Freight Plan

March, 2010

WAMPO

Wichita Area Metropolitan Planning Organization

Developed by the Wichita Metropolitan Planning Organization (WAMPO)

In cooperation with:

U.S. Department of Transportation
Federal Highway Administration
Kansas Department of Transportation
Local Supporting Agencies

Adopted: March 9, 2010

WAMPO

Wichita Area Metropolitan Planning Organization

455 North Main, 10th Floor
Wichita, Kansas 67202-1688
316.268.4457 phone
316.268.4390 fax
www.wampoks.org

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INTRODUCTION

The movement of freight is performed by multiple transportation modes; truck, rail, air, water, and pipeline. These modes work in concert to move freight from its origin (national, international, regional, or local) to the shops and stores consumers frequent, or directly to our homes. Each mode involves systems and infrastructure unique to that mode and various factors related to that infrastructure affect how efficiently freight is moved and delivered.

Freight movement is a function of the private sector but is dependent on governments and public agencies to facilitate that movement. Trucks delivering freight operate on the streets and highways owned and maintained by states, counties, and cities. Freight transport by air is dependent on the availability of publicly-owned airports and their resources, as well as the streets and highways that connect the air facilities to the freight distribution network. Railroads, arguably the most independent of all modes of freight movement, operate on infrastructure owned and maintained by private corporations; but they too depend on their infrastructure, and that of other modes, to accomplish their business plan. Tying all these modes together are intermodal connectors and transmodal facilities that function to transfer freight from one mode to another. All modes that move freight must work in concert and with the public sector to assure that the flow of freight is unfettered.

WAMPO

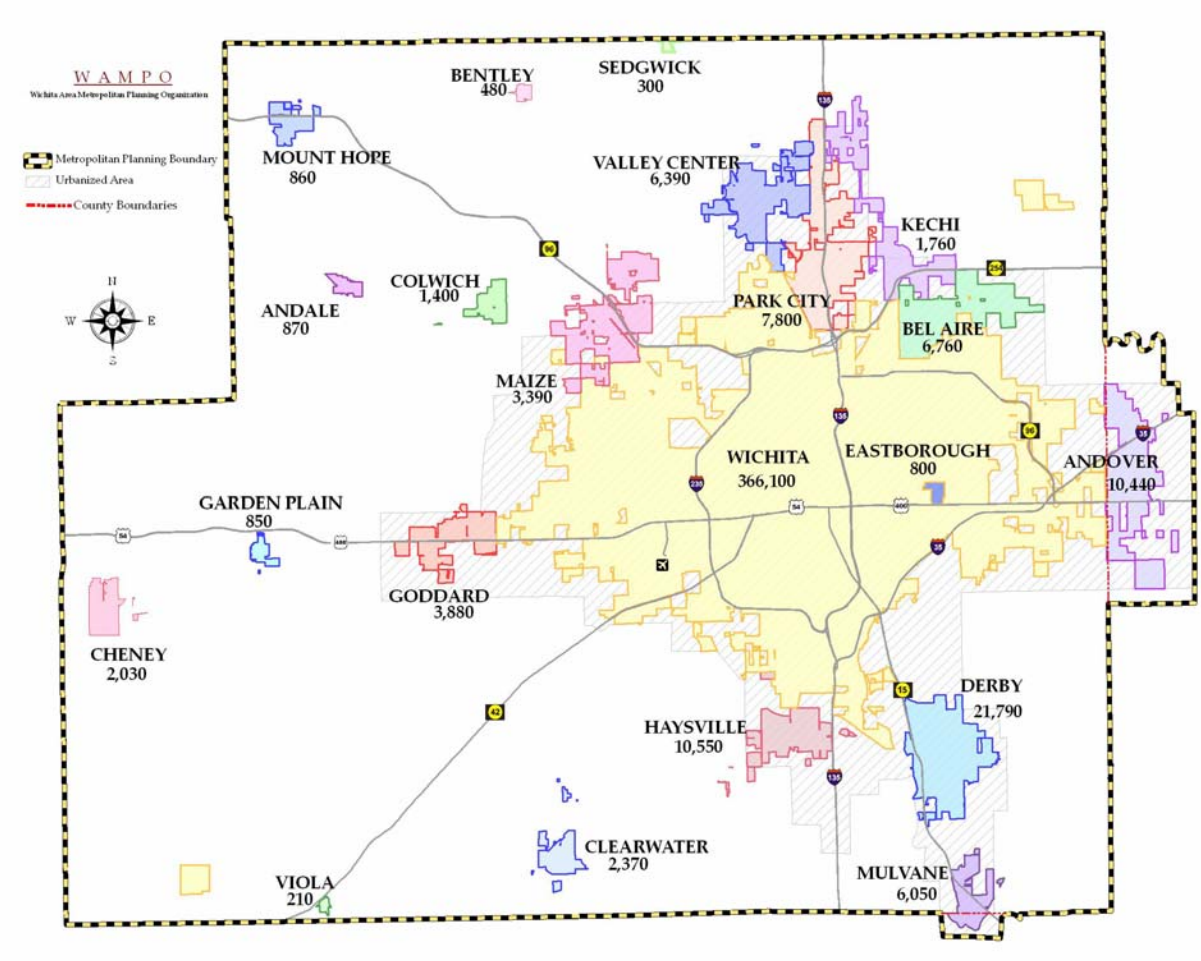
WAMPO is the Wichita Area Metropolitan Planning Organization. It is the governor-designated Metropolitan Planning Organization (MPO) for the region. Under 23 U.S.C. 134 and 49 U.S.C. 5303, WAMPO is to provide for a continuing, cooperative, and comprehensive multimodal transportation planning process for transportation and transportation-related projects in the WAMPO region identified in figure 1 on the following page. The WAMPO planning effort includes a multimodal approach to solving transportation issues. Freight movement is, and will continue to be, one of those issues.

Freight moves from its origin to its destination through multiple states, counties, metropolitan areas, and cities. Each jurisdiction, by the maintenance and update of the transportation systems under their charge, may affect how efficiently freight moves

into, out of, and through their boundaries. WAMPO is responsible for coordinating the efforts of the state and local governments, freight stakeholders, and the public in freight movement in the WAMPO region.

It is the intent of this plan to identify the transportation systems that exist in the WAMPO region that are used to move freight into, out of, and within the region. This plan will also address the factors and trends that dictate, effect, and influence the multiple modes of traffic and the flow of freight, and the procedures for planning and programming freight-related projects through the WAMPO transportation planning process.

figure 1: **WAMPO Metropolitan Planning Area Boundary**



source: Metropolitan Area Planning Department (MAPD) 2008 population estimates.

The WAMPO region consists of Sedgwick County, Kansas; the cities within Sedgwick County; and small portions of Butler and Sumner counties in and around the cities of Andover and Mulvane. Decisions on what transportation improvements are to be made belong to these jurisdictions. The Kansas Department of Transportation (KDOT) is also a major stakeholder in deciding what transportation improvements are to be made, especially on state-owned facilities. WAMPO, as the MPO, assists local jurisdictions in identifying potential freight projects and administers certain categories of federal transportation funding to accomplish these tasks.

Transportation and transportation-related projects that have participating federal funds have those funds approved through the WAMPO transportation planning process. The Federal Highway Administration (FHWA), Federal Aviation Administration (FAA), and the Federal Rail Administration (FRA) are also stakeholders in the planning for freight movement. Each federal agency has input into decisions on the mode of transportation that they oversee. The biggest contributions that federal agencies have related to freight movement are the rules and regulations on how freight may be transported. The federal agencies also provide and administer federal funding through their respective agencies to accomplish transportation improvements.

Importance of Freight Movement

Freight movement is an important component of the national, regional, and local economies. The term "freight" is used generically throughout this plan to mean the commercial transport of goods. Goods need to be shipped from their point of origin to their final destination. The term "goods" used in the plan refers to all items, except services, that can be moved commercially. Freight movement can be by truck, rail, air, water, or pipeline; but usually freight movement is accomplished by a combination of modes. Freight arriving from other countries in container ships at major U.S. maritime ports, or goods manufactured in the U.S., are transferred to rail, trucks, or pipelines and shipped to other distribution centers for additional modal transfers. These goods eventually arrive at shopping malls, grocery stores, car dealers, department stores, other manufacturing centers, or directly to our homes.

Freight plays a significant role within the WAMPO region. As consumer demands increase, the transportation system throughout the region and nation will experience an increase in freight movements (by truck, rail, air, and waterway). According to the

FHWA, the total amount of freight tonnage that moves through the nation's transportation network is expected to nearly double by 2035.

The U.S. Congress and the U.S. Department of Transportation in the last 16 years have placed a greater emphasis on freight and freight movement and have incorporated freight movement into the last three transportation legislations (figure 2).

figure 2: **Transportation Legislation 1993 to 2009**

Federal Transportation Legislation		
1993 - 1998	ISTEA	Intermodal Surface Transportation Equity Act
1998 - 2005	TEA-21	Transportation Equity Act for the 21st Century
2005 - 2009	SAFETEA-LU	Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users

source: WAMPO

The Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) passed in 2005, expired September 30, 2009. SAFETEA-LU is under Congressional continuing resolution until new transportation legislation can be passed. It remains the guiding legislation for transportation planning. SAFETEA-LU maintains seven planning factors guiding MPO planning efforts. Of the seven planning factors included in SAFETEA-LU, three have a direct bearing on freight movement and planning:

- To support the economic vitality of the United States, the states, nonmetropolitan areas, and metropolitan areas, especially by enabling global competitiveness, productivity, and efficiency;
- To increase the accessibility and mobility of people and for freight; and
- To enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.

These planning factors continue the emphasis on freight movement and freight planning efforts initiated under previous authorizing legislation, the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century of 1998 (TEA-21). Freight planning and efficient and effective freight movement, in all probability, will continue to be prime considerations in new authorizing transportation legislation expected to be passed in early 2011. Issues currently being discussed include, but are not limited to:

- Creating a dedicated federal Freight Trust Fund modeled after the Highway Trust Fund to pay for freight-only projects;
- A one percent "excise tax" on all freight bills of lading to pay for freight-only projects; and

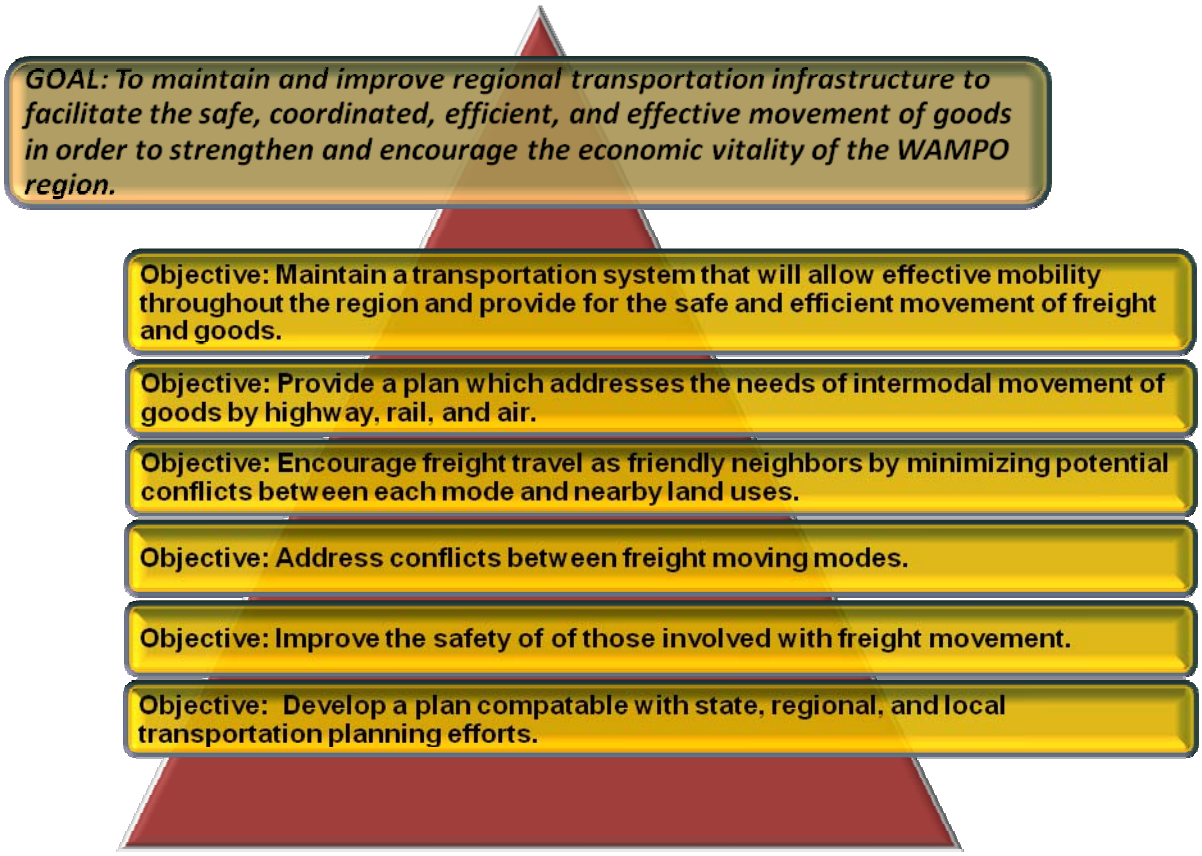
- The development of a national multimodal strategic freight plan.

GOALS

Goals are achieved by defining a set of objectives to meet, and strategies to accomplish those objectives. WAMPO offers the following goal to facilitate the movement of goods into, out of, within, and through the WAMPO region:

To maintain and improve regional transportation infrastructure to facilitate the safe, coordinated, efficient, and effective movement of goods in order to strengthen and encourage the economic vitality of the WAMPO region.

figure 3: **WAMPO Freight Goal and Objectives**



source: WAMPO

WAMPO has established six overall objectives (figure 3 on the previous page) that this plan will address to meet the stated goal. Specific strategies to meet these objectives, and ultimately the goal of this plan, will be developed over time as part of the WAMPO transportation planning efforts.

figure 4: **Suggested Strategies for Freight Movement Improvements**

Issue	Task	Strategy
Congestion and Bottlenecks.	Improve system productivity.	Encourage passenger mode shift to public transportation; develop strategies to reduce peak-hour goods movement.; promote reduction of empty trucks on highways; deploy ITS measures to facilitate traffic flow.
Predicted Freight In, Out, and Through the WAMPO Region.	Balanced system.	Develop strategies to reduce growth for VMT for cars and trucks; coordinate freight-intensive land use with transportation.
System Preservation.	Maintain system condition and performance.	Continued maintenance of key freight corridors; Invest in structurally-deficient or structurally obsolete facilities; develop transportation operations strategies (traffic information, truck routing, etc.)
Rail Capacity Constraints.	Improve system productivity.	Use existing and new rail capacity to encourage shift of freight from highway to rail; expand and coordinate intermodal facilities.
Highway, Rail, and Airport Safety	Safe operating environment.	Reduce crashes and incidents; educate drivers; maintain systems; reduce conflicts at rail/highway crossings.
Freight and Air Quality	Reduce freight contributions to emissions.	Promote strategies to reduce truck and rail locomotive idling. Reduce truck VMT. Link environmental and transportation planning.
Land/Use Zoning Conflict	Increase compatibility of land uses.	Identify ample locations for freight expansion through regional industrial master planning and clustering of freight activities with transportation facilities. Coordinate with local governments.
Air Cargo	Increase freight presences at ICT.	Continue to promote ICT as a freight option and to expand facilities accordingly
Insufficient Coordination with Stakeholders	Improve coordination.	Public Private partnerships, Knowledge of WAMPO planning process, public and stakeholder involvement.

source: WAMPO

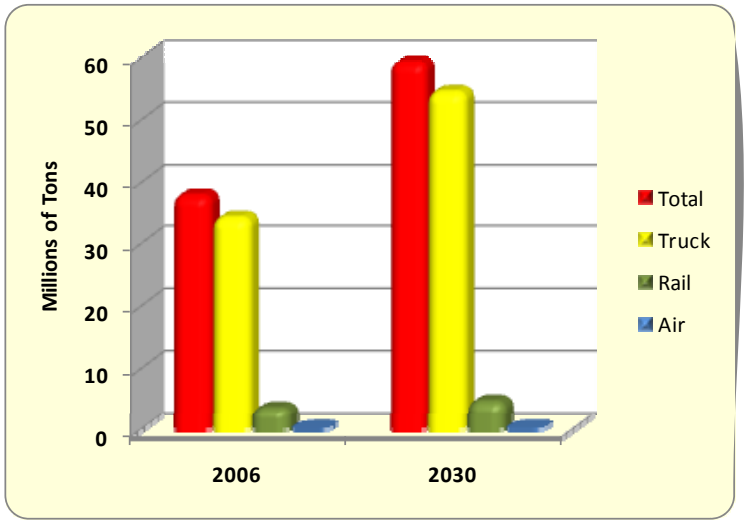
WAMPO, as a MPO, is a regional planning agency and does not make policy for other agencies or private concerns. WAMPO offers the objectives and strategies contained in this plan as recommendations for implementation. Implementation of any capital improvements is the responsibility of local jurisdictions, modal principals, or a combination of both. WAMPO, through its transportation planning process, will build on the suggested strategies (figure 4) and seek transportation and transportation-related projects to move forward in meeting the goal and objectives of this plan.

To meet the goal of this plan, it is first needed to understand the flow of freight, the multiple commodities comprising that freight, and the magnitude of freight movement into, out of, and through the WAMPO region.

