

# Kentucky Freight Plan 2022

KY FACT



March 28, 2022

# Introduction

- 2022 State Freight Plan
  - Update of the 2016/17 State Freight Plan
  - Integrate freight planning efforts statewide and support the LRSTP
  - Federal Freight Plan Requirements have been updated (IIJA)
- Current Status: Finalizing Draft/Compliance with the IIJA
- What do we need from the KY FACT?
  - Ask questions. Meant to be a conversation.
  - What did we miss?
  - Feedback on recommendations and the Freight Investment Plan



## Freight Plan Outline

- 01** Kentucky Freight Plan's Mission, Vision, and Coordination with Other Plans
- 02** Overview of Kentucky's Multimodal Freight System
- 03** Goals and Performance Measures
- 04** Current Conditions of Kentucky's Freight System
- 05** Key Industries and Supply Chains
- 06** Trends and Challenges
- 07** Freight Operational Strategies, Conditions, and Technologies
- 08** Freight System Needs
- 09** Recommendations
- 10** Freight Investment Plan

## Mission and Vision

The 2022 Kentucky Freight Plan (KFP) was designed to supplement the 2022 Long-Range Statewide Transportation Plan (LRSTP).

### Mission

Provide a safe, efficient, environmentally sound, and fiscally responsible transportation system that delivers economic opportunity and enhances the quality of life in Kentucky.

### Vision

Meet or exceed the needs and expectations of our customers. Our focus is on people: our customers, our employees, and our partners. We will continually improve both the delivery of our products and services and the processes which support that delivery. As we progress through the 21st century, we recognize that change is inevitable. We will strive to manage that change to the benefit of all our stakeholders.

## Built Upon Other Plans

- National Freight Strategic Plan
- Kentucky Highway Plan and Statewide Transportation Improvement Plan (STIP)
- Kentucky Truck Parking Assessment and Action Plan (2022)
- Kentucky Statewide Rail Plan (2015)
- Kentucky Riverports, Highway and Rail Freight Study
- Strategic Highway Safety Plan (SHSP)
- Kentucky State (Grade Crossing) Action Plan (2022)
- Statewide Aviation System Plan (2017)
- MPO Freight Plans

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# Overview of Kentucky's Multimodal Freight System



6 major interstates and 10 state parkways



2,583 miles of freight rail: five Class I, one Class II, and seven Class III railroads



1,900 miles of USACE designated navigable waterways, including 1,020 commercially navigable, as well as 11 public riverports



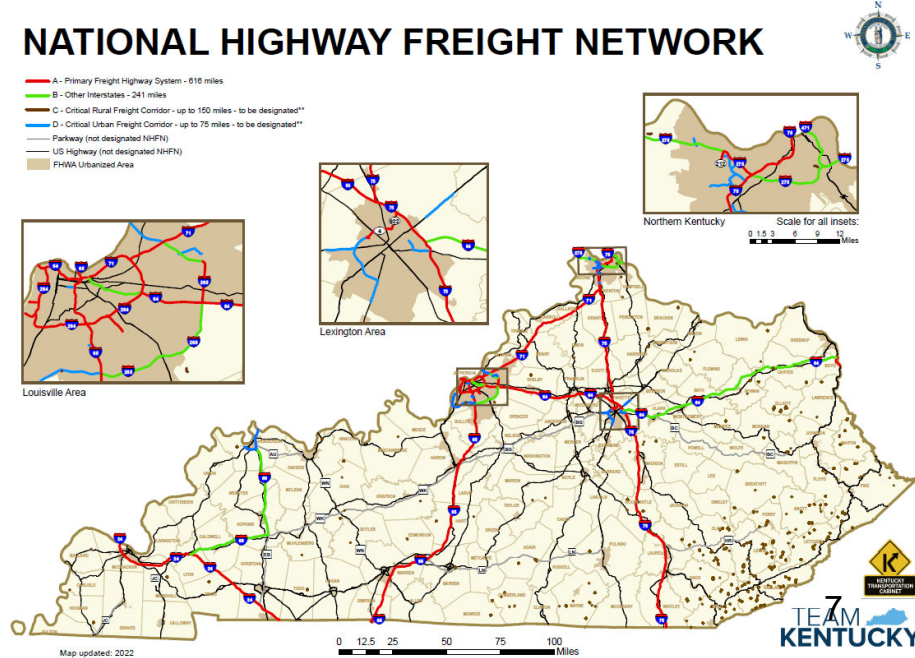
Six commercial airports, including two major shipping hubs that are home to UPS Worldport (Louisville) and DHL Express/Amazon Air (Covington)



41,000 miles of pipelines moving oil, natural gas, and other commodities

# Highway Freight Network

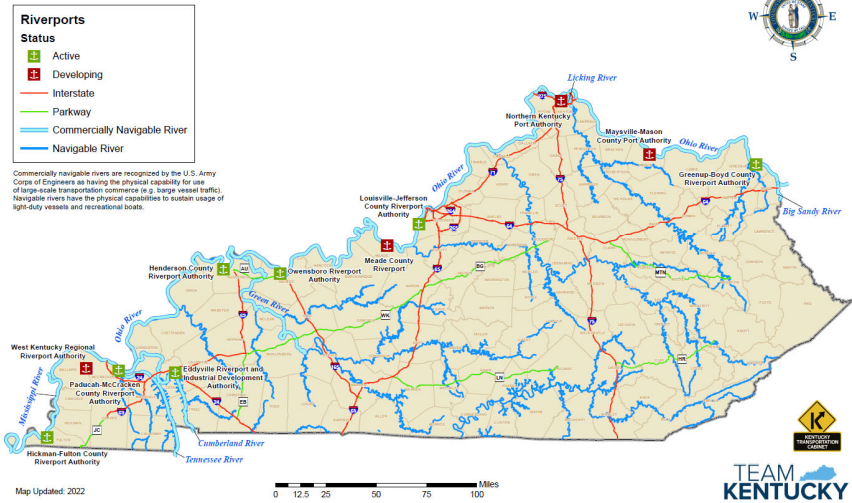
- 80,000 centerline miles of public roads, 28,000 miles maintained by KYTC.
- 14,000 bridges, including 9,000 state maintained.
- 776 miles designated to the National Highway Freight Network (NHFN):
  - **Primary Highway Freight System (PHFS):** Most of the national Interstate System
  - **Other Interstate Highways:** Segments not included in the PHFS.
  - **Critical Urban and Rural Freight Corridors (CUFC/CRFC):** 75 miles of CUFCs and 150 miles of CRFCs.



