

Chapter 11 – Environmental Considerations

Already this Plan recommends many strategies that benefit the environment by reducing congestion, encouraging transit and promoting facilities that support bicycling and walking. The OTO region and southwest Missouri have experienced an incredible amount of growth over the past 20 years. This can be attributed to the natural environment and open spaces that exist in this region. The region also has a number of cultural and historic resources that continue to make the area attractive. The transportation system should strive to protect and enhance these advantageous qualities of the Ozarks.

Natural Environment

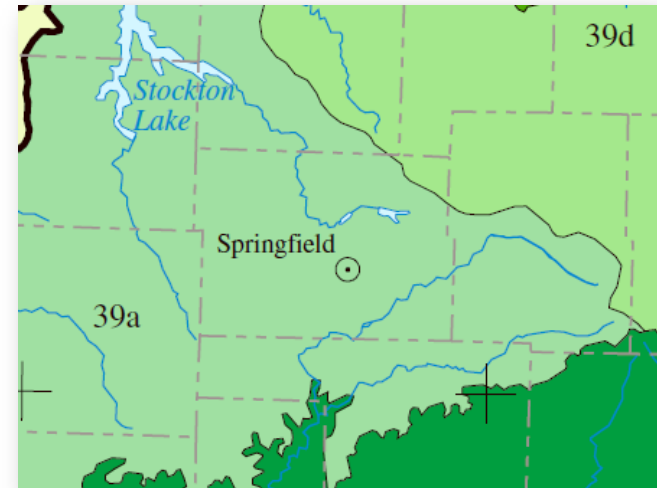
Ecoregions

Source: Chapman, S.S., Omernik, J.M., Griffith, G.E., Schroeder, W.A., Nigh, T.A., and Wilton, T.F., 2002, Ecoregions of Iowa and Missouri ftp://ftp.epa.gov/wed/ecoregions/mo/moia_front.pdf

The Ozarks Transportation Organization planning area can be divided into two ecoregions. The majority of the region is covered by the Springfield Plateau, while a portion of the OTO in Christian County is covered by the White River Hills. Ecoregions denote areas of general similarity in ecosystems and in the type, quality, and quantity of environmental resources. They are designed to serve as a spatial framework for the research, assessment, management, and monitoring of ecosystems and ecosystem components. The Springfield Plateau and White River Hills are part of the Ozark Highlands. The Ozark Highlands is characterized by an irregular physiography, forested areas, and limestone bedrock. The Springfield Plateau has moderate topography with karst features and rocky soils. Land cover is a mix of woodland and areas of pastureland in the cleared prairies. Bicyclists throughout the region benefit from the relatively flat nature of the Springfield Plateau. The White River Hills has more extreme topography and is characterized by cliffs, sinkholes, and caves. Much of the land is wooded and is in public lands.

Figure 79 - OTO Ecoregions

Source: Environmental Protection Agency



Endangered Species

The Missouri Department of Conservation has identified sixteen terrestrial and aquatic species, as well as eight plant species, as endangered within the State of Missouri. Christian and Greene County both have several of these species, as well as some species unique to each county.

Christian County

Black-tailed Jackrabbit

- State Status – Endangered
- No Federal Status

Gray Bat

- State Status – Endangered
- Federal Status – Endangered

Missouri Bladder-pod

- State Status – Endangered
- Federal Status – Threatened

Plains Spotted Skunk

- State Status – Endangered
- No Federal Status

Greene County

Black-tailed Jackrabbit

- State Status – Endangered
- No Federal Status

Geocarpon

- State Status – Endangered
- Federal Status – Threatened

Gray Bat

- State Status – Endangered
- Federal Status – Endangered

Figure 80 - Endangered Species in the Ozarks

Source: Environmental Protection Agency

ftp://ftp.epa.gov/wed/ecoregions/mo/moia_front.pdf



The endangered gray bat, *Myotis grisescens*, was once a common inhabitant of the caves in Ecoregion 39. Habitat loss and human disturbance have significantly reduced their numbers.

Photo: Merlin D. Tuttle, Bat Conservation International



The threatened Ozark cavefish, *Amblyopsis rosae*, is closely linked to the endangered gray bat. The largest Ozark cavefish populations occur in caves used by the gray bat, where the bat guano forms the caves' primary energy source.

Photo: Jim Rathert, MDC

Missouri Bladder-pod

- State Status – Endangered
- Federal Status – Threatened

Niangua Darter

- State Status – Endangered
- Federal Status – Threatened

Ozark Cavefish

- State Status – Endangered
- Federal Status – Threatened

Cultural and Historical Resources

Items of cultural significance in the region include religious facilities, cemeteries, historical facilities, airports, public and private schools, universities, and local markets. Besides those items on the National Register Listings, Route 66 has a strong presence through the OTO region. Route 66 received its name at the former Historic Colonial Hotel in downtown Springfield. Route 66 travels from Strafford at the east OTO boundary, through Springfield, and out west from there.

