulsa counties. These projects are listed in the STIP and consist of energy efficiency roadway lighting, underpass lighting and high mast poles.</p>	
<p>Waterways capacity expansion: The MKARNS system capacity is greatly constrained because the current draft depth is nine feet. Congress authorized the expansion through deepening the channel to 12 feet in the Energy and Water Development Act of 2004, but funds have not yet been appropriated to deepen the waterway channel depth. Additional depth would allow for increased weight and higher volumes to be efficiently moved through the system. ODOT will continue to support groundside access to the ports via roads and bridges. By ensuring waterway ports access and expanding capacity, the MKARNS port can continue to support freight movement and reduce the amount of freight on-road emissions.</p>	
<p>ODOT is participating in the FHWA climate challenge to quantify the environmental impacts of different asphalt mix production and pavement construction strategies by evaluating the broader impacts of Balance Mix Design (BMD) and Warm-Mix Asphalt (WMA) specifications and incentives in Oklahoma through a Life Cycle Assessment (LCA) Framework.</p>	
<p>ODOT’s Pavement Management System is used to evaluate and track pavement conditions, leading to less congestion and vehicle idle times caused by road and lane closures from reoccurring construction. Additionally, pavement in good repair reduces fuel consumption, tire wear, vehicle repair and maintenance.</p>	





Goal Area 3: Mobility and Accessibility

Facilitate the movement of people and goods, improve connectivity between regions and activity centers, and increase travel mode choices.

<p>ODOT is undergoing the first statewide Active Transportation Plan and it is expected to be completed in fall 2023. This plan will provide statewide policies and resources to support and guide local communities’, counties, and MPO active transportation efforts.</p>	
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<p>ACOG, INCOG, and the Frontier MPO support bike sharing programs.</p> <ul style="list-style-type: none"> • Oklahoma City’s bike share service launched in 2012 and is called SPOKIES which includes 60 pedal-only and 53 e-bikes. • Fort Smith’s bike share service was launched in 2022 and is called RIDE 4 SMILIES and includes 40 bikes, both pedal-only and e-bikes. • Tulsa’s bike share service was launched in 2018 and is called THIS MACHINE which includes over 200 bikes, both pedal-only and e-bikes. 	
<p>ACOG, Frontier, and INCOG all have ongoing projects related to bike trail and lane expansions or reconfigurations.</p> <ul style="list-style-type: none"> • ACOG’s TIP for 2022-2025 includes several awarded TAP projects that consist of trail construction and expansion, lane additions, and ADA transitions. • Frontier’s TIP for 2021-2024 identifies various trail projects to be completed for 2023. Frontier will also undertake future bike plans for the City of Arkoma. • INCOG’s TIP for 2022-2025 lays out several projects related to improving bike infrastructure and expanding the Tulsa Riverparks Trail. 	
<p>ODOT’s Mobility Management Statewide Pilot Program helps connect communities with reliable transportation options and improve transportation coordination and communication among transportation providers. It aims to improve access to healthy living resources, health care and employment while offering various transportation options such as public transit, private operators, and volunteer drivers to improve travel access for veterans, older adults, people with disabilities, individuals with lower incomes and the general public.</p> <p>ODOT has partnered with the Oklahoma Department of Health to apply for grant funding to implement the Statewide Mobility Management in Oklahoma. This program will advance regional implementation of ongoing mobility management efforts by establishing 25 new initiatives throughout the state to better serve community needs through mobility managers. Through the implementation of this program, individuals will be connected to a wide range of transportation options and service providers to enhance equitable mobility in all of Oklahoma. The Pilot Program started with two RTPOs: the Southwest Oklahoma Regional Transportation Planning Organization (SORTPO) and the Northern Oklahoma Regional Transportation Planning Organization (NORTPO). Three more RTPOs are now contracted to participate in the Statewide Mobility Management Program.</p>	
<p>ODOT utilizes time of day schedule adjustments for construction projects and adjustments are currently being implemented in Love and Murray Counties. The adjustments allow for construction to occur at times when traffic and congestion are less likely so that road closures do not take place during peak hours and result in increased vehicle idling.</p>	

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<p>The Lawton Area Transit System (LATS), located within the LMPO area, provides free fare during Ozone Alert Days. The DEQ, working with the National Weather Forecast, predicts days when conditions may cause unhealthy levels of ozone in Central Oklahoma and declare Ozone Alert Days. The LMPO reimburses LATS for up to half the cost on Ozone Alert Days.</p>	
<p style="text-align: center;">Goal Area 4: Economic Vitality</p>	
<p style="text-align: center;">Provide a reliable multimodal transportation system for people and goods that supports efficient land use and development practices, ensures livable communities, and supports a healthy and competitive Oklahoma economy.</p>	
<p>Telecommuting and Carpooling: ODOT offers remote work and encourages carpooling for field visits.</p>	
<p>The HALO Hub is a three-state partnership (Arkansas, Louisiana, and Oklahoma) to establish a regional hub for the development, production, and use of clean hydrogen as fuel and manufacturing feedstock. ODOT is working closely with the HALO Hub to ensure the maintenance of transportation networks between major facilities.</p>	
<p>INCOG offers an energy revolving loan program that provides funding to eligible projects such as alternative fuels, building energy efficiency, renewable energy projects, and demand management.</p>	

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Goal Area 5: Environmental Responsibility

Minimize and mitigate transportation-related impacts to the natural and human environment, through increased investment in alternative modes.

The MPOs are actively supporting the conversion of bus fleets to zero or low emissions buses.

- ACOG awards funds through the Clean Air for Public Sector Fleet Grant Program for public-sector fleet alternative fuel vehicle projects. In 2022, funds supported the purchase of a CNG refuse truck for the City of Nichols Hills and an electric vehicle for the Oklahoma Municipal Power Authority (OMPA). ACOG will be continuing this program at a minimum through 2025 as funds permit.
- INCOG supports Tulsa Transit in the expansion of their alternative fuel fleet. In 2022, Tulsa Transit received FTA funds to purchase nine CNG buses and seven electric buses.
- LMPO is undergoing a Zero-Emission Bus Analysis and Rollout Plan for the Lawton Area Transit System

MPOs will continue to work to convert transit fleets to electric or alternative fuels and construct regional transit hubs to better connect transit across each region.

ODOT contributes and has oversight of FTA 5339(b) funds which can be used to replace, rehabilitate and/or purchase vehicles, including vehicle related equipment, and/or to construct bus related facilities. In 2019, ODOT received approximately \$4 million from FTA to purchase new buses and vans to expand rural service and replace vehicles that have exceeded their useful life.

ODOT also contributes and has oversight of FTA 5339c funds which provides funding to state and local governmental authorities for the purchase or lease of zero-emission and low-emission transit buses. In 2023, ODOT, on behalf of Oklahoma State University Stillwater Community Transit (OSU Transit) received funding to complete the new OSU Transportation Operations and maintenance Facility.



