Regional Freight and Land Use Policies, Constraints, and Opportunities

Kansas City Regional Freight Study

CONNECTED FREIGHT KC 2050

A Plan in Action

Prepared for:

Mid-America Regional Council

In coordination with

Lawrence-Douglas County Metropolitan Planning Organization

And

Pioneer Trails Regional Planning Commission

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Acronyms and Abbreviations

AADT	Annual Average Daily Traffic
ADTT	Average Daily Truck Traffic
APWA	American Public Works Association
BNSF	Burlington Northern Santa Fe Railroad
COG	Coucil of Governments
FAC	Freight Activity Center
FedEx	Federal Express
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
GIS	Geographic Information System
GMC	Goods Movement Committee
KCI	Kansas City International Airpot
KCS	Kansas City Southern Railroad
KDOT	Kansas Department of Transportation
LDCMPO	Lawrence-Douglas County Metropolitan Planning Organization
LPKC	Logistics Park Kansas City
MARC	Mid-America Regional Concil
MoDOT	Missouri Department of Transportation
MPO	Metropolitan Planning Organization
PDF	Portable Document Format
PTRPC	Pioneer Trails Regional Planning Commission
RPO	Regional Planning Organization
STBG	Surface Transportation Block Grant
UPS	United Parcel Service
USPS	United States Postal Service

1. Introduction

The Mid-America Regional Council (MARC), in coordination with the Lawrence-Douglas County Metropolitan Planning Organization (LDCMPO) in Kansas and Pioneer Trails Regional Planning Commission (PTRPC) in Missouri, is developing a regional freight plan, Connected Freight KC 2050: A Plan in Action. The study region for this freight plan encompasses fourteen counties in Kansas and Missouri – MARC's nine counties, LDCMPO's one county, and PTRPC's four counties, as shown in **Figure 1**.

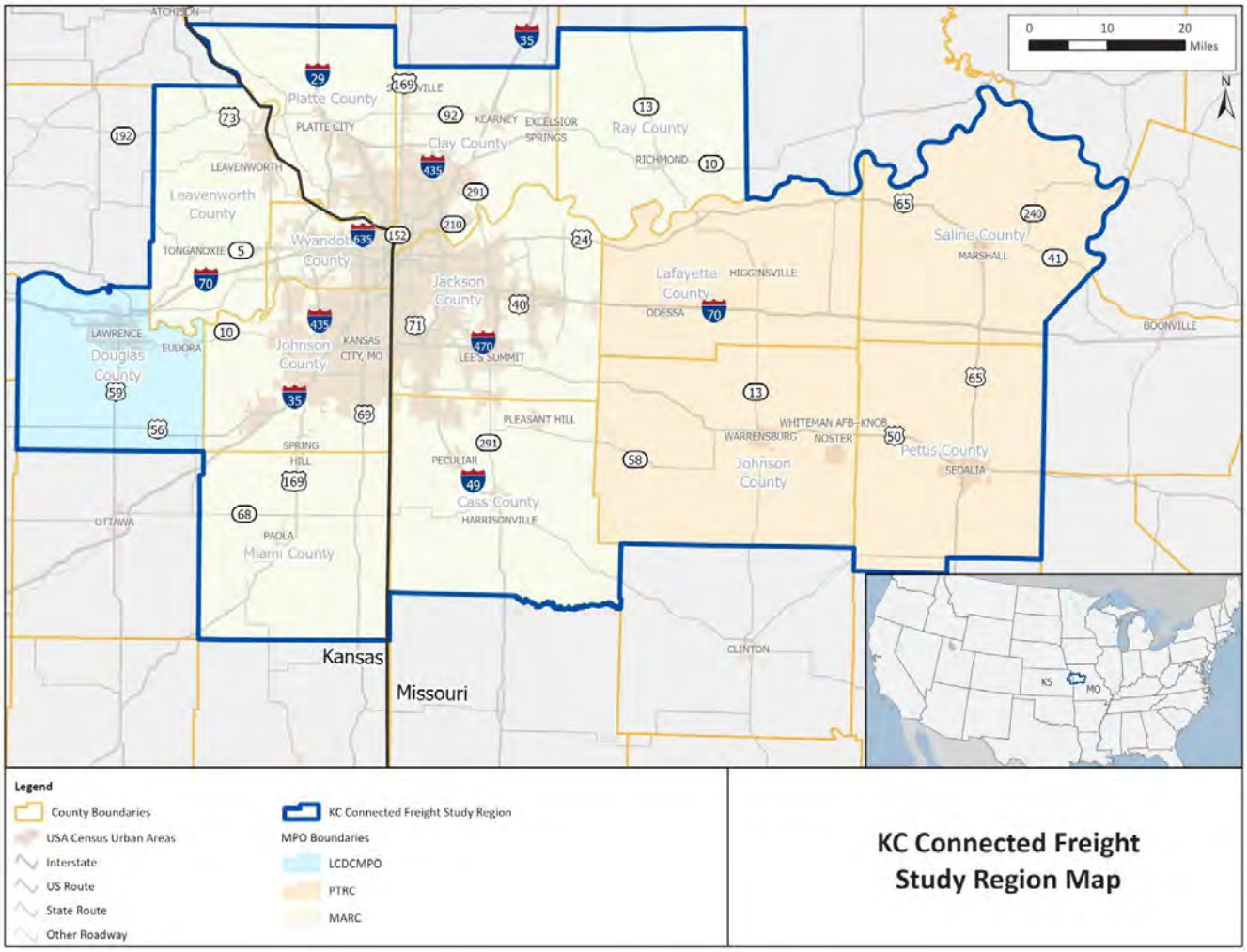

Figure 1. Study Region Map

This document provides an overview of the Kansas City regional land use and policy context that regulates and will direct freight development to specific areas of the region. Special emphasis is given to accommodating and expanding freight activity centers (FAC) in areas with favorable commercial or industrial zoning designations. This document also explores the potential impacts that expansion in regional freight investments may have on future land use planning,