# Inland Waterway Network and Riverports

- Ohio River, Mississippi River, Big Sandy River, and Tug Fork border the commonwealth of Kentucky.
- 11 public riverports (7 operating and 4 developing) and over 150 riverport terminals.

## KENTUCKY RIVERPORTS

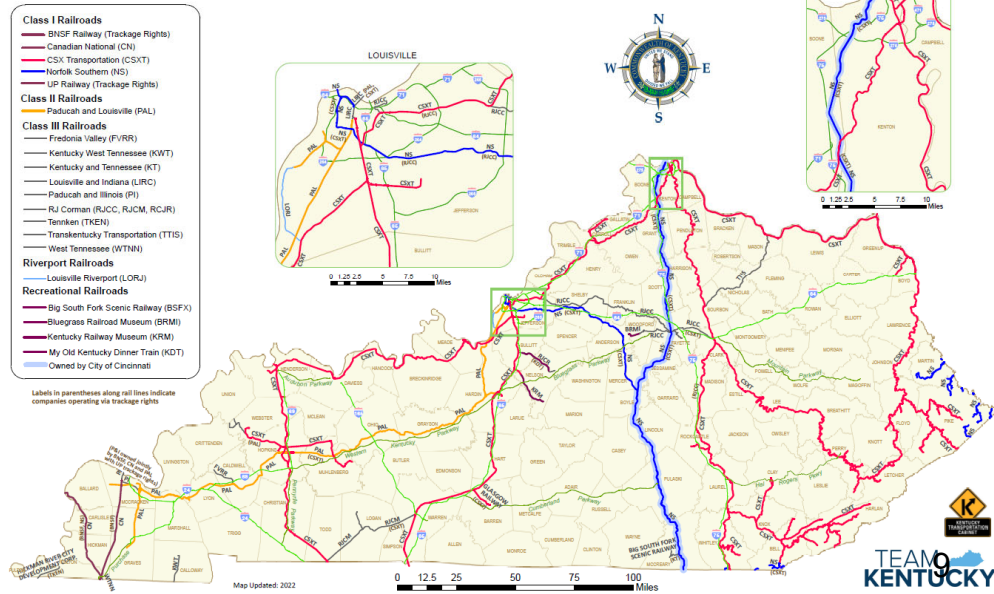




# Rail Network

- 2,583 miles operated:
  - 2,057 miles of **Class I** railroads (BNSF, CN, CSXT, NS, UP).
  - 280 miles of **Class II** railroads (PAL).
  - 246 miles of **Class III** railroads.

## KENTUCKY ACTIVE RAIL LINES



# Pipelines

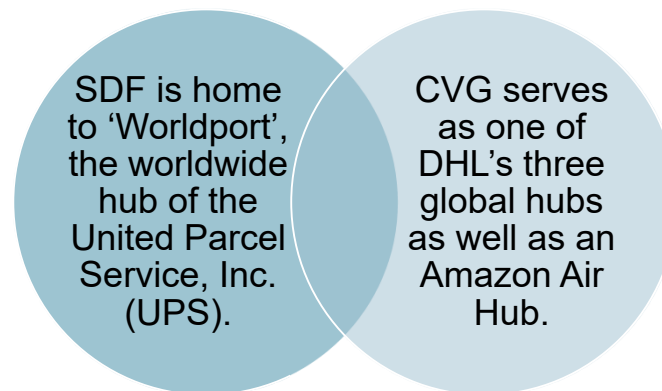
There are approximately 41,000 miles of pipelines moving natural gas, crude oil, refined petroleum products, and highly volatile liquids, flammable liquids, and toxic liquids through the State.

Commodity	Pipeline Miles
Natural Gas	39,846
Crude Oil	602
Refined Petroleum Products*	91
Highly Volatile Liquids, Flammable Liquids, and Toxic Liquids	273
<b>Total Pipeline Miles</b>	<b>40,812</b>