The MPOs are actively supporting the expansion of charging infrastructure across the state.




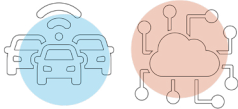

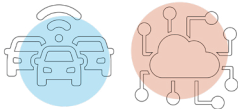
- ACOG awards funds through the Clean Air for Public Sector Fleet Grant Program for electric vehicle charging projects. In 2022, funds supported the purchase of six dual level 2 charging stations in Edmond, two dual direct current (DC) fast charging stations in Norman, and two dual DC fast charging stations in the City of Nichols Hills. ACOG will be continuing this program at a minimum through 2025 as funds permit.

The development of EV charging infrastructure is a high priority for several MPOs, and they are actively engaged in EV planning activities.








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<p>ODOT currently has a Natural Gas Fleet with over 400 half- and three quarter-ton work trucks working in the field and over 20 cars in the motor pool. All should be replaced by the end of 2025.</p>	
<p>Oklahoma's NEVI Plan began in April 2022 and will guide ODOT over the next five years. ODOT has developed a competitive procurement program to award NEVI funding to fully build out Oklahoma's Interstate Highways and FHWA-designated EV alternative fuel corridors to NEVI standards. After ODOT achieves the primary goal of building out a fully NEVI-compliant network on the Interstate Highways and EV alternative fuel corridors, ODOT intends to expand eligibility for NEVI funding to other regional routes of significance. MPOs and RTPOs are supportive of increasing charging stations across the state along the highway system and in rural and metropolitan areas.</p>	
<p>Goal Area 6: Efficient Intermodal System Management and Operation</p>	
<p>Maximize system performance and operations through efficient practices that lower transportation related emissions.</p>	
<p>The Tulsa Clean Cities Coalition, housed within INCOG, supports the City of Tulsa's Mobility Innovation Strategy and the development of AV micro transit. Tulsa Transit is currently running a Micro Transit Pilot Program that is slated to become permanent. Additionally, the Micro Transit program will begin utilizing AV technology to support Micro Transit to become reliable and efficient.</p>	
<p>Dynamic Message Signs (DMS) are used to post information about delays, construction, weather events and any incidents, so motorists do not get caught in traffic and have the option to take alternate routes, reducing emissions. ODOT has DMS installations in multiple Districts in the state along I-35 and I-40. As identified in the STIP, ODOT will continue using ITS and variable message signs to encourage the use of alternative transportation modes.</p>	
<p>Closed-Circuit Television (CCTV) Cameras are used to monitor freeways to respond to incidents and collisions faster. Images are distributed to all emergency responders to assist in clearing the roads and get traffic free flowing. ODOT utilizes CCTV technology in the Oklahoma City and Tulsa metros.</p>	
<p>Operational improvements such as traffic signal improvements help improve the flow of traffic, resulting in less idling, fuel consumption and transportation emissions. ODOT has been working with the City of Atoka to design a signalized intersection that helps improve movement on US- 69, a vital freight corridor. ODOT is also working with other cities around the state to help with updating poorly timed signals. Additionally, the state is utilizing innovative signals to improve efficiency in Hochatown. ACOG supports traffic signal improvements through traffic light coordination in OKC. The Lawton MPO is currently undergoing a traffic flow study that will highlight specific projects to improve congestion.</p>	

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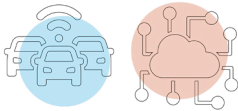






<p>Projects that improve traffic flow without adding capacity are another form of operational improvements. Roundabouts, Diverging Diamond Interchanges (DDIs), and Single-Point Urban Interchanges (SPUI) have been constructed throughout the state as alternative forms of traffic control. Oklahoma constructed the state's first DDI in 2020 and continue to expand their use in new construction.</p>	
<p>In partnership with the Oklahoma Turnpike Authority (OTA), the <i>Drive Oklahoma</i> mobile app provides travelers with real-time speed data, live traffic camera views of many Tulsa and Oklahoma City metro locations, DMS information by location, real-time weather radar information and more. Information self-reported through the Waze app is incorporated as well to provide drivers with real-time data, helping drivers arrive in more efficiently.</p> <p>ODOT will continue to explore the implementation of pilot-programs of internet-based systems and emerging technology for managing traveler information and notifications, which will help move people and goods more efficiently, reducing transportation emissions.</p>	
<p>ODOT is currently studying the use of hard shoulder running for general traffic in urban areas. Hard shoulder running allows for drivers to utilize roadway shoulders during peak periods or traffic.</p>	
<p>Goal Area 7: Fiscal Responsibility</p>	
<p>Sustainably fund and efficiently deliver quality transportation projects that capitalize on alternative fuels and modes while continuing to leverage additional resources in coordination with ODOT's partners.</p>	
<p>Research funding opportunities beyond the Public Transportation Revolving Fund to support metropolitan area transit, passenger rail initiatives, regional transit authority (RTA).</p>	
<p>Continue coordination with Amtrak, the Burlington Northern and Santa Fe Railway (BNSF), and the State of Kansas in evaluating and determining the feasibility of providing potential passenger rail service from Oklahoma City to Newton, Kansas, in order to provide a direct link from Oklahoma to Amtrak's national system.</p>	



ODOT is in the process of planning and envisioning future projects and strategies that reduce transportation emissions, identified below in **Figure 19**.






Figure 19: New Concepts: Projects and Strategies

Goal Area 1: Safety and Security	
Ensure a safe and secure transportation system for all users and modes.	
Description	CRS Project Category
Explore the use of drones as first responders to accidents. This will allow for the traffic operations center to quickly understand the magnitude of a collision and the level of response needed, increasing the speed of which accidents are cleared and reducing traffic idle times and transportation emissions.	
Explore the expansion of the Traffic Operations Center (TOC) to be 24 hours 7 days a week. Having the TOC operate 24/7 would allow for the successful implementation of TIM, which reduces congestion and idle times during traffic incidents.	
Examine the integration of Transportation System Management and Operations (TSMO) projects in the future. TSMO strategies such as traffic incident management (TIM), traveler information systems, and other technologies manage safety in work zones and reduce impacts of congestion-causing incidents and bottlenecks related to freight and in general, lead to less congestion and vehicle idle times.	
Improve the safety of roadway infrastructure and add shoulders on portions of state highways systems that lack or have deficient shoulders to reduce idle times caused by stalled vehicles and high congestion.	
Goal Area 2: Infrastructure Preservation	
Preserve and maintain the condition of Oklahoma’s multimodal transportation system in a state of good repair through a process that considers lower emission construction practices.	
Examine current practices in construction, maintenance, and agency operations to identify areas for potential energy conservation. This could include installing light emitting diode traffic signals, reducing roadside mowing during peak hours, using warm-mix asphalt, and other measures that will use materials that are less environmentally impactful.	

