LEXINGTON AREA METROPOLITAN PLANNING ORGANIZATION FREIGHT PLAN

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1. FREIGHT AND INTERMODAL SYTEM PLANNING

Introduction

What exactly is freight transportation? Basically, *freight transportation is the movement of goods from one point to another.* Freight transportation is divided into two elements; freight demand and freight supply. Freight Demand includes; purchaser, consumers and goods and freight supply includes; infrastructure, (Federal, state, local governments, public-private authorities and private sector) and services (carriers, freight forwarders and brokers, third-party logistic providers (3PLs)).

The differences between passenger planning and freight planning are;

Passenger Planning	Freight Planning
▪ Movements often begin and end within the same jurisdiction. ▪ Less infrastructure impacts ▪ Less inter-model in nature ▪ Can be handle within a single jurisdiction ▪ Trip generation and attractions well understand and predicted ▪ Plenty of publicly available data ▪ Well defined funding and financing sources and strategies ▪ Better understanding the issues by decision makers ▪ Stakeholders are easily identified	▪ Complex chain of inter-regional and international trips ▪ Multi-jurisdictional cooperation required ▪ Freight movements are sensitive to the market forces and difficult to forecast the demand ▪ Fewer sources available ▪ Often requires innovative funding and financing sources ▪ Private sector industry is not always well understood ▪ Freight stakeholders are harder to identify and more challenging to engage.

The focus of this report will serve as an extension of Lexington Area MPO's Long Range Transportation Plan. It will give a detailed spatial picture of goods movement into and out of our MPO area and will identify future trends. In addition, the impacts of possible changes in the economic components of the area will be addressed. It will also provide a foundation for incorporating freight considerations into the MPO's short and long-range transportation planning process.

1.1 Background

Under the provisions of the Intermodal Surface Transportation Efficiency Act (ISTEA), all MPOs were required to consider seven planning factors in the development of transportation plans and programs. With the enactment of the Transportation Equity Act for the 21st Century (TEA-21), the number of planning factors was reduced to seven. TEA-21 requires that MPOs shall provide for consideration of projects and strategies that will consider the following objectives.

1. Support the economic vitality of the United States, the States, and metropolitan areas, especially by enabling global competitiveness, productivity and efficiency;

2. Increase the safety and security of the transportation system for motorized and non-motorized users;

3. Increase the accessibility and mobility options available to people and for freight;

4. Protect and enhance the environment, promote energy conservation, and improve quality of life;

5. Enhance the integration and connectivity of the transportation system, across and between modes throughout the State, for people and freight;

6. Promote efficient system management and operation; and

7. Emphasize the preservation of the existing transportation system.

Of the seven planning factors, five are indirectly-related and two are directly-related to freight. Directly-related freight planning factors are:

- increase the accessibility and mobility options available to people and for freight
- enhance the integration and connectivity of the transportation system, across and between modes, for people and freight

On August 10, 2005, the president signed into law the **Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users** (SAFETEA-LU). Two noteworthy changes were made to the list of factors to be considered in statewide and metropolitan planning:

- safety and security are now listed as separate planning factors in order to give greater importance to security of transportation systems; and
- the environmental factor was revised to include promot(ing) consistency between transportation improvements and State and local planned growth and economic development patterns.

All other factors remained the same.

1.2 Importance of Freight Transportation

The movement of goods and people is an important component of the long range transportation planning process. Because of increased concerns for transportation safety and security, and the projected future growth in the volume of freight traffic over the next several years, The Lexington Area MPO will dedicate its planning resources to begin addressing the concerns of the public and businesses community throughout its two-county area.

To a large degree, the economic success of a region depends on its connections to the rest of the region, state, country, and world and its ability to facilitate the movement of people and goods across and within its boundaries. Increased competition in today's global economy rewards those regions that actively plan for and pursue seamless transportation systems, which depend on

efficient connections between all modes of travel. Transportation facilities and service levels are important elements that companies consider when locating to a new area because of the cost savings and increased economic competitiveness these regions provide. Thus, additional efforts are necessary to maintain the economic competitiveness and attractiveness of the region. Since many of these planning elements involve private sector entities, it is imperative to involve them in the planning process.

Goods transportation differs significantly from passenger transportation, where the vast majority of trips occur within a metropolitan area and within the jurisdiction of a single Metropolitan Planning Organization (MPO). Trips, which distribute goods, may be limited to a single urban area or utilize highways and local roads crossing dozens of states and communities. Figure 1.2.1 shows the intermodal freight system paths. Goods movement's origin and destination differs than people's origin and destination and goods involves more movement than people. Using figure 1.2.1 we can take a look at the production cycle of a simple product to see how many time the good moves before consumed by a consumer. Orange juice will be used as an example and it will be assumed that oranges are not imported.

1st movement: Oranges picked up and loaded on any kind of mode and delivered to the plant from different locations.

2nd movement: Juice made and sent to the wholesaler or distributor using a mode.

3rd movement: By the order distributor sent to the retailer using a mode.

4th movement: Orange juice consumed by a consumer and carried to home.

The above example is a simple product and it moved four times. Some goods may require delivery to a consumer by truck such as furniture, appliances and so on. Some goods will involve more movements such as cars even before it is in the market. Without freight transportation, literally no business could survive. Every individual depends upon freight service in his or her daily life. From the shipper of raw materials to the processor to the wholesaler or retailer and finally to the consumer, the efficient movement of goods/freight is an absolute necessity to the area's economy. Transport of freight is a principal reason for the present location of today's urban area. Therefore, a primary goal of this plan is to maintain and improve the system and policies to allow the predominately private companies, which move goods to operate efficiently.

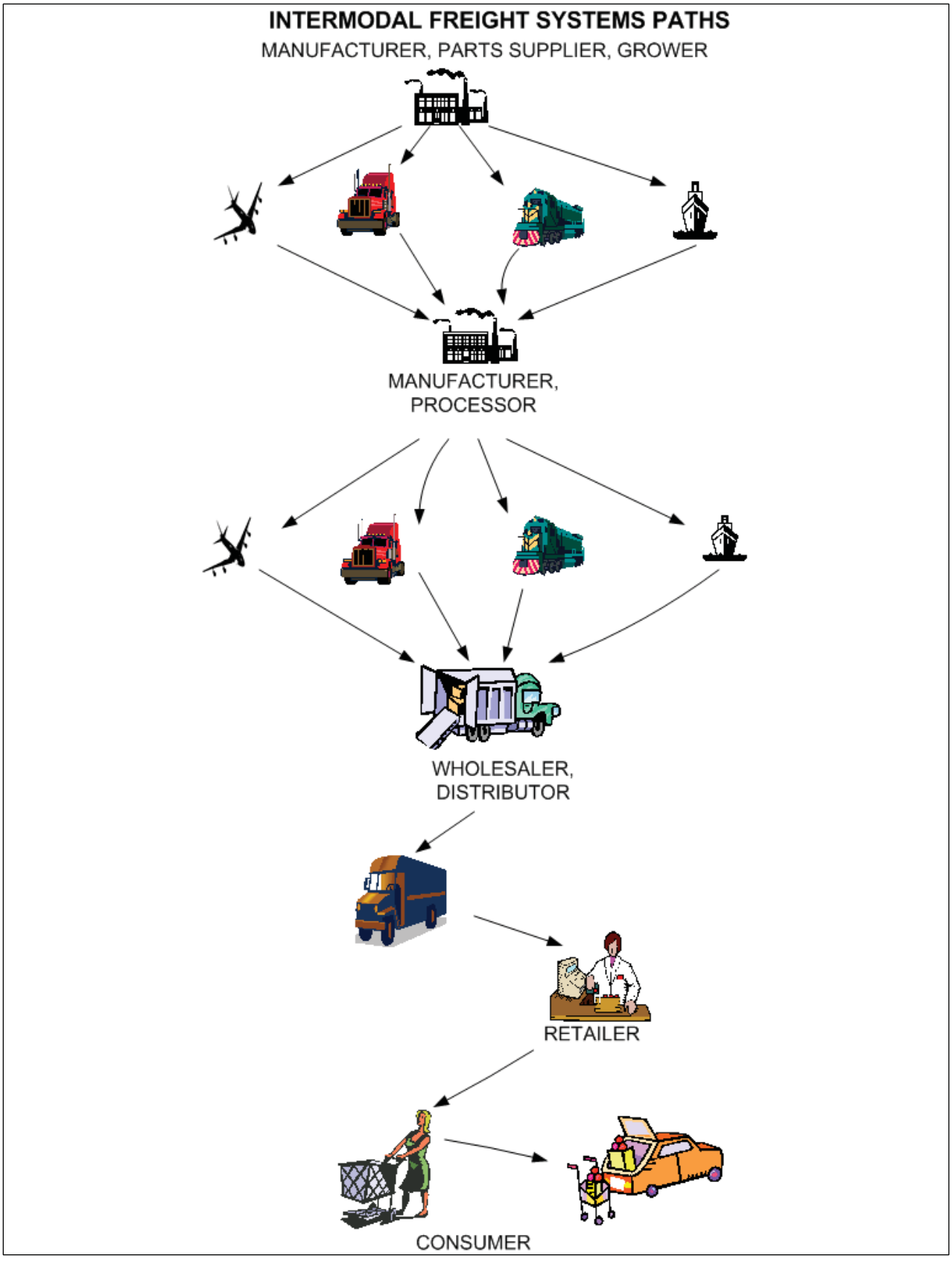

INTERMODAL FREIGHT SYSTEMS PATHS
MANUFACTURER, PARTS SUPPLIER, GROWER
MANUFACTURER, PROCESSOR
WHOLESALER, DISTRIBUTOR
RETAILER
CONSUMER

Figure 1.2.1

1.3 Impact of Freight Traffic

Freight movements invariably impacts land uses Level of Service (LOS), especially along the corridors utilized by truck and trucks accessing railroad intermodal facilities. The level of traffic impacts are often intensified when sensitive receptors, such as neighborhoods, schools, and parks occur along these high truck traffic routes (routes where heavy trucks exceed ten percent of the total traffic volume mix). For example, when existing and long established industrial, manufacturing, and warehousing land uses change to a higher trip generation land use, it generates heavy traffic volumes and reduces the functionality of the roadways for heavy trucks, especially when the existing roadways are not improved to handle the additional capacity to safely handle the additional commercial, retail, and residential traffic volumes. Proper long range planning and coordination with appropriate land use planners can serve to alleviate these impacts. This may include periodic designation and update of truck routes, implementation of additional limited access roadway facilities, and other techniques.

Since freight transportation is a means to various regional economic ends, changes to the regional economy, such as manufacturing and retail, directly impact freight transportation and vice versa. In addition, access to raw materials and markets are key factors in the location decision of most manufacturing and distribution companies. Building an efficient freight infrastructure will require coordination among the various modes of freight transportation. An efficient freight movement system would expand markets, increase opportunity, production, and competition. Freight transportation is viewed as an integral part of the industrial process--an extension of the manufacturing plant.

1.4 Overview of National Freight Transportation

According to 2004 US Department of Transportation (USDOT) and FHWA's Freight Facts and Figures, freight transportation has grown dramatically. Contributing factors were population growth, increased Us economic activities and increasing interdependence of the global economies. The U.S. population grew by twenty-seven percent between 1980 and 2002, while the economy, measured by Gross Domestic Product (GDP), nearly doubled in real terms. Foreign trade has grown faster than the overall economy, more than doubling between 1980 and 2002, reflecting unprecedented global interconnectivity. Demand for freight transportation is expected to grow with increases in population and economic activity. Over the next ten years the U.S. economy is projected to increase by thirty-eight percent and the U.S. population by nine percent. Transportation and warehousing employment is expected to increase by twenty-two percent over this period, faster than employment as a whole at fifteen percent. Truck traffic is concentrated on major routes connecting population centers, ports, border crossing, and other major hubs of activity. Figure 1.4.1 shows national estimated average daily truck traffic by 2020. Most of the routes will experience increases in truck traffic over the next twenty years, which, in combination with increases in passenger travel, will add to existing congestion. See figure 1.4.2.

Estimated National Average Daily Truck Traffic: 2020

Figure 1.4.1
Source: U.S. Dept. of Transportation, FHWA, Office of Management and Operations, Freight Analysis Framework

National Highway System Estimated Peak Period Congestion: 2020

Figure 1.4.2
Source: U.S. Dept. of Transportation, FHWA, Office of Management and Operations, Freight Analysis Framework.

It is mentioned in Freight Facts and Figures, 2004 that the Freight transportation is a big part of the economy. The value generated by transportation services in moving goods and people on the transportation system is about five percent of GDP. In the Transportation Services Sector sixty percent of the value is generated by for-hire transportation services and the rest is generated by in-house transportation. In-house transportation trucking is a transportation system provided by a business for their own uses, accounted for $142 billion in GDP in 1996 and for-hire trucking accounted for $101 billion. Also, Freight Facts and Figures pointed out the number of gallons of fuel burned by commercial trucks has nearly doubled over the past twenty years. The fuel consumed in highway freight transportation increased 20 billion to 37 billion annually between 1980 and 2002. See figure 1.4.3.

Fuel Consumption by Transportation Mode: National

	1980	1990	2000	2002
Highway				
Gasoline, diesel and other fuels (million gallons)	114,960	130,755	162,555	167,730
Truck, total	19,960	24,490	35,229	36,756
Single-unit 2-axle 6-tire or more truck	6,923	8,357	9,563	10,305
Combination truck	13,037	16,133	25,666	26,451
Truck (percent of total)	17.4	18.7	21.7	21.9
Rail, Class I (in freight service)				
Distillate / diesel fuel (million gallons)	3,904	3,115	3,700	3,730
Water				
Residual fuel oil (million gallons)	8,952	6,326	6,410	4,848
Distillate / diesel fuel oil (million gallons)	1,478	2,065	2,261	2,079
Gasoline (million gallons)	1,052	1,300	1,124	1,081
Pipeline				
Natural gas (million cubic feet)	634,622	659,816	642,210	667,027

Sources: Highway: U.S. Department of Transportation, Federal Highway Administration, *Highway Statistics* (Washington, DC: Annual issues), table VM-1and similar tables in earlier editions.

Rail: Association of American Railroads, *Railroad Facts 2003* (Washington, DC: October 2003), p. 40.

Water: U.S. Department of Energy, Energy Information Administration, *Fuel Oil and Kerosene Sales* (Washington, DC: Annual issues), tables 2, 4, and similar tables in earlier editions.

Pipeline: U.S. Department of Energy, *Natural Gas Annual 2002*, DOE/EIA-0131(02) (Washington, DC: January 2004), table 15 and similar tables in earlier editions.

Figure 1.4.3

According to Freight Facts and Figures, 2004 nearly 5,000 people died in crashes involving large trucks in 2003, although only 723 of those were large truck occupants. See figure 1.4.4. Fatalities involving large trucks are about twelve percent of all highway fatalities, while trucks account for about eight percent of highway VMT. Even the number of fatalities involving large trucks declined sixteen percent from 1980 to 2003 all agencies should work together to lower the percentage of the truck crashes. About 12,000 people are injured each year in freight transportation. Like fatalities, most injuries involve trucks. These injuries account less than five percent of the total number of people injured on the highway each year. Approximately, ten percent of injuries are the result of non-highway related incidents, mostly railroading. Since

1980, railroading has become much safer with a drop in injuries of more than eighty percent. Large trucks were involved in about seven percent of all highway crashes in 2003. The estimated number of crushes in 2003 is up about twenty-three percent since 1990. See figure 1.4.4

Transportation Fatalities by Freight Transportation Mode: National

	1980	1990	2000	2003[5]
Total transportation fatalities (passenger and freight)	**NA**	**47,347**	**44,333**	**NA**
Highway (passenger and freight)	**51,091**	**44,599**	**41,945**	**42,643**
Large truck occupants[1]	1,262	705	754	723
Others killed in crashes involving large trucks	4,709	4,567	4,528	4,263
Large truck occupants[1] (percent)	2.5	1.6	1.8	1.7
Others killed in crashes involving large trucks (percent)	9.2	10.2	10.8	10.0
Railroad (passenger and freight)	**1,417**	**1,297**	**937**	**856**
Highway-rail crossing[2]	833	698	425	324
Railroad[2,3]	584	599	512	532
Waterborne (passenger and freight)	**487**	**186**	**137**	**76**
Vessel-related[4]	206	85	49	28
Freight ship	8	0	0	3
Tank ship	4	5	0	0
Tug / towboat	14	13	0	8
Offshore supply	U	2	2	0
Fishing vessel	60	47	28	15
Mobile offshore drilling units	NA	0	0	0
Platform	NA	1	0	0
Freight barge	NA	0	1	0
Tank barge	NA	0	0	0
Miscellaneous	56	11	4	2
Not vessel-related[4]	281	101	88	48
Pipeline	**19**	**9**	**38**	**12**
Hazardous liquid pipeline	4	3	1	0
Gas pipeline	15	6	37	12

Key: NA = not available.

[1]Large trucks are defined as trucks over 10,000 pounds gross vehicle weight rating, including single-unit trucks and truck tractors.
[2]Includes Amtrak.

[3]Includes train accidents and other incidents. Most fatalities are trespassers who are included under other incidents (499 in 2003).

[4]Vessel-related casualties include those involving damage to vessels such as collisions or groundings. Fatalities not related to vessel casualties include deaths from falling overboard or from accidents involving onboard equipment.

[5]Railroad fatalities are preliminary. Waterborne fatalities are for 2002.

Note: Caution must be exercised in comparing fatalities across modes because significantly different definitions are used.

Source: U.S. Department of Transportation, Bureau of Transportation Statistics, *National Transportation Statistics 2004* (Washington, DC: forthcoming).

Figure 1.4.4

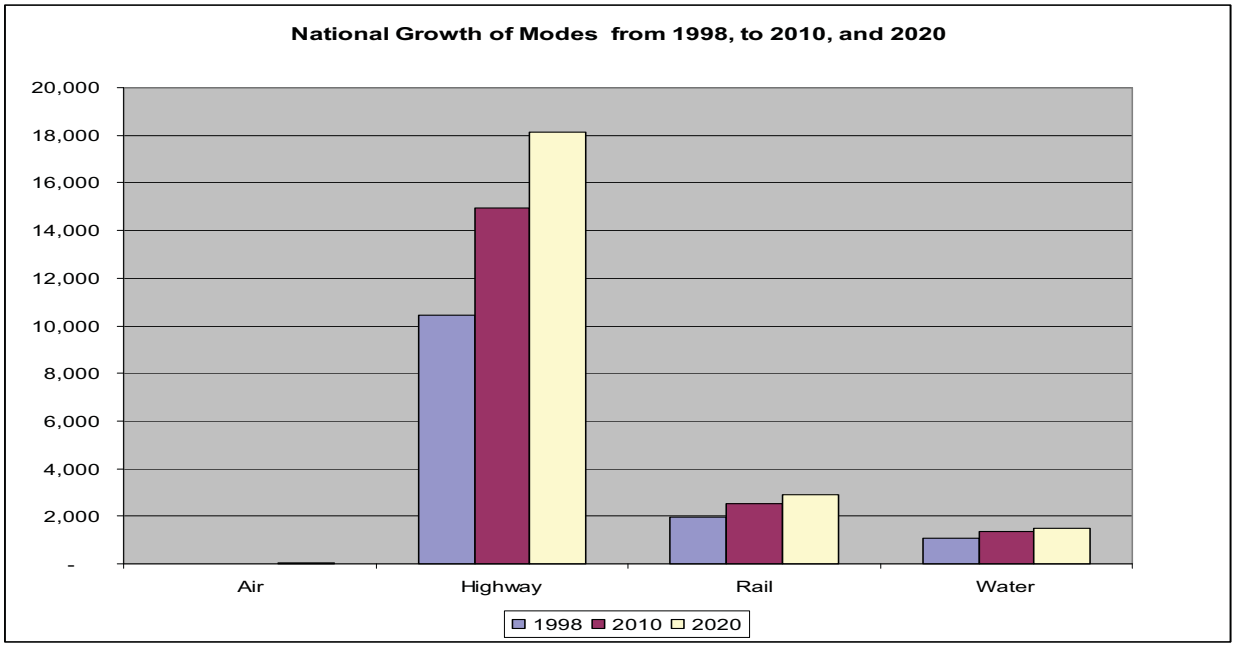
1.5 National Freight Flows

Freight Facts and Figures, 2004 shows that domestic freight transportation grew about 20 percent over the past decade and is expected to increase another 65 percent to 70 percent by 2020 (in terms of tons transported). It is also expected that International shipments would increase even faster than over this period by about 85 percent. See Figure 1.5.1 and 1.5.2.

National Freight Shipments by Weight and Value

	Tons (millions)			Value (Millions)		
Mode	1988	2010	2020	1998	2010	2020
Total	**15,271**	**21,376**	**25,848**	**9,312**	**18,339**	**29,954**
Domestic	**13,484**	**18,820**	**22,537**	**7,876**	**15,152**	**2,405**
Air	9	18	26	545	1,308	2,246
Highway	10,439	14,930	18,130	6,656	12,746	20,241
Rail	1,954	2,528	2,894	530	848	1,230
Water	1,082	1,345	1,487	146	250	358
International	**1,787**	**2,556**	**3,311**	**1,436**	**3,187**	**5,879**
Air	9	16	24	530	1,182	2,259
Highway	419	733	1,069	772	1,724	3,131
Rail	358	518	699	116	248	432
Water	136	199	260	17	34	57
Other	864	1,090	1,259	N/A	N/A	N/A

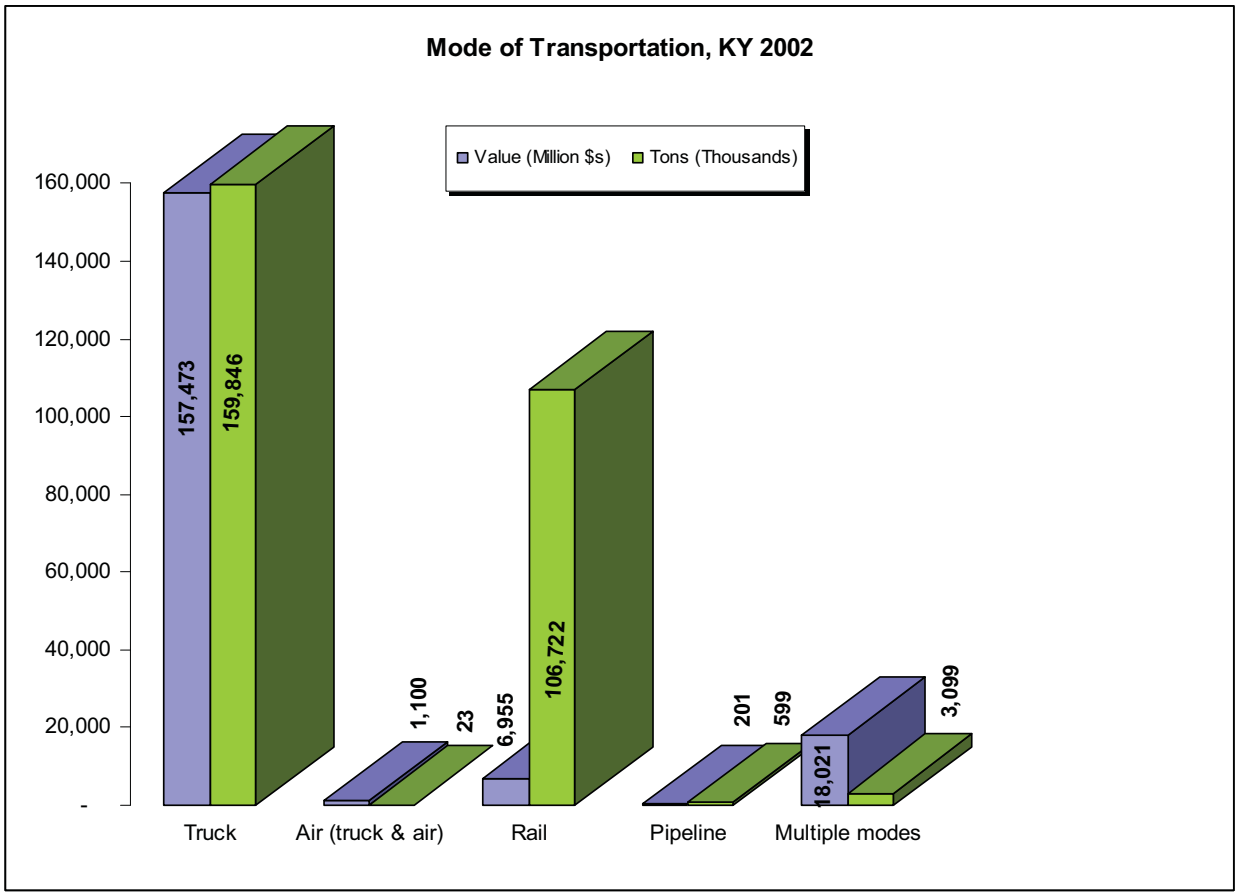
Other includes international shipments that moved via pipeline or by an unspecified mode
Source: Freight Facts and Figures; Office of Freight Management and Operations, U.S. Dept. of Transportation, FHWA
Figure 1.5.1



Source: Freight Facts and Figures; Office of Freight Management and Operations, U.S. Dept. of Transportation, FHWA
Figure 1.5.2

1.6 Overview of State Freight Transportation

In 2002 157,846 million dollar valued commodities with the weight of 159,846 tons moved by truck on Kentucky's roads. Same year rail represented about seven million dollar with 106,722 tons which is the second largest mode in the state. Pipelines carried commodities more than air-truck but air-truck valued more than pipeline. While the commodities carried by the air valued 1,100 million dollar pipeline had only 201 million dollar. It is because of the cost of air freight and the type of commodities. At the same time rail had 599 thousand of tons and air-truck had only 23 thousand of tons of commodities carried. See figure 1.6.1. Multiple modes include two or more of the following modes of transportation were used: Private truck, for-hire truck, Rail, Shallow draft vessel, Deep draft vessel and Pipeline. In Kentucky multiple modes represented 18,021 million dollars and 3,099 thousand tons at the year of 2002. For detail information about the data see *Kentucky: 2002, 2002 Economic Census, Transportation, 2002 Commodity Survey*.



