MARC
MID-AMERICA REGIONAL COUNCIL

Environmental Justice Analysis

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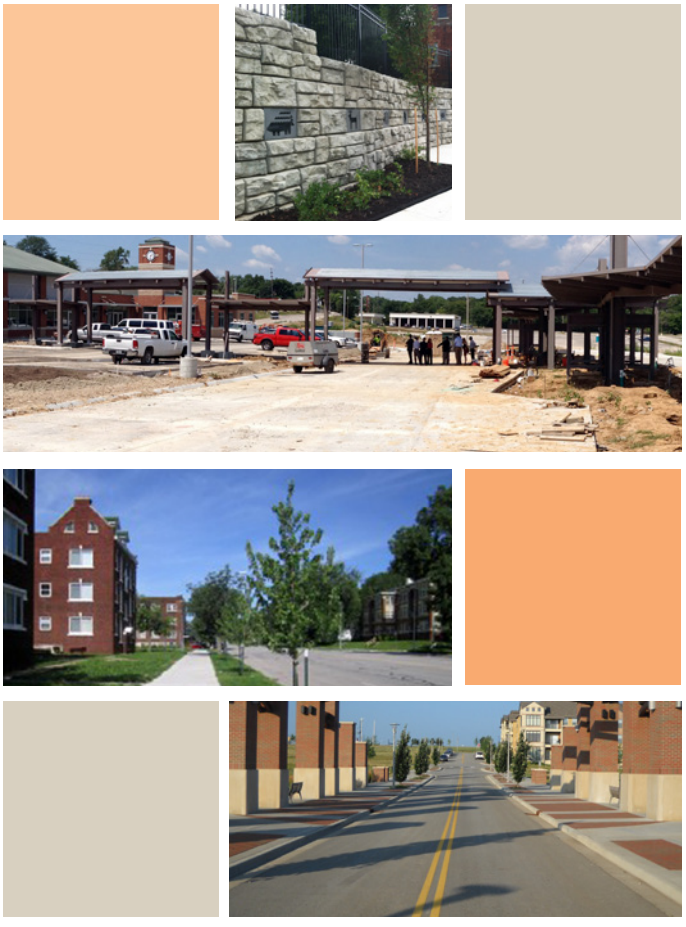
Mid-America Regional Council
Transportation Department



Environmental Justice Analysis

Background

The U.S. Environmental Protection Agency (EPA) defines environmental justice as *the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.*

Environmental justice plays an important role in transportation planning and visioning. Transportation projects have long-lasting physical impacts on communities, and it is critical to incorporate fairness and equity into the development of transportation policies and funding decisions. No group of people — by race, ethnicity or socio-economic status — should receive unfair treatment or bear a disproportionate share of negative environmental consequences as a result of decisions made at the federal, state, regional or local levels.

Ensuring Nondiscrimination

In 1994, Presidential Executive Order 12898 mandated that federal agencies incorporate environmental justice analyses in their missions by analyzing and addressing the effects of all programs, policies and activities. Drawing from the framework established by Title VI of the Civil Rights Act of 1964 and the National Environmental Policy Act (NEPA) of 1969, the U.S. Department of Transportation (USDOT) established three principles to ensure nondiscrimination in federally funded activities:

- Avoid, minimize or mitigate disproportionately high and adverse human health and environmental effects — including social and economic effects — on minority populations and low-income populations.
- Ensure full and fair participation by all potentially affected communities in transportation decision-making procesess.
- Prevent the denial of, reduction in or significant delay in the receipt of benefits by minority and ow-income populations.

MARC's Approach to Environmental Justice

MARC strives to incorporate fairness and equity into its transportation planning and programming processes. MARC analyzes the distribution of impacts and benefits resulting from financial investments in the regional transportation system. In the 2014–2018 TIP, MARC assesses the impacts of all major surface transportation projects planned that will receive federal, state and local funding in the Kansas City region in the next five years. This assessment, the Environmental Justice Analysis, reviews how federal investments are distributed across the region and how target populations — particularly minority and low-income populations — will be affected, as required by Executive Order 12898. MARC pursues public involvement from minority and low-income populations as part of the TIP process and works to ensure these populations receive a proportionate share of the benefits of federal transportation investments.

In addition, MARC examines the geographic distribution of federal transportation investments that impact Hispanic populations, elderly populations (age 65 or older) and people who use public transportation as a means to get to work; MARC also analyzes the effects of the TIP 2014–2018 on zero-car households using travel model data.

Public Participation

Transportation Outlook 2040, the metropolitan transportation plan for the Kansas City region, emphasizes nondiscrimination in planning and programming processes. Public participation is central to environmental justice, and Chapter 3: Public Participation outlines clear strategies for involving traditionally underserved segments of the population, including minority and low-income populations, in the transportation planning process.

In preparation for updating the 2014–2018 TIP, MARC met with community equity partners on Aug. 6, 2013, to review and discuss the agency's approach to conducting environmental justice analyses. Participants — including representatives from community organizations, educational institutions, health departments and housing corporations — received background information on environmental justice, reviewed how MARC has conducted environmental justice analyses in the past, and discussed plans for environmental justice analysis in the 2014–2018 TIP. Area community equity partners provided their thoughts and feedback on how MARC identifies environmental justice populations, analyzes these populations, and engages residents through public participation. See Appendix G for the meeting summary and a list of participants.

Analyzing Transportation Investments

MARC examines transportation investments by breaking down federal funds associated with the 2014–2018 TIP projects, calculating investments per capita and analyzing the distribution of funds in identified environmental justice areas and non-environmental justice areas. MARC also reviews programming for previous rounds of federal transportation funding to determine whether funds have been equitably allocated in environmental justice areas around the region.

The TIP's Environmental Justice Analysis is a spatial analysis that views proposed transportation projects in relation to concentrations of minority populations, low-income households and other selected populations. It visually and geographically assesses whether certain populations are receiving disproportionately adverse impacts as a result of federal transportation investments; and conversely, whether minority or low-income populations are receiving a fair share and distribution of benefits. The spatial analysis displays the geographic distribution of transportation investments using a series of clear, readable maps to help answer these questions. These maps are available online.

Methodology

Spatial Analysis of Transportation Investments

The MARC region is diverse in terms of its population and demographic characteristics. In addition to analyzing the target populations required by Executive Order 12898 (i.e., minority and low-income populations), the 2014–2018 TIP examines the geographic distribution of Hispanic populations, elderly populations, and people who use public transportation to get to work. This is done using dot-density maps to show concentrations of these populations in relation to the location of projects in the TIP. MARC chooses to include these populations because they represent a significant number of people in communities throughout the region, and may face greater challenges than the others in using Kansas City's transportation system to travel around the region. MARC also analyzes the effects of TIP projects on zero-car households, which is discussed in a later section.

Analysis Tools

MARC uses Geographic Information System (GIS) tools — specifically Environmental System Research Institute's (ESRI) ArcMap 10.0 software — to view and tabulate demographic information, and display the locations of TIP projects. A free GIS data viewer called ArcGIS Explorer, available at http://www.esri.com/software/arcgis/explorer, can be used to view and analyze the data in the TIP.

Data Sources

Demographic data from the U.S. Census Bureau's 2007-2011 American Community Survey (ACS) Five-Year Estimates were used to conduct the environmental justice analysis. The analysis includes census tracts and block groups that fall completely or partially within MARC's Metropolitan Planning Organization (MPO) Planning Boundary. The data was joined to tract and block group GIS layers for the spatial analysis.

A census tract is a statistical subdivision of a county designated for the purpose of presenting data. Tracts typically average 4,000 people and their boundaries usually follow visible features; however, they also follow governmental unit boundaries. A census block group is a subset of blocks contained within a census tract.

Identifying Populations

The first step of the environmental justice analysis was to identify minority and low-income populations. They were defined as:

- **Minority populations —** Any identifiable minority group(s) who live in a geographic proximity. This includes people who are Black/African-American, Hispanic or Latino, Asian American, American Indian and Alaskan Native, and Native Hawaiian and other Pacific Islander.
- **Low-income populations —** People whose median household incomes are at or below the U.S. Department of Health and Human Services (HHS) poverty guidelines.

More information on how the U.S. Census Bureau calculates poverty thresholds is available on the HHS website at http://aspe.hhs.gov/poverty/faq.cfm. Additional populations that were analyzed include:

- **Elderly populations —** Individuals ages 65 and over.
- **People who rely on public transportation to get to work —** Individuals who use public transportation (excluding taxicabs) as their mode of travel or type of conveyance to get from home to work. Public transportation includes bus or trolley bus, streetcar or trolley car, subway or elevated train, railroad or ferryboat.

