

Environmental Considerations

Mobility 2035 Supported Goals

- Preserve and enhance the natural environment, improve air quality, and promote active lifestyles.
- Encourage livable communities which support sustainability and economic vitality.
- Develop cost-effective projects and programs aimed at reducing the costs associated with constructing, operating, and maintaining the regional transportation system.

Introduction

The Dallas-Fort Worth area is not only economically and socially diverse, but is also diverse in the natural environments that millions of people rely on for clean air and water and recreational opportunities. These resources are key to supporting a high regional and community quality of life and a healthy distribution of wildlife and habitats. Developing transportation infrastructure in ways that are more sensitive to the high priority environments in the region will support vibrant communities and habitats and enhance quality of life for all residents.

Transportation systems range from sidewalks and planes to highways and trains. How and where the transportation system is built impacts environmental resources that support not only humans but also wildlife. Sometimes the development of these facilities and services can negatively impact habitat and ecosystems. Continued growth, which is forecasted for the Dallas-Fort Worth area, could mean sustained or increased conflicts with air quality, water quality, wildlife habitats, the human (built) environment, and other resources in North Central Texas. Therefore, various components of the natural and built environment must be considered when planning and implementing transportation projects. Reducing the burden that transportation places on the environment through avoiding, minimizing, or mitigating impacts is the goal of Mobility 2035.

Healthy Communities

Promoting healthy or sustainable communities also promotes reduced motor vehicle use which contributes pollution to the air. Furthermore, the more cars

Environmental Considerations at a Glance:

Mobility 2035 outlines strategies to provide a transportation system that serves a diverse region. The region is diverse in not only economic and social structures, but also in the natural environments it relies on for clean air and water and recreational opportunities.

Implementing infrastructure projects for a growing region is necessary. However, major infrastructure improvements such as highways and transit lines can negatively impact habitat and ecosystems. Similarly, many small improvements can add up to have cumulative impacts on a scale larger than the size of individual projects. Making infrastructure more sensitive to wildlife and ecosystems through integrated planning and interagency cooperation is an initiative that promotes conservation priorities, sustainable uses, and explores a variety of mitigation options.

Mobility 2035 supports expediting the process to approve transportation projects while maintaining compliance with all applicable laws, safety, environmental health, and effective public involvement.

In this Chapter:

- Healthy Communities
- Air Quality
- Energy Consumption and Associated Emissions
- Air Quality Conformity
- North Central Texas Natural Resources
- Regional Ecosystem Framework
- Mitigating Transportation Impacts
- Environmental Scoring

Did You Know ...

... since 2005, regional programs such as the Dallas-Fort Worth Clean Cities has displaced over 58 million gasoline equivalent gallons of fuel through the use of alternative fueled vehicles?

... a 63 percent reduction in nitrogen oxide emissions from on-road mobile sources will occur between 2012 and 2035?

... Texas ranks second only to California in terms of overall biodiversity?

removed from the highways and streets means less highway congestion and improved safety as well.

The way people travel impacts the quality of life in communities in many ways. Opportunities to walk instead of drive are linked to healthy communities. The benefits of walking – whether for utilitarian or recreational purposes – can be expressed in terms of improved environment and personal health, reduced traffic congestion, enhanced quality of life, and economic rewards, as well as other benefits.¹ Physical activity such as walking promotes healthy lifestyles by helping maintain a healthy weight, reduce stress, sleep better, and feel better overall.



Southlake Town Square

Source: NCTCOG

More information related to the benefits of walking and biking is included in the Mobility Options chapter.

Access to open space and recreational opportunities is also central to the overall health and well being of communities. Additionally, drinkable water and concern for the overall natural environment is essential to creating an environment that is sustainable for years to come. All of these considerations should be integrated into the

transportation planning process to implement transportation projects that support livable, sustainable, and healthy communities. These elements are considered in the following discussion.

Air Quality

Air quality is vital to a community's overall quality of life, and the negative impacts of polluted air can more deeply affect sensitive populations such as children and the

HEALTHY COMMUNITY: A healthy community is one which includes elements that enable people to maintain a high quality of life and productivity. A healthy community includes elements including access to health care services; a safe community; the presence of roads, schools, playgrounds, and other services to meet the needs of people in the community; and a healthy community has a healthy and safe environment.

Healthy People in Healthy Communities A Community Planning Guide

elderly. Air quality impacts and health is a high concern in the Dallas-Fort Worth area. For example, a recent Community-Wide Children's Health Assessment and Planning Survey by Cook Children's Hospital² profiled children aged 0 to 14 in six North Central Texas counties and found that 18.1 percent, or about 111,000, of children had asthma. Survey data showed that children aged 6 to 15 have a higher percentage of asthma (as high as 25 percent for 9 year olds) than the state and nation at 13 percent and 16 percent, respectively. Regional statistics like this indicate a need to continue to improve air quality for those who have asthma or respiratory problems and are especially sensitive, and for people without respiratory problems or asthma who can also experience health effects from air quality pollution exposure.

There are many programs being implemented to improve air quality in North Central Texas. The North Central Texas Council of Governments (NCTCOG) is responsible for coordinating air quality planning in the federally classified nonattainment area. To accomplish this, NCTCOG, the Regional Transportation Council, and other stakeholders, including local governments and various public and private associations and coalitions, have taken an aggressive approach toward improving regional air quality that includes implementation of a variety of policies and programs that support and enhance federal and state planning efforts. These initiatives have primarily been focused on reducing nitrogen oxide (NO_x) emissions

¹ Pedestrian and Bicycle Information System, 2010, www.walkinginfo.org

² Cook Children's Community-Wide Children's Health Assessment and Planning Survey, 2008, www.cchaps.org

to attain the federal ozone National Ambient Air Quality Standards (NAAQS) as NO_x is the ozone precursor pollutant of primary concern in the Dallas-Fort Worth nonattainment area. However, as federal regulations become more stringent for other criteria pollutants, including particulate matter and nitrogen dioxide, and concern over greenhouse gas emissions increases, the air quality program has expanded its focus to consider multi-pollutant benefits to not only reduce ozone, but help improve overall air quality. Additionally, programs aimed at reducing consumption of traditional petroleum-based fuels provide opportunities to improve air quality and promote energy and technological diversification in the transportation sector.

Mobility 2035 Policies and Programs

Mobility 2035 supports the following air quality policies:

AQ3-001: Pursue successful transportation conformity determinations of the Metropolitan Transportation Plan and Transportation Improvement Program consistent with federal and state guidelines.

AQ3-002: Provide technical assistance and analysis to attain and maintain NAAQS and reduce negative impacts of other air pollutants.

AQ3-003: Support and implement education, operations, technological, and other innovative strategies that improve air quality in North Central Texas including participation in collaborative efforts with local, regional, state, and federal stakeholders.