COMMODITY FLOW

The U.S. Census Bureau defines a commodity as products that an establishment produces, sells, or distributes. A shipment is considered an individual movement of commodities from an establishment to a customer or to another location of the originating company (includes a warehouse, distribution center, retail or wholesale outlet). A shipment may use one mode (truck, railroad, air cargo, waterway, or pipeline) or a combination of modes to transport commodities as freight. Commodities consist of everything you use, or are used, to manufacture those goods. In 2006 37.7 million tons of freight was shipped into, out of, or within the WAMPO region. That amount is projected to increase by 57% by the year 2030 to 59.3 million tons (figure 5). The value of these shipments totaled $68.8 billion in 2006 and is expected to increase 89.6% to $130.4 billion by 2030.

figure 5: **Total Freight by Mode 2006 and 2030**

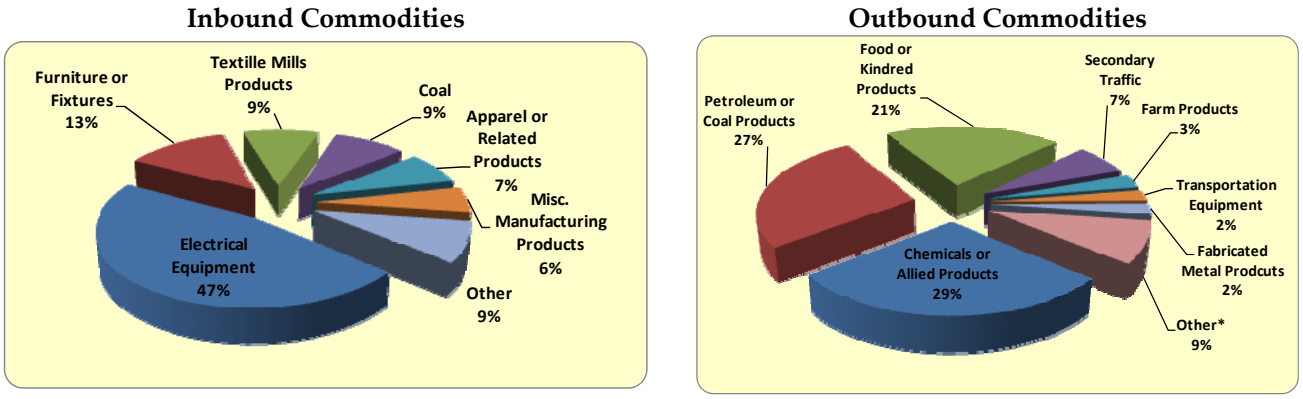


source: 2006 TRANSEARCH® Insight, Cambridge Systematics, Inc.

Commodities vary in type, ranging from basic building materials for major appliances and homes to fresh fish and other foods. The top ten commodities shipped out of and into the WAMPO region in 2006 are identified in figure 6 on the following page.

Nonmetallic minerals (33%) and food (12%) are the most common freight items shipped into the WAMPO region, while petroleum/coal (27%) and chemical/allied products (29%) are the most common items shipped out. Petroleum/coal products remain the largest commodity shipped within the WAMPO region, increasing 1.25% from 2006 to 2030.

figure 6: **Top Ten Inbound and Outbound Commodities by Ton: WAMPO Region 2006**



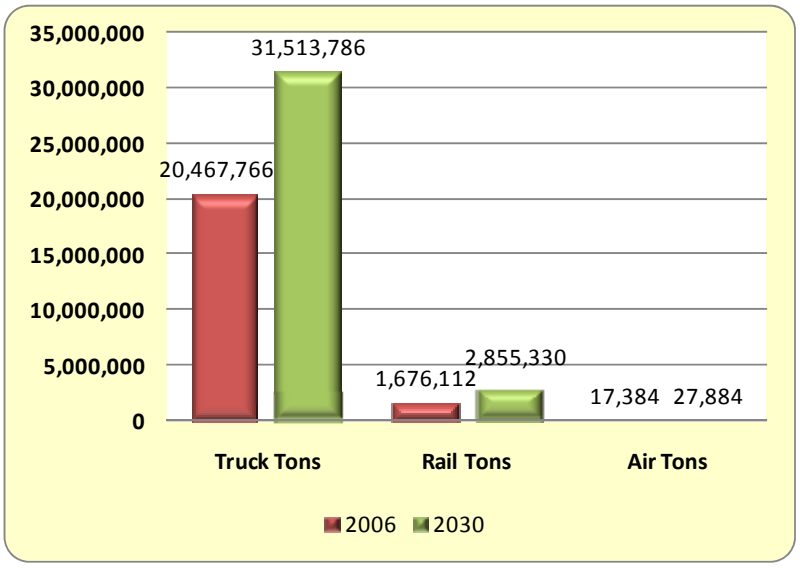
source: 2006 TRANSEARCH® Insight, Cambridge Systematics, Inc.

Inbound Commodities

In 2006, over 20 million tons of various goods were shipped into the WAMPO region by truck. In comparison, 1.6 million tons of freight was shipped by rail and only 17 thousand tons by air (figure 7). Freight movement by truck is anticipated to increase approximately 35% from 20.5 million tons to 31.5 million tons between 2006 and 2030. Rail and air freight tonnage is also projected to increase by 41% and 36%, respectively.

Although overall tonnage shipped into the WAMPO region is anticipated to increase between 2006 and 2030, the relative percentage of goods by truck, rail, and air flowing into the WAMPO region remains the same.

figure 7: **Inbound Freight by Mode 2006 and 2030** (x1,000)



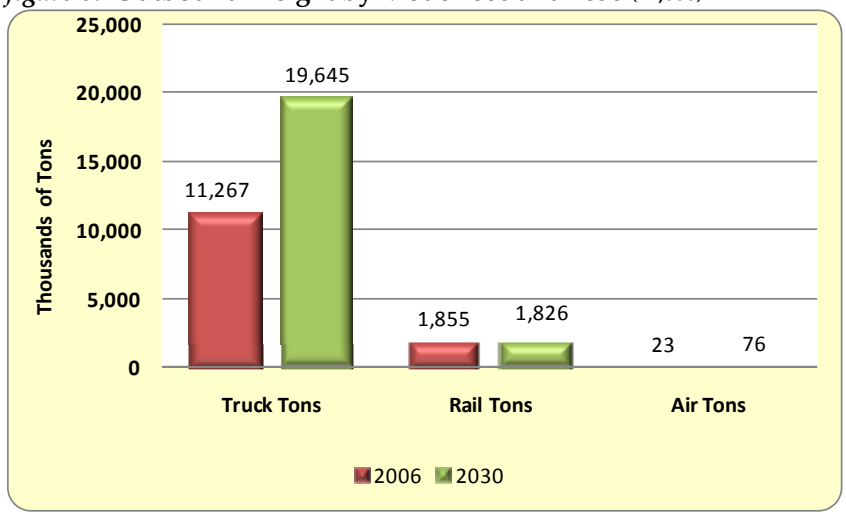
source: 2006 TRANSEARCH® Insight, Cambridge Systematics, Inc.

Outbound Commodities

Over 11 million tons of freight was shipped from the WAMPO region to points outside the region by truck in 2006. Rail and air freight collectively represent approximately 1.9 million tons. Freight shipped from the region by truck is estimated to increase slightly over 74% between 2006 and 2030 to 19.6 million tons. Air freight from the region is projected to

only increase slightly by 75.6%. Freight moved by rail remains somewhat steady at 1.8 million tons. Figure 8 represents the tons of commodities that originated in and were shipped to points outside of the WAMPO region.

figure 8: **Outbound Freight by Mode 2006 and 2030** (x1,000)

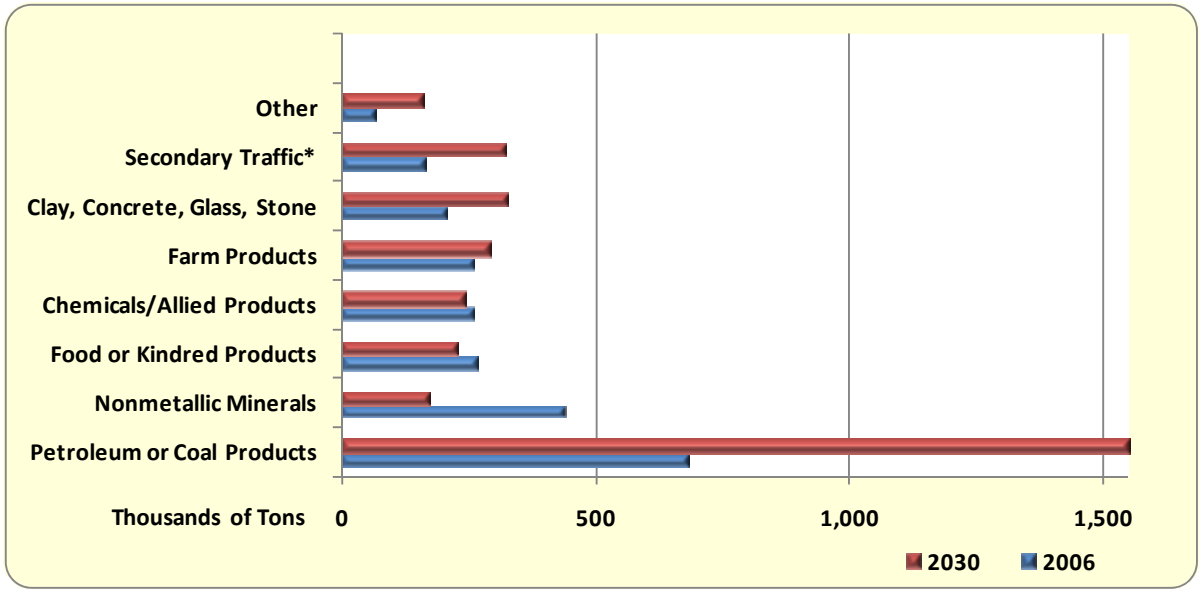


source: 2006 TRANSEARCH® Insight, Cambridge Systematics, Inc.

Intra Region Freight Movement

Commodities shipped within the WAMPO region (figure 9) total 2.4 million tons across all modes. As expected, shipment by truck dwarfs air and rail movement, representing nearly 100% of all freight movement. Intra region freight movement is only expected to rise 29% to 3.3 million tons by all modes, representing less than a one percent change between 2006 and 2030.

figure 9: **Commodities Shipped within the WAMPO Region 2006 and 2030**



* Secondary traffic is defined as freight movement associated with a distribution center or warehouse serving as an intermediate reship facility.

source: 2006 TRANSEARCH® Insight, Cambridge Systematics, Inc.

Freight by Truck, Rail, and Air

Overall, freight movement into, out of, and within the WAMPO region is dominated by trucks. In 2006, trucks represented 91% of all freight movement in the WAMPO region. Rail came in a very distant second at 9%, while air freight movement represented less than 1% of all freight movement in the WAMPO region. This trend is predicted to change little in 2030. Rail is anticipated to lose 1% of the freight it moves to trucks, resulting in 92% of all freight being moved by truck and 8% by rail in 2030. Air freight movement is projected to remain less than 1% of all freight movement in the WAMPO region in 2030.

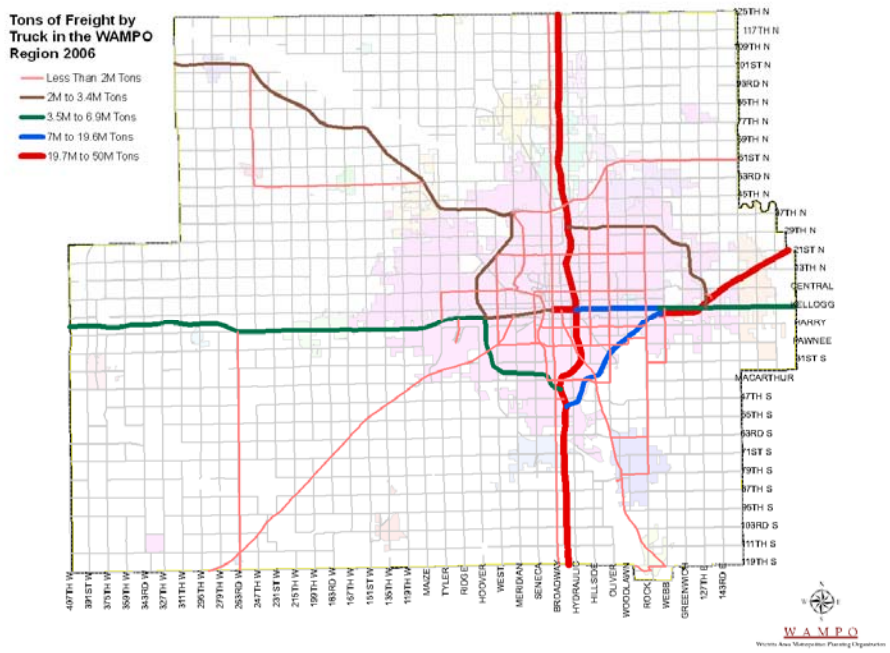
Through Freight Movement

Most evidence suggests that the through movement of freight accounts for the majority of freight affecting transportation systems in the region. The 2006 Transearch data used to demonstrate commodity flow covers only county-to-county freight movement and freight movement through the WAMPO region is not identified in the data. The WAMPO region is served by two National Highway System (NHS) High Priority Corridors: US-50/400 and I-35. US50/400 is designated as the High Plains Corridor which is a major east west freight corridor. I-35/Kansas Turnpike is part of the I-35 Corridor and is a major North American Free Trade Agreement (NAFTA) trade route for freight movement between Canada, Mexico, and the United States.

The amount of tonnage moved on the WAMPO Truck Network (figure 10 on the following page) shows heavy freight movement on I-35/Kansas Turnpike and I-135. US-54/400 and I-235 show moderate levels of freight being moved through the region. Local streets, as expected, carry less through freight but function as the collector /distributor system for the larger networks and for internal and local freight movement. These trends are not anticipated to change much through 2030. Freight flow on US-54/400 increases noticeably between I-135 and I-235 and freight movement increases overall on the WAMPO Truck Network in 2030.

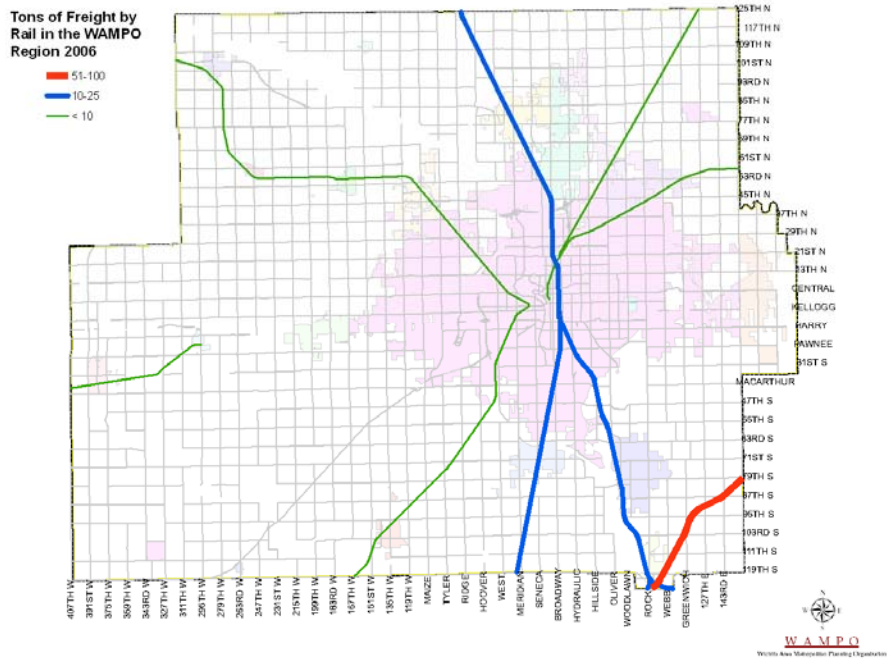
Freight moved through the region on rail (figure 11 on the following page) is done so on the Burlington Northern – Santa Fe Railroad (BNSF) and the Union Pacific Railroad (UPRR). The BNSF hauls between approximately 51 and 100 million tons of freight annually through the region. The UPRR hauls 10 to 25 million tons of freight per year through the region.

***figure 10*: Tons of Freight Moved by Truck in the WAMPO Region**



source: 2006 TRANSEARCH® Insight, Cambridge Systematics, Inc.

***figure 11*: Tons of Freight Moved by Rail in the WAMPO Region**

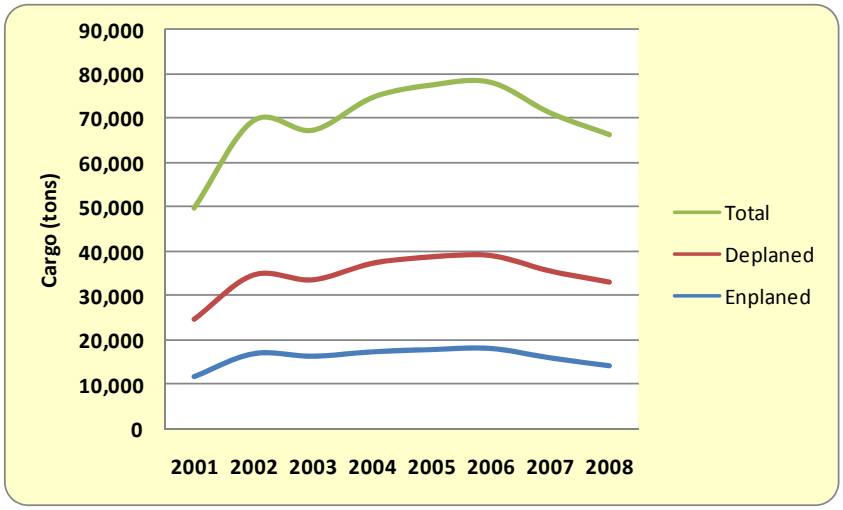


source: 2006 TRANSEARCH® Insight, Cambridge Systematics, Inc.

