



MTP 3.1

Roadways & Bridges

Roadway Issues & Opportunities

Roadway issues and opportunities play a pivotal role in shaping the infrastructure and connectivity of the WAMPO region. One of the primary challenges facing the area is the safety of existing road networks to accommodate the growing population and economic activities. Poor road conditions, inadequate signage, and limited access to transportation hubs hinder not only daily commuting but also the movement of goods and services, impacting local businesses and industries.

- **Safety:** Increases in the incidence of fatalities on regional highways and roads are a critical area of concern for future transportation planning and investment.
- **Deferred Maintenance:** The costs of deferred maintenance on a regional scale are unknown. Understanding the full costs of deferred maintenance is key to building future spending practices and policies.
- **Roadway Upgrading:** Investment in the local street system is needed across the region to enhance safety and bring the roadway system up to current standards.
- **Technology:** Exploration and investment in technological updates to the regional transportation system can be transformative to the future of transportation.

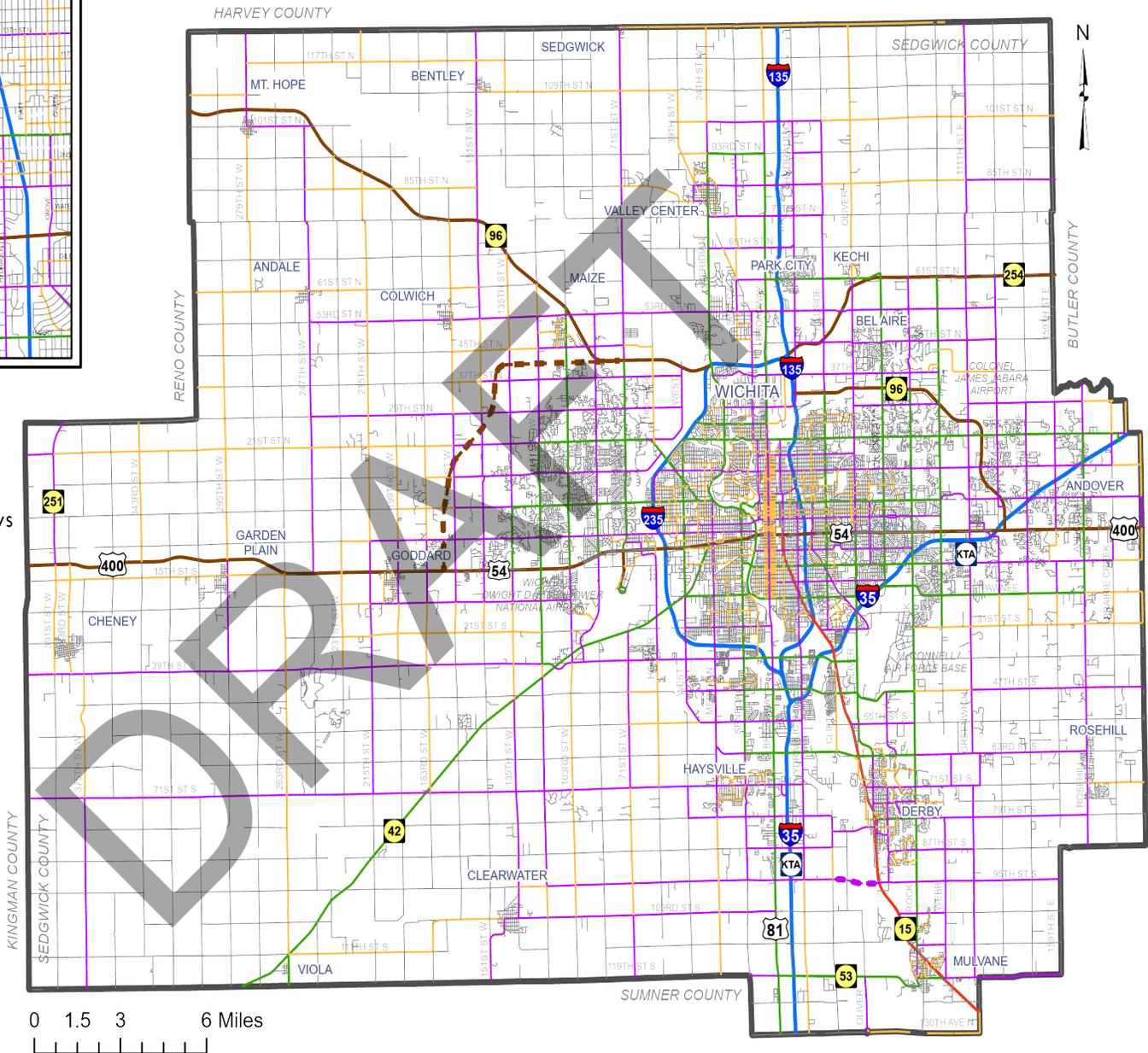
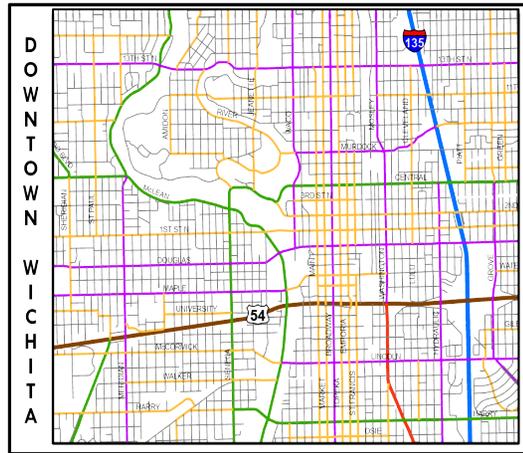


Current Roadway System

ROAD NETWORK & FUNCTIONAL CLASSIFICATION

The 2023 Federal Highway Administration (FHWA) [guidance](#) defines roadway classifications and establishes procedures to update these systems at the local and state levels. Roadways are generally grouped into the following categories: Interstate, Arterial, Collector, or Local. Subcategories such as Principal, Major, and Minor may be applied to better define the roadway and reflect road usage. Roadways that are functionally classified as Interstate, Arterial, or Collector are eligible to receive federal transportation funds. Map 3.1.1 shows the functional classifications of roadways within the WAMPO region that are classified as minor collectors or higher.

Map 3.1.1: Federal Roadway Functional Classification



Functional Classification

- Interstates
- Other Urban Freeways/Expressways
- Other Principal Arterials
- Minor Arterials
- Major Collectors
- Minor Collectors
- - - Future roads (example)

Plan Boundaries

- WAMPO Planning Area
- County Boundaries
- Cities Boundaries

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The majority of roadways within the WAMPO region are classified as local roads, just under 3,100 miles.

Centerline Miles by Functional Classification

Functional Classification	Miles
Interstate	69
Urban Freeway/Expressway	117
Principal Arterial	29
Minor Arterial	257
Major Collector	618
Minor Collector	445
Local	3092

Centerline Miles by Jurisdiction

Jurisdiction	Interstate	Urban Freeways	Principal Arterial	Minor Arterial	Major Collector	Minor Collector	Local	Total
Wichita	38	28	4	148	187	137	1497	2038
Derby	-	-	6	8	14	15	82	124
Andover	2	3	-	6	10	4	59	83
Park City	7	-	-	6	12	0	42	67
Haysville	-	-	-	2	8	5	37	53
Bel Aire	-	-	-	3	9	-	33	46
Valley Center	-	-	-	4	8	6	33	51
Maize	-	-	-	2	9	5	23	39
Goddard	-	3	-	-	5	2	18	29
Mulvane	1	0	3	4	2	5	27	42
Rose Hill	-	-	-	-	3	1	18	22
Kechi	-	4	-	2	6	2	12	26
Clearwater	-	-	-	-	2	0	15	17
Cheney	-	-	-	-	0	4	15	19
Colwich	-	-	-	-	1	2	9	12
Sedgwick	-	-	-	-	0	1	1	2
Andale	-	-	-	-	0	1	5	6
Garden Plain	-	0	-	-	1	1	7	10
Mount Hope	-	2	-	-	2	0	7	10
Eastborough	-	-	-	1	1	0	6	8
Bentley	-	-	-	-	0	1	3	4
Viola	-	-	-	1	-	-	2	2
Unincorporated	21	79	16	70	338	255	1141	1919
Total	69	117	29	257	619	447	3093	4631



Credit: Google Earth - Wichita

Vehicle Miles Traveled (VMT)

Vehicle Miles Traveled (VMT) is a measure used to quantify the total distance traveled by vehicles within a specified period, often over a day or year. VMT is crucial for understanding the cumulative impact of transportation activities on infrastructure wear, fuel consumption, emissions, and overall road usage patterns.

Annual Average Daily Traffic (AADT)

Annual Average Daily Traffic (AADT) is a useful and basic measurement that indicates how busy a point on a road segment is. AADT estimates the total volume of vehicle traffic, in both directions, for a given location along a roadway on an average day during a given year. AADT is one of the most widely used data elements in transportation planning and traffic engineering. There are many uses for AADT in supporting various agency functions related to planning, design, operations, safety, and maintenance.

Daily VMT and AADT on Major WAMPO State Corridors

In 2024, WAMPO developed a daily VMT and AADT report, with data from 2023, to inform and illustrate to the public and stakeholders traffic volumes on seven (7) of WAMPO's major state corridors. These corridors include:

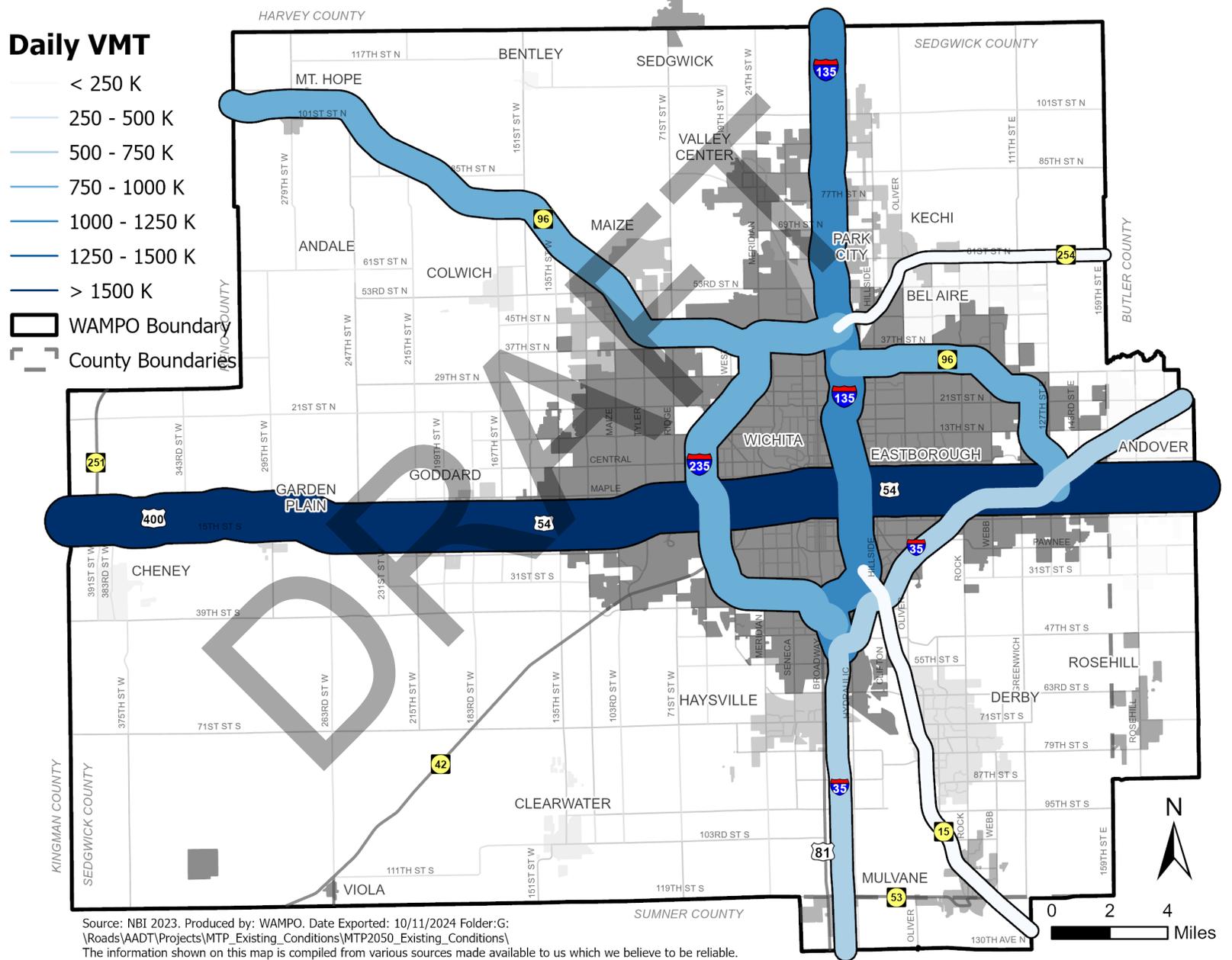
- > I-35
- > I-135
- > I-235
- > US-54/Kellogg
- > K-15
- > K-96
- > K-254

Map 3.1.2 compares which major corridors are most heavily traveled relative to one another by daily VMT. Figure 3.1.1 lists specific Daily VMT numbers for each corridor. When comparing all seven (7) corridors, US-54 is the most traveled corridor in the WAMPO region. US-54 provides a continuous east-west connection for drivers whether traveling out of and/or into Wichita and through Wichita.

Map 3.1.3 compares the relative AADT volumes of each corridor by road segment. Figure 3.1.2 identifies the busiest road segment by peak AADT along each of those seven (7) corridors. Several segments with the highest traffic volumes are near or at junctions, specifically those with I-135.

To learn more about AADT, daily VMT, and data collection, please view the [2024 Daily Vehicle Miles Traveled \(VMT\) and Annual Average Daily Traffic \(AADT\) Report](#).