Source: U.S. DOT, Bureau of Transportation Statistics and U.S. Dept of Commerce Economic and Statistics Administration, U.S. Census Bureau, 2002 Commodity Flow Survey
Figure 1.6.1

Mode of transportation for the highway estimated number for the year of 2010 is 436 million tons with the value of 461 billion dollar and for the year of 2020 is 524 million tons with value of 706 billion dollar. It is obvious that in the future it will be more trucks on Kentucky's highways.

See figure 1.6.2. Same study shows that estimated rail is 201 million tons with the value of 54 billions dollar for 2010 and 218 million tons with the value of 77 billions dollar for 2020. Figure 1.6.3 represents Kentucky Freight Flows by rail for 1999. Although mode of water is not one of the most used modes in Kentucky, numbers will increase in the future. See figure 1.6.2.

	Tons (millions)			Value (billions $)		
	1998	2010	2020	1998	2010	2020
KY Total	558	757	877	349	672	1,053
By Mode						
Air	1	2	3	60	148	257
Highway	304	436	524	250	461	706
Rail	160	201	218	34	54	77
Water	93	118	132	5	9	13
By Destination/Market						
Domestic	532	718	827	328	626	965
International	25	39	50			

Source: Freight Facts and Figures, Office of Freight Management and Operation, US Dept of Transportation, FHWA,2004

Figure 1.6.2

KY Freight Flows by Rail 1999

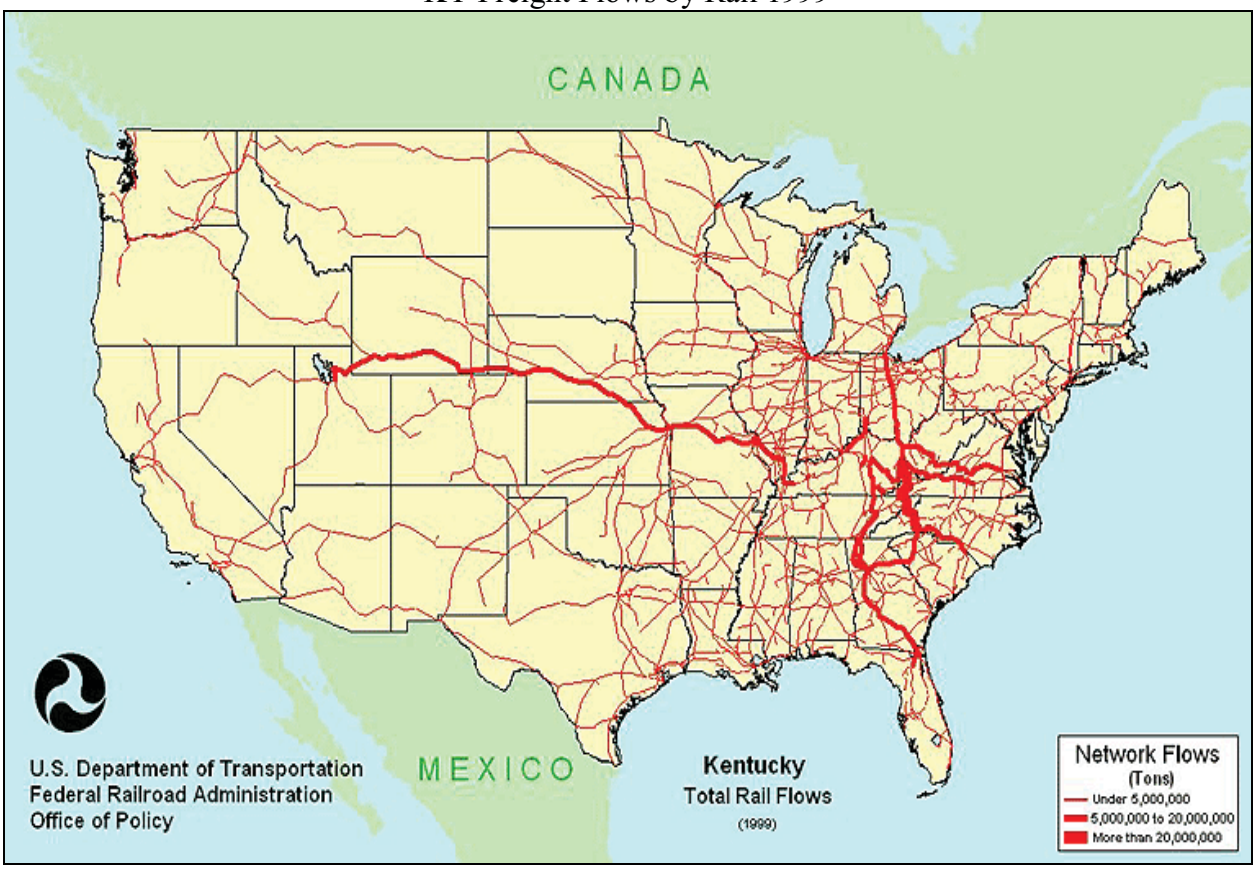


Figure 1.6.3

Figure 1.6.4 exhibits total combined truck flows in Kentucky in 1998. Figure 1.6.5 gives us closer look about Average Annual Daily Truck Traffic for the same year.

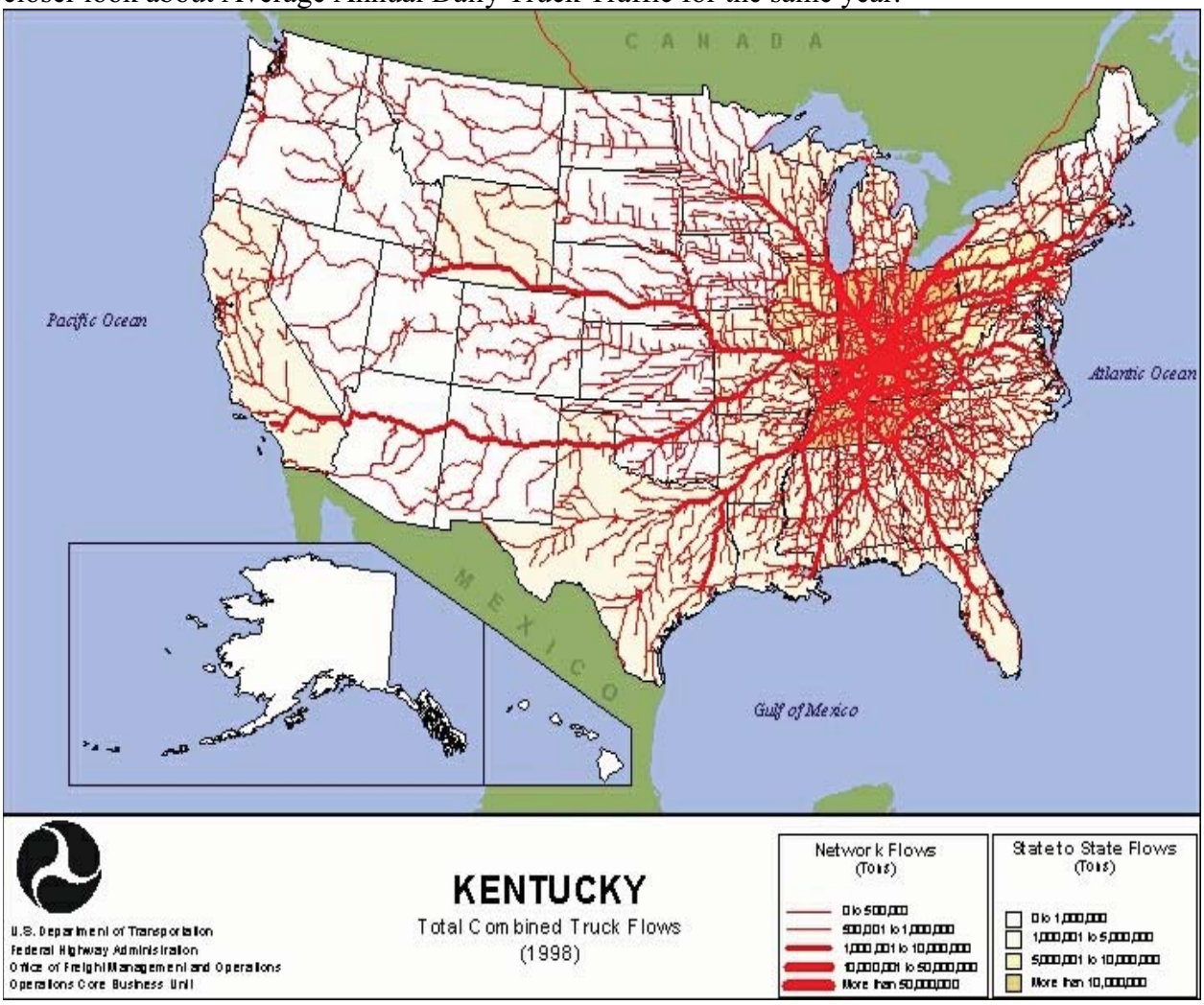


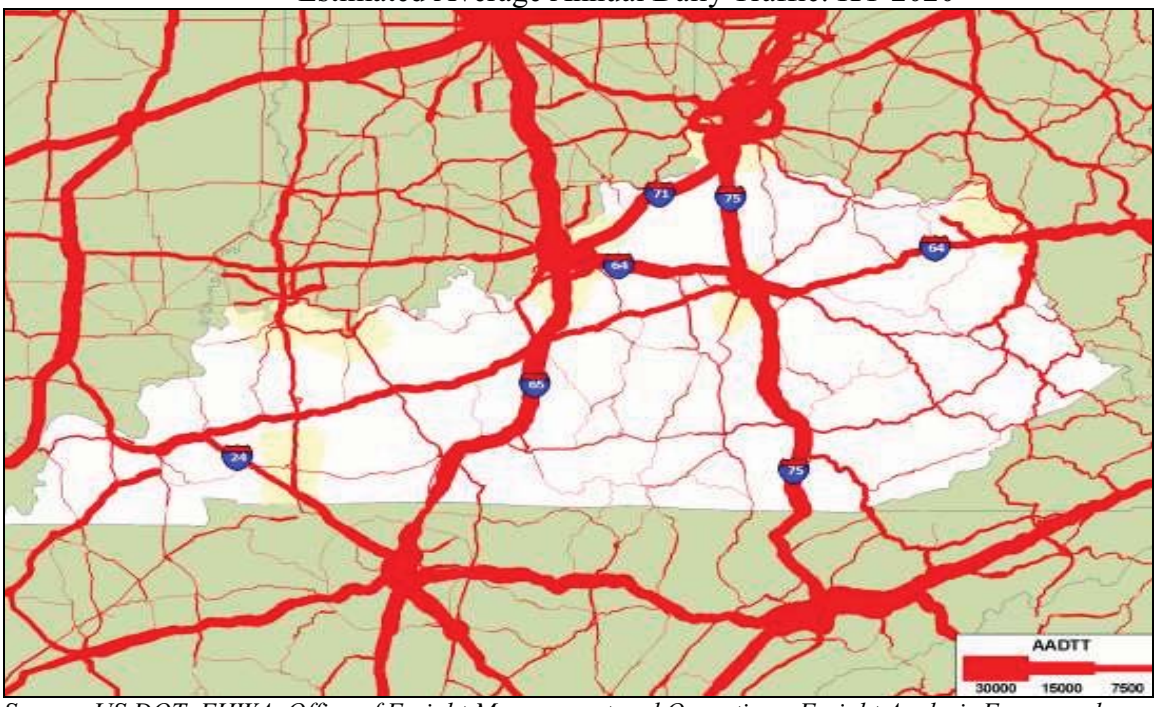
Figure 1.6.4

The map Average Annual Daily Traffic (AADT) for the year 2020 (figure 1.6.5) clearly shows that interstate I-75, I-71 and I-65 will have major truck traffic in a given year. Addition to the mentioned highways Blue Grass Parkway which is a major connector between interstates will have a large amount of increase on truck traffic. Figure 1.6.6 shows that most part of these interstates will be exceed its capacity for the same year.

One of the reasons that I-75 and I-65 had/have larger truck traffic is inbound and outbound shipments (origin/destination) from/to Kentucky. Largest outbound shipments is 157,690 thousand tons to East south Central States and 81,218 thousand tons to South Atlantic States and 56,071 thousand tons to East North Central States which 159,849 thousand tons of shipments by truck only in 2002. See figure 1.6.7 and 1.6.8. As far as inbound shipments same regions have the largest inbound shipments; from East South Central States 146,117 thousands tons, from East North Central States 58,360 thousand tons and from South Atlantic States 19,948 thousand tons.

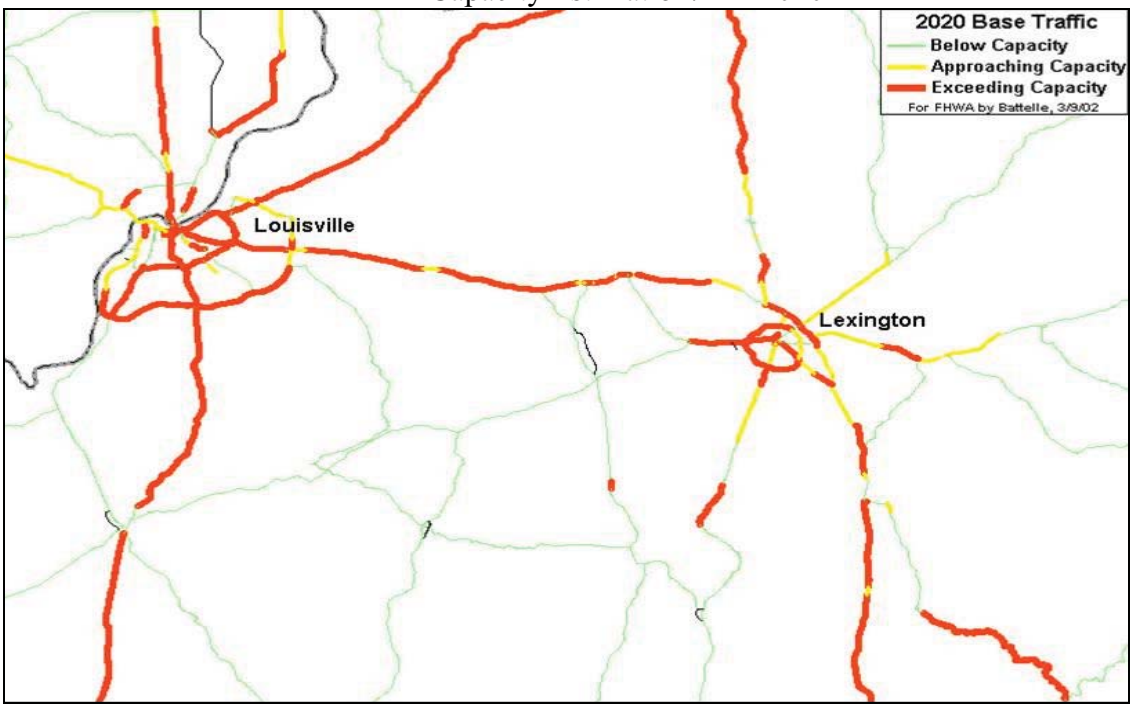
See figure below 1.6.9 and 1.6.10. A chart has been added for the list of states in different region categorized by US Department of Commerce.

Estimated Average Annual Daily Traffic: KY 2020



Source: US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework
Figure 1.6.5

Capacity Estimation: KY 2020



Source: US DOT, FHWA, Office of Freight Management and Operations, Freight Analysis Framework
Figure 1.6.6