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Goal Area 3: Mobility and Accessibility

Facilitate the movement of people and goods, improve connectivity between regions and activity centers, and increase travel mode choices.

<p>MPOs support the creation of rural transit hubs providing connections to city buses. ODOT could research the development of rural transit hubs by exploring the FTA's Rural Transit Grants and the USDOT's Rural Opportunities to Use Transportation for Economic Success (ROUTES) initiative which improves the opportunity to access alternative modes of transportation.</p>	
<p>ODOT will explore opportunities to coordinate with MPOs and RTPOs to examine the connections between land use and transit planning, including pedestrian and bicycle connections to transit routes, practical transit stop locations, transit shelters, park-and-ride lots, access for elderly and disabled, and transit-oriented development. Coordination could include expanding and improving connections between rural transit systems and tribal systems, intercity bus stops/terminals, urban transit system transfer points, airports, and Amtrak Heartland Flyer stop. Encouragement and increased use of alternative and active modes reduces the use of single- occupancy vehicles reducing overall transportation emissions.</p>	
<p>Continue to implement the Oklahoma Public Transit Policy Plan, which will allow public transit options expanded, encouraging alternative transportation modes and reduced emissions.</p>	
<p>ODOT will explore opportunities to coordinate with MPOs and RTPOs to examine the inclusion of bicycle and pedestrian facilities into new and renovated intermodal facilities and connection points, such as train depots and bus terminals. Coordination could include assessing and responding to needs for pedestrian and bicycle infrastructure on or adjacent to state highways concurrent with related highway improvements, and as a part of the project development process, which improves the ability to be able to use and increase the use of active transportation modes.</p>	
<p>Continue integrating time of day schedule adjustments for construction projects during non-peak hours resulting in less vehicle idling overall.</p>	

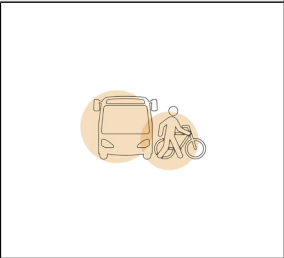
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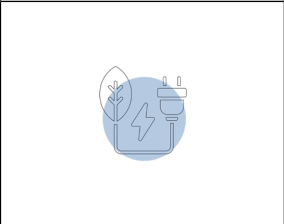
Goal Area 4: Economic Vitality

Provide a reliable multimodal transportation system for people and goods that supports efficient land use and development practices, ensures livable communities, and supports a healthy and competitive Oklahoma economy.

Continue to monitor ridership and work to secure funding to improve the existing Amtrak passenger rail service which promotes the use of alternative modes of transportation. ODOT and the Kansas Department of Transportation (KDOT) are creating a Service Development Plan and have submitted a grant for the Federal Railroad Administration (FRA) Corridor Identification and Development Program for planning along the Amtrak corridor.



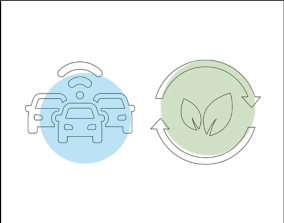
Implement the multimodal freight strategies identified in the 2023-2030 Oklahoma Freight Transportation Plan. The OFTP considers pilot programs for emerging transportation technology, encourages the expansion of alternative fueling facilities, and identifies other strategies which reduces the freight transportation industries dependency of gas- and diesel- powered vehicles.



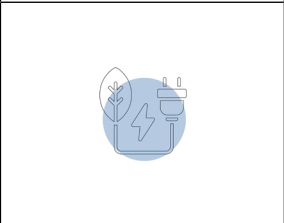
Goal Area 5: Environmental Responsibility

Minimize and mitigate transportation-related impacts to the natural and human environment, through increased investment in alternative modes.

Fleet Reduction and Fleet Sharing: ODOT will reduce its fleet by systematically reviewing various divisions use of the fleet and reducing the existing fleet accordingly. Additionally, ODOT will look into fleet sharing with sister agencies to reduce the number of vehicles used by the State, reducing emissions emitted from vehicles.



Explore the use of clean fuels by focusing efforts on conserving fuel, such as leasing an electric vehicle (EV), developing efficient traffic operations, traffic signal optimization, and work zone design to minimize idling time, etc. By incorporating alternative fuel vehicles and utilizing emerging technology, ODOT can reduce transportation emissions.








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Goal Area 6: Efficient Intermodal System Management and Operation

Maximize system performance and operations through efficient practices that lower transportation related emissions.

<p>ODOT and MPOs will support transit agencies efforts to implement micro transit throughout the state, which increases the use of alternative modes of transportation and reduces single-occupancy vehicle use.</p> <ul style="list-style-type: none"> • INCOG supports a micro transit program in Tulsa that is part of Tulsa Transit and is looking to expand in the future. • In the ACOG, the City of Oklahoma City is in the process of trying to work with EMBARK and other relevant stakeholders to secure funding and develop a micro transit program. • In the LMPO area, the MTP identifies hiring and monitoring a consultant to plan micro transit zones. 	
<p>Consider policies related to communications technology (e.g., 5G, broadband) to support public-private implementation of emerging transportation technologies and explore what is required to develop a fully integrated CAV system on clearly defined corridors. By increasing vehicle to vehicle communications, vehicles could move people and goods more efficiently, reducing transportation emissions.</p>	
<p>Continue developing data sharing public/private partnerships with companies (such as Uber, Lyft, Lime, and Bird) providing transportation services and identify best practices on collecting, storing, using, and sharing data from emerging transportation technology. Assist with data sharing regarding travel patterns. ODOT has existing data sharing agreements with Waze and continuing to expand partnerships will help ODOT make informed data driven decisions that will support the reduction of emissions.</p>	
<p>Continue collaboration with stakeholders in the development of an electric database and mobility management system for transit service routes and locations to support increased efficiency of transit routes.</p>	
<p>Consider HOV lanes within the highway system. MPOs are open to the idea of managed lanes on high-capacity roadways in urban areas. HOV lanes will reduce single-occupancy vehicle use and support emissions reduction.</p>	



Goal Area 7: Fiscal Responsibility

Sustainably fund and efficiently deliver quality transportation projects that capitalize on alternative fuels and modes while continuing to leverage additional resources in coordination with ODOT's partners.

<p>Consider carbon reduction in the project selection process for the Eight Year Construction Work Plan.</p>	
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<p>Seek partnerships with private-sector user groups, economic development associations, and other stakeholders to promote a less carbon intensive mode for the movement of freight by deepening the MKARNS channel.</p>	
<p>Consider the information on historical trends and how it is provided to state government leaders and the Congressional Delegation to support their search and acquisition of new/additional funding sources for the transportation system, including rural, urban, and tribal transit; passenger and freight rail service improvements; aviation improvements; and waterway improvements.</p>	

IMPLEMENTATION

Incorporation of the CRS is the first step in ODOT’s approach to reducing transportation emissions. ODOT will build on the strategy and continue to implement projects and strategies that support the reduction of transportation emissions. This CRS will act as a tool for ODOT similar to how other planning documents guide project prioritization, to provide emphasis on emissions reduction during project selection.