Christian County National Register Listings

Ozark Courthouse Square Historic District

- Portions of 2nd Ave, Church, Elm, and 2nd Streets, on the Courthouse Square in Ozark
- The Courthouse is a Classic Revival designed by H. H. Hohenschield.
- The buildings on the square were constructed between 1880 and 1945.

Southwest Missouri Prehistoric Rock Shelter and Cave Sites Discontiguous Archeological District

- Address restricted
- Cave sites with prehistoric human occupations, circa 12,000 – 250 B.P.

Wilson’s Creek National Battlefield

Figure 81 - Missouri Bladder-Pod

Source: Environmental Protection Agency

ftp://ftp.epa.gov/wed/ecoregions/mo/moia_front.pdf



The endangered Missouri bladder-pod, *Leaquerlla filifomis*, grows in open limestone glades with shallow soils and around rock outcrops.
Photo: Jim Rathert, MDC

- Southwest of Springfield on MO 174
- The Battlefield includes virtually the entire scene of action of the Battle of Wilson’s Creek in 1861.

Greene County National Register Listings

Greene County has many facilities listed on the National Register. Additional details can be found on the State Historic Preservation Office website through the Missouri Department of Natural Resources - <http://www.dnr.mo.gov/shpo/Greene.htm>.

Table 32 - Greene County National Register Listings

Source: Missouri Department of Natural Resources, State Historic Preservation Office

Abou Ben Adhem Shrine Mosque	Hotel Sansone	Schneider, Henry, Building
Ambassador Apartments	Jefferson Street Footbridge	South Avenue Commercial Historic District
Anderson, Elijah Teague, House	Keet-McElhany House	Springfield Furniture Co.
Bentley House	King, J.E., Manufacturing Co.	Springfield Grocer Co. Warehouse
Benton Avenue AME Church	Kite, Robert B. and Vitae A., Apartment Building	Springfield National Cemetery
Berry Cemetery	Landers Theater	Springfield Public Square Historic District
Boegel and Hine Flour Mill-Wommack Mill	Lincoln School	Springfield Seed Co. Office and Wholesale Building
Boone, Nathan, House	Marquette Hotel	Springfield Warehouse and Industrial Historic District
Camp Manor Apartments	Marx-Hulbert Building	Stone Chapel
Campbell Avenue Historic District	Mid-Town Historic District	U.S. Customhouse and Post Office
Christ Episcopal Church	Netter-Ullman Building	Walnut Street Historic Commercial District
College Apartments	Oberman, D.M., Manufacturing Co. Building	Walnut Street Historic District
Commercial Street Historic District	Old Calaboose	Washington Avenue Baptist Church
Day House	Palace Hotel	West Walnut Street Commercial Historic District
Finkbiner Building	Pearl Apartments and Windsor Apartments	Wilhoit, E.M., Building
Franklin Springfield Motor Co. Building	Pearson Creek Archeological District	Wilhoit, Edward M. and Della C., House
Gillioz Theater	Producers Produce Co. Plant	Wilshire Apartments
Gilmore Barn	Pythian Home of Missouri	Wilson’s Creek National Battlefield
Gottfried Furniture Co. Building	Rail Haven Motel	Wise Feed Co. Building
Greene County Courthouse	Rock Fountain Court Historic District	Woods-Evertz Stove Co. Historic District
Heer’s Department Store	St. John’s Mercy Hospital Building	
Holland Building	St. Paul Block	

Strategy to Implement Plan Goals

- *OTO, member jurisdictions, and MoDOT should be aware of environmentally sensitive areas when planning and constructing transportation projects.*
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Environmental Justice

Environmental justice is a fundamental ideal that ensures federally funded plans and projects do not create a disproportionately adverse effect on minorities, low-income, disabled, elderly and/or under age 18 populations. This ideal is built on the framework of Title VI of the Civil Rights Act of 1964, which states, “No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” In 1994, President Clinton issued an Executive Order directed to all Federal agencies to consider and address the effects of all program, policies, and activities on “minority and low-income populations.” This has been further expanded to include the elderly, disabled, and the under 18-years of age populations. President Bush signed an Executive Order in 2000, expanding protection against national origin discrimination, by ensuring programs are accessible by people with limited English proficiency.