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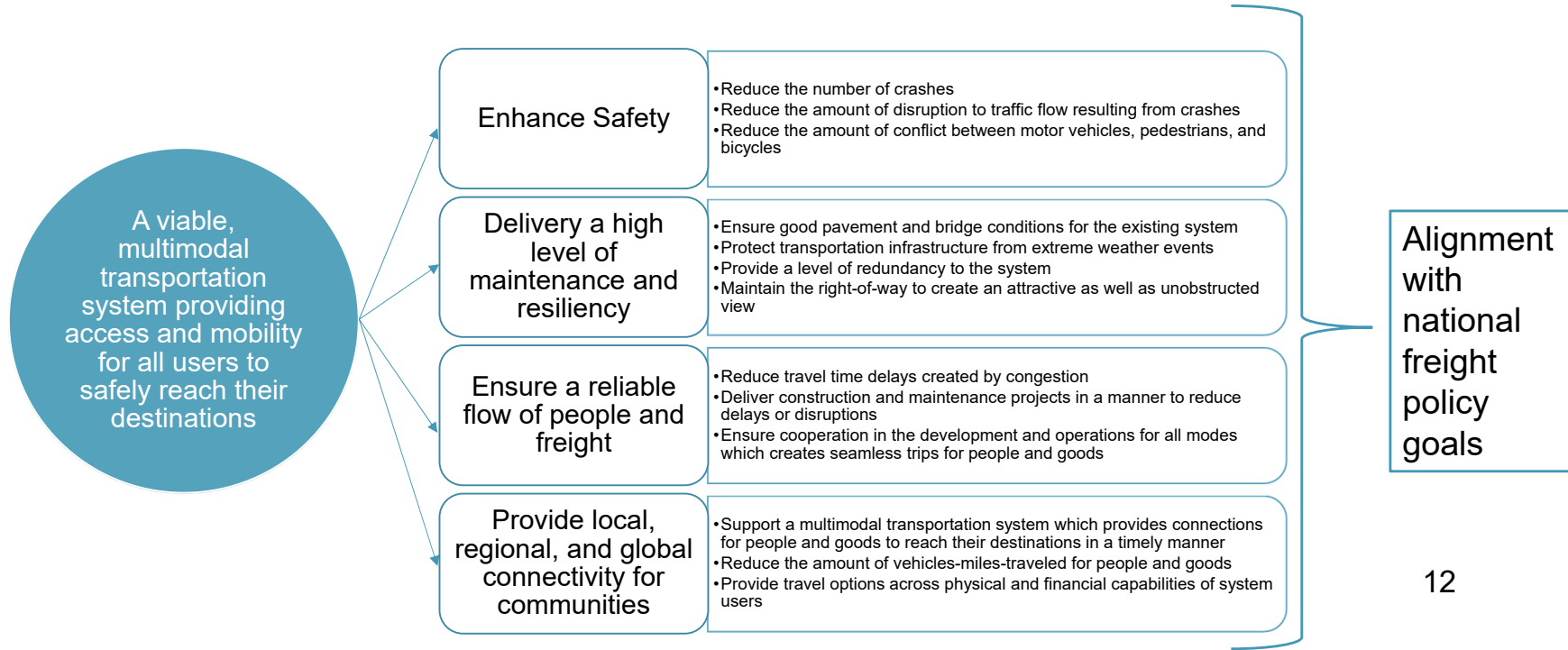
## Air Cargo

- Louisville International Airport (SDF) and Cincinnati/Northern Kentucky International Airport (CVG):
  - Kentucky's primary air cargo handling airports.
  - Handled over 4.2 million tons of total air cargo in 2020, a 5.82% annual increase since 2016.
  - Ranked in the top 10 in North America and top 25 in the world in terms of total air cargo tonnage in 2020.



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# 2045 (DRAFT) LRSTP Goals



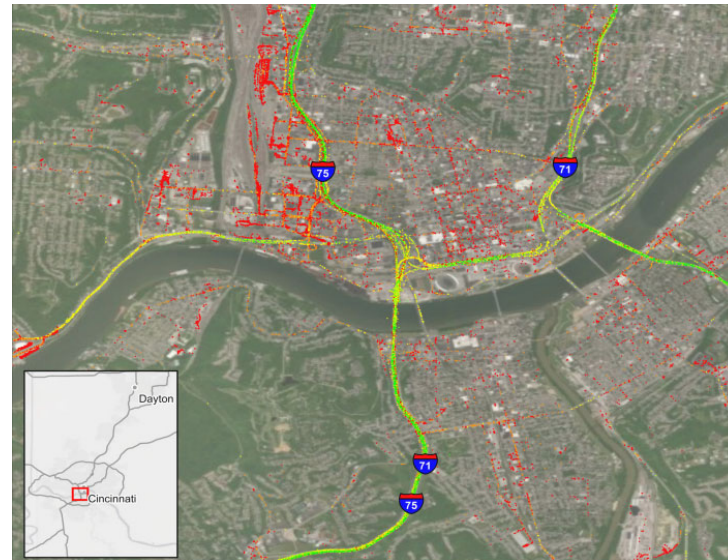
# Proposed Measures

LRSTP/KFP Goal	Performance Measures
<b>Enhance Safety</b>	<ul style="list-style-type: none"> <li>Commercial vehicle crash rate</li> <li>Grade crossing crash/incident rate</li> </ul>
<b>Delivery a high-level of maintenance and resiliency</b>	<ul style="list-style-type: none"> <li>Percent of structurally deficient bridges on freight network</li> <li>Percent of freight network meeting pavement condition targets</li> <li>Number of weight-restricted bridges on the freight network</li> <li>Number of vertical restrictions on the freight network</li> <li>Congestion of the freight network (level of service or volume/capacity)</li> <li>Reliability (buffer index/planning index)</li> <li>Pavement and bridge ratings on intermodal connectors and roads leading to major energy/manufacturing centers</li> </ul>
<b>Ensure a reliable flow of people and freight</b>	<ul style="list-style-type: none"> <li>Congestion on intermodal connectors and road leading to major energy/manufacturing centers</li> <li>Reliability on intermodal connectors</li> </ul>
<b>Provide local, regional, and global connectivity for communities</b>	<ul style="list-style-type: none"> <li>MPO air quality ratings</li> <li>Last mile Level of Service ratings</li> <li>Bottlenecks (delay)</li> <li>Bottlenecks (reliability)</li> </ul>

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## Current Conditions: Highways

- Congestion and Bottlenecks
  - I-71 and I-75 Interchange in Cincinnati (less than a mile north of the Kentucky and Ohio state line) ranked as the **2<sup>nd</sup> worst freight bottleneck in the U.S.** in 2022.
- Top Truck Speed Bottlenecks (NPMRDS)
  - Update underway