ODOT is committed to advancing an equitable transportation system for Oklahoma. The underserved, overburdened, and disadvantaged communities will be considered during project selection and development.

Additionally, ODOT will incorporate the carbon reduction goals, objectives, projects and strategies included in the CRS within the next update of the LRTP. The coordination and public engagement process for the next 2025-2050 LRTP update will begin in 2024 and will continue through at least 2025.

As a coordinating partner to DEQ’s efforts to quantify GHG emissions, provide emissions projections, and the development GHG reduction targets and goals, ODOT’s participation will help bring further awareness to projects that reduce transportation emissions and identify alignments in efforts between agencies. Overall, the CRS will work in tandem with other emissions reduction measures in the state.

The projects and strategies identified within this CRS provide the opportunity to reduce transportation emissions while also supporting local, regional, and statewide transportation existing and future plans.

Overall, the CRS provides a deeper understanding of the pathways for the reduction of transportation emissions at ODOT and within the State of Oklahoma.



APPENDIX A: CARBON REDUCTION PROGRAM COMPLIANCE

U.S.C. Statute	Notes of Compliance
<p>§ 175 (d)(1) IN GENERAL. -Not later than 2 years after the date of enactment of the Surface Transportation Reauthorization Act of 2021, a State, in consultation with any metropolitan planning organization designated within the State, shall develop a carbon reduction strategy in accordance with this subsection.</p>	<p>As shown in the section titled <i>ODOT and Partners Roles and Responsibilities</i>, this CRS was developed in consultation with the state's four MPOs.</p> <p>This CRS is planned to be finalized and submitted to the FHWA for certification by the USDOT Secretary before the November 15, 2023.</p>
<p>§ 175 (d)(2) -The carbon reduction strategy of a State developed under paragraph (1) shall-</p>	
<p>§ 175 (d)(2)(A) support efforts to reduce transportation emissions</p>	<p>The background for understanding the context for transportation emissions from carbon is provided in this CRS and is present in the section titled <i>CARBON REDUCTION IN TRANSPORTATION</i>.</p> <p>ODOT's CRS includes the planning framework, and project and strategies that are able to be implemented by ODOT and the MPOs in support of carbon reduction, located in the section titled <i>CRS FRAMEWORK & PROJECTS AND STRATEGIES</i>.</p>
<p>§ 175 (d)(2)(B) identify projects and strategies to reduce transportation emissions;</p>	<p>Projects and strategies that are able to be implemented by ODOT and the MPOs to reduce transportation emissions are identified in this CRS within the section titled <i>CRS FRAMEWORK & PROJECTS AND STRATEGIES</i>.</p>
<p>§ 175 (d)(2)(C) support the reduction of transportation emissions of the State;</p>	<p>ODOT has the opportunity to support the reduction of the state's transportation emissions through the implementation of energy efficiency retrofits in equipment or facilities as well as other ways. Additional opportunities to support the reduction of the state's transportation emissions are found in the section titled <i>CRS FRAMEWORK & PROJECTS AND STRATEGIES</i>.</p>
<p>§ 175 (d)(2)(D) at the discretion of the State, quantify the total carbon emissions from the production, transport, and use of materials used in the construction of transportation facilities within the State; and</p>	<p>As of this time, ODOT will not be quantifying the total transportation emissions resulting from the production, transport, and use of materials in the construction of transportation.</p>
<p>§ 175 (d)(2)(E) be appropriate to the population density and context of the State, including any metropolitan planning organization designated within the State</p>	<p>Oklahoma's developed this CRS in consultation with the state's four MPOs, considering the general transportation context of the state, which included travel behaviors, freight system trends, planning roles and responsibilities.</p>



APPENDIX B: STAKEHOLDER COORDINATION

Oklahoma Department of Transportation
Carbon Reduction Strategy

Stakeholder Meeting #1 Summary

Date & Time: Monday, 02/06/2023

Attendees:



Metropolitan Planning Organizations

Charlotte Brown	Community Services/Planning Director, LMPO
Jonathan Stone	Transportation Planner, LMPO
Reese Brewer	MPO Director, FRONTIER
Braden Cale	Transportation Programs Coordinator, INCOG
John Sharp	Deputy Director, Transportation Planning Services, ACOG
Hannah Nolen	Program Coordinator, Transportation Planning Services, ACOG

ODOT

Dawn Sullivan	Deputy Director
Laura Chaney	Planning & Policy Manager
Sarah McElroy	Planning Coordinator
Gary Flynn	Planning Coordinator

Federal Government

Isaac Akem	Community Planner, FHWA
Marc Oliphant	Community Planner, FTA

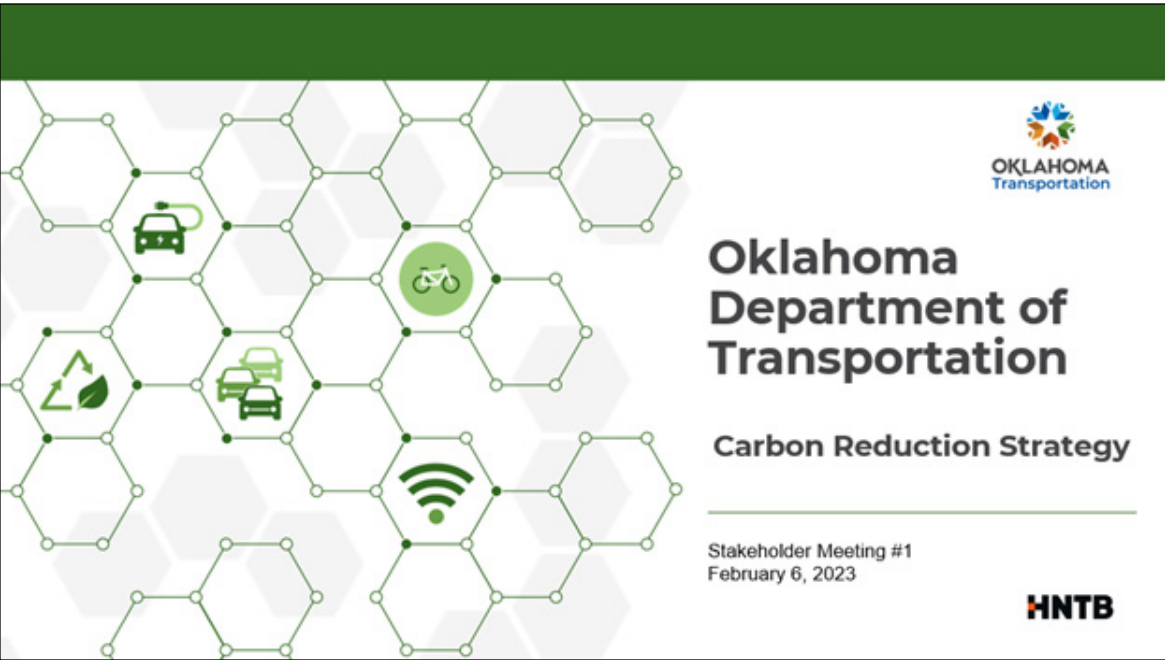
HNTB (Consultant Team)