Federally funded recipients are to ensure that there are no disproportionate adverse impacts in these communities, or those considered transportation dependent due to age or physical limitations, when allocating or spending federal funds. These recipients are also required to review the benefits and burdens of projects and programs (in this case, transportation improvements) are balanced between the population at large and those traditionally underserved in the planning and programming process.

While it is difficult to make any significant change to the transportation system without negatively affecting someone, the focus of environmental justice is on these impacts and alternative solutions. Any major transportation system change should first consider whether society will be better off with the change, and second, determine the distributional impacts. The first consideration addresses the economic efficiency of a project; that is benefit-cost analysis. The second addresses the equity of who will receive more of the benefits and who will pay more of the costs. This question of equity is the concern of environmental justice. If it is determined that a project negatively impacts a population, the project can be rejected or the population impacted can be compensated. Should a project still move forward, attempts should be made to minimize the negative impacts.

Adverse Impacts

- Adverse impacts, as defined by the U.S. Department of Transportation, include, but are not limited to:

- Bodily impairment, infirmity, illness, or death
- Air, noise, and water pollution, and soil contamination
- Destruction, or disruption of man-made or natural resources
- Destruction or diminution of aesthetic values
- Destruction or disruption of community cohesion or a community's economic vitality
- Destruction or disruption of public and private facilities and services
- Vibration
- Adverse employment impacts
- Displacement of persons, businesses, farms, or non-profit organizations
- Increased traffic congestion
- Isolation, exclusion, or separation of minority or low-income individuals within a given community or from the broader community.
- The denial of, or reduction or significant delay in the receipt of DOT programs, policies, and/or activities

Positive Benefits

The following list represents a list of positive impacts from transportation projects that can be used to offset negative impacts:

- Improved air quality
- Reduced traffic congestion
- Improved access to public transportation
- Improved access to jobs
- Natural hazard mitigation
- Improved access to disadvantaged business enterprises
- Improvement of aesthetic values
- Improved connectivity of minority/low-income neighborhoods to the broader community
- Reduced noise and vibration
- Reduction in possibility of impairment or death due to transportation infrastructure

Mitigating Disproportionate Impacts

The focus of environmental justice is to determine if adverse impacts are the burden of, or occur at a greater severity, for minority, low-income, elderly, disabled, under 18-years of age, or limited English proficiency populations compared to the general population. If a disproportionately adverse impact is shown to be affecting these populations, the activity should not be carried out using federal funds unless:

- Alternative approaches or further mitigation measures that would avoid or reduce the disproportionate impacts are not practicable, and
- A substantial need exists for the program, policy, or activity, based on the overall public interest and alternative approaches that would have less adverse impacts on protected populations would either –
 - Have other adverse social, economic, environmental, or human health impacts that would be more severe, or
 - Involve increased costs of extraordinary magnitude.

Actions to Identify Information Concerning Human Health and Environmental Impacts

The public must have access to complete information concerning human health and environmental impacts. Four actions early in the development of major programs, policies, or activities can help agencies develop this information.

- Identifying and evaluating environmental, public health, and interrelated social and economic effects
- Proposing measures to avoid, minimize, and/or mitigate disproportionately high and adverse environmental and public health effects and interrelated social and economic effects, offsetting benefits or opportunities should be provided to enhance communities, neighborhoods, and individuals whenever permitted by federal law and policy
- Considering alternatives when they would enable disproportionately high and adverse impacts to be avoided and/or minimized
- Elicit public involvement opportunities, including soliciting input from affected minority and low-income populations in considering alternatives.

Analysis

OTO has identified minority and Hispanic, low-income, disabled, elderly and youth, and limited English proficiency populations within the OTO region. The location of these populations has then been compared to the location of the constrained projects included in the Long Range Transportation Plan.