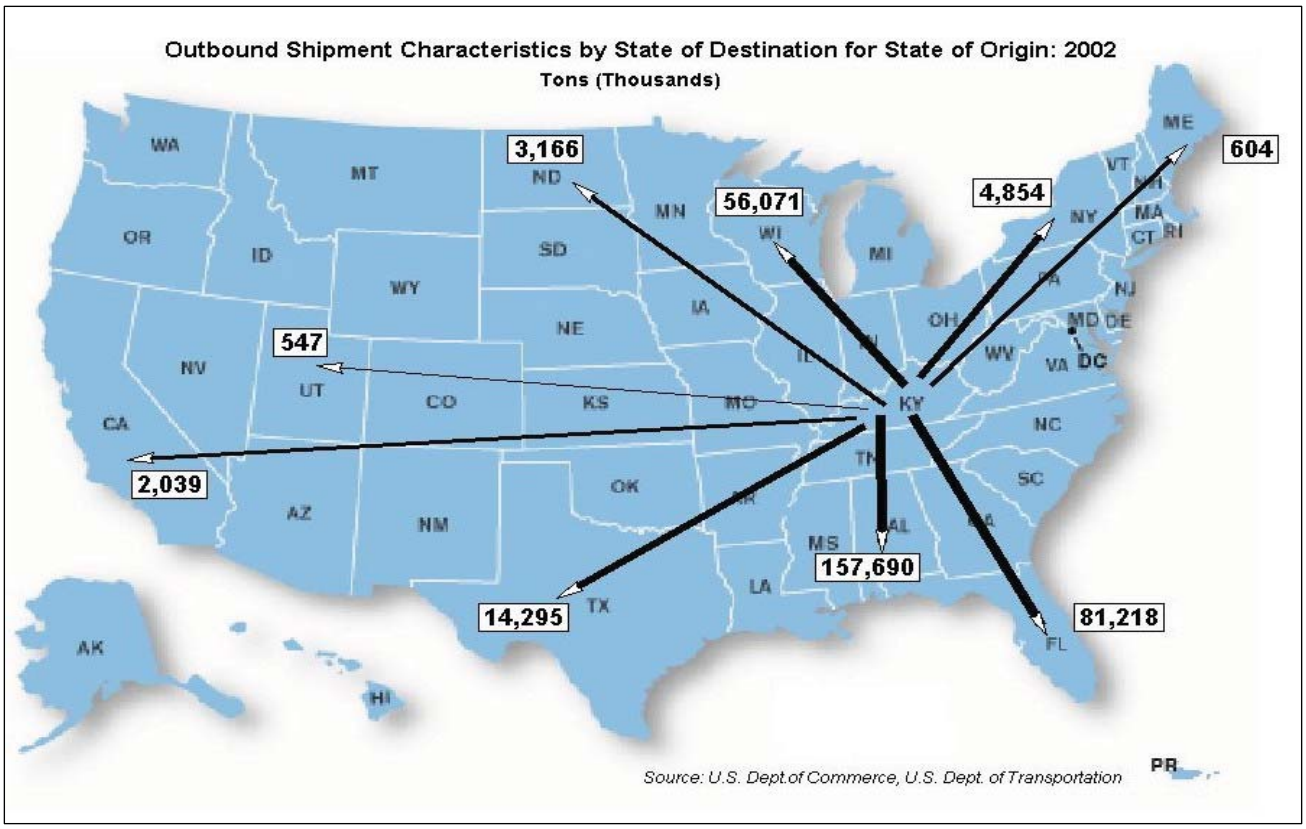


Figure 1.6.7

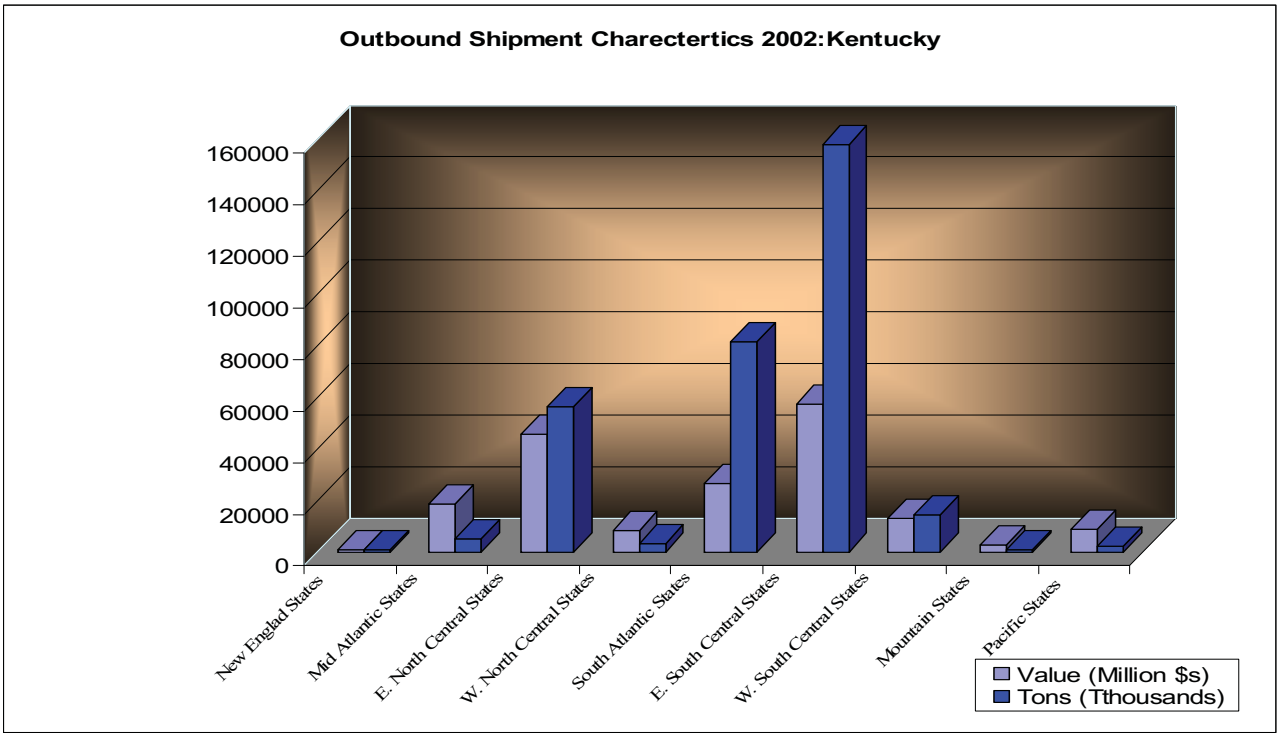


Figure 1.6.8 *Source: US Dept. of Commerce, US dept of Transportation*

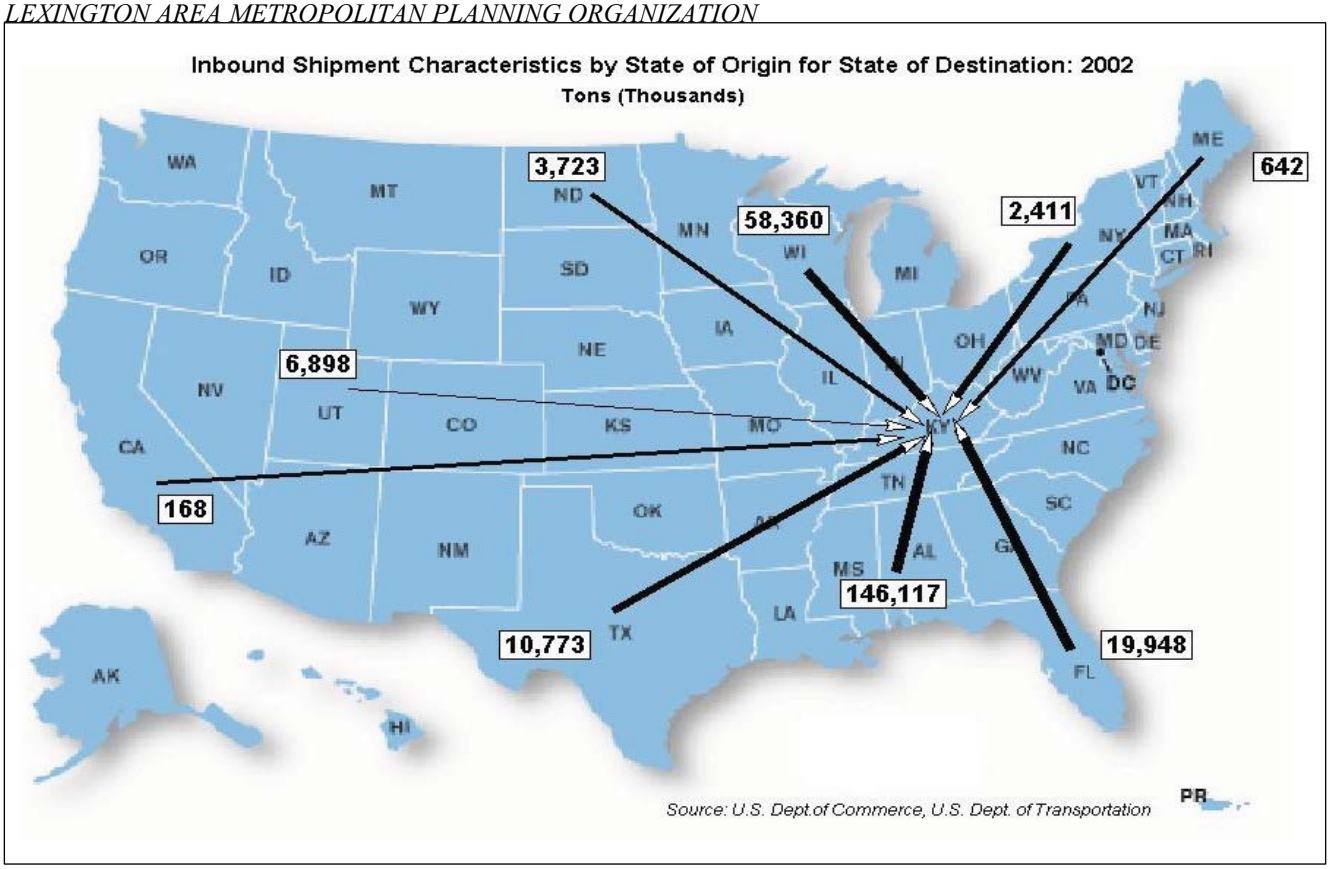


Figure 1.6.9

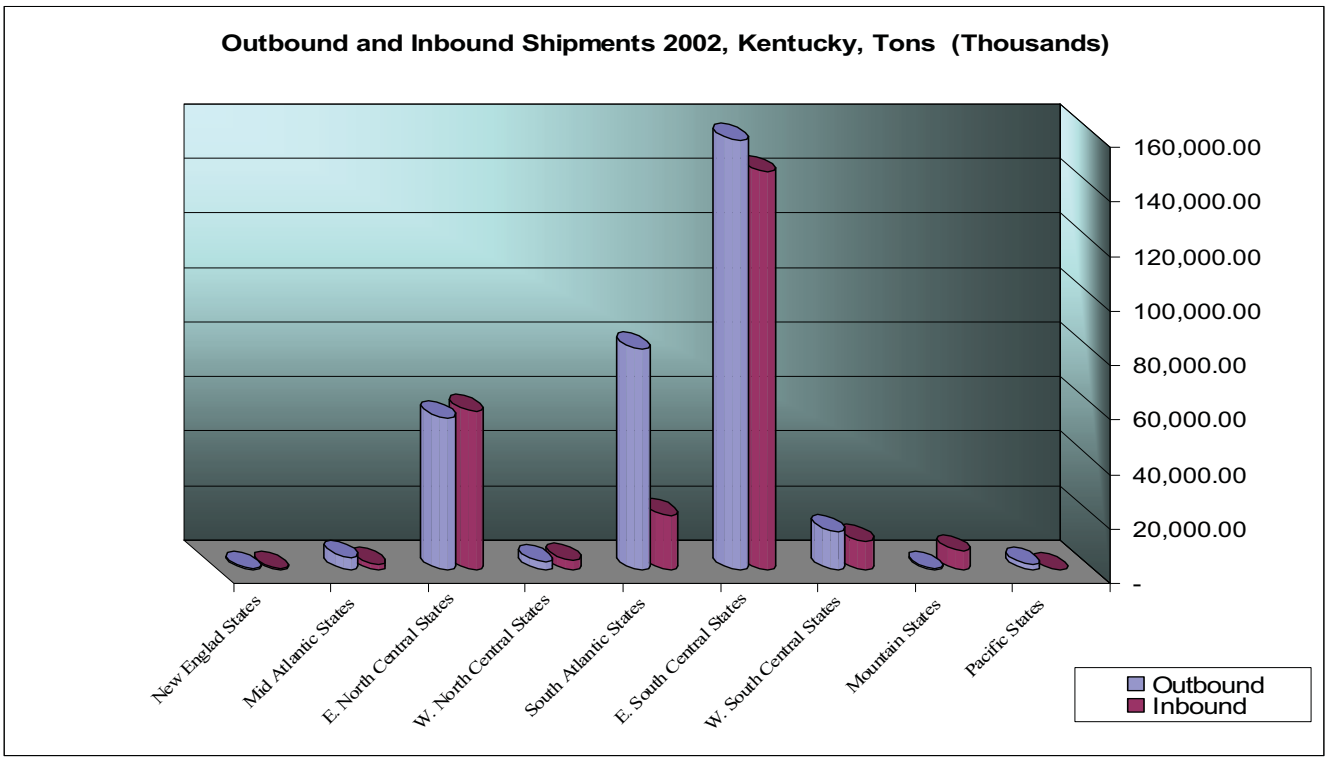
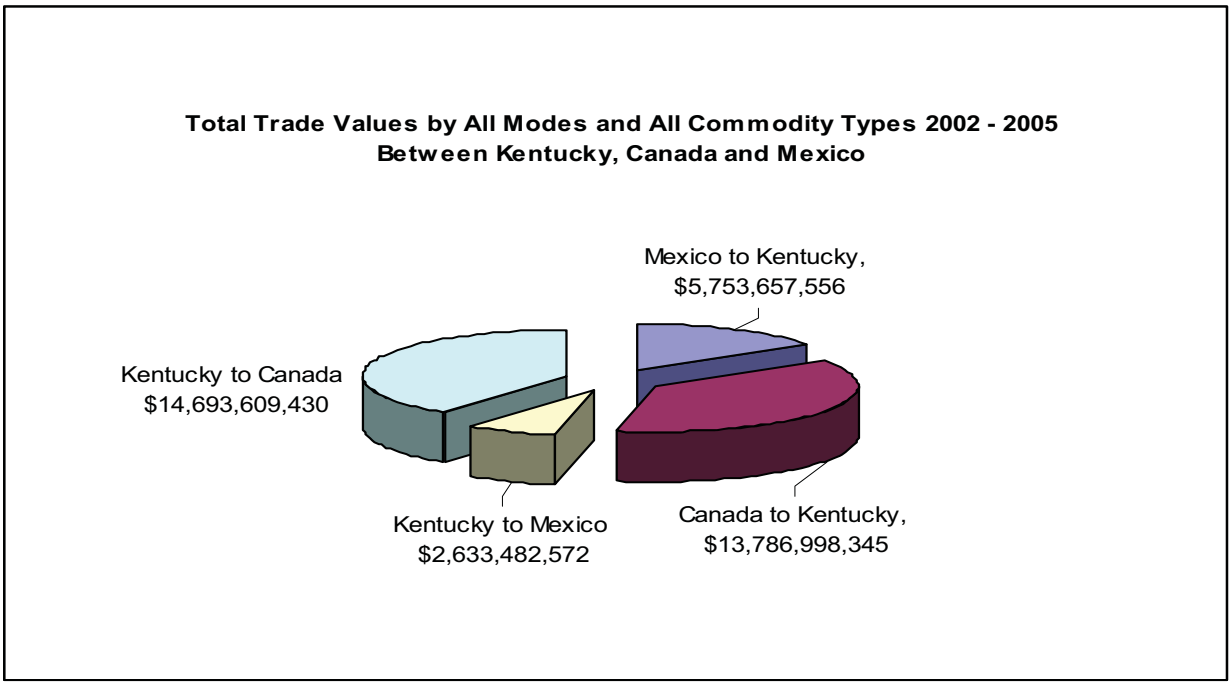


Figure 1.6.10 *Source: US Dept. of Commerce, US dept of Transportation*

New England States: Connecticut, Massachusetts, Maine, Rhode Island, Vermont

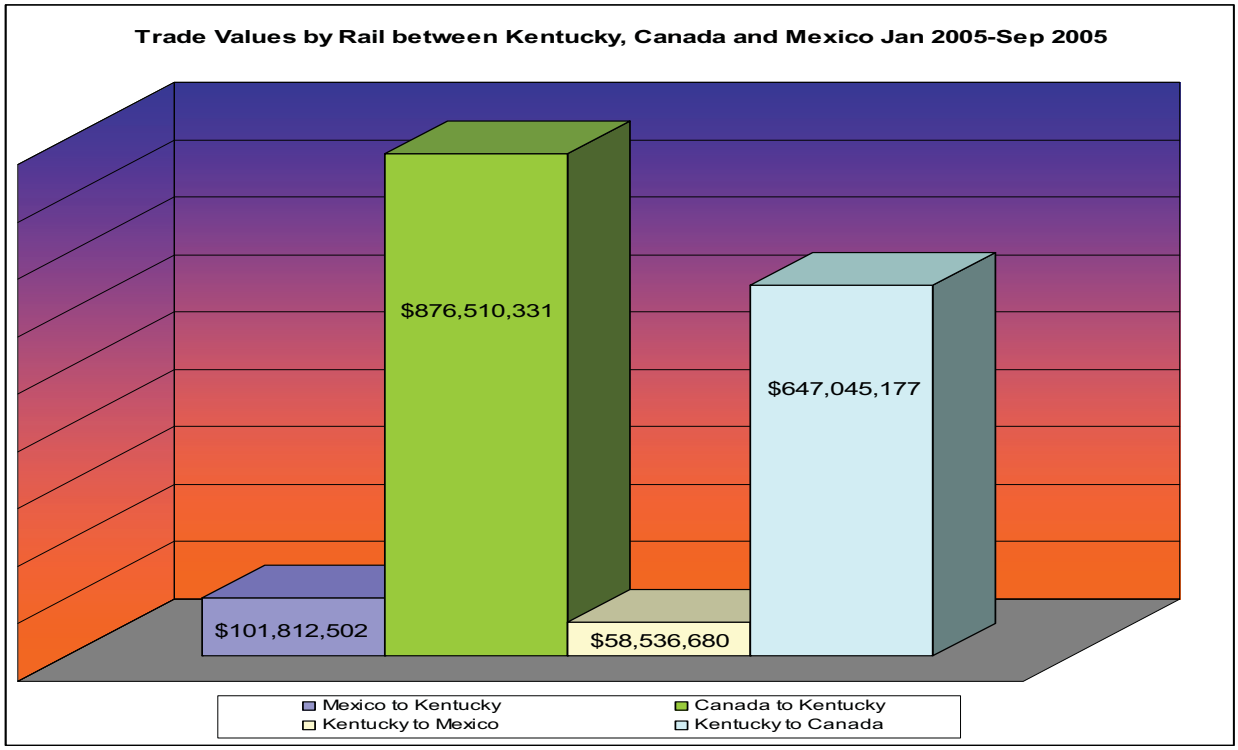
Mid Atlantic States: New Jersey, New York, Pennsylvania
E. North Central States: Illinois, Indiana, Michigan, Ohio, Wisconsin
W. North Central States: Iowa, Kansas, Minnesota, Missouri, Nebraska, N. Dakota, S. Dakota
South Atlantic States: Delaware, DC, Florida, Georgia, Maryland, N. Carolina, S. Carolina, Virginia, W. Virginia
E. South Central States: Alabama, Kentucky, Mississippi, Tennessee
W. South Central States: Arkansas, Louisiana, Oklahoma, Texas
Mountain States: Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, Wyoming
Pacific States: Alaska, California, Hawaii, Oregon, Washington
Source: US Dept. of Commerce, US dept of Transportation

Addition to domestic freight movement, North American Free Trade Agreement (NAFTA) has a big impact on freight transportation in Kentucky. According to US North American Trade and Freight Transportation Highlights study in the year of 2004 Kentucky took 15th place in the nation by the value of the trade. 2003 value was 8,595 million dollar and it increased about 24.5 percent by the year of 2004 with the value of 10,697 million dollars. Between Canada and Kentucky the value was 8,205 million dollar in 2004 which is 19.6 percent higher then the year of 2003. Trade value between Mexico and Kentucky increased 43.5 percent in 2004. Trade value was 1,737 million in 2003 and 2,492 million in 2004. See figure 1.6.11 for total values between 2002 and 2005. The figure represents all commodities and all modes between Kentucky, Canada and Mexico. Data for 2005 is until September.



Source: Bureau of Transportation Statistics
Figure 1.6.11

Figure 1.6.12 shows the total value of the trade between Kentucky, Canada and Mexico, all commodity types by rail between January 2005 and September 2005.



Source: Bureau of Transportation Statistics
Figure 1.6.12

Total Values- All Commodities and all Modes January 2005 to September 2005

Mexico to Kentucky	$ 1,438,697,625.00
Canada to Kentucky	$ 3,036,677,987.00
Kentucky to Mexico	$ 967,892,450.00
Kentucky to Canada	$ 3,606,272,597.00

Source: Bureau of Transportation Statistics
Figure 1.6.13

From Canada to Kentucky all type of commodities value that carried by rail mode is $876,510,331 million which is thirty percent of the total value. On the reverse from Kentucky to Canada value of all type of commodities that carried by rail mode is eighteen percent of the total value. See figure 1.6.13 for the total value. Mode of truck is the first and mode of rail is the second most common modes among the NAFTA countries.

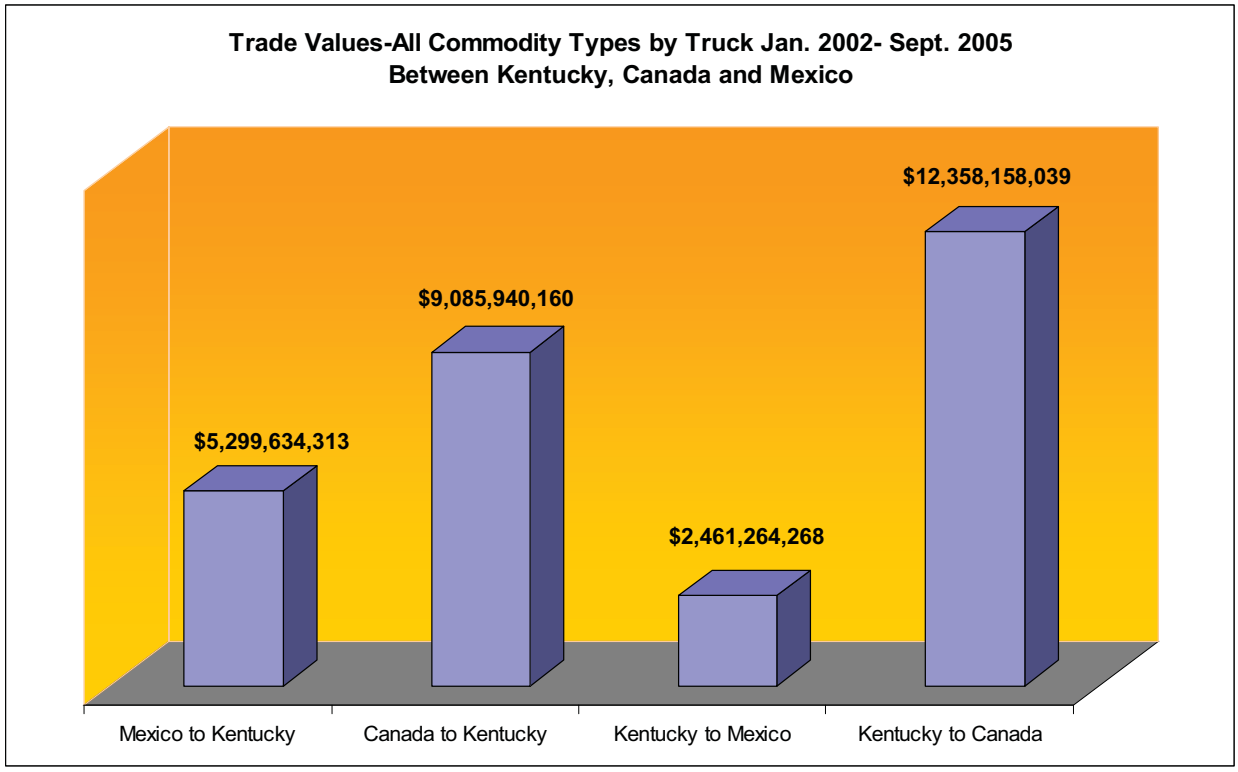


Figure 1.6.14 *Source: Bureau of Transportation Statistics*

Between January 2002 and September 2005 commodities that originated/destined by truck within Kentucky valued total of $29,204,996,780. See figure 1.6.14 for origin/destination values. In this section briefly we will look at the several types of commodities that carried between Kentucky, Canada and Mexico in 2005.

Mode of Truck January 2005 to September 2005,
Commodity code: 87
Vehicles, other than railway or tramway rolling stock, and parts and accessories thereof

Origin/Destination	Value
Mexico to Kentucky	$109,243,664
Canada to Kentucky	$500,679,333
Kentucky to Mexico	$169,594,093
Kentucky to Canada	$1,198,589,153

Figure 1.6.15 *Source: Bureau of Transportation Statistics*

Between January 2005 and September 2005 commodity of vehicles shipped by the mode of truck from Kentucky to Canada valued of $1,198,589,153. See figure 1.6.15 for other origin destination values by truck. Figure 1.6.16 shows randomly picked commodity values by truck between Kentucky, Canada and Mexico. Also see code of commodities reference below.

Value of Commodities by Truck January 2005 to September 2005
Commodity Codes

	87	85	61	68	72	1	8
Mexico to Kentucky	$109,243,664	$107,209,383	$7,677,614	$378,240	$14,872	$0	$25,088
Canada to Kentucky	$500,679,333	$82,286,848	$1,599,102	$2,048,726	$45,480,735	$25,194,437	$243,270
Kentucky to Mexico	$169,594,093	$159,283,857	$1,440,572	$334,535	$13,315,733	$218,552	$0
Kentucky to Canada	$1,198,589,153	$213,736,670	$7,185,263	$3,052,100	$96,346,238	$4,821,707	$49,943

Figure 1.6.16 *Source: Bureau of Transportation Statistics*

Commodity codes

8 7 = Vehicles, other than railway or tramway rolling stock, and parts and accessories thereof
8 5= Electrical machinery and equipment and parts thereof; Sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles
72 = Iron and steel
68 = Articles of stone, plaster, cement, asbestos, mica or similar materials
61 = Articles of apparel and clothing accessories, knitted or crocheted
1 = Live animals
8 = Edible fruit and nuts; Peel of citrus fruit or melons

More information about trade by values, commodities and modes can be found at the following website; http://www.bts.gov/programs/international/transborder/mon_reports.html.

Kentucky Commercial Service Airport Enplanements: 2000
(For airports with scheduled service and 2,500 or more passengers enplaned)

Airport	Large certificated air carriers	Commuter and small certificated air carriers	Air taxi commuter operators	Foreign air carriers	Total enplanements
Cincinnati/Northern Kentucky	9,968,723	1,181,423	357	73,463	11,223,966
Louisville International-Standiford	1,873,961	98,961	467	880	1,974,269
Blue Grass	436,239	70,056	1,039	0	507,334
Barkley Regional	11,985	18,815	83	0	30,883
Owensboro-Daviess County	122	6,908	3,004	0	10,034

NOTE: Rank order by total enplaned passengers on air carriers of all types, including foreign air carriers.
Source: U.S. Department of Transportation, Federal Aviation Administration, Office of the Associate Administrator for Airports, CY 2000 Enplanement Activity at U.S. Commercial Service Airports, available at http://www.faa.gov/arp/Planning/v3.htm
Figure 1.6.17

Above figure (1.6.17) gives us a summary about the airport activities in Kentucky for the year of 2000.

The truck involved crashes were decreasing until the year 2004 in Kentucky. Fatal and non-fatal crashes increased from 2,295 to 2,370 between 2003 and 2004. Overall number of fatalities increased from 114 to 134 and fatal crashes went up from 97 to 123 between 2000 and 2004. See figure 1.6.18

Kentucky: Summary of Large Trucks Reported in Crashes

	2000	2001	2002	2003	2004
Number of Large Trucks Reported in:					
Fatal and Non-Fatal Crashes	2906	2780	2611	2295	2370
Fatal Crashes	97	95	114	117	123
Non-Fatal Crashes	2809	2685	2497	2178	2247
Injury Crashes	1553	1401	1241	1002	1014
Towaway Crashes	2563	2531	2442	2178	2255
HM Placard Crashes	97	92	78	65	70
Number of:					
Fatalities	114	97	120	117	134
Injuries	2201	1976	1762	1454	1434

*Non-Fatal distributions are based on the National MCMIS Crash database. It is estimated that the National MCMIS Crash database contains approximately 95% of all state-reportable crashes for the Nation
Data Source: FARS & MCMIS (September 2005 data snapshot)
Figure 1.6.18

Large Trucks Involved in Crashes by Intrastate vs. Interstate Carriers - 2004 Kentucky

Intrastate vs. Interstate	Fatal USA Total	Fatal USA %	Fatal State Total	Fatal State %	Fatal State-USA % Difference	Non-Fatal USA Total	Non-Fatal USA %	Non-Fatal State Total	State % Non-Fatal	State-USA % Difference
Intrastate	774	16.40%	9	7.70%	-53.00%	28258	21.10%	263	11.70%	-44.50%
Interstate	3833	81.10%	108	92.30%	13.80%	103466	77.20%	1979	88.10%	14.10%
Missing	122	2.60%				2328	1.70%	5	0.20%	-88.20%
Total	4729		117			134052		2247		

Fatal and Non-Fatal distributions are based on the National MCMIS Crash database. It is estimated that the National MCMIS Crash database contains approximately 80% of all state-reportable crashes for the Nation.
For the year 2004 states reported 4,729 Large Trucks involved in Fatal Crashes Nationally and 117 in Kentucky; and 134,052 Large Trucks involved in Non-Fatal Crashes Nationally and 2,247 in Kentucky.
Data Source: MCMIS (September 2005 data snapshot)
Source: http://ai.volpe.dot.gov/siteguide/siteguide.asp
Figure 1.6.19

Figure 1.6.19 is a comparison of the National and the state's large truck involved in crashes by interstate vs. interstate carriers for the year 2004. While below figure (1.6.20) gives us information about ten years span of the fatalities in crashes involving large trucks figure 1.6.21 is the total fatalities in motor vehicle crashes in Kentucky.