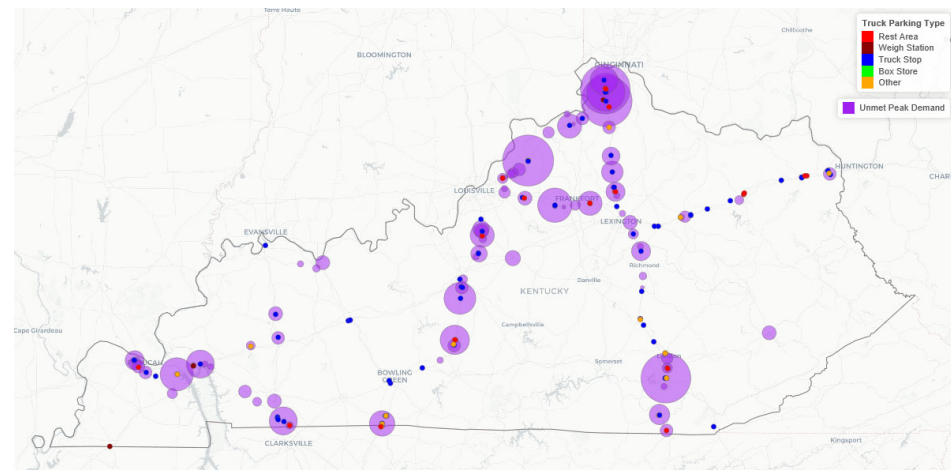


I-71 and I-75 Interchange (Cincinnati)  
Source: ATRI Freight Bottlenecks

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## Highways: Truck Parking

- Every weekday night, there are approximately **9,000 trucks parked** in Kentucky for **more than 4 hours**.
- There are **7,196 truck parking spots** in Kentucky.
- The busiest night for truck parking is **Wednesday**.
- **82 percent** of truck parking spots are provided by private sector truck stops.
- **18 percent** of parking by KYTC is located at rest areas and weigh stations.



Unmet Peak Demand by Interchange

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# Highways

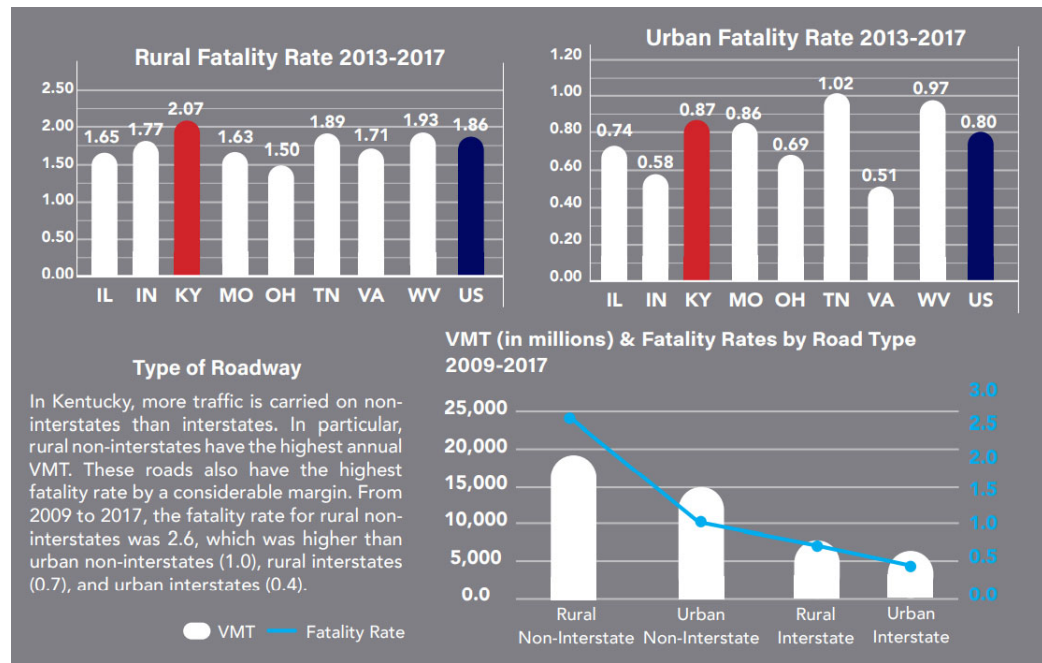
- Pavement Conditions
  - All road classifications have a statewide maintenance score of **81.4** and a grade of **B** according to the 2020 Maintenance Rating Program (MRP) Report.
- Bridge Conditions
  - The number of state-maintained bridges in poor condition decreased from **657** in **2010** to **535** in **2021** according to the National Bridge Inventory (NBI). (currently being updated)



# Highways

- Highway Safety

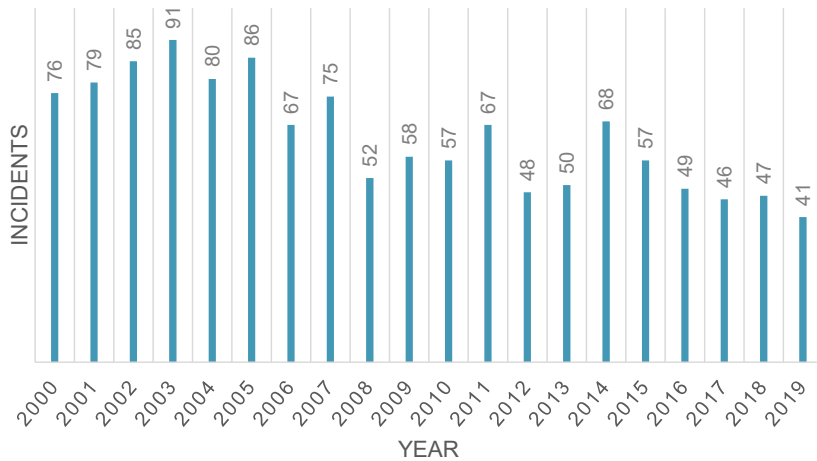
- High ranking for fatality rate per hundred million vehicle miles traveled (VMT) as compared to adjacent states and the U.S.
- 12<sup>th</sup> worst rural fatality rate in the U.S.** and worst among all bordering states



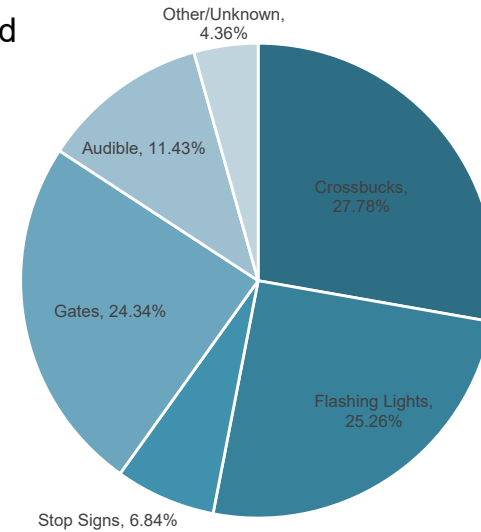
KYTC Strategic Highway Safety Plan (SHSP) 2020-2024

# Freight Rail

- 4,311 highway-rail at-grade crossings
- Kentucky ranked 27<sup>th</sup> and 28<sup>th</sup> in the U.S. respectively for injuries and fatalities at highway-rail grade crossing facilities in 2021.