AQ3-004: Support and implement strategies that promote energy conservation, reduce demand for energy needs, reduce petroleum consumption, and/or decrease greenhouse gas emissions.

F3-002: Incorporate sustainability and livability options during the project selection process. Include additional weighting or emphasis as appropriate and consistent with Regional Transportation Council (RTC) policy objectives including, but not limited to, demand management, air quality, natural environment preservation, social equity, or consideration of transportation options and accessibility to other modes (such as freight, aviation, bicycle and pedestrian). *(While this is listed as a financial policy, it has specific implications for the air quality portion of the plan.)*

Mobility 2035 supports the following air quality programs:

AQ2 -001: Air Quality Communication Program

AQ2-002: Air Quality Demonstration Program

AQ2-003: Air Quality Enforcement Program

AQ2-004: Air Quality Regional Policies

AQ2-005: Air Quality Technology Improvements

AQ2-006: Air Quality Technical Planning and Analysis

Ozone

On April 15, 2004, the Environmental Protection Agency (EPA) designated nine North Central Texas counties including Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant counties as nonattainment under the 8-Hour Ozone NAAQS which was established in 1997. This area is outlined in *Exhibit 4.1* along with the NCTCOG Metropolitan Planning Area boundary.

Nonattainment status means that ground-level ozone concentrations in this area exceed the limit established by the EPA as being protective of human health and the environment. Ground-level ozone pollution is caused by a photochemical reaction of volatile organic compounds (VOCs) and NO_x, which are known as ozone precursors, in the presence of sunlight and heat.

Based on the magnitude of ozone pollution in a given area, the EPA classifies counties into one of the following categories which are listed in order of increasing severity: marginal, moderate, serious, severe 15, severe 17, and extreme. The Dallas-Fort Worth area is classified as a serious nonattainment area and has until June 2013 to attain the NAAQS ozone standard.

The region faces challenges in meeting increasingly stringent air quality standards. The Clean Air Act (CAA) requires the EPA to re-evaluate all criteria pollutant standards every five years. The EPA has announced plans to propose a new ozone NAAQS in July 2011. It is expected that the new regulations will lower the limit from 84 parts per billion (ppb) ozone to between 60 to 70 ppb to protect human health and create a new standard to protect sensitive ecosystems. *Exhibit 4.2*

illustrates both progress in reducing ambient ozone concentrations since 1998, as well as the level of previous ozone NAAQS and the range being considered by the EPA for the 2011 regulations.

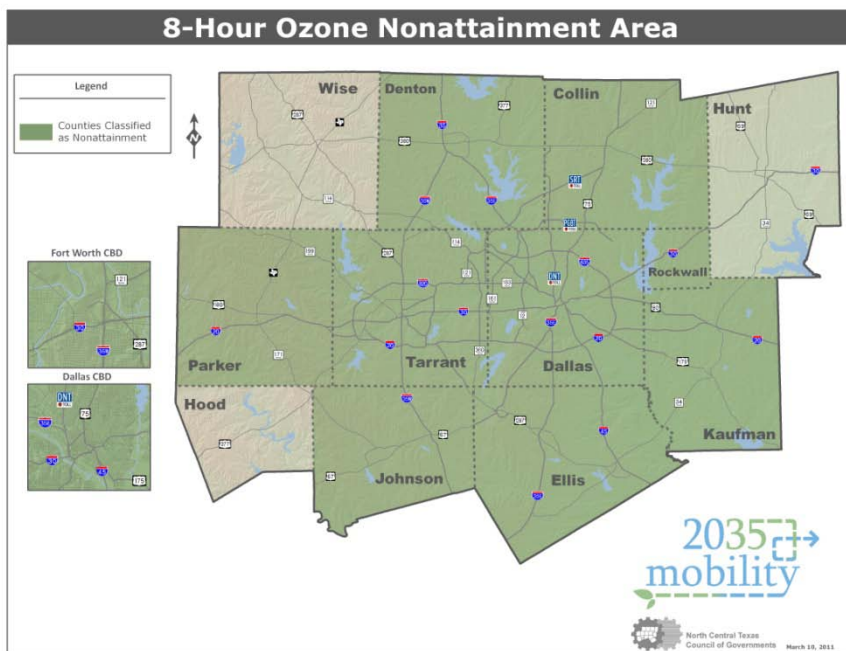


Exhibit 4.1: Metropolitan Planning Area Boundary and 1997 8-Hour Ozone Nonattainment Area

NCTCOG participates in a cooperative, collaborative process with local, state, and federal agencies to work toward improving air quality across the region. This partnership includes close coordination with the Texas Commission on Environmental Quality (TCEQ) for development of the State Implementation Plan (SIP). The SIP is a regional air quality plan developed by TCEQ and required by the Clean Air Act which outlines how ozone concentrations will be reduced in the nonattainment area to a level that complies with the federal standard.

The RTC has taken a proactive role in assisting with development of SIP revisions for the Dallas-Fort Worth area. This includes NCTCOG assistance with air quality technical planning and implementation of control strategies at the local level that enhance federal and state efforts. Numerous other stakeholders throughout the

region, including local governments and business coalitions, also support this process and facilitate local implementation.

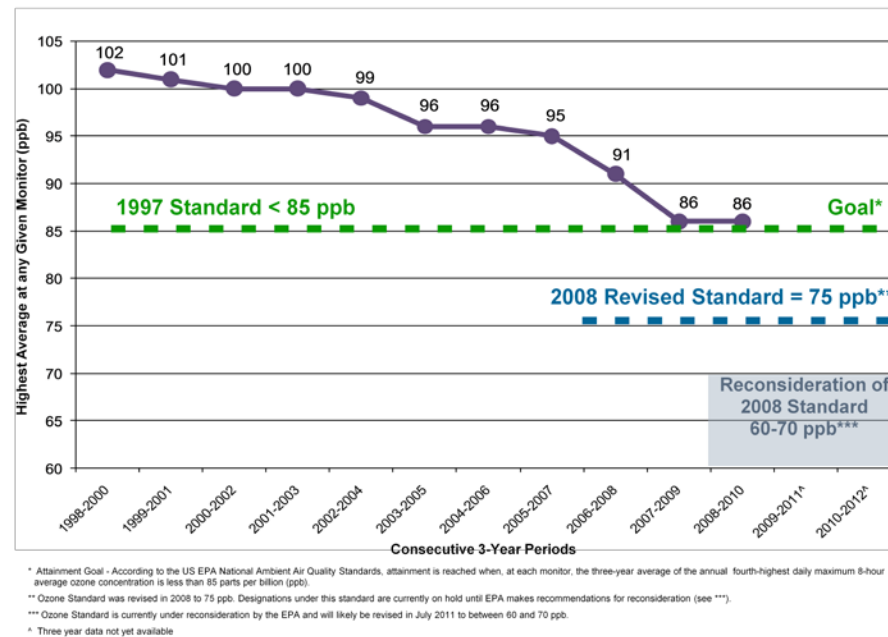


Exhibit 4.2: Eight-hour Ozone Trend Line (1998–2010) Source: NCTCOG

Energy Consumption and Associated Emissions

The programs and policies supported by Mobility 2035 not only aim at improving the efficiency of the transportation system, which in turn improves air quality, but also serve to reduce petroleum use. According to the Federal Highway Administration, the consumption of petroleum fuels by the transportation sector has increased 74 percent since 1960.