Defining Environmental Justice Areas

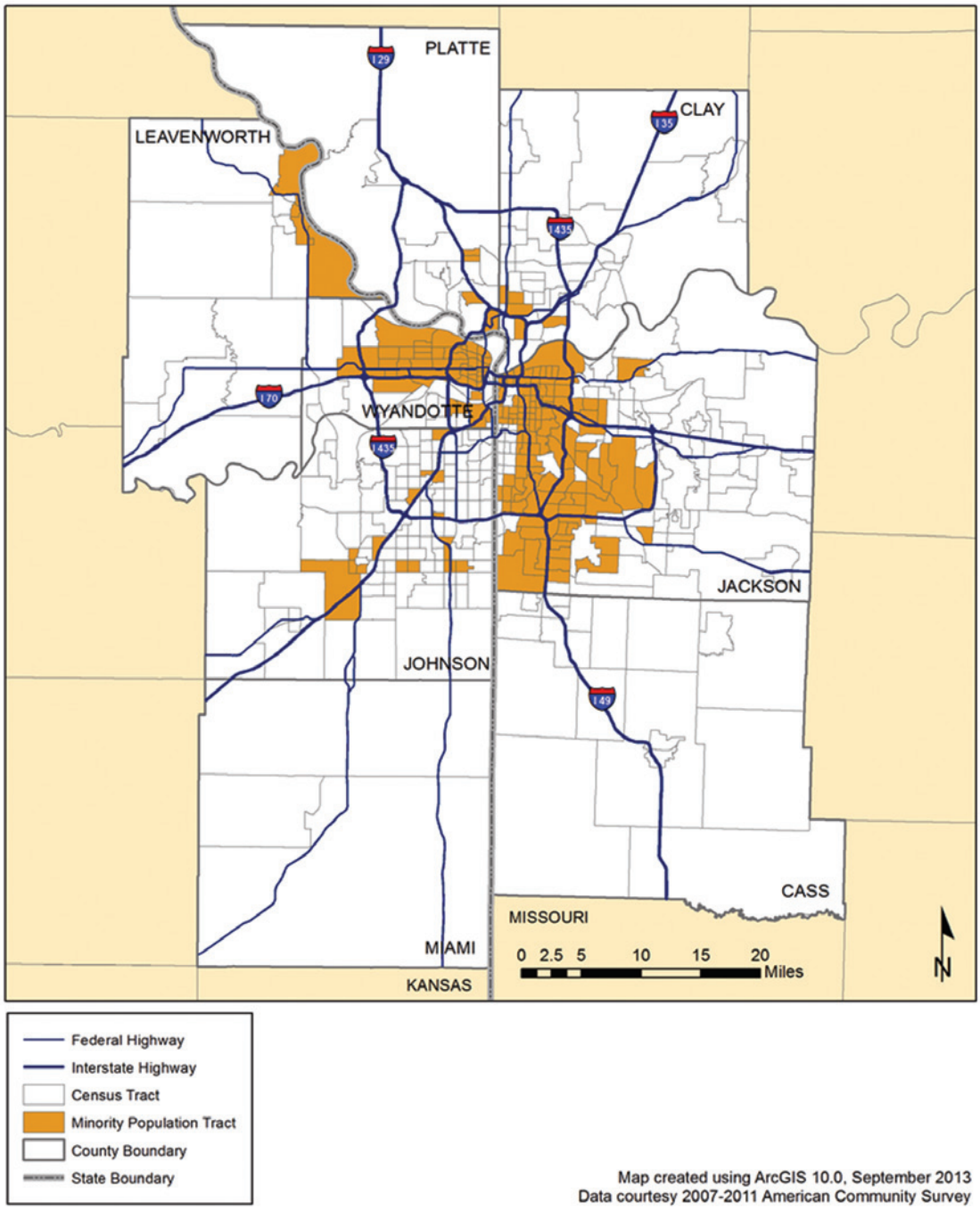
Although any population within the community may be subject to disproportionate impacts from given transportation projects and investments, the identification of minority and low-income populations was useful in understanding the comparative effects throughout all of the affected populations. Benchmarks for both minority and low-income populations were established in accordance with Federal Transit Administration (FTA) and Federal Highway Administration (FHWA) policy guidance on environmental justice. MARC defines environmental justice areas as census tracts in which:

1. Minority populations are greater than the MPO area average (21.54%).
2. More than 20 percent of households are in poverty.

Identifying Minority Areas

Once minority populations in the study area were identified, MARC calculated the average percentage of minority populations for all census tracts within the MPO boundary. Tracts that exceeded this average, 21.54 percent, were identified as environmental justice areas. See Figure 1 for a spatial view of tracts where minority populations exceed the regional average.

Figure 1: Minority Population Map

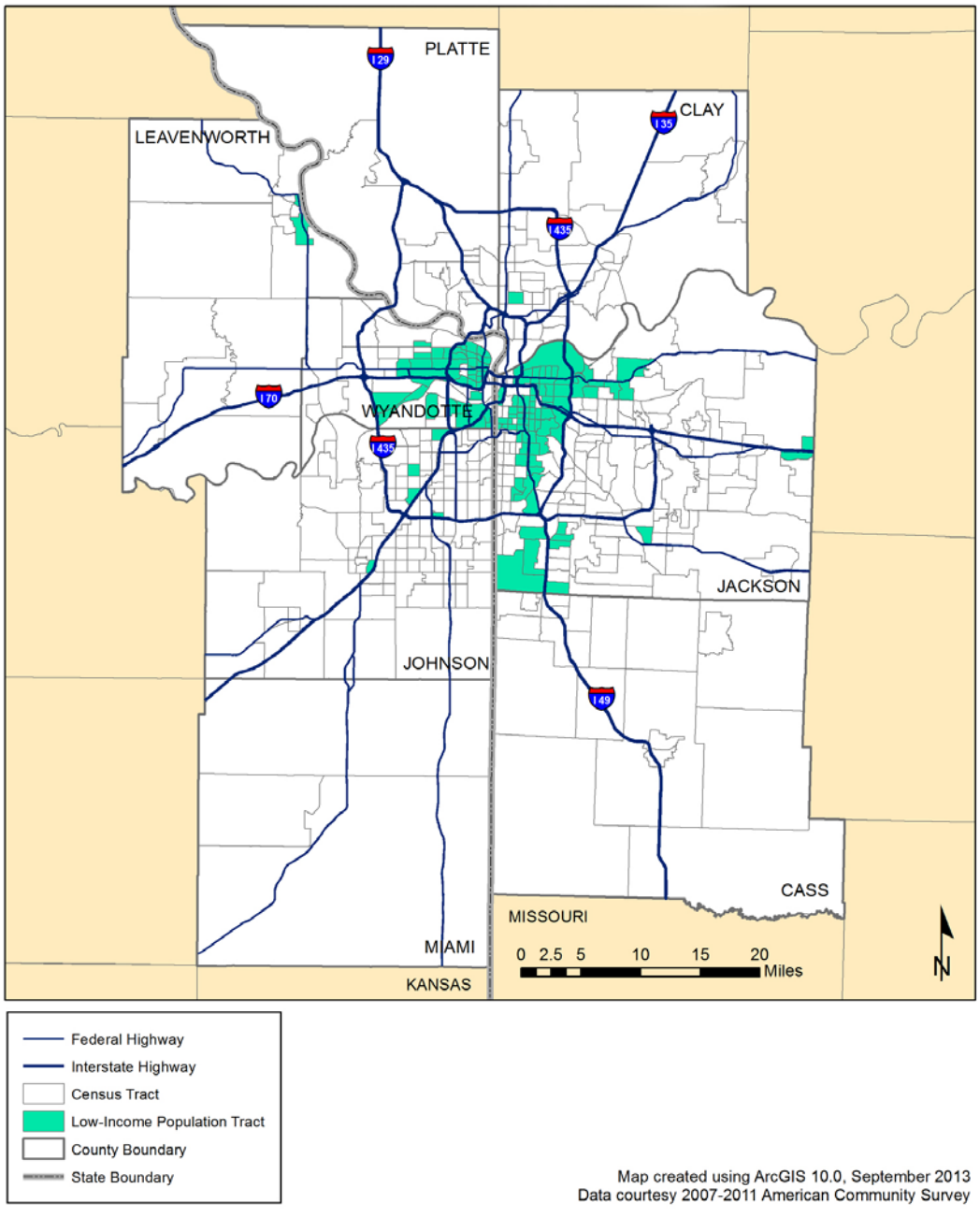


Low-Income Populations

MARC identified low-income populations based on census tracts as identified by the ACS that more than 20 percent of households were living in poverty. ACS calculated this for each tract based off the U.S. Census Bureau's 2011 poverty thresholds, which are available online at www.census.gov/hhes/www/poverty/about/overview/measure.html. Thresholds vary by family size and composition. If a family income is less than the dollar value of a particular threshold, the family's household is considered to be in poverty. More information about ACS definitions and determinations of poverty status is available in the *2011 Subject Definitions* document, available online at www.census.gov/acs/www/Downloads/data_documentation/SubjectDefinitions/2011_ACSSubjectDefinitions.pdf.

See Figure 2 for a spatial summary of low-income population areas.

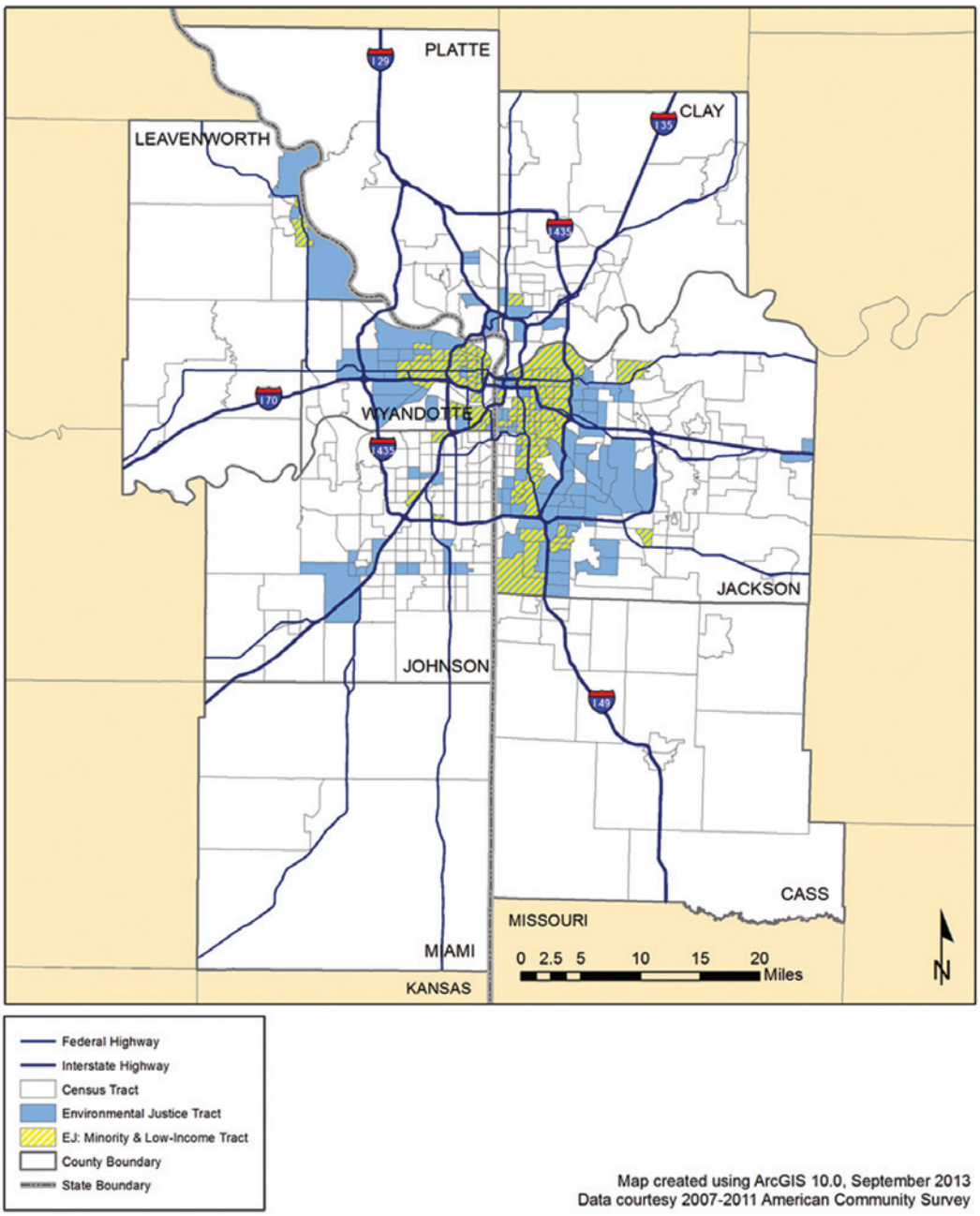
Figure 2: Low-income Populations Map



Environmental Justice Areas

Census tracts meeting one or both the criteria are referred to throughout this document as environmental justice (EJ) areas or tracts. Census tracts that do not meet the criteria or fall outside of defined EJ area boundaries are referred to as non-environmental justice (non-EJ) areas or tracts. Minority or low-income populations within EJ areas may also be referred throughout this document as protected populations. See Figure 3 for a spatial summary of EJ areas as defined by MARC in accordance with FTA and FHWA policy guidance.