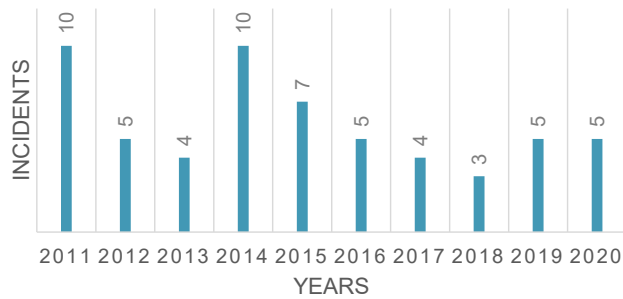
Kentucky Highway-Rail Grade Crossings Crashes (2000-2019). Source: FRA 2021



Highway-Rail Grade Crossings Accidents by Warning Device. Source: FRA 2021

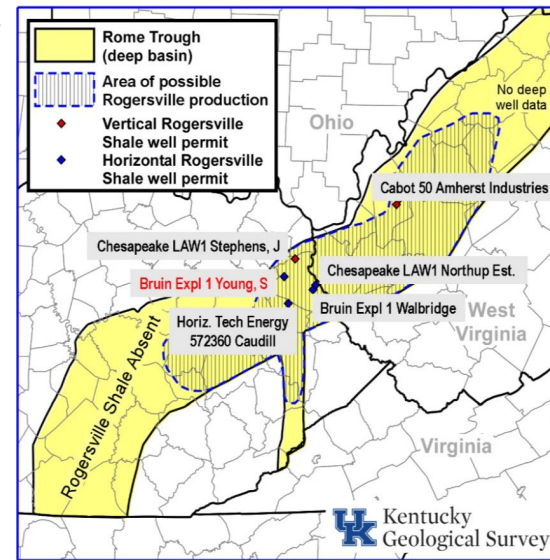
# Pipeline

- **Two oil refineries** with a combined operating capacity of 291,000 barrels per calendar day in 2020, according to the EIA.
- Home to the **Big Sandy field**, largest natural gas field in the Appalachian Basin.
- Rogersville Shale: potential energy source of oil and gas
  - January 2019: shale tested well on its Kentucky part.
  - January 2020: launch of new \$7.4 million study for the shale's potential.



Kentucky Pipeline Incidents (2011-2020)

Source: PHMSA 2021



Rogersville Shale

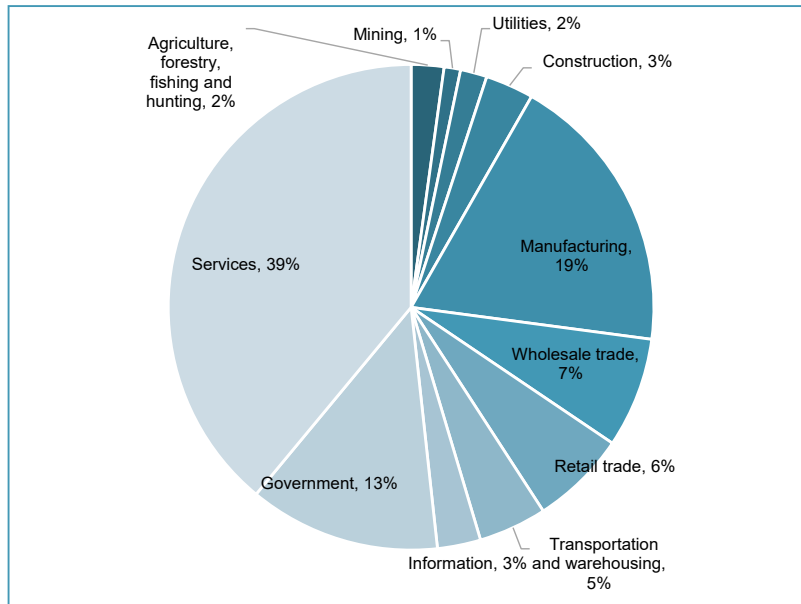
## Air Cargo

- Louisville International Airport (SDF) & Cincinnati/Northern Kentucky International Airport (CVG)

Airport	Number of Runways	Longest Runway Length (feet)	2016 Total Cargo Tonnage	2020 Total Cargo Tonnage	2016-2020 CAGR	North American Rank 2020	Global Rank 2020
<b>SDF</b>	3	11,887	2,437,010	2,917,243	3.66%	3 <sup>rd</sup>	5 <sup>th</sup>
<b>CVG</b>	4	12,000	742,256	1,300,758	11.87%	7 <sup>th</sup>	21 <sup>st</sup>

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## Key Industries and Supply Chain