Figure 82 - 2010 Elderly by Block Group

Source: US Census Bureau – 2010 SF1, Table P12

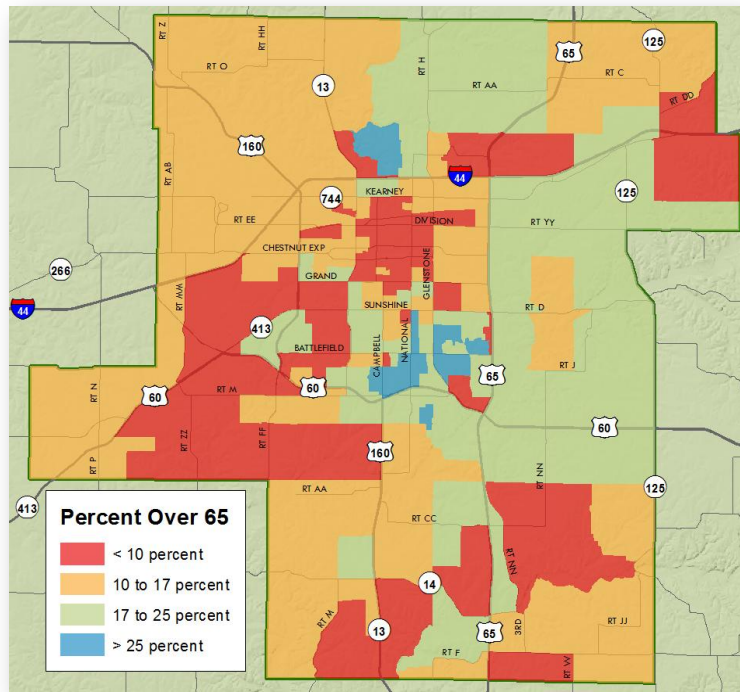
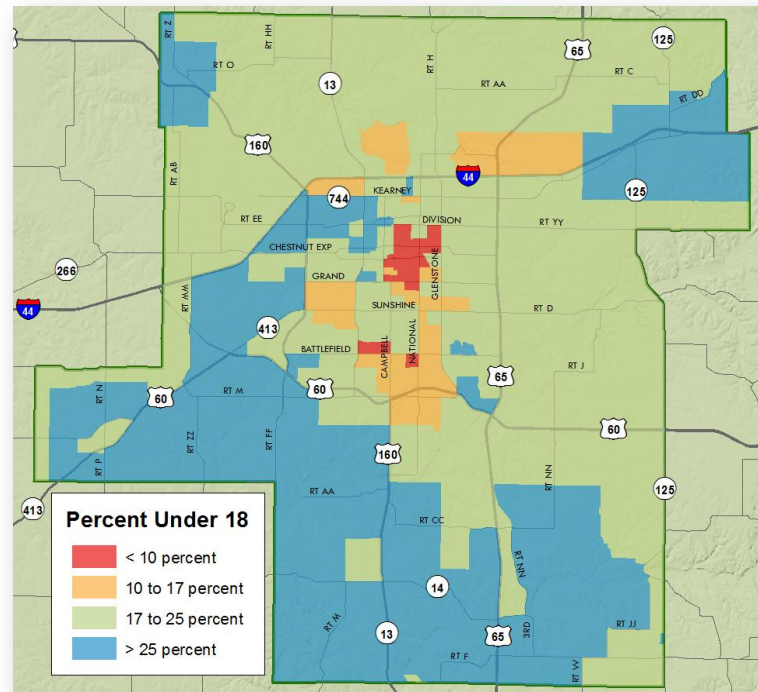


Figure 83 - 2010 Youth (under age 18) by Block Group

Source: US Census Bureau – 2010 SF1, Table P12



Persons over the Age of 65

Specific transportation projects that may need further examination to ensure no undue hardship is placed on persons over the age of 65 would include:

- Battlefield Road and Fremont Avenue Intersection Improvements, Fremont Avenue Improvements – Intersection improvements at Fremont Avenue, improvements on Fremont Avenue from Sunset Street to Battlefield Road
- Business 65 (Glenstone Avenue) Access Improvements – Intersection improvements at Independence Street/Luster Avenue Connection and Republic Road
- Campbell Avenue and Republic Road Intersection Improvements – Intersection improvements at Republic Road
- Republic Road Bridges over James River Freeway (Route 60) – Bridge improvements for Republic Road bridges over Route 60 (James River Freeway)
- Route 13 (Kansas Expressway) Access Management – Improved access management from I-44 to Route 744 (Kearney Street)

- Route 13 (Kansas Expressway) and Route 60 (James River Freeway) Interchange Improvements – Interchange improvements at Route 60 (James River Freeway)
- Route 65 and Battlefield Road Interchange Improvements – Interchange improvements at Battlefield Road

Persons under the Age of 18

The youth population is fairly significant throughout the OTO region. Nearly all projects may need further examination to ensure no undue hardship is placed on persons under the age of 18.