community character, the environment, workforce development, and quality of life. National and local FAC definitions were reviewed and documented in concert with a local land use policy review to develop a regional FAC identification methodology. The FAC identification methodology was employed to determine essential infrastructure needs and key focus areas for regional local governments. This approach aims to ensure that appropriate land use regulations and infrastructure investments are made, facilitating the favorable accommodation of expanding existing FACs or attracting new regionally significant freight investments.

2. Freight Land Use and Development Policies from Local General Plans

To identify land use policy opportunities and constraints associated with expanding existing FACs or developing new ones, a literature review of regional transportation plans, county, and local land use plans is documented in **Table 1**, **Table 2**, and **Table 3**. All county general/comprehensive plans available online were reviewed. Considering the large number of incorporated communities within the Kansas City region, only incorporated communities with populations greater than 100,000 with general/comprehensive plans available online were reviewed and synthesized in **Table 1**. Documentation of policies from these plans is intended to serve as a baseline for identifying key policies local governments in the Kansas City region should consider when expecting freight in areas with commercial and industrial land use designations and zoning. Land use policies for Kansas City, MO were not described in the land use analysis due to its generalized format, which did not allow for explicit extraction of data compared to other cities with populations over 100,000.

In addition to identifying land use policies relative to freight from Kansas City region incorporated community general/comprehensive plans with a population of greater than 100,000, **Table 2** synthesizes and documents all land use policies for each Kansas county in the Connected Freight KC 2050 study area**.** Documentation of policy focus areas in these plans is intended to serve as a baseline for identifying key considerations local governments in the Kansas City region should consider when expecting freight in areas with commercial and industrial land use designations and zoning.

In addition to identifying land use policies relative to freight from Kansas City region general/comprehensive plans for incorporated communities with a population greater than 100,000 and all Kansas counties in the Connected Freight KC 2050 study area, **Table 3** synthesizes and documents all freight-related land use policies for each Missouri county in the study area**.** Documentation of policy focus areas from these plans is intended to serve as a baseline for identifying key elements local governments in the Kansas City region should

consider when expecting freight in areas with commercial and industrial land use designations and zoning.

Table 1. Incorporated Communities with a Population Greater than 100,000 Land Use Policies Relative to Freight

Policy Focus	Overland Park, KS[1]	Kansas City, KS[2]	Olathe, KS[3]	Independence, MO[4]	Lee's Summit, MO[5]
Locate industrial development along strategic investment corridors and along key nodes.	x	x	x	x	x
Promote the retention and expansion of existing, and attraction of new industrial development opportunities in suitable locations.	x	x	x	x	x
Encourage mitigation of negative impacts to residential areas located near industrial areas through adequate buffering, appropriate lighting, and attractively designed sites.	x		x	x	x
Encourage protecting and preserving existing open space and park land to meet the community's needs.	x	x	x	x	x
Promote infill development, where appropriate, to support more compact urban form and avoid needless costly sprawl.	x	x	x	x	x
Promote redevelopment that maximizes existing infrastructure.	x	x	x	x	x
Industrial uses should have access to arterials, highways, or interstates within 1/8 mile. May have internal driveways. Access does not go through adjacent residential areas and buffers are typically present within residential areas.					x
Development patterns should be planned with consideration of the alignment and location of existing and future public facilities and infrastructure.	x	x	x	x	x
Industrial uses must have full infrastructure availability and sewer connections are required.					x
Focus on providing development ready sites to attract businesses and jobs.				x	
Encourage programs and incentives that promote the compatible, adaptive reuse and sustainable modernization of vacant or deteriorating properties.					x
Explore funding options for the acquisition and assemblage of property in potential development areas.				x	

Policy Focus	Overland Park, KS[1]	Kansas City, KS[2]	Olathe, KS[3]	Independence, MO[4]	Lee's Summit, MO[5]
Promote compact, contiguous development to ensure the efficient use of land and to enhance opportunities for alternatives to commuting by car.				x	
Consider defining and enhancing city gateways and focal points to create a sense of place.				x	
Design infill and redevelopment to avoid negative impacts and ensure compatibility and appropriate transitions between land uses.	x	x	x	x	x
Prioritize pedestrians in new development.	x	x	x	x	x
Utilize the design review process for private development and public improvements to improve bicycle and pedestrian linkages to and between employment centers, recreational and open space, and educational facilities.	x	x	x	x	x
Support preservation and reclamation of streamway and greenway corridors.			x		x
Encourage preservation of right-of-way or easements to protect trail networks and connections between public lands.	x		x	x	x
Consider the desired context and character of existing neighborhoods and industrial centers.	x	x	x	x	x
Minimize adverse impacts on valued natural resources and wildlife habitats.	x	x	x	x	x
Preserve what remains of rural resources by incentivizing preservation and discouraging development of higher intensity uses on prime agricultural land.					x
Develop new or amended ordinances to further restrict development in the Federal Emergency Management Agency (FEMA) regulatory floodplain (e.g., freeboard higher than FEMA minimum requirement; manage future condition projections; cluster development; offer density bonuses; and transfer of development rights).					x
Increase the riparian buffer required along waterways for new development.					x
Explore enhancing the American Public Works Association (APWA) 5600 peak discharge criteria to improve flood peak attenuation for new developments.					x