Map 3.1.2: Daily VMT



Map 3.1.3: Annual Average Daily Traffic

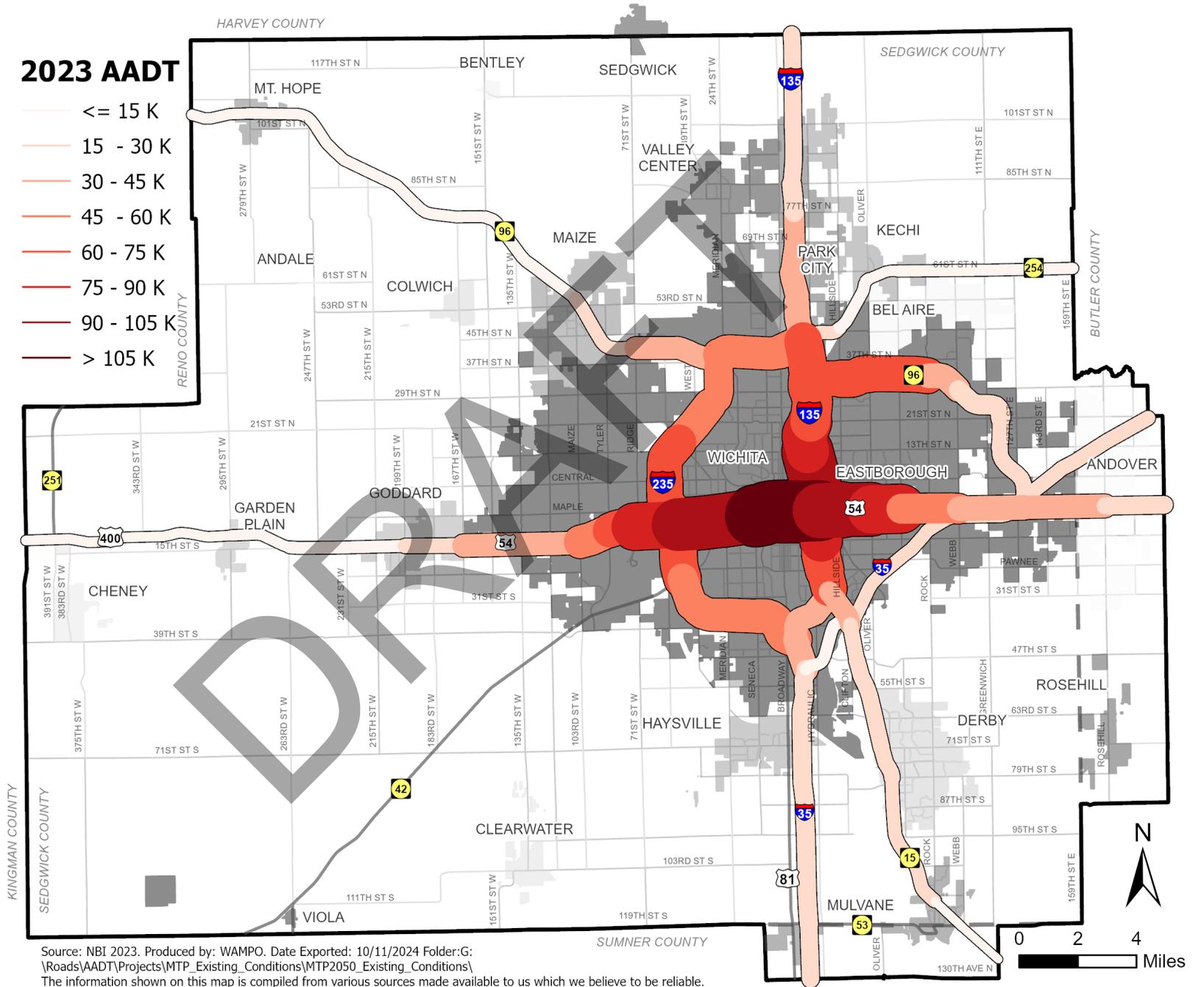


Figure 3.1.1: Daily Vehicles Miles Traveled by Corridor

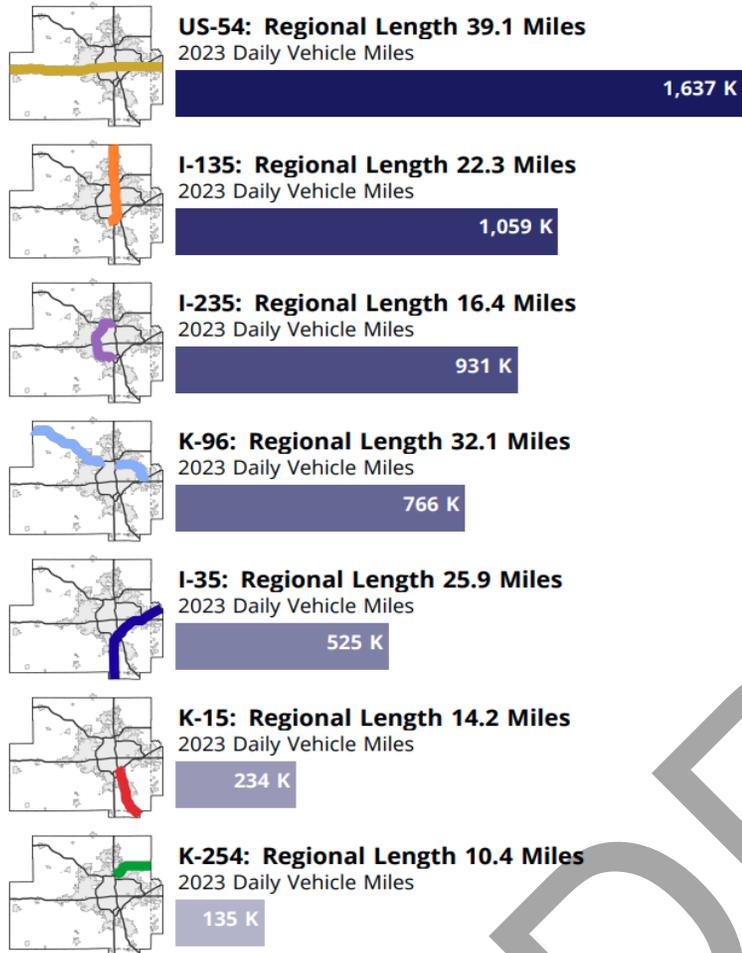
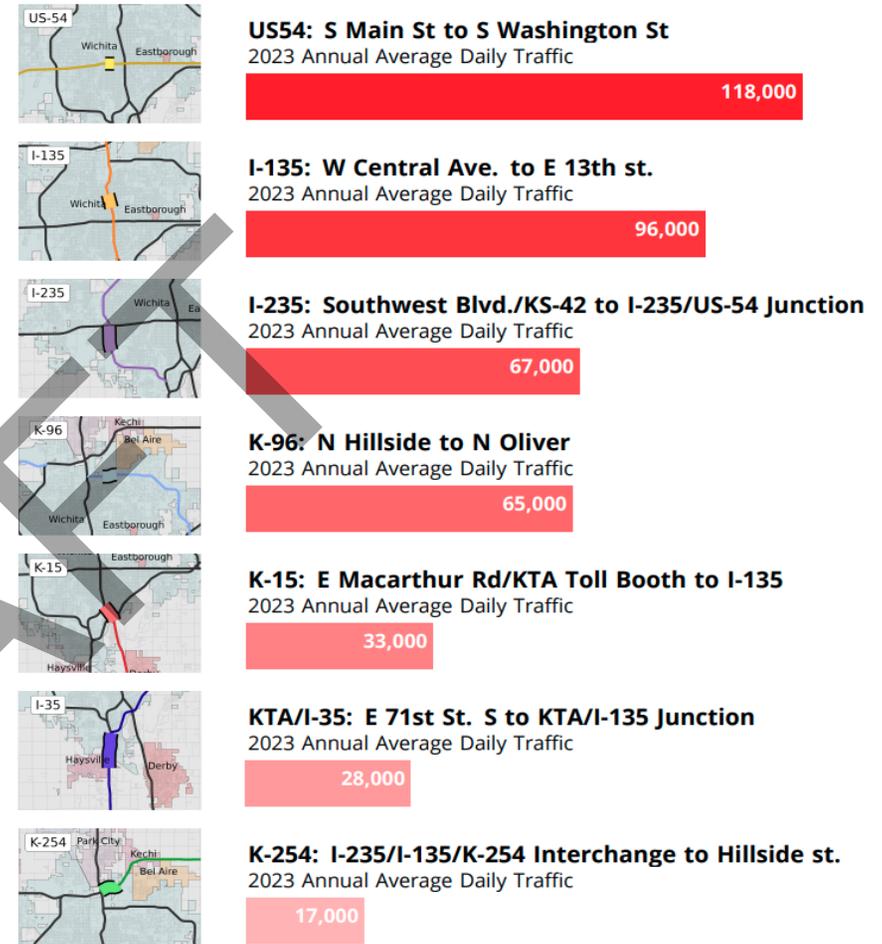


Figure 3.1.2: Peak AADT Road Segments by Corridor



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Bridges

Bridges and other structures are key components of the roadway network that provide transportation connectivity to safely cross features such as waterways, railways, roadways, and other obstacles. The Federal Highway Administration manages and defines bridge sufficiency ratings using the National Bridge Inspection Standards (NBIS). NBIS are the standards established for the safety inspections of highway bridges on public roads throughout the United States. Periodic and thorough inspections of bridges are necessary to maintain safe bridge operation and prevent structural and functional failures.

Within the WAMPO region, there are more than 1,400 bridges on federal, state, and local roads.

Table 3.1.1 illustrates the number of bridge structures by jurisdiction owner. Slightly over two-thirds (62%) of bridges in WAMPO are maintained by Sedgwick County. The second-highest maintainer of bridges (29%) in WAMPO is the City of Wichita.

Table 3.1.1: Bridge Structures Maintained by Local Governments

Owner/Maintainer	# of Structures
City of Andover	16
City of Bel Aire	4
Butler County	18
City of Derby	12
City of Maize	4
City of Park City	7
Sedgwick County	595
Sumner County	10
City of Valley Center	14
City of Wichita	282
Grand Total	962

Table 3.1.2: Bridge Structures Maintained by Non-Local Authorities

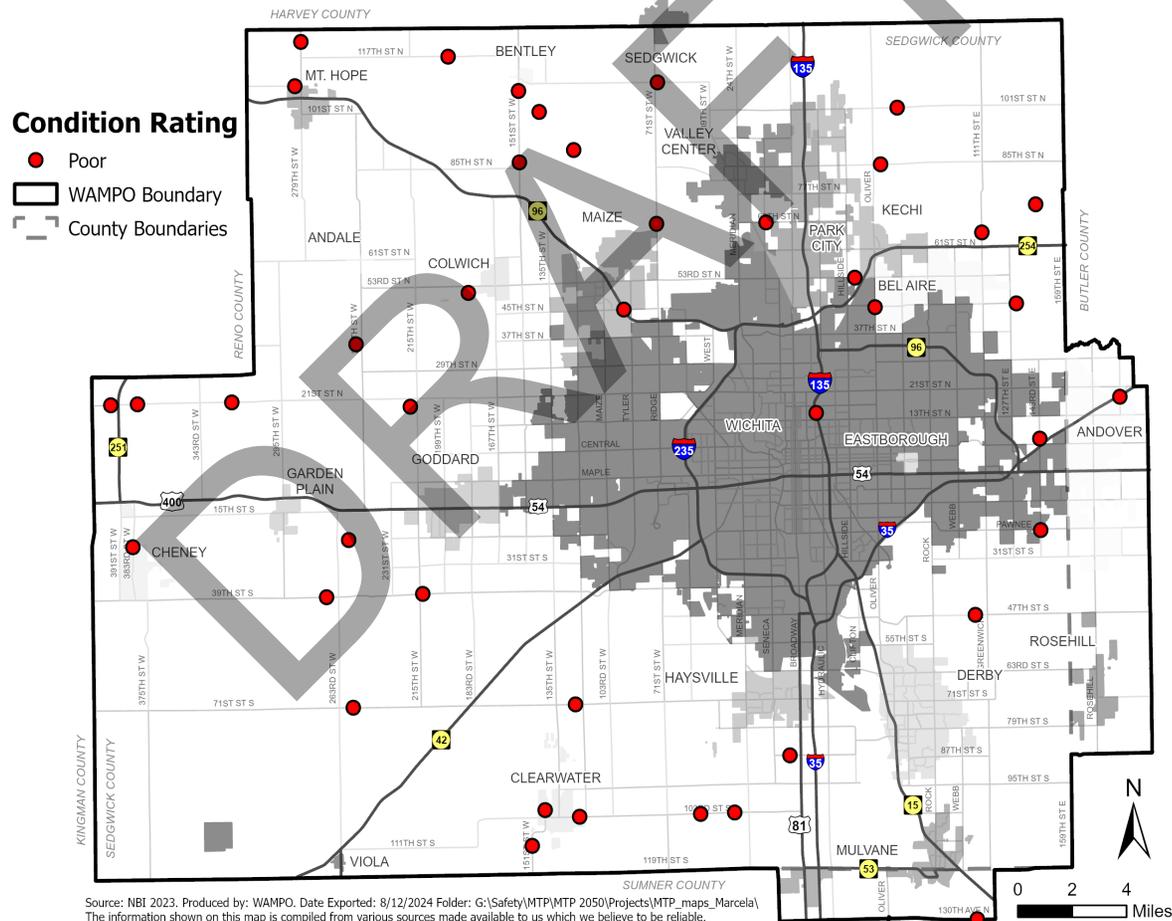
Owner/Maintainer	# of Structures
KTA	65
Railroad	3
State Highway Agency	376
Grand Total	444

Bridge Conditions

Bridge conditions are another critical aspect of roadway infrastructure in the WAMPO region. Currently, approximately 97% of the bridges in the area are classified as in either 'Good' (69%) or 'Fair' (28%) condition. While this indicates a relatively favorable state for the majority of bridges, it's essential to address the remaining 3% classified as 'Poor' to ensure overall safety and functionality.

Investing in bridge maintenance and rehabilitation programs is paramount to prevent deteriorating conditions that could lead to disruptions in transportation and potential safety hazards. Regular inspections, timely repairs, and strategic upgrades based on engineering assessments can prolong the lifespan of bridges and mitigate risks associated with aging infrastructure. Map 3.1.4 shows bridges classified as in poor conditions by the National Bridge Inventory.

Map 3.1.4: Bridges in Poor Conditions



3.2

Transit & Paratransit

Transit service within the WAMPO region is currently offered by 25 providers. Of these 25 providers, 8 are categorized as public transit agencies: Wichita Transit, Butler County Regional Transit Program, Derby Dash, Haysville Hustle, Cowley County Council on Aging, Mulvane Senior Center, Park City Senior Center, and Sedgwick County Transportation. The remaining 17 providers are nonprofit organizations offering transit services for various groups in the region. This section provides a general overview of each public transit provider, including information pertaining to service areas, hours of operation, route information, and rider eligibility, where applicable.



Providers of paratransit services, also referred to as demand response services, offer safe, accessible transportation to various destinations for seniors and people with disabilities. Regional paratransit service providers include the Butler County Regional Transit Program, Derby Dash, Haysville Hustle, Sedgwick County Transportation, Wichita Transit, and other community-based providers (both for-profit and non-profit).



TRANSIT ISSUES & OPPORTUNITIES

- **Travel Time:** One regional goal is to decrease the large gap in overall trip travel time between transit and car.
- **Coordination:** There are inefficiencies in coordinating trips among transportation service providers, and a need to institute centralized mobility management to streamline coordination efforts among transportation service providers.
- **Accessibility:** There are accessibility barriers for many system users, and a need to remove barriers that make accessing and using public transportation prohibitive for older adults, people with disabilities, and low-income households.

Wichita Transit

Wichita Transit is operated by the City of Wichita and provides both fixed-route and demand-response transit services within the city limits. Serving over 160 square miles and a population of approximately 400,000 residents as of the most recent estimates, Wichita Transit remains the largest and sole provider of fixed-route transit services within the Wichita Area Metropolitan Planning Organization (WAMPO) region.

TRANSIT SERVICE & FARE SCHEDULE

Fixed-Routes

The fixed-route system consists of 18 routes, running 5 AM to 7 PM Monday through Friday and 6 AM to 6 PM on Saturdays. Most routes operate with frequencies of 45 minutes during weekdays and 60 minutes on Saturdays.

Wichita Transit maintains a tiered fare structure with discounted fares available for eligible groups. In addition to single-ride fares, there are multiple unlimited-ride pass options available, detailed in the current fare schedule.

Demand Response

Wichita Transit provides origin-to-destination paratransit service, also known as demand response service, to any destination within the City of Wichita. All fixed routes including the circulator (i.e. Q-Line) provide ADA complementary paratransit service Monday-Saturday. Extended evening service is available within $\frac{3}{4}$ of a mile from fixed routes.

Users have two options for scheduling demand-response rides — subscription service and standard trips. The subscription service allows riders to schedule recurring trips to and/or from the same location for a period of up to 30 days for purposes such as school, work, religious services, medical appointments, etc, while the standard trip service allows users to schedule a one-time trip to any location with at least one-day advance notice. Riders are able to schedule rides by calling Wichita Transit's Administrative Offices.

Since paratransit service is reserved for individuals with a disability that prevents them from using the fixed-route service, an eligibility application for using the service must be submitted to Wichita Transit. Eligibility for the service falls into three categories, and an eligible user must meet the criteria for at least one of the three categories to be deemed eligible for paratransit services:

- **Category 1:** Individuals who cannot get on, ride, or get off a bus because of their disability.
- **Category 2:** Individuals with a disability who can ride accessible fixed-route transit, but there is no accessible transit on the route they need to use. For example, an individual requiring an accessible fixed-route vehicle when the vehicle is out for maintenance may use the paratransit service.
- **Category 3:** Individuals with a disability that prevents them from getting to/from a transit stop, including built barriers such as curbs or environmental conditions such as distance.

ANNUAL FARE REVENUES, OPERATING EXPENSES AND OPERATING STATISTICS

Fixed Routes

In 2022, Wichita Transit, part of the City of Wichita government, provided transit services across a geographic coverage area of 227 square miles, with a service area encompassing 164 square miles. The agency managed a fleet of 76 revenue vehicles and 8 service vehicles, with all 76 revenue vehicles available for maximum service. The total operating expenses for the year amounted to \$10,669,898, with \$1,707,289 in fare revenues. The annual passenger miles traveled reached 5,414,758, and the operating expense per vehicle revenue mile for bus services was \$6.29.

Geographic Coverage

This refers to the total physical or spatial area that an entity (such as a plan, network, or policy) encompasses. It's a broader term that could include everything within a specific region, whether or not services are provided to all parts of it. For instance, a geographic coverage area might include areas beyond where active services are available, such as rural zones that are physically included but not served.

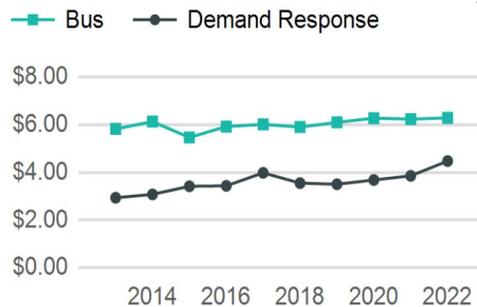
Service Area

This is more specific and refers to the portion of the geographic area where actual services are provided. For example, in transportation, the service area would be where transit, deliveries, or other specific services are actively offered. The service area is often a subset of the geographic coverage area, defined by where the provider's resources are deployed.

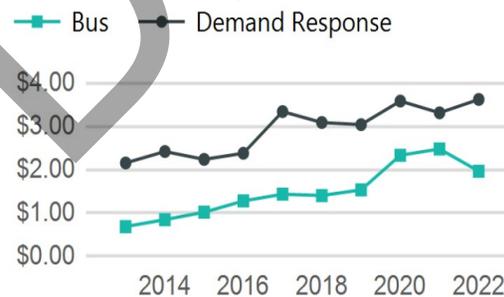
Demand Response

Wichita Transit managed 22 directly operated vehicles in maximum service (VOMS) for demand response. The total operating expenses for these services were \$2,761,632, with \$245,654 in fare revenues. The annual passenger miles traveled for demand response services reached 760,219, with an operating expense per vehicle revenue mile of \$4.48.