The Wichita Mid Continent Airport (ICT) is one of fourteen airports in the state of Kansas that support air cargo operations and the only airport in the WAMPO region to do so. It serves as a local market station, in that inbound cargo is destined for the surrounding market area.

ICT is one of only two airports in Kansas that support scheduled air cargo service, and operates and maintains runways that can handle wide-body aircraft. As such, ICT accounts for the majority of air cargo tonnage shipped into and out of Kansas. It is anticipated that ICT will enplane and deplane approximately 78,000 tons of freight in 2023. This is up 78% from the 33,000 tons of freight enplaned and deplaned in 2008 (figure 12).

figure 12: **Tons of Cargo Enplaned and Deplaned at ICT**



source: Wichita Airport Authority Aviation Activity Report

The Wichita area is home to several aircraft manufacturers. These manufacturers either own or contract for airport facilities in the WAMPO region. Multiple parts and materials used to manufacture aircraft arrive at aircraft factories by truck, rail, or air. The final product is then flown out under its own power. As such, there is a large imbalance between the transportation demands of the inbound freight used to make the aircraft versus the relatively small demands on the transportation system to deliver the final product.

Other Freight Moving Modes

The commodity flow data shows that trucks, rail, and air provide the bulk of freight movement for the WAMPO region. Two other modes that can carry commodities are waterways and pipelines. Although waterways can provide an efficient means of shipping commodities, there are no navigable waterways within the WAMPO region. As such, this plan does not address freight moved on waterways.

Pipelines do exist in the WAMPO region but offer limited commodity movement. Commodity flow through the pipeline networks vary by the inventory, type of commodity needed, and the season of the year. Various commodities flow from a source to a destination, usually a modal transfer point. The commodity is then transferred to another freight mode for delivery, or to another modal transfer point before it reaches its final destination.

The size and lengths of the pipelines determine the amount of product that can be moved. Figure 13 identifies known pipeline operations in the WAMPO region, the commodity they transport, pipeline diameter and length, and the calculated quantity in estimated gallons that can be transported. The amount of petro-chemical and petroleum products moved through the WAMPO region at any given time is estimated to be seven million gallons.

figure 13: **Commodity Flow through Pipelines**

Carrier	Commodity	Pipline Diameter (inches)	Pipline Length (miles)	Quantity (est. gallons)
Williams	Natural Gas	6	102.98	798,635
Williams Eneergy	Natural Gas	6	9.47	73,442
Conoco	Diesel/Gasoline/Jet Fuel	10	13.68	294,699
Equilon Shell	Crude Oil/Liquid Pretrolium Gas	4	28.95	99,784
Equilon Shell	Crude Oil/Liquid Pretrolium Gas	6	28.95	224,514
Equilon Shell	Crude Oil/Liquid Pretrolium Gas	10	28.95	623,651
Koch Petroleum	Refined Petroleum Products	10	33.61	724,038
Phillips Chisholm	natural Gas Liquids	10	19.05	410,382
Philips Standish	Butane/Diesel/Kerosene/Propane/Gasoline	10	60.89	1,311,714
Farmland Industries	Crude Oil	6	19.03	147,582
Getty Gas Gathering	Natural gas	12	37.94	1,176,936
Kansas Industries Energy Supply	natural Gas	4	13.71	47,255
Jayhawk	Crude Oil	8	56.07	773,043
Kinder Morgan Energy Partners	Liquid Petrolium Gas	8	13.65	188,194
Kaneb	Fuel Oil/Gasoline	8	12.39	170,822

source: Commodity Flow Survey for Sedgwick County, Kansas, March 2003

FREIGHT TRENDS

Trends in freight movement are dependent on several factors; the most common being changes in industrial composition, shifting population patterns, and growing income. These trends all contribute to freight demand and influence how and where freight is shipped. Other trends in freight movement include fuel costs, land use changes, and market-based models such as on-demand delivery which emphasizes the need to move freight as quickly and efficiently as possible.

The potential to increase business and industry in existing, as well as new and emerging technologies, can change the dynamic of freight movement in the future. Efforts by local groups and agencies (Chambers of Commerce, Economic Development Corporations, Kansas World Trade Center, etc.) to recruit these industries would increase the flow of freight into and out of the region and place more demands on the existing transportation systems.

Industrial composition

Freight transportation in the region reflects the industries and businesses that make up its economy. The level of demand for commodities, as well as the modes that are used to ship these commodities, are driven by the characteristics of the economy. The availability of any given mode, as well as the supply chain requirements (size, weight, value, etc.) to meet the inbound and outbound needs of the industry determine which freight mode will be used. Industry and businesses can be divided into two groups, Goods-Dependent industries and Service industries, based on their dependence on freight transportation services (figure 14).

figure 14: Goods-Dependent and Service Industry Summary

Goods-Dependent Industries	Service Industries
Agriculture, forestry, fishing, and hunting Mining (including oil and gas extraction) Utilities Construction Manufacturing (durable and nondurable goods) Wholesale Trade Retail Trade Transportation and Warehousing (excludes postal service)	Information Finance and Insurance Real estate and rental and leasing Professional and technical services Management of companies and enterprises Administrative and waste services Educational services Health care and social assistance Arts, entertainment, and recreation Accommodation and food services Other services, except government Government (Federal civilian, Federal military, state, and local)

source: U.S. Bureau of Economic Analysis

Goods-Dependent industries are businesses that rely on transportation to receive raw supplies and manufactured goods and to send their refined/finished product to market. Those markets may be local, regional, national, or international. Service industries are not as dependent on movement of raw or manufactured materials, but they do rely on shipments of materials to support their business. Goods-Dependent industries represent, on average (1997-2008), 38% of the gross domestic product by industry nationwide and 43% of the gross state product by industry in the state of Kansas. Goods-Dependent industries for the WAMPO region cannot be separated from gross

state product totals due to disclosure requirements (figure 15). Employment levels within the individual Goods-Dependent and Service industries (figure 16) may indicate the general trend for each type of industry in the WAMPO.

figure 15: **Gross Products for the Nation, State, and Region**

Year	Gross National Product (Millions of Dollars)			Gross State Product (Millions of Dollars)			Gross Regional Product (Millions of Dollars)		
	Goods-Dependent	Service	Total	Goods-Dependent	Service	Total	Goods-Dependent	Service	Total
1997	$3,349,569	$4,888,424	$8,237,993	$33,333	$38,737	$72,070	NA	NA	NA
1998	$3,491,499	$5,188,158	$8,679,657	$34,444	$41,561	$76,005	NA	NA	NA
1999	$3,644,873	$5,556,264	$9,201,137	$34,790	$43,875	$78,665	NA	NA	NA
2000	$3,826,516	$5,922,586	$9,749,102	$36,597	$46,214	$82,811	NA	NA	NA
2001	$3,825,387	$6,232,783	$10,058,170	$37,915	$48,515	$86,430	(D)	(D)	$20,283
2002	$3,883,721	$6,514,682	$10,398,403	$38,001	$51,571	$89,572	(D)	(D)	$20,587
2003	$4,038,307	$6,847,865	$10,886,172	$39,185	$54,374	$93,559	(D)	(D)	$20,302
2004	$4,329,076	$7,277,967	$11,607,043	$41,173	$57,254	$98,427	(D)	(D)	$21,155
2005	$4,594,459	$7,744,545	$12,339,004	$43,403	$59,485	$102,888	(D)	(D)	$22,111
2006	$4,907,334	$8,183,442	$13,090,776	$47,751	$62,150	$109,901	(D)	(D)	$25,727
2007	$5,057,040	$8,658,701	$13,715,741	$50,678	$66,307	$116,985	(D)	(D)	$26,859
2008	$5,127,401	$9,038,163	$14,165,564	$52,874	$69,856	$122,730	(D)	(D)	$28,541

source: U.S. Bureau of Economic Analysis

figure 16: **Employees by Occupation (age 16 and over) for Kansas and the WAMPO Region**

Employess by Occupation (age 16 and over)	1990				2000			
	Area		Percent		Area		Percent	
	Kansas	WAMPO Region	Kansas	WAMPO Region	Kansas	WAMPO Region	Kansas	WAMPO Region
Total Employees (age 16 and over)	***1,172,214***	***198,134***	***100.00%***	***100.00%***	***1,316,283***	***219,098***	***100.00%***	***100.00%***
Goods-Dependent Industries								
Agriculture, forestry, fishing and hunting, and mining:	72,878	4,380	***6.22%***	***2.21%***	50,508	1,732	***3.84%***	***0.79%***
Construction	61,897	9,464	***5.28%***	***4.78%***	85,298	13,113	***6.48%***	***5.98%***
Manufacturing	196,485	52,299	***16.76%***	***26.40%***	197,960	53,710	***15.04%***	***24.51%***
Wholesale trade	50,637	8,348	***4.32%***	***4.21%***	43,786	7,105	***3.33%***	***3.24%***
Retail trade	193,262	32,739	***16.49%***	***16.52%***	151,262	25,069	***11.49%***	***11.44%***
Transportation and warehousing, and utilities:	87,555	11,860	***7.47%***	***5.99%***	68,864	8,579	***5.23%***	***3.92%***
Total G-I Employees	***662,714***	***119,090***	***56.54%***	***60.11%***	***597,678***	***109,308***	***45.41%***	***49.89%***
Service Industries								
Information	N/A	N/A	N/A	***N/A***	44,030	4,765	***3.35%***	***2.17%***
Finance, insurance, real estate and rental and leasing:	73,632	11,859	***6.28%***	***5.99%***	80,129	11,963	***6.09%***	***5.46%***
Professional, scientific, management, administrative, and waste management services.	76,573	14,586	***6.53%***	***7.36%***	94,768	15,842	***7.20%***	***7.23%***
Educational, health and social services:	215,935	31,439	***18.42%***	***15.87%***	288,200	43,014	***21.89%***	***19.63%***
Arts, entertainment, recreation, accommodation and food services:	12,892	2,439	***1.10%***	***1.23%***	91,807	16,628	***6.97%***	***7.59%***
Other services (except public administration)	78,595	12,534	***6.70%***	***6.33%***	61,122	10,307	***4.64%***	***4.70%***
Public administration	51,873	6,187	***4.43%***	***3.12%***	58,549	7,271	***4.45%***	***3.32%***
Total SI Employees	***509,500***	***79,044***	***43.46%***	***39.89%***	***718,605***	***109,790***	***54.59%***	***50.11%***

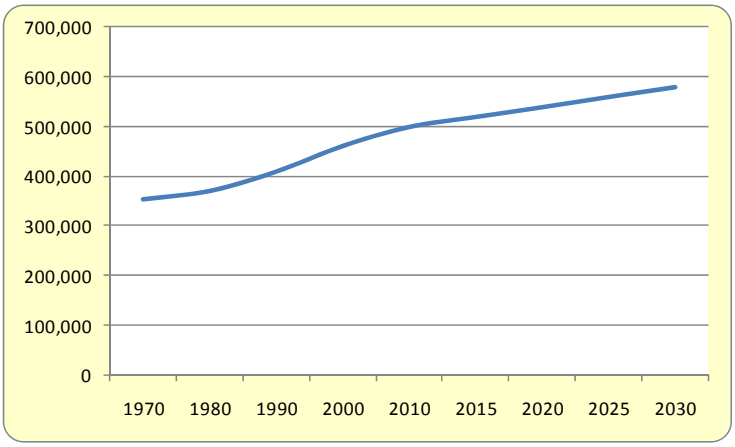
source: U.S. Bureau of Economic Analysis

The number of people employed by Goods-Dependent industries in the WAMPO region has declined from approximately 60% of the work force in 1990 to approximately 50% in 2000. The decline in Goods-Dependent industry in the state of Kansas reflects a similar trend. Goods-Dependent industries in Kansas declined from 56% of the workforce in 1990 to 45% in 2000.

Population

Population in the WAMPO region has shown a steady increase over the last 30 years (figure 17), and is predicted to increase through 2030. Employment opportunity and quality of life have contributed to population growth in the region. In July 2006, CNN/Money and *Money* magazine ranked Wichita (the largest city in the WAMPO region) 9th on its list of the 10 best U.S. big cities in which to live. In 2008, MSN Real Estate ranked Wichita 1st on its list of most affordable cities.

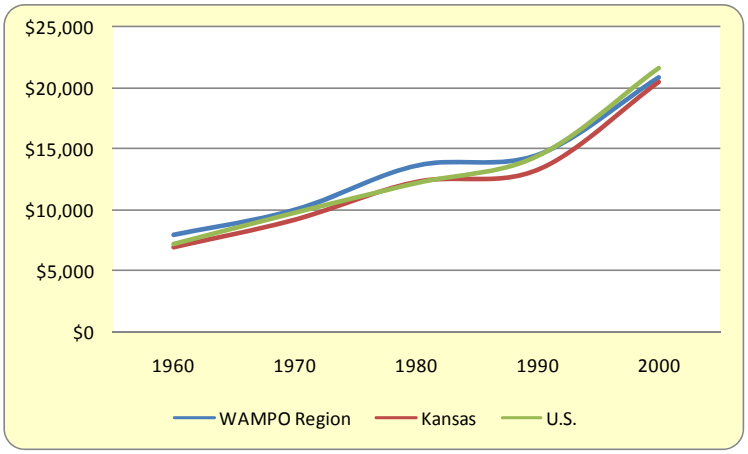
figure 17: **Population Trends in the WAMPO Region**



source: U.S. Census of the Population

Population in the WAMPO region saw an approximate 30% increase in population between 1970 and 2000 and is expected to grow another 20% between 2000 and 2030. These growth rates exceed those experienced by the state of Kansas for the same time frame. The change in population in Kansas grew 26% from 1970 to 2000 and is anticipated to grow 9% between 2010 and 2030.

figure 18: **Per Capita Income - U.S., Kansas, & the WAMPO Region**



source: U.S. Census of the Population

Per Capita Income

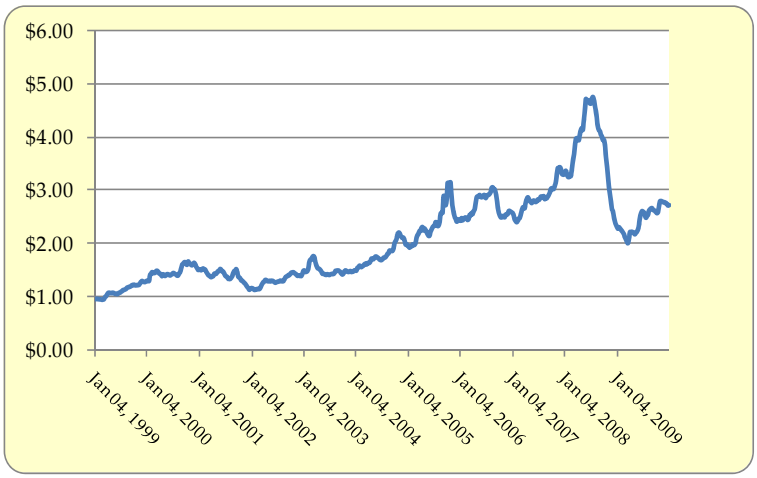
Per capita income (figure 18)

reflects the relative economic well-being of the people in the WAMPO region, and the nation as well. It can be used as a barometer for the demand for goods and services, which in turn affects demand for freight transportation. Per capita income in the WAMPO region has increased steadily in the last 40 years and has kept pace with the State of Kansas and the U.S.

Fuel Costs

Over the last five years the escalating cost of fuel has had a definite effect on the movement of freight. Business models once sought to maximize profit by outsourcing to low labor cost regions, creating complex supply chains thousands of miles long. This model worked well when the cost of transportation was relatively inexpensive. With the recent rise in the price of fuel, provoked by a number of converging political and economic influences (oil production, international terrorism, political unrest), the way companies ship goods is changing. The cost of diesel fuel saw a steady increase from 1999 to 2009 (figure 19). It peaked at $4.70 (national average) per gallon in July of 2008. Higher fuel costs mean higher delivery costs and that increase is passed on to the consumer.

figure 19: **Weekly U.S. Retail On-Highway Diesel Prices**



source: Energy Information Administration

Just-In-Time Delivery

New business models based on a global supply chain are emphasizing the use of logistics strategies to bring supplies to manufacturers for assembly, packaging, and delivery. Businesses are reducing the amount of inventory that they maintain on site in favor of Just-In-Time delivery of inventory. Just-In-Time delivery is an inventory strategy that strives to improve a business's return on investment by reducing in-process inventory and associated carrying costs. The days of having an on-site warehouse to store goods and materials required for the manufacture of goods have given way to smaller, more frequent deliveries of materials to supply the manufacturing process. Just-In-Time delivery requires a reliable transportation system that can provide a predictable, consistent movement of freight across the entire journey.

Just-In-Time delivery also relies on the right type and mix of modes to deliver the inventory in a timely fashion. The freight industry estimates that a business loses $1,000,000 for every hour a freight delivery is delayed. With no supplies delivered, production lines sit idle, orders are delayed, and employees are either released until the delivery is made, or kept on the clock while waiting for the materials they need to do their job. The freight transportation networks become an important link in the supply chain in assuring that materials are delivered on time.