Policy Focus	Overland Park, KS[1]	Kansas City, KS[2]	Olathe, KS[3]	Independence, MO[4]	Lee's Summit, MO[5]
Adopt climate change action to reduce risks to vulnerable populations such as planting more vegetation in areas that experience urban heat island effects.					x
Include vulnerable population representation in all existing plans and in future planning efforts.					x
Identify and protect buildings, districts, and sites of historical, architectural, archaeological, or cultural significance.	x	x	x	x	x
Developments should incorporate placemaking strategies.	x				
Make buildings and development sites safer and healthier by design.	x	x	x	x	x
Encourage pedestrian, bicycle, and transit connections to and within commercial and industrial centers.	x	x	x	x	x
Minimize truck traffic on local streets outside industrial areas.			x		
Encourage development of buffered commercial and industrial uses within walking distance of residences.	x	x	x	x	x
Promote higher densities and mixed uses in the center of town, commercial and industrial centers, employment centers; and a variety of densities in fringe areas.	x	x	x	x	x
Support redevelopment of commercial and industrial areas to support expansion of business, and the promotion of a variety of uses, services, and densities.	x	x	x	x	x
Respect unique community and neighborhood identities, settings, and histories.	x	x	x	x	x
Protect industry from encroachment by residential development and ensure neighborhoods will not be undermined by the impact of incremental expansion of business into residential areas.	x	x	x	x	x
Design streets that increase safety, walkability, and bikeability that consider the surrounding land use context.	x	x	x	x	x
Land use development and/or redevelopment decisions should consider the effects of off-site regional traffic impacts and those land use assumptions of adjoining jurisdictions.			x		x
Evaluate net benefits and costs of new or redevelopment projects in terms of traffic impacts, accessibility to daily services, walkability, noise, lighting, and density.			x		x
Preserve the rural character of the community by not overbuilding streets.	x				

Policy Focus	Overland Park, KS[1]	Kansas City, KS[2]	Olathe, KS[3]	Independence, MO[4]	Lee's Summit, MO[5]
Promote use of streetscape and tree canopy improvements to provide a pleasant pedestrian experience.	x				
Enhance internal walkability in industrial and commercially zoned areas.	x				
Prioritize transit-accessible mixed-use development surrounding transit nodes.	x				
Support resilient, ecologically healthy development that balances growth and the natural environment.	x	x	x	x	x
Promote citywide and regional sustainability efforts through collaboration, education, and incentives.	x				
Cooperate with the private sector to foster the revitalization of existing commercial and industrial areas to greater vitality.			x		
Improve communications with railroad companies to coordinate compatibility between the rail system and the city's land use and transportation system.			x		
Create partnerships with adjacent cities and counties to share fiscal resources and responsibilities to implement common plans.	x	x	x	x	x
Provide strategic technical assistance and information for commercial, industrial, and retail rehabilitation.					x
Improve and expand airport services, equipment, and facilities when necessary to attract new corporate aviation users.					x
Leverage the development potential of land on and adjacent to Lee's Summit Municipal Airport.					x
Participate in shared regional data and administrative systems to promote real estate development and reinvestment activity.					x
Support development and redevelopment with major infrastructure improvements and upgrades.	x	x	x	x	x
Develop flexible curbside policies to support local business with pick-up and drop-off needs.					x
Review and as needed, refine other city policies that govern transportation and its relationship to land use.	x	x	x	x	x
Continue to consistently incorporate the Thoroughfare Master Plan in consideration of development, transportation improvement needs, future right-of-way requirements and the overall project approval process.					x

Policy Focus	Overland Park, KS[1]	Kansas City, KS[2]	Olathe, KS[3]	Independence, MO[4]	Lee's Summit, MO[5]
Develop urban freight policies that combine deliveries to reduce the number of freight trips while increasing efficiency and safety.					x
Adjust parking requirements as new transportation technologies such as micromobility and autonomous vehicles change the demand for driving and parking.					x
Industrial recommended building types are concrete, masonry, and tilt-up.					x

Sources:
[1] Framework OP Comprehensive Plan. 2024 Available: https://www.opkansas.org/city-services/planning-development/long-range-planning/comprehensive-plan/. Accessed December 27, 2024.
[2] Plan KCK Citywide Comprehensive Plan. 2024 Available: https://www.wycokck.org/files/assets/public/v/1/planning-amp-urban-design/documents/comprehensive-plan/plankck_final_05272024.pdf. Accessed December 27, 2024.
[3] Olathe 2040 Future Ready Strategic Plan. 2024 Available: https://www.olatheks.gov/home/showpublisheddocument/15490/637171197877170000. Accessed December 27, 2024.
[4] Imagine Independence Comprehensive Plan 2040. 2024 Available: https://issuu.com/cityofindepmo/docs/comprehensive_plan_2040_imagine_independence?fr=xKAE9_zU1NQ. Accessed December 27, 2024.
[5] Ignite! Fuel Our Future Comprehensive Plan, Lee's Summit, Missouri. 2024 Available: https://devservices.cityofls.net/Planning/GetFile/606764. Accessed December 27, 2024.