While the average fuel efficiency of motor vehicles has increased over time, so has the overall miles driven. Vehicle miles traveled is forecasted to grow from approximately 176 million miles per year in 2012 to 279 million miles per year in 2035, translating to a continued strong demand for traditional petroleum fuels. While technologies such as electric vehicles and increased availability of alternative fuels will provide options to reduce petroleum consumption and promote energy

conservation, fleet turnover and market penetration of these fuels will take time to make a difference.

Dallas-Fort Worth Clean Cities, which was established in 1995, became one of the first Clean Cities established under an Energy Policy Act provision for an organization that promotes the use of alternative fuels and advanced vehicle technologies to lessen American dependence on foreign sources of petroleum. Programs and policies supported by Mobility 2035, such as the Dallas-Fort Worth Clean Cities Program, continue to evaluate solutions that improve energy conservation and reduce petroleum consumption in the transportation sector.



Greenhouse Gases

In the United States, transportation is the largest source of greenhouse gas emissions after electricity generation.³ As Exhibit 4.3 shows, there has been an increase in carbon dioxide (CO₂) emissions from the transportation sector nationwide from 1973 to 2009. Periods of decline in CO₂ emissions are evident; however, it is likely that transportation will continue to remain a large contributor of greenhouse gas emissions in the US in the near term.

Some greenhouse gases occur naturally in the atmosphere while others result from human activities. Naturally occurring greenhouse gases include water vapor, CO₂, methane, nitrous oxide, and ozone. Certain human activities, however, add to the levels of most of these naturally occurring gases:

- Carbon dioxide is released to the atmosphere when solid waste, fossil fuels (oil, natural gas, and coal), wood, and wood products are burned.
- Methane is emitted during the production and transportation of coal, natural gas, and oil. Methane emissions also result from the decomposition of organic wastes in municipal solid waste landfills and the raising of livestock.
- Nitrous oxide is emitted during agricultural and industrial activities, as well as during combustion of solid waste and fossil fuels.

Greenhouse gases that are not naturally occurring include by-products of foam production, refrigeration, and air conditioning called chlorofluorocarbons, as well as hydrofluorocarbons and perfluorocarbons generated by industrial processes.

³US Department of Transportation, www.climate.dot.gov

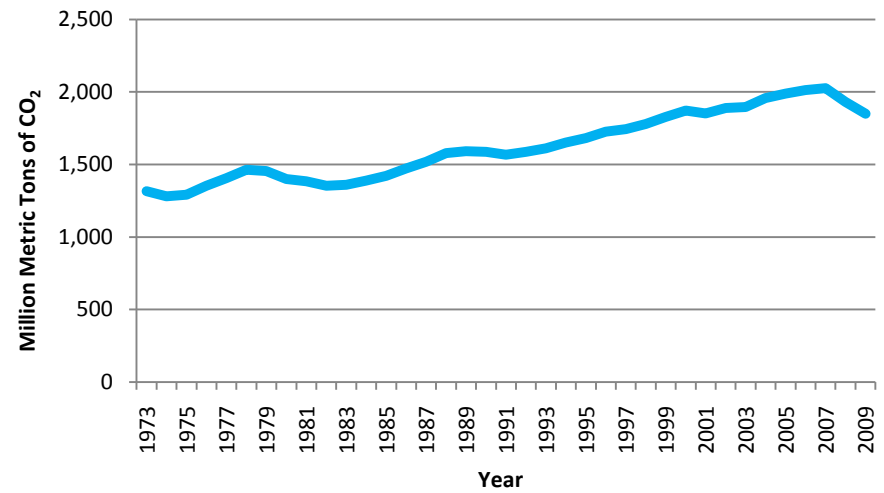


Exhibit 4.3: Total Energy Transportation Sector Carbon Dioxide Emissions (1973–2009)⁴

Greenhouse gases trap heat in the atmosphere and create a naturally occurring warming phenomenon called the greenhouse effect. With human activities and the increased burning of fossil fuels that produce greenhouse gasses such as CO₂ and methane, the atmosphere is trapping more heat and causing warming of the atmosphere. The induced changes resulting from the warming of the atmosphere are called climate change. The impact of climate change on the built and natural environment are potentially broad reaching and unpredictable at a regional level. Potential impacts to the North Central Texas region could include changes in precipitation levels, impacts to human health, and impacts to natural ecosystems.

Currently, scientists are unable to determine which parts of the US will become wetter or drier, but there is likely to be an overall trend toward increased precipitation and evaporation, more intense rainstorms, and drier soils. While the impacts of climate change on the Dallas-Fort Worth area are unknown at this time, the potential impacts of climate change are important to consider in the context of infrastructure design and future maintenance needs. For example, if temperatures and precipitation changes over time, this could impact flooding of roads and increase maintenance associated with weather events. Research has shown that an increase in average temperatures could also exacerbate ozone issues and increase the difficulty in attaining federal ozone standards.

⁴ www.eia.gov, 2010

Adapting the transportation system to these potential changes is an initiative that is emerging at the federal transportation level. Adaptation planning could include strategies such as:

- Evacuation route planning
- Relocation of at-risk infrastructure and communities
- Extreme weather events (flooding, tornado activity, hurricanes) and associated transportation impacts

NCTCOG and other regional partners are providing resources to support transportation and climate change mitigation and adaptation as an additional benefit of implemented air quality programs. As the region begins to consider climate change in the planning process, greenhouse gas reductions, particularly reductions of CO₂, will be included in a multi-pollutant evaluation when making funding decisions regarding regional projects. Further guidance from the appropriate federal and state agencies will be incorporated as it is made available. Additionally, identification of resources, both natural and built, that are potentially sensitive to climate change impacts is essential to identifying mitigation strategies to adapt future systems to climate change impacts.