Fatalities in Crashes Involving Large Trucks by State: 1994 - 2004

State	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Kentucky	109	106	100	115	112	94	101	107	122	119	124

Source: http://ai.volpe.dot.gov/siteguide/siteguide.asp
Figure 1.6.20

Fatalities in Motor Vehicle Crashes by State: 1994 - 2004

State	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Kentucky	778	849	842	857	858	814	820	845	915	928	964

Source: http://ai.volpe.dot.gov/siteguide/siteguide.asp
Figure 1.6.21

By looking at these two tables we can see that 12.9 % of the total fatalities are involved in large trucks in 2004, 12.8% in 2003, 13.3% in 2002 12.7% 2001 and 12 % in 2000. Although there is a slight decrease we hope that the percentage will be smaller than it is now. Out of 123 large trucks involved crashes 97 of the crashes happened on rural roads in 2004 and 26 of the crashes took place on urban roads.

Large Trucks Involved in Crashes by Type of Trafficway - 2004 Kentucky

Trafficway	Fatal USA Total	Fatal State Total	Non-Fatal USA Total	Non-Fatal State Total
Two-Way Trafficway, Not Divided	2475	65	41387	701
Two-Way Trafficway, Divided, Without Barrier	1538	51	26632	987
Two-Way Trafficway, Divided, With Barrier	647	6	27487	542
One-Way Trafficway, Not Divided	31		6200	17
Not Physically Divided (With Two-Way Continuous Left-Turn Lane)	79			
Entrance/Exit Ramp	66	1		
Not Reported			1006	
Unknown	26		2050	
Missing			29290	
Total	4862	123	134052	2247

Non-Fatal distributions are based on the National MCMIS Crash database. It is estimated that the National MCMIS Crash database contains approximately 95% of all state-reportable crashes. For the year 2004 states reported 134,052 Large Trucks involved in Non-Fatal Crashes Nationally and 2,247 in Kentucky.
Data Source: FARS & MCMIS (September 2005 data snapshot)

Source: http://ai.volpe.dot.gov/siteguide/siteguide.asp
Figure 1.6.22

Figure 1.6.22 represents the type of trafficway that large trucks involved in crashes in 2004. Non-fatal crashes have the highest number on two-way trafficway without barrier. On the other hand fatal crashes have the highest number on two-way not divided trafficway. It is opposite to the national crashes. In the USA two-way not divided trafficway has more fatal crashes and non-fatal crashes in 2004. Attention might be given these types of trafficways by the transportation professionals to decrease the number of crashes. When we look at the time of the day we can see that the most of the fatal large truck involved cashes occurred between 12:00 pm and 2:59 pm in Kentucky in 2004. The figure 1.6.23 shows that time of the day is as same as fatal large truck involved crashes in the nation. The time of the day is same for non-fatal crashes in Kentucky and in the nation for 2004.

Large Trucks Involved in Crashes by Time of Day - 2004 Kentucky

Time of Day	Fatal USA Total	Fatal State Total	Non-Fatal USA Total	Non-Fatal State Total
12:00 am - 2:59 am	345	3	6,858	108
3:00 am - 5:59 am	436	5	9,476	130
6:00 am - 8:59 am	699	20	23,077	368
9:00 am - 11:59 am	899	21	27,284	446
12:00 pm - 2:59 pm	933	27	27,298	450
3:00 pm - 5:59 pm	727	25	22,395	399
6:00 pm - 8:59 pm	457	15	10,252	216
9:00 pm - 11:59 pm	365	7	7,193	130
Unknown	1			
Missing			219	
Total	4,862	123	134,052	2,247

Non-Fatal distributions are based on the National MCMIS Crash database. It is estimated that the National MCMIS Crash database contains approximately 95% of all state-reportable crashes. For the year 2004 states reported 134,052 Large Trucks involved in Non-Fatal Crashes Nationally and 2,247 in Kentucky.
Data Source: FARS & MCMIS (September 2005 data snapshot)

Source: http://ai.volpe.dot.gov/siteguide/siteguide.asp
Figure 1.6.23

For the same year most of the large truck involved non-fatal crashes happened on Tuesdays in Kentucky and in the Nation. In 2004, the number of the non-fatal crashes in Kentucky were 429 and in the nation 24,702. Unlike non-fatal crashes most of the fatal crashes happened on Wednesdays (855 crashes) in the nation. In Kentucky Tuesday has the highest number in fatal crashes (429 crashes) as non-fatal crashes. See figure 1.6.24.

Large Trucks Involved in Crashes by Day of Week - 2004 Kentucky

Day of Week	Fatal USA Total	Fatal State Total	Non-Fatal USA Total	Non-Fatal State Total
Sunday	303	6	6,463	119
Monday	769	17	23,219	365
Tuesday	819	30	24,702	429
Wednesday	855	25	23,801	383
Thursday	840	19	23,234	401
Friday	846	22	22,942	408
Saturday	430	4	9,691	142
Total	4,862	123	134,052	2,247

Non-Fatal distributions are based on the National MCMIS Crash database. It is estimated that the National MCMIS Crash database contains approximately 95% of all state-reportable crashes. For the year 2004 states reported 134,052 Large Trucks involved in Non-Fatal Crashes Nationally and 2,247 in Kentucky.
Data Source: FARS & MCMIS (September 2005 data snapshot)

Source: http://ai.volpe.dot.gov/siteguide/siteguide.asp
Figure 1.6.24

Non-Domiciled Large Trucks Involved In Crashes In Kentucky (2004)

State/Country	Fatal	Non-Fatal	State/Country	Fatal	Non-Fatal
Alabama		34	Nebraska	5	19
Arizona	4	30	New Jersey		8
Arkansas	1	74	New Mexico		1
California		9	New York		7
Colorado		2	North Carolina	3	31
Delaware		1	North Dakota		1
Florida	2	62	**Ohio**	9	**193**
Georgia		38	Oklahoma	1	16
Idaho		2	Oregon		1
Illinois	3	58	Pennsylvania	1	46
Indiana	**10**	**141**	South Carolina	2	5
Iowa	1	28	South Dakota		4
Kansas		12	**Tennessee**	**11**	**174**
Louisiana		6	Texas	2	34
Maine		1	Utah		2
Maryland		9	Vermont		1
Massachusetts		3	Virginia	1	35
Michigan	5	72	Washington		4
Minnesota	2	20	West Virginia	1	26
Mississippi	1	15	Wisconsin	3	48
Missouri	2	48	Canada	1	31
Montana		4	**Totals**	**71**	**1356**

Data Source: MCMIS (September 2005 data snapshot)
Source: http://ai.volpe.dot.gov/siteguide/siteguide.asp
Figure 1.6.25

Above figure (1.6.25) shows that Kentucky's neighboring states have the highest crash number in Kentucky. The reason of that is the commodity flow between these states and Kentucky. See figures 1.6.9 and 1.6.10 for inbound and outbound shipments. Figure 1.6.26 shows domicile and non-domicile crashes in Kentucky for 2004.

Large Trucks Involved in Crashes by Domicile vs. Non-Domicile Carriers - 04 Kentucky

Domicile vs. Non-Domicile	Fatal State Total	Non-Fatal State Total
Non-Domiciled Carrier	71	1356
Domiciled Carrier	46	891
Other/Unknown		
Total	117	2247

Fatal and Non-Fatal distributions are based on the National MCMIS Crash database. It is estimated that the National MCMIS Crash database contains approximately 80% of all state-reportable crashes for the Nation.
Data Source: MCMIS (September 2005 data snapshot)
Source: http://ai.volpe.dot.gov/siteguide/siteguide.asp
Figure 1.6.26

2. OVERVIEW OF LOCAL FREIGHT TRANSPORTATION

Lexington Area MPO's Recent Trucking and Railroad Goods Movement Study:
Transportation problems within the MPO area stem primarily from the imbalance between the amount, timing, and location of urban development and the ability to provide transportation facilities and services. Over the last 40 to 50 years, development growth patterns in Lexington, the central city of the region, have predominately moved in a southerly direction toward land seemingly more desirable because of the availability of sewers and other less tangible factors. In more recent years, large areas of land within the designated "Urban Service Area" have been developed or are developing in the North, East, and Southeast of Fayette County and North, East, and West of Jessamine County. Street and highway plans have not always been implemented completely or lag behind travel demand/traffic congestion due to the ever-present conflict between community-wide and neighborhood/individual desires and the limited funding/resources available for all government programs.

In 1979, the Lexington Fayette Urban County Government commissioned the firm of Wilbur Smith Associates to conduct a comprehensive Trucking and Railroad Goods Movement Study as an important part of its Transportation Planning Unified Work Program. This document contains considerable information on the area's truck and rail goods movement systems. The majority of the information in this report still holds true today. Since the MPO planning boundary was officially expanded to include all Fayette and Jessamine counties on March 23, 1993, the study does not include Jessamine County.

- One of the problems found at the study was rail movement conflict on S. Broadway Rd. Recommendation related to the problem was construct a road bridge over the rail road or construct a road tunnel under the railroad. *In the 80's LFUCG built overpass on S. Broadway Rd.*
- The other problem that found at the study was a number of roads in the urban area were too narrow for truck movement, particularly Mercer Rd and Forbes Rd. *According to the LFUCG Division of Engineering Forbes Rd will be widened to 35 feet very soon with a bike lane addition on it.*

2.0 Current Fright transportation System in the MPO's Area

Lexington's original downtown grid pattern was overlaid by a radial street system, which served Lexington as it grew toward the rural areas of the region. However, over time and as urbanization occurred, greater vehicular traffic was placed upon the radial arterial street system without adequate attention to cross-town or circumferential routes. Federal Highway Administration functional classification guidelines recommend that major plus minor arterial streets make up from 15-25% of an urban area's road system and collectors make up 5-10%. In Fayette County, the arterials = 18.23% and collector roads = 15.65%. According to FHWA Functional Classification Guidelines, the existing traffic volumes indicate that collector roads are serving and functioning as arterial streets within Fayette County. Need same information for Jessamine County.

Lexington is a growing city in the heart of Central Kentucky, and has become the economic, educational, medical, and entertainment hub of the Bluegrass area. However, Jessamine County and Nicholasville, Kentucky, are also growing communities facing the challenges of significant development pressure and are open to seeking economic opportunities.

2.0.1 Land Use for Freight Operations

Land use patterns directly impact the movement of freight in a region. The location and densities of residences and businesses both dictate the type and volume of freight shipments, whether they consist of finished products for consumer purchase, interim products used in secondary manufacturing or assembly operations, or goods to support the service industry. By recognizing the link between land use and transportation in the development of the freight component of its Long-Range Transportation Plan, the Lexington Area MPO can begin to develop a better understanding of the ways in which existing and future land use patterns affect the efficient flow of freight into, out of, and within the two Counties.

2.0.2 The Freight network

According to the state publication, Traffic Characteristics of Kentucky Highways 1997, the percentage of truck traffic on the Lexington MPO area highway system varies between rural and urban areas, and facility types. As in most areas, the highest truck volumes are found on the rural and urban interstates and principal and minor arterials. Listed below are some examples of 1996 truck traffic percentages of total average daily traffic (ADT) at selected locations and facility types. See figure 2.0.2.1 for ADT and 2.0.2.2 for Truck Network.

- I-75/I-64 - Urban Interstate between Newtown Pike (KY 922) and Paris Pike (US 27/68), trucks = 22.1% of total ADT.
- New Circle Road (KY-4) - Urban arterial between Newtown Pike (KY 922) and Paris Road (US 27), trucks = 5.9% of total ADT.
- Versailles Road (US 60) - Urban arterial, inside of New Circle Road (KY 4), trucks = 2.8% of total ADT. Paris Pike (US 27/68) - Minor arterial, between New Circle and I-64/I-75, trucks = 4.4% of total ADT.

2.0.3 Trucking

The trucking industry is a vital component of the goods movement system because at one point or another in freight shipment, almost all goods and services are moved by truck. The typical freight "trip" usually involves three to six moves within the freight system—most of the movements made by trucks. The pattern of industrial and commercial development has changed with the advent of motorized trucks. Early businesses that used transportation for goods movement were required to locate contiguous to railroad facilities. Trucks enabled freight producers and attractors to locate anywhere that a good road existed. For example in 2003 4,285,663 tons of coal hauled in Fayette County's highways. One of Fayette County's major arterials, US 60, runs from East-West, carried 1,361,869 tons of coal in 2003. See figure 2.0.3.1 and 2.0.3.2.

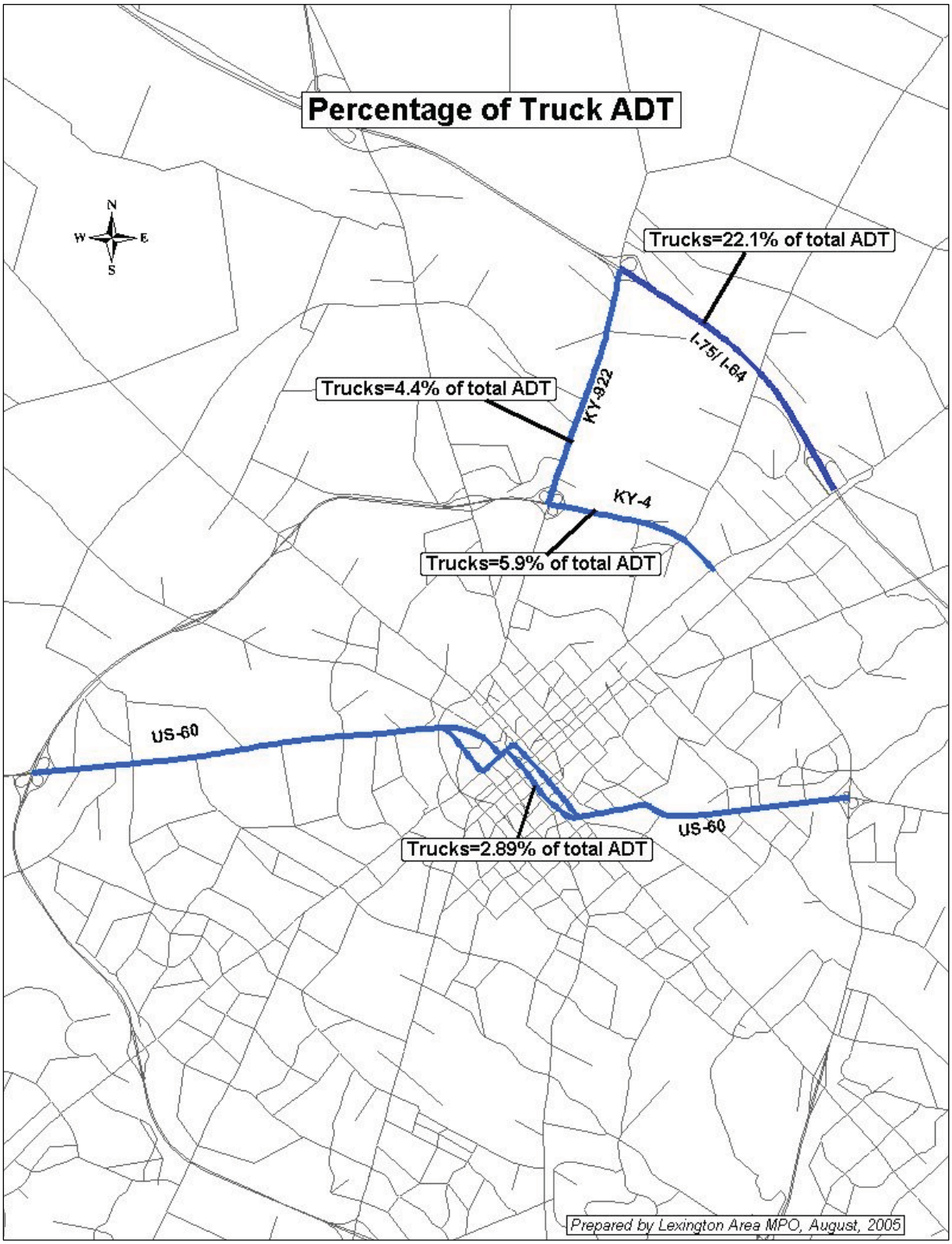


Figure 2.0.2.1 Truck ADT 1996

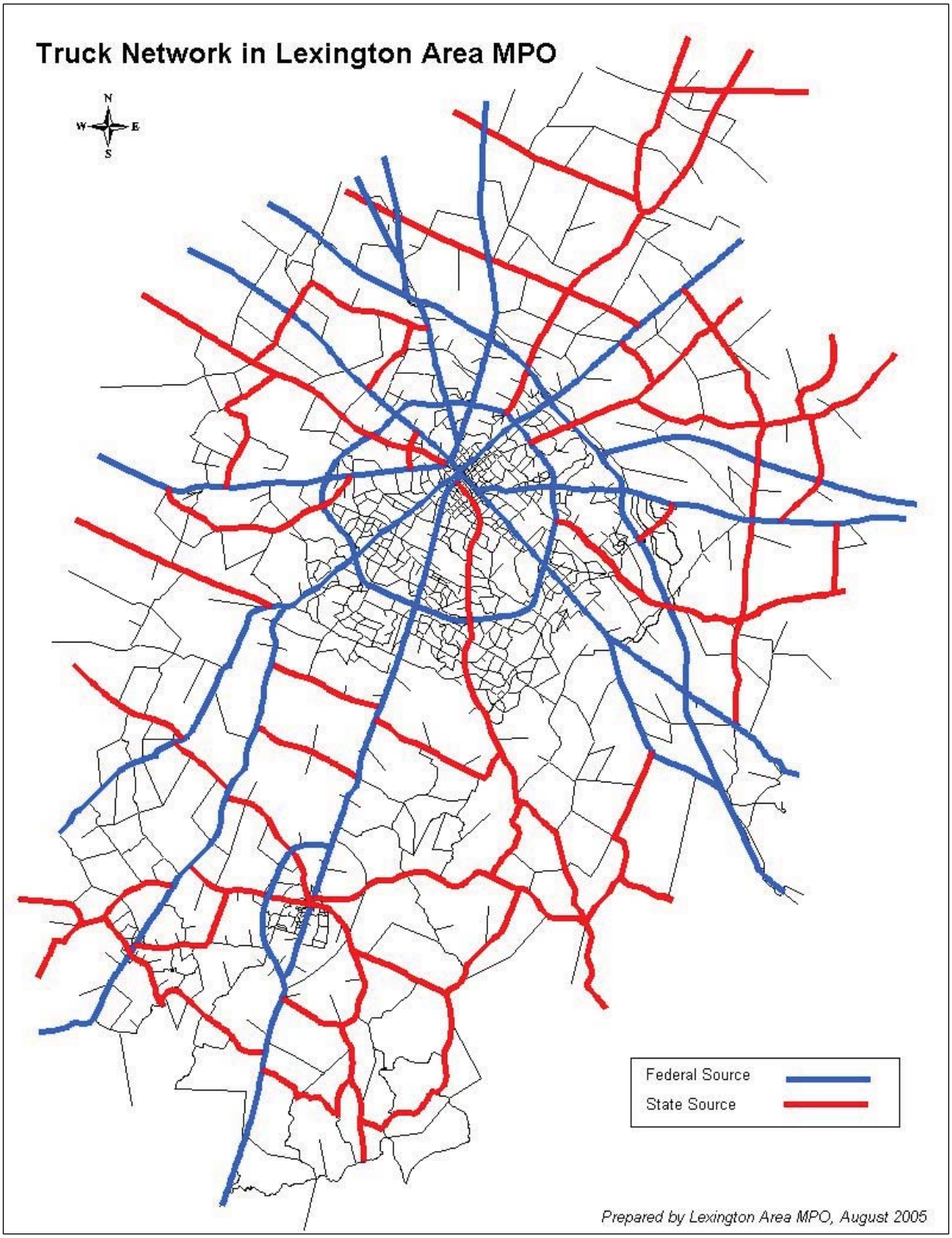

Truck Network in Lexington Area MPO
N
W
E
S
Federal Source
State Source
Prepared by Lexington Area MPO, August 2005

Figure 2.0.2.2

TONS OF COAL HAULED BY HIGHWAY SEGMENT :2003

Fayette County

ROUTE	MILE POINTS BEGIN	END	LENGTH	TONS OF COAL CARDINAL	TONS OF COAL NON-CARDINAL	EACH DIRECTION TOTAL	TON-MILES
I 64	71	74.7	3.7	0	23,012	23,012	85,144
	81	89.5	8.5	0	107,449	107,449	913,317
ROUTE TOTAL 998,461							
I 75	97.7	111.2	13.5	9,798	0	9,798	132,273
	111.2	112.8	1.6	117,247	0	117,247	187,595
	112.8	117.6	4.8	90,410	0	90,410	433,968
	117.6	120.8	3.2	67,398	0	67,398	215,674
ROUTE TOTAL 969,510							
KY 4	4.6	12.7	8.1	0	97,461	97,461	789,434
ROUTE TOTAL 789,434							
US 27	9.6	15.8	6.2	26,837	0	26,837	166,389
ROUTE TOTAL 166,389							
US60	0	4.6	4.6	0	98,842	98,842	454,673
	4.6	10.2	5.6	0	1,381	1,381	7,734
	10.2	19.3	9.1	0	98,842	98,842	899,462
ROUTE TOTAL ,361,869							
COUNTIES TOTAL 4,285,663							

Source KY Transportation Cabinet

Figure 2.0.3.1

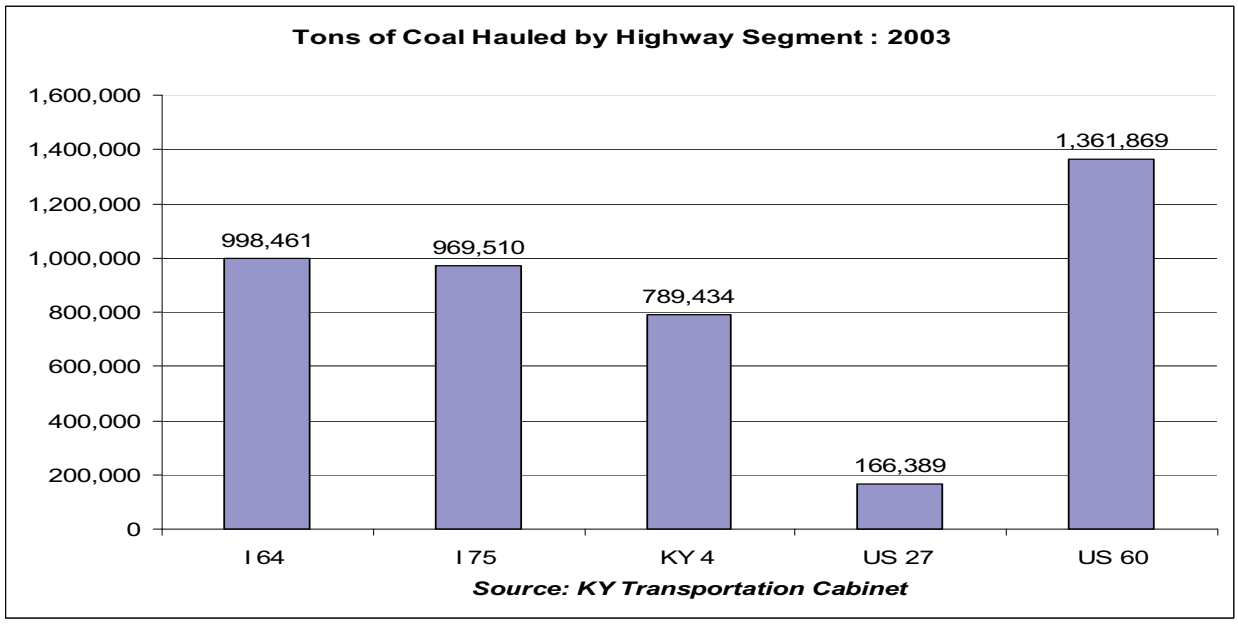


Figure 2.0.3.2

There are more than 50 motor carriers that serve the Lexington Statistical Area (MSA). More than 21 of these carriers operate terminals locally. These carriers fall under various classes according to the type of carrier and the type of commodities carried. There are also numerous service trucks, e.g., telephone, water, gas, electricity; and craftsman vehicles, e.g., painters, plumbers, and electricians. These vehicles are classified as trucks and contribute to area traffic and parking (excluding weekends) but seldom carry goods. Figure 2.0.3.3 and 2.0.3.4 show that commercial trucks represent 31% of total registered vehicles in Fayette and 34.78 % in Jessamine County at the year of 2004. Total number of commercial trucked register in 2004 is 58,185 in Fayette and 13,973 in Jessamine County. It makes total of 72,158 commercial trucks that will produce trips in the Lexington Area MPO's region.