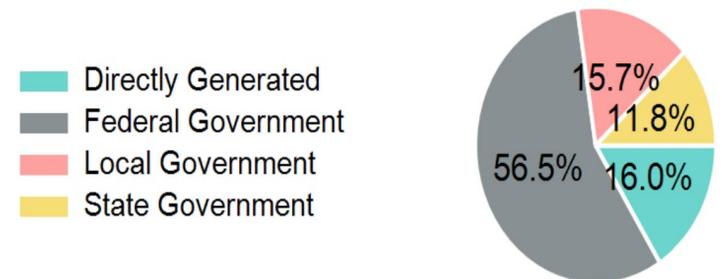
Graph 3.2.1: Operating Expenses per Vehicle Revenue Mile



Graph 3.2.2: Operating Expenses per Passenger Mile



Graph 3.2.3: Operating Funding Sources



https://www.transit.dot.gov/sites/fta.dot.gov/files/transit_agency_profile_doc/2022/70015.pdf

SERVICE EFFICIENCY & EFFECTIVENESS STATISTICS

The FTA publishes additional statistics in the National Transit Database (NTD) that assess the efficiency and effectiveness of transit agency operations by calculating six measures; operating expense per vehicle mile, operating expense per vehicle revenue hour, operating expense per passenger mile, operating expense per passenger trip, passenger trips per vehicle revenue mile, and passenger trip per vehicle revenue hour.

Table 3.2.4: City of Wichita Service Supplied

Service Supplied	
Annual Vehicle/Passenger Car Revenue Miles (VRM)	2,314,083
Annual Vehicle/Passenger Car Revenue Hours (VRH)	148,773
Vehicles Operated in Maximum Service (VOMS)	65
Vehicles Available for Maximum Service (VAMS)	76

Table 3.2.5: Service Efficiency and Effectiveness

Metrics	Service Efficiency		Service Effectiveness			
	OE per VRM	OE per VRH	UPT per VRM	UPT per VRH	OE per PMT	OE per UPT
Demand Response	\$4.48	\$93.28	0.1	2.6	\$3.63	\$36.54
Bus	\$6.29	\$89.54	0.6	8.4	\$1.97	\$10.66
Total	\$5.80	\$90.28	0.5	7.2	\$2.18	\$12.48



Bicycle & Pedestrian



Walking and bicycling, which are considered two of the more common modes of active transportation, have clear public health benefits due to the physical activity required. However, active transportation modes have proven to offer benefits beyond improved public health. By providing active transportation infrastructure, communities can offer residents opportunities beyond private vehicle travel that can alleviate traffic congestion and improve travel reliability. Furthermore, walkable communities that contain a mix of land uses have been shown to create many economic benefits, such as increased property valuations and increased business revenues related to higher levels of pedestrian traffic, as well as decreased household transportation and healthcare costs.

Bicycle & Pedestrian Counts

WAMPO facilitates an annual bicycle and pedestrian count event in which volunteers count the number of bicyclists, pedestrians, and other nonmotorized transport users (i.e., scooters, skateboards, roller skaters, etc.) over specific periods at specific locations. These counts are recorded following National Bicycle and Pedestrian Documentation (NBPD) methodology, <http://bikepeddocumentation.org>, which accounts for weather and other community events that may influence the amount of active transportation users recorded on the regional bicycle and pedestrian network at the time of the counting event.

Since 2012, WAMPO has counted bicycle and pedestrian traffic at dozens of specific locations throughout the region. The counts are conducted during five two-hour time slots in September: two weekday mornings, two weekday evenings, and a Saturday afternoon (a complete count at a given site includes data from one weekday morning, one weekday evening, and one Saturday afternoon). The days were chosen based on recommendations from the National Bicycle and Pedestrian Documentation Project. Each site is either a screenline or an intersection; at an intersection, the direction of travel of each counted person is recorded. A screenline is a conceptual or physical boundary used in transportation planning and traffic studies to measure the flow of vehicles, pedestrians, or other forms of traffic across a defined area. By placing this boundary, transportation planners can “screen” or capture the movement of traffic entering or exiting specific zones, providing data for analysis of travel patterns, congestion, and overall network usage.

Between the years 2012 and 2024, volunteers recorded counts at 42 different sites across the region. However, all 42 sites were not included in each year’s counting event due to varying numbers of volunteers. Map 3.3.1 displays the region’s bicycle and pedestrian counts for 2024.

Figure 3.3.1: 2024 Top 5 Counting Locations



In 2024, counts were conducted at 36 locations throughout the WAMPO region. Daily projected bicycle and pedestrian traffic at these individual sites ranged from 100 to 7,301 trips. Across all locations, the average for the Annual Average Daily Traffic (AADT)—which represents the estimated number of daily trips based on the count data—was 971, while the median was 462. AADT is a projection that helps account for variations in data by estimating the typical number of daily trips at a given location over the course of a year.

Figure 3.3.1 highlights the five locations with the highest bicycle and pedestrian AADT in 2024. For the previous two years, the intersection of Douglas Ave. and Washington St. in Wichita held the top spot for the highest bicycle/pedestrian AADT. However, in 2024, the highest count location shifted to the Arkansas River Path at the Keeper of the Plains.



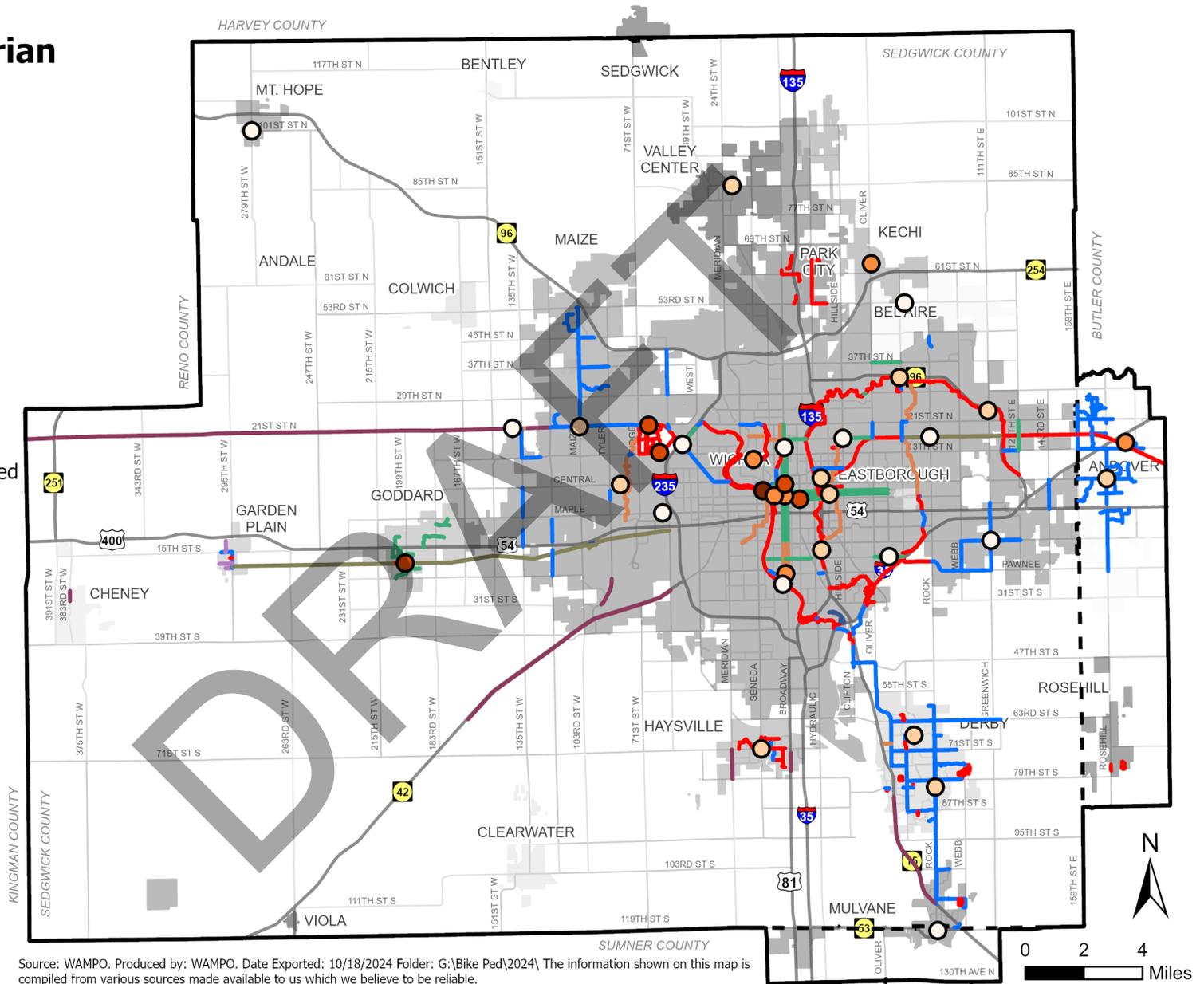
Map 3.3.1: 2024 Bicycle and Pedestrian Count Projections

Bicycle Pedestrian AADT 2024

- 100 - 380
- 381 - 791
- 792 - 1423
- 1424 - 2539
- 2540 - 7301

Facility Type

- Shared Use Path
- Sidepath
- Bicycle Lane
- Marked/Signed Shared Lane
- Bicycle Boulevard
- Paved Shoulder
- Unpaved Trail
- Mountain Bicycle



Source: WAMPO. Produced by: WAMPO. Date Exported: 10/18/2024 Folder: G:\Bike Ped\2024\ The information shown on this map is compiled from various sources made available to us which we believe to be reliable.

Benefits of Bicycling & Walking Infrastructure

The WAMPO region has made significant investments in a variety of bicycle and pedestrian infrastructure, including standalone facilities and multi-use paths alongside surface streets.

Biking, walking, and other forms of active transportation are important alternatives to automobiles in the WAMPO region, promoting healthy living, reducing emissions, and serving as the primary means of travel by those who do not have the option of motorized transportation. People's ability to use these nonmotorized modes is largely dependent upon the availability of sidewalks and/or paved trails between their intended origins and destinations.

There are several benefits associated with walkable and bikeable communities.

➤ **Economic:** Several studies have shown that walkable and bikeable neighborhoods lead to economic benefits. According to a 2019 study from Smart Growth America and George Washington University, the benefits of walkable neighborhoods include attracting a more educated workforce, higher levels of social equity, and higher levels of economic productivity.

➤ **Greenhouse Gas Reduction:** When bicycle and walking trips are substituted for motorized vehicle trips, vehicle emissions from transportation are reduced, including greenhouse gas emissions. A 2015 study from the Institute for Transportation and Development Policy estimates that a shift in urban transportation to more bike trips could reduce carbon dioxide emissions from urban passenger transport by nearly 11% in 2050.

➤ **Community Health:** Walkable and bikeable communities by design encourage their residents to exercise more and improve overall resident health. Creating more walkable neighborhoods is part of a Center for Disease Control and Prevention (CDC) initiative created by its Community Preventive Services Task Force. People who use active transportation are, on average, more physically fit, less obese, and have a reduced risk of cardiovascular disease compared to people who use only motorized transportation. The CDC stated that walking is the most common form of physical activity; community and street scale designs that improve walking and bicycling infrastructure lead to increases in physical activity rates. It is estimated that obesity costs the U.S. healthcare system \$147 billion a year; improvements that promote walking and bicycling may help to reduce that cost by improving rates of obesity and obesity-related diseases like heart disease, stroke, type 2 diabetes, and certain types of cancer.

Bicycle/Pedestrian Issues & Opportunity

- **Safety:** WAMPO will be focusing on safety concerns, particularly the rise in fatalities and serious injuries among bicyclists and pedestrians, in the Regional Active Transportation Plan.
- **Network Expansion & Connection:** The need and preference for an expanded and connected bicycle and pedestrian network within and between communities was a frequently-expressed theme during WAMPO public engagement.
- **Place-Making Considerations:** Effective place-making at both the local and regional levels is critical for creating a quality living environment to support, attract, and retain people and jobs. Focusing on place-making will inform future land use and transportation planning.
- **Data:** One of the greatest challenges for bicycle and pedestrian planning is the lack of usage and demand data and documentation. Without accurate and consistent demand and usage information, it is difficult to measure the positive benefits of investments in these modes, especially when compared to other transportation modes such as the private automobile. While current information sourced from the annual point-in-time counts is valuable, enhancing this data with additional ongoing sources is useful for future planning.
- **Regional Pathways Plan Update:** WAMPO is updating the Regional Pathways Plan into a new 'Regional Active Transportation Plan.' The last update was in 2011, and this effort will involve revising associated strategies with input from partners and community-based stakeholders. A key part of this work will include identifying missing linkages on regional pathways. The new update will be a new plan titled 'Regional Active Transportation Plan.' Please review Appendix K for more information.



Credit: Bike Walk Wichita

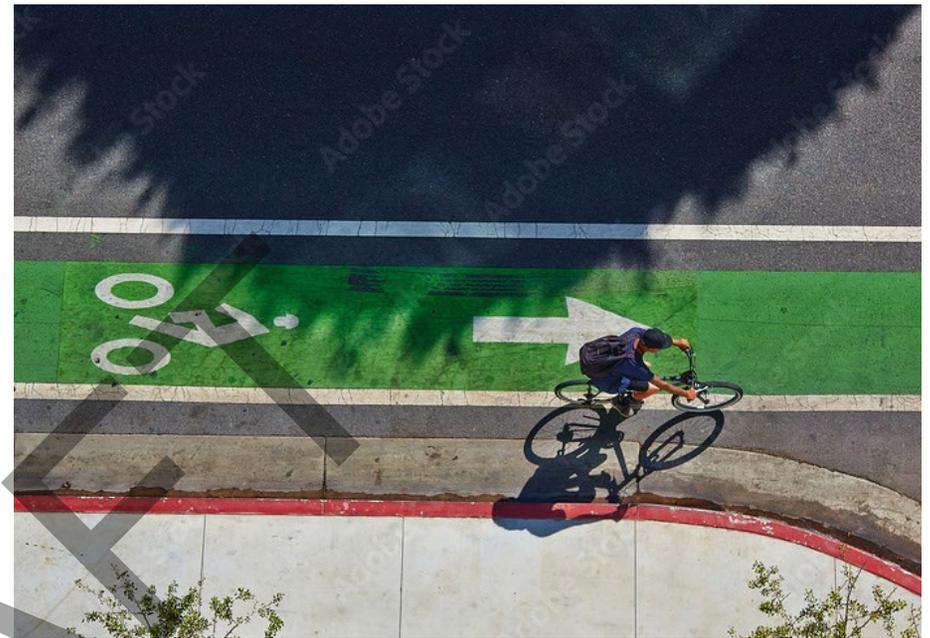


Credit: Bike Walk Wichita

Bicycle Network Inventory

The existing bicycle network in the WAMPO area consists of four types of facilities—bike lanes, bike boulevards, shared roadways, and shared-use path— designed to connect the City of Wichita with the surrounding communities, and create connections between communities. These facilities can be categorized into on-street facilities (bike lanes, bike boulevards, and shared roadways) and off-street facilities (shared-use paths) that are located adjacent to roadways or as trails through recreational areas. Within the WAMPO region, the on-street and off-street facilities are defined as:

- **Bike Lane:** A portion of a roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use by bicyclists.
- **Bike Boulevard:** A low-speed and low-volume street bicycle route shared with vehicles. These boulevards incorporate additional markings and improved crossings to facilitate safer bicycle travel.
- **Shared Lane/Roadway:** A roadway open to both bicycle and motor vehicle travel.
- **Shared-Use Path:** A bikeway physically separated from motorized vehicular traffic by an open space or barrier, and either within the right-of-way or within an independent right-of-way. Also shared with pedestrians.
- **Mountain Bike Trail:** A designated off-road path or route specifically designed for mountain biking.
- **Unpaved Trail:** A path or route that does not have a hard, artificial surface like asphalt, concrete, or other paving materials.



EXISTING AND FUTURE BIKEWAYS MAP

WAMPO created a bikeways map for the region. It can be found at www.wampo.org/bicycle-pedestrian#bikepedmap. The map consists of shared use paths, sidepaths, bicycle lanes, marked/signed shared lanes, bicycle boulevards, unpaved trails, mountain bicycle trails, and planned future paths.