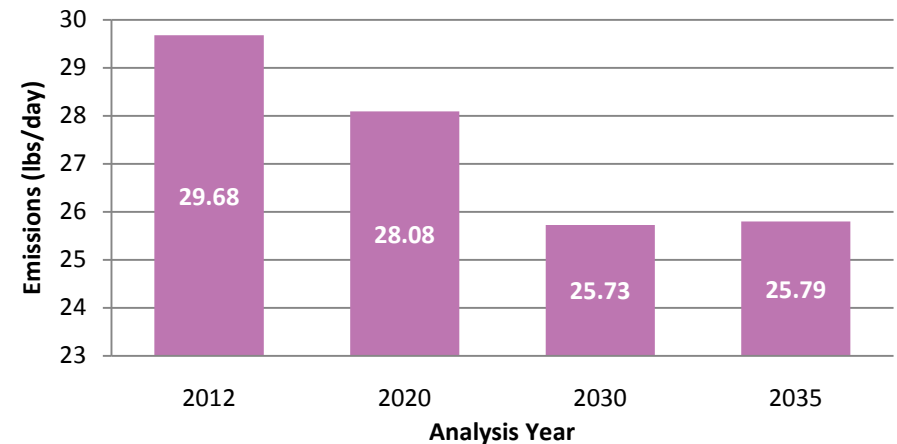
Exhibit 4.4 displays per capita on-road transportation emissions of CO₂ for the Dallas-Fort Worth area. As shown, the per capita emissions of CO₂ from on-road transportation sources will decline by 15 percent from 2012 to 2035.

Mobile Source Air Toxics

In addition to the criteria air pollutants for which there are NAAQS, the EPA also regulates air toxics. Most air toxics originate from human-made sources including on-road mobile sources (highway vehicles), non-road mobile sources (airplanes and construction equipment), area sources (dry cleaners), and stationary sources (factories and refineries).

Mobile Source Air Toxics (MSAT) are a subset of the 188 air toxics defined by the CAA. MSATs are compounds emitted from on-road vehicles and non-road mobile vehicles and equipment. Some toxic compounds are present in fuel and are emitted

into the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.



*Exhibit 4.4: On-road Transportation CO₂ Emissions (per capita) 2012–2035**

*Based on EPA Mobile 6.2 Emissions Factor Model for the 9-county Nonattainment Area, NCTCOG.

Exhibit 4.5 shows that over time, even while vehicle miles traveled dramatically increases, national MSAT emissions are expected to decline drastically as compared to 1999 levels. Reductions in MSAT emissions can be attributed to the use of cleaner fuels, as well as cleaner engines.

Air Quality Conformity

Due to the ozone nonattainment status of the Dallas-Fort Worth area, a federal requirement known as transportation conformity is necessary to continue approval and implementation of projects and programs within the nonattainment area. Under this federal requirement, NCTCOG is responsible for conducting transportation conformity for the counties that are designated as nonattainment.

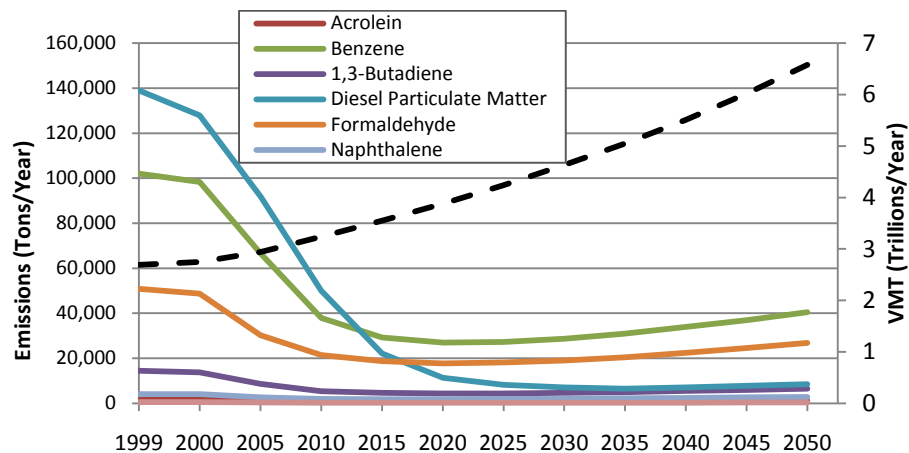


Exhibit 4.5: National MSAT Emission Trends 1999-2050 for Vehicles Operating on Roadways⁵

A conformity determination is a two-step process in metropolitan areas. In the first step, the RTC, as the Metropolitan Planning Organization policy body, makes the initial transportation conformity determination at the local level. In the second step, the Federal Highway Administration (FHWA) and Federal Transit Administration (FTA) make the final transportation conformity determination at the federal level. The conformity analysis does not measure ozone directly, but rather measures ozone precursors: VOCs and NO_x.

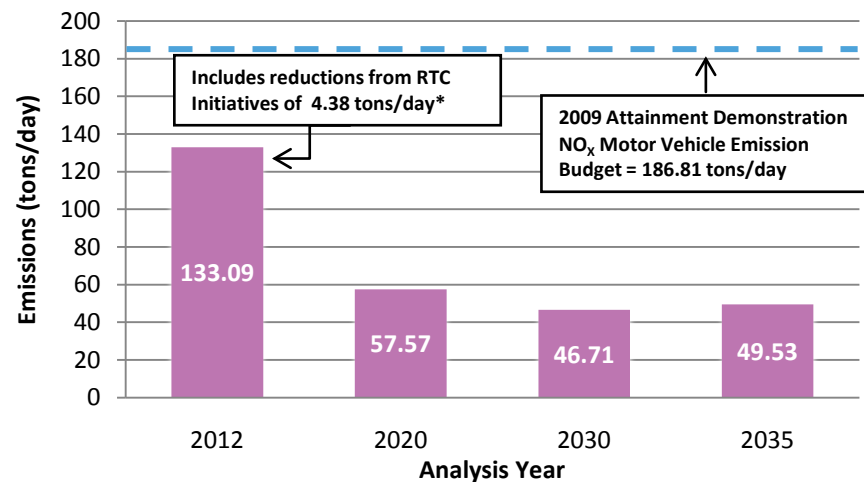
As part of the conformity analysis, a motor vehicle emission budget (MVEB) test is usually conducted if EPA-approved MVEBs, also known as budgets, are applicable at the time of analysis. Budgets for NO_x and VOCs are established in the regional SIP. Under the MVEB test, vehicle emissions for each analysis year must be less than the identified air quality budgets. The vehicle emission results documented in the 2011 Transportation Conformity document demonstrate that the nine-county Dallas-Fort Worth ozone nonattainment area meets the regional air quality conformity requirements of the budget test. The conformity analysis results are shown in Exhibits 4.6 and 4.7.

RTC initiatives, including Transportation Control Measures and other elements of the RTC Air Quality Program, were instrumental in meeting NO_x budgets in analysis

⁵ FHWA, 2011, www.fhwa.dot.gov

year 2012. With RTC initiatives, NO_x emissions for 2012 were reduced by an additional 4.38 tons per day. The magnitude of emission reductions from RTC initiatives demonstrates the regional commitment and effectiveness at reducing vehicle emissions.