Table 2. Kansas County Land Use Policies Relative to Freight

Policy Focus	Johnson[1]	Leavenworth[2]	Miami[3]	Wyandotte[4]
Historic structures and architectural or archeological remnants (trails) should be protected, and development should be sensitive to the area's history.	x	x	x	x
Development in predominantly rural areas should be designed with compatible elements (e.g., larger setbacks, low densities, buffering, landscaping) that blend the development into surrounding rural character.	x	x	x	
Development should be sensitive to the natural environment, incorporating or connecting with existing natural resources (open space and woodlands.) Scattered development that interrupts open spaces and does not contribute to the continuation of existing natural areas should be discouraged.	x	x	x	

Policy Focus	Johnson[1]	Leavenworth[2]	Miami[3]	Wyandotte[4]
Islands of unincorporated area surrounded by cities are not desirable from a planning perspective due to the inefficiencies and difficulties of providing County services to these areas.	x			
Areas within unincorporated county areas that are currently developing or are expected to develop near cities should be planned in cooperation with the nearby city or cities.	x	x	x	
Coordinate the dedication and acquisition of rights-of-way and easements with other utility providers to achieve efficient and cost-effective installations of future roads and utilities.	x	x	x	
Development should be located where public infrastructure (water, sewer, and roads) is already adequate or can be most cost effectively extended.	x	x	x	
New businesses should be discouraged from locating where there are no public sanitary sewers to serve them.	x	x	x	
Major development proposals that may have regional impacts should be coordinated with neighboring community plans.	x	x	x	
The capacity of arterial roads should be enhanced by limiting the number and location of driveways and street intersections and by other access control measures.	x	x	x	x
Developments should be designed to recognize and minimize the impact of the traffic generated on area roads.	x	x	x	x
Use the connectivity requirements of the Zoning and Subdivision Regulations to require through streets to adjoining properties, where appropriate.	x	x	x	
Coordinate new development in urban fringe locations to provide pedestrian connections (sidewalks, walking/biking trails) or greenway connections within the development and future adjacent developments.	x	x	x	x
Development should respect existing natural assets and minimize adverse impact on the natural environment.	x	x	x	x
Developments should utilize natural drainage systems and appropriate control methods as part of their stormwater management.	x	x	x	x
Development should be avoided in locations where there is a potential for flooding by one percent annual chance of a flood.	x	x	x	
The availability of land for the vital expansion of non-agricultural activities should be balanced with maintaining rural areas to prevent the random, premature conversion of agriculture or undeveloped land to isolated, residential, or commercial uses.	x	x	x	

Policy Focus	Johnson[1]	Leavenworth[2]	Miami[3]	Wyandotte[4]
Development patterns that promote orderly growth and minimize conflicts with adjacent land uses should be encouraged.	x	x	x	x
Proposed development with densities greater than allowed within the designated policy area should be directed to cities or locations within the unincorporated area where there is planned infrastructure to support it (existing sanitary sewer districts, New Century AirCenter) and where such development would not require an upgrade of infrastructure at the county's expense.	x			
Development should be planned so that it is coordinated with future orderly urban expansion, especially regarding roads and public utilities.	x	x	x	x
Agriculture is a valued resource and asset that should be encouraged and protected from premature or incompatible development.	x	x	x	
Commercial and industrial development is best suited in cities or the New Century AirCenter or where there is existing commercial/industrial zoning for it and where there is or will be adequate infrastructure to support it.	x			
Direct the clustering of industrial and commercial uses toward strategic intersections, corridors, and areas adjacent to such existing uses. Such uses should be unified developments, should be compatible with any adjacent industrial or commercial development, and should be appropriately transitioned from any nearby residential development. Such areas should contain compatible environmental characteristics and adequate infrastructure.	x	x	x	x

Sources:

[1] https://www.jocogov.org/sites/default/files/files/2024-04/Rural%20Comprehensive%20Plan_0.pdf. Accessed January 3, 2025.

[2] Leavenworth County Comprehensive Plan – Sustainably Managing Growth and Maintaining Rural Lifestyles. 2025 Available: https://files.leavenworthcounty.gov/Department/Planning%20&%20Zoning/Document%20Center/Comprehensive%20Plan%20Project/LVCO%20COMPREHENSIVE%20PLAN.pdf. Accessed January 3, 2025.

[3] Miami County, Kansas Comprehensive Plan – A Solid Foundation, A Dynamic Future! 2025 Available: https://www.miamicountyks.org/DocumentCenter/View/241/Comprehensive-Plan?bidId=. Accessed January 3, 2025

[4] Plan KCK Citywide and Countywide Comprehensive Plan. 2025 Available: https://www.wycokck.org/files/assets/public/v/1/planning-amp-urban-design/documents/comprehensive-plan/plankck_short_final.pdf.