Pedestrian Network Inventory

A pedestrian network is a system of interconnected pathways and infrastructure designed to support safe, efficient, and convenient walking and other forms of pedestrian travel within a community or region. It is made up of various components, including:

- **Sidewalks**
- **Crosswalks**
- **Trails and paths**
- **Footbridges and overpasses**
- **Pedestrian signals**
- **Curb ramps**
- **Plazas and pedestrian zones**
- **Stairways and ramps**
- **Lighting and signage**

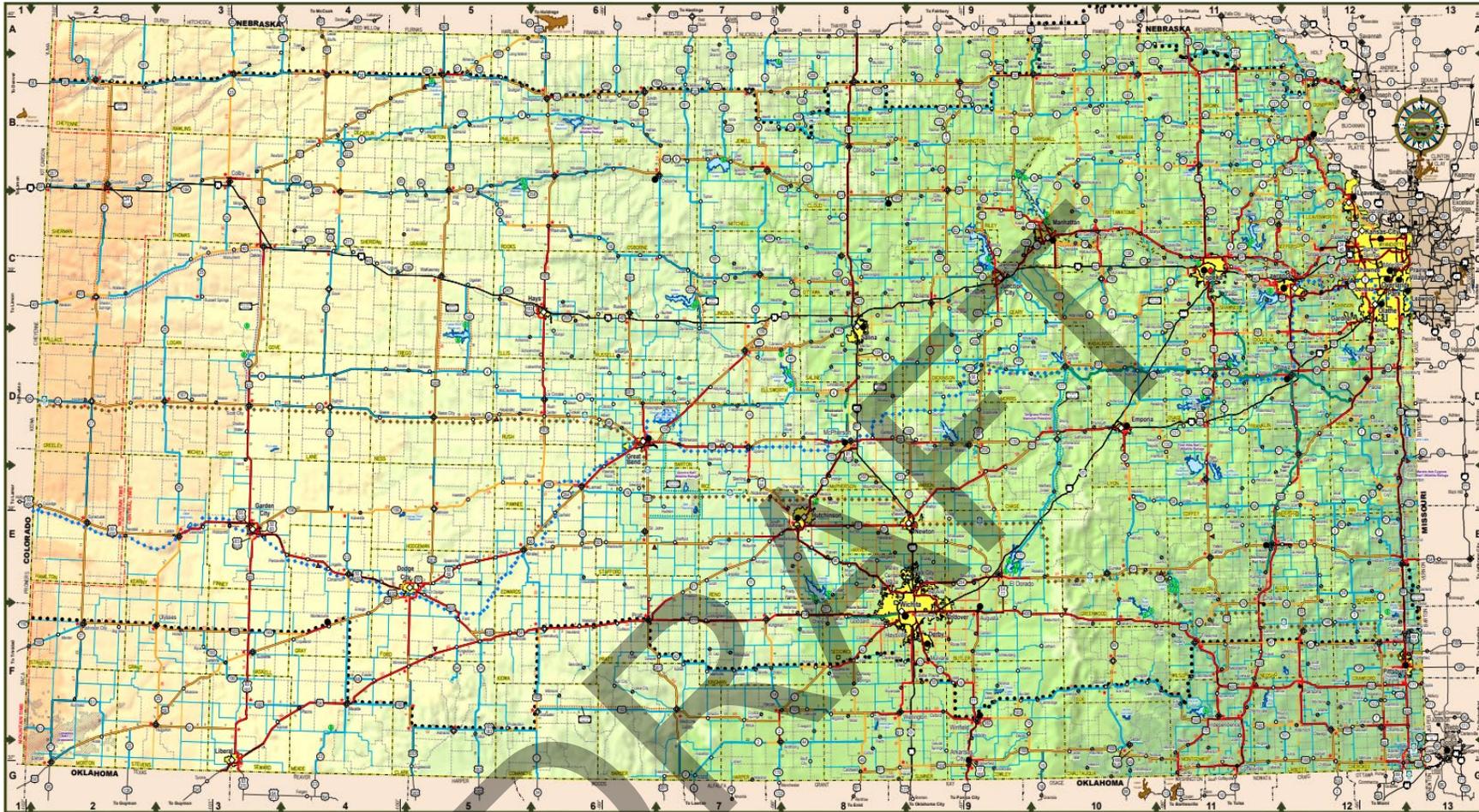
To determine how connected and accessible the WAMPO region's sidewalk/trail network is, WAMPO staff have developed a comprehensive map of all sidewalks and paved trails in the region. WAMPO member jurisdictions were given access to the draft ArcGIS feature class for review. They were asked to inform WAMPO staff of any omissions or inaccuracies in the existing sidewalk map. The existing sidewalk map provides an account of the locations of off-road active transportation facilities in the WAMPO region, which assists in the planning and prioritization of future active transportation projects by providing a way to assess how much connectivity is improved by any given project. This map is used to identify gaps in the active transportation network, help travelers plan their routes, and identify critical links in the system.

Statewide Bicycle & Pedestrian Network

The State of Kansas maintains several statewide bicycle and pedestrian routes that connect cities and towns and major recreational opportunities, bridging gaps between the state's urban and rural areas. The major route traversing the state is the U.S. Bicycle Route 76 trail, which begins in Western Kansas and extends east to the town of Frontenac on the border of Kansas and Missouri. This route lies just north of the city of Wichita, crossing through the city of Newton.

Two state bicycling routes have been dedicated as part of the annual Bike Across Kansas (BAK) event that began in 1975 as a way to promote health, wellness, and the enjoyment of the natural and cultural amenities of the state. Although the BAK route changes each year, the routes are based on one of two general paths, either crossing the northern part of the state or through the southern half. Map 3.3.2 shows the locations of the Statewide Bicycle and Pedestrian System. As shown, state bicycling routes run near the Wichita metro area. Additional trail connections within the metro area have the potential to connect the region to the wider statewide bike network.

Map 3.3.2: Kansas Bicycle Map 2023-2025



MAP EXPLANATION

HIGHWAY MARKERS

- Interstate Route
- Kansas Turnpike (KTA)
- U.S. Route
- State Route

COUNTY ROADS

- Paved High Daily Traffic Volume
- Paved Moderate Daily Traffic Volume
- Paved Low Daily Traffic Volume
- Unpaved Low Daily Traffic Volume

ROUTES ACROSS KANSAS

- Trans-America Trail / USBR 76
- American Discovery Trail
- Biking Across Kansas Route (2016 & 2018)

BYWAYS

- Kansas Scenic Byway
- National Scenic Byway
- Kansas Historic Byway

MAP SYMBOLS

- Rest Area
- State Park
- Bike Shop(s)
- U.S. Bicycle Route

HIGHWAY CLASSIFICATIONS

DAILY TRAFFIC VOLUMES FOR ROADS (vehicles per day)

High = Greater than 3,000 Moderate = 1,000-3,000 Low = Less than 1,000

- High Daily Traffic Volume Multilane
- Moderate Daily Traffic Volume Multilane
- High Daily Traffic Volume w/Shoulder
- Moderate Daily Traffic Volume w/Shoulder
- Low Daily Traffic Volume w/Shoulder
- High Daily Traffic Volume
- Moderate Daily Traffic Volume
- Low Daily Traffic Volume
- Accumulated Mileage (Between Stars)
- Local Mileage (Between Towns and Junctions)
- Interstate (Bicycles Prohibited)

3.4 > Freight >>>>

In general, Kansas' economy is more reliant on goods-dependent industries than the overall economy of the United States. Goods-dependent industries, which rely on transportation infrastructure to receive raw materials and manufacturing goods and to send their refined/finished products to market, represented about 42.3% of Gross Domestic Product (GDP) in Kansas in 2023, compared to 38.8% nationwide (U.S. Bureau of Economic Analysis, 2023).

Despite an overall decline of goods-dependent industries in the WAMPO region, the region's economy is still heavily reliant on them, especially relative to other metropolitan areas.

The WAMPO region is home to several industries that rely on the movement of commercial goods to, from, and through the region using a combination of truck, rail, air, and pipeline transportation. Goods-dependent industries in the region have historically been a major source of employment, but these local industries have been declining, leading to slower GDP growth relative to the United States, overall, compounded by slow population growth and the aging of the population in the region.

Eight freight-reliant industry sectors are important to the WAMPO region's economy: Agriculture, Mining, Utilities, Construction, Manufacturing, Wholesale Trade, Retail Trade, and Transportation and Warehousing.

The WAMPO region remains a critical hub for agricultural shipments moving from western Kansas to national and international markets. Recent data indicate the most significant commodities moving to, from, and within the region are cereal grains (by weight) and mixed transportation equipment (by value).

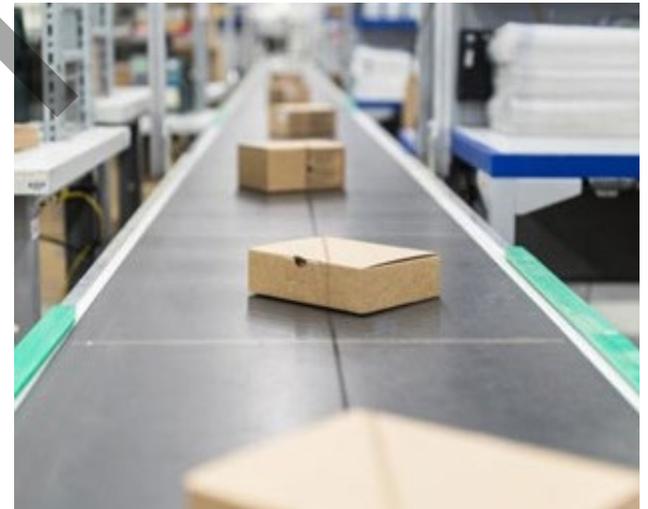


FREIGHT ISSUES & OPPORTUNITIES

The economic fabric of Kansas and the WAMPO region is intricately woven with goods-dependent industries reliant on efficient transportation networks. From advanced manufacturing to agricultural exports, these sectors form the backbone of the region's economy, facing both challenges and promising opportunities. As we delve into freight issues and opportunities, we uncover the vital role of transportation infrastructure in shaping economic growth and resilience in the WAMPO area.

- **Truck Parking:** Truck parking can be an issue, in light of increased truck traffic and electronic-logging-device rules for truck drivers that increase accountability for following hours-of-service limits. These requirements can lead to truck drivers using unapproved parking lots, side roads, shoulders, or freeway ramps for parking to stay out of service for the required periods. In 2019, Kansas was one of eight Midwest states to participate in the implementation of the Traffic Parking Information and Management System (TPIMS), which collects and shares truck-parking availability information at nearly 150 select lot locations along major freight corridors in the eight covered states. The closest TPIMS parking lot to the WAMPO region is located on I-135, at the Harvey County Rest Area (Mile Marker 23). There are currently no TPIMS locations on I-35 in Kansas.
- **Last Mile Deliveries:** There are issues connecting freight hubs and warehouses with customer-end “last mile” goods deliveries. Shippers capable of executing first-mile and last-mile transportation are better positioned to control costs, ensure delivery speed and accuracy, and enrich the customer-service experience. Home delivery growth is the most noticeable impact of e-commerce, as consumers switch to online purchases, especially for discretionary goods. Transportation systems are seeing a reduction in consumer travel to stores and an increase in deliveries by parcel services. The demand placed on last-mile logistics by growing parcel deliveries is changing roadway-system usage and needs.

- **Bridge Restrictions:** Truck traffic in the region can be impeded by barriers such as low overpass clearances and weight restrictions on bridges. There is currently one weight-restricted bridge located on the freight network in the WAMPO region, on N. Prairie Creek Road over I-35, about two miles east of the Sedgwick County line.



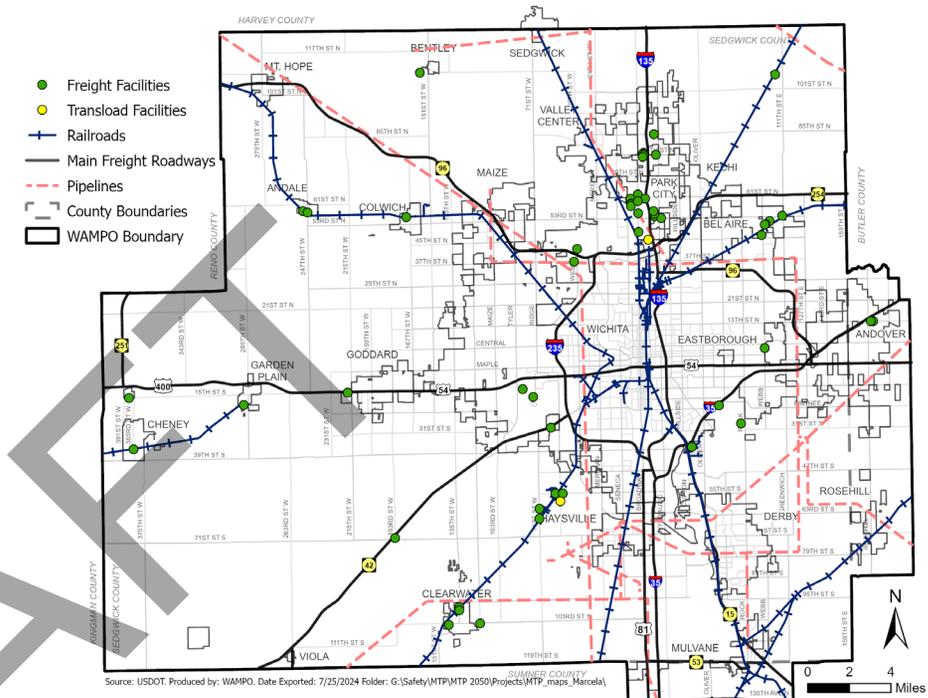
Highway Network & Facilities

Freight transportation infrastructure in the WAMPO region includes highways, railroads, airports, and pipelines. There are no navigable freight waterways in the region. Freight movement is most concentrated around facilities that require input or output of goods to market. These freight facilities include transload facilities, distribution centers, bonded warehouses, grain elevators, and more. Freight facilities and their location relative to the freight transportation network are shown in Map 3.4.1.

TRANSLOAD FACILITIES

Transload facilities are multimodal sites where products move from one mode of transportation to another. For instance, products may be transferred from a truck to a rail car. Products are unloaded from one mode and then loaded onto another mode at a transload facility, as distinct from an intermodal facility, where products remain in the same shipping container for all legs of their journey. Transload facilities are important in markets with bulk shipments, warehouse products, or dimensional products (e.g., steel beams, wind-power components, pipes). A truck-rail transload facility may be as basic as an unpaved storage area adjacent to a set-out or siding track, but can be built with permanent storage facilities or in proximity to other railyard operations. Equipment used to transfer loads ranges from forklifts to specialized cranes.

Map 3.4.1: Freight Facilities and Infrastructure in the WAMPO Region



In 2015, the Kansas Department of Transportation (KDOT) prepared a Transload Facility Site Analysis to identify statewide facility needs. Through this analysis, KDOT reviewed 111 sites around the State and selected sites in Great Bend and Garden City for funding. The number of sites that were evaluated illustrates that transportation options in Kansas are important to shippers and economic development agencies. KDOT continues to support investment in rail infrastructure through the State Rail Service Improvement Fund.

Transload services offer companies the long-haul economy of rail shipment and the direct service of trucks. This is beneficial when the production or consumption point is not near a railroad or if shipment variability does not make investment in a dedicated facility practical.

There are two transload facilities in the WAMPO region, both for the Burlington Northern and Santa Fe (BNSF) Railway. United Warehouse Company is located near the North Junction (interchange of I-135, I-235, and K-254), has multiple loading docks, and consists of one large warehouse building. Garvey Public Warehouse is located south of the Dwight D. Eisenhower National Airport, has six loading docks, and is made up of eight buildings. These facilities are shown in yellow in Map 3.4.1.

To determine whether or where additional transload facilities are appropriate within the WAMPO region, WAMPO and its partners (Class I railroads, shortline railroads, economic development agencies, shippers, and KDOT) should review current facilities to determine if they have the capacity and facilities to serve existing and potential customers. Additional awareness of existing transload options may address the needs of the region. If such an inventory reveals a need for more facilities, a targeted market study, evaluation of additional sites, further marketing of existing sites, or other solutions could be advanced.

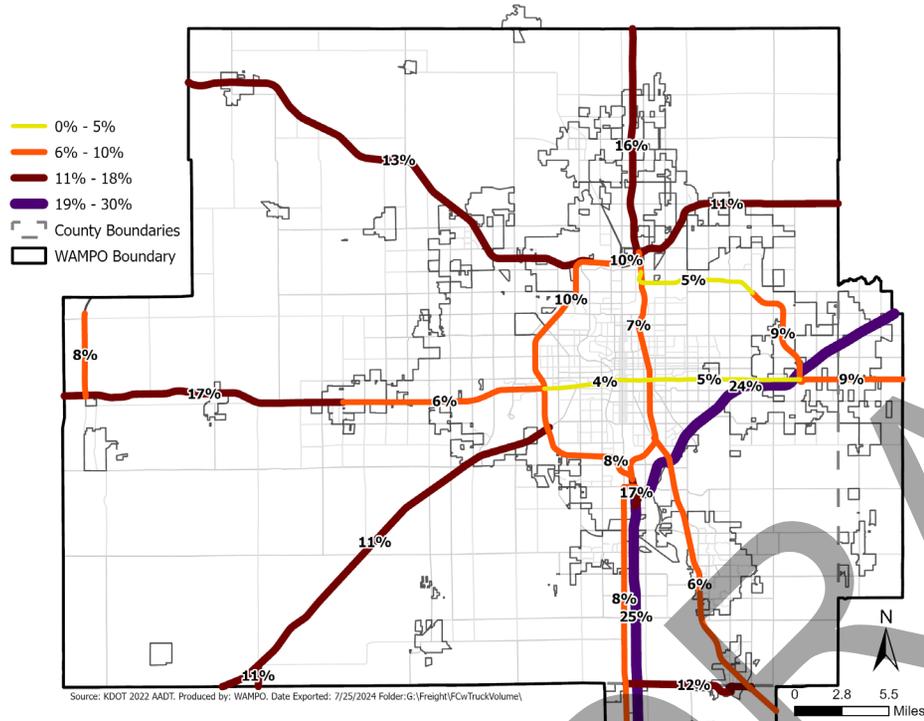
HIGHWAYS

Of the nearly 4,700 roadway centerline miles in the WAMPO region, approximately 440 miles are in the WAMPO Multimodal Freight Network. Interstates (I-35, I-135, I-235) provide north-south access and a partial beltway around the City of Wichita. Other key federal or state highway routes (US-54/400, K-96, K-254, K-42, K-15, K-53) provide connections with other urban centers and states outside of the WAMPO region. An estimated 90% of freight movements into, out of, and through the region are via truck, on highways and other roadways.