The results of the conformity determination demonstrate that Mobility 2035 meets the specific transportation air quality conformity requirements of the CAA (42 USC 7504, 7506(c) and (d)) and amendments, the applicable revision to the air quality plan (five percent Increment of Progress Plan), and the transportation conformity rule (40 CFR Parts 51 and 93). This conformity determination was approved by the RTC in March 2011 and approved by FHWA and FTA in June 2011. For additional transportation conformity information, refer to the 2011 Transportation Conformity document.⁶



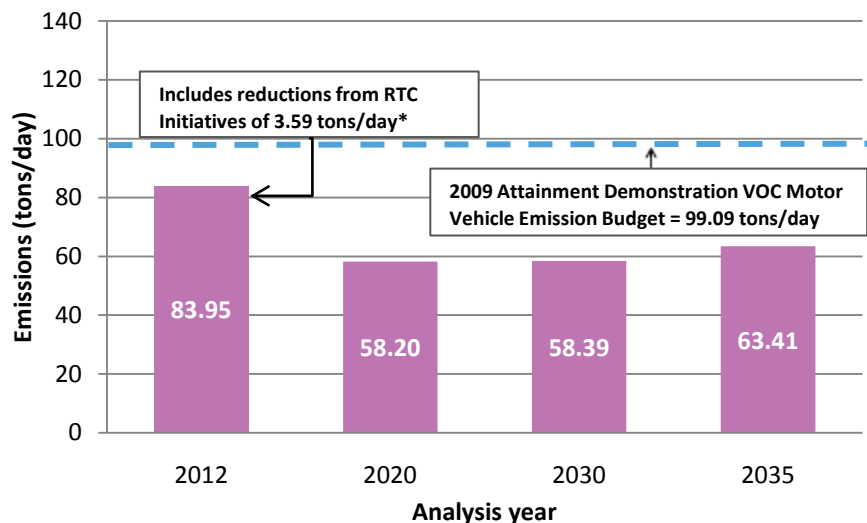
*Local Initiative Benefits Shown Represent Post Processed Estimates, Source: NCTCOG

Exhibit 4.6: Dallas-Fort Worth Ozone Nonattainment Area Air Quality Conformity Analysis Results: Emissions of Nitrogen Oxides

Air quality impacts are, and will continue to be, integrated into regional planning factors that include emphasis on increasing mobility, supporting economic vitality, enhancing the environment, promoting energy conservation, and improving the

⁶ North Central Texas Council of Governments, 2011, Transportation Conformity, www.nctcog.org/trans/air/conformity

quality of life. Many programs, policies, and projects described in other chapters of this document result in air quality benefits through improved efficiency in the transportation system. Transportation-related emissions are reduced through various means including, but not limited to, mitigation of congestion caused by vehicle incidents, reduction of the number of commuters through the use of alternative transportation options, and improved roadway design that facilitates traffic flow.



*Local Initiative Benefits Shown Represent Post Processed Estimates, Source: NCTCOG

Exhibit 4.7: Dallas-Fort Worth Ozone Nonattainment Area Air Quality Conformity Analysis Results: Emissions of Volatile Organic Compounds

Many of these programs and projects are defined as Transportation Control Measures by the CAA and are included as air quality control strategies in the Dallas-Fort Worth SIP. In these cases, the primary goal of improved transportation system operation yields additional benefits in air quality. In addition to these transportation system improvements, the RTC has instituted many programs and policies that are developed with air quality as the primary goal. These efforts include measures to reduce emissions and energy consumption from a wide variety of emissions sources such as traditional transportation sources (on-road motor vehicles) and non-transportation mobile sources (construction equipment), while others are designed to reduce energy consumption as a way to reduce emissions from power plants and other stationary sources.

AIR NORTH TEXAS is a campaign created to educate North Texans on simple things they can do in their everyday lives to improve Air Quality. In 2010, the campaign started Clean Air Action Day on July 7. This annual awareness day will remind North Texans to try something new in their lives that will reduce emissions such as, but not limited to, taking transit, bringing their lunch to work, or combining errands, with the hope that individuals will continue these activities all year or at least during Ozone Season.



Numerous communication strategies, such as Air North Texas, are necessary to explain the importance of these measures to stakeholders and the public; this need has resulted in the development of additional education programs, as well as inclusion of outreach components in many strategies. This comprehensive approach to emission reduction strategies will become increasingly important as the region balances population and economic growth with the need to continue to reduce emissions.

All air quality policies, programs, projects, and maps are included in Appendix C.

Green and the Grey Infrastructure

Considering the green infrastructure that makes up our surroundings is important when developing transportation plans and projects. Green infrastructure, as defined, considers the open spaces including natural lands (open space) and working landscapes (agricultural) that promote natural ecosystem functions. Valuing green infrastructure is just as significant as valuing grey infrastructure or the man-made or built environment. The green and grey environments can both be developed strategically to enhance and promote each other.

Open spaces such as parks are key components of quality of life and healthy communities in North Central Texas. While open space is often associated with recreation opportunities for humans, it can serve as habitat for wildlife and

contributes to maintaining healthy water quality for human and wildlife consumption.

GREEN INFRASTRUCTURE: Strategically planned and managed networks of natural lands, working landscapes, and other open spaces that conserve ecosystem values and functions and provide associated benefits to human populations.

The Conservation Fund

ECOREGION: Ecological regions are areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components.

Commission for Environmental Cooperation

As partners in the transportation planning process, assessing and integrating conservation priorities will produce transportation projects that are sensitive to the high priority environments in the region, better support healthy communities and habitats, and foster a high quality of life for all residents.

Mobility 2035 Policies and Programs

Mobility 2035 supports the following environmental resource policies:

ER3-001: Protect, retain, restore, or enhance the region’s environmental assets through avoiding, minimizing, and/or compensating for the effects of transportation programs and projects.

ER3-002: Work cooperatively with regulatory and conservation partners to develop innovative approaches that meet their conservation priorities and expedite the delivery of transportation projects.

ER3-003: Encourage transportation programs and projects that provide access to the natural environment to support healthy lifestyles.