Table 3. Missouri County Land Use Policies Relative to Freight

Policy Focus[1]	Cass[2]	Clay[3]	Jackson[4]	Johnson[5]	Lafayette[6]	Platte[7]
Industrial uses, other than those of an agricultural nature or operations which need to be in remote locations, should be encouraged to locate within existing cities.	x	x	x	x	x	x
New urban development should be encouraged to be contiguous to existing development to avoid the inefficient "leapfrog" pattern of growth.	x	x	x	x	x	x
Residential, commercial, or industrial land uses should be encouraged to develop in areas where they are not likely to interfere with or become a nuisance to normal agricultural operations.	x	x	x	x	x	x
New developments should be encouraged to locate in areas which are relatively free of environmental problems relating to soil, slope, bedrock, and water table elevations.	x	x	x	x	x	x
New development should be encouraged to be located to avoid disturbing significant natural resources including prime agricultural land and where natural resources may be utilized by public utilities.	x	x	x	x	x	x
The county should be granted drainage easements for all major drainage ways.	x	x	x	x	x	x
Industrial sites should be directed to areas that have access to arterial roads leading directly to major highways.	x	x	x	x	x	x
Locate or require the design of industrial development to have access to or develop adequate utility services, police, and fire protection.	x					
Locate industrial development to minimize the negative impact on the environment and on other residential or commercial uses.	x	x	x	x	x	x
Separate or buffer proposed industrial uses from surrounding non-industrial uses. Locate heavy industrial uses away from existing or projected residential growth areas.	x	x	x	x	x	x
Locate or visually screen industrial uses which have a visual impact to limit the effect on the county landscape.	x	x	x	x	x	x
Provide direct access onto major thoroughfares and carefully control the number of access points by frontage roads for adjacent commercial and residential land uses.	x					

Policy Focus[1]	Cass[2]	Clay[3]	Jackson[4]	Johnson[5]	Lafayette[6]	Platte[7]
Require proposed large scale new developments to provide evaluation of their impact on the surrounding road system and infrastructure and to confirm that design capacities will not be exceeded.	x	x	x	x	x	x
Major road improvements should be financed in part through impact fees imposed at the time of creation of new parcels and uses, to compensate the public for the impact on the surrounding road system infrastructure that results from the proposed new development.	x					
Compact building design: encourage development that uses land efficiently and minimizes sprawl by focusing on compact, higher-density development patterns, where applicable.	x	x	x	x	x	x
Strengthen and direct development towards existing communities: encourage infill development and redevelopment of underutilized areas within existing communities to revitalize urban areas and reduce pressure on undeveloped lands.		x				
Review county zoning regulations to ensure and require appropriate sizes and types of buffers between residences and commercial and industrial uses.	x	x	x	x	x	x
Prioritize commercial and industrial development, where appropriate, along the principal urban growth corridors outlined in the Economic and Market Analysis: Interstate 35; Highway 152; Interstate 435; and Highway 169. Consider future developments along Highway 92 and Highway 69. Growth areas should focus around urban areas and municipality boundaries.		x				
Continue to preserve right-of-way for future roadway connections as a component of future development and redevelopment consistent with street classifications.	x	x	x	x	x	x
Prohibit commercial or industrial land uses in rural areas if they are likely to interfere with or become a nuisance to normal farming operations.	x	x	x	x	x	x
Locate new developments in areas which are free of environmental hazards or problems relating to soil, slope, bedrock, and water table.	x	x	x	x	x	x
Limit development in the 100-year floodplain to recreational uses and parks.		x				

Policy Focus[1]	Cass[2]	Clay[3]	Jackson[4]	Johnson[5]	Lafayette[6]	Platte[7]
Limit development within the designated 100-year and 500-year floodplain areas.						x
Strongly encourage new urban development in the Urban Service Tier to annex into an adjoining city before development. If located in the unincorporated area, urban development should be consistent with the policies and development standards of the adjoining city.		x				
Coordinate with nearby municipalities to provide essential services that support urban growth around the Midwest National Air Center airport.		x				
Promote the development of airport compatible land uses including light industrial and transportation-based industry, business park, offices, and residential uses.		x				
The county should limit industrial and other uses that generate high volumes of traffic to locations where the use will not significantly increase traffic through residential neighborhoods.	x	x	x	x	x	x
Encourage sustainable development that supports transit and advocate for new development around stations which generally are denser than existing development patterns in the area, contain a mix of uses, have a compact and attractive urban design, and are oriented to allow easy pedestrian access to transit facilities.			x			
Jackson County should use its unified development code to ensure appropriate density and design of development located on moderate (15–30 percent) and steep slopes (greater than 30 percent).			x			
Application of hillside development policies to an individual development proposal will be based on site-specific slopes analysis.			x			
The county should promote land use patterns and a transportation network that decrease reliance on automobiles for commuting and other routine trips.	x	x	x	x	x	x
Limit infrastructure improvement within rural agricultural areas to those projects necessary to serve agricultural needs and to resolve compelling threats to the public health and safety.	x	x	x	x	x	x
Limit commercial and industrial zoning to unincorporated areas that capitalize on regional transportation access without detracting from the economic vitality of cities.	x	x	x	x	x	x