Brian Comer	Associate Vice President
Laura Davis	Planner III
Loreana Marciante	Principal Technologist



Key Questions and Discussion Topics

- Laura Davis and Loreana Marciante from ODOT’s consultant team (HNTB) presented an overview of the Carbon Reduction Program (CRP), including what it is and its overall purpose.
- Following the overview, the team presented on the development of a Carbon Reduction Strategy and project categories that may qualify for Carbon Reduction Program funding. That also included a description of how those project categories align with ODOT’s Long Range Transportation goals and objectives.
- Information presented in regard to funding also identified the steps to obtaining funding and implementing projects.
- The team then discussed the timeline of the stakeholder involvement and when the next meetings are anticipated to occur, highlighting a presentation on the Carbon Reduction Strategy Framework for the next stakeholder involvement meeting.
- The presentation continued with team members requesting stakeholder attendance and participation for upcoming meetings and relevant feedback that can be applied to the development of the Carbon Reduction Strategy.
- Lastly, the consultant team closed the presentation by discussing the next steps for the project and the stakeholder involvement process, which included survey materials that would determine the date of the next meeting.
- The presentation took place during an MPO Quarterly meeting, and no comments were received.



Agenda



- Welcome/Introductions
- Carbon Reduction Program Overview
 - Carbon Reduction Strategy
 - Eligible Projects
 - Funding Suballocation
- Stakeholder Involvement
- Next Steps

Carbon Reduction Program (CRP) Plan

Carbon Reduction Program Overview



Carbon Reduction Program

What is it?	Purpose
New formula program established by the Bipartisan Infrastructure Law (BIL)	Provide funding for projects designed to reduce transportation emissions, defined as carbon dioxide (CO ₂) emissions from on-road highway sources.

- Requires development of Carbon Reduction Strategy
- Funding suballocation according to population

For more information: https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm

Carbon Reduction Program (CRP) Plan

Carbon Reduction Strategy



- Carbon Reduction Strategy must:
 - Support efforts to reduce transportation emissions
 - Be appropriate to the population and context of the state
 - Identify projects and strategies that will reduce emissions
- Must be:
 - Developed in consultation with MPOs
 - Updated at least every 4 years



Carbon Reduction Program (CRP) Plan



Examples of CRP Eligible Projects



Traffic/Congestion Management

Managed Lanes (HOV, Truck)
Fair Miles Pilot (Pay Per Mile)
Electronic Tolling



Alternative Modes

Bicycle
Pedestrian
Transit



Alternative Fuels/ Energy Efficiency

Electric Vehicles (EV)/
Alternative Fuel Vehicles (AFV)
Diesel Engine Retrofits
Freight/Port Emissions
Energy Efficient Lighting



Technology Solutions

Traffic Management Facilities
Adaptive signals
Intelligent Transportation Systems
Other Advanced Tech



Other

Projects that improve traffic flow, without adding capacity
Other projects that demonstrate a reduction in on-road carbon emissions

Carbon Reduction Program (CRP) Plan

CRP – Funding Suballocation



CRP TOTAL FUNDING

Any area
35%



Allocated by population
65%

- 65% of funds are divided based on population
 1. More than 200,000
 2. 50,000 to 200,000
 3. 5,000 to 49,999
 4. Less than 5,000

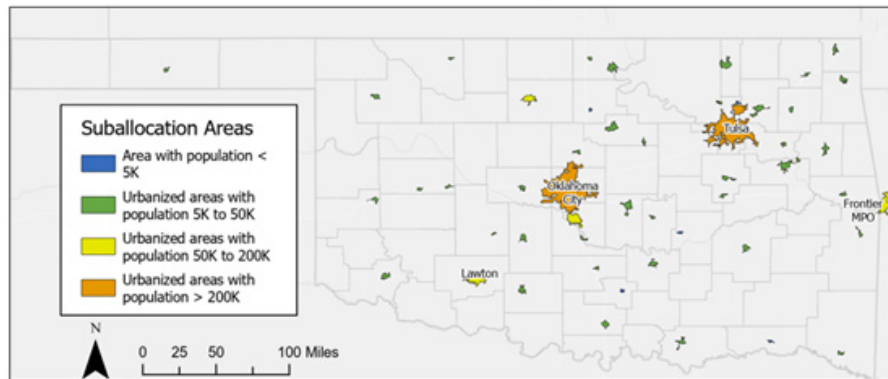
- 35% can be spent in any area of the State

Carbon Reduction Program (CRP) Plan

CRP– Oklahoma Funding



\$106 million over 5 years



Carbon Reduction Program (CRP) Plan



Stakeholder Involvement - Timeline



Stakeholder Meeting #1

- CRP Program Overview
- Solicit Information

Feb (2/6/23)

Stakeholder Meeting #2

- Carbon Reduction Strategy Framework

June (Date TBD)

Stakeholder Meeting #3

- Final Carbon Reduction Strategy

Sept/Oct (Date TBD)

Carbon Reduction Program (CRP) Plan

Stakeholders – What we need from you!



- All Stakeholders
 - Attend & participate in stakeholder meetings
 - Provide relevant feedback for the development of the Carbon Reduction Strategy

Carbon Reduction Program (CRP) Plan

Next Steps



- Look for a survey to select a preferred date for the next stakeholder meeting in June
- Materials will be sent in advance of next meeting

Carbon Reduction Program (CRP) Plan



Oklahoma Department of Transportation

Carbon Reduction Strategy

Stakeholder Meeting #2 Summary

Date & Time: Tuesday, 06/27/2023

Attendees:



Metropolitan Planning Organizations

John Sharp	Deputy Director, Transportation Planning Services, ACOG
Hannah Nolen	Program Coordinator, Transportation Planning Services, ACOG
Jennifer Sebesta	TPS Division Manager, Transportation Planning Services, ACOG
Reese Brewer	MPO Director, FRONTIER
Desaray Fuentes	Transportation Planner, FRONTIER
Thomas Dow	Director, Transportation Planning and Programs, INCOG
Braden Cale	Transportation Programs Coordinator, INCOG
Michelle Merchant	Sustainability Programs Planner, INCOG
Andrea Craig	Environmental Planner, INCOG
Clinton Johnson	Director, Office of Energy and Environmental Sustainability, INCOG
Jonathan Stone	Transportation Planner, LMPO