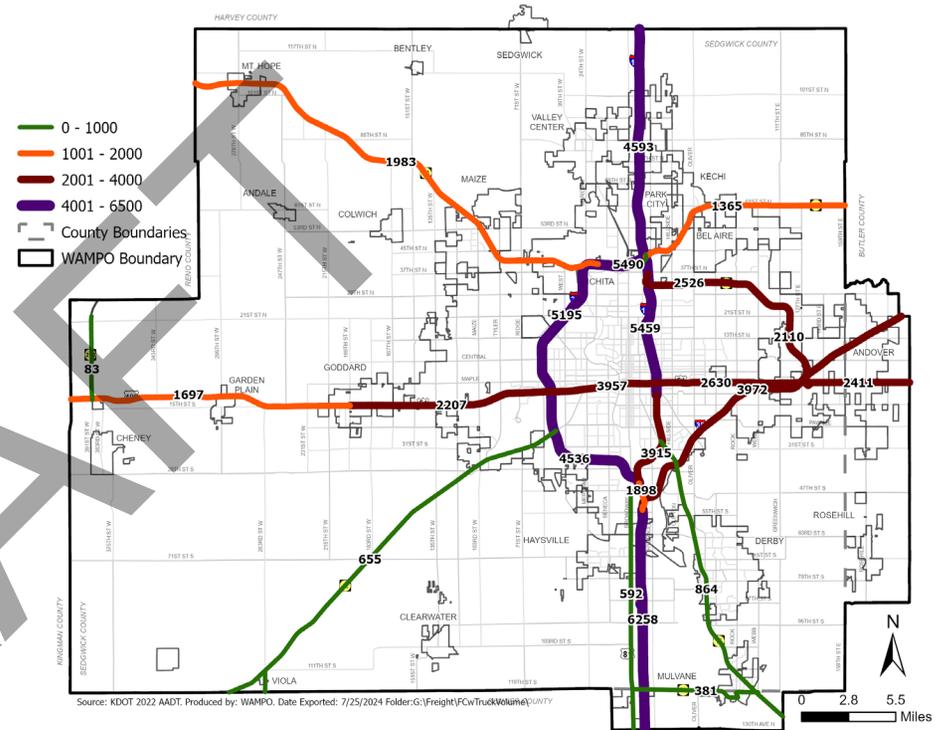
The WAMPO region has high truck traffic volumes, particularly on the I-35 corridor, with truck Annual Average Daily Traffic (AADT) greater than 4,500. Rural regions and major highways have the highest percentage of truck traffic, while increased passenger traffic in urbanized areas results in fewer trucks traveling through them. Percentages of overall AADT on major WAMPO-region highways that are truck traffic are shown in Map 3.4.2. Annual average daily heavy commercial traffic is shown in Map 3.4.3.



Map 3.4.2: Freight Share of Total AADT (%)



Map 3.4.3: Annual Average Daily Heavy Commercial Traffic



In general, WAMPO does not experience much traffic congestion. For freight, this is measured through the Truck Travel Time Reliability (TTTR) Index and has been calculated for WAMPO’s Interstate Highways. This index is a ratio of the median time it takes a truck to cross a section of road to the 95th percentile time for that same road segment. In other words, it compares the travel time that a truck might expect on an average day (the median truck travel time) to the worst day of congestion in a given month (The 95th percentile truck travel time). For most of the WAMPO Interstate system, this ratio is less than 1.25. This means that, for most of the region’s Interstate system, even on the worst day of congestion in about a month, the time it takes a truck to cross a given section of road is extended by less than 25%, relative to the median. This implies truck travel times on the region’s Interstate system are reliable. The TTTR indices for WAMPO’s Interstates are shown in Map 3.4.4. More information can be found in Chapter 5: Performance Measures.

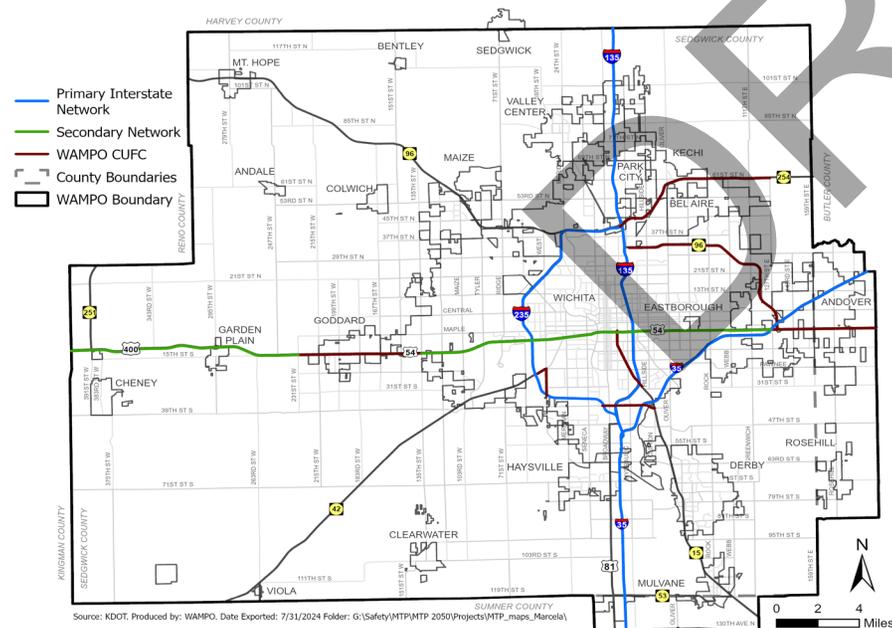
National Highway Freight Network

The National Highway Freight Network includes: the Primary Interstate Network, the Secondary Network, Critical Urban Freight Corridors (CUFCs), and Critical Rural Freight Corridors (CRFCs). Map 3.4.5 and Map 3.4.6 show the National Highway Freight Network corridors in the WAMPO region. There are no Critical Rural Freight Corridors in the WAMPO region.

The Primary Highway Freight Network (PHFN) includes those highways identified as the most critical on the U.S. freight transportation system. In the WAMPO region, the PHFN includes:

- **I-35/ KANSAS Turnpike**
- **I-135**
- **I-235**

Map 3.4.5: Primary Highway Freight Network



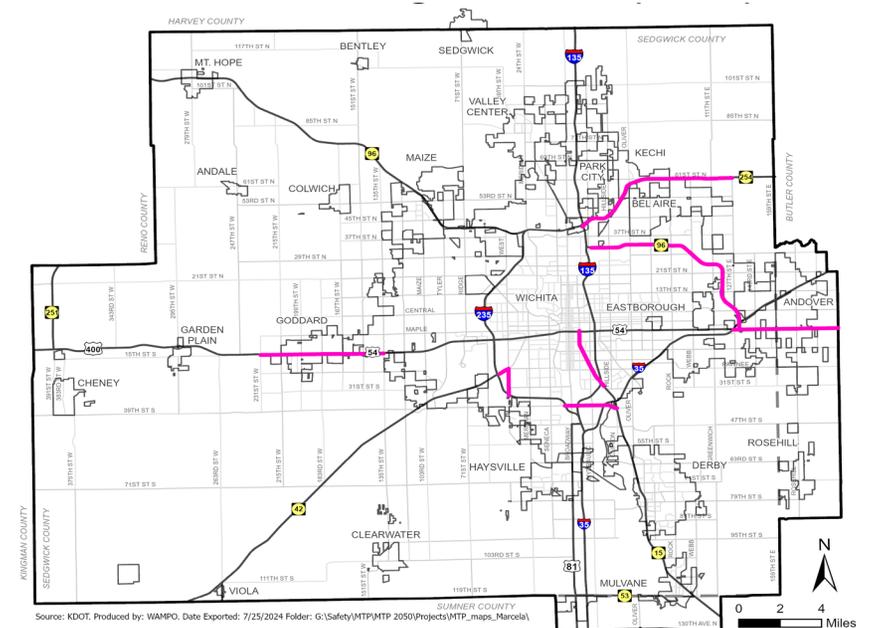
Critical Urban Freight Corridors

Critical Urban Freight Corridors (CUFCs) are public roads in urbanized areas that provide access to the Primary Highway Freight Network/Interstates, with connections to important ports or intermodal facilities. Nine of the twenty-four CUFCs in Kansas are located in the WAMPO region, highlighting the importance of the region's roadway network to the movement of freight. The official CUFCs in the WAMPO region are as listed in Table 3.4.1.

Table 3.4.1: Critical Urban Freight Corridors in the WAMPO Region

Road Name	From	To	Miles
US-54/400	231st St. W	135th St. W	6.0
US-54/400	I-35 Interchange	Meadowlark Rd.	5.1
K-254	I-135	127th St. E	8.4
K-96	US-54/400	I-135	10.6
MacArthur Rd.	I-235	K-15	2.5
Southeast Blvd.	US-54/400	I-135	3.0
K-42	I-235	West St.	0.6
West St.	K-42	I-235	1.4

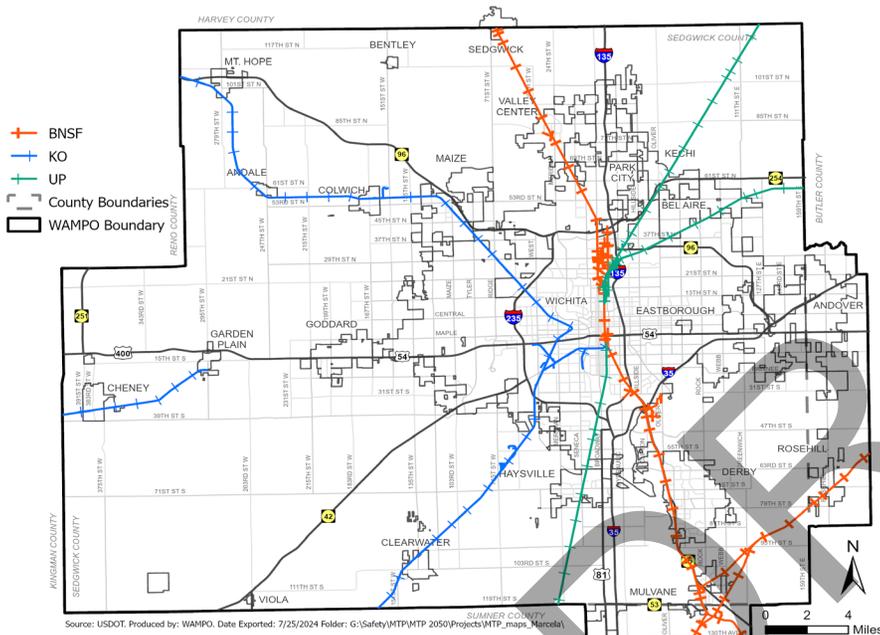
Map 3.4.6: Critical Urban Freight Corridors (CUFCs)



RAIL

Four railroads operate on approximately 175 miles of track in the WAMPO region: Union Pacific Railroad (UP), BNSF Railway (BNSF), Kansas & Oklahoma Railroad (K&O), and Wichita Terminal Association (WTA). The Wichita Terminal Association (WTA) operates as a switching and terminal railroad. All railroads in the WAMPO region are visualized in Map 3.4.7.

Map 3.4.7: Railroads in the WAMPO Region



The main commodities by revenue transported by Union Pacific are intermodal, grain, and energy. BNSF's main commodities by revenue are consumer products, industrial products, and agricultural products. The top commodities of each company reflect their entire networks. Both of these railroads are capable of maximum loaded car weights of 286,000 pounds or more, with no clearance restrictions.

The Kansas & Oklahoma Railroad has trackage radiating north, west, and southwest from its headquarters in Wichita. The main commodities it transports are grain products and industrial products such as chemicals and petroleum gas. The Wichita Terminal Association is a switching and terminal railroad owned by a partnership between UP and BNSF. It operates nine miles of UP and BNSF track on which it primarily moves grain, grain-related products, and scrap steel.

Issues related to the movement of goods by freight railroad include track weight, highway-railroad crossings, and rail location. Various railroad/roadway intersections have been identified as needing upgrades to their crossing devices. The WAMPO Freight Plan (2010) also identified three locations for possible upgrades to highway-railroad crossing condition, seven locations for upgraded warning devices, six candidate locations for crossing consolidation, and eight candidates for grade separation. All seven locations identified for upgraded warning devices have since been addressed.

Rail transit times between the Wichita area and other destinations in the contiguous United States range from one to seven days. Given sufficient volume, dedicated trains can be scheduled, potentially saving two days in transit time to either coast. Each railroad has a class based on revenue per year attached to it: Class I – Greater than \$250M/year; Class II – \$20M/year - \$250M/year; Class III – Less than \$20M/year. The classifications of the railroads in the WAMPO region are as follows:

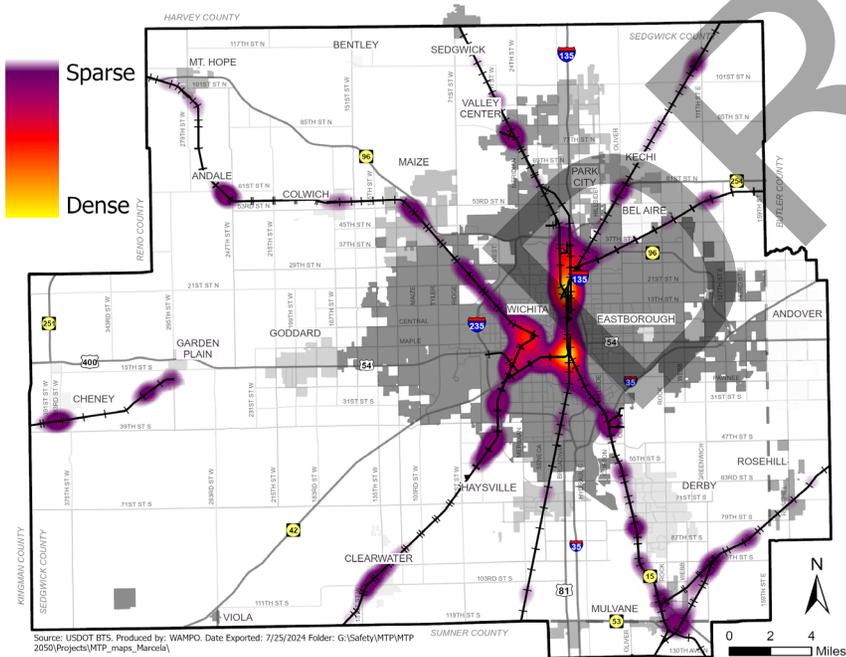
1. Class I - Union Pacific Railroad and Burlington Northern Santa Fe Railroad
2. Class II - Kansas & Oklahoma Railroad and Wichita Terminal Association

Rail Freight Issues & Opportunities

Some of the challenges that freight rail transportation faces in the WAMPO region include:

- **Infrastructure Condition:** Outdated infrastructure (e.g., tracks, bridges, sidings) that is not capable of carrying the weight of modern train cars.
- **Conflicts with Roadways:** There are currently 369 at-grade railroad/roadway crossings in the WAMPO region, as shown in Map 3.4.8.
- **Passenger Rail Service:** The Kansas Department of Transportation is updating its Passenger Rail Service Development Plan (SDP) and evaluating the expansion of passenger rail in South Central Kansas. Most passenger trains operate on the same tracks as freight trains.

Map 3.4.8: Density of At-Grade Railroad/Roadway Crossings



WATER

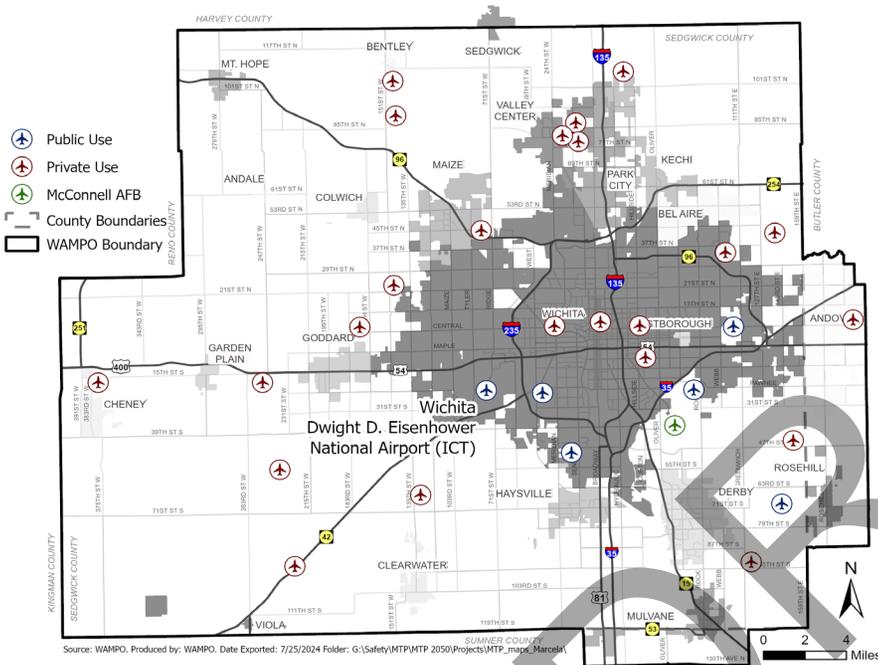
The WAMPO region has access to the U.S. Inland Waterway System via Interstate highways and railroads at the following ports:

- **Port of Kansas City:** Located 200 miles northeast of Wichita, this port provides access to the Mississippi River system via the Missouri River.
- **Tulsa Port of Catoosa:** Located 170 miles southeast of Wichita, this port provides access to the Mississippi River system via the Arkansas River.



There are 31 airports in the WAMPO region offering commercial passenger service, freight service, military service, and/or general aviation service: twenty-three private general aviation facilities, seven public civilian airfields, and one military airfield. All airport locations are shown in Map 3.4.9.