Policy Focus[1]	Cass[2]	Clay[3]	Jackson[4]	Johnson[5]	Lafayette[6]	Platte[7]
Facilitate discussions with cities to locate and develop an industrial park in the I-10 corridor that will provide opportunities for long-term employment growth.					x	
Review development proposal impacts on the historic assets of Lafayette County as part of the decision-making process.					x	
Limit development on slopes over 15% grade to mitigate erosion, sedimentation, landslides, and scenic degradation.						x
Guide development activity to adhere to smart growth principles.	x	x	x	x	x	x
In the development review process, all historic features (man-made structures or objects more than 50 years old) should be identified on preliminary plats.						x
Where feasible, facilitate the relocation of significant historic features if their preservation in place is not possible.						x
Encourage developers to consider relocating historic features that cannot be feasibly maintained on site.						x
Ensure that development and improvements are sensitive to the historic context of the communities within Platte County.						x
Preserve level areas near key interstate interchanges for business and commercial uses to advance the economic development of the county.			x			x
Identify key interchanges with good potential for business or commercial use.						x
Discourage premature development at major intersections where interchanges are identified or projected but not yet planned.						x

Sources:
[1] Pettis, Ray, and Saline County do not have general/comprehensive plans available online as of January 2025.
[2] Cass County Master Plan – 2010 and Beyond. 2025 Available: https://www.casscounty.com/DocumentCenter/View/3977/2010-Master-Plan. Accessed January 6, 2025.
[3] Clay County Compass 2040 Comprehensive Plan. 2025 Available: https://www.claycountycompass.com/_files/ugd/92b245_4cf7fbdc4d1e4da68238fa3d937aff4c.pdf. Accessed January 6, 2025.
[4] Building a Vision Together: Jackson County Development Plan. 2025 Available: https://www.jacksongov.org/files/sharedassets/public/v/1/departments/public-works/development-plan-pdf.pdf. Accessed January 6, 2025.
[5] Johnson County, Missouri Comprehensive Plan. 2025 Available: https://www.olddrum.net/zoning//2007/plan-draft-jul08.pdf. Accessed January 6, 2025
[6] Lafayette County, Missouri Comprehensive Development Plan Update – 2003-2020. 2025 Available. https://cms3.revize.com/revize/lafayettecounty/Documents/Service/FINALPlan.pdf. Accessed January 6, 2025.
[7] Land Use Plan, Platte County, Missouri. 2025 Available: https://www.co.platte.mo.us/media/Pages%20document/Land%20use%20plan/2010_land_use_plan.pdf. Accessed January 6, 2025.

3. Freight Activity Center Defining Factors

To compliment the local agency land use policies relative to freight review, this section summarizes key findings associated with how the Federal Highway Administration (FHWA) and local stakeholders define FACs and key elements of the Kansas City regional freight network. In addition, past discussions with the MARC Goods Movement Committee (GMC), the MARC Sustainable Places Policy Committee, a review of Surface Transportation Block Grant (STBG) project evaluation criteria, and Kansas City SmartPort industrial property sales and leasing promotional characteristics are all documented. The intent of this review is to further define FACs infrastructure and community characteristics that should be fostered to accommodate successful, efficient, accessible, and safe freight operations. This review also identifies future data needs that will be required to properly plan for and prioritize infrastructure investments that will accommodate regional freight movement and promote private investments in FACs that are regionally significant.

3.1. Federal Highway Administration

To identify key characteristics that define a FAC, FHWA resources were reviewed and documented. This information was used to identify land use characteristics and areas with the greatest potential for expansion of existing freight facilities and locating new facilities within the Kansas City region. Identification of FACs provides additional land use considerations that account for local freight network and land use characteristics included in the development of "what to expect when expecting freight" land use and infrastructure recommendations for local governments.

The following is an example of typical types of FACs as defined by FHWA.[1]

- **Industrial parks near major highways:** Large areas with multiple businesses that require frequent freight deliveries, often with dedicated truck access roads.
- **Intermodal terminals:** Facilities where containers are transferred between rail and truck transportation.
- **Port facilities:** Waterfront areas where large cargo ships are unloaded, and goods are distributed further inland.

According to FHWA FAC definitions, key factors to consider when identifying a FAC include:

- Transportation Connectivity
  - Access to interstate highways, major roadways, rail lines, ports, and airports

[1] FHWA Freight and Land Use Handbook. 2025 Available. FHWA Freight Management and Operations - FHWA Freight and Land Use Handbook. Accessed January 6, 2025.

  - Proximity to intermodal connections and transloading
  - Proximity to key distribution hubs
- Land availability and suitability
  - Large, flat, and/or contiguous parcels of land with adequate space for truck maneuvering and staging areas. Typical land area needed for freight is:
    - Light Industrial
      - 0.5 to 5 acres
      - Small manufacturing often needs 1 to 2 acres
      - Warehousing typically requires 2 to 5 acres
    - Heavy Industrial
      - 5 to 50+ acres
      - Large manufacturing facilities often need 10 to 20 acres
      - Major industrial complexes can require 50+ acres
    - Distribution Centers
      - Modern facilities typically require 20 to 100+ acres
      - E-commerce facilities often require 40 to 100 acres
  - Well-drained soils and minimal flood risk
  - Potential for future expansion
  - Zoning that allows for industrial and freight operations (manufacturing, industrial, light industrial)
  - Buffer zones between operations and residential areas. Typically, buffer width can range from:
    - 50 to 200 feet for light industrial uses
    - 200 to 1,000+ feet for heavy industrial uses
- Facility design and functionality
  - Well-designed loading docks, cross-docking capabilities, and truck access points
  - Secure and sufficient storage areas for freight and containers
  - Adequate parking for trucks and drivers
  - Wide turning radii to allow large truck maneuverability