2004 Fayette County Vehicle Registrations

Passenger	117,088
Cars	62.46%
Farm	1,873
Trucks	1.00%
Commercial	58,158
Trucks	31.02%
Motor-	3,813
Cycles	2.03%
Truck	2,200
Trailers	1.17%
Camp	1,862
Trailers	0.99%
House	192
Trailers	0.10%
House	708
Car	0.38%
Disabled	511
Parking	0.27%
Apportioned	1,057
	0.56%
Total	187,462
Vehicles	100%

Source: Kentucky Transportation Cabinet
Figure 2.0.3.3

2004 Jessamine County Vehicle Registrations

Passenger	21,587
Cars	53.73%
Farm	1,625
Trucks	4.04%
Commercial	13,973
Trucks	34.78%
Motor-	758
Cycles	1.89%
Truck	736
Trailers	1.83%
Camp	754
Trailers	1.88%
House	17
Trailers	0.04%
House	152
Car	0.38%
Disabled	152
Parking	0.38%
Apportioned	421
	1.05%
Total	40,175
Vehicles	100%

Source: Kentucky Transportation Cabinet
Figure 2.0.3.4

Trucks, recreational vehicles, and buses affect traffic flow in two ways: (1) they occupy more space on the roadway than cars, and (2) the operating capabilities of such vehicles (acceleration, deceleration, maintenance of speed, etc.) are inferior to those of passenger cars. Passenger car equivalents (the number of passenger cars that are displaced by a single heavy vehicle) are two

or more for every truck. The end result of truck traffic is less efficient traffic flow with gaps that cannot readily be filled by passing maneuvers; thus, roadway-operating capacity is lowered.

Nearly all truck companies operating in the area do so from a base in the Lexington urban area. A truck terminal usually consists of loading/unloading docks (the number of docking bays varies) upon which freight is sorted and deposited in another truck or other mode. In the Lexington Urbanized Area, truck terminals are located primarily in the north. This puts them in close proximity to interstates and allows ease of access with other regional population centers. The 2001 Compressive Plan illustrates these and other land use concentrations and can be obtained from:

The Lexington-Fayette Urban County Government Center - Division of Planning
101 E. Vine Street, Suite 700
Lexington, Kentucky 40507
Phone - (859)-258-3160

Other shippers/receivers of goods are concentrated along major arterials in retail, professional service, and commercial zones (e.g., malls, shopping centers, universities, and office parks).

There are over 29 carriers serving the Nicholasville area. Primarily, these carriers use U.S. 27 and the Nicholasville Bypass to provide freight service. Trucks (including pickup trucks) accounted for approximately 22% of total daily traffic on U.S. 27 north and south of Nicholasville. Jessamine County industrial zones that ship and receive freight are concentrated primarily along or near U.S. 27 or the Nicholasville Bypass.

In order to achieve the quickest time path, truck traffic in the Lexington Metropolitan Area tends to follow the area's major roadways to the greatest extent possible. Only when approaching a destination, away from the major road network, they utilize local streets. In addition, the majority of pickup and delivery truck trips occur during regular business hours, thus avoiding peak hour congestion or delay. See figure 2.0.2.2 for truck network. Local and national studies show that Mondays and Fridays tend to be very heavy days in terms of pickups and deliveries.

In Fayette County, through truck trips (without a local destination) are required by city ordinance to use New Circle Road (avoiding the inner urban area) or the interstates to the north (avoiding the urban area altogether). New Circle Road is the only officially designated truck route in the area as it provides access that penetrates or is near all light and heavy industrial zoning in the Lexington urban area and is less than a mile by major arterial away from three interchanges with I-64/I-75. Figure 2.0.3.5 shows the list of designated truck network in Fayette and Jessamine County.

State motor vehicle regulations set maximum limits on weight, height, width, and length of vehicles that operate on the many state roads in the Lexington area. There are no local ordinances controlling vehicle weights on non-state highways.

The LFUCG Division of Traffic Engineering prohibits trucks and through truck movement in many locations in the area by posting signs that read "No Trucks" or "No Thru Trucks," which is enforced by local police. Most signs have been placed in response to complaints from local

residents in neighborhoods where it has been determined that truck traffic conflicts with residential areas and is inappropriate. Local manufacturers and shippers have indicated that adjacent and adjoining land use changes have impacted their roadway networks, i.e. industrial land changing to residential uses and filling roadway networks to capacity with daily residential trips.

Figure 2.0.3.5 - Designated Truck Network in Fayette and Jessamine County:
(STAA National Truck Network)

Route	County	Description	Length	Source
KY 4	Fayette	New Circle Rd. In Lexington (entire circle)	19.283	Federal
US 25	Fayette	From KY 418 SE of Lexington to KY 4	2.544	Federal
US 26	Fayette	From KY 4 to Nandino Blvd	0.215	Federal
US 27	Jessamine	From Garrard Co. Line to Fayette Co. Line	15.278	Federal
US 27	Fayette	From Jessamine Co. To KY 4	2.412	Federal
US 27	Fayette	From KY 4 to Bourbon Co. Line	7.317	Federal
US 60	Fayette	From KY 4 Interchange to I-75 Interchange	1.892	Federal
I-64	Fayette	From Scott Co. Line to I-75 N. of Lexington	3.729	Federal
I-64	Fayette	From I-75 Intchg. to E. of Lexington to Clark Co. Line	8.443	Federal
KY 418	Fayette	From US 25 S. of Lexington to SE limits of I-75	2.602	Federal
US 421	Fayette	From KY 4 in Lexington to Scott Co. Line	6.408	State
KY 922	Fayette	From KY 4 in Lexington to N. limits of I-64/I-75	2.02	Federal

Source: Kentucky Transportation Cabinet, 28-Aug-03

Pick-ups and deliveries (or loading and unloading) are one of the most costly functions in truck trips in terms of time and money. Truck movement often conflicts with traffic movement when searching for parking space, parking, loading and unloading. Generally, periphery areas have sufficient space for trucks to pull off the road to load or unload, whereas central city areas where parking is scarce tend to have more truck-traffic conflict. To alleviate this conflict, the LFUCG Division of Traffic Engineering has designated on-street loading zones where needed. These signs read "No Parking - Loading Zone - Commercial Vehicles Only." Many of these are restricted to use only in off-peak traffic periods.

2.0.4 COMMERCIAL MOTOR VEHICLE COLLISIONS IN THE AREA

According to Federal Motor Carrier Safety Administration, Commercial Motor Vehicle means a motor vehicle or combination of motor vehicles used in commerce to transport passengers or property if the vehicle-

(1) Has a gross combination weight rating of 11,794 or more kilograms (26,001 or more pounds) inclusive of a towed unit with a gross vehicle weight rating of more than 4,536 kilograms (10,000 pounds); or

(2) Has a gross vehicle weight rating of 11,794 or more kilograms (26,001 or more pounds); or

(3) Is designed to transport 16 or more passengers, including the driver; or

(4) Is of any size and is used in the transportation of materials found to be hazardous for the purposes of the Hazardous Materials Transportation Act (49 U.S.C. 5103(b)) and which require the motor vehicle to be placarded under the Hazardous Materials Regulations (49 CFR part 172, Subpart F).

In 2005 there were total of 557 commercial vehicle collisions in Fayette County. See figure 2.0.4.1 for locations. Locations on the map are approximate. 27 percent of the collisions were on the local street, 25 percent of it was on federal roads, 17 percent of it was on state roads and 13 percent of the collisions were on interstates (See Figure 2.0.4.2) Out of 557 collisions, 73 were on I-75 and I-64, 50 collisions on New Circle Rd (KY4), 36 collisions on Nicholasville Rd (US-27) and 30 collisions on Broadway Rd. See Figure 2.0.4.3 for top ten highest collisions rates in Fayette County. About 76 percent of the collisions were on dry road whereas only 20 percent of it was wet road see Figure 2.0.4.4. 20 percent of the collision was sideswipe type and 18 percent was rear end type collisions see Figure 2.0.4.5 for other type of collisions. Although, collisions dispersed almost evenly among months, December has the highest collision rate with ten percent. See Figure 2.0.4.6. 18 percent of the collisions occurred on Mondays, Friday and Wednesday followed by 17 percent. See figure 2.0.4.7 for other days. Instead of peak hours the highest rate of time of days is between 9AM to 12 PM with 24 percent of the total collisions. See Figure 2.0.4.8 for other hours.

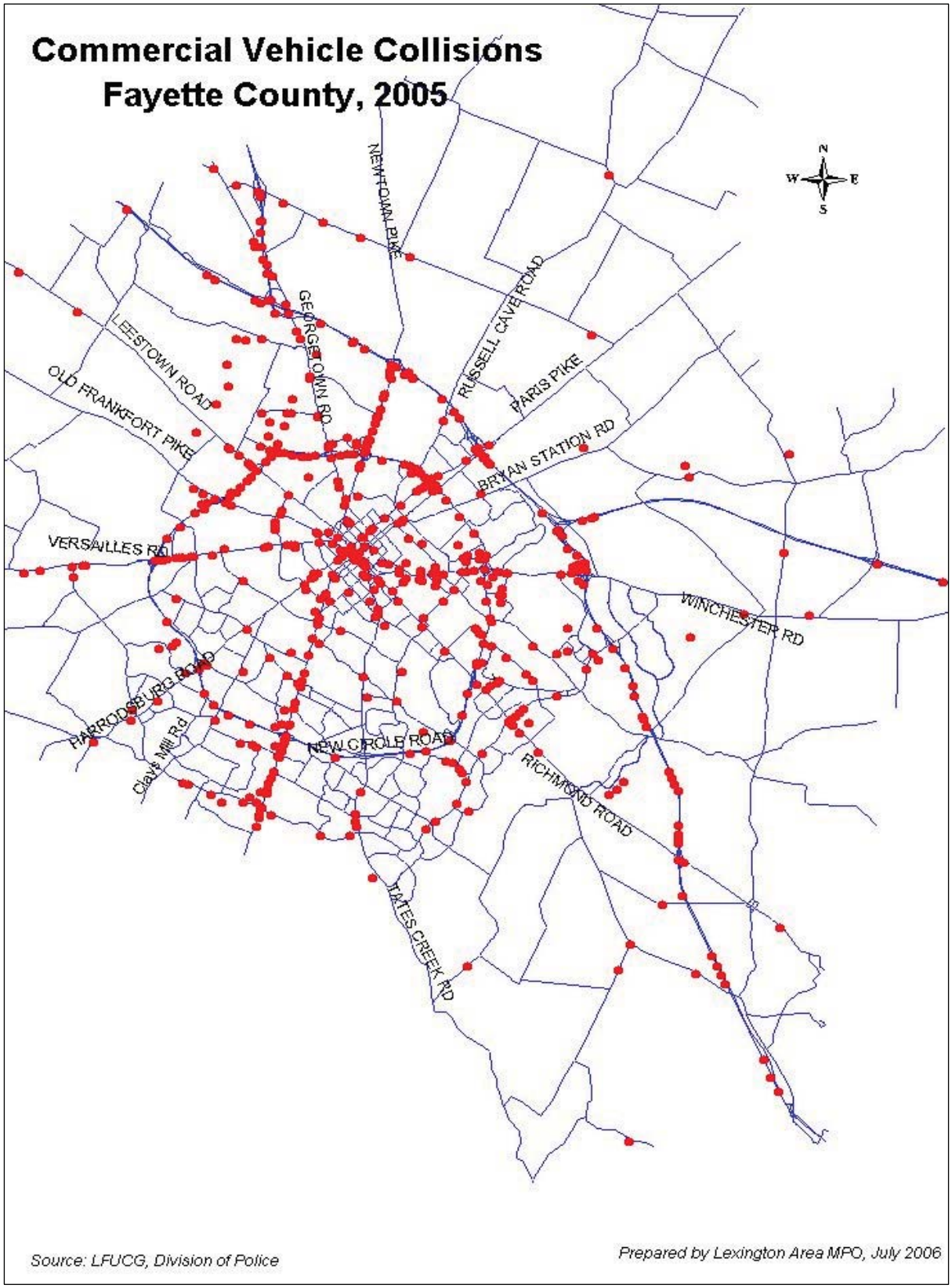

Commercial Vehicle Collisions
Fayette County, 2005
N
W
E
S
NEWTOWN PIKE
GEORGETOWN RD
RUSSELL CAVE ROAD
PARIS PIKE
LEESTOWN ROAD
OLD FRANKFORT PIKE
BRYAN STATION RD
VERSAILLES RD
WINCHESTER RD
PARROCOSS URG ROAD
Clay's Mill Rd
NEW CIRCLE ROAD
RICHMOND ROAD
TATES CREEK RD
Source: LFUCG, Division of Police
Prepared by Lexington Area MPO, July 2006