Figure 3: Environmental Justice Map



Findings

Transportation Investment

To conduct the spatial analysis component of the environmental justice analysis, all regionally significant transportation projects were geocoded in ArcMap 10.0. See Figure 13 for the location of all transportation projects listed in the 2014–2018 TIP. Approximately 52 percent of mapped transportation projects fell within defined EJ areas. EJ areas account for approximately 334.6 square miles (8.7 percent of the MARC MPO region's total 3,849 square miles).

Examination of transportation investment per capita provides another view of the distribution of transportation impacts and benefits. Transportation investment per capita was calculated by dividing the total cost of projects within a particular area by the number of people living in that area. Investment per capita was calculated for both EJ and non-EJ tracts in the MARC MPO region, as displayed in Table 1 below.

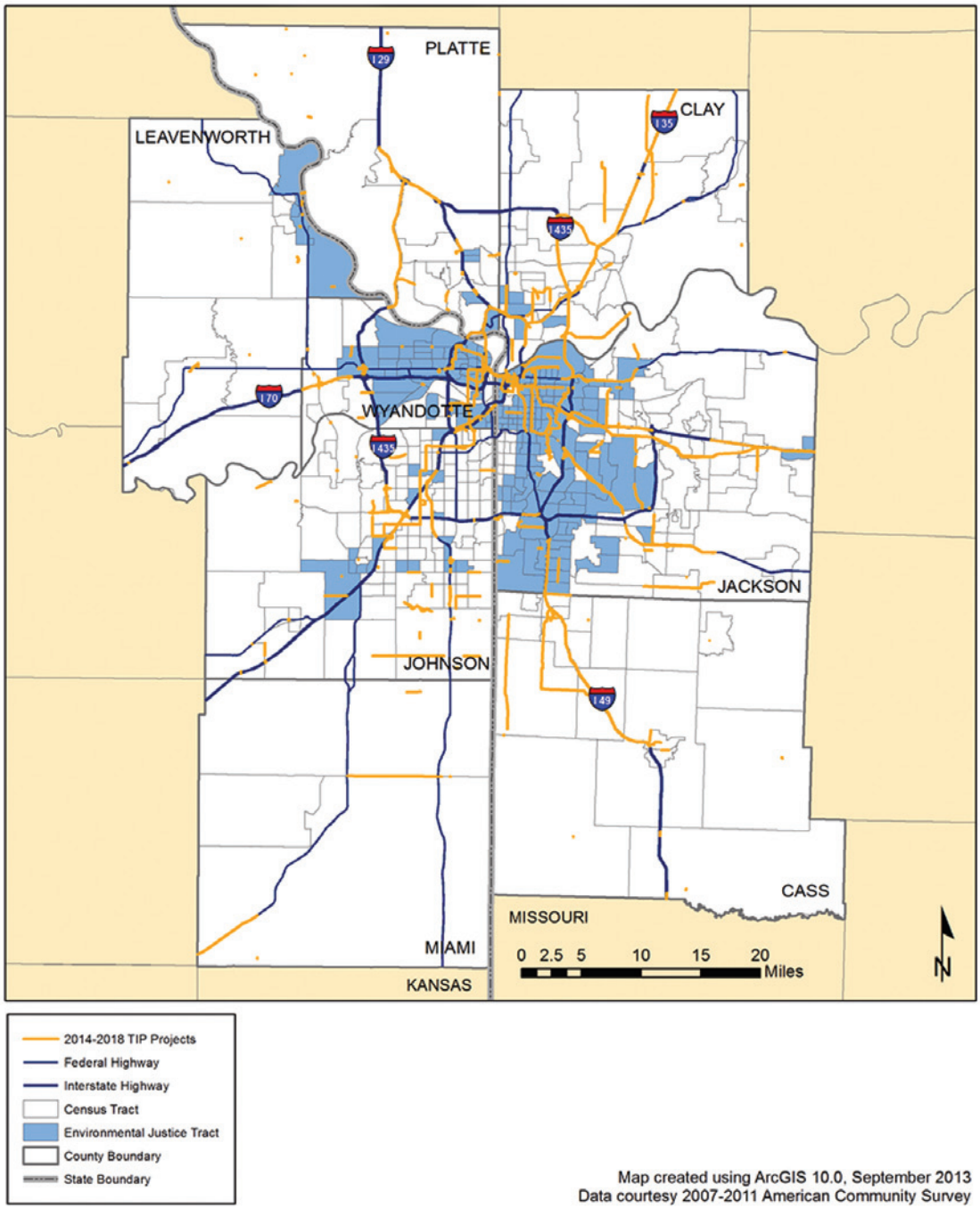
Table 1: Transportation Federal Investment Per Capita

	EJ Areas	Non-EJ Areas	Total
Population in EJ Tracts	620,937	1,347,932	1,968,869
Percent of Total Population	31.5%	68.5%	100.0%
Total Federal Funds 2014-2018	$174,278,144	$78,429,983	$252,708,127
Percent of Total Federal Funds	69.0%	31.0%	100.0%
Per Capita Funding	$280.67	$58.19	$128.35

Table 16 indicates that minority and low-income populations are receiving more benefits from federal transportation investment funds per capita — by a factor of four — than non-minority and non-low-income populations. Furthermore, there do not appear to be any disproportionately high or adverse impacts from federal transportation investments (human or environmental) on protected populations. (See Conclusions.)

Note: Only those projects which can be mapped or relate to a specific location are included in this analysis. Due to the difficulties of associating community benefits and impacts from programs such as RideShare, education programs, or alternative fuel vehicles to exact geographies, those types of projects are not included in this analysis. Additionally, the funding data in Table 16 includes federal transportation dollars for projects that cross EJ/non-EJ boundaries, as both populations may benefit from these projects. Finally, only projects for which federal funding has been received are included in this analysis.

Figure 4: 2014-2018 TIP Projects Map



Spatial Analysis of Transportation Investments

In addition to the spatial analysis of 2014–2018 TIP projects in relation to environmental justice areas, this document examines the projects in relation to other selected populations that may be impacted. By identifying where these populations exist throughout the region, we can assess whether or not they will equitably benefit from the geographic distribution of transportation investments.

Table 2: Traditionally Underserved Populations within MARC MPO Region		
Minority Populations	**Total**	**Percentage**
Black or African American	244,838	12.4%
American Indian and Alaska Native	8,543	0.4%
Asian	44,091	2.2%
Native Hawaiian and Pacific Islander	2,354	0.1%
Other ethnicity	49,221	2.5%
Two or more ethnicities	49,969	2.5%
Hispanic or Latino	150,753	7.7%
White Hispanic or Latino	81,811	4.2%
Non-White Hispanic or Latino	68,942	3.5%
Minority Population	480,827	24.4%
Total Population	1,968,869	100.0%
Households	Total	Percentage
Low-Income Households	76,670	10.4%
All Other Households	657,214	89.6%
Total Households	733,884	100.0%

U.S. census Bureau's 2007-2011 American Community Survey (ACS) 5-year estimate.

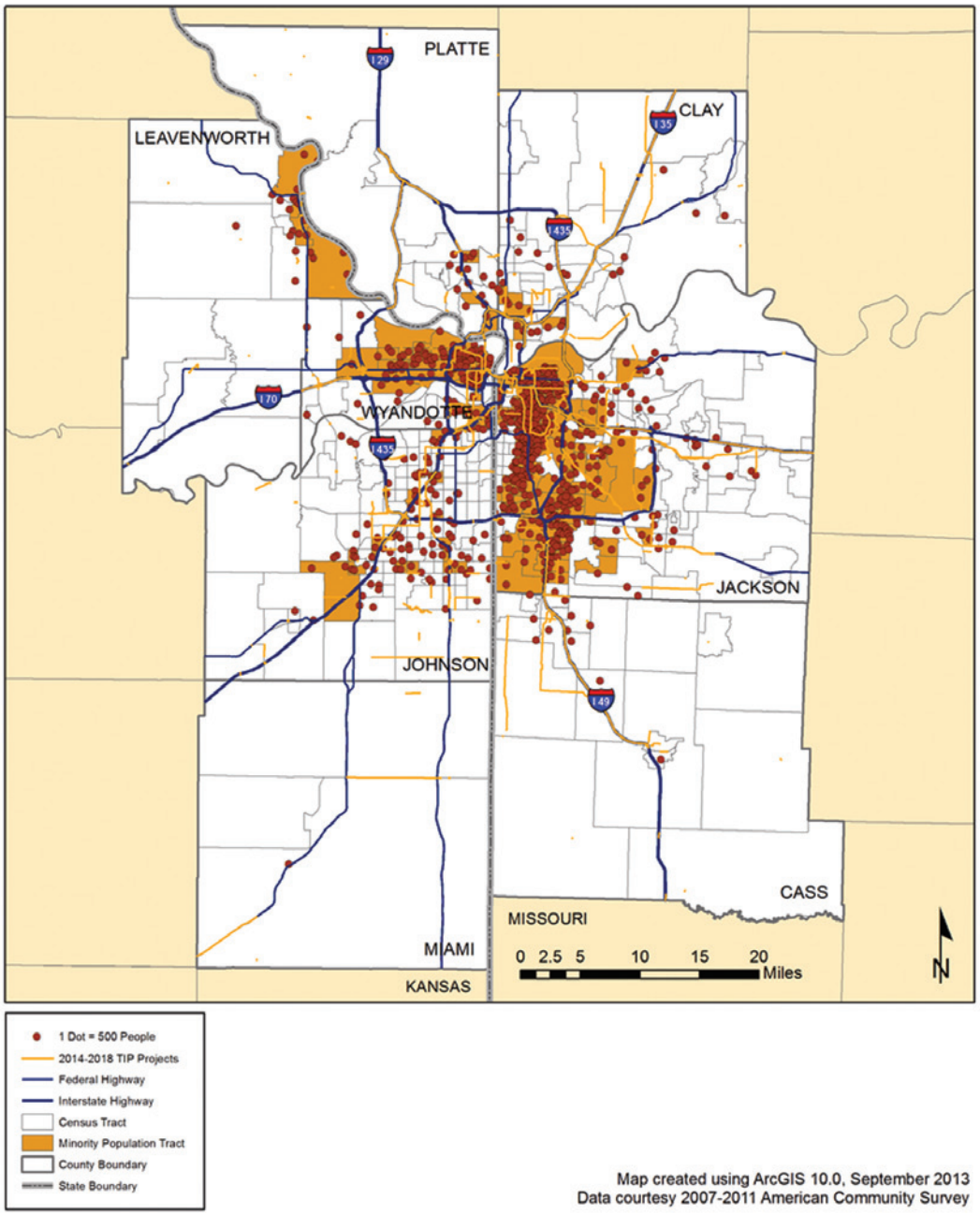
Table 17 above displays population totals and percentage of population compared to the total MARC MPO region population. See Figures 10 and 11 for spatial summaries of minority populations and low-income households in relation to the location of transportation projects listed in the TIP. These populations are spatially distributed by census block group boundaries on each map, a subdivision of a census tract, although the block group boundaries are not visible on the maps.