Public-Private Partnerships

Involving the private sector in transportation planning for freight can be very beneficial to the transportation planning process. The private sector can bring a new perspective to transportation planning and can provide first-hand insight on:

- Bottlenecks and infrastructure;
- How passenger-oriented improvements may affect the flow of freight; and
- Providing information helpful to planning efforts (e.g., data), and can help leverage financial and political resources for implementing needed improvements.

Public-private freight planning partnerships should be targeted to meet the needs of individual areas. Twenty-three states have Public-Private Partnership enabling language in state legislation. Kansas is not one of those states.

Congestion and Delays

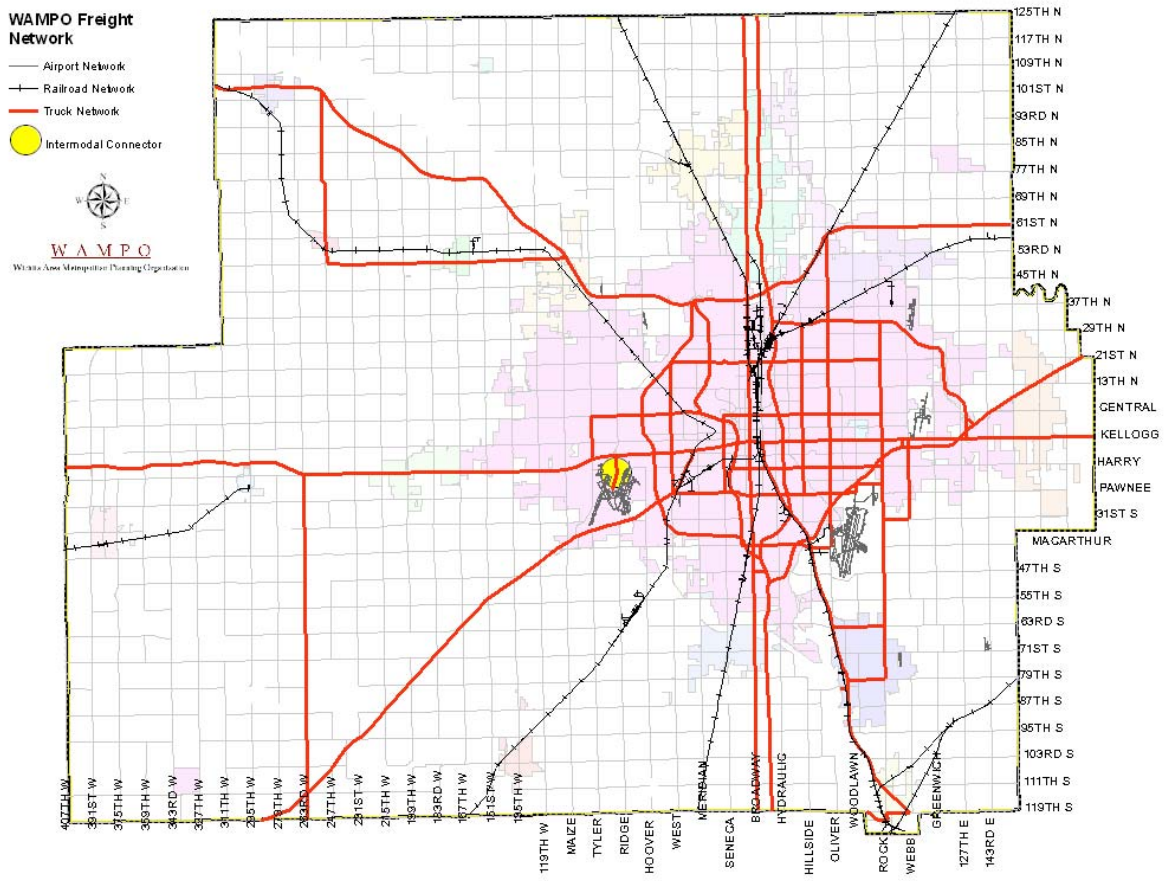
Congestion and delays adds cost to the shipment of goods and services, as carriers incur additional labor and equipment costs to provide the same number of deliveries. Congestion can happen on any mode (truck, rail, or air) and can be caused by a variety of factors (crashes, substandard facilities, poor document collection). Congestion, of all the factors that may affect freight movement and goods delivery, is one thing that transportation planners can address and mitigate.

WAMPO MULTIMODAL FREIGHT NETWORK

The street and highway system, rail, and air modes carry the bulk of freight into, out of, and within the WAMPO region. WAMPO has identified the various modes of freight movement and a multimodal freight network (figure 20 on the following page). The multimodal freight network consists of select street and highway sections that carry a Federal Functional Classification of collector or above, or identified as National Highway System Intermodal Connectors (NHSIC). The network also includes the

various rail providers with operations in the WAMPO region, and major airport facilities operating in the WAMPO region.

figure 20: **WAMPO Multimodal Freight Network**



source: WAMPO

Street and Highway Portion

As stated earlier, trucks carry most of the burden in moving freight in the WAMPO region. As an individual mode, trucks carry 91% of all freight. As part of a multimodal freight network, they provide access to and from railroad terminals, airports, and other modal transfer centers.

There are approximately 4,560 miles of streets, county roads, interstates, turnpike, and other public roads in the WAMPO region. Every mile is capable of providing a means for truck traffic to deliver freight, however not all streets and highways are used for

freight delivery at the same level. Approximately 440 miles (9.6%) of streets and highways in the WAMPO region are identified on the WAMPO Multimodal Freight Network. The Truck Network portion is derived from the KDOT Statewide Freight Plan Commodity Flow Profile. It consists of highways and streets on the National Highway System (NHS), urban and rural facilities with Federal Functional Classifications of arterials and collectors, NHS Intermodal Connectors, and specific local streets.

The NHS includes the Interstate Highway System and other roads, which are important to the nation's economy, defense, and mobility. Functional classification is the process when streets and highways are grouped into classes, or systems, according to the character of service they provide. Projects on streets and highways that seek federal funding must have a Federal Functional Classification (FFC) of Rural Major Collector or higher (figure 21).

figure 21: **Urban and Rural Federal Functional Classifications**

Urban FFC	Rural FFC
Principal Arterial Interstate Other Freeway/Expressway Other Principal Arterial Minor Arterial Collector Local (not eligible for federal funds)	Principal Arterial Interstate Other Principal Arterial Minor Arterial Major Collector Minor Collector (not eligible for federal funds unless approved by FHWA. Local (not eligible for federal funds)

source: Federal Highway Administration

NHS facilities, and those identified with an FFC of Rural Major Collector or above can be categorized into four basic types:

1. **Intercity Truck Corridors.** Intercity truck corridors are transcontinental and interregional routes, using rural Interstate highways and rural state highways. Almost all of these corridors are designated as truck corridors on the National Truck Network and state truck networks.
2. **Urban Truck Corridors.** Urban truck corridors are Interstate highways and major state and city arterials that serve both local distribution and through

moves. Most but not all of these corridors are designated as truck corridors on the National Truck Network and state and city truck networks.

3. **Intermodal Connectors.** Intermodal connectors are the "last mile" of National Highway System roadways connecting major port, airport, rail, or truck terminals to intercity routes.
4. **Truck Access Routes.** Truck access routes include designated truck routes to industrial or commercial zones, warehousing and distribution centers, central business districts, and suburban centers. The category includes local, urban, and rural routes not designated as urban truck corridors or intermodal connectors.

Intercity truck corridors offer connections with other urban centers and states that are outside of the WAMPO region. This report will concentrate on transportation facilities within the WAMPO region. Locally, these facilities are Kansas highways K-96, K-254, K-42, K-15, US-81, US-54/400; interstates I-235, I-135, and I-35/Kansas Turnpike; and local streets with federal functional classifications of principal arterial, minor arterial, and collector. All facilities on the WAMPO Truck Network are eligible to receive federal aid for improvements and upgrades.

Rail Portion

The freight rail network infrastructure in the WAMPO region is described in terms of trackage, both with regard to total miles and the class of operation. Railroads are divided into three categories: Class I, Class II, and Class III railroads. Class III railroads are also called short-line railroads. Railroad classifications are based on the annual gross revenues of the railroad and the amount of trackage. There are four railroads that have operations in the WAMPO region. The Union Pacific Railroad (UPRR) and the Burlington Northern – Santa Fe Railroad (BNSF) are Class I railroads. The Kansas and Oklahoma Railroad (K&O) and Wichita Terminal Association (WTA) are classified as short-line railroads. There are no Class II railroads operating in the WAMPO region.

The BNSF, UPRR and K&O operate on 175 miles of rail in the WAMPO region. The BNSF mainline carries over 75 trains per day and between 100 and 150 million gross tons per mile annually through the WAMPO region. The UPRR main lines carry between 6 and 10 trains per day carrying between 10 and 25 million gross tons per mile per year. The K&O consists largely of trackage radiating north, west, and southwest from their headquarters in the city of Wichita. These tracks carry five or less trains per day and less than ten million tons per mile. Additionally, the WTA operates a

switching railroad that accounts for three miles of track and provides switching operations to move rail cars from the short-line trackage to the Class I facilities.

Airport Portion

Although there are six airports operating in the WAMPO region, only the Wichita Mid Continent Airport (ICT) is equipped to handle substantial freight movement into and out of the WAMPO region.

Airport facilities are divided into two distinct elements: airside facilities and landside facilities. Airside facilities are those that have a direct relation to the operation of an airport (i.e. runways, taxiways, ramps, etc.). Landside facilities are used to support air operations (buildings, parking lots, tank farms, access roads, etc.).

Airside Facilities

figure 22: **ICT Airport Airside Inventory**

	Runway		
	01L\19R	**01R\19L**	**14/32**
Runway	Primary	Auxiliary	Auxiliary
Length	10,301	7,301	6,301
width	150	150	150
Surface	Concrete	Concrete	Concrete
Surface Condition	Good	Good	Good
Edge Lights	High Intensity	High Intensity	High Intensity
Treatment	Grooved	Grooved	Grooved
Markings	Precision Instrument	Precision Instrument	Non-precision Instrument/Basic
Marking Condition	Good/Good	Good/Good	Good/Good
Approach lights	ALSF2/MALSR	MALSR/MALSR	N/A
Runway End Identifier Lights (REIL)	No/No	No/No	Yes/Yes
Centerline lights	Yes/Yes	No/No	No/No
Touchdown lights	Yes/No	No/No	No/No
Runway Weight Capability (lbs.)			
Single Wheel	100,000	125,000	100,000
Double Wheel	210,000	240,000	190,000
Double Tandem Wheel	300,000	400,000	280,000
Dual Double Wheel	N/A	N/A	N/A
Runway Category	Precision Instrument Runway	Precision Instrument Runway	Other than utility runway with a non-precision approach having visibility minimum greater than 3/4 mile.

source: Wichita Airport Authority

The Wichita Mid Continent Airport (ICT) offers three runways that are 150 feet wide and lengths of 10,301, 7,301 and 6,301 feet. The main runway can handle landing loads of up to 400,000 pounds (figure 22 on the previous page). All three runways have High

Intensity Runway Lighting (HIRL) and the primary runway is equipped with centerline lights and instrument landing systems.

Landside Facilities

Landside services provide support for air operation and freight shipping. Effective and efficient freight movement by air is facilitated by various landside facilities that provide the infrastructure to load, unload, and process freight to be moved by air.

Dedicated and Integrated Cargo Carriers

Air freight cargo carriers can be either dedicated or integrated (figure 23). Dedicated carriers ship freight only. Integrated cargo carriers are passenger carriers that offer freight shipping as a limited option. Integrated cargo carriers transport the largest percentage of air cargo nationally. The reduction in aircraft size and fewer flights scheduled has had a significant adverse effect on integrated air cargo capabilities. Freight operations based at ICT include five dedicated air cargo carriers and eight integrated cargo carriers.

figure 23: **Cargo Services Operating Out of ICT**

Dedicated Air Cargo Carriers	Integrated Cargo Carriers	
• DHL • Federal Express Corp. • United Cargo • United Parcel Service • UPS Supply Chain Solutions	• ABX AIR • American West Airlines • American Airlines • American Eagle Airlines	• ExpressJet • Mesa Airlines • United Airlines • USA Jet Airlines

source: Wichita Airport Authority

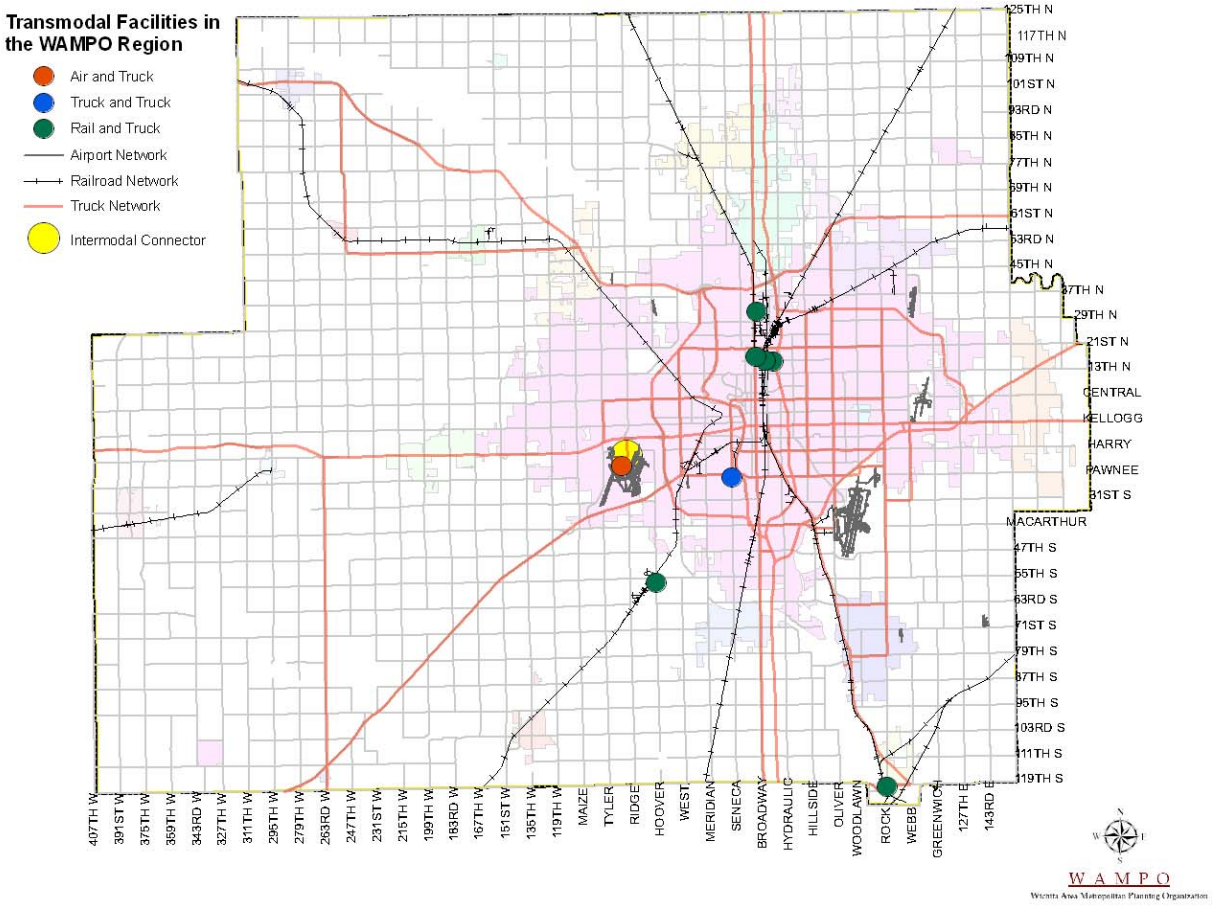
Intermodal Connectors and Transmodal Facilities

The National Highway System includes a designation for intermodal connectors. These highways provide access between major intermodal facilities and the other four subsystems making up the National Highway System. There are seven designated intermodal facilities in the state of Kansas but only one in the WAMPO region; a 2.4 mile connector road between US-54/400 and the Mid Continent Airport in Wichita.

Transmodal facilities are those in which freight is transferred from one mode to another. Any mode to mode transfer (truck to rail, rail to truck, air to truck, etc.) offer

transmodal opportunity. There are several transmodal facilities in operation in the WAMPO region (figure 24).

figure 24: **Transmodal Facilities in the WAMPO Region**



source: WAMPO

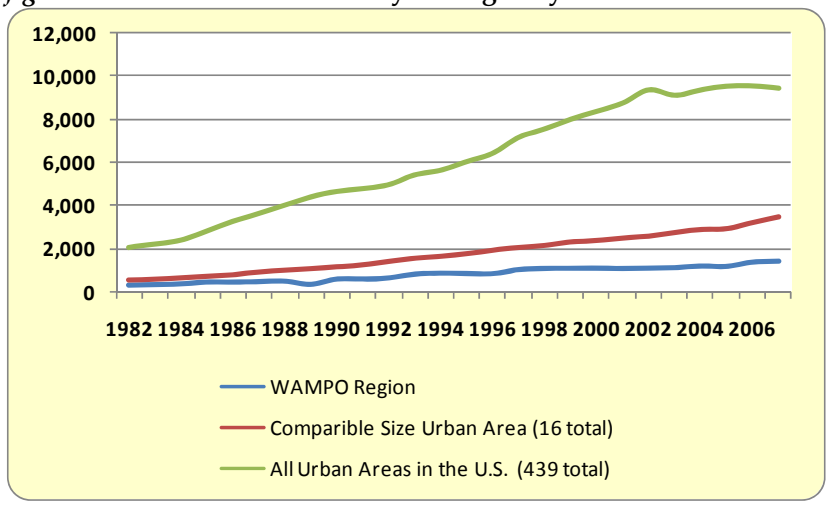
PROBLEM AREAS

The WAMPO region is not a major freight center and does not suffer from the various problems and issues that face other areas of the country. Even so, freight movement in the WAMPO region can be, and is, effected by delay.