Industry Share of the Kentucky Economy by GDP

Source: BEA 2020

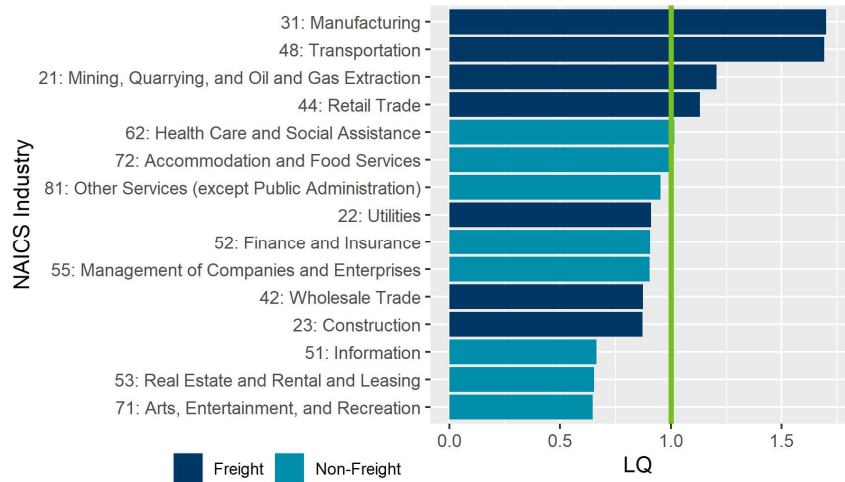
- Coal is one of the top commodities transported by weight, but mining only accounts for 1 percent of the total economic activity (in terms of GDP).
- According to FAF, coal's share of freight tonnage moved in Kentucky decreased for **32 percent** in **2007** to **8.7 percent** in **2020**.

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# Transportation Framework for Supply Chain Decisions

The Location Quotient (LQ) approach measures the importance of each freight-related industry to the state's economy by evaluating the degree of specialization of that specific industry compared to the national degree of specialization.

$$LQ = \frac{\frac{\text{Industry Emp. in KY}}{\text{Total Emp. in KY}}}{\frac{\text{Industry Emp. in US}}{\text{Total Emp. in US}}}$$



## Kentucky Freight Corridors

Kentucky's international exports have grown from just over **\$19 billion** in **2010** to nearly **\$25 billion** in **2020**.

Ranked by Weight	Kilotons
1 Mixed freight	849.75
2 Plastics/rubber	554.27
3 Base metals	341.73
4 Coal	273.87
5 Motorized vehicles	263.94
6 Wood prods.	253.46
7 Chemical prods.	190.90
8 Alcoholic beverages	180.45
9 Waste/scrap	164.83

Top Kentucky International Exports by Weight

Source: FHWA FAF 2020

Ranked by Value (2017 Dollars)	Millions \$
1 Machinery	\$8,651.95
2 Motorized vehicles	\$2,540.10
3 Electronics	\$2,456.52
4 Pharmaceuticals	\$1,953.88
5 Plastics/rubber	\$1,857.80
6 Base metals	\$1,134.62
7 Chemical prods.	\$1,100.18
8 Articles-base metal	\$861.48
9 Precision instruments	\$857.57

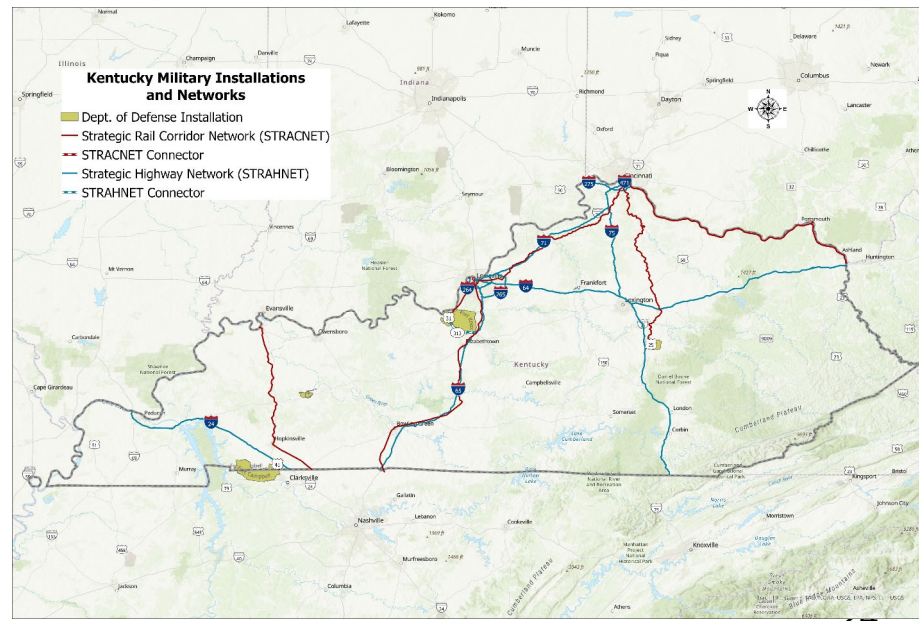
Top Kentucky International Exports by Value

Source: FHWA FAF 2020

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# Kentucky Military Freight

- **Fort Campbell**
  - Highest concentration of U.S. Army rotary-winged aircraft.
  - Fifth largest concentration of soldiers in the U.S., approximately 30,000.
- **Fort Knox**
  - Home to combat, logistics, combat-support, operations, and administrative Army units.
- Other key installations including the **Blue Grass Army Depot** and the **Wendell H. Ford Regional Training Center** (Kentucky National Guard).
- Numerous Army and Air Guard units for the Kentucky National Guard including the **123<sup>rd</sup> Airlift Wing** based in Louisville.





## Internal Trends and Challenges



### Energy

- **Decline in eastern Kentucky coal production**, even with 69% of electricity produced in Kentucky being coal-generated in 2020.
- **Two of the largest coal-fired power plant retirements** in the U.S. took place in Kentucky in 2020.
- In 2020, 69% of Kentucky's coal was exported out of state, and 30% stayed in state.
- In 2020, coal was:
  - 2<sup>nd</sup> ranked commodity transported from and 3<sup>rd</sup> ranked commodity transported within and to Kentucky by tons.
  - Outside the top 10 commodities by value of shipment to, from, and within Kentucky.