Minority Populations

According to 2007-2011 ACS Five-Year Estimates, there are 480,827 minority persons in the eight-county MARC MPO region; this comprises 24.4 percent of the total population. Spatial analysis reveals that minority populations are clustered along western Jackson County, Mo., and eastern Wyandotte County, Kan. Minority populations are also dispersed around Johnson County, Kan., and Clay County, Mo., but not as prevalent in other parts of the region.

Approximately 49.3 percent of mapped 2014–2018 TIP projects fall within or intersect census tracts that were identified as having large numbers of minority populations. This amounts to $173,700,344 in federal funds, or 68.7 percent of the total federal funds within the TIP.

Figure 5: Minority Populations Map

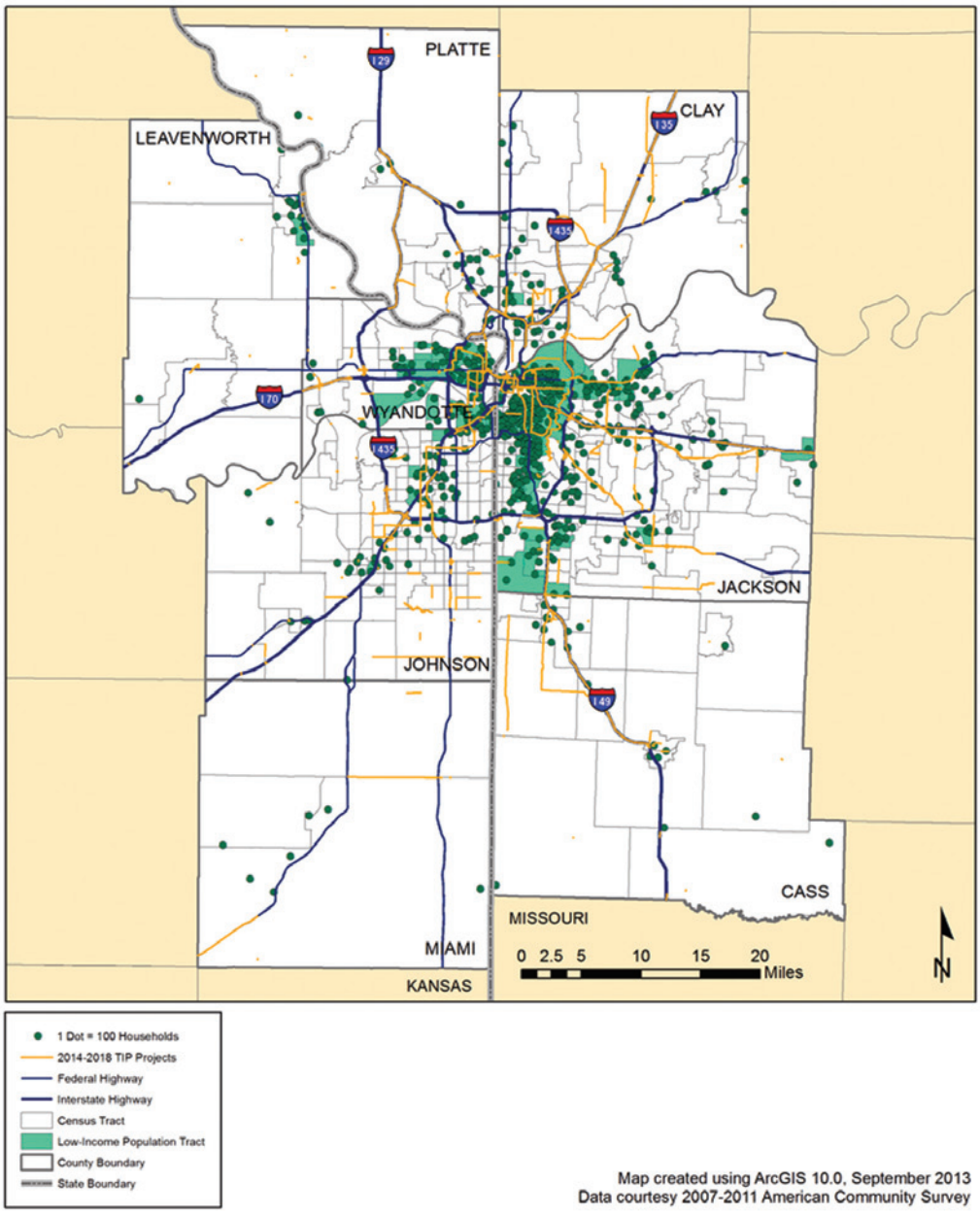


Low-Income Populations

According to ACS five-year estimates from 2007–2011, there are 76,670 low-income households in the MARC MPO region; this comprises 10.4 percent of total households. Spatial analysis reveals that low-income households are predominately clustered in western Jackson County, Mo., and eastern Wyandotte County, Kan. These populations is sparsely dispersed in the region's outlying counties and not identified as low-income household tracts.

Approximately 20.4 percent of mapped TIP projects reside in or intersect with low-income population census tracts. This amounts to $29,209,016 in federal funds, 11.2 percent of the total federal funds within the TIP. Transportation investments outside of the identified low-income population census tracts depicted in Figure 15 will serve low-income households as well.

Figure 6: Low-income Populations Map



Additional Spatial Analysis of Transportation Investments

Separate from the spatial analysis of EJ populations, this document examines TIP projects which may impact additional populations, including elderly and persons who use public transportation to get to work. This spacial analysis helps to identify where these populations exist throughout the region and to define how the 2014–2018 TIP may serve them in the future. These populations contain transportation-disadvantaged individuals who face mobility challenges traveling around the region.

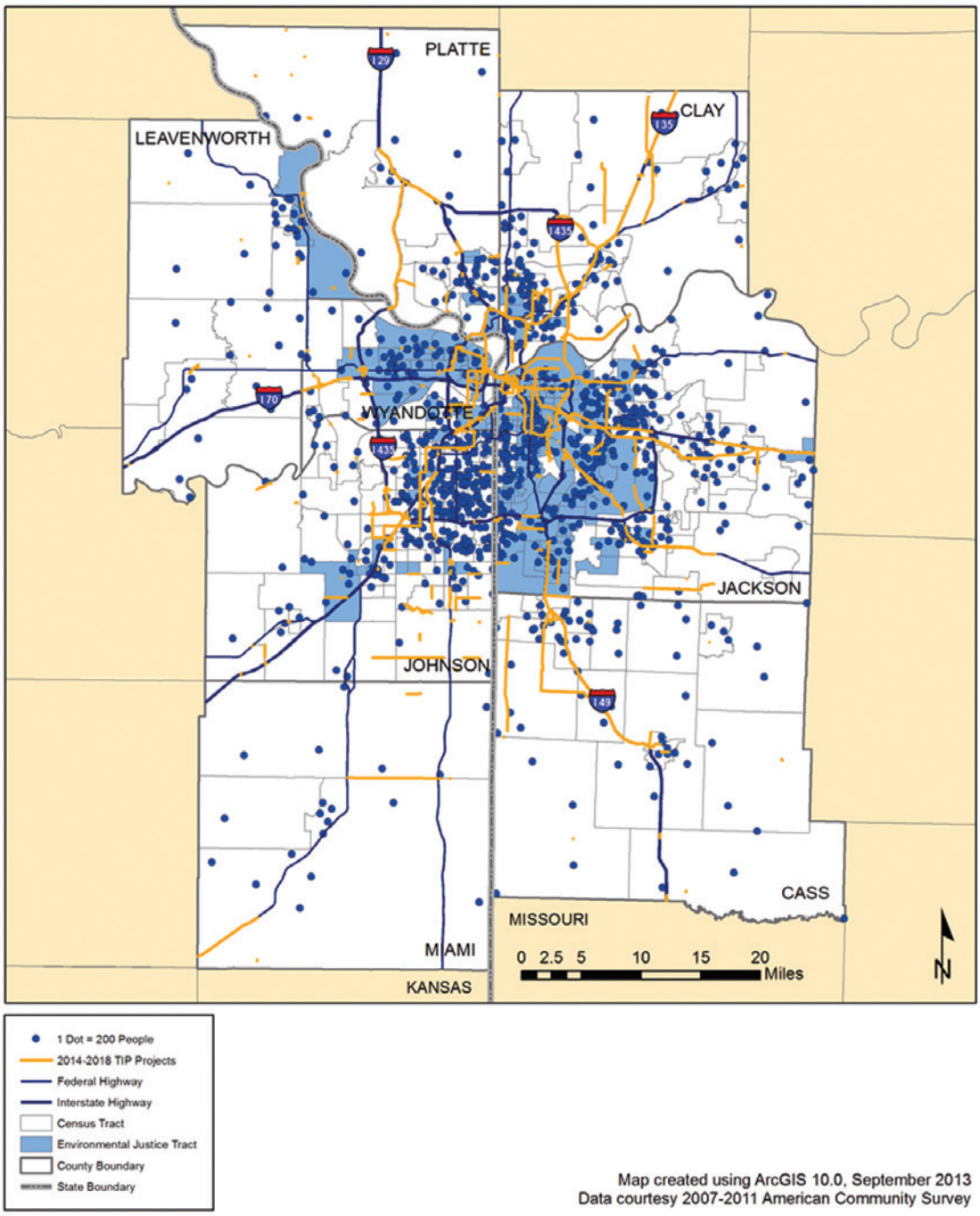
Table 3: Additional Populations within MARC MPO Region within MARC MPO Region		
Population	**Total**	**Percentage**
Elderly Populations	212,754	11.4%
Persons taking Public Transportation to Work	12,319	0.7%

See Figure 16 and 17 for spatial summaries of these additional populations relating to the location of transportation projects listed in the TIP. Populations are spatially distributed by census block group boundaries on each map, a statistical subdivision of a census tract not visible in the maps.