Figure 84 - 2010 Minority Population by Block Group

Source: US Census Bureau – 2010 SF1, Table P2

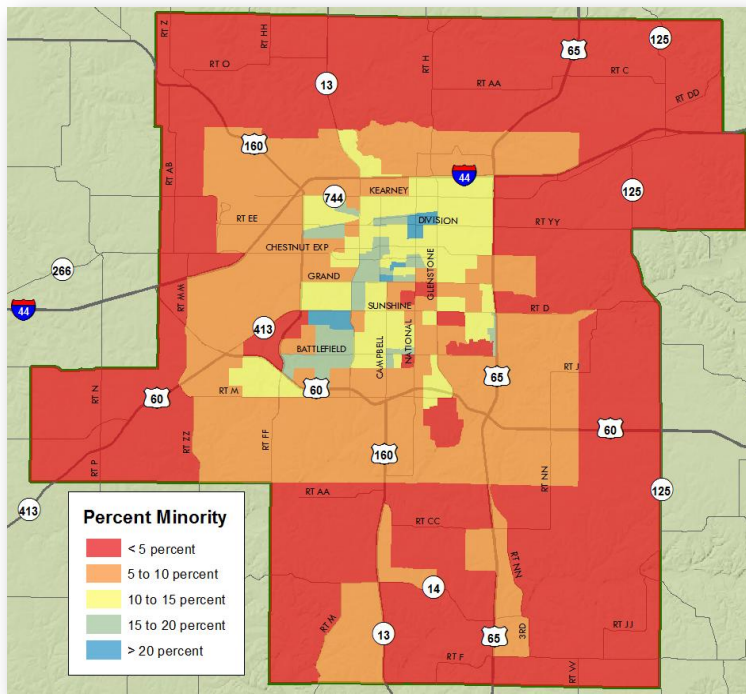
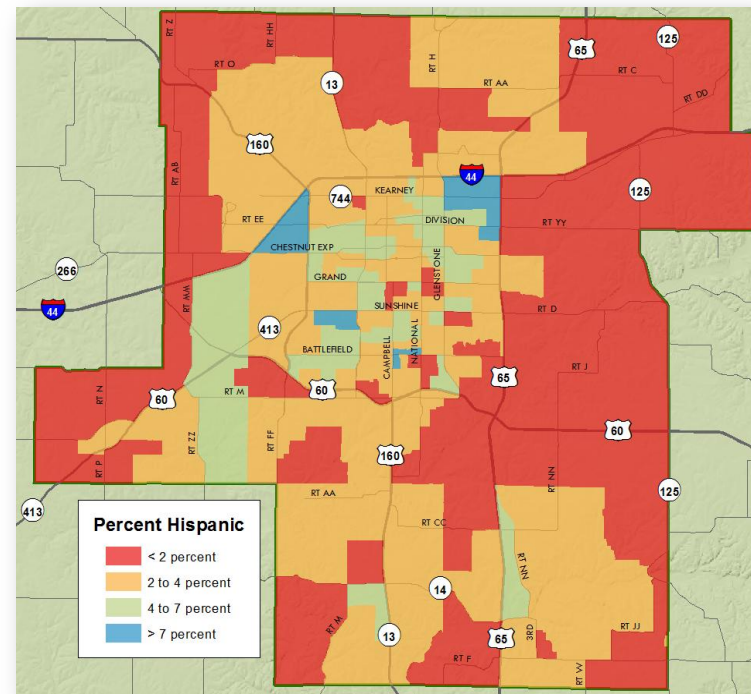


Figure 85 - 2010 Hispanic Population by Block Group

Source: US Census Bureau – 2010 SF1, Table P2



Minority and Hispanic Populations

Specific transportation projects that may need further examination to ensure no undue hardship is placed on minority and Hispanic populations would include:

- Battlefield Road and Fremont Avenue Intersection Improvements, Fremont Avenue Improvements – Intersection improvements at Fremont Avenue, improvements on Fremont Avenue from Sunset Street to Battlefield Road
- Route 13 (Kansas Expressway) and Route 60 (James River Freeway) Interchange Improvements – Interchange improvements at Route 60 (James River Freeway)
- Route 13 (Kansas Expressway) and Sunset Street Intersection Improvements – Intersection improvements at Sunset Street
- Route 13 (Kansas Expressway) Safety and System Improvements – Safety and system improvements from College Street to Route 60 (James River Freeway), Access Management
- Route 160 (West Bypass) and Route 60 (James River Freeway) Interchange Improvements – Interchange improvements at Route 60 (James River Freeway)
- Route 160 (West Bypass) and Route 744 (Kearney Street) Intersection Improvements – Intersection improvements at Route 744 (Kearney Street)
- Route 60 (James River Freeway) Operational Improvements – Operational improvements on James River Freeway from Route 413 (West Sunshine) to Route 65
- Route 65 and Route YY (Division Street) Interchange Improvements – Interchange improvements at Route YY (Division Street)
- Route 744 (Kearney Street) and Packer Road Intersection Improvements – Intersection improvements at Packer Road