Figure 2.0.4.1

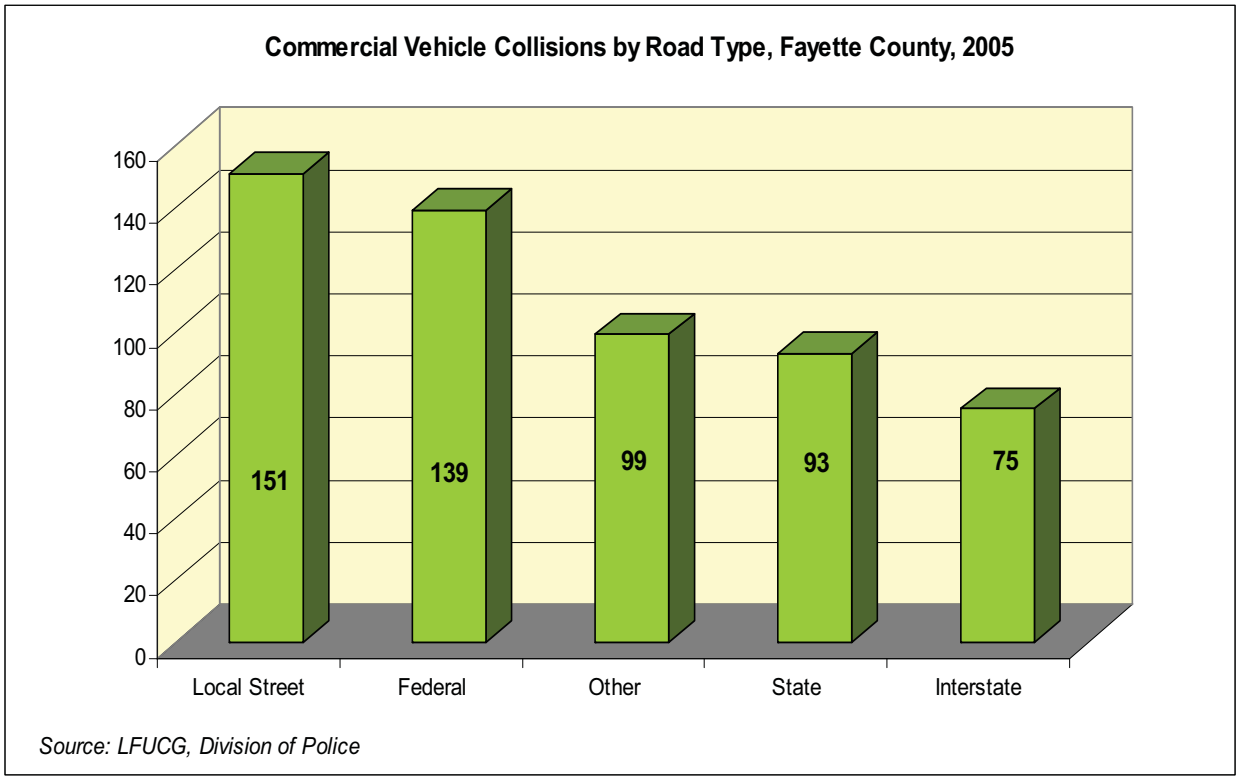


Figure 2.0.4.2

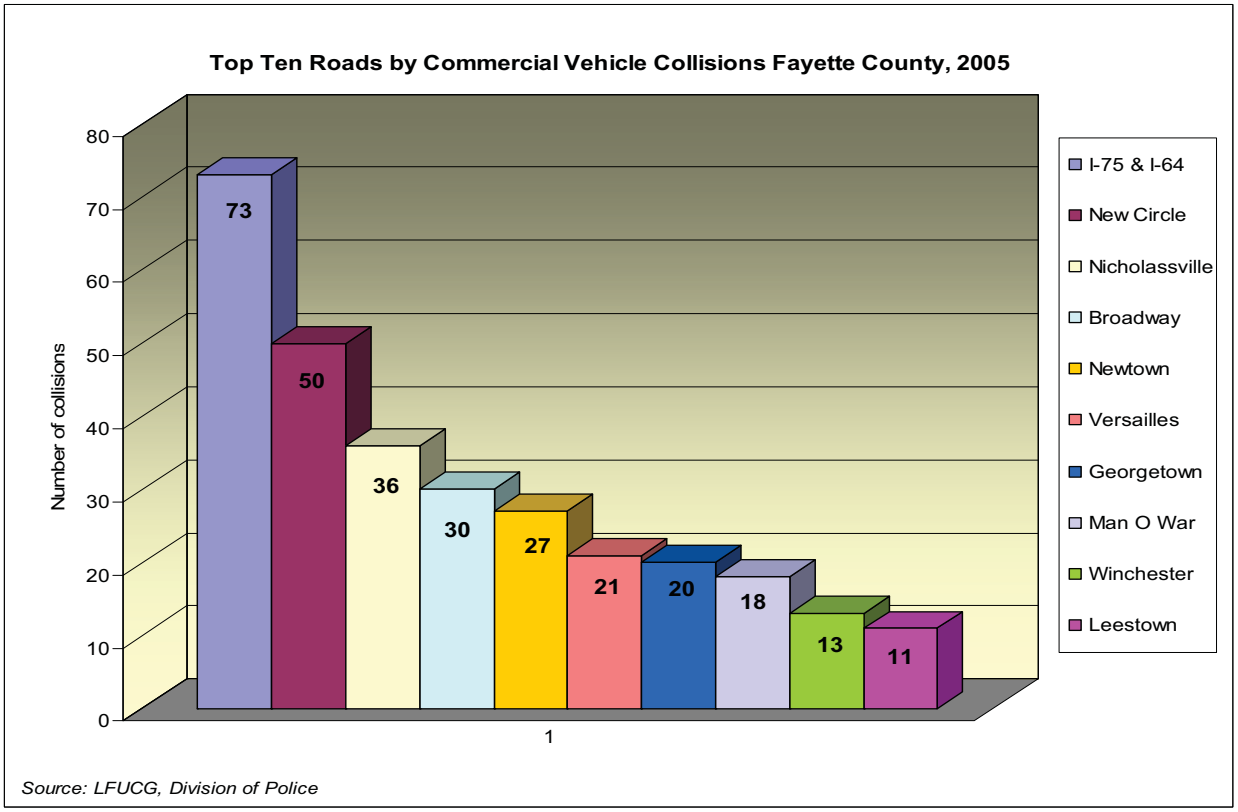


Figure 2.0.4.3

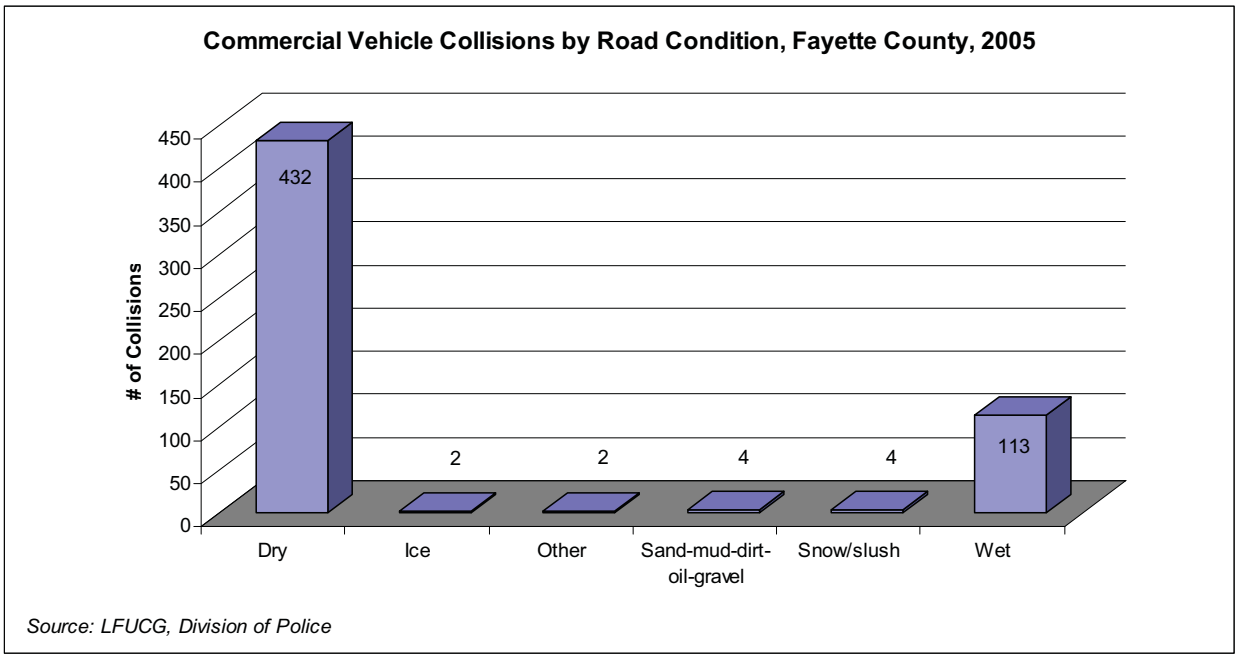


Figure 2.0.4.4

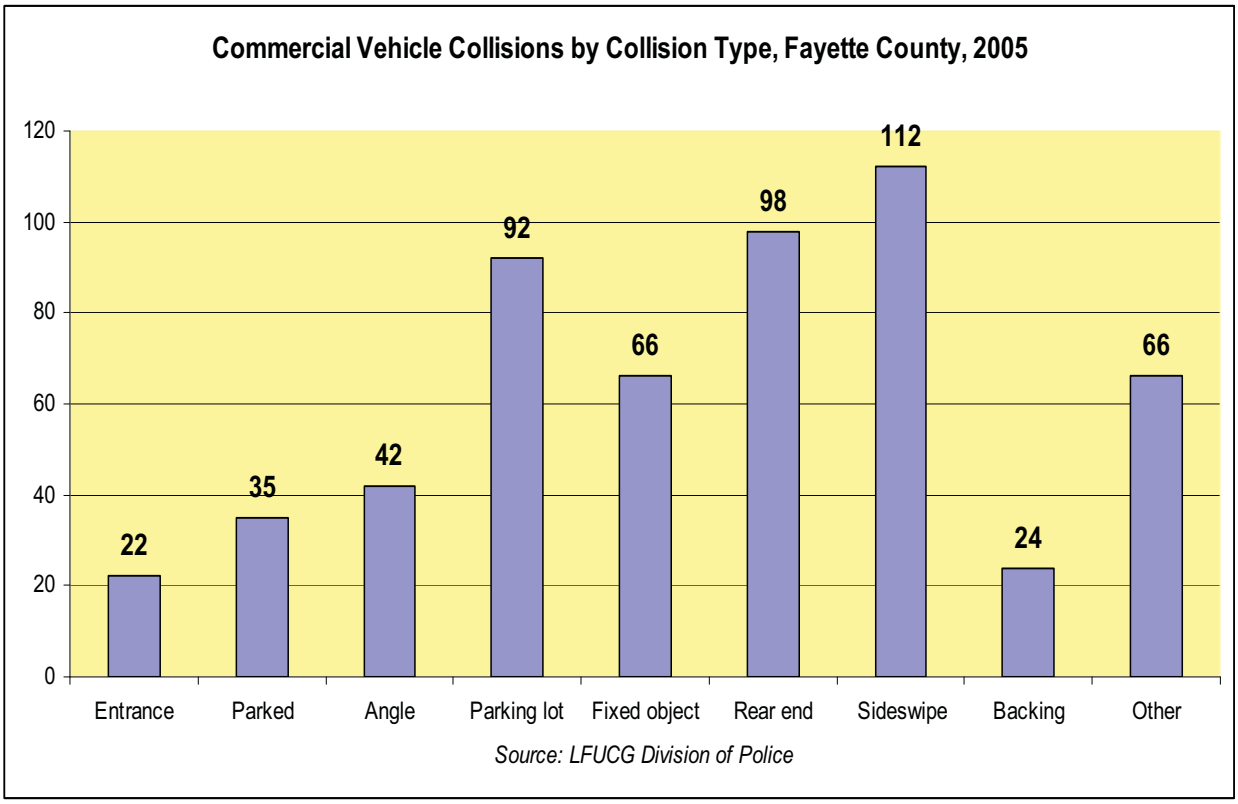


Figure 2.0.4.5

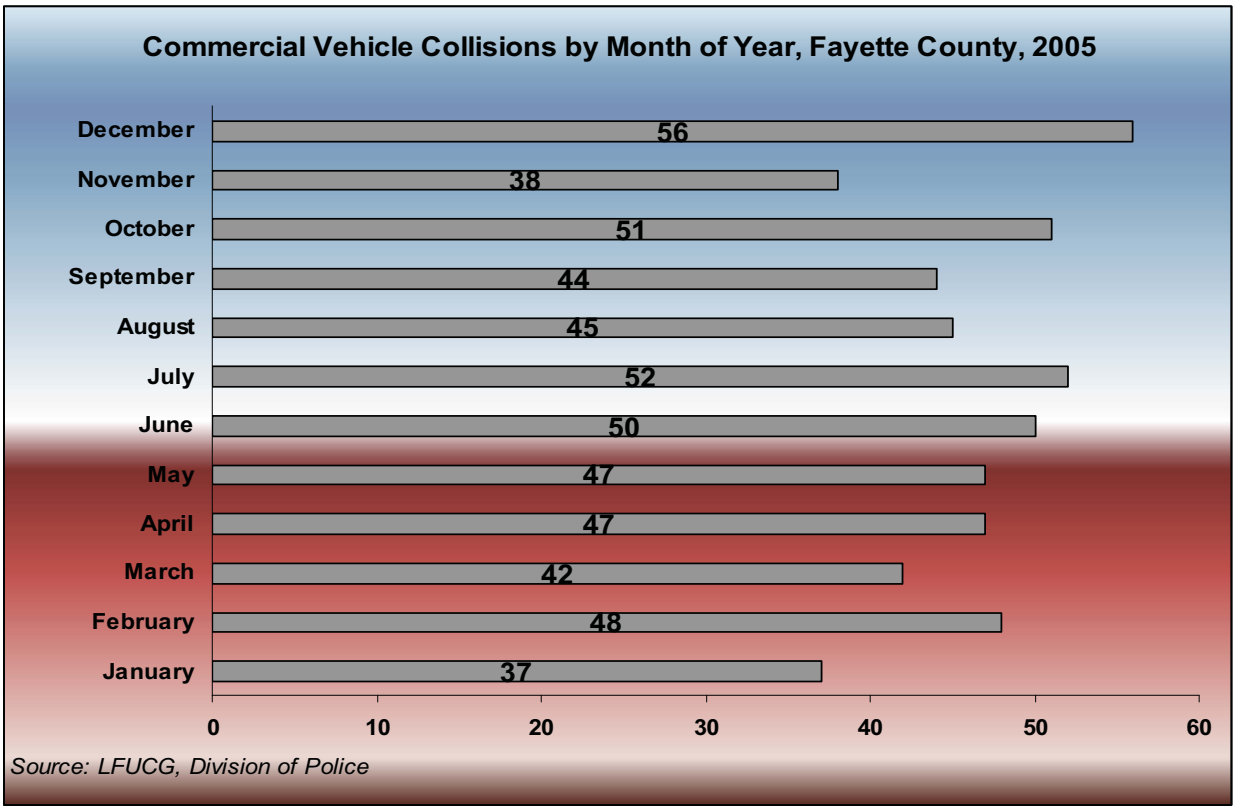


Figure 2.0.4.6

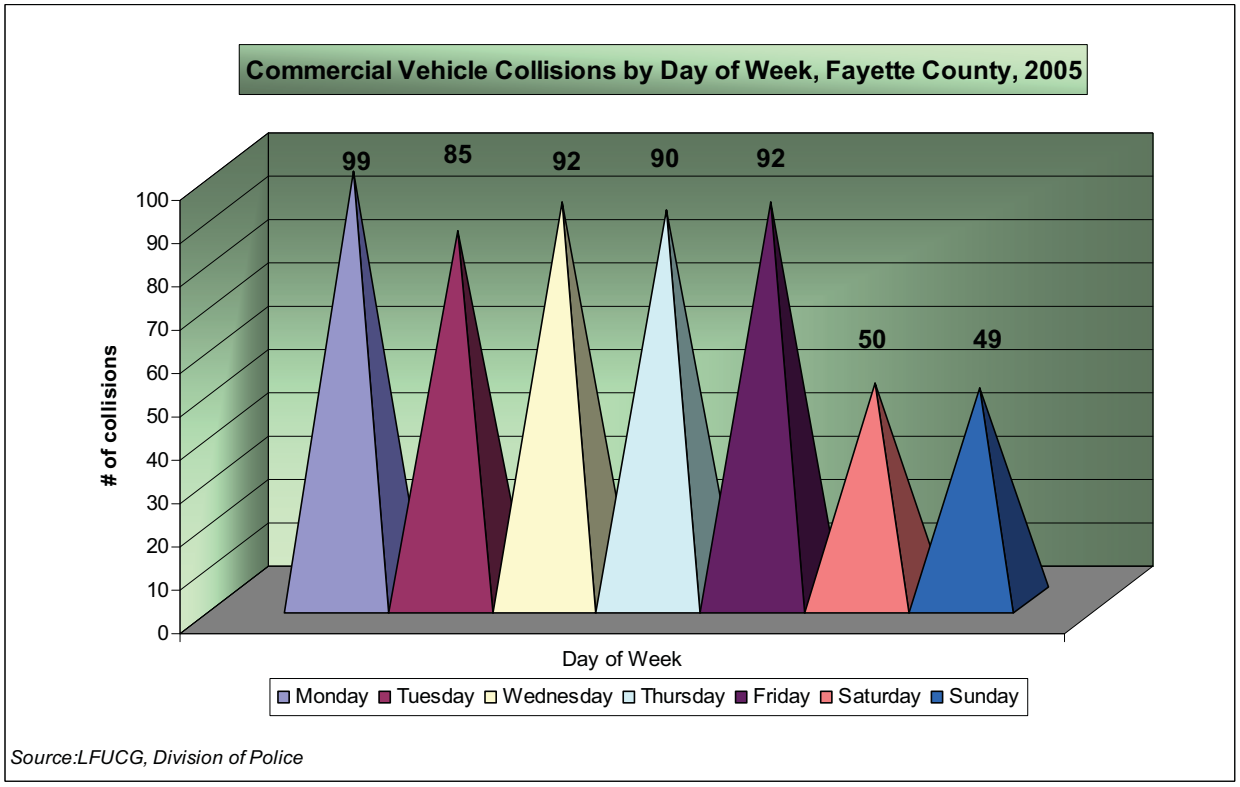


Figure 2.0.4.7

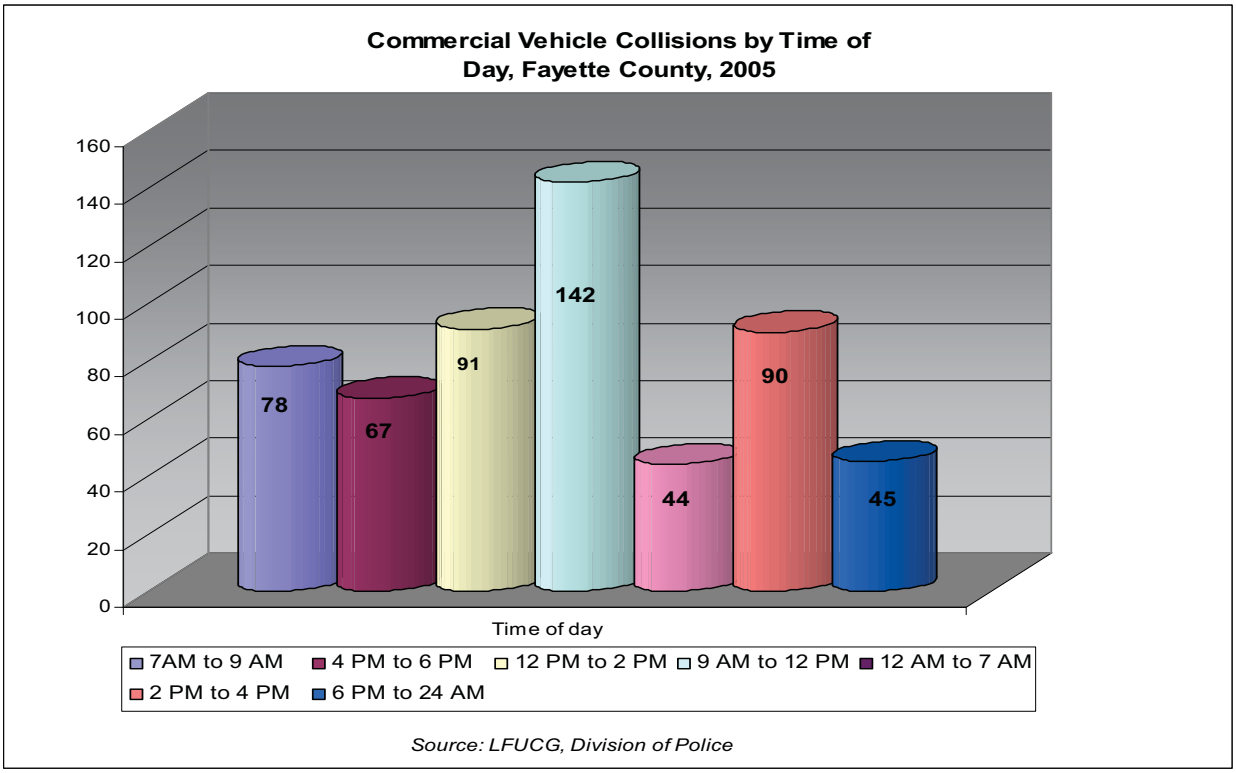


Figure 2.0.4.8

In 2005 there were total of 42 commercial motor vehicle collisions in Jessamine County. See Figure 2.0.4.9 for locations. Locations on the map are not exact location of collisions. 43 percent of total collision occurred on business type land use. 33 percent of it was on rural type of land use. Residential land use holds 19 percent of the total commercial vehicle collision. See figure 2.0.4.10. Weather condition; 60 percent was clear, 26 percent was cloudy, and 14 percent was rainy. 81 percent of total collision was during daylight and 14 percent was in dark. See Figure 2.0.4.11. 33 percent of the collision was rear end type and 19 percent of it was angle type collision. 21 percent was single vehicle collision. See Figure 2.0.4.12. Collisions month of year pattern is different than Fayette County. In December 2005 there were no collision and November ranks lowest in Jessamine County. Total 42 percent of the collision dispersed equally between March, April and August. See Figure 2.0.4.13. Numbers of collisions were same on Monday and Thursday. About 48 percent of collisions happened on Monday and Thursday. Saturday has the lowest collision number whereas Sunday has zero collision. Unlike Fayette County, most collisions happened on Wednesday in Jessamine County (26 percent of the total collision). See Figure 2.0.4.14. 24 percent of the collisions happened between 12 PM to 2 PM time period unlike Fayette County. See Figure 2.0.4.15 for Jessamine County commercial vehicle collision by time of day.

In conclusion, Lexington Area MPO will consider collision data when prioritizing the projects. One of the goals will be lowering commercial vehicle collision in Fayette and Jessamine Counties.

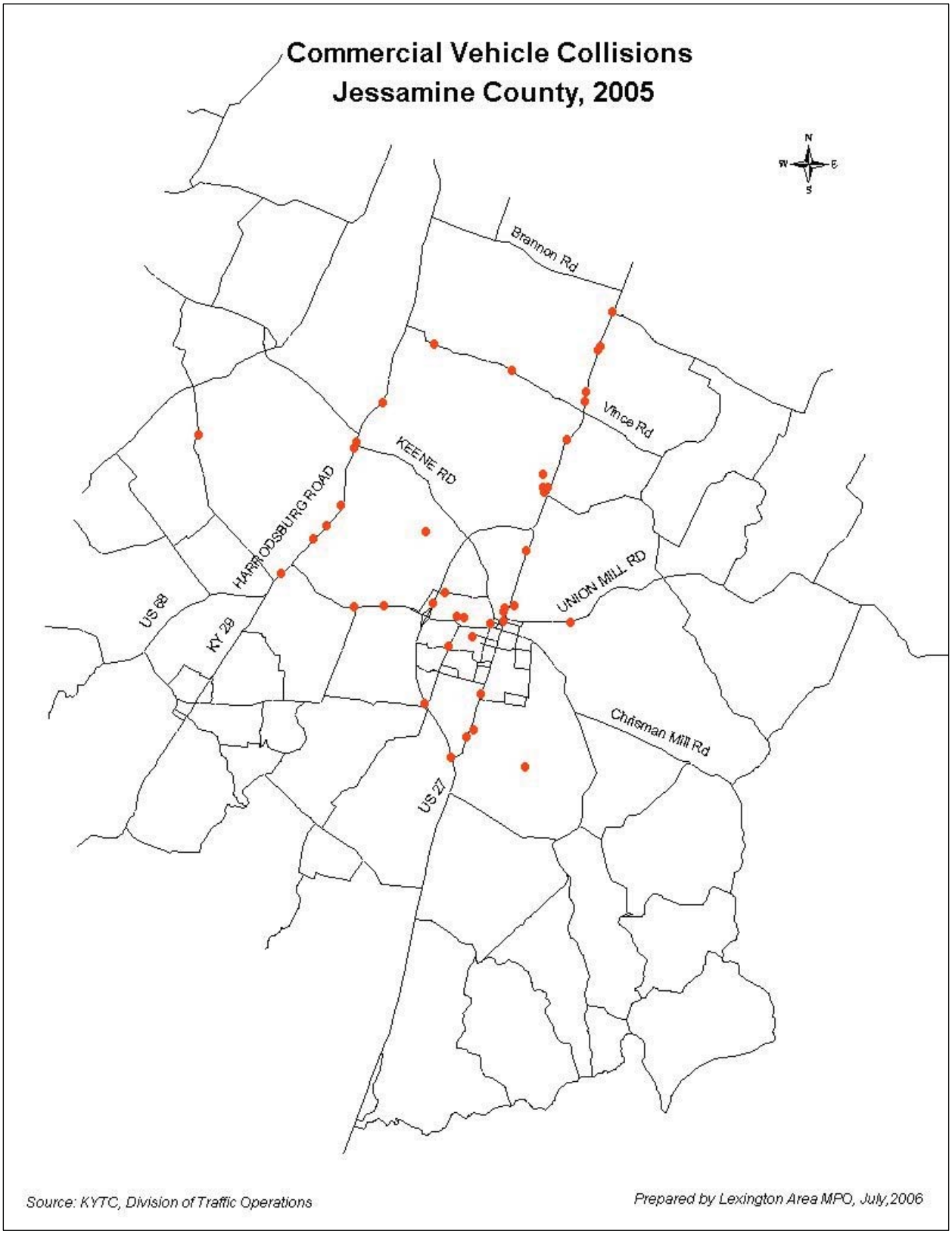

Commercial Vehicle Collisions
Jessamine County, 2005
N
W
E
S
Brannon Rd
Vince Rd
KEENE RD
HARRODSBURG ROAD
US 68
KY 29
UNION MILL RD
Chrisman Mill Rd
US 27
Source: KYTC, Division of Traffic Operations
Prepared by Lexington Area MPO, July,2006