F3-002: Incorporate sustainability and livability options during the project selection process. Include additional weighting or emphasis as appropriate and consistent with RTC policy objectives including, but not limited to, demand management, air quality, natural environment preservation, social equity, or consideration of transportation options and accessibility to other modes (such as freight, aviation, bicycle and pedestrian). *(While this is listed as a financial policy, it has specific implications for the environmental resources portion of the plan.)*

Mobility 2035 supports the following environmental resource program:

ER2-001: Regional Ecosystem-based Approach to Mitigating Impacts

North Central Texas Natural Resources

Texas has many natural environments to offer for the enjoyment of the population. In fact, Texas ranks second only to California in terms of overall biodiversity.⁷ While Texas offers many unique environmental aspects, there are many threats to maintaining these rich environments. According to Texas Parks and Wildlife (TPWD), land fragmentation is the number one threat to Texas’ biodiversity. In the North Central Texas region, there are several natural environments including ecoregion and habitat types that are considered high priority for conservation. General descriptions and current status of a select number of ecoregions and habitat types are included in the following discussion. The potential transportation system impacts to these resources will be monitored over time.

Blackland Prairie

The TPWD Wildlife Action Plan identifies the Blackland Prairie as a Tier I High Priority Ecoregion.⁸ The Blackland Prairie, as shown in *Exhibit 4.8*, covers about half of the Metropolitan Planning Area including portions of Collin, Dallas, Denton, Ellis, Hunt, Kaufman, Johnson, and Rockwall counties. The Blackland Prairie is the most severely altered of Texas’ ecoregions due to conversion to crops or urban development. It is estimated that 95 percent of the original blackland prairies have been converted for agricultural uses and development. Currently, only 3,000 acres

⁷ NatureServe’s 2002 State of the Union: Ranking America’s Biodiversity.

⁸ Texas Parks and Wildlife Department, 2005, *Texas Wildlife Action Plan*.

of an original 12 million acre range remain in the Dallas-Fort Worth area (predominantly White Rock Lake and Cedar Hills State Park). All seven main habitat classes in this ecoregion are threatened by rapid population growth and fragmentation.

The Blackland Prairie is a stopover habitat for migrant songbirds and wintering raptors. The TPWD conservation priority for this ecoregion is to protect and restore any remaining remnant prairies. More information on potential mitigation strategies for the Blackland Prairie is provided in Appendix C.

Cross Timbers and Prairies

The TPWD Wildlife Action Plan identifies the Cross Timbers and Prairies ecoregion as a secondary priority ecoregion or Tier II. As shown in *Exhibit 4.8*, this ecoregion covers Denton, Hood, Johnson, Parker, Tarrant, and Wise counties. Conversion and fragmentation due to high projected population growth is a major threat to this ecoregion. Rivers and streams in this ecoregion have been altered by extensive reservoirs, inundating hundreds of miles of river forests reducing downstream flows. This ecoregion is home to only one rare plant, but provides nesting habitat for the federally endangered Black-capped Vireo and the Golden-cheeked Warbler. TPWD has identified protection of this ecoregion's prairies, woodlands, and remaining river corridors as the major priorities in the Cross Timbers and Prairies Ecoregion.

Individual habitat types that make up these larger regions are important to identify as smaller scale conservation priorities as they may support individual species populations or serve vital ecosystem functions.

Priority Habitat Types

While every ecoregion has individual habitats, communities, and species that are essential, the TWPD Wildlife Action Plan identifies priority habitat types as native prairies, grasslands, and riparian habitats that cross ecoregion boundaries. These habitats are the most important wildlife habitats, contain the highest numbers of rare species, and are often the most threatened.

Native prairies were once a significant portion of the Texas landscape; however, very little of this native habitat still exists today. With proper management, these habitats can be restored.

Habitats found along banks and floodplains of rivers, creeks, and streams are often the only place where trees and wildlife species are able to survive in times of drought. These riparian areas provide nutrients to streams and rivers, thereby improving water quality. They also slow the rate that water moves from land into streams. In the Dallas-Fort Worth area, there are many high priority riparian habitats, the most notable being the Trinity River and those riparian areas that contribute to the Trinity River Basin.



Exhibit 4.8: Texas Ecoregions and Metropolitan Planning Area Boundary.⁹

High Priority Species

Texas is the second most diverse state in the US in terms of species diversity. The Texas Priority Species List prioritizes five major groups of wildlife including birds, mammals, herptiles, aquatic species, and terrestrial invertebrates into low, medium, or high priority conservation need. For example, in the Blackland Prairie

⁹ Data from TPWD, www.tpwd.state.tx.us. Map produced by NCTCOG.

and Cross Timbers and Prairies ecoregions, several bird species, including the Piping Plover, Interior Least Tern, Black-capped Vireo, and others are ranked as high priority. While some of these birds are federally endangered or threatened species consistent with the Endangered Species Act, some are also listed as state endangered or threatened species. Others are only listed as a species of concern at the federal or state level.



Federal and State Endangered Male Black-capped Vireo (Vireo atricapilla)
Source: TPWD

The Texas Priority Species List also includes the associated habitats, problems and threats, conservation actions, and monitoring actions for each species. Additional information related to additional species included on this list in each wildlife group is available in the Texas Wildlife Action Plan.

Aquatic Resource Priorities

Water is a necessity for all life forms. Living in Texas presents challenges associated with water due to the wide variety of landscapes and a growing urban population. According to the TPWD Wildlife Action Plan, reduced water quality and decreased water quantity are the most significant challenges to both freshwater and saltwater systems. Continued population growth creates increased demands for water that affect the quality and quantity of water.

Point source and nonpoint source pollution contribute to nutrient loading of waterways which threatens fish and wildlife and human beings. One example of nonpoint source pollution related to the transportation system is highway runoff. This is water that cannot be absorbed through the pavement and runs off the roads into stormwater drains that drain to the streams, rivers, and lakes.

Several of the TPWD's fresh water conservation goals include maintaining or improving water quality, maintaining adequate water quantity, and protecting springs and wetlands.

Trinity River and Trinity River Basin

One of the most important water resources in the Dallas-Fort Worth area is the Trinity River. The Trinity River and its basin provide water to over half of the population of Texas. According to the Trinity River Authority,¹⁰ the quality of the water is a major consideration throughout the Trinity River Basin because so many residents rely on its surface water. Continued population growth and increased urbanization of the area means that water quantity and quality issues will become more critical. Additionally, water quantity and quality are not just essential for the residents of the Trinity River Basin, but to wildlife as well. The TPWD's priority conservation strategy is to ensure water availability for wildlife. Additionally, TWPD encourages emphasis on the restoration of riparian and aquatic habitats that have been compromised over several decades due to human interference. TWPD supports projects that aim to rehabilitate river habitat back to its natural state.

Wetlands

Wetlands comprise less than five percent of Texas' total land area; however, Texas has the fourth greatest wetland acreage in the lower 48 states. Many wetland types exist in Texas and wetlands can be found along rivers, streams, lakes, and ponds; in upland depressions where surface water collects; and at points of groundwater discharge



Trinity River and Floodplain near Downtown Dallas, TX
Source: NCTCOG

such as springs or seeps. Wetlands provide habitat, environmental quality, and socioeconomic value to the state.¹¹ Texas wetlands provide many benefits to society; however, approximately half of the historic wetland acreage has been converted to cropland and urban development. The Texas Wetlands Conservation

¹⁰ Trinity River Authority of Texas, 2010, *Trinity River Basin Master Plan*.