Map 3.4.9: Airports In the WAMPO Region



Wichita’s Dwight D. Eisenhower National Airport (ICT), [ranked 3rd best small hub airport](#) in the United States by USA Today’s Readers’ Choice in 2020 and 2023, is located in southwest Wichita, approximately six miles (12 minutes) from downtown, via a four-lane, limited-access highway. Easily accessible to the region, Eisenhower National Airport served more than 1.7 million passengers in 2023.

Of the airports in the WAMPO region, only Eisenhower National Airport is equipped to handle substantial freight operations on three runways (6,300 feet, 7,300 feet, 10,300 feet). As one of only three airports in Kansas that supports scheduled air cargo service, it accounts for the majority of air cargo tonnage shipped into and out of Kansas (78% of all air inbound and outbound cargo tonnage in Kansas in 2019). Eisenhower Airport is not only the air freight hub of Kansas, but it is also the gateway for planes and aerospace products manufactured in the region to depart under their own power.

Immediate proximity to the interstate highway system provides access to suppliers and markets. Air cargo activity at Eisenhower Airport is significant, including UPS, FedEx, and DHL, with more than 26,000 tons of cargo flying in or out in 2023.

Industrial areas host aircraft companies such as Cessna and Bombardier. Customs Service offices and a Postal Service General Mail Facility are also located at Eisenhower National Airport. Commercial air service to the Wichita region is provided through Eisenhower Airport by six airlines with direct flights to 16 destinations (mostly airlines’ major hub airports). McConnell Air Force Base primarily conducts in-air refueling and airlift operations. The airfield receives approximately 2 million gallons of fuel per month via pipeline to complete these activities. McConnell Air Force Base accommodates a workforce of more than 5,500 employees, as well as approximately 6,700 family members and 8,500 retirees.

Air Freight Issues & Opportunities

There are currently no road-congestion issues around Eisenhower National Airport that would substantially delay the shipment or delivery of freight in the region. The KDOT 2016 Aviation System Plan did not identify any access issues at the airport, and it stated that the goal should be to maintain cargo facilities to continue to be able to support large freight aircraft operations. The ICT 2005 Airport Master Plan, produced by Coffman Associates, Inc. for the Wichita Airport Authority, recommended an expansion of air cargo facilities and the air cargo apron and the extension of a runway from 7,300 feet to 8,700 feet, which could facilitate larger aircraft.

- **Customs Facility:** A new customs facility is needed to accommodate more international air travel in and out of the region.
- **Commercial Air:** There is an identified need to increase commercial air service (airlines and routes out of Eisenhower National Airport).
- **Air Service:** Opportunities to collaborate with the business community can enhance Wichita's passenger and freight air service competitiveness.

PIPELINES

There are relatively few pipelines in the WAMPO region, offering limited commodity movement. The most significant pipeline provides fuel to McConnell Air Force Base for aircraft refueling operations. In 2017, a pipeline disruption caused a temporary shift to trucking. During this outage, 123 trucks were needed weekly to supply the base with the quantity of fuel normally transported by pipeline daily.

Only a very limited number of commodities are moved by pipeline, predominately petrochemical and petroleum products, often to a modal transfer point. In 2022, improvements to Eisenhower Airport's fuel farm, which receives airplane fuel via pipeline were completed.



Commodity Flow Analysis

In 2017, The Federal Highway Administration conducted a commodity flow survey. Based on that data, they made projections that currently go out to the year 2050. This section looks at the inbound, internal, and outbound movement of commodities/goods in the WAMPO region. Inbound freight movement starts elsewhere and ends in the Wichita region, internal freight movement starts and ends in the Wichita region, and outbound freight movement starts in the Wichita region and ends elsewhere.

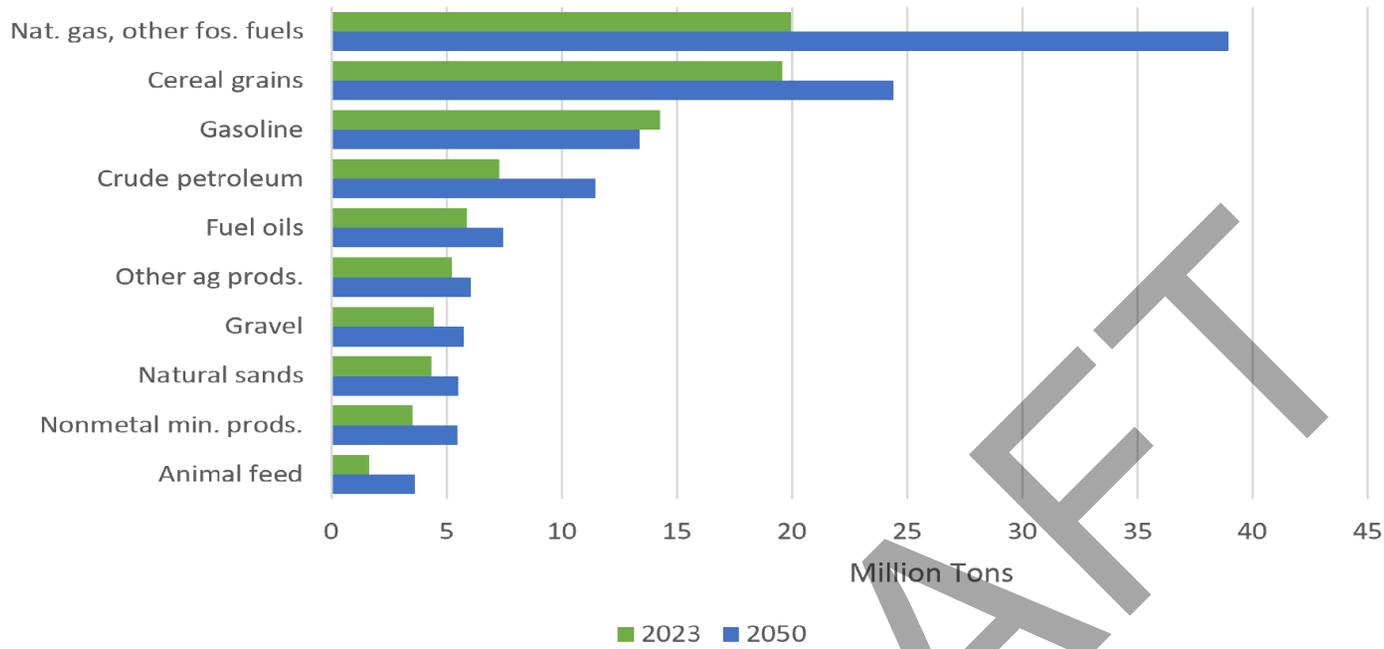
The commodity-flow analysis from the Federal Highway Administration's (FHWA's) Freight Analysis Framework (FAF5) includes historical 2023 and forecasted 2050 data for the Wichita region. The analysis examines freight modes, commodities, trade flows, and connections to trading partners within and outside of the United States. International trade partners are classified by regions around the world (i.e. Europe and East Asia), with the exceptions of Canada and Mexico who were classified by their countries' names. Domestic trade partners are states and territories around the country; the only exception is Kansas, which includes everywhere in Kansas except the Wichita area. In 2023, about 99 million tons of freight moved over the Wichita area's transportation system, valued at about \$106 billion. By 2050, it is projected that the Wichita area's transportation system will carry 149 million tons of freight annually, valued at around \$183 billion in 2023 dollars, an increase of 50% by tonnage and 72% by value.

TOP COMMODITIES

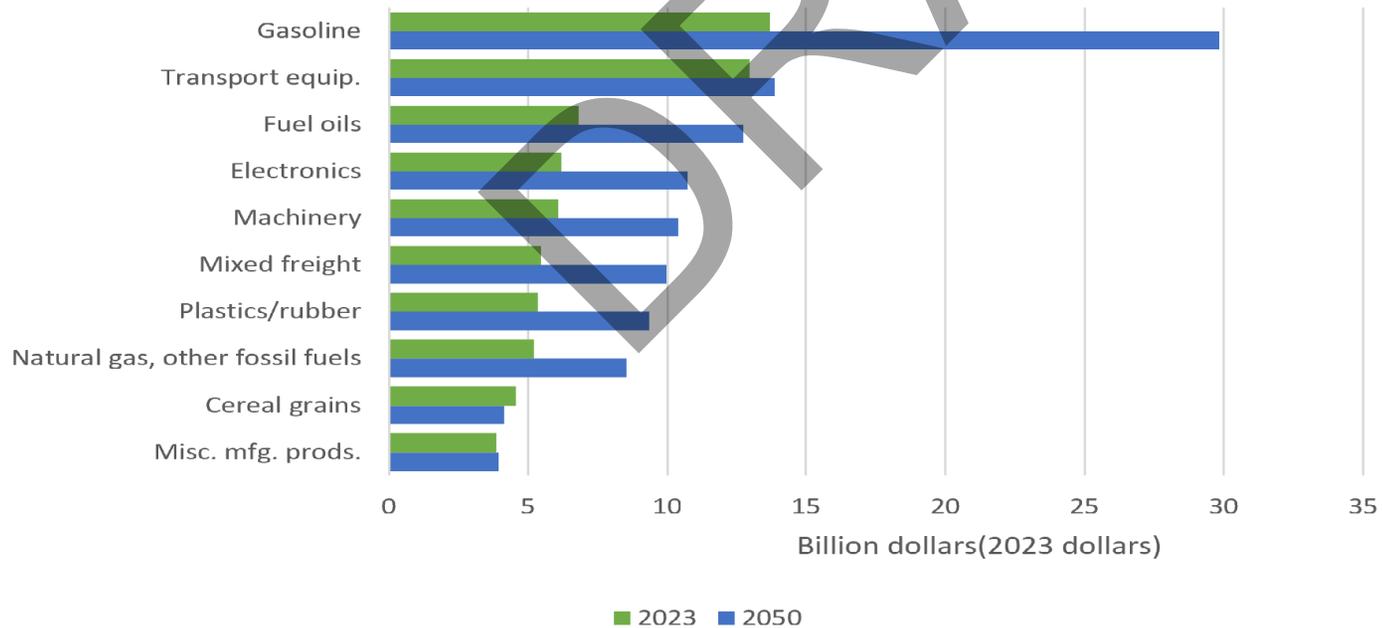
The WAMPO region is a critical hub for agricultural shipments moving from western Kansas to national and international markets. In 2023, the top commodity moved into, out of, or within the Wichita area by weight was natural gas and other fossil products (20%). The other top five commodities by weight were cereal grains, gasoline, crude petroleum, and fuel oils. The top five commodities by weight made up 67% of the total tonnage in 2023. By value, the top commodity moved was gasoline, followed by transportation equipment, fuel oils, electronics, and machinery. Shipments of these five commodity types in the Wichita area were valued at about \$46 billion in 2023, 43% of the total value of goods moved in area in that year.

In 2050, the top five commodities by weight are projected to be transportation equipment, plastics/rubber, electronics, machinery, and miscellaneous manufacturing products, accounting for 64% of all goods by weight. The top commodity by value in 2050 is also projected to be transportation equipment, followed by plastics/rubber, electronics, machinery, and miscellaneous manufacturing products. These five commodities combined are expected to account for 42%, or about \$78 billion, of the total value of all goods moved. Top commodities by weight and value in 2023 and 2050 are shown in Figure 3.4.1 and Figure 3.4.2.

Graph 3.4.1: Critical Commodities by Weight, 2023 and 2050



Graph 3.4.2: Critical Commodities by Value, 2023 and 2050



MODAL SPLIT

In 2023, trucks were the dominant mode utilized for freight movement in the region, carrying 53% of the total weight of goods. Pipelines had the second-greatest modal share by weight, at 37%. Rail had the third-greatest modal share by weight, at 7%.

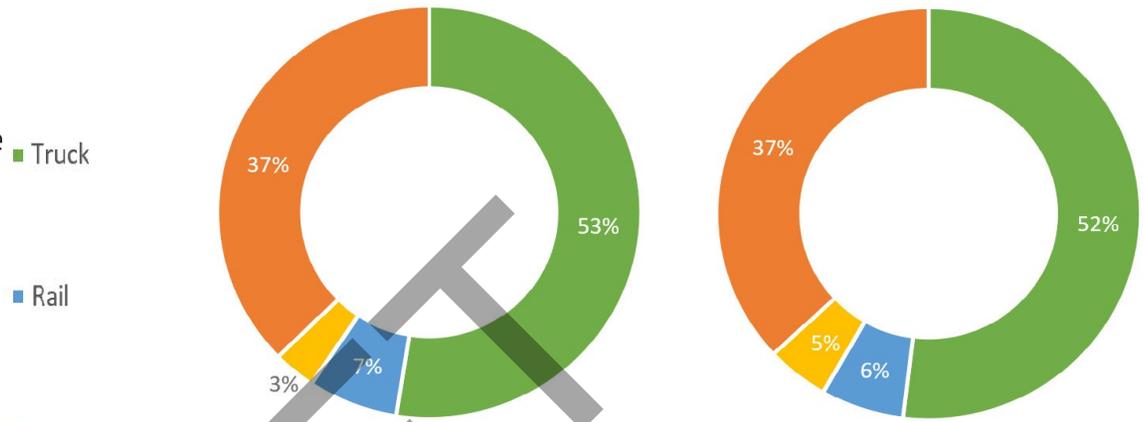
Measuring by value, trucks transported about \$68 billion in goods in 2023 (64% of the regional total). Pipelines had the second-greatest share by value, at about \$20 billion in goods (19%). Transportation by multiple modes and/or by mail, including package delivery services like the U.S. Postal Service and FedEx, had the third-greatest modal share by value, at \$13 billion (12%).

The movement of agricultural, mineral, and food products is projected to grow substantially by 2050, contributing to a significant increase in freight volumes. Trucks are expected to remain the dominant mode, projecting to account for 52% of freight movement by weight and 69% by value. The share of freight moved by multiple modes/mail is expected to increase and reflects the projected continued growth of e-commerce. Modal splits by weight and value in 2023 and 2050 are shown in Graph 3.4.3 and 3.4.4. Projected 2023-2050 percent increases in the weights and values of freight moved by each mode are shown in Graph 3.4.5.

Graph 3.4.3: Freight Weight by Mode, 2023 and 2050

2023 TOTAL TONS: 99 MILLION

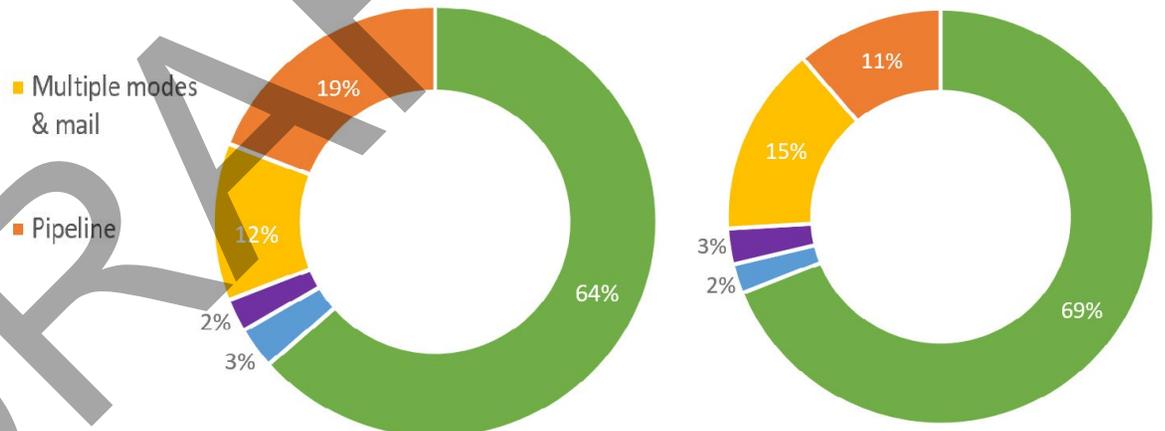
2050 TOTAL TONS: 149 MILLION



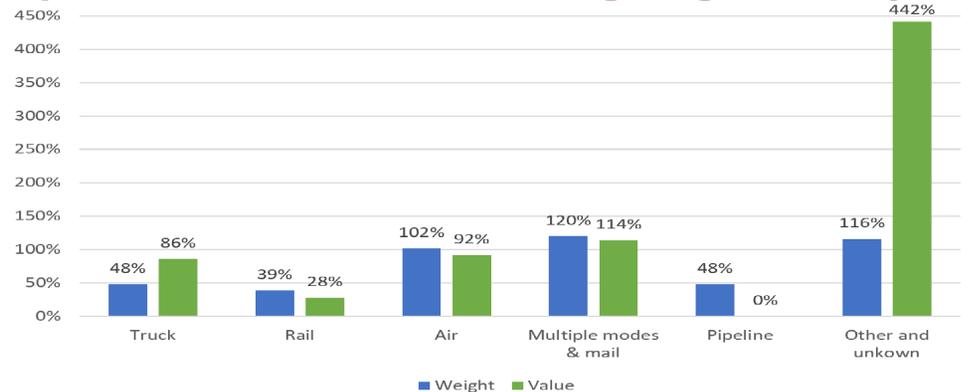
Graph 3.4.4: Freight Value by Mode, 2023 and 2050

2023 TOTAL VALUE: \$106 BILLION

2050 TOTAL VALUE: \$183 BILLION



Graph 3.4.5: 2023-2050 Percent Increases in Freight Weight and Value by Mode



DIRECTIONAL SPLIT

In 2023, inbound shipments accounted for 48% of the approximately 99 million tons of freight moved in the Wichita area, internal shipments accounted for 35%, and outbound shipments accounted for 17%. The imbalance between inbound and outbound goods can be explained by the presence of aircraft manufacturers in the region, which account for the delivery of a large portion of general aviation aircraft built in the United States. These manufacturers require the input of multiple parts and materials to construct their aircraft, but the final product is then flown out under its own power.