Though a significant portion of freight movement is through the WAMPO region, inbound, outbound, and local movements contribute to the burden placed on the general transportation system. Major industries in the WAMPO region still need supplies shipped to them, and need to ship their products from the region by one or

multiple modes. The WAMPO region is a critical hub for agricultural shipments moving from western Kansas to markets around the county and around the world. It is not important whether freight is moved into, out of, through, or within the region; those that move the freight (trucking companies, railroads, air carriers) need to move their freight as quickly and efficiently as possible.

figure 25: **Annual Hours of Delay on Highways**

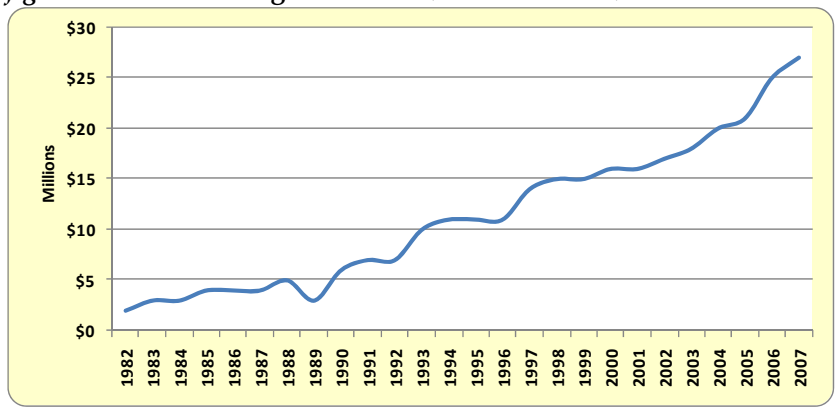


source: Texas Transportation Institute

Street and Highway

Congestion within the region is estimated to have cost drivers approximately 1400 hours annually in 2007 (figure 25). This delay is less than that of urban areas of comparable size and greatly less than that for all urban areas still, delay in any amounts affect the flow of freight.

figure 26: **Annual Congestion Cost (millions of dollars)**



source: Texas Transportation Institute

The annual cost associated with congestion in the WAMPO region is on the rise (figure 26), showing a 1,250% increase from 1982 to 2006. The movement of goods and freight by truck is anticipated to increase by 67% nationally through 2030. Unless the increase in truck traffic is planned for, congestion, and the cost of that congestion, will also increase.

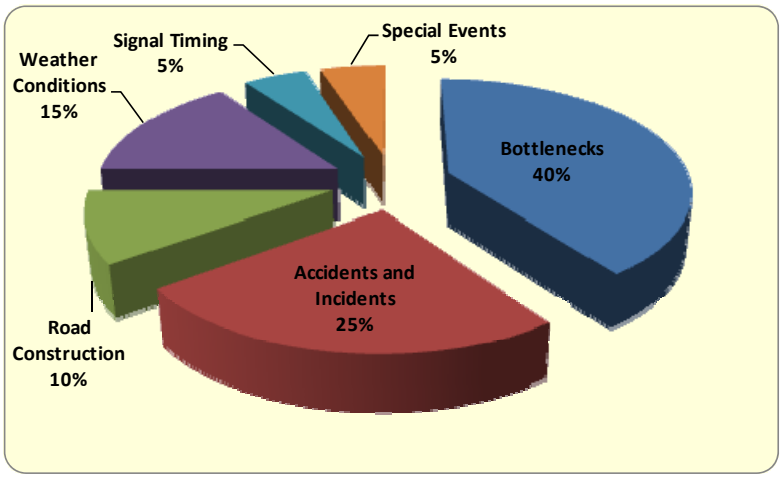
Rail traffic is not immune to growth in delays. Switching delays and train storage and building capacity limitations in the WAMPO region are currently impacting the efficiency of rail movements in and through the region.

Congestion

When a system is unreliable or inefficient, freight delivery reflects that inefficiency and has real consequences for the economy and the community. Freight assets like trucks and trains become less productive. Businesses put more trucks and rail cars on the systems to meet customer needs. More trucks and rail cars in service mean more congestion, more air quality issues, and greater costs for all involved.

Congestion may be defined as any instance or issue that causes a system, or a portion of that system, to approach or exceed its available capacity. Congestion may vary significantly from day to day because of traffic demands. Available capacity also varies and is constantly changing.

figure 27: **Percent of Congestion by Cause, National Average**



source: Federal Highway Administration

Congestion can be attributable to a variety of factors (figure 27) and may be recurring or non-recurring in nature (figure 28). Recurring congestion, though a detriment to the efficiency of traffic flow, is predictable. As such, recurring congestion can be planned for with the transportation plan of providers and shippers. Non-recurring events such as weather, construction delays, accidents and incidents, and special events may also contribute to congestion. Non-recurring events are unpredictable and impacts both the efficiency and the ability of providers to properly service the shipper.

figure 28: **Examples of Recurring and Non-recurring Related Congestion**

Recurring	Non-Recurring
• Bottlenecks • Signal Timing	• Weather Delays • Construction Delays • Accidents and Incidents • Special Events

Any issue that causes congestion should be mitigated to keep freight moving and freight carriers on schedule. Whether the congestion is recurring or non-recurring, the problems that congestion brings make freight movement less effective and efficient.

Bottlenecks

A street or highway is only as efficient as the number and type of bottlenecks that exist to restrict traffic flow. Recurring issues tend to create bottlenecks that can prevent

traffic from flowing freely. Bottlenecks are narrow or obstructed sections of a highway that generate an area of traffic congestion.

Bottlenecks can be categorized into six basic constraint types:

- Maintenance issues (Level of Service -LOS, pavement condition, bridge condition)
- Lane drops.
- Interchange design and function.
- Intersection/signal operations.
- Roadway geometry.
- Regulatory barriers.

Each category on its own, or in concert with others, has the potential to slow traffic and delay freight movements.

Maintenance Issues

Level of Service

Level of Service (LOS) is defined as "a measure used by traffic engineers to determine the effectiveness of elements of transportation infrastructure". LOS is most commonly used to analyze highways, but the concept has also been applied to intersections as well. Each highway is given a grade from "A" to "F" that indicates how well the roadway is serving its intended traffic. Roads with a level of service "A" are the best, with a free flow of traffic with no delays. Roads with a level of service "F" are at the opposite end of the scale and traffic flow is virtually at a standstill. These facilities are generally the ones with major traffic issues and are generally prioritized for improvements and innovations to make the roadway better.

Roadways are usually built to provide a LOS of C or D. Depending on the volume of traffic the facility carries, lower LOS factors are usually allowed due to problems with congestion. The KDOT acceptable LOS for rural highway routes is LOS C, but they accept LOS D for some urban highway routes. I-35/Kansas Turnpike, a facility that carries a large volume of traffic and freight, maintains an acceptable LOS of C.

Most streets and highways in the WAMPO region operate at LOS A or B. Some exceptions to this are the I-235, K-42, US-81, and US-54 corridors. These facilities generally operate at LOS C. There are, however, pockets of lower LOS in the region. US-54/400, another well traveled facility, has sections that operate at LOS E. At certain times of the day, or when weather, crashes, or other incidents occur, major system interchanges (I-135/K-254/K96, I-235/US-54) will operate at LOS F.

Pavement Condition

Pot holes, cracking, joint separations, rutting, and a host of other conditions can make a facility less desirable for trucks and freight movement. Using a Pavement Condition Index (PCI), streets and highways can be rated on how well they are standing up to traffic and weather. KDOT, city, and county jurisdictions in the WAMPO region maintain PCIs for roadways under their jurisdiction. Rating systems vary between local jurisdictions. The City of Wichita and KDOT use a rating system of 0 to 100 as their index. Generally, segments with a rating of 100 are considered perfect pavement condition. Those segments with ratings of 50 or less are rated as fair to poor. Ratings of 30 or less on a segment represent a section of street or highway that is in very poor condition.

Most roads in the WAMPO region with Federal Functional Classifications (FFC) of collector or above, are rated as being in good condition. There are only a few segments of local collectors and arterials (totaling approximately 23 miles, 4 miles of which are on the WAMPO Intermodal Freight Network) with a rating of 50 or less and rated as fair to poor. Local facilities that have a rating of 30 or less (poor to very poor) total just over 2 miles, none of which are on the WAMPO Truck Network.

KDOT facilities in the WAMPO region include the Interstate, federal, and state highways and are generally rated good to very good.

Bridge Condition

There are approximately 1,300 KDOT and local bridges in the WAMPO region. Bridges need to be functional to accommodate truck traffic. Wide and oversize loads will always be an issue for older bridges built with outdated design standards and should be avoided by trucks until such time that the bridge is rebuilt. Bridges can be rebuilt at any time with local funding. Consideration in the design of a new bridge should provide for horizontal and vertical clearances, weight, and the geometrics of the bridge approaches. To qualify for federal funds, a bridge must have a sufficiency rating (SUFRAT) of 50 or less and be identified on a national bridge database. Sufficiency rating is the general condition of the bridge. Bridges on the WAMPO Intermodal Freight Network that have a SUFRAT of 50 or less will need to be upgraded to continue to handle existing and future truck traffic.

Lane Drops

Lane drops are where a street or highway goes from more lanes to fewer lanes. This may be by design to accommodate areas of high traffic, or may be due to construction or crashes that remove one or more lanes from service for the duration of the incident.

Most facilities in the WAMPO region that carry freight traffic offer at least four lanes of traffic; two lanes in each direction. Local collectors and arterial streets drop from four or five lanes in areas in which the need for additional capacity drops off. I-135 from the K-254/K-96 interchange south through Wichita to I-35 is constructed as a six lane facility. US50/400 between Rock Road and Maize Road is constructed with six lanes of traffic with an eight lane section from the Arkansas River to near I-135. These lane drops are by design and usually function without issue. The points at which these facilities drop lanes may create bottlenecks during times of high volumes of traffic as traffic needs to merge into the reduced lanes.

When lanes become unavailable due to construction, traffic is slowed and merged into other lanes or onto the shoulders of the facility to maintain as much capacity as possible. Merging distances and the amount of advanced warning of the lane drop is identified in the Uniform Code of Manual Control Devices (MUTCD) for lane closures. Such actions help to mitigate congestion but, given the Average Annual Daily Traffic (AADT) on the facility, may not totally relieve the congestion.

Crashes on major transportation facilities often force lane drops. Such events cannot be foreseen and congestion caused by these lane drops is not relieved until the crash has been cleared. The increased use of incident management techniques to mitigate the crash sites can decrease the duration of the incident.

Interchange Bottlenecks

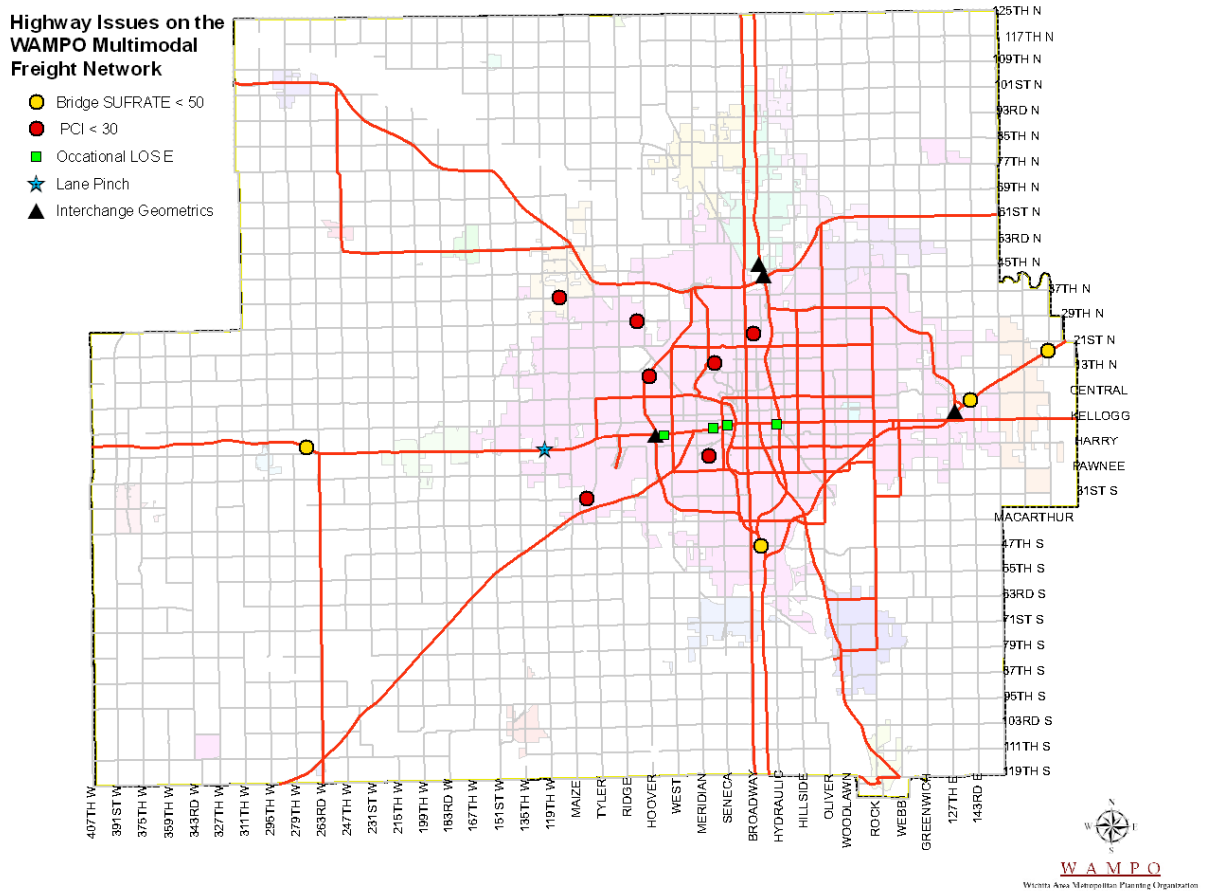
An interchange is defined as a junction of highways on different levels that permits traffic to move from one to another without crossing traffic streams. Interchanges can be either a system interchange or a service interchange. A system interchange connects two major arterial systems. Service interchanges connect major arterial systems to local streets. Both system interchanges and service interchanges may fail due to congestion issues and freight movement is delayed.

KDOT identifies four major highway bottlenecks in the WAMPO region. Three of these interchanges, I-135/I-235/K-254, I-235/US-54, and I-35/K-96, are on system interchanges of major roadways. The forth, I-135/47th Street, is a service interchange providing local access. These bottlenecks present a significant source of delay for truck traffic in the area. Problems can be design issues related to the interchanges, capacity issues, pavement condition, or a combination of causes.

Intersection/Signal Bottlenecks

Intersection and signal bottlenecks occur more in the urbanized area of the WAMPO region. Lack of turning lanes, pedestrian crossings, unsynchronized light timing, school

figure 29: **Highway Problem Areas**



source: WAMPO

zones, and other restricted speed zones all can impede traffic and freight flows.

Many traffic signals deployed in the WAMPO region operate in "isolated" mode. This means that the operation of one signal does not consider conditions at any other signalized intersection. Isolated intersections are either controlled with fixed timing plans that do not change regardless of traffic demand, or in a traffic-actuated mode in which the fixed plan may be modified slightly if an immediate demand is sensed at the stop line of at least one approach to the intersection.

As the use of traffic signals has grown due to growing traffic demand it has become clear that efficient system operations cannot occur with signals functioning in an isolated mode.

Roadway Geometry

Roadway geometry is how the roadway facility is designed. Consideration should be given in the design of roadways to accommodate truck traffic and freight movement. The American Association of State Highway and Transportation Officials (AASHTO) provided standards and recommendations for roadway geometrics. Elements of roadway geometry include, but are not limited to:

- Lane widths;
- Horizontal and vertical clearances;
- Sight distance;
- Turning treatments and turning radii;
- Length of acceleration / deceleration lanes; and
- Turning radius on curves and ramps.

State Departments of Transportation (DOTs) have specific design standards that they use to build and maintain highways. Local jurisdictions also have specific design standards that usually meet or exceed those prescribed by the state DOT. Older facilities built with outdated standards are updated to newer standards when they are rebuilt or receive major rehabilitation efforts. The potential of bottlenecks and congestion, and therefore delays in freight movement, will exist until the facility is upgraded.

Regulatory Barriers

Regulatory barriers are restrictions on what freight movers can and cannot do. An example is a restriction on some facilities of the size and weight of trucks. This may be a safety issue or one of roadway geometry. Also, speeds may be limited, as are the amount of time drivers may be allowed to drive. Other examples of regulatory issues include:

- Tractor-trailer combination units;
- Length restrictions;
- Height restrictions;
- Width Restrictions;
- Weight restrictions;
- Speed and lane restrictions;
- Bridge postings; and
- Over-dimensional truckloads.

WAMPO is prohibited from actively participating in the political atmosphere in which regulatory barriers are debated. As such, this plan does not address regulatory barriers, nor offer solutions to those barriers. Regulatory barriers limit the available routes that

freight can be transported on and can create congestion on other facilities that are not similarly restricted.