Elderly Populations

According to ACS five-year estimates, the MARC MPO region is home to 212,754 elderly persons, 11.4 percent of the total population. Spatial analysis reveals elderly populations are widely dispersed around the region, predominately clustered throughout Kansas City's first-ring suburbs within the I-435 loop. Assessment of the transportation investments reveals that most of the TIP projects serve areas that contain large numbers of elderly populations.

Figure 7: Elderly Populations Map

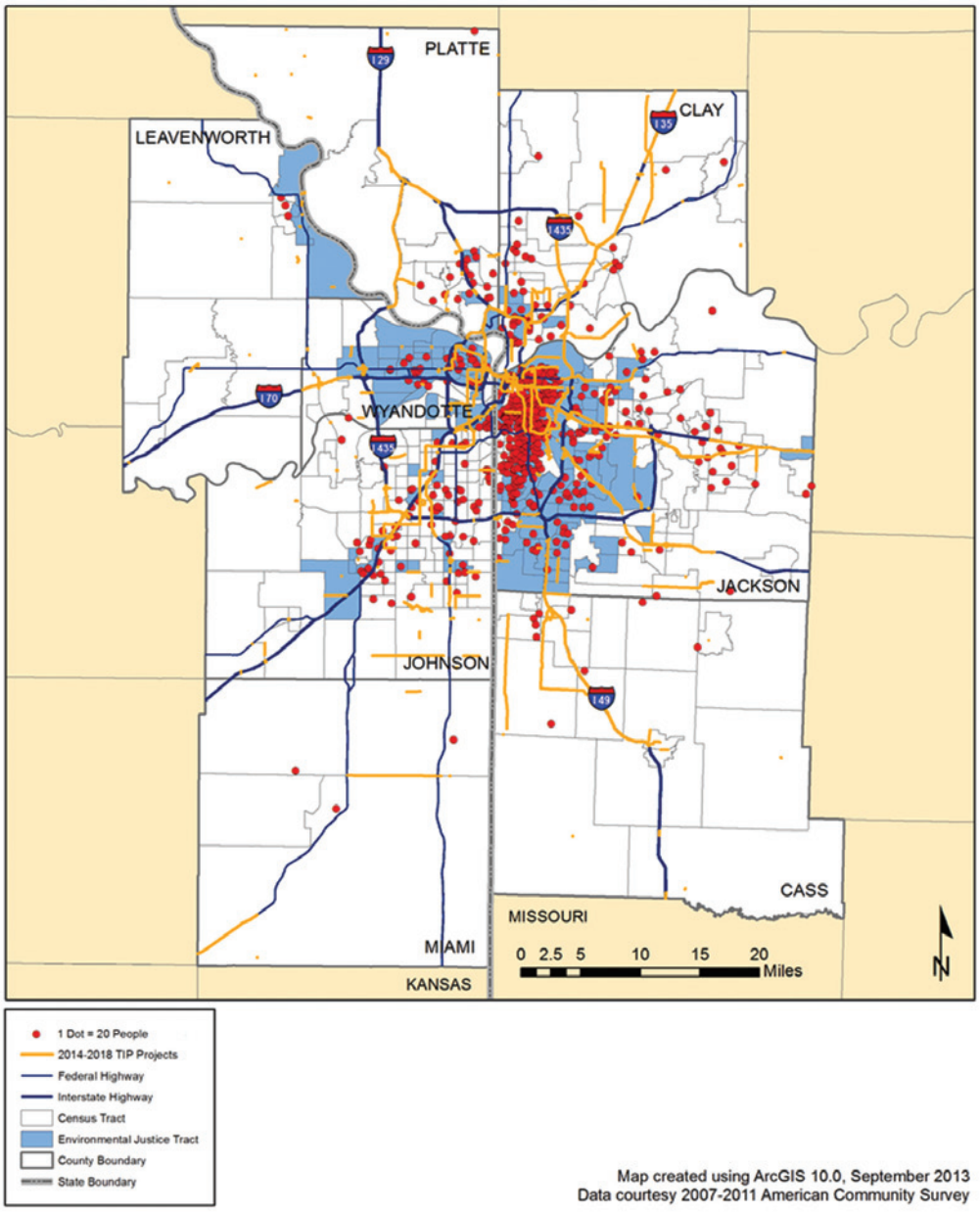


People who take Public Transportation to Work

According to 2007-2011 ACS Five-Year Estimates, around 12,319 people use public transportation as their primary mode of transportation to work in the eight-county MARC MPO region; this comprises just 0.7 percent of the total population. Spatial analysis reveals that many people who take public transportation to work reside in locations where minority and low-income populations exist; however, large populations are also heavily clustered in Kansas City, Mo., in eastern Jackson County, Mo., Coincidentally, these areas are where the majority of regional transit service exists. People who take public transportation to work are also dispersed throughout the rest of Jackson County, Mo.; Wyandotte County, Kan.; and Johnson County, Kan.

Approximately 52.3 percent of mapped 2014–2018 TIP projects fall within or intersect environmental justice tracts that were identified as having large numbers of people taking public transportation to work. This amounts to $174,278,144 in federal funds, or 69.0 percent of the total federal funds in the TIP.

Figure 8: People Who Take Public Transportation to Work Map



Transit Service

An examination of fixed-route transit service compared to environmental justice areas provides another context for assessing regional equity — particularly whether minority and low-income populations equitably benefit from the geographic distribution of available transit service. Figure 8 provides a spatial summary of fixed-route daily transit service in MARC's MPO region in relation to EJ areas.

Figure 9 reveals that EJ areas benefit from more daily hours of transit service than non-EJ areas. When looking at average headways (time between buses) for peak hours of the day (7–9:00 a.m. and 4–6 p.m.), Figure 10 shows that EJ areas have shorter headways than non-EJ areas.

Figure 9: Hours of Daily Transit Services Map

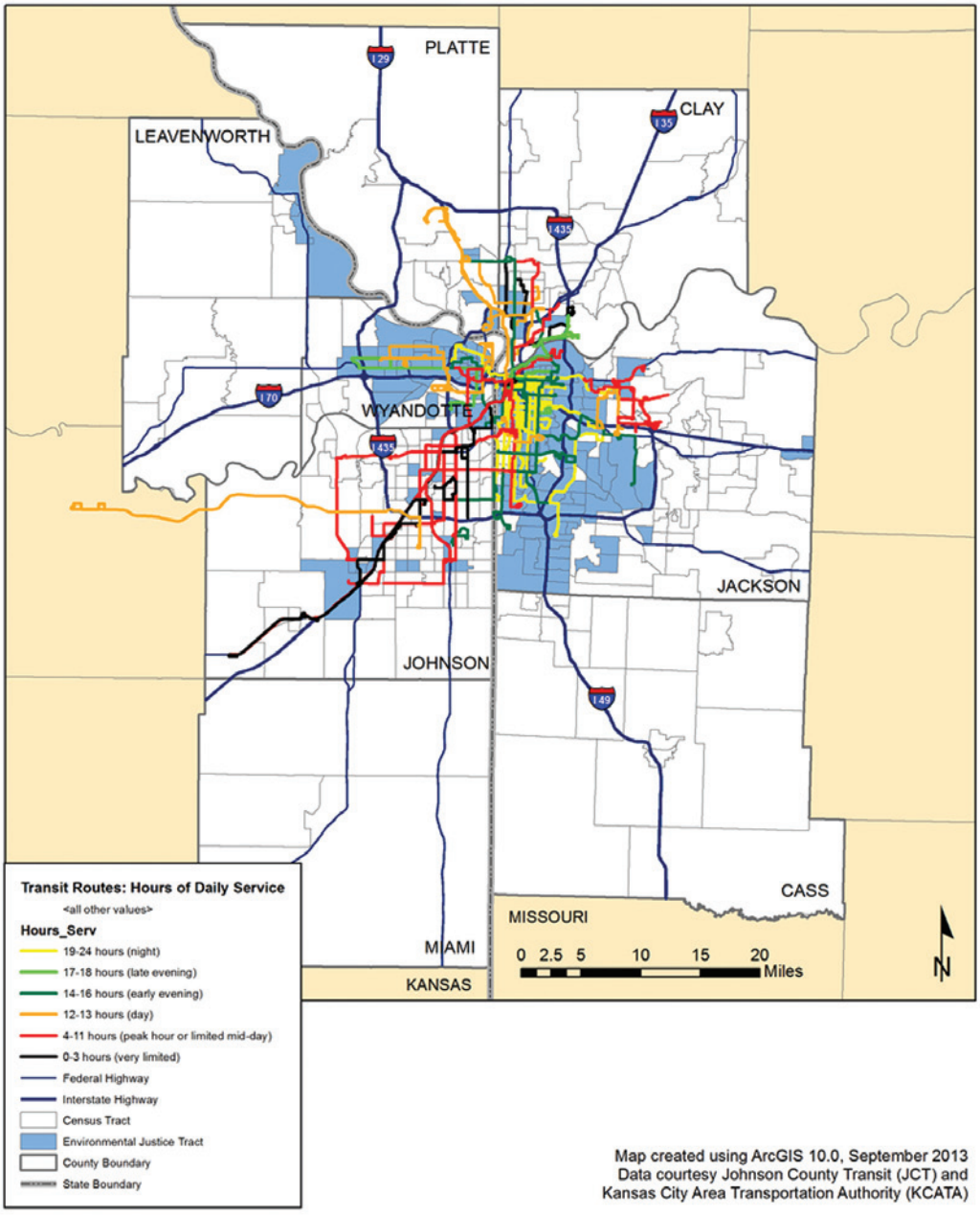
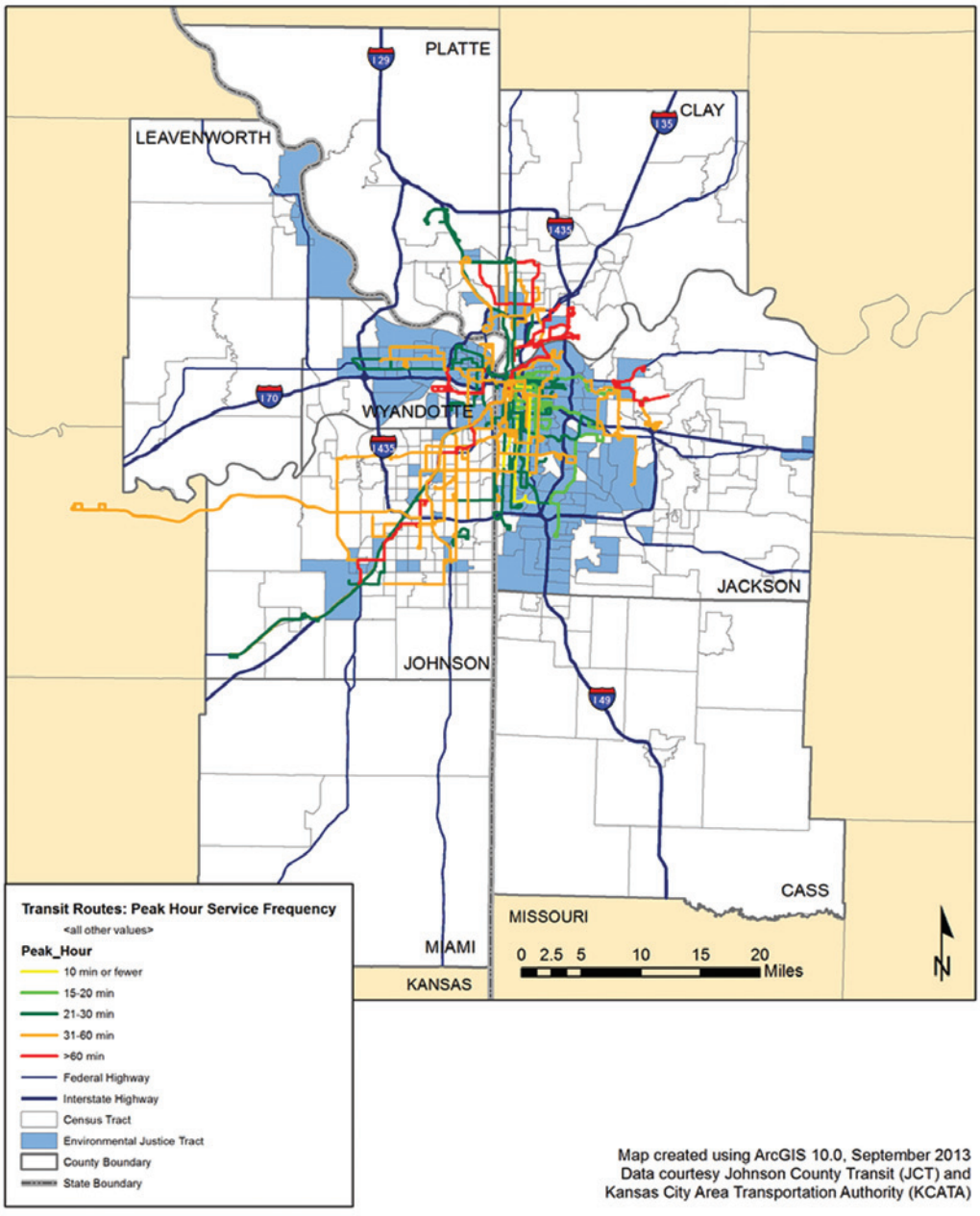