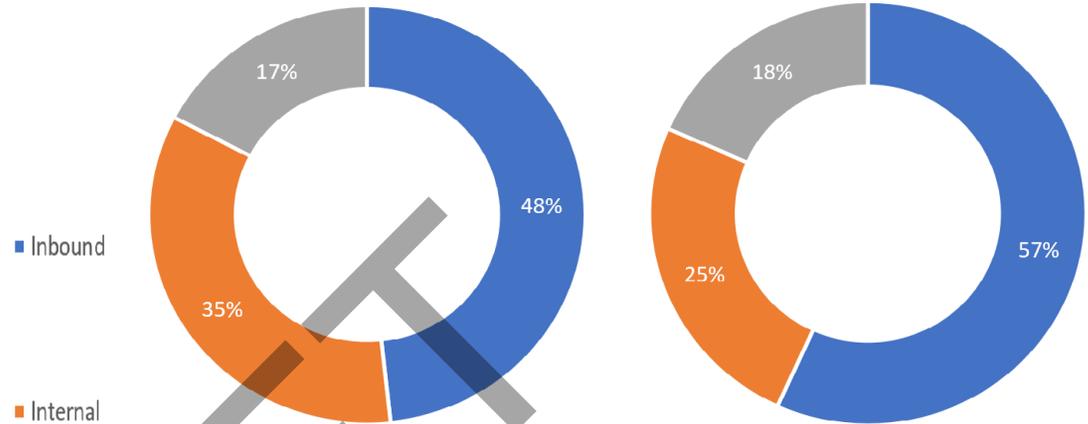
Measured by value, inbound shipments accounted for 42% of the Wichita area's freight movement in 2023. Due in part to the high value of finished aviation products, the outbound share of freight movement by value was 29%. The remaining 29% of the overall value of goods moved in the region is attributable to internal goods movement.

In 2050, freight-movement directional splits are projected to remain largely consistent with current trends, as shown in Graph 3.4.6 and 3.4.7. Inbound-goods movement is projected to grow the fastest during 2023-2050, increasing by 76% in terms of weight and 94% in terms of value. Internal-goods movement is expected to grow the least, increasing by only 8% in terms of weight and 16% in terms of value. Outbound-goods movement is expected to increase similarly to inbound-goods movement, with an increase of 60% in terms of weight and 95% in terms of value. Graph 3.4.8 illustrates these projected 2023-2050 percentage changes in weights and values of freight into, out of, and within the region in a given year.

Graph 3.4.6: Direction of Goods Movement by Weight, 2023 and 2050

2023 TOTAL TONS: 99 MILLION

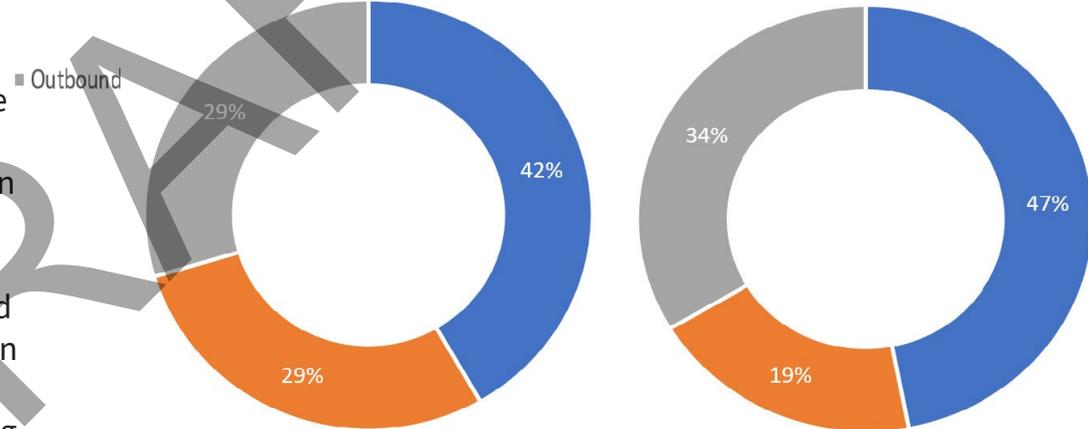
2050 TOTAL TONS: 149 MILLION



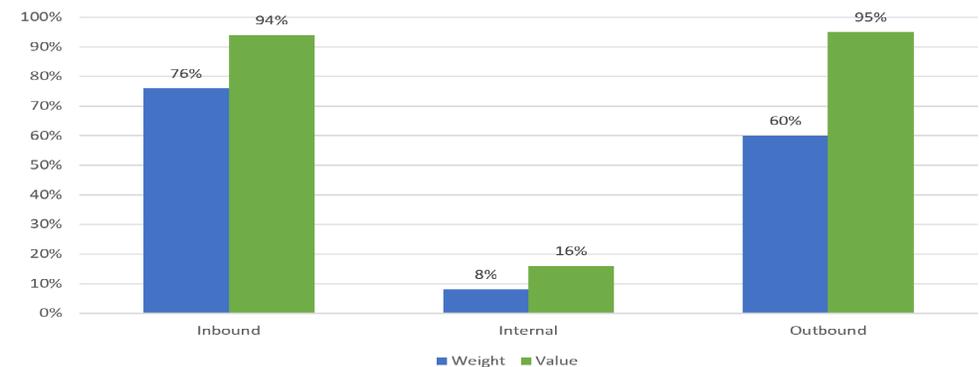
Graph 3.4.7: Direction of Goods Movement by Value, 2023 and 2050

2023 TOTAL VALUE: \$106 BILLION

2050 TOTAL VALUE: \$183 BILLION



Graph 3.4.8: 2023-2050 Percent Increases in Freight Weight and Value by Direction



ORIGINS & DESTINATIONS

Domestic Trading Partners: Inbound Goods

The WAMPO region receives goods from trading partners across the country. In 2023, almost 48 million tons of goods were shipped to the Wichita area. The top domestic origins by weight were the rest of Kansas (34%), followed by Oklahoma (28%), Texas (12%), Nebraska (6%), and Colorado (5%). The top five origins by weight accounted for about 40 million tons of goods shipped to the Wichita area in 2023. In 2050, the only projected change to the top five is North Dakota replacing Colorado as the fifth top trading partner.

The top five origins of goods by value accounted for about \$27 billion of the total value of goods shipped to the Wichita area in 2023. The top domestic origins of goods by value were the rest of Kansas (20%), Texas (13%), Oklahoma (13%), California (7%), and Colorado (5%). Projections for the year 2050 show a swap of positions for Texas and Oklahoma in the top five, but with both of them still at approximately 13%.

Domestic Trading Partners: Outbound Goods

Goods shipped from the region travel to a wide variety of U.S. destinations. The top five destinations by value accounted for about 14 million tons of goods (83%). The top domestic destinations by weight were the rest of Kansas (45%), followed by Texas (25%), Oklahoma (7%), Missouri (4%), and California (3%). No change in the top five destinations by weight is projected by 2050.

The top domestic destinations of Wichita-area goods by value in 2023 were dispersed across the country, indicating that high-value goods reach farther markets than high-weight goods. The top five destinations by value accounted for about \$18 billion (58%) of the total value of outbound goods in 2023.

The top domestic destinations by value were the state of Washington (20%), the rest of Kansas (13%), Texas (10%), California (8%), and Oklahoma (7%). Washington is the top domestic destination for goods by value because Spirit AeroSystems ships aircraft components to Boeing's final assembly facility in Renton, Washington by truck and rail. In 2050, Washington is expected to remain the top domestic destination by value. California is projected to switch places with Texas to be the number-three destination by value.

International Trading Partners

In 2023, international trade accounted for nearly 3 million tons of goods shipped to and from the Wichita area, with a total value of about \$5.5 billion. By weight, 24% of international shipments were imports and 76% were exports. By 2050, total international shipments to/from the Wichita area are projected to rise to about 13.6 million tons of goods, worth about \$16.3 billion (in 2023 dollars). By 2050, the shares of international imports and exports are projected to flip: 75% of international shipments will be imports and 25% will be exports.

In 2023, the top three international destinations by weight for Wichita-area exports were Mexico, Canada, and Eastern Asia. The top export to Mexico was cereal grains, the top export to Canada was natural gas and other fossil products, and the top export to Eastern Asia was meat/seafood. These three destinations accounted for 88% of the nearly 2.3 million tons of exported goods by weight. By value, Canada is the top international export destination, followed by Mexico and Eastern Asia. The top exports by value to Eastern Asia and Mexico were the same as those by weight (meat/seafood and cereal grains, respectively), while the top export by value to Canada was electronics. The top overall export by value was meat/seafood to Eastern Asia. These three destinations accounted for 58% of the nearly \$2 billion in goods exported

to outside of the United States from the Wichita area in 2023. In 2050, Mexico is projected to remain the top export destination by weight, followed by Eastern Asia and Canada. In terms of value, Eastern Asia is projected to become the top export destination, followed by Canada and Europe.

In 2023, the top three origins of international imports to the Wichita area by weight were Canada, Eastern Asia, and Europe. The top import from Canada was crude petroleum, while the top import from both Eastern Asia and Europe was machinery. These three origins accounted for about 590,000 tons of imports by weight, 83% compared to a total of about 720,000 tons of imports. The value of imports to the Wichita area totaled just over \$2.1 billion in 2023. The top three import origins by value were Eastern Asia, Europe, and Canada, accounting for about \$1.5 billion (70%) of imported goods. By value, the top import of all three was machinery, highlighting the Wichita region's aerospace and manufacturing sectors. In 2050, Canada is projected to remain the top country for imports by weight, increasing from 320,000 tons in 2023 to about 9.5 million tons. Canada is projected to be followed by Eastern Asia and Southeast Asia & Oceania in terms of imports by weight. The total value of international imports is projected to more than quadruple by 2050, to over \$9 billion (2023 dollars). By 2050, Canada is projected to surpass Eastern Asia and Europe for imports to the Wichita area by value. The number one commodity imported from Canada is projected to be crude petroleum, surpassing all other international imports to the Wichita area in 2050 and constituting the primary driver of Canada's projected future status as the Wichita area's number-one international trade partner. The top imports from Eastern Asia and Europe by value are projected to change to electronics and machinery, respectively.



3.5



Electric Vehicles



WAMPO's Electric Vehicle Network Plan was developed to support the growing market for plug-in electric vehicles (PEVs) in the region by enabling municipalities and others to address immediate needs and long-term planning objectives so the WAMPO region will become an electric vehicle (EV) destination, corridor, and gateway.

The Electric Vehicle Network Plan (see appendix L) outlines the first steps the region can take to support and encourage electric vehicle adoption. It delivers a comprehensive course of action to provide EV charging infrastructure and remove barriers to further EV adoption in the WAMPO region efficiently and effectively. This plan serves as a starting point for private and public entities to grow familiarity with the opportunities and challenges with EVs, charging infrastructure, and adoption.

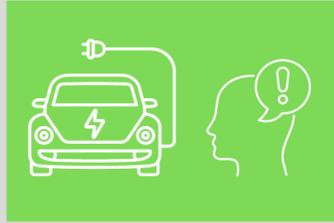
The Electric Vehicle Network Plan supports Metropolitan Transportation Plan 2050 and the Charge Up Kansas National Electric Vehicle Infrastructure (NEVI) Plan, by advancing the use of EVs to improve air quality and fostering economic development. WAMPO has an opportunity to adapt to emerging technologies by closing EV charging infrastructure gaps and removing barriers to EV adoption.

The nation is beginning to significantly advance in EV adoption after the 2021 Federal Bipartisan Infrastructure Law (BIL) was enacted. It provides investments to help modernize infrastructure assets and support emerging technologies, including electric vehicles (EV). There will be long-lasting infrastructure and mobility improvements by developing a national network of EV chargers.

In Kansas, private industry has played a crucial role in establishing charging station infrastructure across the state. However, a majority of this infrastructure is not situated near Kansas' interstate system, and many existing stations do not adhere to NEVI (National Electric Vehicle Infrastructure) guidelines.

BENEFITS OF ELECTRIFIED MOBILITY

Electrifying transportation opens doors to revolutionize mobility, offering eco-friendly and budget-conscious travel choices, all while advancing energy self-sufficiency.



A lack of general awareness and education, coupled with the higher initial prices of new electric vehicles, has contributed to misconceptions about the total cost of ownership. However, with substantially reduced maintenance costs and zero visits to the gas station, the long-term expenses associated with EVs are expected to decrease.



One energy sector fuel source (for electricity generation) is natural gas. Natural gas is becoming more popular and is a cleaner fuel source compared with coal-based electricity. At the same time, Missouri utilities are rapidly investing in renewable energy sources, which could further reduce an EV's carbon footprint.



The absence of diversity in transportation energy sources can result in an excessive dependence on particular energy providers. This vulnerability exposes the Wichita region to shifts in the global energy market, such as price fluctuations and availability. Electric vehicles (EVs), on the other hand, can be powered by a variety of energy sources.



The automotive industry is among the primary sources of greenhouse gas emissions (GHGs).



Why EVs in Cities?

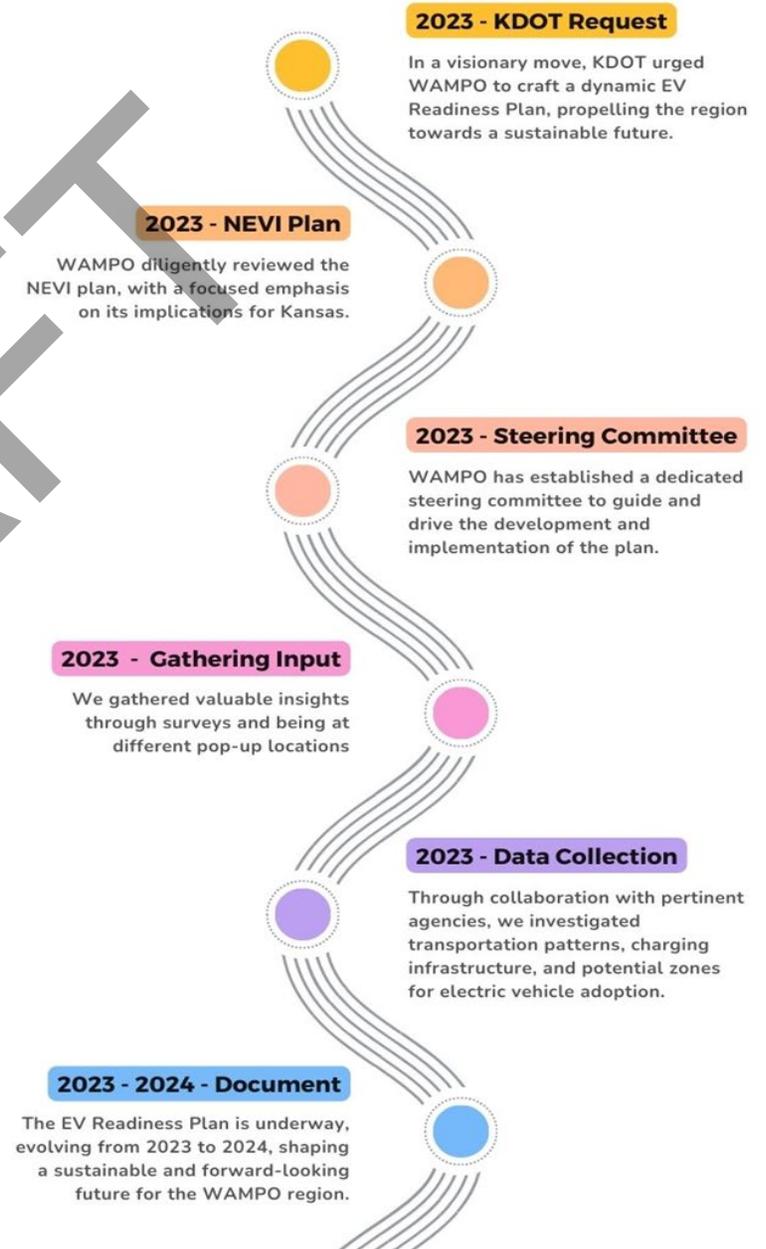
City and county officials have the chance to take bolder actions, enact changes more expeditiously, and attain significant outcomes more swiftly compared to their counterparts at the state and federal levels. Immediate advantages for local governments include a reduction in emissions, lower operational expenses, and the aforementioned benefits tied to advancements in health, social equity objectives, economic growth, and energy security. Policies promoting transportation electrification can additionally contribute to other objectives, such as diminishing air pollution, hastening the integration of renewable energy, achieving decarbonization, and enhancing certainty regarding future fuel costs.

Plan Development

The development of the WAMPO Electric Vehicle Network Plan represents a collaborative effort led by WAMPO, with diverse stakeholders contributing their expertise. Engaging with representatives from Wichita, Wichita Transit, Sedgwick County, Kechi, Derby, Valley Center, Kansas Department of Transportation, environmental specialists, airport authorities, and workforce representatives, the planning process has garnered insights from multiple perspectives. Over several months, the dedicated efforts of these stakeholders have laid the groundwork for a comprehensive plan poised to capitalize on expanding the EV market for the benefit of the WAMPO region.