Capacity Improvements

One of the most cost effective and safe ways to make highway improvements is through advanced planning and providing incremental improvements to the system. When the LOS on a facility starts approaching "D", "E", and "F" levels, local governments may consider improving the LOS through incremental improvements, but in some situations may consider capacity expansion. Capacity expansion is adding travel lanes to existing facilities, building new facilities, or updating intersection to accommodate more turning movements or adding storage capacity to exiting turn lanes. Each jurisdiction in the WAMPO region produces a capital improvement program which identifies projects that add capacity to the existing street and highway system.

Travel Demand Management

Travel Demand Management (TDM) is the application of strategies and policies to reduce automobile travel demand, or to redistribute this demand in space or time. The primary purpose of TDM is to reduce the number of vehicles using the road system while providing a wide variety of mobility options to those who wish to travel. Freight movement becomes more efficient as the competition with the general public for roadway resources and capacity is reduced.

TDM strategies include improvements in alternative modes of transportation; financial or time incentives for the use of these alternative modes; information dissemination and marketing activities to promote these modes; and supporting services that make the use of alternatives more convenient or that remove psychological impediments to their use.

Integrating TDM into the transportation planning process to help manage congestion instead of adding capacity to existing facilities should be considered in any transportation improvement project. TDM can be as simple as relieving congestion in and out of manufacturing areas by staggering employee start and end times or coordinating delivery and outgoing freight. TDM can be as intricate as employing real-time Intelligent Transportation Systems (ITS)-based information to freight movers to give advance warning of construction or crashes and the ability to reroute.

TDM can also be used to decrease the amount of traffic on the street and highway system by establishing car pools, providing more transit options, and moving freight shipments away from trucks and on to other freight-moving modes.

ITS Measures

Intelligent Transportation Systems (ITS) are measures that use technology to increase the performance, operation, and safety of traffic on the nation's streets and highways. ITS systems work as separate systems or link together to provide a system of integrated devices that provide for the efficient movement of freight.

ITS architectures represent both the physical and logical flows of information and data. These flows of data can provide freight movers information on road conditions that are causing congestion well in advance and provide options for avoiding the congestion. They may also be used for enforcement, permitting, and pre-clearance activities to speed trucks through weigh stations. ITS systems are divided into subsystems that address specific elements of logical and physical environments. ITS subsystems that have influence on freight movement are:

- Commercial Vehicle Administration (CVO).
- Commercial Vehicle Check.
- Commercial Vehicle Subsystem.
- Fleet and Management Subsystem.
- Maintenance and Construction Management.
- Remote Traveler Support.
- Roadway Subsystem.
- Toll Administration.
- Toll Collection.
- Traffic Management.

ITS systems provide the means to make information available through a host of modern technologies:

Information

- Construction updates.
- Incidents.
- Emergencies.
- Weather.
- Real-time conditions.
- Real-time schedules.
- Transit-carpool availability.

Technologies

- Navigation.
- Internet.
- GPS.
- Networks.
- Wireless Communications.
- E-Payment.

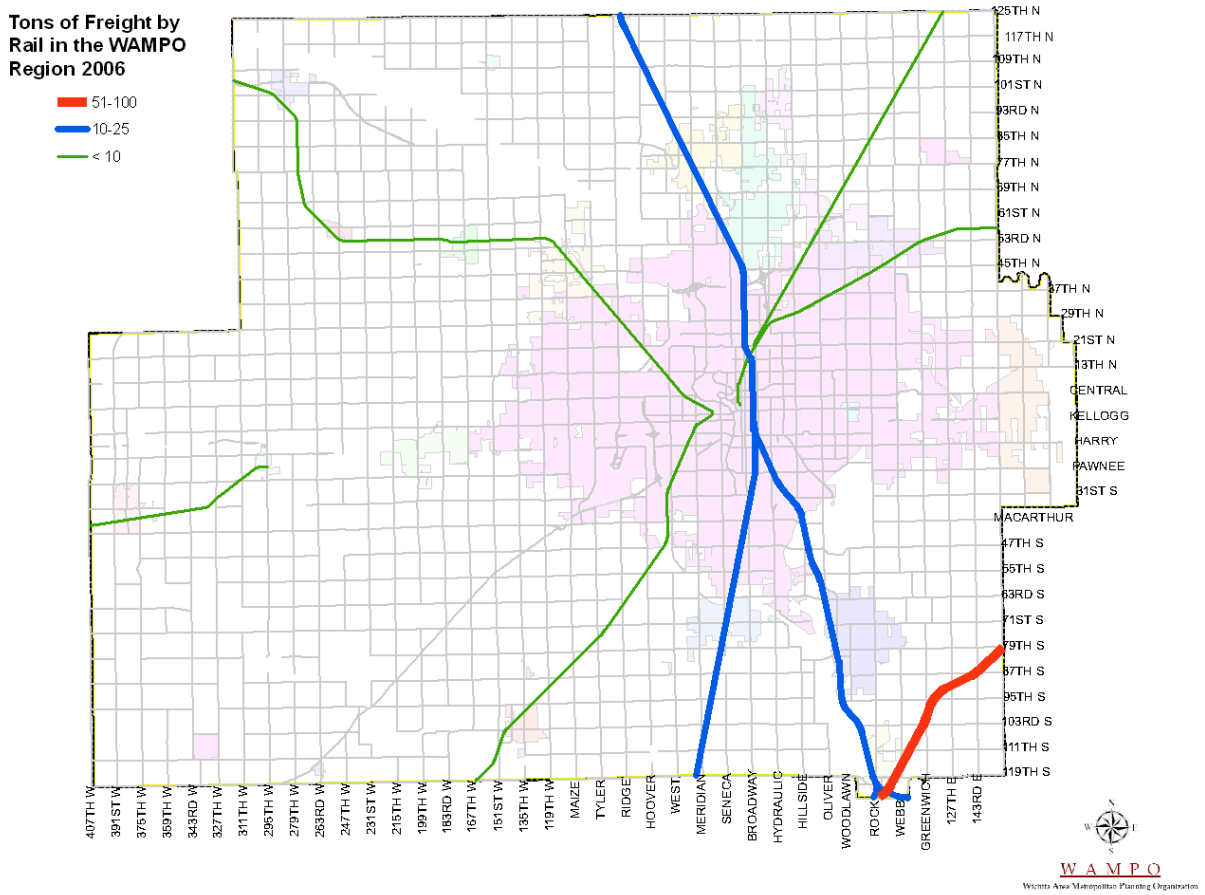
ITS improvements identified in the WAMPO region to be deployed are identified in the *WAMPO Regional ITS Architecture*.

Rail System

Rail is the most independent of freight modes in that the majority of the infrastructure used is owned and operated by private corporations. Rail, as a private venture, operates within the guidelines and goals defined in corporate business models. The

number of trains operated by the Union Pacific Railroad (UPRR), Burlington Northern-Santa Fe Railroad (BNSF) and the Kansas and Oklahoma Railroad (K&O), the condition and operational capacity of the infrastructure related to those operations, and the type and quantity of commodities shipped by them is guided by the individual railroad operators. The investment in infrastructure to meet these goals is also determined by the individual railroad corporations.

figure 30: **Annual Gross Tons (millions)**



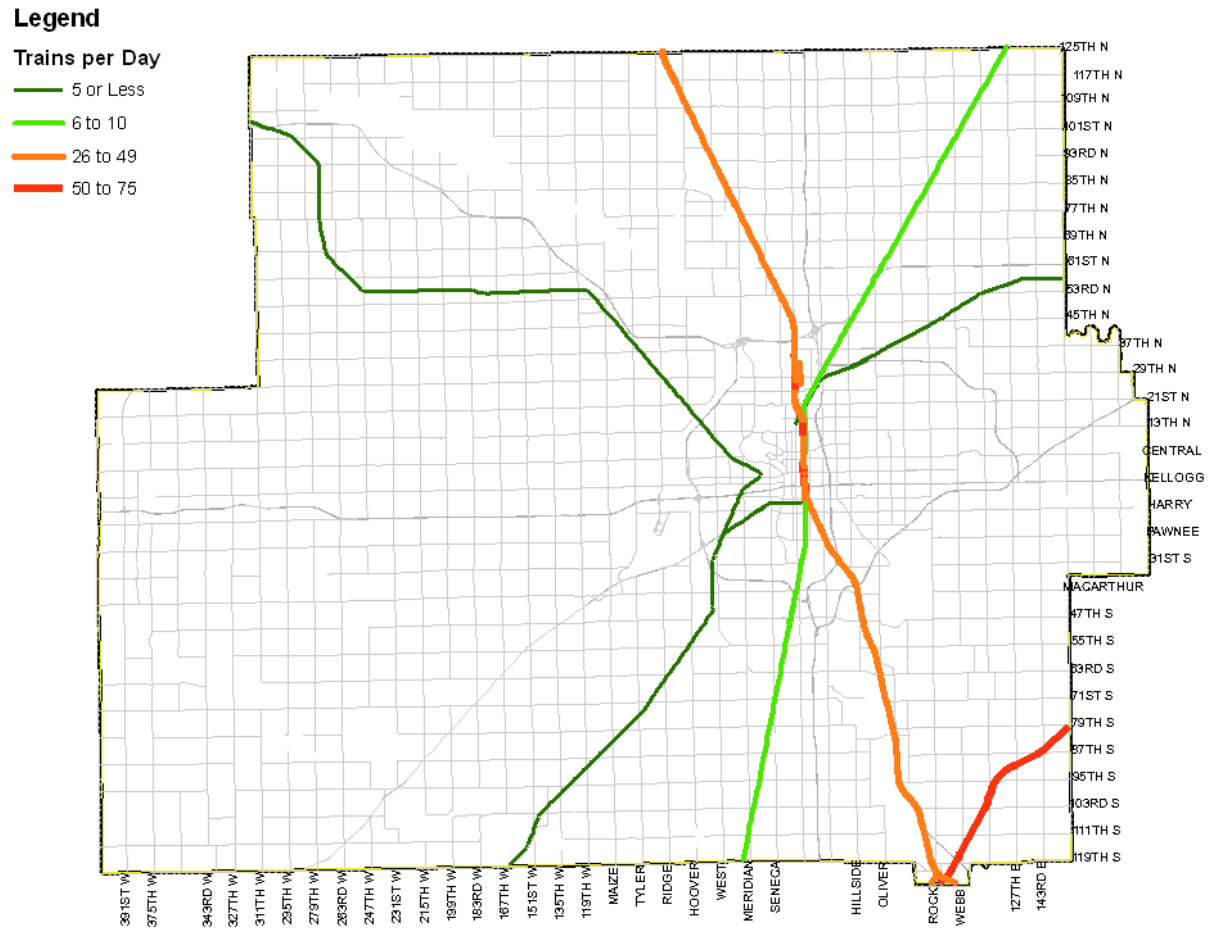
source: Kansas DOT

As with freight movement by truck, the commodity data presented in this report is based county to county movement and is limited in scope. As such, the commodity flow data does not present the through movement of freight by rail. Although rail is used as an option to move freight within the WAMPO region, and to some extent to ship freight into and out of the region for transfer to other modes, most of the rail traffic in the WAMPO region is just passing through. How quickly freight can move through the region is contingent on:

- The total number of trains on the system;
- The annual gross tons per mile the trains carry;
- The track weight, and other infrastructure conditions (crossties, ballast, etc.) of the facility; and
- The number, type, and condition of rail crossings.

The total number of trains, and the volume of freight they carry, can contribute to the congestion on the system. The tonnage of freight moved in the WAMPO region by rail can be found in figure 30 on the previous page. The number of trains per day in service within or through the WAMPO region is identified in figure 30.

figure 31: **Volume of Trains per Day**



source: Kansas DOT

Track Weight

Rail is graded by weight over a standard length. Heavier rail can support greater axle loads and higher train speeds without sustaining damage than lighter rail, but at a

greater cost. Track weights on the rail system in the WAMPO region currently handle the existing loads. One section on the K&O railroad in the southwest portion of the region is identified by KDOT as a stretch of rail that should be upgraded to accommodate heavier traffic.

Railroad Crossings

Cities in the WAMPO region literally grew up around railroad facilities. As such, conflict exists between rail traffic and traffic traveling on the street and highway network.

There are limited options to avoid or mitigate the conflicts of rail and street and highway. Options include relocating rail lines to areas of less congestion, consolidating crossings to minimize the number of conflicts, or separating the conflict points by routing the rail facility over or under the street or highway, or relocating the highway over or under the rail facility.

Rail Relocation

Although rail is responsible for just over 9% of freight movement in the region, it is still a major component of the transportation activity within the WAMPO region. Conflicts between rail and highway routes are more noticeable in the urbanized areas of the region. Rail operations, as well as roadway traffic movement and efficiency can be delayed. Rail movement can also be slowed by the requirement to slow trains within urban areas in order to reduce the likelihood that crashes will happen, most often near at-grade highway-rail crossings.

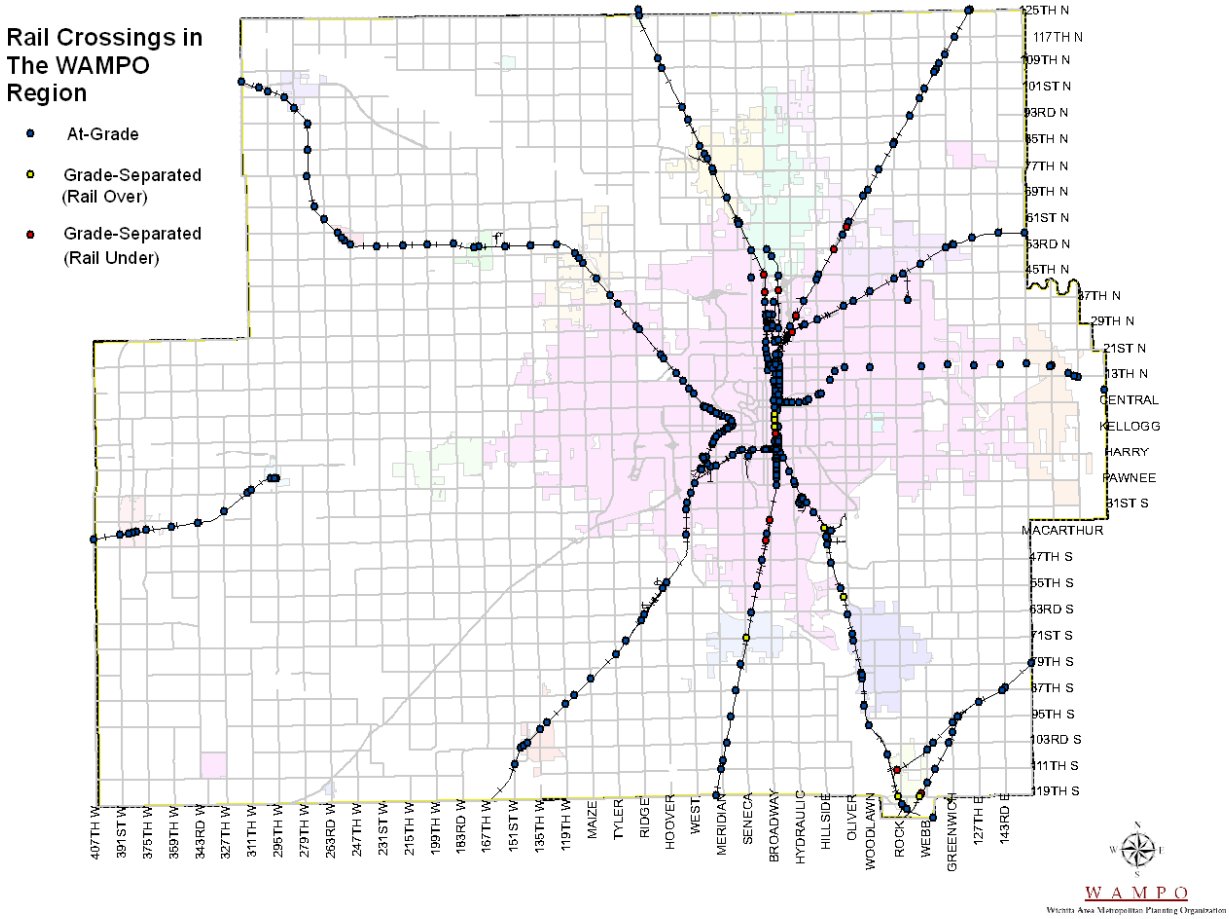
Freight movement by rail in the urbanized area of the WAMPO region could potentially be minimized by relocating train operations to alternative rail corridors that would be established outside the urban area. Another option is to consolidate rail operations from several urban routes to a single corridor that is grade separated or has other safety features that improve mobility and improve safety. Such projects are expensive and the benefit-to-cost ratio of relocating or consolidating rail operations would be determined by the railroad companies that would be involved.

Implementing certain types of rail relocation projects could potentially improve the overall efficiency of the regional freight system as a whole. New rail locations could provide growth in truck-to-rail modal diversion. Less populated areas adjacent to the relocated rail lines could add capacity to switching facilities and other rail operations.

Rail Crossings

Rail crossings are categorized by the type of crossing. Crossings are classified as either at-grade or grade-separated. An at-grade crossing is one where the street/highway physically crosses the railroad on the same vertical alignment. Grade separation is when either the railroad or the street/highway passes over the other at different vertical alignments. Railroad crossings may also be public or private. Public rail crossings are on publicly-owned facilities and are maintained with public funds. Private railroad crossings are owned and maintained by private entities. Private railroad crossings will not be addressed by this plan.

figure 32: **Rail Crossings in the WAMPO Area**



source: Kansas DOT

Of the 376 rail crossings in the WAMPO region, approximately 360 are at grade and approximately 16 are grade-separated. These crossings are identified in figure 32.