Figure 2.0.4.9

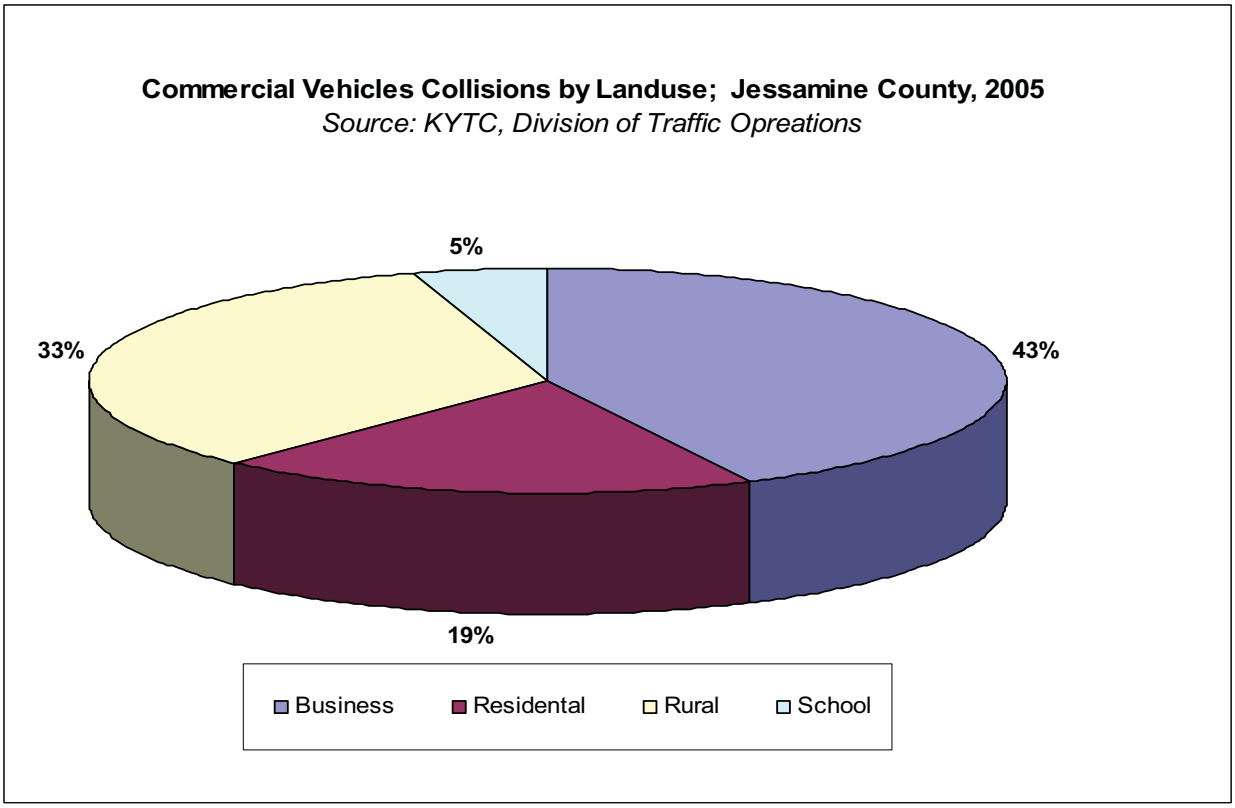


Figure 2.0.4.10

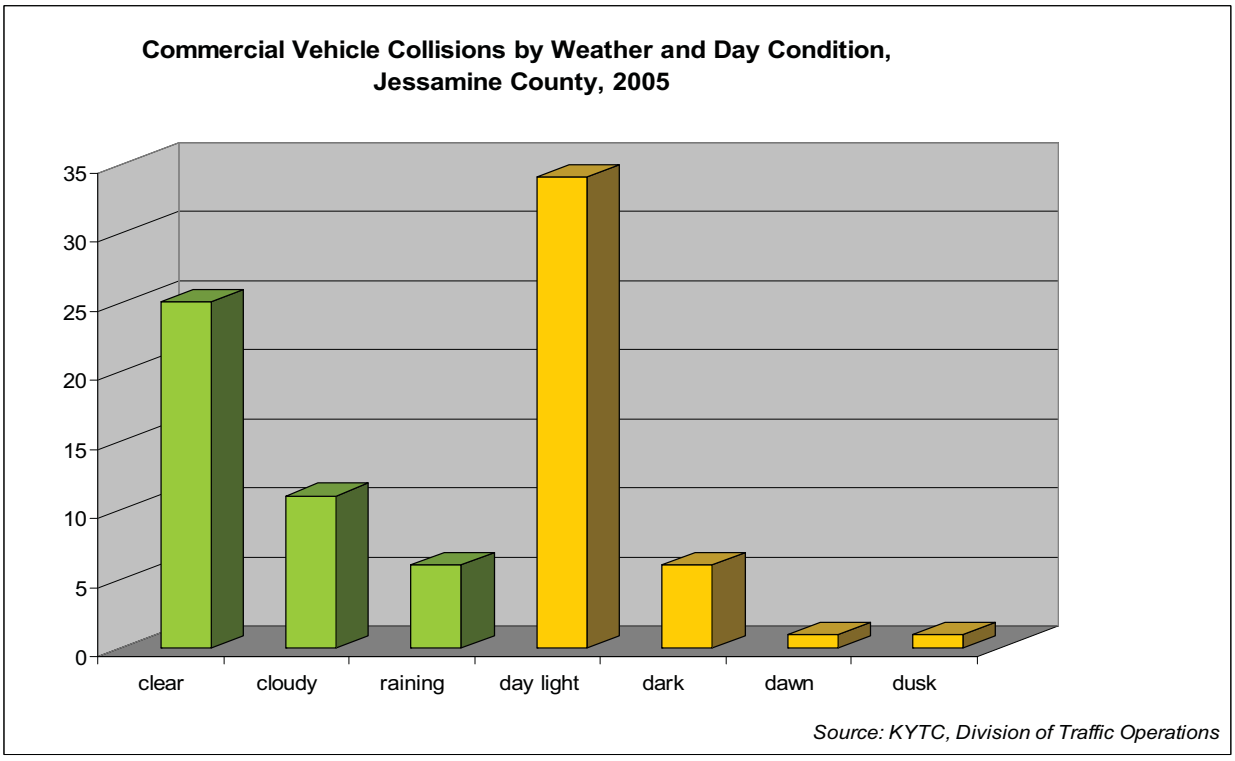


Figure 2.0.4.11

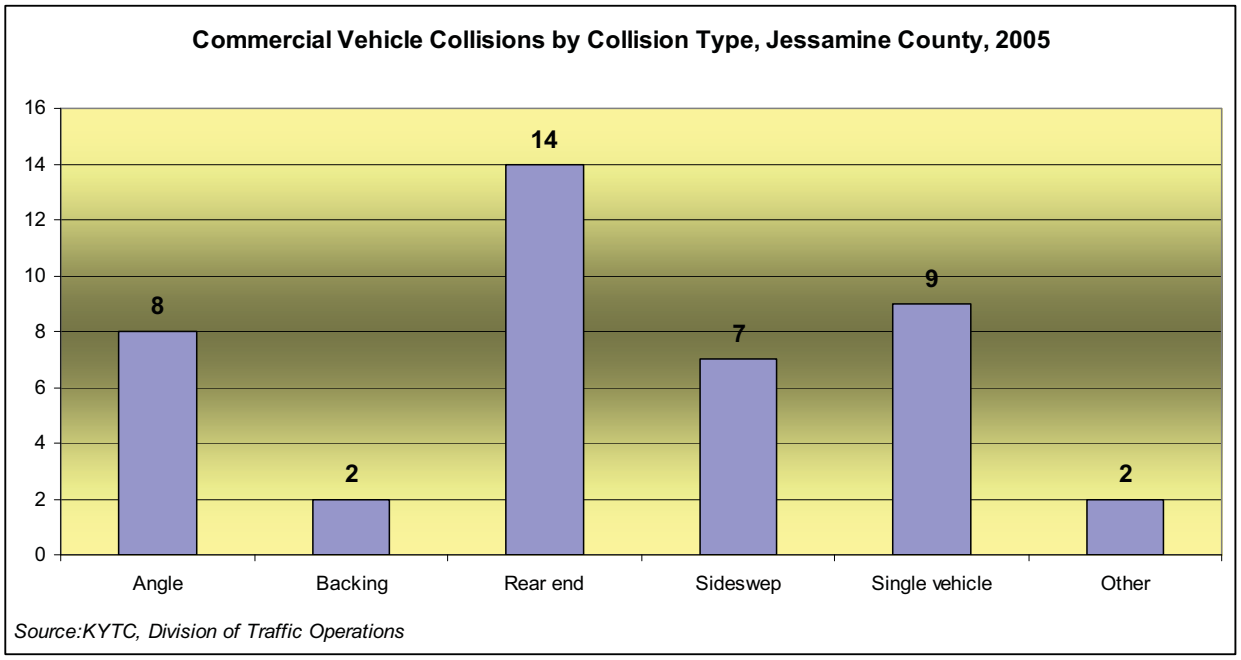


Figure 2.0.4.12

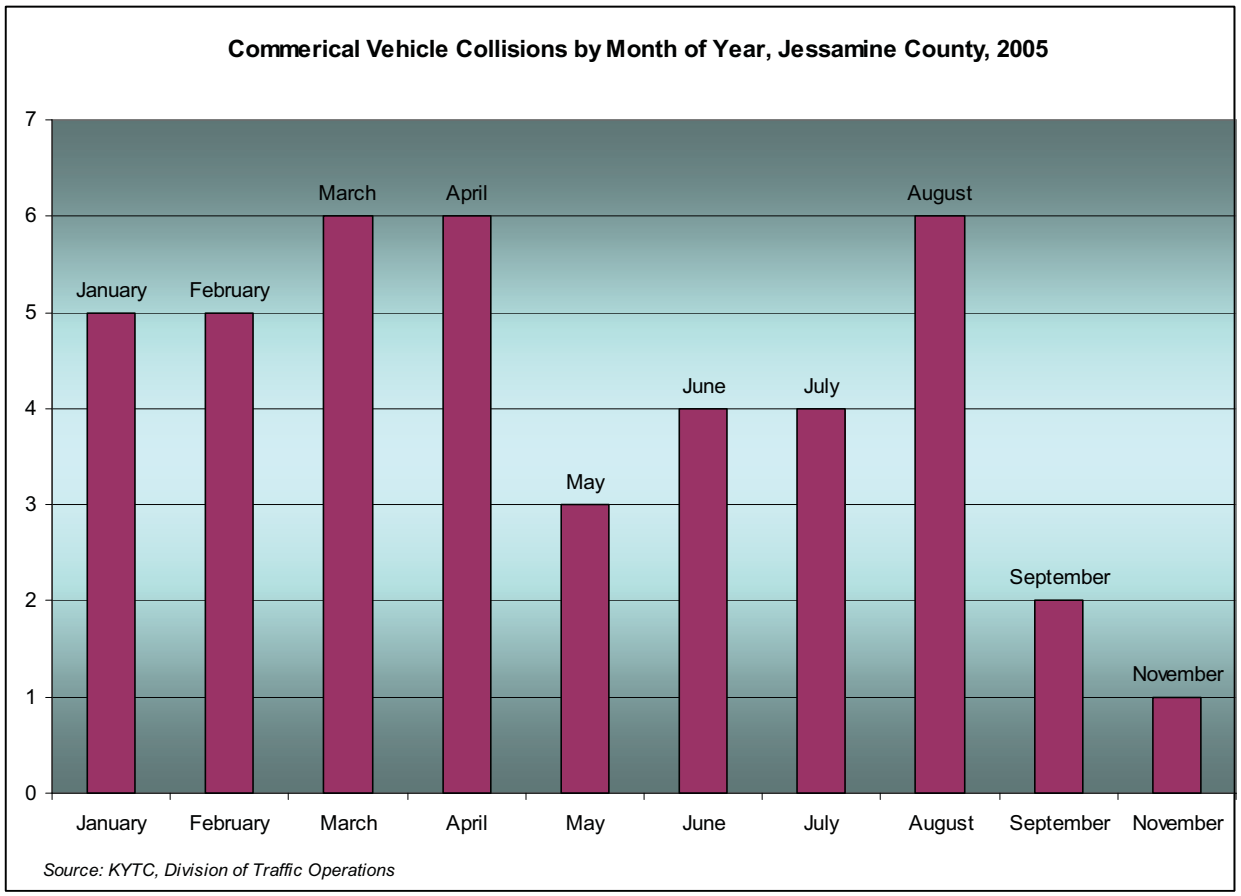


Figure 2.0.4.13

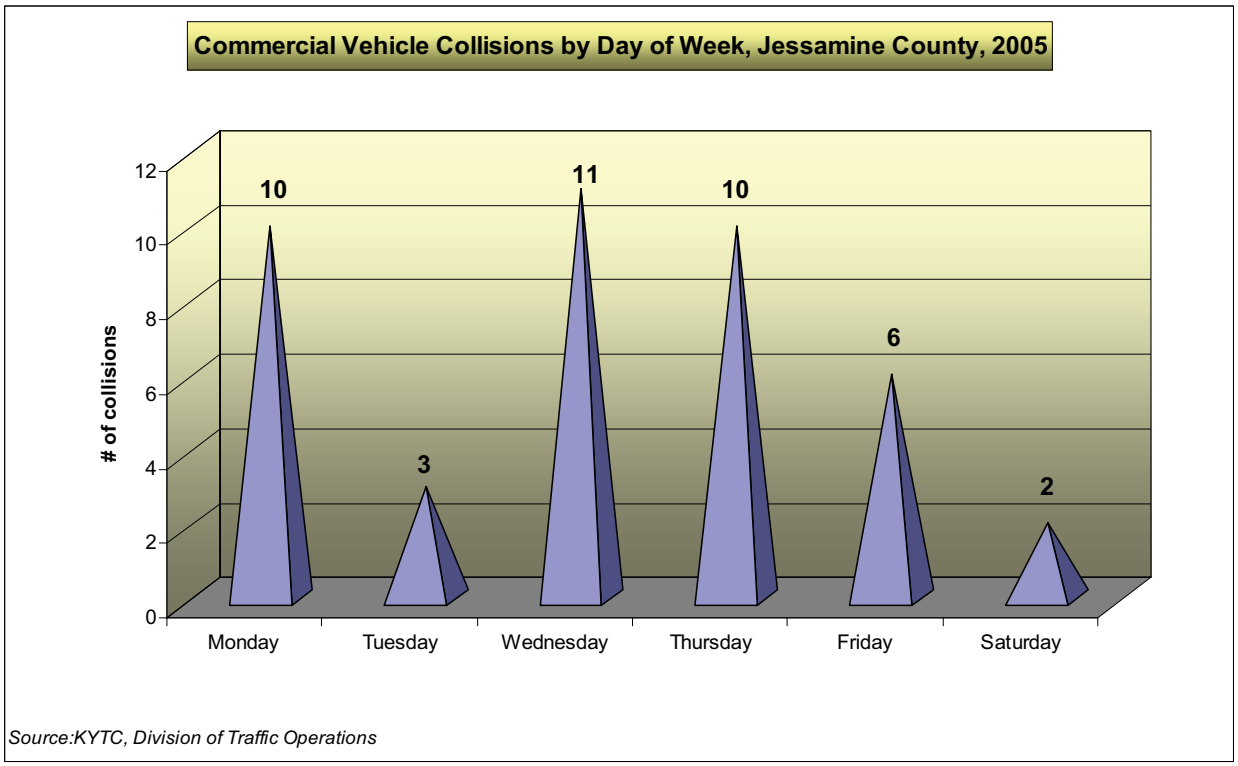


Figure 2.0.4.14

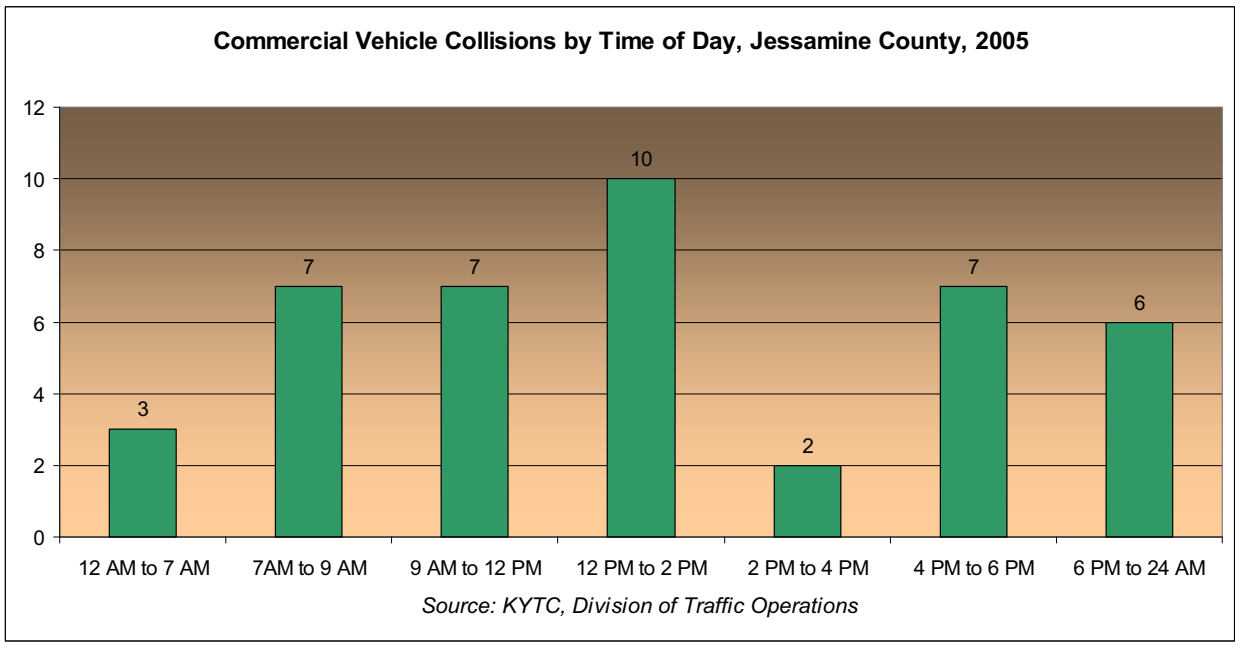


Figure 2.0.4.15

2.0.5 Rail

The Lexington MPO planning area is served primarily by two of the nation's busiest railroads and one short line railroad: CSX Transportation and Norfolk Southern Corporation, both of which are Class I. Figure 2.0.5.1 shows the railroads and switching yards, which exist in the Lexington MPO planning area.

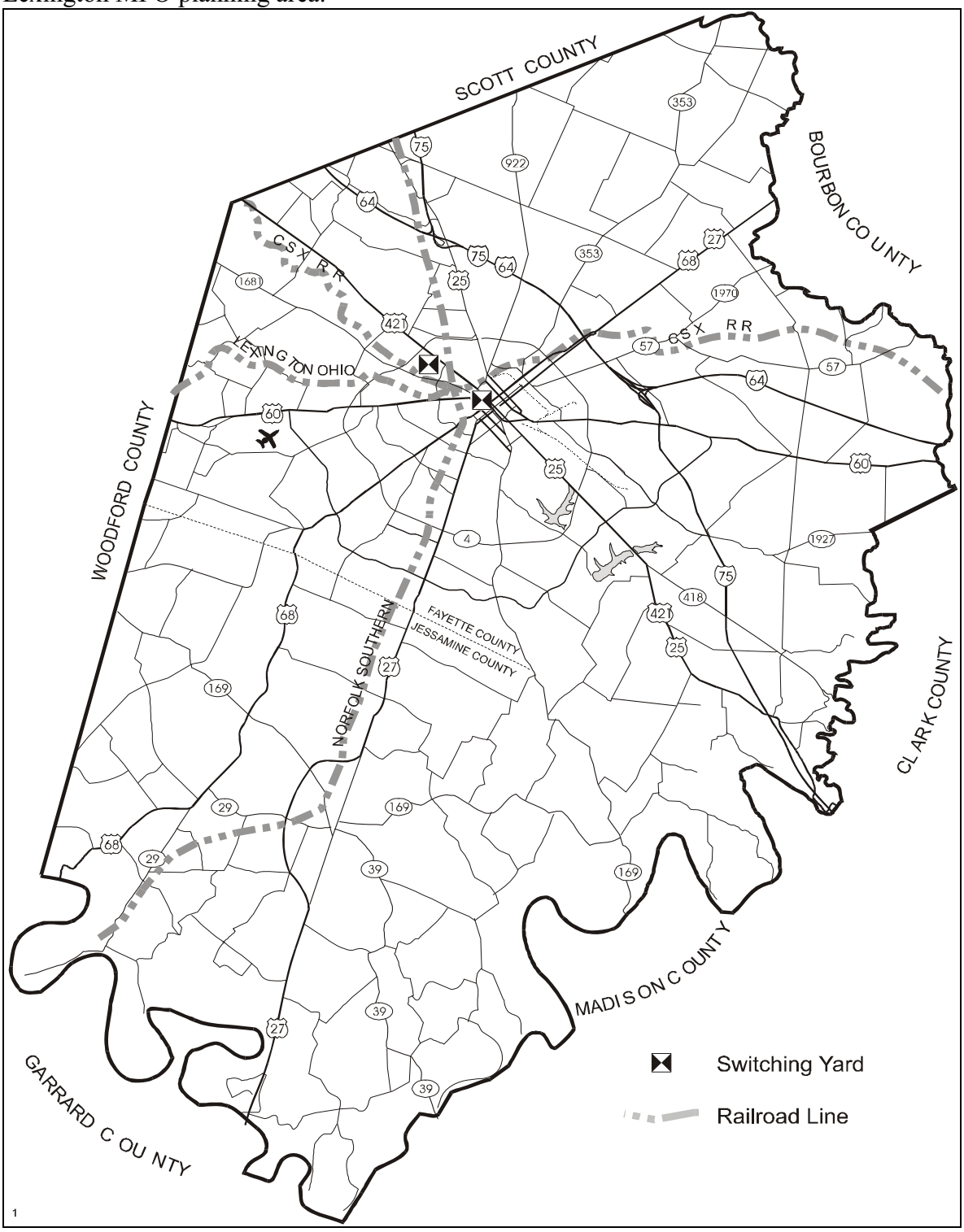
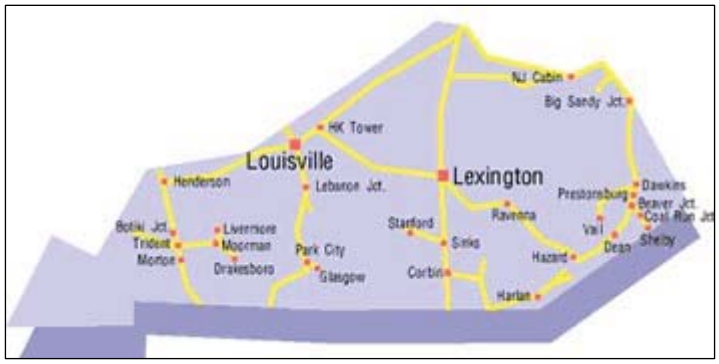


Figure 2.0.5.1
Today's rail freight service is customers demand "just-in-time" and consistent service to meet their schedules. This demand puts a premium on railway capacity and currently prohibits the consideration of passenger rail services by most of the nation's major rail freight carriers. To remain competitive, many railways offer a full range of distribution services, whether rail, truck, barge, aircraft, or a combination of all four. In addition, this demand has resulted in innovative advancements in many areas, which include intermodal transfer facilities, rail/tank car design, logistics, inter-industry cooperation, and safety.

CSX Transportation
CSX is a freight-only service that route connecting Louisville, Lexington and Winchester. Major commodities originated and/or moved through/from Kentucky are coal, grains, forest products, automobiles, chemicals, paper, building materials, food, and consumer products.

Figure 2.0.5.2



Source:htpp//www.csx.com

CSX Transportation has approximately 23 miles of heavy rail, main-line track running east-west (Winchester to Frankfort, Kentucky) through the Lexington-Fayette County area, not including branch lines or spurs which run off of the main line to serve certain Lexington customers such as Proctor & Gamble along East Third Street. Lexington lies on the Hazard-Ravenna-Lexington-Frankfort-Louisville route, a route between eastern Kentucky and Louisville Kentucky on the Ohio River. See figure 2.0.5.2 CSX interchanges goods with the Norfolk Southern Railway to transport to, from, and through the Lexington MPO area. On an average day, CSX may have 6 to 12 trains delivering goods, returning empty cars, or traveling through the MPO area. On a busy day there may be over 15 trains.

The CSX Railroad has a main switching and freight classification yard in central Lexington on Buchanan Street just south of West Main Street. At this "Bulk Industrial Distribution System" (or BIDS) facility, CSX can "trans-load" from railcar to truck and vice versa to serve the Lexington area. Some CSX shipper and receiver customers in the area such as Lexmark International, Incorporated, are served conveniently by having facilities located contiguous to the CSX main line.

Norfolk Southern Corporation

Norfolk Southern Corporation, also a freight-only service. The company owns North American Van Lines, a trucking line. Norfolk Southern has approximately 30 miles of heavy main-line rail running north south (Georgetown to Danville, Kentucky) through the Lexington-Jessamine MPO area. See Figure 2.0.5.3. The Norfolk line through Lexington comes from Chattanooga and Knoxville and connects to Cincinnati. This branch line enables engines to travel west to serve customers located in Versailles, Kentucky, (Woodford County). Norfolk Southern carries a wide variety of goods. Some of the major commodities carried include forest products, chemicals (i.e., plastic and asphalt), cars, peanuts, liquor, and steel. On an average day, Norfolk Southern may have as many as 35 to 40 trains travel in, out, or through the MPO planning area.

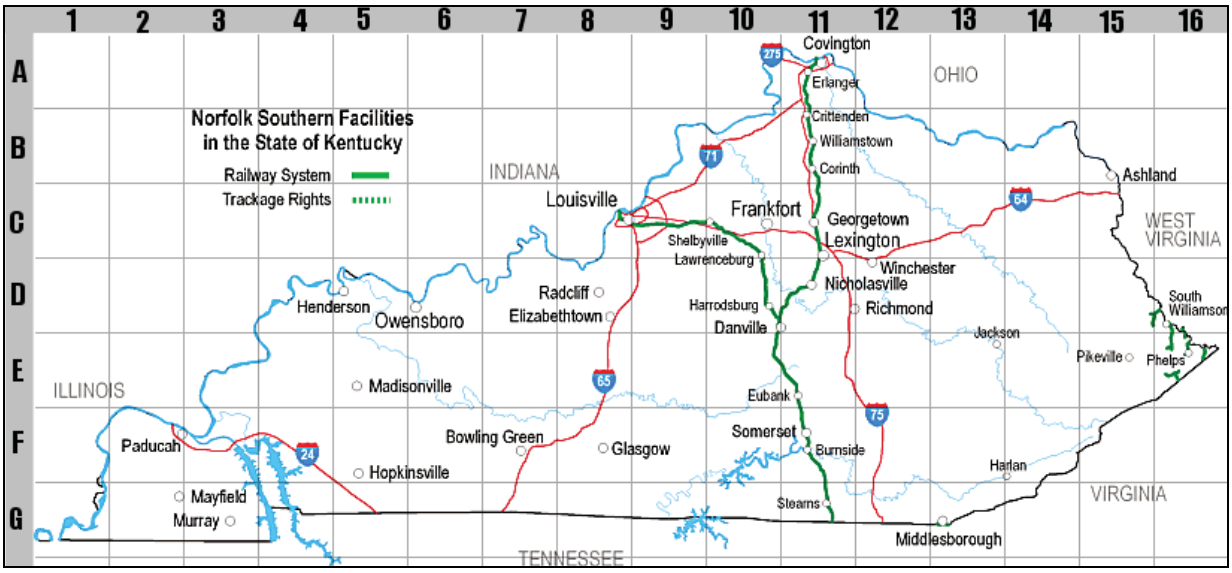


Figure 2.0.5.3 *Source:http://www.ncorp.com*

The company has switching yards in Lexington. It also serves customers in Nicholasville. Norfolk has lumber related and general warehouse facilities in Nicholasville by Mid-South Reload. See Figure 2.0.5.4 and 2.0.5.5 for facility location. Facility has 5 rail stops, inside storage is 25,000 square feet, outside storage is 5 acres, and has unload centerbeams and unload boxcars features.

In central Lexington, the yard is located off South Broadway between DeRoode Street and Angliana Avenue. Norfolk has steel distribution facility by Transload Services in Lexington. Facility features are; company-owned trucks, overhead crane, temperature and humidity control, heavy duty floor, slitting, blanking, and leveling. Facility also serves CSX and has inside rails. Other than steel Norfolk has general warehousing facility by G. F. Vaughn Storage Corporation. Facility is 300,000 square feet, has 4 company-owned trucks, has maximum 3000 plus forklift capacity. Facility's features; fenced, bar code, inventory management, warehouse management system, security system, sprinkler system and shrink wrap. Like CSX customers, many Norfolk Southern shippers and receivers in the area are conveniently served by having facilities located

contiguous to the Norfolk Southern main line, such as Fort James-Dixie Northern (formerly Dixie Cup), Atlantis, Lexington Metal Recyclers, Gulf States and others.