Figure 10: Peak Hours of Transit Service Frequency Map



Transportation Safety

Progress toward improving the safety and well-being of the traveling public is impacted by transportation investments, including projects listed in the 2014–2018 TIP. For example, projects that maintain and modernize existing roadways, affect congestion levels, accommodate and promote non-motorized travel modes, enforce traffic laws, invest in public transit, and educate roadway users about responsible driving behaviors all can affect transportation safety. MARC's 2014–2018 TIP includes projects and programs that incorporate safety strategies of the four E's of transportation safety — education, engineering, enforcement and emergency response — as a way to improve regional safety and public health.

The four Es of Transportation Safety:

- ***Education.***
- ***Engineering.***
- ***Enforcement.***
- ***Emergency reponse.***

Due to the importance of safety to the region's transportation users, another component of the spatial analysis is an examination of crash data in relation to identified EJ areas. This analysis helps determine whether or not a disproportionately high numbers of crashes occur in areas with traditionally underserved populations, and if so, how to address these negative impacts.

Methodology

MARC maintains a traffic crash geodatabase that contains traffic crash records obtained from the Missouri Department of Transportation (MoDOT) and Kansas Department of Transportation (KDOT). These records are spatially located along street centerlines in the region and can be examined by a variety of characteristics and contributing factors. MARC selected crash data from the geodatabase over the most recent four-year period of time available (2009–2012) and assigned those crash records to specific geographic point locations using ArcMap 10.0 software.

This portion of the Environmental Justice Analysis looks a high-severity crashes (i.e., crashes where vehicle occupants were fatally injured or suffered disabling injuries). High-severity crashes result in tremendous fiscal, emotional and societal damage and typically have the largest impacts on the transportation system and society. See Figure 11 for a spatial summary of high-severity crash locations recorded over the four-year period.

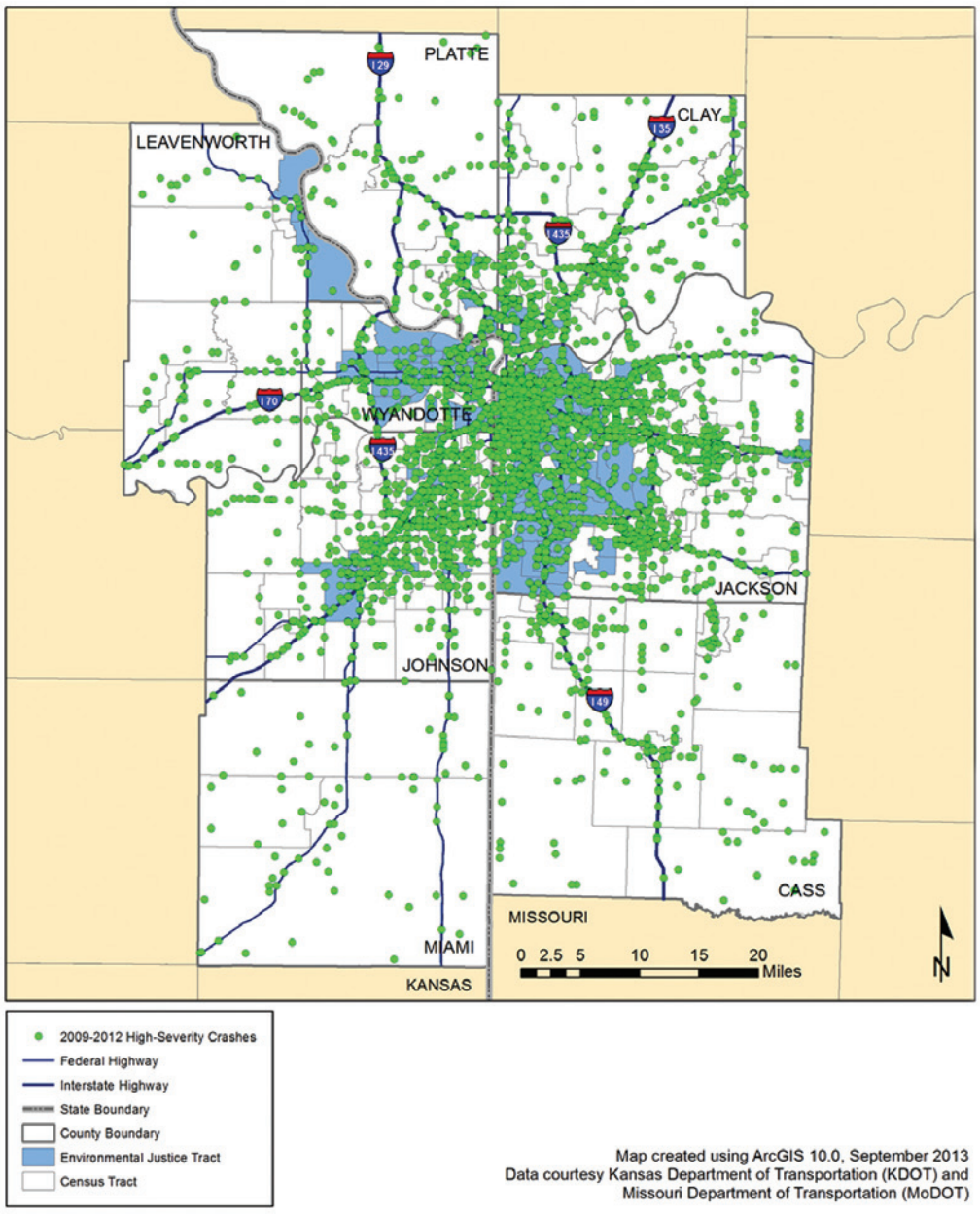
Note: The spatial analysis of crash data examines traffic crashes in relation to geographic areas, not the makeup of the individuals(s) involved in the crash. When traffic crashes occur within an EJ area, it does not necessarily mean the individual(s) involved in the crash incident belong to a minority or low-income population or reside within an EJ area.

Table 4: High-severity crashes, 2009–2012

	EJ Areas	Non-EJ Areas	Total
Total number of high-severity crashes	1,630	3,294	4,924
Total percentage	33.1%	66.9%	100.0%
Total Population	620,937	1,347,932	1,968,869
Population Percentage	31.5%	68.5%	100.0%

Table 11 compares high-severity crashes in EJ areas vs. non-EJ areas. Slightly more than one-third of high-severity crashes occurred in EJ tracts — slightly higher than the proportion of population residing in those tracts.

Figure 20: High-severity Crash Locations



Almost every trip taken requires some form of pedestrian travel. Walking is both a healthy and economical form of transportation; however, if pedestrians are involved in a crash, they are more likely to sustain injuries compared to other roadway users.

Pedestrian safety was identified as a "high priority" emphasis area in the Kansas City Regional Transportation Safety Blueprint, a document modeled after the Strategic Highway Safety Plans of both Kansas and Missouri. Additionally, MARC's 2012 Annual Safety Report — a document that supplements the blueprint with an annual update of crash trends for high priority areas — found that pedestrian travel was the only high-priority area with an increase in fatalities and disabling injuries in the region in 2011 compared to the previous five-year average. As a result, MARC included an examination of pedestrian-related crashes with motorized vehicles in this Environmental Justice Analysis. See Figure 21 for a spatial summary of pedestrian-related crash locations — recorded over the five-year period from 2008–2012 — in relation to environmental justice areas.