### Agriculture

- 2<sup>nd</sup> ranked state in the production of tobacco.
- **Cereal** forms most shipments by tonnage transported from, to, and within Kentucky.

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# Internal Trends and Challenges



## Automotive

- **Top ranking producer state** of cars, light trucks, and SUVs (per capita).
- 520 automotive-related companies and over 490 parts suppliers.
- **\$4.8 billion of automotive-related exports** in 2019.
- 7.8% of Kentucky GDP.
- In 2020:
  - 5<sup>th</sup> ranked commodity transported to and from and 9<sup>th</sup> ranked transported within Kentucky by tons.
  - **Top ranking commodity** transported from and within and 3<sup>rd</sup> ranked transported to Kentucky by value.



Two assembly plants in Louisville: Kentucky Truck Plant (KTP) and Louisville Assembly Plant (LAP)  
 Ford announced in October 2021 the largest electric battery plant in the U.S. to be built in Hardin County next to I-65



Toyota Motor Manufacturing Kentucky (TMMK): company's largest vehicle manufacturing plant in the world



Exclusive production home of Chevrolet's high-performance Corvette since 1981 in Bowling Green

## External Trends and Challenges



### Panama Canal

- 70% of all cargo that passes through the Panama Canal either originated from, or is headed towards the U.S.
- Long-term effects on Kentucky freight flows



### Near-shoring

- U.S. businesses are opting to return manufacturing processes to North America from overseas in response to reduced cost advantages of manufacturing in low-cost countries as well as changes in supply chains.



### New Technology

- Dedicated freight infrastructure
- E-commerce and drone delivery
- Automated/connected vehicles

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## Operational Strategies, Conditions, and Technologies

- Classification Counts: weigh-in-motion (WIM) data from 25-30 sites statewide
- Overweight / Over-Dimensional Surveys
- Notify Every Truck (NET) System
- Traffic Operations/Management Centers:
  - Statewide Traffic Operations Center
  - Cumberland Gap Tunnel Authority
  - Lexington Traffic Management Center
  - Ohio Traffic Operations Center
- Truck Parking Information Management System (TPIMS) covering 725 truck parking spaces

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# Strengths and Weaknesses

	Strengths	Weaknesses
<b>Business Climate</b>	<ul style="list-style-type: none"> <li>Major player in the auto industry with four assembly plants</li> <li>Home to three major air cargo hubs</li> </ul>	<ul style="list-style-type: none"> <li>Declining position as an energy exporter</li> </ul>
<b>Connectivity</b>	<ul style="list-style-type: none"> <li>Significant and growing interstate and parkway access</li> <li>Good connection by water and rail</li> </ul>	<ul style="list-style-type: none"> <li>Antiquated locks and dams on the inland waterway system</li> <li>Incomplete sections of I-69 to the south of KY</li> </ul>
<b>Funding</b>	<ul style="list-style-type: none"> <li>Variable-rate fuel tax</li> <li>Funding through IIJA for grade crossings safety projects</li> </ul>	<ul style="list-style-type: none"> <li>Heavy reliance on the fuel tax</li> </ul>
<b>Location</b>	<ul style="list-style-type: none"> <li>Strategic location at the center of a 34-state distribution area</li> <li>Attractive location for air cargo hubs due to its generally temperate weather and short travel times</li> <li>Hub of the nation's inland waterways</li> </ul>	<ul style="list-style-type: none"> <li>Mountainous terrain</li> <li>Areas prone to flooding</li> <li>Air quality issues</li> </ul>
<b>System Capacity</b>	<ul style="list-style-type: none"> <li>Well-connected system for handling highway freight traffic</li> <li>Significant rail infrastructure</li> <li>Maritime access</li> <li>Five commercial airports</li> </ul>	<ul style="list-style-type: none"> <li>Several inactive short line railroads</li> <li>Challenge to maintain capacity as significant freight growth takes place in KY</li> </ul>
<b>System Operation/Condition</b>	<ul style="list-style-type: none"> <li>Ranked 7th for best roads in the U.S.</li> <li>KYTC surpassed the target for pavement condition</li> </ul>	<ul style="list-style-type: none"> <li>Pavement condition of rural secondary roads</li> <li>Pavements conditions have been trending downward</li> <li>Increasing number of structurally deficient bridges</li> </ul>

## Future Needs

Initiate a program to impact Kentucky's ability to compete in the regional, national, and global marketplace

Support and work with private rail carriers to provide a safe, reliable, efficient, and effective rail transportation system

Prepare western Kentucky for the ever-changing flow of freight, including developing coordinated plans of action and improvements to ports, railroads, and interstate highways

Improve the commercial vehicle crash rates with serious injury on Kentucky interstates and U.S. highways that have a KAB of greater than 25 percent

Improve key highway bottlenecks

Build resiliency and redundancy to maintain safe operational capabilities related to extreme weather events or earthquakes

Understanding future supply chain needs is crucial to making optimal investments in future freight infrastructure

Improve the capacity and operations of the rural freight system

Continue working with the FAA to lengthen additional GA airport runways to 5,000 linear feet.

Seek opportunities to incorporate Intelligent Transportation Systems (ITS), Information Technology (IT), and other new technologies into freight transportation planning and freight projects

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## Program-Level Recommendations

Focused investment in the Kentucky Freight Network

Implement recommendations outlined in the Truck Parking Plan, Aviation Plan, Riverport Study and State Rail Plan

Continued focus on freight performance measures

Maintain roadways that support the air cargo, advanced manufacturing, agriculture, and energy industries

Continued work to integrate freight stakeholders in the state and MPO planning processes

Continued partnership with MAFC and regional initiatives like TPIMS

Collaborate with KCED, EDCs, ADDs and MPOs to ensure transportation supports economic development strategies

Update freight modal and system plans on a regular basis

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# Policy-Level Recommendations

## Provide local, regional, and global connectivity for communities

- Partner with local governments and private partners to proactively manage the condition of intermodal connectors and connectivity points
- Develop a program to educate local officials on the importance of intermodal connectors and work with local officials to mitigate negative impacts of the projected increase in truck traffic volumes
- Identify and close any first or last mile gaps near major manufacturing hubs and multimodal connectivity points
- Support the use of CMAQ funds towards freight-related transportation projects that reduce emissions.