ODOT

Sarah McElroy	Planning Coordinator
Laura Chaney	Planning & Policy Manager

Federal Government

Isaac Akem	Community Planner, FHWA
Marc Oliphant	Community Planner, FTA

HNTB (Consultant Team)

Robyn Arthur	Planning Department Manager
Laura Davis	Planner III
Loreana Marciante	Principal Technologist
Zachary Harland	Planner I



Key Questions and Discussion Topics

- Laura Davis and Loreana Marciante from ODOT's consultant team (HNTB) presented an overview of the Carbon Reduction Program (CRP), including what it is and its overall purpose.
- Discussion on the Carbon Reduction Strategy also included project categories that may qualify for Carbon Reduction Program funding. This also included a description of how these project categories align with ODOT's Long Range Transportation goals and objectives.
- Information presented in regard to funding also identified the steps to obtaining funding and implementing projects.
- Following the overview, the team presented on the development of a Carbon Reduction Strategy.
- The Carbon Reduction Strategy discussion followed the description on the strategy and the funding for carbon reduction. Discussion items included were the review of the ODOT Carbon Reduction Strategy (vision, goals, examples of applicable projects) and the development of the potential project/strategies and other items to inform the strategy.
- A discussion exercise was conducted towards the end of the presentation and consisted of the following five questions:
 - What projects/strategies are you currently doing that support carbon reduction?
 - What types of carbon reduction projects/strategies would you like to see implemented?
 - What challenges do you anticipate/have you experienced with implementing carbon reduction strategies/projects?
 - What are some successes you have found in implementing carbon reduction strategies? (Examples: Incentivizing drivers/commuters/freight carriers to adopt new behaviors)
 - What projects and strategies are most feasible in the short term (next 5) vs the long-term (next 20)
- Discussions on question 1 included the following ideas and topics for project categories that are most equipped to implement strategies:
 - *Frontier MPO SMILIES bikeshare program (undertaking future bike plans for the City of Arkoma)*
 - *ACOG MPO – bike lanes, bus stops, trails, CNG & electric buses, traffic light coordination, bike share, ITS*
 - *ACOG – electric chargers & CNG charging for transit*
 - *Tulsa Riverparks Trail extension south to Jenks Free fares for Tulsa transit in the summer*



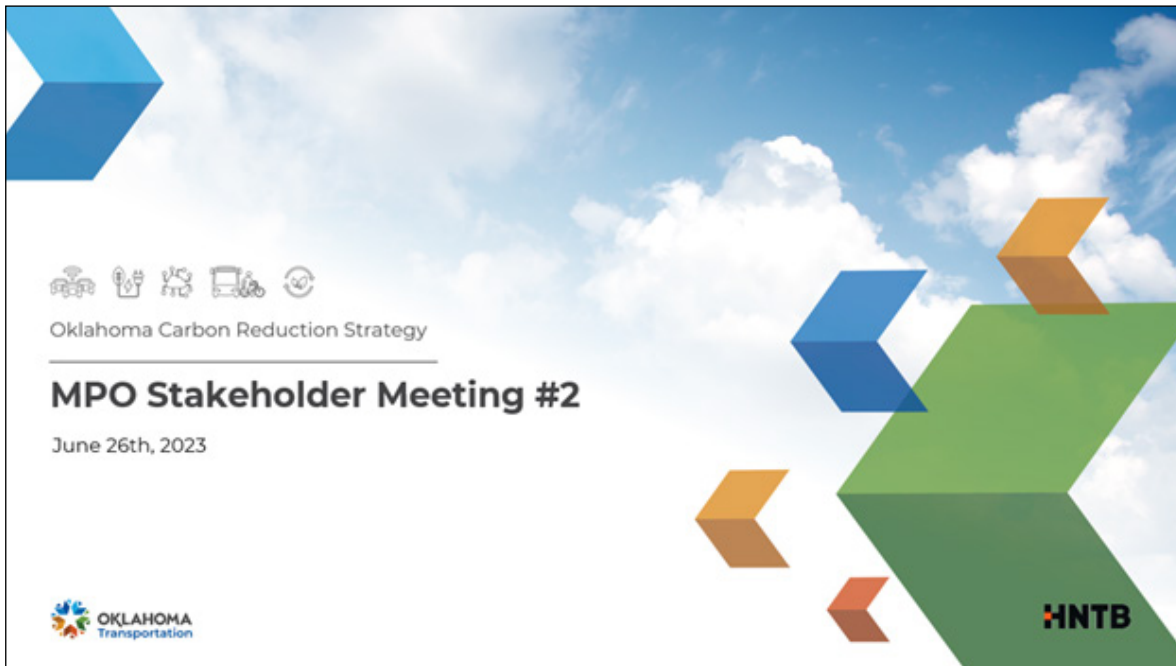
- *Tulsa Area Clean Cities program through INCOG, supports carbon reduction. Examples: EV and other low carbon fuel infrastructure buildout, fleet conversions, AV micro transit, electric bike share, alternative fuel school bus funding outreach, workplace EV charging initiative, City of Tulsa's Mobility Innovations Strategy*
- *Lawton is conducting a traffic flow study that will provide specific projects that will improve congestion. Working with the transit system and completed a zero-emissions transition plan*
- *Zero emissions vehicles in Tulsa TMA*
- *ACOG – fleet conversion grants*
- *INCOG's energy revolving loan program*
- *Improved transit services and other shared modes.*
- *Micro transit and carsharing*
- *Receiving additional CMAQ funding to provide to MPOs*
- *Discussions on question 2 included the following ideas and topics for project categories that are most equipped to implement strategies:*
 - *Rural transit hubs that meet city busses and more charging stations*
 - *Trails along waterways*
 - *State transportation dollars for rail in metro areas*
 - *Electric vehicle charging stations*
 - *Express bus service from suburbs to Tulsa's downtown*
 - *Traffic operations center for Tulsa suburbs*
 - *Expansion of 'This Machine' in Tulsa*
 - *Commuter rail and intercity rail*
 - *Micro transit*
 - *Carsharing*
 - *Additional state transportation dollars for rails in metros*
 - *Use of state CMAQ funds on CMAQ-related projects instead of flexing to other programs*
 - *Enhancement of bike routes throughout the city for better connectivity*
 - *More CMAQ and CRP funds for MPOs*
 - *ODOT Complete Streets Policy*
 - *Micro transit beyond pilot projects in Tulsa (concern over the cost for the average person)*
 - *Conversion of general lanes to HOV lanes*
 - *Updating of outdated ramps to prevent accidents and idle time*
- *Discussions on question 3 included the following ideas and topics for project categories that are most equipped to implement strategies:*
 - *Funding and limited political will*
 - *Convincing elected officials for funding*