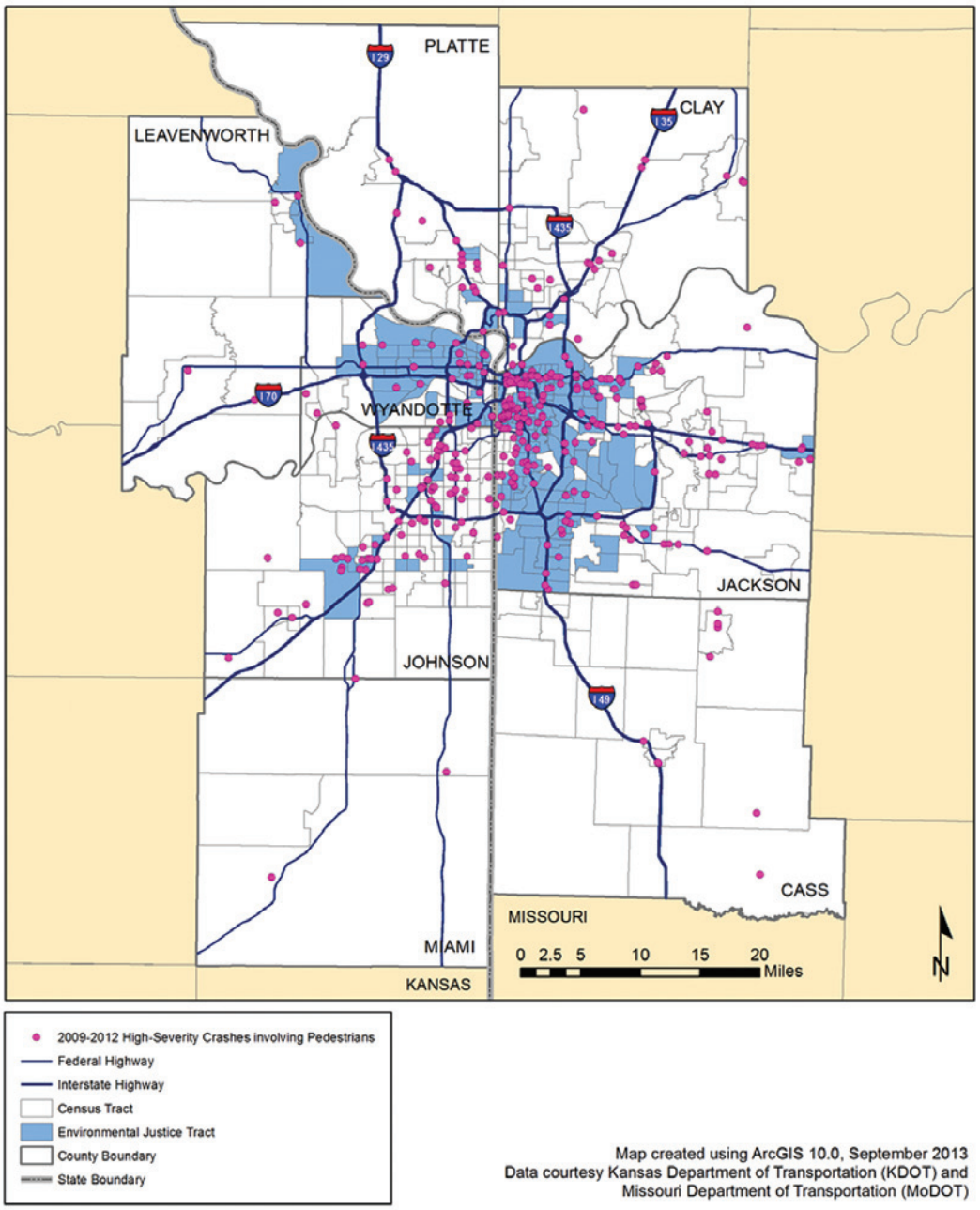
Figure 12 reveals high-severity crashes involving pedestrians are dispersed throughout the region, with a majority of locations around Kansas City's first-ring suburbs within the I-435 loop. Many crashes occurred along highways. The greatest grouping of high-severity crashes involving pedestrians exists in northeast Jackson County, Mo., around the downtown's central business district that have high pedestrian traffic; these areas tend to be home to large minority and low-income populations.

Table 5: High-severity crashes involving pedestrians, 2008-2012

	EJ Areas	Non-EJ Areas	Total
Total Number of High-Severity Crashes involving Pedestrians	183	209	392
Total Percentage	46.7%	53.3%	100.0%
Total Population	620,937	1,347,932	1,968,869
Population Percentage	31.5%	68.5%	100.0%

Table 19 indicates a disproportionate share of crashes involving pedestrians in EJ areas compared to non-EJ areas. More than half of all crashes involving pedestrians were reported in identified EJ areas. In late 2013, MARC will release a Pedestrian Crash Analysis report that will spatially and numerically examine the data at a deeper level. The report will also identify trends and patterns, and provide strategies to combat pedestrian-related crashes from occurring.

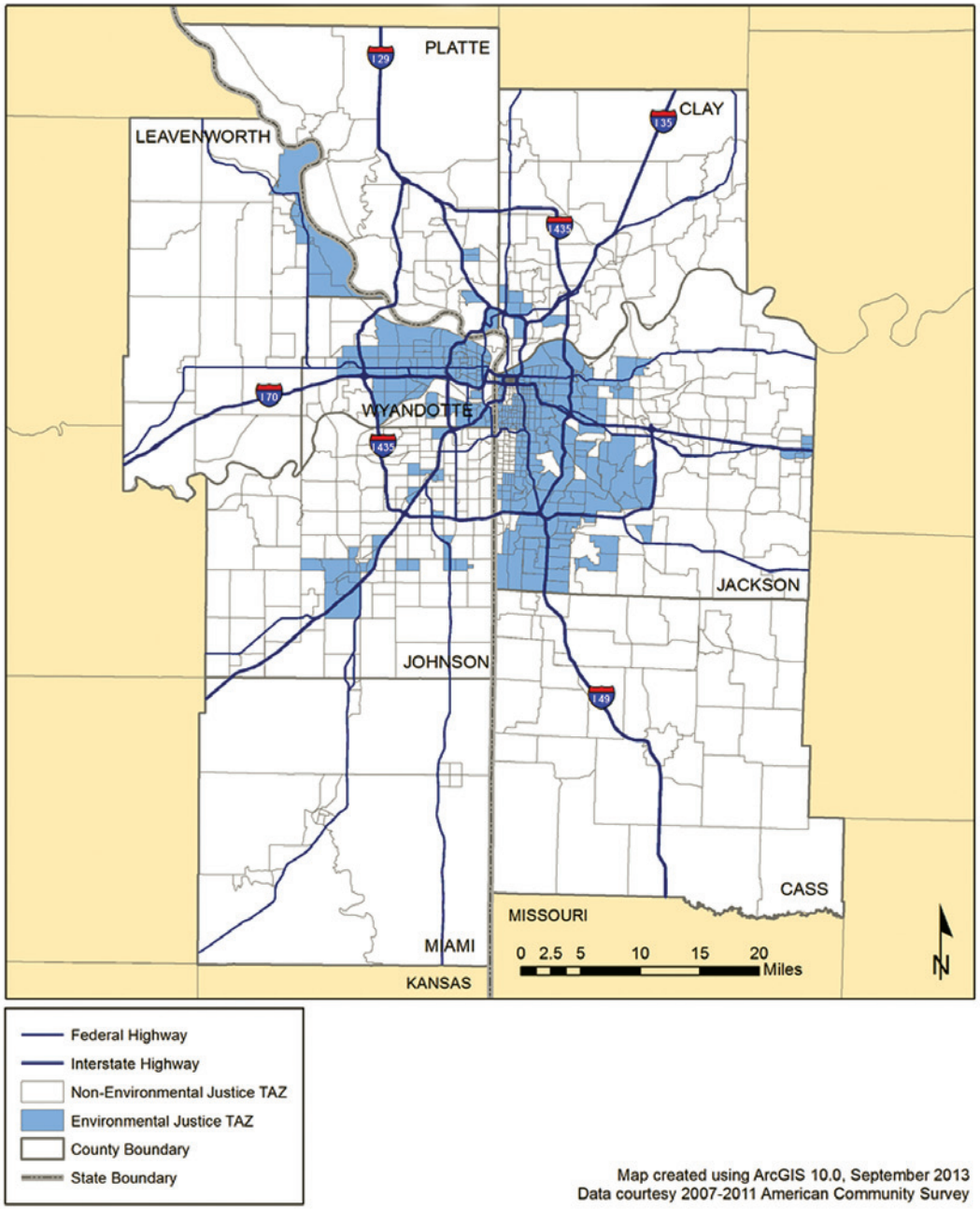
Figure 12: High-severity Crash Locations involving Pedestrians



Travel Model Analysis

MARC analyzes the effects of TIP projects on the region's transportation system through its travel-demand model. The travel-demand model is mathematical — taking into account traffic volumes, land use, roadway type, and population — to predicts travel patterns and trip-generation statistics for particular geographic areas in the region, Traffic Analysis Zones (TAZs). TAZs are similar land-use and activity areas that serve as the primary analytical unit in travel demand forecasting, containing socioeconomic data related to land use and representing where trips begin and end. In terms of size, TAZs are similar to the sizes of census tracts. The MARC MPO region contains 951 TAZs. See Figure 13 for a spatial summary of EJ TAZs and non-EJ TAZs in the MARC MPO region.

Figure 13: Traffic Analysis Zones



MARC maintains a travel-demand model network for each decade listed in the region's Metropolitan Transportation Plan, *Transportation Outlook 2040*, as well as for each TIP update. This analysis uses land-use and demographics adopted by the MARC Board, and integrates projects contained in the 2014–2018 TIP into the region's current transportation system. The results of the model's analysis are displayed in Table 21.

Note: Trips originating from an EJ TAZ may not necessarily end in that same TAZ. Trips can have destinations reside in another TAZ, which may be an EJ TAZ or not. Household vehicles include cars, vans, and pickup or panel trucks of one-ton capacity or less.

Categories in Table 21 are defined as:

- Single-occupant vehicle: a privately operated motorized vehicle whose only occupant is the driver.
- High-occupancy vehicle: a motorized vehicle that includes a driver and at least one or more passengers.
- Home-based work trip: a trip originating from the home for work-related purpose; destinations typically end in employment centers.
- Home-based other: a trip originating from home with its purpose being non-work-related.
- Non home-based trip: a trip originating at a location other than the home.
- Peak hour trip: a trip originating between 7–9 a.m. or 4–6 p.m.
- Non-peak hour trip: trip originating a times other than 7–9 a.m. or 4–6 p.m.
- Park-and-ride to transit – Traveling facility that allows commuters to park and leave vehicles, then transfer to a transit mode.
- Kiss-and-ride to transit: carpooling and being dropped off by another driver, then transfer to a transit mode.