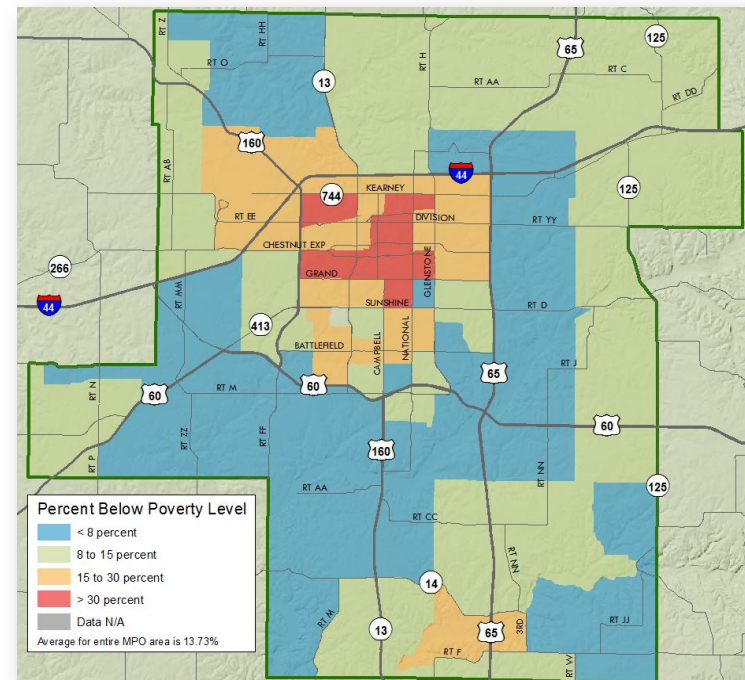
Low-Income Population

Specific transportation projects that may need further examination to ensure no undue hardship is placed on low-income populations would include:

- Route 13 (Kansas Expressway) Access Management – Improved access management from I-44 to Route 744 (Kearney Street)

Figure 86 - 2005-2009 Low-Income Population

Source: US Census Bureau – American Community Survey, Table B17001



- Route 13 (Kansas Expressway) and Sunset Street Intersection Improvements – Intersection improvements at Sunset Street
- Route 13 (Kansas Expressway) Safety and System Improvements – Safety and system improvements from College Street to Route 60 (James River Freeway), Access Management
- Route 160 (West Bypass) and Route 744 (Kearney Street) Intersection Improvements – Intersection improvements at Route 744 (Kearney Street)

Limited English Proficiency Population

The limited English proficiency population is well represented geographically in the OTO region. Most projects in the region may need further examination to ensure no undue hardship is placed on limited English proficiency populations.

Figure 88 - 2000 Disabled Population

Source: US Census Bureau – 2000 SF3, Table P42

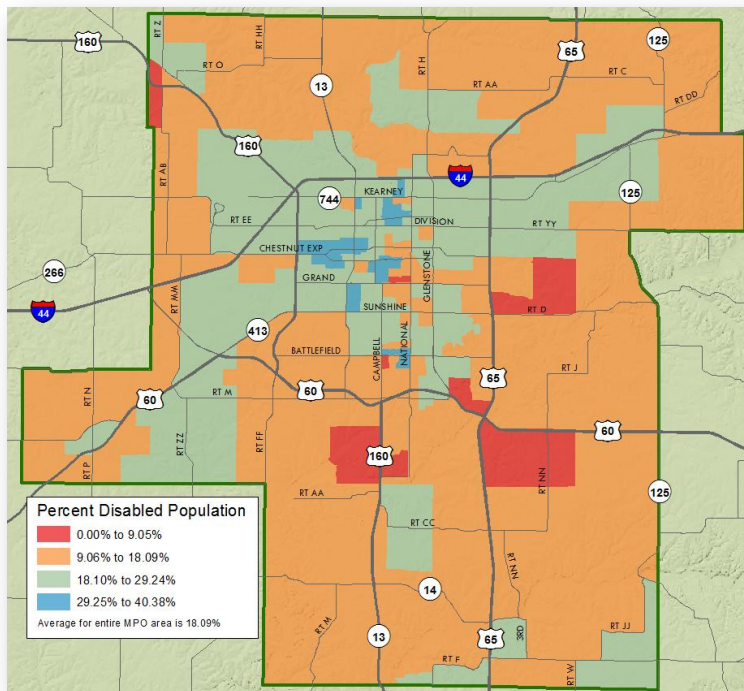
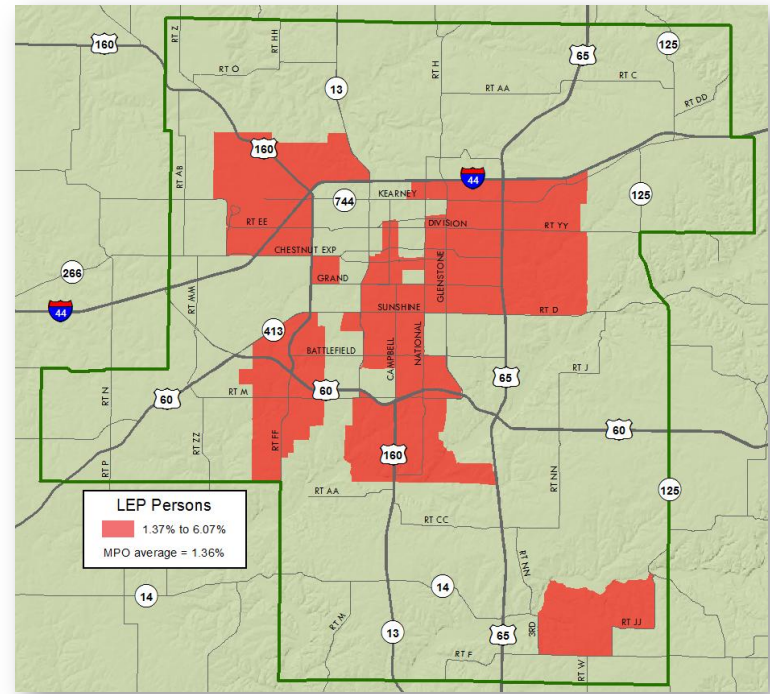