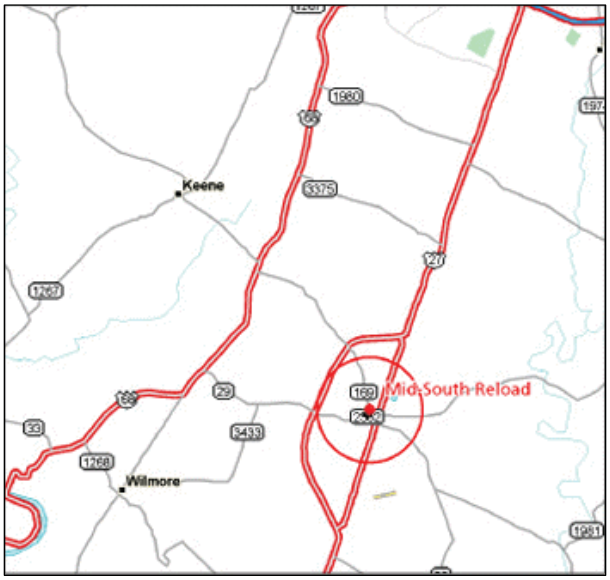


Figure 2.0.5.4 *Source:http://www.ncorp.com*

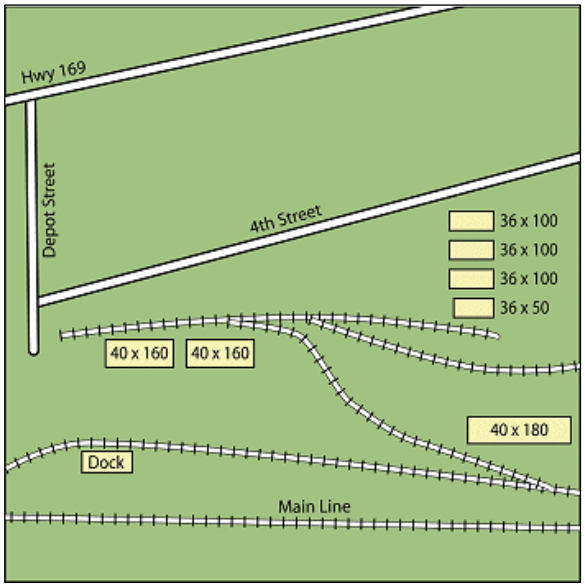


Figure 2.0.5.5. *Source:http://www.ncorp.com*

Norfolk Southern has rail terminals located just north and south of the Lexington in Georgetown and Danville, Kentucky. Terminals in Georgetown and Louisville, have full "intermodal facilities" to transfer double-stacked truck trailers from railcar to truck tractors and vice versa. The Georgetown facility, 20 miles to the north, serves the Lexington area extensively.

Central Kentucky Lines (Lexington and Ohio Railroad)
Lexington Ohio Railroad is operated by R.J. Corman Railroad Company and now it is called Central Kentucky Lines. According to company's profile, The Central Kentucky Lines consist of two separate short line railroads. The Versailles portion of the line is approximately 15 miles, from Versailles to the interchange with NS in Lexington. The second portion of the Line is more than 100 miles in length, from the CSX interchange at HK Tower in Louisville, through Shelbyville, Frankfort, and Lexington to Winchester where it interchanges again with CSX. The Lexington yard office is in downtown Lexington, the NS interchange is just south of the yard. The Central Kentucky Line runs through the State Capital and hosts numerous previous sites for businesses wanting to be located with access to rail as well as many new industrial development sites with rail access and interstate access throughout the line. Goods that are carried by the line are; peanuts, aluminum ingots, alcohol, paper, plastic, fertilizer, limestone, sand, scrap paper, brick, corn syrup and oil.

The Central Kentucky Line runs 25-30 cars every other day from Berea, Kentucky to Logan Aluminum in South Union, Kentucky. These cars carry aluminum ingots made from recycled aluminum cans (over 1 millions cans per ingot). The Line also provides service to the largest peanut butter plant in the world, Smuckers, transporting over 140,000 tons of peanuts per year.

When MPO receives current rail information the section will be updated.

2.0.6 Air Cargo

Located in western Fayette County along Versailles Road and Man o' War Boulevard, Blue Grass Airport is one of the area's most significant intermodal transfer points (air-to-highway/highway-to-air). Air cargo at Blue Grass Airport is handled by both the airlines and independent cargo carriers, and consists of airfreight, air express and the United States mail. Air express and the mail are currently handled through a 14,000 square foot cargo building. Additional air express/freight is handled through separate facilities operated by Tex Sutton, Murphy Surf-Air and Delta. Current cargo building space contained in all four cargo buildings is 22,800 square feet.

Even though United States mail activity has continued to increase over the past several years, air express/freight has declined in Lexington as a result of the growth of airfreight hubs in Cincinnati, Louisville and Indianapolis. Many military operations involve the movement of freight. In 1999, there were 2,890 military operations at Blue Grass Airport. Operations numbers have fluctuated since 1988 with an average of 2,700 operations per year. In 2000, Blue Grass Airport transported 3.8 million pounds of mail and 956,000 pounds of airfreight.

To make way for an expanded covered rental car facility the current air freight complex will be relocated and replaced with a new facility featuring roughly the same size and features of the existing site.

2.0.7 Hazardous Materials

Our society depends on products manufactured from hazardous materials, from blue jeans to television sets to life-saving medicines. Because of the dependence on these products, their transportation has become an integral part of daily living.

There is a great deal of hazardous materials moved in/out and through the Lexington MPO planning area by air, rail, water, pipeline, and highway. The railroad industry moves more than 1.5 million carloads of hazardous materials every year. Safety has improved by way of innovative equipment design, education, training, information, emergency response, maintenance, and grade crossing improvements.

State and federal agencies regulate air, rail, water, pipeline, and highway carriers of hazardous materials. There are no local hazardous material regulations in the Lexington MPO area; however, the LFUCG Divisions of Fire, Police, and Environmental and Emergency Management are experienced, trained, and prepared to respond and resolve hazardous material incidents. In 2005 there were 12 collisions with hazardous cargo and one involved spilling material in Fayette County.

3. MPO'S CONSIDERATIONS

3.0. Demographics, Land Use and Environment

Population growth will present a challenge to the Fayette and Jessamine County transportation system. The growth will undoubtedly lead to increased travel, congestion, and delay on both Counties' transportation system, affecting the overall mobility of both people and goods in the region.

Since Jessamine County's socio-economic data in need for update, the model data is used to compare with base year and projected year of 2003 for Fayette County. Figure 3.0.1 exhibits employment data for Manufacturing, Transportation, Communication and Utilities, Wholesale, Services-Retail and Government for Fayette County for the year of 2000. In Fayette County in 2000 total of service and retail categories made sixty-four percent, wholesale was five percent and Transportation-Communication-Utilities was five percent of the total employment. Figure 3.0.2 shows projected year of 2030 for the same categories. Forecasted Service Employment is 181,898 for the year of 2030.

In Fayette County total of Service and Retail employment will be sixty-nine percent of the total employment increasing about five percent. Transportation-Communication-Utilities employment will increase about one percent (from five to six). Wholesale employment will decrease about one percent (from five to four). Also government employment will decrease from 2.2 percent to 1.9 percent. Figure 3.0.3 shows forecasted freight related employment locations by TAZ for 2030. Following figure 3.0.4 shows only service employment locations in Fayette County for 2030.

There is no doubt that increase among employment will affect Fayette County's transportation system. Service industry employment will nearly be doubled in the future. The increased emphasis on service-based and other industries in the County will result in an increased demand for premium transportation services such as those provided by less than-truckload (LTL) carriers, couriers, and air cargo carriers.

Diverse land use patterns in Fayette County generate truck trips throughout the region. Based on employment and household data by traffic analysis zone (TAZ), there are many areas throughout the county that generate truck trips. Location of Commercial Vehicle Collision map presents those areas very clearly. In the future these truck trips will continue to experience truck traffic in support of specific land use patterns. Service and retail employment, as well as population centers, are responsible for many of these trips. As a result, truck trips in the region not only originate from major trip generators and surrounding industrial areas, but also rapidly-growing employment and population hubs within two counties and neighboring counties. In 2003, the US Census Bureau designated adjoining Madison County's principal cities of Richmond and Berea as a Micropolitan Statistical Area.

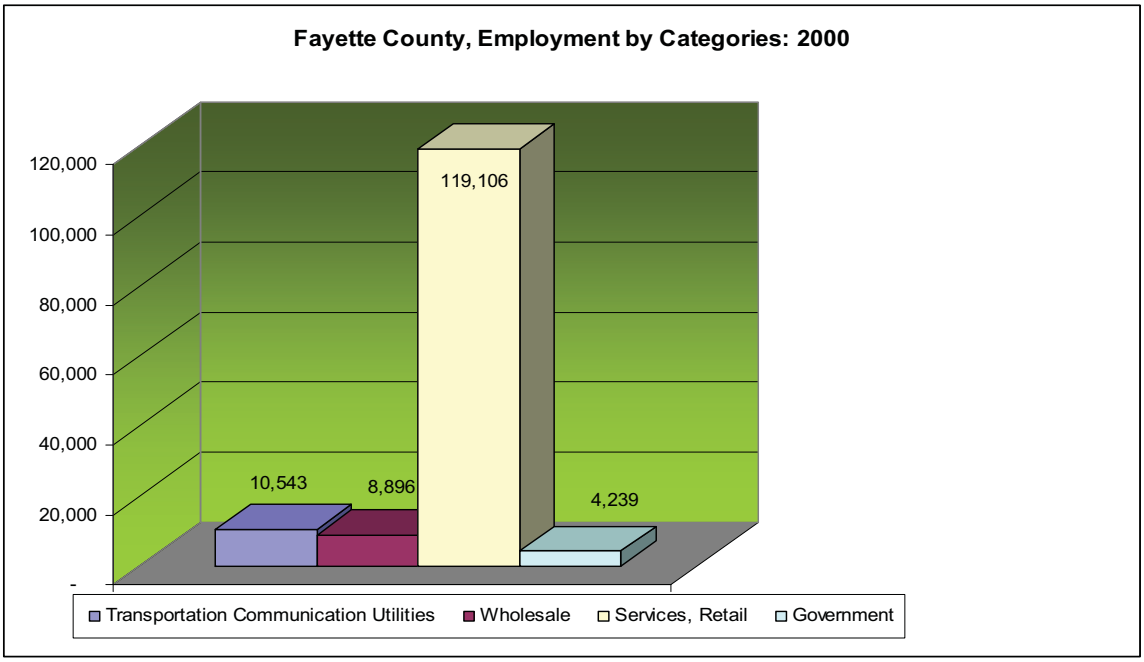


Figure 3.0.1

Although Fayette County has succeeded in managing environmental impacts, transportation improvement projects can often have significant impacts on both the natural and human environment. The region holds the categorization of "non-attainment" for air quality. However, potential impacts on all environmental factors will be continuously monitored and addressed as part of the region's development and transportation improvement planning process.

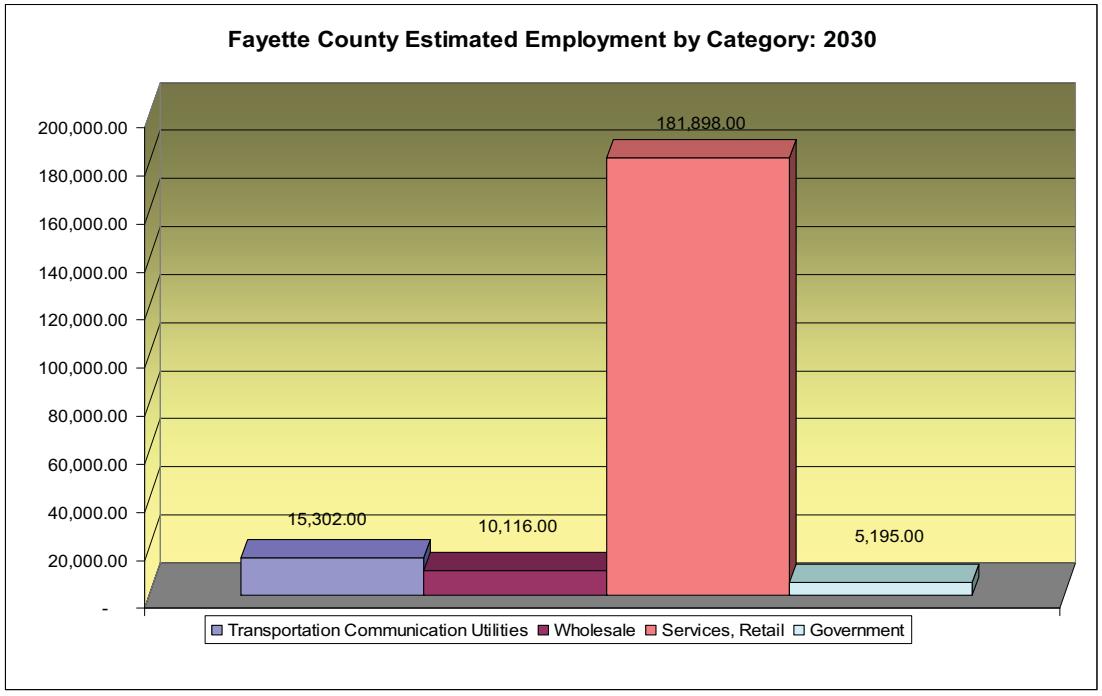


Figure 3.0.2

3.1. Design

The design of all roadways should be consistent with their intended function and be responsive to the environment through which they pass. This principle is especially important when considering roads that are used by trucks. Common design elements that are a priority for trucks include appropriate lane widths, turning radii, and adequate separation for pedestrian facilities. A general set of design considerations to ensure the roads can safely accommodate trucks, MPO will continue to monitor its highways system to provide improved access and circulation around major transportation corridors. In addition, the MPO will closely coordinate area roadway planning with freight objectives, including access management and mobility in the context of other community planning objectives.

3.2. Zoning and Developments

Areas suitable for freight handling and are serviced by primary freight routes generally correspond with other part of industrial zones under both the metropolitan planning and local town planning. Such areas will be recognized in both regional and local planning strategies, and where appropriate identified as special control areas under town planning. Areas of influence associated with primary freight routes (existing and proposed), will be included as special zones in order to facilitate appropriate control of development. Identification of such areas of influence will be coordinated by all relevant departments. Geometric design is considered for larger vehicles such as school buses and emergency vehicles. Currently, MPO staff attends every zoning review meeting in the division of planning and conducts traffic impact studies for the proposed zone change and developments. MPO will continue to make every effort and give information to the decision makers to consider freight issues in the proposed area.

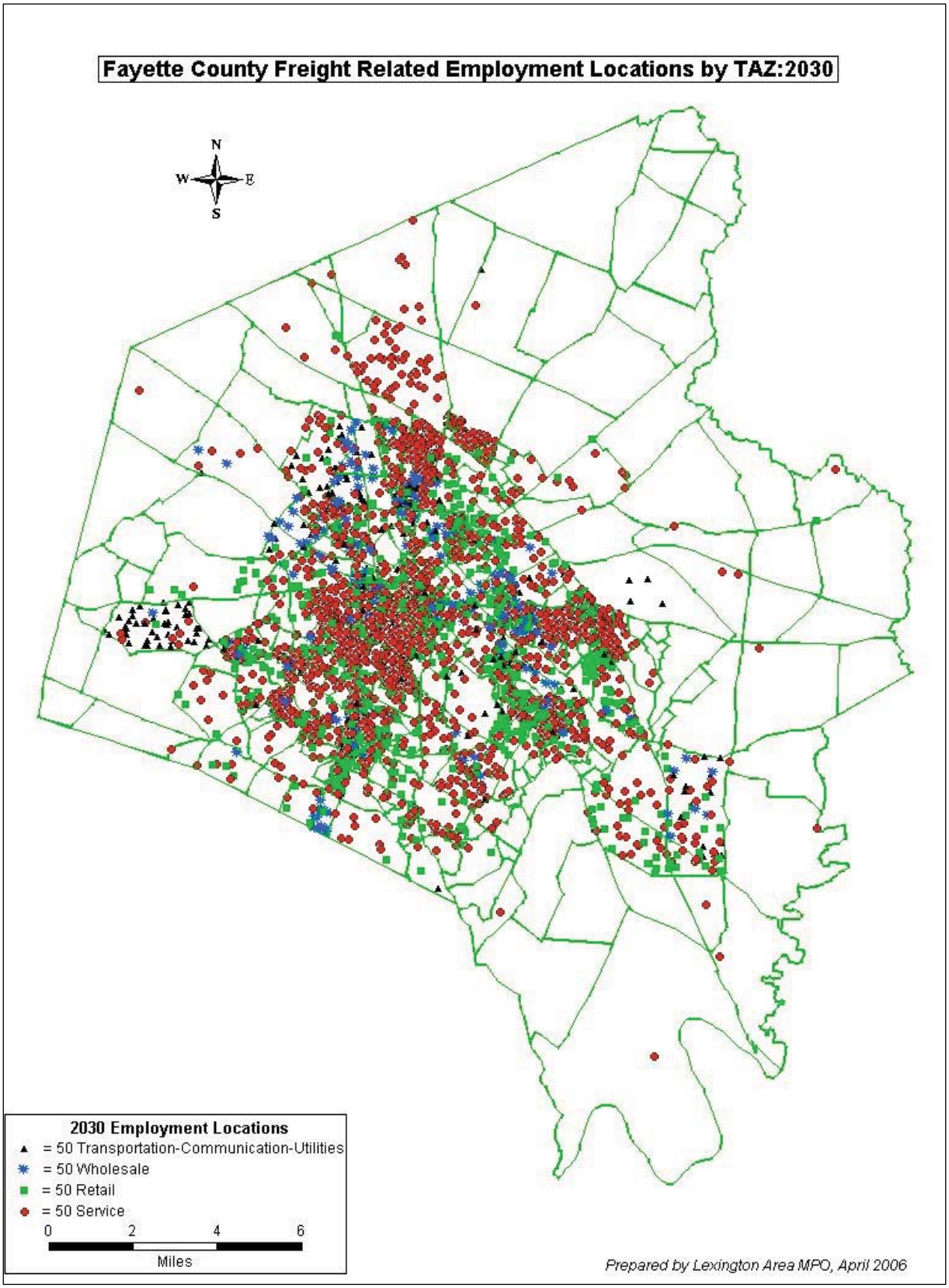

Fayette County Freight Related Employment Locations by TAZ:2030
N
W
E
S
2030 Employment Locations
= 50 Transportation-Communication-Utilities
= 50 Wholesale
= 50 Retail
= 50 Service
0
2
4
6
Miles
Prepared by Lexington Area MPO, April 2006

Figure 3.0.3

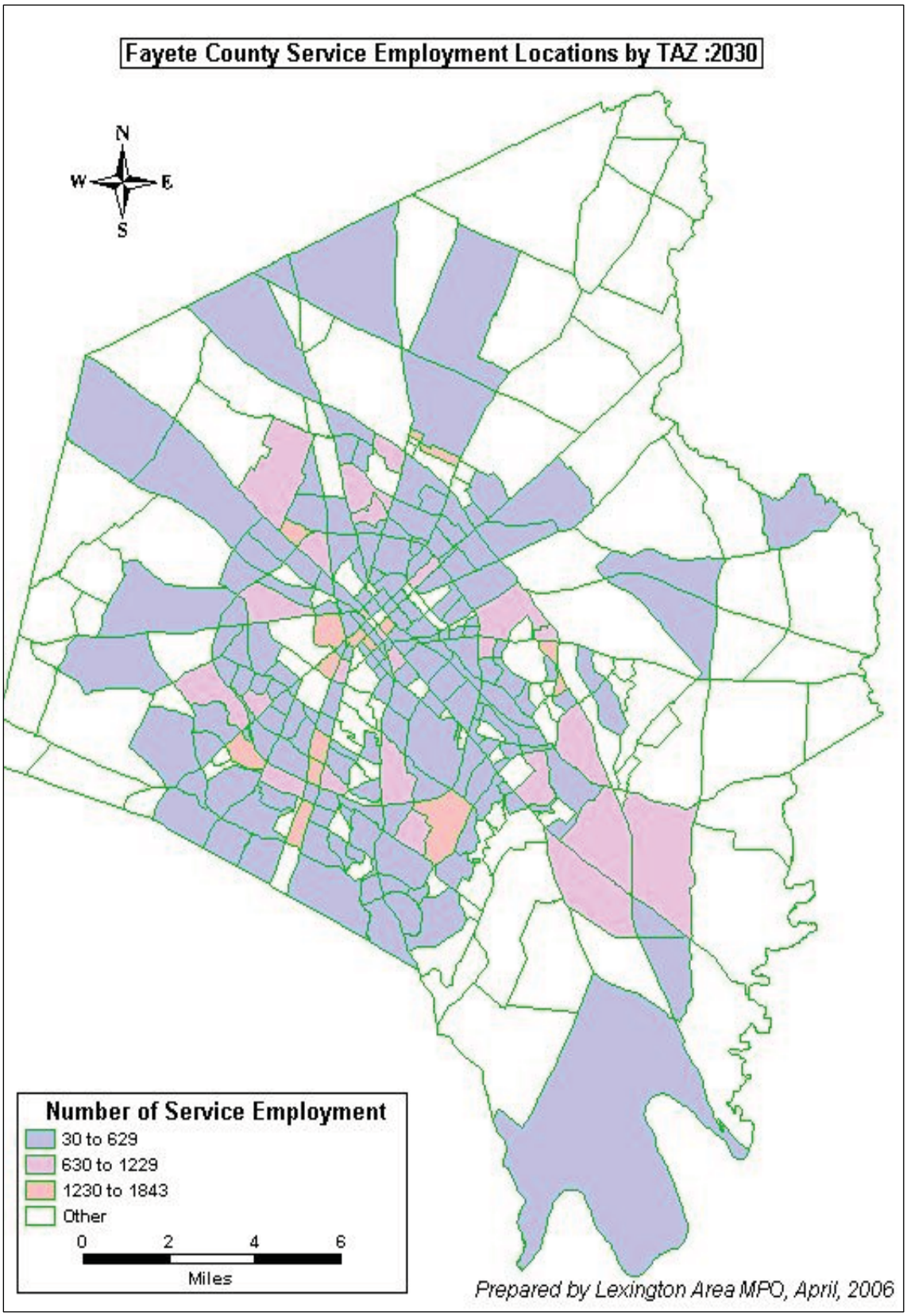

Fayete County Service Employment Locations by TAZ :2030
N
W
E
S
Number of Service Employment
30 to 629
630 to 1229
1230 to 1843
Other
0
2
4
6
Miles
Prepared by Lexington Area MPO, April, 2006

Figure 3.0.4

4. MPO'S PLANNED FUTURE ACHIEVEMENTS

Being aware of the importance of the freight planning the Lexington Area MPO established achievements for the successful freight transportation in its region.

Achievement 1: Coordinate Freight Issues

Freight providers tend to be very knowledgeable about bottlenecks in the system that hinders truck and other vehicle movements. In addition, they may be aware of signal timing, signage, or geometric (e.g., turning radii) deficiencies in the system. With their involvement, the MPO can develop a detailed list of improvement needs and incorporate them into the transportation improvement program (TIP) for implementation. While long-range freight planning is necessary, short-term results are also important in engaging and maintaining interest from freight providers.

The MPO will work with freight transportation companies operating in the region to identify specific deficiencies in the transportation system that hinders freight movements and to incorporate design elements for large trucks in roadway planning and design. In addition, coordination with KYTC on freight issues could provide increased information regarding freight flows and improvement needs. It may be desirable to establish a freight task force for this purpose.

Achievement 2: Land Use Considerations

To the extent possible, heavy truck traffic should be separated from light vehicle traffic and sensitive land uses (e.g., neighborhoods, schools, parks, etc.). Industrial land uses should be isolated from residential and commercial areas. Land use planning activities for areas near the airport should carefully consider noise and other impacts so that only compatible uses occur. MPO actively involves with the Long Range Planning Section and Comprehensive Plan update process in the Division of Planning. MPO will continue to make every effort and give information to the decision makers to consider freight issues in the proposed area.

Achievement 3: Roadway Design and Access Management

Due to their large size, trucks and buses have special needs for moving through the transportation system. Roadway and access requirements for these vehicles should be considered in the design of intersections and interchanges. Roads in and around industrial areas should be designed specifically for the movement of large trucks. MPO is currently working closely with engineering departments in two counties. After having input from private industries MPO will review designated truck routes and access.

Achievement 4: Designated Truck Routes

Truck routes provide freight haulers with a network of the most efficient and least impacting locations for traveling through Fayette and Jessamine counties. Designated truck routes can have a positive influence on traffic safety if properly planned, implemented, and enforced. Hazardous materials traffic should be carefully considered and routed accordingly. These will be updated periodically, especially as land use changes and roadway improvements occur.

Achievement 5: Develop a Freight Model

Although Lexington Area MPO has a Travel Demand Model, components of freight is not included in the modal. The MPO will look at the possibilities to develop freight demand model. Developing a freight demand model will be depending on available data in the Lexington Area MPO's region.

Achievement 6: Commodity Survey and Freight Study for Two Counties

Since last study is out of date, Lexington Area MPO will look at the possibilities of conducting commodity and freight study for two counties.