¹¹ Texas Parks and Wildlife Department, 1997, *Texas Wetlands Conservation Plan*.

Plan recommends conservation actions including supporting riparian and buffer protection, restoration and enhancement projects, implementing wetland restoration and enhancement needs and opportunities on state-owned property, encouraging voluntary broader application of mitigation banking programs to compensate for wetland losses in the same watershed, and incorporating wetlands into watershed-based management plans. Because wetlands provide value to the state and areas of the Dallas-Fort Worth area, conserving these unique water resources is fundamental to supporting healthy ecosystems.

Governing Regulations

Many federal, state, regional, and local agencies are tasked with regulating and ensuring the health of both human and natural environments. These agencies have many laws and regulations that must be adhered to when implementing transportation projects. For example, the Clean Water Act and its regulations are monitored and regulated by several federal and state agencies such as the Environmental Protection Agency, United States Army Corps of Engineers, and the Texas Commission on Environmental Quality. Other agencies such as Texas Parks and Wildlife and US Fish and Wildlife regulate other federal and state laws such as the Endangered Species Act. Agencies such as these, in addition to non-government organizations such as The Nature Conservancy, local municipalities, and special districts, collectively ensure that environmental laws, whether social or natural, are adhered to. Additionally, these agencies participate in and have the duty to ensure priority habitats and environmental resources of interest are sustained for the next generations. Appendix C, Exhibit C.1 provides a summary of relevant federal, state, and local resource agencies that are stakeholders in the transportation planning process and that have specific resources and regulations of interest during the development and implementation of transportation projects.

Ecosystem Approach to Developing Infrastructure Projects

Positive opportunities for environmental stewardship can be permanently lost when the traditional, project-specific approach to avoiding, minimizing, reducing, or compensating impacts is used for infrastructure projects.

For more than a decade, federal agencies have been encouraging the use of a coordinated approach to restore or sustain the health of ecosystems. This

ecosystem approach supports collaboration and integrated planning among transportation and conservation planning agencies. The ecosystem approach also expands focus to a broader, ecosystem scale as opposed to one confined by project boundaries, allowing for more efficient and cost-effective avoidance and minimization strategies, as well as identification of more meaningful mitigation and conservation opportunities.¹²

The ecosystem approach is supported by the development of the North Central Texas Regional Ecosystem Framework (REF). NCTCOG, in consultation and coordination with resource agencies and regional stakeholders, has developed a REF. The REF can streamline infrastructure development by identifying ecologically valuable areas, potentially impacted resources, regions to avoid, and mitigation opportunities before new projects are initiated. It is intended to protect, sustain, and restore vital ecosystems while simultaneously providing recreational and mobility opportunities, and contribute to the positive health of people and communities in North Central Texas.

Through consultation with environmental resource agencies such as EPA, TPWD, and other conservation/regulatory agencies, ten Vital Ecosystem Information Layers (VEIL) have been selected to represent the first iteration of the REF. The ten VEIL layers include wetlands, surface waters, flood zones, agricultural lands, wildlife habitats, natural areas, impaired water segments, diversity, sustainability, and rarity. Each VEIL layer was calculated by subwatershed to develop a REF Composite Score as shown in *Exhibit 4.9*. Individual VEIL layer maps are included in Appendix C, Exhibits C.2 through C.12. The relative environmental vulnerability of each subwatershed is indicated by a composite score. Blue subwatersheds, or those scoring 26 to 37, indicate that resources of relatively high concern may be present and that additional review, documentation, and consultation with the applicable agency may be needed.

The REF can be utilized to identify natural and social resources earlier in the transportation planning process and to determine mitigation strategies that help advance preservation or restoration initiatives that complement resource agency partners' conservation priorities.

¹² US DOT/Volpe National Transportation Systems Center, 2006, *Eco-Logical: An Ecosystem Approach to Developing Infrastructure Projects*.

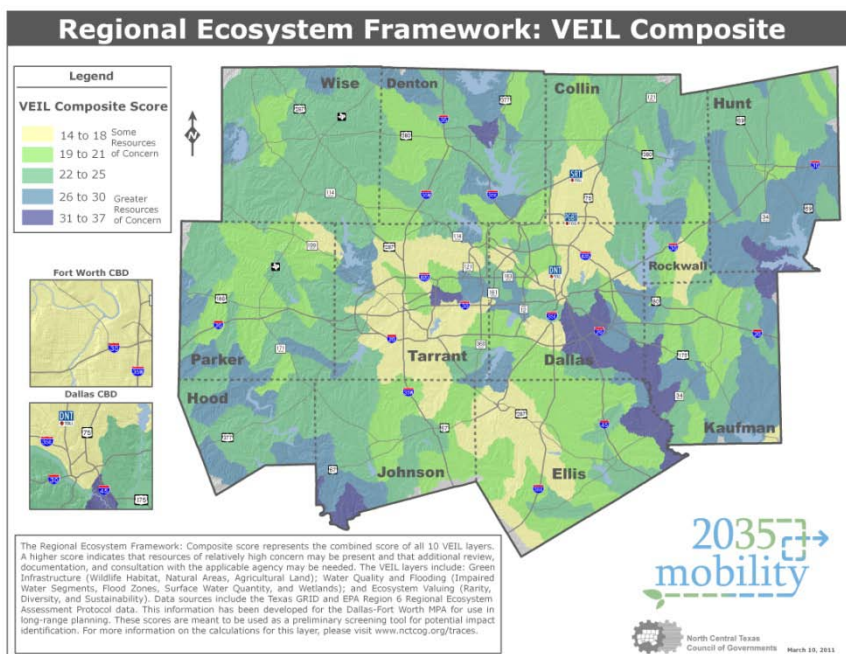


Exhibit 4.9: Regional Ecosystem Framework VEIL Composite Score by Subwatershed

Mobility 2035 has utilized the REF to identify subwatersheds, and the REF score for each roadway and transit corridor is shown on the Roadway and Transit Fact Sheets in Appendix G. These scores provide initial screening information for project level planning studies and may assist in the identification of key resources at the planning level that may warrant additional review during the project level planning process.

The subwatershed values provide a comparative scoring tool that could assist in the development of mitigation strategies that promote and target unique conservation needs. Additional information on how the REF was developed can be found on the Transportation Resource Agency Consultation and Environmental Streamlining Website.¹³

Mitigating Transportation Impacts

The operation of transportation systems is an obligation of local, state, and federal governments as they strive to provide their residents with the mobility needed to

conduct business, transport goods, recreate, and carry out daily activities. Many times this involves major construction of transportation infrastructure that can negatively impact habitat and ecosystems. Mobility 2035 has incorporated a summary of mitigation strategies to develop and explore further as projects progress through the project development process. The environmental mitigation strategies and activities are intended to be regional in scope; however, mitigation may address and be applied for project-level impacts.