Figure 87 - 2005-2009 Limited English Proficiency Population

Source: US Census Bureau – American Community Survey, Table B16001



Disabled Population

The most recent mapped data available for the disabled population in the OTO region is from the 2000 Census. Specific transportation projects that may need further examination to ensure no undue hardship is placed on low-income populations would include:

- Route 13 (Kansas Expressway) Access Management – Improved access management from I-44 to Route 744 (Kearney Street)
- Route 13 (Kansas Expressway) and Route 60 (James River Freeway) Interchange Improvements – Interchange improvements at Route 60 (James River Freeway)

- Route 13 (Kansas Expressway) Safety and System Improvements – Safety and system improvements from College Street to Route 60 (James River Freeway), Access Management

Air Quality

Air quality throughout the nation is regulated through the Clean Air Act, which was last amended in 1990. The Clean Air Act and its Amendments requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (40 CFR part 50) for pollutants considered harmful to public health and the environment. When areas exceed the levels set by these standards, they are considered non-attainment.

7 Regulated Pollutants

- Carbon Monoxide
- Lead
- Nitrogen Dioxide
- Particulate Matter (PM₁₀)
- Particulate Matter (PM_{2.5})
- Ozone
- Sulfur Dioxide

One portion of Greene County is considered non-attainment for sulfur dioxide. This is due to the James River Power Plant. Since transportation is not a contributing source for sulfur dioxide, this designation does not affect the OTO.

Ozone

Ozarks Clean Air Alliance Clean Air Action Plan

<http://www.showmecleanair.com/downloads/CAAPJuly2010.pdf>

For the OTO region, ozone is of the greatest concern. Ozone is a gas composed of three atoms of oxygen – O₃. Ozone occurs both in the Earth's upper atmosphere and at ground level. The ozone in the upper atmosphere protects the earth from the sun's ultraviolet rays. Ozone at ground level can cause adverse health and environmental effects.

Ozone is created by a chemical reaction between volatile organic compounds (VOCs) and nitrogen oxides (NO_x) in the presence of heat and sunlight. Since ozone requires sunlight and heat to form, it is of most concern from April through October. According to the EPA, health impacts

include chest pain, coughing, throat irritation, and congestion. Ozone can worsen bronchitis, emphysema, and asthma. Repeated exposure may permanently scar lung tissue. Ozone can also damage vegetation and ecosystems. The EPA website states that in the United States, ozone is responsible for an estimated \$500 million in reduced crop production each year.

Emissions Sources for NO_x and VOCs

Electric Generating Units (EGU)

- Power Plants

Non-Electric Generating Units (Non-EGU)

- Factories
- Industrial and commercial boilers
- Chemical processing
- Large petroleum storage facilities

Area

- Small businesses (dry cleaners, autobody shops, printers, painting operations, gas stations, etc.)
- Homes (wood combustion, furnaces, paint and solvent use, etc.)
- Office buildings (heating sources, etc.)
- Wildfires
- Waste disposal (landfills)
- Agricultural sources (open burning, pesticide application, tilling, feedlots, etc.)