There are three factors that create conflict points and affect the flow of freight at railroad crossings:

- The physical condition of the crossing;
- The delay caused by waiting for trains to clear the crossing; and
- The type and amounts of signalization deployed at the crossing.

Hazard Index

The *WAMPO Railroad Crossing Plan* identifies problem railroad crossings in the region. The study also developed a hazard index for the at-grade crossings in the region that considers crossing surface conditions, average daily traffic, trains per day, and warning devices. All of these factors affect the movement of freight in the WAMPO region. A listing of 50 crossings with the highest hazard index is included in figure 33 on the following page.

Crossing Surfaces

Bad or deteriorating crossing surfaces pose both a congestion and safety issue for train and truck traffic. Crossings with poor surface conditions can cause damage to trucks and automobiles, harm the existing track, and can slow traffic as vehicles crossing the railroad have to slow down to avoid possible damage.

Crossing surfaces can be constructed with various materials ranging from asphalt to rubber and may be built with either monolithic or sectional considerations. Monolithic surfaces are formed at the crossing, i.e. asphalt, and need to be totally removed when in disrepair. Sectional construction offers a better maintenance option for rail crossings. Sectional designs are manufactured in pieces and only those pieces that need to be replaced can be without having to remove the entire structure.

The WAMPO *Railroad Crossing Plan* identified three locations in the WAMPO region for possible upgrades to crossing condition:

- 17th Street in Wichita on the WTA/WUT (Crossing # DOT009315);
- 55th Street in Wichita on the BNSF (Crossing # DOT009385Y); and
- 71st Street in Derby on the BNSF (Crossing # 009390V).

Railroad Crossing Devices

At-grade crossings control access by a variety of means. Vehicular and pedestrian traffic is warned of the approaching train or that a crossing exists by physical and mechanical devices.

Approximately 60% of the railroad crossings in the WAMPO region are considered active. Active means that crossings are controlled by some sort of mechanical device

figure 33: **Top 50 Hazard Index Locations**

Rank	Crossing Number	Hazard Index	Crossing Street	Railraod	Adjacent Land Use	Crossing Condition	Crossing Consolidation	Grade Separation	Geometric Issues	Signal Upgrades
1	009286B	78037	Pawnee Street	BNSF Railway	Commercial			✔		
2	009295A	68742	47Th Street	BNSF Railway	Commercial					
3	009268D	56612	13 Street	BNSF Railway	Industrial					
4	009272T	51072	Murdock Street	BNSF Railway	Industrial					
5	009273A	50810	Central Street	Wichita Union Terminal Railway Comp	Industrial					
6	009293L	49943	Macarthur Road	BNSF Railway	Commercial					
7	009263U	49066	21 Street	BNSF Railway	Commercial					
8	009290R	48906	Private Ent@31St	BNSF Railway	Industrial					✔
9	009283F	45338	Harry Street	BNSF Railway	Commercial					
10	009388U	41439	63Rd Street	BNSF Railway	Commercial					
11	670158K	38304	Meridian Street	BNSF Railway	Commercial				✔	
12	009377G	37688	K-15 Highway	BNSF Railway	Industrial				✔	✔
13	009382D	35183	K-15 Highway	BNSF Railway	Open Space				✔	✔
14	009280K	31814	Lincoln Avenue	BNSF Railway	Industrial			✔	✔	
15	009259E	29427	29 Street	BNSF Railway	Commercial					
16	009252G	28815	53 Street	BNSF Railway	Commercial				✔	
17	009284M	27010	Mt. Vernon Stree	BNSF Railway	Residential				✔	
18	009285U	26847	Hydraulic Street	BNSF Railway	Residential			✔	✔	
19	445091N	26786	21Sr Street	Union Pacific Railroad Company	Industrial			✔	✔	
20	009248S	25696	77 Street	BNSF Railway	Commercial	✔	✔	✔	✔	
21	009257R	24411	37 Street	BNSF Railway	Commercial					
22	009282Y	21972	Washington Stree	BNSF Railway	Commercial				✔	
23	009393R	19832	Market Street	BNSF Railway	Commercial					
24	009287H	18745	Wassall Road	BNSF Railway	Industrial			✔		
25	009368H	18460	Seneca Street	Kansas & Oklahoma Railroad Compan	Commercial					✔
26	009266P	17628	17 Street	BNSF Railway	Industrial				✔	
27	595029R	16878	21St Street	Union Pacific Railroad Company	Industrial			✔		
28	595037H	16690	9Th Street	Union Pacific Railroad Company	Industrial					
29	595060C	16075	Pawnee Street	Union Pacific Railroad Company	Commercial			✔		
30	595034M	15343	13Th N Street	Union Pacific Railroad Company	Industrial					
31	009406P	14865	K-53 Highway	BNSF Railway	Industrial			✔	✔	
32	009315J	13545	17 Street	Wichita Terminal Association	Industrial	✔				✔
33	595035U	13250	11Th N Street	Union Pacific Railroad Company	Industrial					
34	445161B	12857	Douglas Street	Kansas & Oklahoma Railroad Compan	Commercial				✔	✔
35	595038P	12577	Murdoch Street	Union Pacific Railroad Company	Industrial					
36	009636R	11518	95Th E Street	BNSF Railway	Open Space				✔	
37	009246D	11400	Main Street	BNSF Railway	Commercial	✔			✔	
38	445179I	10851	29Th Street	Kansas & Oklahoma Railroad Compan	Industrial					✔
39	595063X	9981	Macarthur Road	Union Pacific Railroad Company	Commercial					
40	595065L	9677	47Th Street	Union Pacific Railroad Company	Industrial				✔	
41	009231N	9576	1 Street	BNSF Railway	Residential					
42	445187D	8984	Meridian Street	Kansas & Oklahoma Railroad Compan	Residential		✔		✔	✔
43	445167S	8935	Maple Street	Kansas & Oklahoma Railroad Compan	Institutional				✔	✔
44	009251A	8311	61 Street	BNSF Railway	Residential	✔	✔	✔	✔	
45	009390V	8113	71St Street	BNSF Railway	Commercial	✔				
46	009628Y	8008	190Thll Street	BNSF Railway	Open Space			✔	✔	
47	009385Y	7934	55Th Street	BNSF Railway	Open Space	✔			✔	
48	595053S	7304	Harry Street	Union Pacific Railroad Company	Commercial					
49	009294T	7110	Clifton Avenue	BNSF Railway	Residential					
50	445210V	6402	Maize Road	Kansas & Oklahoma Railroad Compan	Residential	✔	✔	✔	✔	

source: WAMPO Railroad Crossing Study

such as lights or crossing gates, while the remaining 40% are considered passive and marked by only cross bucks. Crossings with flashing lights account for 18% while crossings equipped with flashing lights and crossing gates account for 42% of the active

crossings. The WAMPO *Railroad Crossing Plan* also identified seven locations in which upgraded warning devices are warranted (figure 34).

Grade Separation and Crossing Consolidation

Ideally, conflicts between rail and other modes could be eliminated by replacing all at grade crossings with grade separated structures. As with adding lanes to highways to relieve congestion, having a rail system totally separated is limited by existing rights of way and can be cost prohibitive. There are instances when grade separation is a logical alternative and would provide for more efficient and effective movement of freight. Grade crossings with high general traffic or truck Average Annual Daily traffic (AADT) would be prime candidates for grade separated rail crossings. At-grade crossings experiencing high levels of train traffic may also be considered, especially where that delays the even flow of vehicle or pedestrian traffic.

figure 34: **Potential Signal Upgrade Locations in the WAMPO Region**

Street	DOT#	City	Hazard Index	Railroad	AADT (2006)	Trains per Day	Exisitng Warning Device
31st Street	009290R	Wichita	48,906	BNSF	1,287	38	Crossbucks
K-15	009377G	Wichita	37,688	BNSF	31,407	2	Lights
K-15	009382D	Wichita	35,183	BNSF	29,319	2	Lights
17th Street	009315J	Wichita	13,545	WUT/WTA	4,515	3	Crossbucks
29th Street	445179I	Wichita	10,851	K&O	10,851	1	Crossbucks
Maize Road	445210V	Maize	6,402	K&O	5,335	2	Lights
Woodlawn Blvd.	439344F	Bel Aire	6,179	UPRR	10,299	1	Lights

source: WAMPO Railroad Crossing Plan

Crossing consolidation becomes an option where total AADT and truck AADT are low, or it is not economically sound to invest in infrastructure (crossing upgrades, automated devices, etc). As stated in the Manual on Uniform Traffic Control Devices, "Any highway grade crossing for which there is not a demonstrated need should be closed."

A railroad-highway grade crossing having any of the following characteristics should be analyzed for closing:

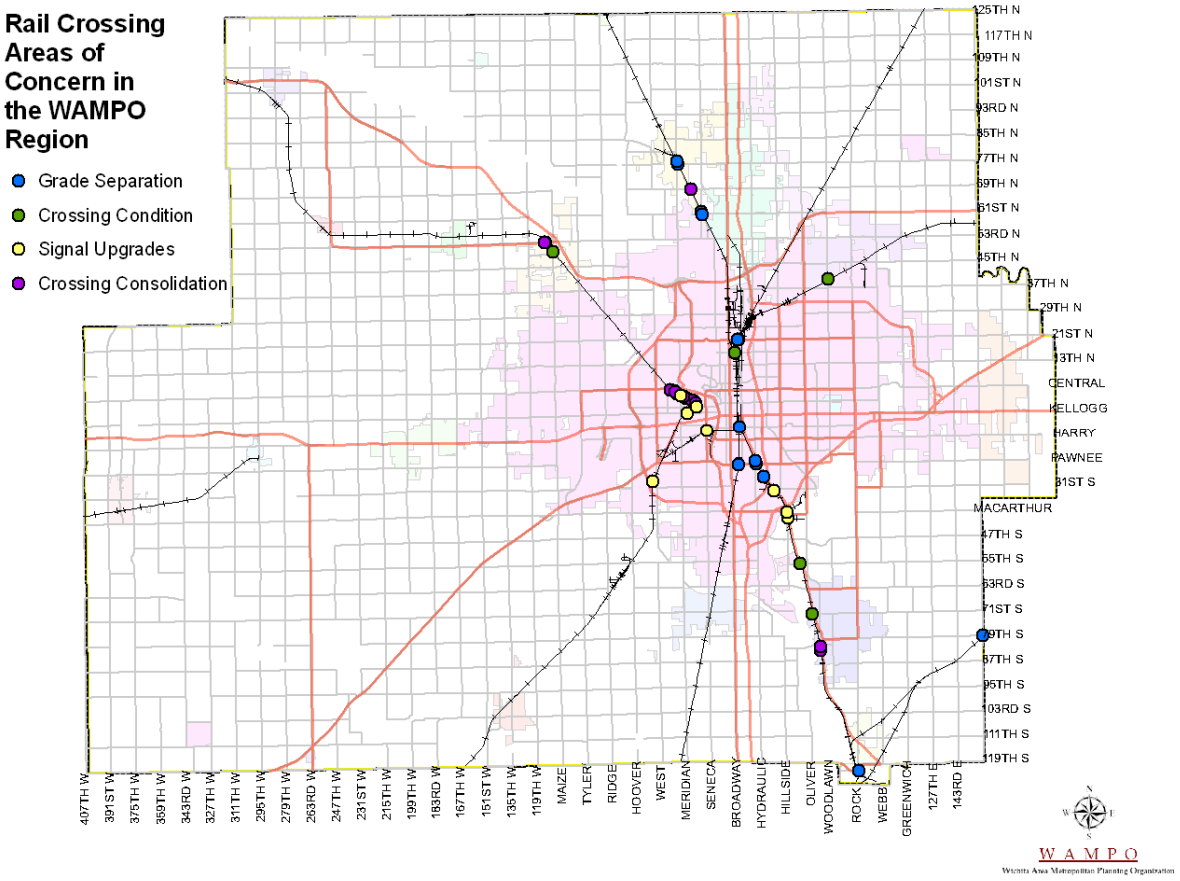
- Redundant railroad crossings such as crossings in cities/towns where the track crosses a road every few hundred feet.
- Crossings on unpaved roads and those with minimal average daily traffic (ADT) where an alternative route is readily available.
- Any crossing without active warning devices being considered for the installation of active warning devices.
- Adjacent crossings that are located within one-half mile of any crossing being upgraded or grade separated.

- Crossings involved in a high speed corridor or passenger route.
- Crossings with four or more trains crossing per day.
- Crossings where the geometrics of the track and/or roadway make the location of the crossing a hazardous location such as a "humped" crossing where trucks could get stuck on the track or a diagonal crossing where there is no safe way for a truck or long machinery to cross safely due to limited sight distance.

Roads crossing the track, as a general rule, should not serve as a main route for fire, ambulances or any other emergency vehicles. Delays caused by trains in the crossing can delay the delivery of emergency services.

The *WAMPO Railroad Crossing Plan* identified six candidate locations for crossing consolidation and eight for grade separation. Additionally, the Central Corridor project

figure 35: **Rail Crossing Concerns in the WAMPO Region**



source: WAMPO Railroad Crossing Plan

calls for elevating the rail corridor through the center of Wichita. The new vertical alignments will grade separate three new crossings and corrects vertical clearance at

two other locations. Locations for upgrades to crossing condition, upgraded warning devices, and consolidations and grade separation are identified in figure 35 on the previous page.

Airport

There currently is not a congestion problem at the Mid Continent Airport (ICT) that would substantially delay the delivery and shipment of freight. The Wichita Airport Authority is currently planning on expanding several airside and landside facilities to make ICT more competitive in passenger and freight movement (figure 36 on the following page).

Landside services provide support for air operation and freight movement. Effective and efficient freight movement by air is facilitated by various landside facilities that provide the infrastructure to load, unload, and process freight to be moved by air. Such infrastructure should provide, but is not limited to:

- Dedicated parking aprons for air cargo services (should include lighting for nighttime operations, be secure, be clearly marked, and provide clearance around the aircraft for loading and unloading operations);
- Direct access to aircraft for air cargo vehicles;
- Support services for aircraft maintenance, repair and fueling;
- Cargo handling with the terminal and other facilities; and
- On-airport regulatory agencies such as the TSA, FAA, USDA, U.S. customs, and USPS.

figure 36: **Airside and Landside Improvements Planned for ICT**

Airside Improvements	Landside Improvements
• Extension of all parallel taxiways to provide full-length taxiway access along runways. • Extension of Runway 1R-19L to 8,700 feet. • Rehabilitation of Taxiway A, and rehabilitation and expansion of general aviation ramp. • Expansion of air carrier apron (in conjunction with a new terminal). • Expansion of air cargo apron. • Relocation of Airport Surveillance Radar (south side of airfield).	• Construction of a replacement terminal facility and reconfiguration of parking and loop road. • Relocation of air cargo building and expansion of facilities to meet demand. • Expansion of general aviation facilities (hangers and maintenance facilities). • Acquisition of land parcels for aviation-related development. • Provision for relocation of Hoover Road.

source: Wichita Airport Authority

ICT currently offers an air freight building that is used by the major airlines to sort air freight carried by the scheduled passenger airlines.

All cargo carriers operate from an air cargo apron located east of runway 1L/19R. It encompasses approximately 65,000 square yards for aircraft movement and parking. The apron is also used to store ground servicing equipment along the eastern portion of the apron. Freight is processed in two dedicated all-cargo buildings, also located on the east portion of the air cargo apron.

ICT also owns and maintains a fleet of 18 snow removal vehicles and equipment to maintain the aprons and runways in times of bad weather.

ICT has Aircraft Rescue and Firefighting Facility (ARFF) that houses equipment to respond to incidents at the airport. Equipment currently includes:

- A rapid response vehicle (Safety One);
- Two primary vehicles (Safety Two and Safety Three); and
- A backup vehicle (Safety Four).

figure 37: **ICT Landside Checklist**

Element	Available at ICT
Dedicated parking apron	Yes
Nighttime Operations	Yes
Dedicated cargo buildings	Yes
Direct access to aircraft	Yes
Support services	Yes
Truck access	Yes
Train access	Yes
ARFF	Yes
Maintenance equipment	Yes
Onsite U.S. Customs office	No
Onsite USDA office	No
Foreign Trade Zone	No

source: Wichita Airport Authority

Most notably missing from the airport inventory (figure 37) is the presence of onsite customs, USDA personnel, and a foreign trade zone designation.

ICT has truck access through Airport Cargo Drive that is connected to the WAMPO Truck Network through a system interchange with US-54/400. ICT does not have access to the railroad network.