- Community considerations
  - Noise mitigation strategies
  - Stormwater runoff mitigation strategies
  - Traffic management plans to minimize congestion
  - Visual buffers and landscaping to improve aesthetics
- Economic Factors
  - Proximity to major consumer markets
  - Workforce availability and skillset
  - Proximity to daily necessities and amenities
  - Proximity to workforce housing
  - Cost of land and development
  - Presence of complementary businesses and services
- Infrastructure and utilities
  - High-capacity electrical power supply
  - Reliable telecommunications and internet connectivity
  - Adequate water supply and wastewater treatment capacity
  - Proper lighting for 24/7 operations
  - Stormwater management systems

3.2. Goods Movement Committee

On Tuesday, October 4, 2022, the MARC GMC held a meeting to discuss various Kansas City region freight elements including an overview of the Missouri Department of Transportation (MoDOT) State Freight and Rail Plan. The Plan focused on seven goals that align with MoDOT's three foundational pillars of Safety, Resiliency, and Stability. The Plans goals are 1) Safety and Security, 2) Connectivity and Mobility, 3) Equity and Environmental Resiliency, 4) Coordination & Collaboration, 5) Maintaining, 6) Economic Growth & Competitiveness, and 7) Innovation. These plan goals should be considered by local governments when planning for freight in the future and are incorporated into land use considerations and recommendations. There was a discussion about the importance of providing rail spurs into business developments. At the meeting, Supply Chain Task Force recommendations were reviewed and include considerations related to land use including housing affordability, physical distance between a worker and essential services they need to find and maintain employment including the tendency for warehousing and

manufacturing jobs to typically locate in areas far away from other land uses, and lack of connectivity to freight employment, resulting in high worker transportation costs. An additional element for consideration is the provision of publicly owned truck parking including parking spaces at welcome centers, rest areas, truck parking-only facilities, and weigh stations. Targeted Supply Chain Task Force recommendations with ties to land use include the following:

- Establishing state general revenue funds for railroads and rail access
- Implement a short line infrastructure tax credit to support investment in rail
- Consider developing secondary distribution sites with direct access by truck or rail to reduce congestion at port sites
- Expand housing subsidies
- Establish affordable housing incentives for new developments
- Provide incentives to municipalities to enact zoning reform
- Increase truck parking availability at public and private sites

During the meeting, the identification of Kansas City region FACs in the 2009 Freight Outlook Study was discussed. Freight zones were identified as locations that meet certain criteria for land use, heavy freight activity, and large employment.

Criteria from the 2009 study were based primarily on land use and acreage, with some light adjustments made based on employment data. Thirty FAC boundaries were identified in the MARC region as shown in **Figure 2**. These FACs typically contain at least 250 acres of freight-related activities, including proposed vacant/agricultural freight-related land use, or if there is less than 250 acres then the zone boundary would need to have over 3,000 square feet or more of industrial freight-related building space.