Data collection and analysis form the bedrock of the plan's development. Collaborating with relevant agencies, the plan delves into current transportation patterns, charging infrastructure, and potential areas for EV adoption. This empirical foundation enables the formulation of informed strategies to harness the economic, environmental, and social benefits of electric vehicle integration in the WAMPO region.

Plan Development



Electric Vehicles

Electric vehicle technology is advancing, making EVs more affordable and diverse. They use electricity instead of gasoline, reducing emissions. Types include Battery Electric Vehicles (BEVs), Plug-in Hybrids (PHEVs), Hybrids (HEVs), and Fuel Cell Vehicles (FCEVs). This overview covers EV types and supporting infrastructure.

BATTERY ELECTRIC VEHICLE (BEVs)

Fully powered by electricity; they have no internal combustion engine, and they produce zero tailpipe emissions. More efficient compared to hybrids and plug-in hybrids.

BEV technology runs entirely on a battery-powered electric drivetrain. The electricity is stored in a large battery pack which can be charged by plugging it into the electricity grid.

PLUG-IN HYBRID ELECTRIC VEHICLE (PHEV)

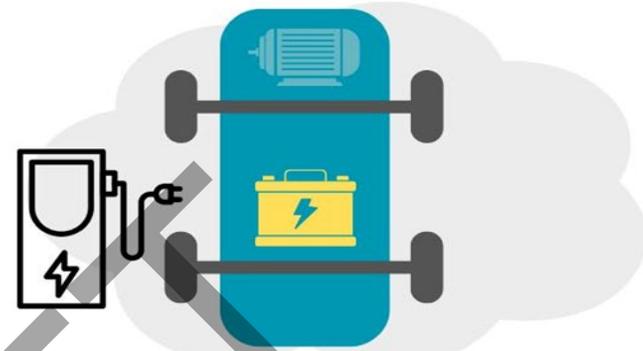
Uses both an internal combustion engine and a battery charged from an external socket (they have a plug). This means the vehicle's battery can be charged with electricity rather than the engine. PHEVs are more efficient than HEVs but less efficient than BEVs.

HYBRID ELECTRIC VEHICLE (HEV)

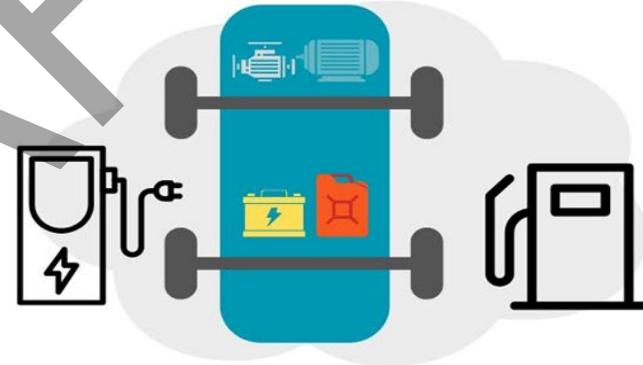
The vehicle uses both the internal combustion (usually petrol) engine and the battery-powered motor powertrain. The petrol engine is used both to drive and charge when the battery is empty. These vehicles are not as efficient as fully electric or plug-in hybrid vehicles.

FUEL CELL ELECTRIC VEHICLE (FCEV)

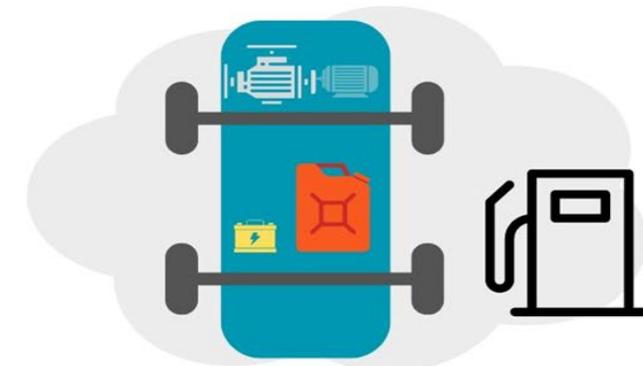
Electric energy is produced from chemical energy, for example, hydrogen. FCEVs are also known as zero-emission vehicles.



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Charging Infrastructure

Charging equipment for PEVs is classified by the rate at which the batteries are charged. Charging times vary based on how depleted the battery is, how much energy it holds, the type of battery, and the type of charging equipment (e.g., charging level and power output).

LEVEL 1 CHARGING

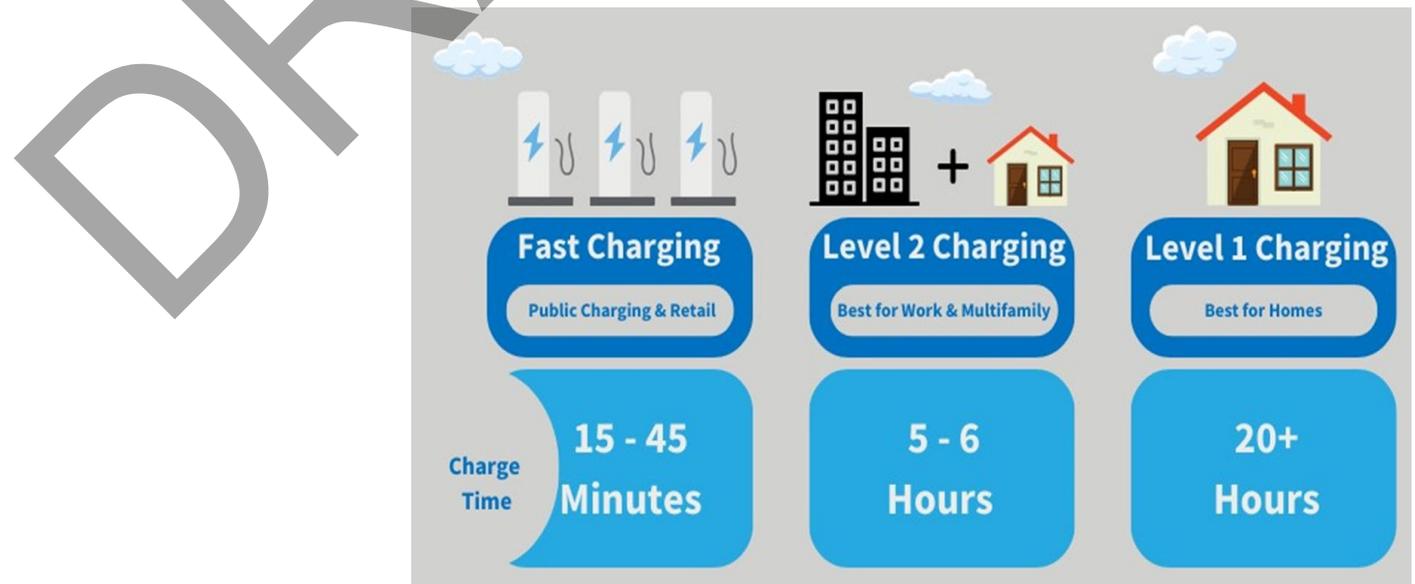
Charging an electric car with a Level 1 (L1) charger does not require any special equipment. You can plug your car into a regular 120-volt AC plug, though you will need to plug into a dedicated circuit that does not supply electricity to anything else in your house. Nearly all electric vehicles come with a cord that will fit a standard 3-prong outlet and the car. With L1, it will take about an hour of charging time to add a range of 3 - 5 miles to your vehicle. Because of the time needed, most people will charge their car this way when they are at home and overnight. Level 1 charging works well for plug-in hybrid electric vehicles (PHEVs) because they have smaller batteries.

LEVEL 2 CHARGING

Level 2 (L2) chargers are the most common chargers used for daily charging. They are faster than L1 but require special equipment. With L2, you can get up to 60 miles of range per hour of charging time and can fully charge an empty battery in 5-6 hours. This allows for use in a public or work environment, as vehicles are often parked for extended periods.

DIRECT CURRENT FAST CHARGING

Direct Current Fast Charging (DCFC) is much faster than L1 and L2, which makes it preferable for drivers on the go. The fastest speed enables rapid charging along heavy-traffic corridors. DCFC equipment can charge an electric battery up to 80 percent in just 15 minutes to 45 minutes. Most EVs have battery management systems to try to blunt any negative effects of DC fast charging on their battery. However, compared to Level 1 and Level 2 charging, DC fast charging can put more strain on batteries.



Plan Vision and Goals

The WAMPO EV Network Plan vision and goals were developed by first reviewing the NEVI Formula Program objectives and criteria for funding to deploy a network of EV chargers nationwide. Second, the project team conducted a review of the plan and developed transportation goals, system objectives, and guiding principles for the future.

PLAN VISION

To transform WAMPO into a sustainable, forward-thinking, and environmentally conscious transportation hub, leading the way in electric vehicle adoption and reducing our carbon footprint. Our vision is a future where clean and accessible electric transportation options are the norm, improving air quality, reducing greenhouse gas emissions, and enhancing the quality of life for all residents.

GOALS

- Infrastructure Expansion & Accessibility
- Incentives & Support
- Fleet Electrification
- Education & Awareness
- Clean Energy Integration
- Collaboration & Partnership

EV Network Plan Goals



Current EV Ownership in the WAMPO Region

Electric vehicle ownership is growing in the region. As of April 30, 2023, there were 117 registered electric vehicles, 17 electric hybrid vehicles, 499 hybrid vehicles, and 11 electric plug-in hybrid vehicles in Butler County. Sedgewick County has 952 electric vehicles, 714 electric hybrid vehicles, 2,942 hybrid vehicles, and 147 electric plug-in hybrid vehicles registered. Sumner County has 10 electric vehicles, 5 electric hybrid vehicles, 75 hybrid vehicles, and 3 electric plug-in hybrid vehicles. (Kansas Department of Revenue)

Current EV Infrastructure in the WAMPO Region

As of June 2023, there were 32 EV charging stations (8 public level 1 stations, 18 public level 2 stations, and 6 DC level stations) serving the WAMPO region. Locations and charging types are included on Map 3.5.1

FINDING PUBLIC CHARGING INFRASTRUCTURE

Drivers typically use mobile applications to locate public charging stations. EV drivers can find these charging locations by using several online resources. Additionally, each charging network (e.g. ChargePoint, PlugShare, Tesla, etc.) has its own web-based or mobile application to help its members find network-specific charging stations. Locating charging stations during regional travel is a crucial resource for EV owners, especially for the WAMPO region due to its growth.

CURRENT EV OWNERSHIP IN WAMPO REGION

Butler County



- Electric Vehicles 117
- Electric Hybrid Vehicles 17
- Hybrid Vehicles 499
- Electric Plug-in Hybrids 11

Sedgewick County



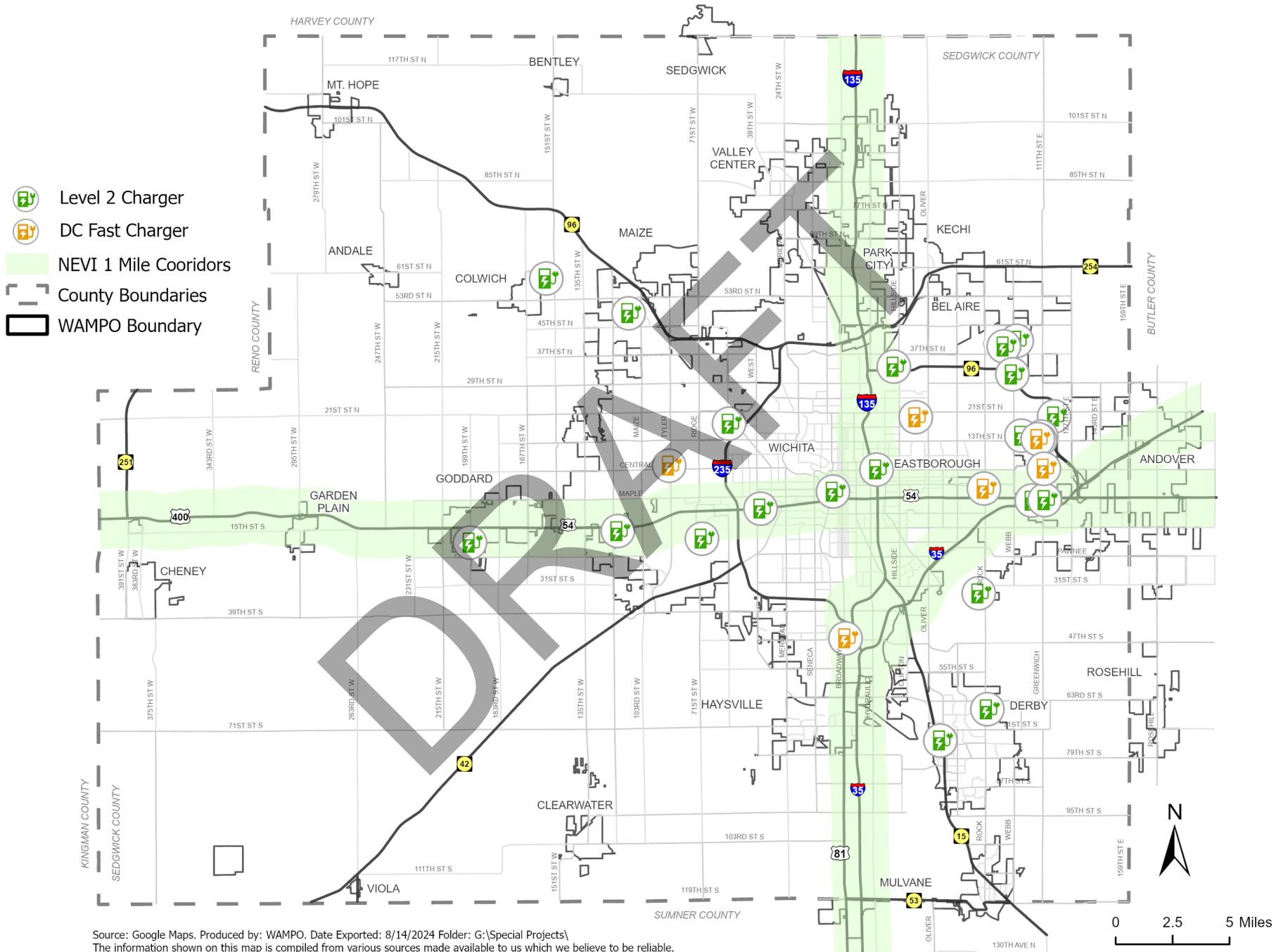
- Electric Vehicles 952
- Electric Hybrid Vehicles 714
- Hybrid Vehicles 2,942
- Electric Plug-in Hybrids 147

Sumner County



- Electric Vehicles 10
- Electric Hybrid Vehicles 5
- Hybrid Vehicles 75
- Electric Plug-in Hybrids 3

Map 3.5.1: Electric Vehicle Charging Stations in the WAMPO Region



Source: Google Maps. Produced by: WAMPO. Date Exported: 8/14/2024 Folder: G:\Special Projects\
 The information shown on this map is compiled from various sources made available to us which we believe to be reliable.

Summary

The WAMPO Electric Vehicle Network Plan aims to support the increasing adoption of plug-in electric vehicles (PEVs) by addressing both immediate needs and long-term goals, transforming the WAMPO region into an electric vehicle destination, corridor, and gateway. The plan outlines initial steps to encourage EV adoption, providing a comprehensive strategy for EV charging infrastructure and identifying barriers to overcome. This plan is designed to help public and private entities become familiar with the opportunities and challenges associated with EV vehicles and charging infrastructure, serving as a foundation for broader adoption.

Supporting Metropolitan Transportation Plan 2050 and the Charge Up Kansas NEVI Plan, the Electric Vehicle Network Plan aims to improve air quality and stimulate economic development by closing gaps in EV charging infrastructure and removing adoption barriers. The initiative is part of a broader national effort following the 2021 federal Bipartisan Infrastructure Law (BIL), which promotes modern infrastructure investments, including a national network of EV chargers. In Kansas, the focus is on upgrading and expanding charging stations to comply with NEVI guidelines, ensuring a reliable and accessible charging network along interstate corridors.

The WAMPO plan involves collaboration with various stakeholders, including city officials, transportation departments, environmental specialists, and community representatives, to gather insights and create a community-driven strategy. Data collection and analysis are crucial to identifying current transportation patterns and potential areas for EV adoption. The plan also reviews existing policies and proposes recommendations to foster an enabling environment for EV growth. Financial modeling, funding strategies, and community education efforts are integral to the plan's success, ensuring its feasibility, sustainability, and public support.

WAMPO ADDRESSING COMMENTS & CONCERNS

WAMPO will address diverse comments and concerns by taking a balanced approach to expanding EV infrastructure. They will develop a clear, transparent plan outlining the goals, benefits, and impacts, including environmental, health, and economic aspects. The plan will include timelines, milestones, and measurable objectives to keep the community informed and engaged.

WAMPO will engage stakeholders through public meetings and listening sessions to gather input and ensure continuous community involvement. They will strategically advise placement of Level 3 DC Fast Charging stations in key areas and Level 2 chargers in residential and workplace locations. WAMPO will encourage jurisdictions to seek funding for EV infrastructure and collaborate with the private sector and utility companies to share costs and benefits. They will also explore incentives, like tax breaks or subsidies, to encourage private investment in charging infrastructure.