THE COUNCIL ON ENVIRONMENTAL QUALITY REGULATIONS DEFINE MITIGATION AS:

- **Avoiding** the impact altogether by not taking a certain action or parts of an action.
- **Minimizing** impacts by limiting the degree or magnitude of the action and its implementation. Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
- **Reducing** or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- **Compensating** for the impact by replacing or providing substitute resources or environments.

ECOSYSTEM-BASED MITIGATION: The process of restoring, creating, enhancing, and preserving habitat and other ecosystem features in conjunction with or in advance of projects in areas where environmental needs and the potential environmental contributions have been determined to be greatest.¹²

Appendix C, Exhibit C.13 provides regional mitigation strategies that transportation agencies can employ to minimize, reduce, mitigate, or compensate for transportation project impacts that cannot be avoided.

NCTCOG supports coordination with federal, state, and local resource agencies to develop a regional ecosystem-based approach to mitigating transportation project impacts that expedites the delivery of transportation projects while encouraging

¹³ TRACES Website, www.nctcog.org/traces

preservation and restoration of high priority ecosystems. Ecosystem-based mitigation extends existing compensatory mitigation options by offering a way to evaluate alternatives for off-site mitigation and/or out-of-kind mitigation in the ecologically most valuable areas as defined by interagency partners and the public. Development of the REF was the first step in promoting ecosystem-based mitigation in the Dallas-Fort Worth area and coordination efforts will continue with transportation and conservation planning agencies to integrate these concepts into transportation planning and projects.

Leveraging opportunities and combining planning efforts, or integrated planning, will support conservation priorities while maintaining compliance with applicable laws and developing needed infrastructure.

It is a requirement that as projects advance toward further planning and development stages such as the federal National Environmental Policy Act (NEPA), evaluations and equivalent state processes that detailed environmental analysis of individual transportation projects will occur. At this stage, project features may be narrowed and refined, and the environmental impacts and mitigation strategies are appropriately ascertained for individual projects.

Environmental Trends in Transportation

Transportation projects funded with federal transportation dollars must adhere to environmental review processes before construction. This review, conducted under the guidance of NEPA, documents the environmental, economic, and social impacts of a particular project. With this critical stage in mind, transportation planning is trending toward decision making that considers environmental, community, and economic goals early in the planning stage and then carries them through project development, design, and construction.

Additional trends occurring at the planning level include assessing environmental impacts or benefits associated with transportation projects on a cumulative or system-wide level, and integrating ecosystem approaches to mitigating impacts. For example, a discussion of potential impacts to environmental justice populations associated with the implementation of Mobility 2035 is included in the Social Considerations chapter. The air quality conformity process is another cumulative analysis that continues to advance both regionally and nationwide.

NCTCOG supports approaches to transportation decision making that consider environmental, community, and economic goals early in the planning stage and carry them through the NEPA review process, project development, design, and construction. This can lead to a seamless decision-making process that minimizes duplication of effort, promotes environmental stewardship, and reduces delays in project implementation. Decisions made early in planning and project development play a substantial role later in the NEPA environmental review process.

Environmental Scoring

In addition to providing Regional Ecosystem Framework subwatershed scores for transit and roadway corridors, environmental scoring was conducted for the Mobility 2035 transit and roadway recommendations. The resulting scores are found in Appendix C, Exhibits C.14 and C.15. The results include scores derived from two EPA analysis tools including NEPAAssist and the Geographic Information System Screening Tool (GISST). For any one corridor, the questions presented in *Exhibit 4.10* are provided with a corresponding Yes or No answer or score. The answers provide insight into resources where there may be relatively high concern and further review, documentation, and consultation with the applicable regulatory or planning agency may be needed during the planning and project development processes. These scores are meant to be used as a preliminary screening tool for potential impact identification.

Summary

Mobility 2035 supports many programs that demonstrate adherence to federal air quality conformity requirements and will improve the region's air quality through comprehensive strategies and partnerships. In addition, Mobility 2035 supports and presents some new initiatives aimed at expediting project delivery while enhancing stewardship for key natural resources in North Central Texas. Developing transportation infrastructure in ways that are more sensitive to the high priority environments in the region will support healthy communities and habitats, and a high quality of life for all residents.

All environmental resource policies, programs, projects, and maps are included in Appendix C.

EPA Analysis Tool	Category	Question/Scoring Criterion	
NEPAssist Analysis	Facility	<ul style="list-style-type: none"> ▪ Within 100/1000 meters of a hospital? ▪ Within 100/1000 meters of a Toxic Release Inventory site? ▪ Within 100/1000 meters of a regulated facility? 	
	Water	<ul style="list-style-type: none"> ▪ Within 100 year floodplain? ▪ Within 500 year floodplain? 	<ul style="list-style-type: none"> ▪ Within a NLCD wetland? ▪ Within 1000 meters of NLCD wetland?
	Ecology	<ul style="list-style-type: none"> ▪ Within a federal/state park or wildlife area? ▪ Within 1000 meters of a federal/state park or wildlife area? ▪ Within a critical habitat area? ▪ Within 1000 meters of a critical habitat area? ▪ Within 100 meters of a REAP Composite area that is within the top 10% highest scores? 	<ul style="list-style-type: none"> ▪ Within 100 meters of a REAP Diversity area that is within the top 10% highest scores? ▪ Within 100 meters of a REAP Sustainability area that is within the top 10% highest scores? ▪ Within 100 meters of a REAP Rarity area that is within the top 10% highest scores?
	Other	<ul style="list-style-type: none"> ▪ Within 100/1000 meters of a place on the NRHP? ▪ Within 100/1000 meters of a school? ▪ Within an air quality nonattainment area? 	
GISST Analysis	Hydrological Unit Code Related	<ul style="list-style-type: none"> ▪ Surface Water Use ▪ STORET Exceedances ▪ Unified Watershed Assessment 	
	Other Water Related	<ul style="list-style-type: none"> ▪ Distance to Water (feet) ▪ Surface Water Quantity ▪ % 100 Year Floodplain 	<ul style="list-style-type: none"> ▪ % 500 Year Floodplain ▪ Groundwater Probability ▪ Soil Permeability
	Land Cover Related	<ul style="list-style-type: none"> ▪ % Wildlife ▪ % Agriculture 	<ul style="list-style-type: none"> ▪ % Wetlands ▪ Land Use Ranking

Exhibit 4.10: Environmental Scoring Categories and Questions