## Policy-Level Recommendations

### Ensure a reliable flow of people and freight

- Work with KSP to develop alternative route plans for major incidents/unplanned closures
- Work to identify and improve highway connectivity with other modes
- Improve and expand Intelligent Transportation Systems (ITS) technology along key corridors to increase efficiency and reliability
- Actively work to reduce the impact and address freight bottlenecks.
- Proactively protect KYTC assets from potential freight-related incidents; identify potential barriers restricting freight movements, plan work zones, and detours to handle freight vehicles, etc.

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# Policy-Level Recommendations

## Deliver a high level of maintenance and resiliency

- Corridor-level investment needed in facilities that show high truck volumes and declining pavement/bridge quality.
- Further evaluate multimodal freight corridors for the redundancy and resiliency.
- Mitigate freight flow disruptions along key freight corridors (especially those with resiliency/redundancy issues) by close attention to bridge inspection reports.
- Work with railroads (through the development of the Kentucky Rail Plan) to identify issues on their network(s).
- Implement recommendations of the Riverport Study that pertain to riverport maintenance and overall resiliency of the maritime system.
- Continue to work with the riverports to identify opportunities and solve unique riverport infrastructure challenges around Kentucky

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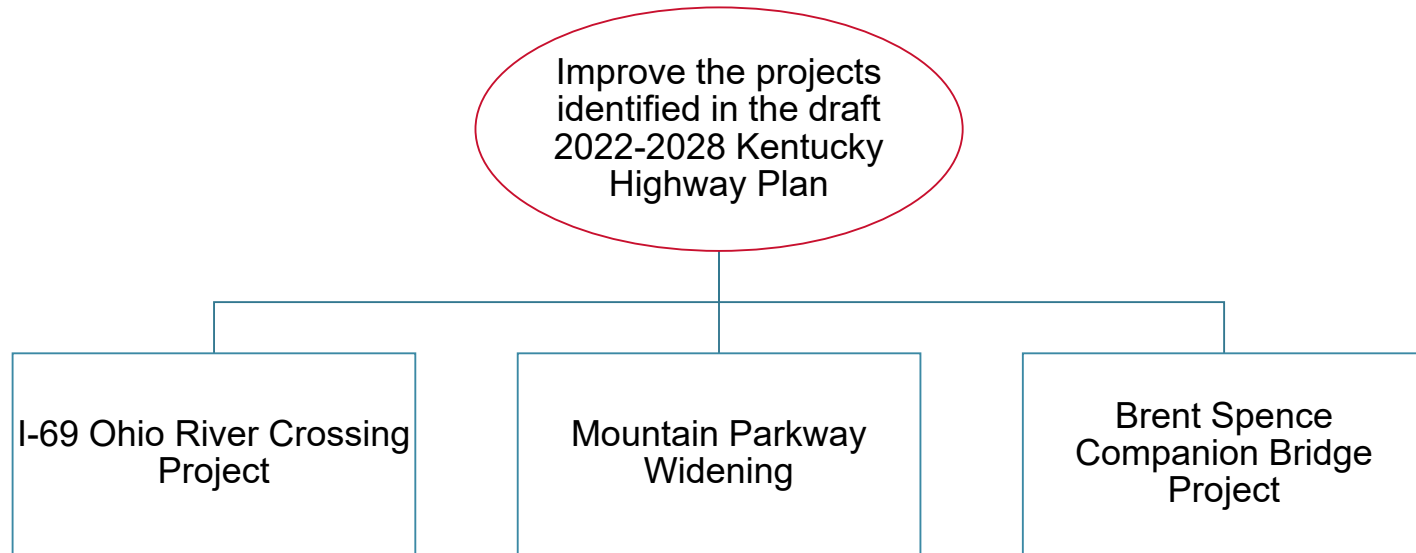
# Policy-Level Recommendations

## Enhance Safety

- Work with legislators and the railroads to expand grade crossing funding opportunities
- Partner with the Kentucky State Police to address safety – specifically truck parking and overweight truck enforcement
- Expand the MAASTO TPIMS initiative in Kentucky
- Implement recommendations from the Truck Parking Needs Assessment and Action Plan to reduce truck parking on highway ramps.
- Encourage increased truck safety analysis in the next KYTC Strategic Highway Safety Plan

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# Project-Level Recommendations



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# Funding Programs for Freight-Related Projects

- Limitations of state gas tax revenue
- Highlighted Programs:
  - Surface Transportation Block Grant Program
  - National Highway Freight Program
  - Highway Safety Improvement Program
  - National Highway Performance Program
  - Congestion Mitigation and Air Quality Improvement Program
  - INFRA and RAISE Programs



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# Freight Investment Plan

- Focused solely on National Highway Freight Program
  - Approximately \$25 million/year
- Program allocations remain the same through FFY 2030
- Fiscal Constraint – Temporal Complications
- Based on current draft Kentucky Highway Plan
  - Pending approval
- For Discussion – Round Numbers
  - Does not include federal match calculations

	2023	2024	2025	2026	2027	2028	2029	2030
<b>Brent Spence Companion Bridge</b>	\$25m	\$25m	\$25m	\$20m	\$10m		\$TBD	\$TBD
<b>I-69 Ohio River Bridge</b>				\$5m	\$15m	\$25m	\$TBD	\$TBD

## Next Steps

- Finalize Plan and Freight Investment Plan
- IIJA Compliance Check
  - Most new requirements were covered
  - Take a closer look at the resiliency/environmental freight mobility impact of:
    - Extreme weather and natural disasters
    - Local air pollution
    - Flooding and stormwater runoff
    - Wildlife habitat loss

# Questions?

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