Table 6: Travel-demand Model Results

Demographics	EJ TAZs	Non-EJ TAZs
Population	494,601	1,368,164
Households	197,109	535,881
Area (square miles)	265	2,996
Employment	322,762	599,442
Vehicles Available	**EJ TAZs**	**Non-EJ TAZs**
Households with zero vehicles	25,919	35,833
Households with one vehicle	69,989	172,087
Households with two wehicles	75,027	230,079
Households with three or more vehicles	26,175	97,883
Percentage of vehicles available	**EJ TAZs**	**Non-EJ TAZs**
Percentage of households with zero vehicles	13.1%	6.7%
Percentage of Households with one vehicle	35.5%	32.1%
Percentage of Households with two vehicles	38.1%	42.9%
Percentage of Households with three or more vehicles	13.3%	18.3%
Trips generated (by mode)	**EJ TAZs**	**Non-EJ TAZs**
Single-occupant vehicle trips (originating from)	1,079,021	2,979,640
High-occupancy vehicle trips (originating from)	378,544	1,085,480
Transit trips (originating from)	28,120	14,326
Trips generated (by purpose)	**EJ TAZs**	**Non-EJ TAZs**
Home-based work trips	301,269	853,761
Home-based other trips	764,183	2,063,751
Non home-based trips	392,113	1,147,608
Travel times (Average time in min.)	**EJ TAZs**	**Non-EJ TAZs**
Peak hour trips	23.7	34.4
Off-peak hour trips	23.2	33.7
Transit travel times (avg. Time in min.)	**EJ TAZs**	**Non-EJ TAZs**
Peak walk to transit	107.7	142.9
Off-peak walk to transit	133.5	192.7
Peak park-and-ride to transit	120.7	133.0
Off-peak park-and-ride to transit	156.9	183.5
Peak kiss-and-ride to transit	106.8	134.1
Off-peak kiss-and-ride to transit	134.7	187.4

Table 21 indicates that while EJ TAZs contain less than half the population and households as non-EJ TAZs, but EJ TAZs will generate more transit trips. Looking at the percentage of households, there's a greater proportion of households in EJ TAZs with 0 vehicles and 1 vehicle available than non-EJ TAZs; whereas Non-EJ TAZs have a greater proportion of households with two or more vehicles available. This tells us that populations residing in EJ TAZs have less access to vehicles than non-EJ TAZs; programming TIP projects that reduce transportation system users' dependence on the automobile is important. EJ TAZs benefit from shorter trip travel times (an average of 23.7 minutes) than non-EJ TAZs (an average of 34.4 minutes). Looking closer at travel times associated with transit trips, EJ TAZs have shorter average (peak and off-peak) walking, park-and-ride, and kiss-and-ride trips to transit.

MARC Programming

MARC incorporates environmental justice into its planning and programming processes. In 2012, MARC's Missouri and Kansas Surface Transportation Program (STP) committees, and Missouri Transportation Enhancements (TE) Committee programmed funds using environmental justice as an element in their project evaluation criteria. In 2013, MARC's Kansas TE Committee also programmed funds using environmental justice as an element in its project evaluation criteria.

Individuals submitting project applications through MARC's programming processes must provide project location(s). MARC staff maps the project locations as a layer in ArcMap 10.0; these project locations are then compared to identified EJ areas. If a portion of any project intersects with a census tract defined as an EJ area, that project is noted. In all of MARC's programming scoring criteria, a project that touches or resides within an EJ area receives more points than a project that doesn't. Additionally, projects can receive more points if individuals clearly explain in the application how the project will improve access for or positively impact an EJ area and its populations. Table 22 compares total applications submitted and funded in MARC's most recent programming rounds to those that received points for improving access for or positively impacting EJ areas.

Table 7: Comparison of Total Applications and Funded Projects

MO-STP (FFY 2015-2016)	Projects Receiving EJ Points	All Projects	% EJ
Applications	21	44	47.7%
Total federal funds requested	$45,793,000	$113,274,000	40.4%
Funded Projects	8	14	57.1%
Total federal funds programmed	$25,808,350	$44,642,450	57.8%
KS-STP (FFY 2015-2016)	**Projects Receiving EJ Points**	**All Projects**	**% EJ**
Applications	6	25	24.0%
Total federal funds requested	$13,752,000	$58,296,000	23.6%
Funded Projects	4	16	25.0%
Total federal funds programmed	$6,466,000	$26,599,600	24.3%
MO-TE (FFY 2012-2013)	**Projects Receiving EJ Points**	**All Projects**	**% EJ**
Applications	13	42	40.0%
Total federal funds requested	$5,049,212	$16,336,806	30.9%
Funded Projects	5	15	33.3%
Total federal funds programmed	$1,443,320	$5,376,926	26.8%

Table 7: Comparison of Total Applications and Funded Projects			
KS-TE (FFY 2012-2013)	Projects Receiving EJ Points	All Projects	% EJ
Applications	5	12	41.7%
Total federal funds requested	$5,379,601	$8,974,164	59.9%
Funded Projects	1	4	25.0%
Total federal funds programmed	$880,000	$2,097,492	42.0%

The Missouri STP Committee and Kansas STP committees programmed a greater proportion of federal funds for projects touching or residing within EJ areas than was originally requested. Although the Missouri TE Committee and Kansas TE Committee programmed smaller proportions of federal funds for these types of projects, keep in mind that EJ areas only make up 8.7 percent of MARC's MPO region. Additionally, the Kansas Department of Transportation (KDOT) awarded statewide transportation enhancement funds in June 2013 to two of the five EJ projects whose applications were also submitted through MARC's TE programming process; thus three of the five original EJ project applications requesting federal funds through the Kansas TE Committee were programmed.

Additional Analysis

Analysis of transportation investments and their impact on environmental justice was performed by MARC in 2010 as part of the update to the region's metropolitan transportation plan, *Transportation Outlook 2040*. The analysis examines percentages of operations and maintenance, travel times by mode, and the congestion management network performance as a percentage of posted speed. The results of the analysis are available at: http://www.marc.org/2040/assets/plan/AppendixF_EnvironmentalJusticeAnalysis.pdf.

MARC will conduct an additional assessment of transportation investments and their impact on environmental justice in 2014 as part of the update to *Transportation Outlook 2040*.

Conclusion

MARC's Environmental Justice Analysis for the 2014–2018 TIP assesses the impacts of all major surface transportation projects planned to receive federal, state and local funding in the Kansas City region in the next five years. The analysis looks at the distribution of federal transportation investments throughout the region and how target populations — particularly minority and low-income populations — will be affected. The Environmental Justice Analysis numerically, geographically, and visually assesses whether or not protected populations, required by Executive Order 12898, and other selected target populations are equitably benefiting from the 2014–2018 TIP.

Numeric Conclusions

Numeric analysis reveals that 52 percent of mapped 2014–2018 TIP projects fall within identified EJ areas; this comprises $174,335,744 of federal funding, or64.8 percent of total federal funding. EJ areas make up only 8.7 percent of the region's geographic area and 31.5 percent of its population, yet these areas benefit from almost two-thirds of the investments associated with the 2014–2018 TIP.

Minority and low-income populations also receive four times more benefits from federal transportation investment funds per capita than non-minority and non-low-income populations. There do not appear to be any disproportionately high or adverse impacts (human or environmental) to these protected populations when examining the breakdown of federal transportation investments.

Spatial Conclusions

Spatial analysis shows large proportions of mapped 2014–2018 TIP projects within or intersecting census tracts containing selected target populations; 66.5 percent of total federal funding is allocated in census tracts with high minority populations, and 66.8 percent of funding is allocated in EJ tracts that contain large numbers of Hispanic populations and people who take public transportation to work. Nearly all funding serves areas that contain large numbers of elderly populations. Census tracts with high minority populations account for only 8.0 percent of the region's square mileage and EJ tracts account for only 8.7 percent.

Areas containing large numbers of low-income households, on the other hand, displayed different results. Only 11.2 percent of total federal funding is allocated in census tracts that contain large numbers of low-income households, but these tracts account for an even smaller portion — 3.6 percent — of the region's square mileage. It's also important to keep in mind that transportation investments outside of these identified census tracts will serve low-income households as well.

Additional Population Spatial Conclusions

Spatial analysis of additional populations shows environmental justice Census tracts containing large numbers of persons taking public transportation to work. 69.0 percent of total federal funding is allocated in environmental justice Census tracts. Nearly all funding contained in the TIP serves areas containing large numbers of elderly populations. It's estimated that over 200,000 individuals ages 65 and over reside within MARC's region, and that population is expected to double over the next 20 years. Additionally, the elderly face a number of physical and geographic mobility challenges in reaching employment, retail, and social service destinations around the Kansas City region.

An additional population to consider exploring in the future is Hispanics (i.e., individuals of Hispanic, Latino, or Spanish origin. This includes the heritage, nationality group, lineage, or country of birth of the person or the person's parents or ancestor before their arrival in the United States). Though they only comprise 7.7% of MARC's MPO region population, Hispanics are the second-largest minority group in the region and grew 77.8 percent between 2000 and 2010, well above the region's total population rate of 11.5 percent. Moreover, Spanish is the most prevalent language spoken by Limited English Proficiency (LEP) individuals in the MARC MPO region.

Travel Model Conclusions

MARC's travel-demand model shows that — with the implementation of projects contained the 2014–2018 TIP — EJ TAZs will benefit from shorter-trip travel times than non-EJ TAZs, and EJ TAZs will have shorter average walking, park-and-ride and kiss-and-ride trips to transit than non-EJ TAZs. Looking at the number of vehicles available per household, EJ TAZs have a greater proportion of zero vehicles and one vehicle available than non-EJ TAZs; non-EJ TAZs have a greater proportion of households with two or more vehicles available. It's important to continue programming TIP projects that reduce transportation system users' dependence on the automobile.

Programming Conclusions

Comparison of project applications and funding results from MARC's programming committees indicates that MARC's STP/BR Committees programmed a greater proportion of federal funds towards projects within or intersection EJ areas than was originally requested. For the Missouri STP/BR Committee, eight projects affecting EJ areas (out of 44 applications) received 57.8 percent of total federal funding. For the Kansas STP/BR Committee, four projects affecting EJ areas (out of 25 applications) received 24.3 percent of total federal funding. The Missouri TE Committee had five projects affecting EJ areas (out of 42 applications) receive 26.8 percent of total federal funding. The Kansas TE Committee had one project (out of 12 applications) receive 42.0 percent of total federal funding.

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