Mobile

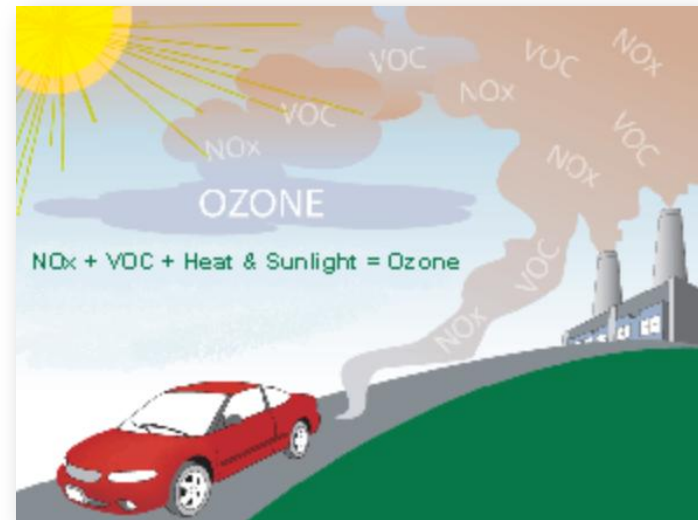
- Cars
- Motorcycles
- Trucks
- Heavy-duty trucks (semi-tractor trailers, dump trucks, etc.)

Non-Road

- Construction equipment (excavators, bull dozers, skid steers, etc.)

Figure 89 - How Ozone is Made

Source: Environmental Protection Agency



- Lawn and garden equipment (lawn mowers, gas powered weedeaters, chainsaws, leaf blowers, chippers, etc.)
- Off-road motorcycles and ATV's
- Golf carts
- Snowmobiles
- Boats
- Farm equipment (tractors, sprayers, balers, etc.)
- Aircraft

Natural

- Plants and trees emit VOCs (biogenic sources)
- Biologic decay emits NOx

Current Levels

In 2008, the EPA reduced the standard from 80 parts per billion to 75 parts per billion. The new standard has also been under review, but it has been decided not to consider an even lower standard at this time. The standard is calculated on a three-year average of the fourth highest 8-hour ozone value. This is called a design value. Ozone values are measured using the highest of two monitors in Greene County. One is located at Hillcrest High School and the other is at Fellow's Lake. A peak year for the OTO area was 2007, using values from 2005-2007. Since then, however, the values have declined to a low of 67, placing OTO and the region well under the current standard. Should this standard be reduced in the future, though, OTO could face non-attainment.

Table 33 - OTO Ozone Design Values
Source: Missouri Department of Natural Resources

Years	Value
2002-2004	70
2003-2005	71
2004-2006	71
2005-2007	77
2006-2008	73
2007-2009	69
2008-2010	67

Ozone and Transportation Conformity

The 1990 Clean Air Act Amendments placed greater emphasis on transportation sources and connections between air quality planning and transportation planning. Transportation conformity is a way to ensure that federal funding and approval goes to those transportation activities that are consistent with air quality goals. It applies to transportation plans, transportation improvement programs (TIPs), and projects funded or approved by FHWA or FTA in areas that are considered non-attainment or maintenance.

Since the OTO region is currently in attainment, transportation conformity is not yet a concern. If the region were to go non-attainment, however, OTO would have many responsibilities complying with transportation conformity. These responsibilities would also extend to the entire non-attainment area, not just the portion within the OTO boundaries.

Conformity is established by a regional emissions analysis, which determines if projected emissions for the Plan and TIP exceed emissions limits established by a State Implementation Plan (SIP). A SIP contains region specific information and goals on appropriate emissions levels that will keep a region in attainment. The regional emissions analysis must be conducted following a process established by EPA. This includes providing data produced by the OTO travel demand model. Currently, the OTO model is not sufficient for this analysis. When finalized, the conformity determination shows that the total emissions projected for the long range transportation plan or TIP are within the on-road mobile source emissions limits established by the SIP. Transportation conformity is a public process that must include interagency consultation.

Strategy to Implement Plan Goals

- ***When OTO updates its travel demand model, it should ensure that the model complies with needs for a regional emissions analysis to demonstrate transportation conformity.***
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The actual conformity determination is made by FHWA and FTA. The OTO Board of Directors would make the initial conformity determination and that would be approved by FHWA and FTA.

When to Determine Conformity

- On a long range transportation plan or TIP
 - At least every four years
 - 24-months after SIP motor vehicle emissions budgets are found adequate or are approved
 - Within 12-months after new non-attainment designations become effective.
- Prior to acceptance of a new or updated long range transportation plan, TIP, and certain plan or TIP amendments
- Prior to the first time a non-exempt federal project is adopted, accepted, approved, or funded (project-level conformity)
 - Applies 12 months after the effective date of non-attainment designation

Strategy to Implement Plan Goals

- ***The requirement that conformity must be determined within 12-months after a new non-attainment designation means that OTO should start preparing for the possibility of becoming non-attainment before it becomes a reality.***
-