- *Truck electrification at truck stops*
- *Inadequate public engagement*
- *Lack of education about carbon reduction*
- *Regional connection to the oil & gas industry*
- *Car-centric mentality of residents and others*
- *Providing equitable outcomes*
- *Jurisdictional issues*
- *Less investment in low-income areas*
- *Converting to electric vehicles in city and transit fleets and building trails*
- *Multiple agencies at various levels of government who each have their own missions and are not necessarily pulling in the same direction*
- Discussions on question 4 included the following ideas and topics for project categories that are most equipped to implement strategies:
 - *Expanding sidewalks and bike networks*
 - *Trail building*
 - *Public fleet conversions*
 - *Working with new partners to promote healthy transportation choices, such as with Mercy Hospital and medical colleges (U of Arkansas) for SMILIES bikesharing program*
 - *Updating traffic signals to reduce idle time*
 - *Adoption of alternative fuel vehicles*
 - *Cost savings or stability through alternative fuel conversion*
 - *Bird/Lime scooter usage (potentially causes other issues)*
 - *CMAQ dollars to replace low-emission vehicles (currently having trouble obtaining EV's)*
 - *CNG and EV's not an easy sell, but some success*
 - *Short term – enhanced bicycle across the city in Tulsa. Long term sustainability of micro transit. Long term – commuter rail, eventually intercity rail to OKC*
 - *Expanding what the nonprofit UP WITH TREES is doing in Tulsa*
- Discussions on question 5 included the following ideas and topics for project categories that are most equipped to implement strategies:
 - *Expanded bus service*
 - *Regional commuter rail system*
 - *Expansion of EV charging infrastructures across communities*
 - *Expansion of bikeshare network*
 - *Lowering speeds*
 - *Transit fleet conversion to electronic and regional transit hub*



- Continue to add to bike network and allow people to truly have a safe option
 - Short term – enhanced bicycle connectivity across Tulsa, long term sustainability and expansion of micro transit & BRT Long term – commuter rail and intercity rail
 - Free bus transit through CMAQ funds
- After the Carbon Reduction Strategy discussion ended, the presentation wrapped up with the timeline and next steps for the stakeholder involvement process following the presentation.



Agenda

Meeting Objective: Discuss projects and strategies for development of Carbon Reduction Strategy.

Topic	Presenter
Welcome & Introductions	
Carbon Reduction Program (CRP)	Laura Davis, HNTB
Carbon Reduction Strategy Discussion	Loreana Marcianete, HNTB
Timeline & Next steps	
Adjourn	

OKLAHOMA Transportation



Carbon Reduction Program (CRP)

Carbon Reduction Program

What is it?	Purpose
New formula program established by the Bipartisan Infrastructure Law (BIL)	Provide funding for projects designed to reduce transportation emissions, defined as carbon dioxide (CO2) emissions from on-road highway sources.

Requires development of Carbon Reduction Strategy
 Funding suballocation according to population

For more information: https://www.fhwa.dot.gov/bipartisan-infrastructure-law/crp_fact_sheet.cfm

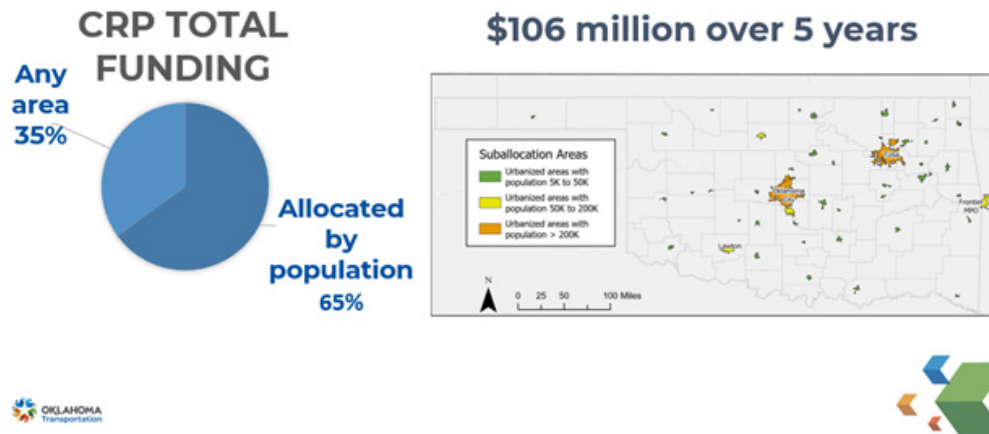


Examples of CRP Eligible Projects

Traffic/Congestion Management	Alternative Modes	Alternative Fuels/ Energy Efficiency	Technology Solutions	Other
Managed Lanes (HOV, Truck)	Bicycle	Electric Vehicles (EV)/ Alternative Fuel Vehicles (AFV)	Traffic Management Facilities	Projects that improve traffic flow, without adding capacity
Fair Miles Pilot (Pay Per Mile)	Pedestrian	Diesel Engine Retrofits	Adaptive signals	Other projects that demonstrate a reduction in on-road carbon emissions
Electronic Tolling	Transit	Freight/Port Emissions	Intelligent Transportation Systems	
		Energy Efficient Lighting	Other Advanced Tech	



CRP – Funding Suballocation



Carbon Reduction Strategy

- Carbon Reduction Strategy must:
 - Support efforts to reduce transportation emissions
 - Be appropriate to the population and context of the state
 - Identify projects and strategies that will reduce emissions
- Must be:
 - Developed in consultation with MPOs
 - Updated at least every 4 years



Carbon Reduction Strategy Discussion



Discussion Items

1. Review ODOT Carbon Reduction Strategy

- Vision
- Goals
- Examples of applicable projects

2. Develop list of potential project/strategies and other items to inform the strategy



Vision Statement

Oklahoma will continue to strive for a multimodal transportation system that reduces emissions and supports an improved natural environment and enhanced quality of life for residents.



Goals

Goal Area	Goal	CRS Project Categories
Safety	Ensure a safe and secure transportation system for all users and modes	
Infrastructure Preservation	Preserve and maintain the condition of Oklahoma's multimodal transportation system in a state of good repair through a process that considers lower emission construction practices.	
Mobility and Accessibility	Facilitate the movement of people and goods, improve connectivity between regions and activity centers, and increase travel mode choices.	



Goals

Goal Area	Goal	CRS Project Categories
Economic Vitality	Provide a reliable multimodal transportation system for people and goods that supports efficient land use and development practices, ensures livable communities, and supports a healthy and competitive Oklahoma economy.	
Environmental Responsibility	Minimize and mitigate transportation-related impacts to the natural and human environment, through increased investment in alternative modes.	
Efficient Intermodal System Management and Operation	Maximize system performance and operations through efficient practices that lower transportation related emissions	
Fiscal Responsibility	Sustainably fund and efficiently deliver quality transportation projects that capitalize on alternative fuels and modes while continuing to leverage additional resources in coordination with ODOT's partners.	