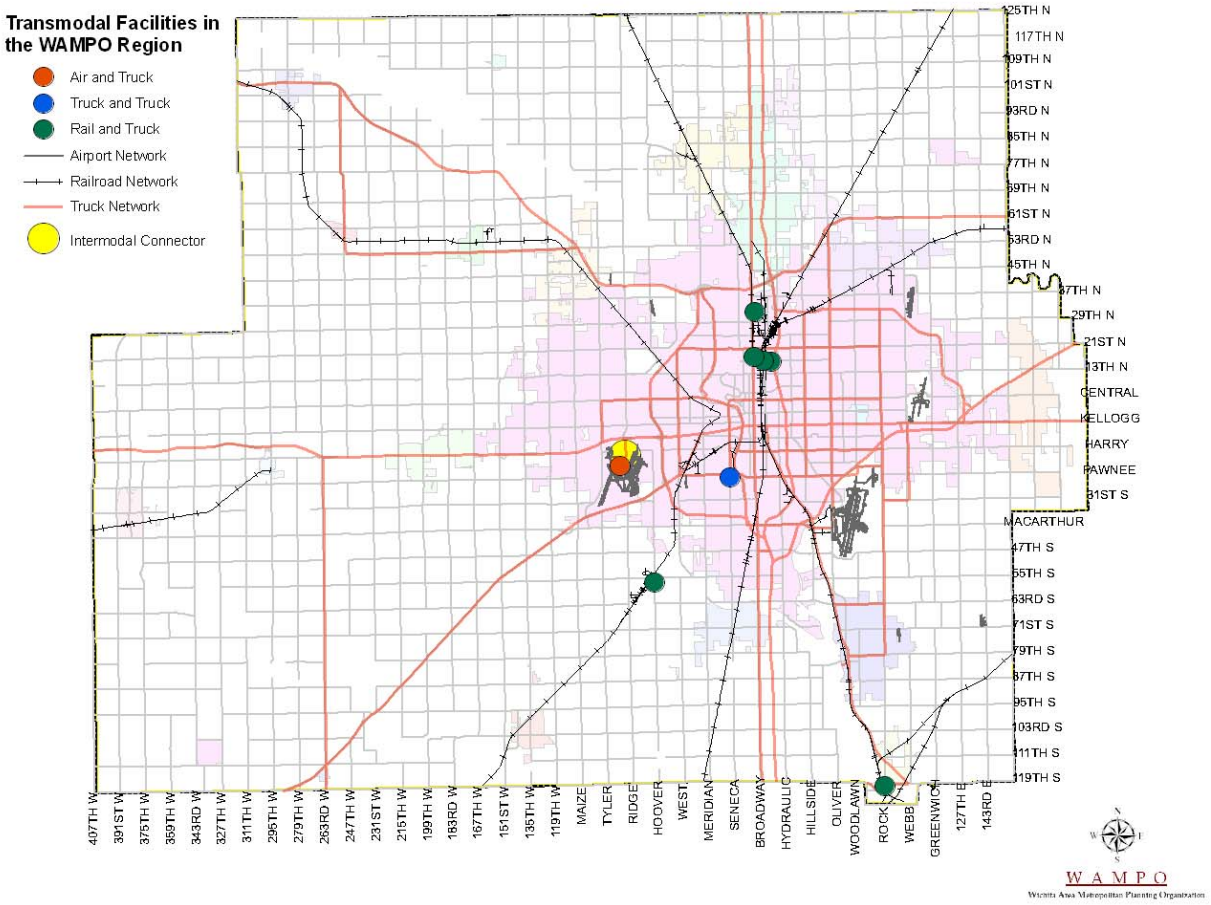
Transmodal

Transmodal facilities are those in which freight from one mode (truck, rail, and air) is transferred to another mode. A well designed intermodal facility can provide for an efficient transfer of freight. Three issues contribute to problems with intermodal facilities:

- Institutional issues (ownership, operations, facilities that serve multiple operators, or competition for space);
- Physical Constraints (room to grow and expand); and

- Traffic Impacts (may result in additional traffic on the adjacent roadway network).

figure 38: **Transmodal Facilities in the WAMPO Region**



source: Kansas DOT

There are eight transmodal facilities located in the WAMPO region (figures 38 and 39).

Mid Continent airport serves as a transmodal facility to transfer freight from air to truck and truck to air. The United States Postal Service (USPS) operates a transmodal facility to transfer mail and freight from trucks

figure 39: **Transmodal Facilities in the WAMPO Region**

Facility	Transmodal Type
Emery Forwarding	Air & Truck
Mulvane Cooperative	Rail & Truck
Cereal Food Processors, Inc.	Rail & Truck
Garvey Elevators, Inc.	Rail & Truck
Heiman Elevator, Inc.	Rail & Truck
USPS Remote Inc.	Truck & Truck
Garvey Public Warehouse	Rail & Truck
CTSs Bulk Terminal	Rail & Truck

source: WAMPO

coming from other regions to trucks that deliver to postal distribution centers in the WAMPO region.

As stated earlier, the WAMPO region is an active location for the transfer of agricultural goods from rural Kansas to the national rail system. There are six truck-to-rail and rail-to-truck transmodal facilities operating in the WAMPO region. Institutional issues for the operation of the Wichita Terminal, as well as being land-locked, cause periodic delays in transferring goods from the short line railroads to the BNSF and UPRR railroads.

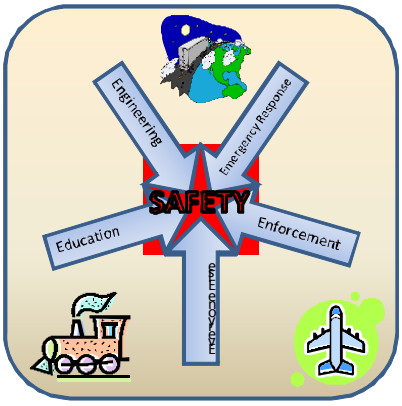
All transmodal facilities are located inside or within one mile of the corporate limits of the City of Wichita. As such they can have an influence on traffic within and around the facility. Rail relocations, as identified previously, allow for moving rail to areas outside of the City core and can provide room for transmodal facilities to expand. Maintaining the existing street and highway system may help in mitigating the effects of traffic in and around existing transmodal facilities.

SAFETY

If you look at safety from all viewpoints you can identify five specific elements that make any transportation mode, and the movement of freight a safer environment. There are 5 Es of safety (figure 40) that can be addressed:

- Engineering;
- Enforcement;
- Education;
- Emergency response; and
- Everyone Else.

figure 40: **The 5 Es of Safety**



source: WAMPO

This plan has focused on the engineering portion of the 5E process. As a transportation planning agency, WAMPO has the ability to direct federal funding and staff efforts to identify and address the transportation needs of the region. As stated previously, WAMPO is limited in its role to address changes in policy or to enforce those policies. That does not make the enforcement and emergency response aspects of safety any less important. WAMPO staff, the government authorities within the WAMPO region, federal and state authorities, freight movers, suppliers, distributors, and the general public are all "everyone else". It is up to us all to aim for a safer environment for the movement of freight. In doing so, we make the streets, highways, rails, and airports safer for us all.

Highway Safety

Highway safety is a concern of anyone who uses the street and highway network. Crashes are inevitable due to multiple issues (roadway design, weather, animals, etc.), but statistically, most crashes are attributable to bad judgments made by drivers. Freight movement is adversely affected by crashes of any kind. Delays caused by crashes can be costly to the manufacturers and shippers who rely on efficient and effective movement of freight. Figure 41 provides a glimpse at crash data for the highways in the WAMPO region.

figure 41: **Highway Crash Data for the WAMPO Region**

	WAMPO Region	State of Kansas	WAMPO Region as % of Kansas
Population *(2008 US Census estimates)*	499,080	2,802,134	17.81%
Miles of railway	175	4,776	3.66%
At-grade crossing crashes *(1999 - 2008)*	69	608	11.35%
Fatalities	12	144	8.33%
Non-fatal injuries	82	1,705	4.81%
Crash per 1,000 population	0.14	0.22	63.72%
Fatalities per 1,000 population	0.02	0.05	46.79%
Non-fatal injuries per 1,000 population	0.16	0.61	27.00%
Crashed per mile of rail	0.39	0.13	309.72%
Fatalities per mile of rail	0.07	0.03	227.43%
Non-fatal injuries per mile of rail	0.47	0.36	131.25%

source: WAMPO

Freight safety can also be implemented at a regulatory level by increasing the vehicle inspection process and increased enforcement of truck regulations. Public awareness and education on the differences in driving trucks, as compared to cars should also be investigated.

Rail Safety

The State of Kansas has a rail network totaling some 4,776 miles of mainline track, 175 miles of which are located in the WAMPO region. The WAMPO region has 4% of all railroad trackage in the state but has over 11% of all crashes. Over 8% of all fatalities recorded between 1999 and 2008 occurred in the WAMPO region. By population (2008 Census estimate), the WAMPO region shows 0.14 crashes per 1,000 people compared to 0.22 crashes per 1,000 people for the State of

figure 42: **Rail Crossing Crash Data for the WAMPO Region**

	WAMPO Region	State of Kansas	WAMPO Region as % of Kansas
Population *(2008 US Census estimates)*	499,080	2,802,134	17.81%
Miles of railway	175	4,776	3.66%
At-grade crossing crashes *(1999 - 2008)*	69	608	11.35%
Fatalities	12	144	8.33%
Non-fatal injuries	82	1,705	4.81%
Crash per 1,000 population	0.14	0.22	63.72%
Fatalities per 1,000 population	0.02	0.05	46.79%
Non-fatal injuries per 1,000 population	0.16	0.61	27.00%
Crashed per mile of rail	0.39	0.13	309.72%
Fatalities per mile of rail	0.07	0.03	227.43%
Non-fatal injuries per mile of rail	0.47	0.36	131.25%

source: WAMPO

Kansas (figure 42).

Airport Safety

Safety incidents are reported to the Aviation Safety Reporting System maintained by NASA for the Federal Aviation Administration (FAA). Incidents are defined as an occurrence other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operations. There have been no accidents at Mid Continent Airport but there have been a handful of incidents, mostly runway incursions, which may have had an effect on airport operations and subsequently on the movement of freight.

The FAA systematically reviews each runway incursion in terms of the severity of its outcome. Severity is measured using four categories; A, B, C, and D. Category A is the most serious and Category D is the least serious incursion.

The severity categories consider factors such as the speed and performance characteristics of the aircraft involved, the proximity of one aircraft to another aircraft or vehicle, and the type and extent of any evasive action by those involved in the event.

figure 43: **Runway Incursions (RI) by Year and by 10,000**

Year	Severity					Total RI
	Collision	A	B	C	D	
2004	0	0	0	1	1	2
2005	0	0	0	1	1	2
2006	0	0	0	0	1	1
2007	0	0	0	0	1	1

Year	Severity					RI for every 10,000 Ops.
	Total Operations	A	B	C	D	
2004	176089	0.00	0.00	0.01	0.01	0.11
2005	176554	0.00	0.00	0.01	0.01	0.11
2006	178925	0.00	0.00	0.00	0.01	0.06
2007	157654	0.00	0.00	0.00	0.01	0.06

source: Federal Aviation Administration

Incidents occurring between 2004 and 2007 at ICT are identified in figure 43. The Wichita Mid Continent Airport recorded six Runway Incursions (RI) between 2004 and 2007; four Category D and two Category C incursions.

Freight and Air Quality

All modes that move freight have an effect on air quality. Internal combustion engines used to power trucks, locomotives, and aircraft produce two pollutants that affect the air quality of the region. These engines produce large quantities of nitrogen oxide (NO_2) and particulate matter of 10 microns in diameter (PM_{10}). NO_2 emissions contribute to the formation of ground-

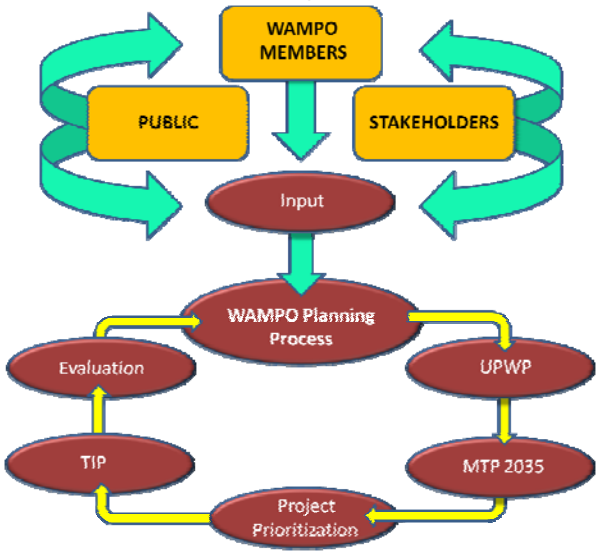
level ozone, an increasing issue in the WAMPO region. Particulate matter (which consists of dust, dirt, soot, and smoke), along with ozone, contribute to smog and causes low visibility and safety concerns.

Trucks and railroad locomotives are the largest contributors to freight-related NO_2 and PM_{10} emissions. Trucks contribute approximately 67% of the NO_2 emissions and 65% of PM_{10} emissions. Rail locomotives produce 15% of NO_2 and 12% of PM_{10}. New U.S. Environmental Protection Agency (EPA) emissions standards for heavy-duty trucks should dramatically reduce NO_2 and PM_{10}. Similarly, the expected adoption of strict standards for locomotives will also decrease emissions, but slow fleet turnover means the full effect of these standards will not be felt for several years.

WAMPO PLANNING PROCESS

This plan has identified various problem areas that detract from the efficient and effective flow of freight in the WAMPO region. Solutions aimed at overcoming these problem areas come from the transportation planning process employed by local, state and federal agencies. WAMPO, as the MPO, is a regional agency that seeks solutions to these problem areas on a regional level. WAMPO provides a setting for effective regional decision-making in evaluating transportation alternatives, such as freight movement, in the region. To do so, WAMPO employs a planning process that identifies transportation, or transportation-related projects and programs them for implementation, and reviews their effectiveness in meeting the goals and objectives of this plan and other plans developed and maintained by WAMPO (figure 44). The process includes input from the public, from stakeholders, and from WAMPO member jurisdictions.

figure 44: **WAMPO Planning Process**



source: WAMPO

Potential transportation and transportation-related projects are evaluated, ranked, and prioritized though the development of the WAMPO Long Range Transportation Plan

(LRTP). Projects are then prioritized and programmed in the WAMPO Transportation Improvement Program (TIP). WAMPO staff programs development of these projects into its Unified Planning Work Program (UPWP). Projects are contracted, completed and evaluated on the effects that they have in relation to the goals and objectives stated in the MTP 2035. All activities are governed by the WAMPO Transportation Policy Body (TPB).

WAMPO Transportation Policy Body

The WAMPO Transportation Policy Body (TPB) is a nine-person policy committee representing the WAMPO member jurisdictions. The TPB meets monthly to discharge their duties as the governing body for the MPO. The TPB directs WAMPO staff efforts in the development of products and services related to the WAMPO Planning Process. The freight plan, as part of the WAMPO transportation planning process, is reviewed and approved by the WAMPO TPB. The TPB has total discretion on the content of the plan.

WAMPO Technical Advisory Committee

The WAMPO TPB is supported by various transportation committees. The Technical Advisory Committee (TAC) is the primary support committee. The TAC is a 14 member committee (13 voting members, 1 ex officio member) that exists to provide their collective expertise in reviewing transportation issues and interpreting data related to various transportation interests within the WAMPO region. The TAC provides the TPB with recommendations for transportation issues within the WAMPO region.

WAMPO Long Range Transportation Plan

The current WAMPO long-range transportation plan expires in August of 2010. WAMPO is currently developing the Metropolitan Transportation Plan (MTP) 2035 to replace it. The MTP 2035 provides a coordinated and long-range vision of the regionally significant transportation improvements and policies that will be needed to efficiently move freight and people within and through the WAMPO region.

MTP 2035 is a tool for planning, implementing, and maintaining the transportation system in the WAMPO region. It provides goals and objectives to ensure that development of the region's transportation system meets all needs for the use of the traveling public and for freight movement. The long-range plan is updated every five

years to reflect changes in federal legislation, funding, priorities, and new transportation issues.

The WAMPO long-range plan is the basis for all transportation planning efforts in the WAMPO region. It provides a blueprint for the direction of transportation and transportation-related improvements. To implement projects and concepts identified in the long-range plan, WAMPO produces an annual Transportation Improvement Program.

WAMPO Transportation Improvement Program

The Transportation Improvement Program (TIP) is the implementation portion of the long-range transportation planning effort. Projects are submitted to WAMPO, reviewed by staff for consistency with the existing long range transportation plan. Projects that include ITS elements are reviewed by staff for consistency with the WAMPO Regional ITS Architecture. The TIP is reviewed by the WAMPO Technical Advisory Committee (TAC) before it is forwarded to the WAMPO Transportation Policy Body (TPB) for approval.

The TIP covers a four-year time frame identifying projects to be funded with available federal, state, and local funds within that time frame. Projects that are regionally significant are also included. The WAMPO TIP also includes a list of contingency projects that may be programmed if additional funding becomes available. All transportation projects receiving federal funds, and those projects with regional significance, need to be identified in the TIP before federal funds will be released.

The WAMPO TIP is officially adopted by the TPB and forwarded to the Kansas Department of Transportation for inclusion, by reference, in the Statewide TIP (STIP). WAMPO certifies that the transportation planning process associated with the TIP complies with applicable federal laws and regulations as required in 23 CFR 450.114C.

Stakeholder Involvement

Freight stakeholders should be actively involved in the WAMPO transportation planning process to assure that needs relative to their respective mode are addressed by WAMPO and local jurisdictions. Early and continued communication with local representatives or WAMPO do not ensure that projects will be developed or implemented but it does draw attention to areas in which freight stakeholders have issues.

Update Schedule and Amendments

The WAMPO Freight Plan will be reviewed on a five-year cycle, corresponding to the review cycle of the WAMPO long range transportation plan, but will be updated or revised as needed to reflect changes in the planning environment.

Any and all revisions, changes, or amendments shall be subject to the WAMPO transportation planning process. This process includes review by the TAC, TPB, and public input and review as identified in the WAMPO Participation Plan (PP).

For more information on this plan, please contact WAMPO at:

W A M P O

Wichita **A**rea **M**etropolitan **P**lanning **O**rganization
455 N. Main, 10th Floor
Wichita, KS 67202
T: 316.268-4421
F: 316.268.4390

Visit us on the web at www.wampoks.org