Existing Known Projects that Reduce Transportation Emissions



Project Category:



Project Category:



Project Category:

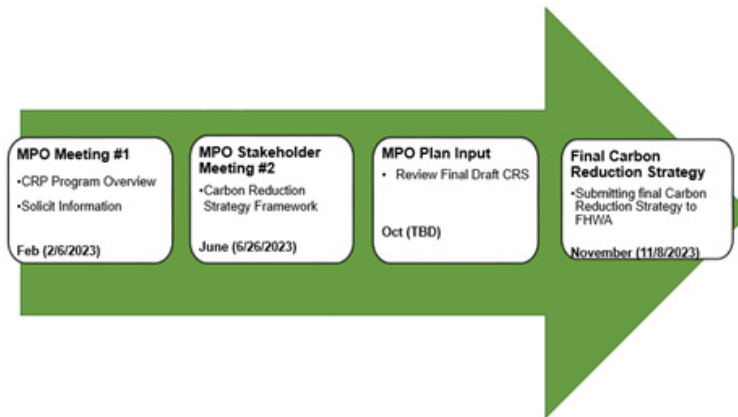


Discussion Questions

1. What projects/strategies are you currently doing that support carbon reduction?
2. What types of carbon reduction projects/strategies would you like to see implemented?
3. What challenges do you anticipate/have you experienced with implementing carbon reduction strategies/projects?
4. What are some successes you have found in implementing carbon reduction strategies? (Examples: Incentivizing drivers/commuters/freight carriers to adopt new behaviors)
5. What projects and strategies are most feasible in the short term (next 5) vs the long-term (next 20)?



Timeline & Next Steps



Contact Information

Sarah McElroy
SMcElroy@odot.org

Laura Davis
ladavis@hntb.com



APPENDIX C: PUBLIC COMMENT PERIOD SUMMARY

Comment Period Summary

The Oklahoma Department of Transportation facilitated a public comment period from September 25, 2023 to October 16, 2023 to provide an opportunity for MPOs, RTPOs, residents, and interested stakeholders to leave comments, questions, and suggestions about the Plan. The Plan was publicized on social media, including the ODOT X (formerly Twitter) and Facebook pages and promoted via a press release on the ODOT website. Comments were received and documented via the Public Involvement Management Application, an online tool that allows stakeholders to review project information, leave comments, and sign up for project updates. A summary of comment themes and support levels is provided below.

Out of 20 comments, 10 were at least somewhat supportive of the Carbon Reduction Strategy. Prominent themes included creating passenger rail service between Oklahoma City and Tulsa, incorporating efficient and carbon-friendly traffic engineering, and planting trees or vegetation that will help to offset transportation emissions. Respondents also would like to see an increased focus on alternative modes of transportation such as public transit and active transportation and enhanced regional travel. For those opposed to the Strategy, most respondents did not believe carbon emissions were a problem.

Frequently Asked Questions

An FAQ was created to address the most frequently asked questions and comments. A summary of those questions and accompanying responses are below.

Why not plant more trees or vegetation to offset carbon emissions?

Under guidance from the Federal Highway Administration, projects eligible for CRS funding must be directly transportation related and result in the reduction of carbon from on-road sources. Additionally, ODOT does consider when and where to plant trees and vegetation as part of the Transportation Asset Management Plan. The Department also has a beautification program including a roadside wildflower program. For more information please visit: <https://oklahoma.gov/odot/programs-and-projects/beautification.html>



Oklahoma needs increased regional rail service especially between Oklahoma City and Tulsa.

Oklahoma is exploring a variety of passenger rail options throughout the state including increasing the frequency of the Amtrak Heartland Flyer service and expanding operations from Oklahoma City into Newton, KS. Currently, the Heartland Flyer service offers daily connections between Oklahoma City and Fort Worth, Texas. The Department also understands the need for more intermodal linkage especially between Oklahoma City and Tulsa. However, Amtrak has determined that service between these two cities is not quite viable at this time. ODOT will continue to work with Amtrak to determine possible solutions in the future. For more information visit: <https://www.oklongrangeplan.org/s/Chapter-8-Modal-Needs.pdf>

What about utilizing traffic engineering practices to help reduce carbon emissions?

ODOT is currently exploring numerous alternate traffic engineering practices to help facilitate and improve traffic movements. As an example, ODOT is partnering with the City of Atoka to design a signalized intersection to help reduce congestion on U.S. 69. In accordance with the Carbon Reduction Strategy, ODOT will continue exploring ways to use alternative traffic engineering practices to help mitigate congestion issues. Several practices that can be incorporated include utilizing more efficient interchange types, specific to the traffic in the area. Options include: Roundabouts, Diverging Diamond Interchanges (DDIs), Single-Point Urban Interchanges (SPUIs) when applicable, and working to replace ill-timed traffic signals. For more information see page 39.

A portion of funding should be dedicated to alternative modes of transportation.

Planning for alternative modes of transportation including bicycle and pedestrian infrastructure and public transit systems is conducted in concert with regional MPOs and local municipalities. ODOT will continue to work with MPOs and local governments to provide funding and support for improved infrastructure across all modes. Currently ODOT administers Federal Transportation Alternative Program (TAP) funds to applicable projects. More information can be found at: <https://www.oklongrangeplan.org/s/Chapter-8-Modal-Needs.pdf>



Is ODOT going to encourage synthetic or alternative fuels across the state?

Oklahoma has launched EVOK, the statewide Electric Vehicle Infrastructure Program in which the Department receives federal funding to greatly enhance and improve the electric vehicle charging network across the state. With increased access to charging infrastructure and the emergence of a reliable and dependable network, electric and hybrid vehicles will become a more viable option for Oklahoma residents. To learn more about the EVOK program please visit: <https://oklahoma.gov/evok.html>

How were “urbanized” and “non-urbanized” areas defined?

Under federal guidance from FHWA, 65% of funding is proportionately allocated to federally defined urban areas. Urbanized areas are tiered according to their relative share of the state. The tiers are as follows (1) populations greater than 200,000, (2) populations greater than 50,000 but less than 200,000, and (3) populations greater than 5,000 but less than 50,000. Suballocation in urban areas with populations between 5,000-50,000 will be handled at ODOT District levels. For more information on federally defined urban areas please review the [Federal Carbon Reduction Plan Guidance](#).

How will ODOT measure the effectiveness of carbon-reducing projects and strategies?

ODOT is still determining how best to address, implement, and evaluate its carbon reduction strategies. As the Plan is incorporated into other statewide transportation planning processes, ODOT will continue to assess which performance measures will be most beneficial in evaluating carbon emissions reduction. According to federal guidelines, the Plan will be updated every four years and ODOT will continue to explore ways to evaluate and define the success of its Carbon Reduction Plan.



Media Promotions

Over the three-week comment period, ODOT posted several posts promoting the Plan on Facebook (**Figure 1**) and X (**Figure 2**). The Plan was also published on the ODOT website with an accompanying press release.

Figure 1: Facebook Post



Figure 2: X Post