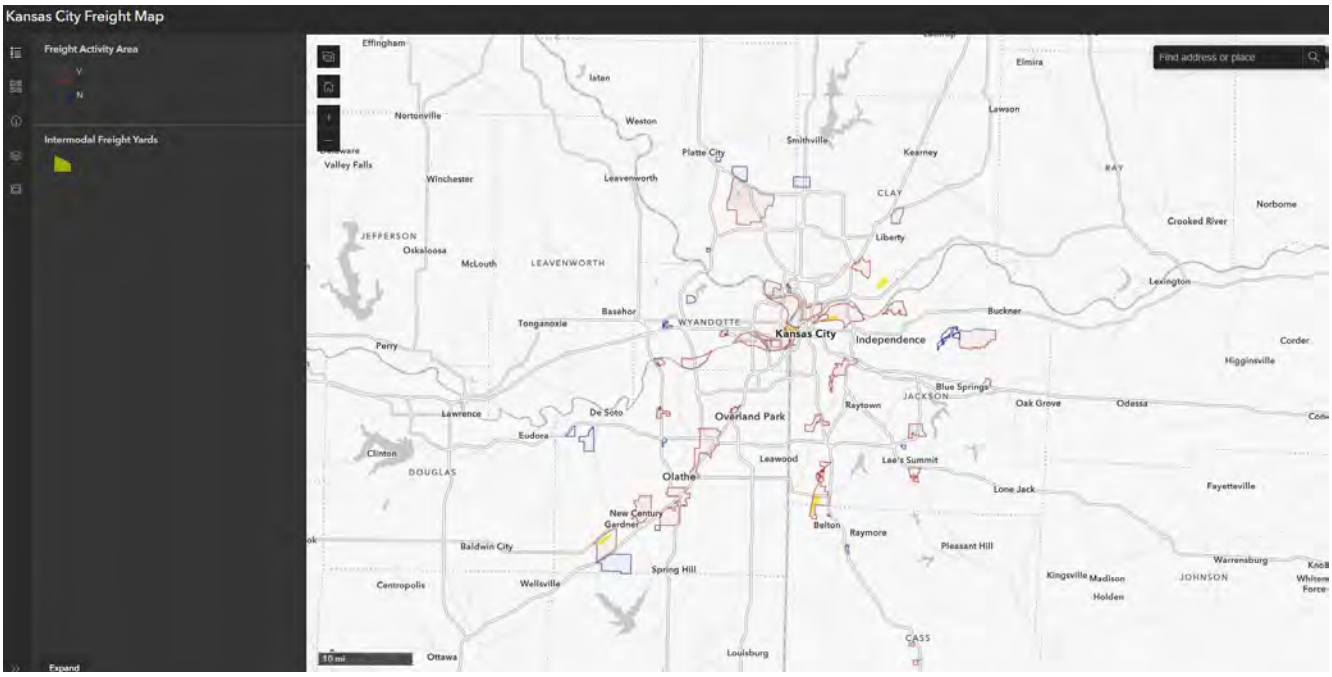

Figure 2. Mid-America Regional Commission 2009 Freight Outlook Study Freight Activity Centers

3.3. Evaluation Identification and Project Evaluation Criteria

During a MARC Goods Movement Committee meeting, FAC criteria were identified and discussed. The following considerations were identified as key FAC elements:

- Top twenty warehousing sites by square footage
- Top twenty manufacturers by number of employees
- Presence of a rail/truck or air/truck intermodal facility
- Presence of a Foreign Trade Zone
- Located within a mile of a significant regional corridor (roadway with greater than 1,000 trucks/day)
- Area with two out of four transportation modes: air, barge, rail, truck

In addition to discussing and defining FACs, the GMC discussed and refined definitions of national, regional, and local corridors of freight significance as defined in **Table 4**.

Table 4. Regional Freight Corridor Significance Definitions

Corridor Designation	Highway	Rail	River	Air
National	>4,000 trucks/day	Primary/AAR	Mississippi River	KCI
Regional	1000–3,999 trucks/day	None	None	KCI
Local	500–999 trucks/day	<10 trains/day	Missouri River	New Century

It was determined that local delivery truck traffic does not constitute significant freight movement. For a candidate transportation project to receive project selection for programming points the project location must meet at least one of the following:

- On a designated national, regional, or local Corridor = 5 pts
- Direct connection to A, B, C, D, F below (does not include E) = 5 pts
- Any 4 combination of A thru F below but not all = 4 pts
- Any 3 combination of A thru F below = 3 pts
- Any 2 combination of A thru F below = 2 pts
- Within a mile of A thru F or E below = 1

Within a mile of:

A. Top twenty warehousing site by square footage
B. Top twenty manufacturer by number of employees
C. Presence of a rail/truck or air/truck intermodal facility
D. Presence of a Foreign Trade Zone
E. Located within a mile and a direct connection of a significant regional corridor (roadway with greater than 1,000 trucks/day)
F. Area with two out of four transportation modes: air, barge, rail, truck

3.4. Sustainable Places Policy Committee Freight Project Evaluation and Decision-Making Priorities

On November 8, 2024, a presentation was given to the MARC Sustainable Places Policy Committee with the intent of garnering feedback related to how the Kansas City region can proactively plan for freight. The discussion framework centered on how to encourage a vibrant

freight future including discussion topics focused on how the region can best identify impacts to FACs and corridors, enhance freight connections between transportation modes, and explore the potential for a Planning Sustainable Places Atlas database layer.

The presentation included an overview of the MARC GMC role, mission, and membership. The Connected Freight KC 2050 Plan process and schedule were also presented. After an overview of the project process and schedule were presented, a conversation was facilitated that focused on defining what proactive freight planning for the region includes.

MARC maintains many datasets and maps describing boundaries, resources, and features in the Kansas City region. MARC provides this information to increase regional awareness on shared issues, to provide a public service, and to assist local governments and planning agencies with their own maps, analyses, and decision-making processes. To enhance freight datasets that will lead to improved inter-agency regional coordination and data-driven decision-making, the Sustainable Places Policy Committee was engaged to determine the data components that would be beneficial to track in a GIS format in the future. Recommended data layers that would be beneficial to identifying FACs and destinations included the following:

- Truck counts
- Freight land use clusters
- Transportation network connectivity to federal, state, and local routes
- Locations of industrial and commercial businesses
- Square footage of businesses, warehouses, and other freight facilities

When the Sustainable Places Policy Committee was asked how freight "vibrancy" should be defined, the following network characteristics were identified as the most important:

- Mitigating congested network locations and bottlenecks
- Identification and promotion of nearby facilities, services, and land uses that accommodate the housing, educational, recreational, and retail needs of freight industry workers
- Utilization of brownfields or undeveloped areas for construction of new freight facilities vs. utilization of greenfields or undeveloped land for new developments

In summary, the Planning Sustainable Places Atlas Freight Destination Layers should allow for regional stakeholders to determine the following when making future decisions related to the location and components of freight facilities attraction, development, and provision of an efficient and safe freight network:

- FAC square footage and surrounding population characteristics

- Provision of the ability to determine FAC compatibility with surrounding land uses and the appropriate mix of land uses to enhance freight activity while preserving community quality of life and providing economic opportunities for all
- Determination of the need for freight adjacent housing and housing choices for a diverse population (apartments, rentals, condos, mixed-use, single-family homes)
- Job accessibility with a focus on provision of access to minority populations
- Resource availability in the vicinity (water, utilities, etc.) and the impacts of impervious surfaces on stormwater runoff and the urban heat island effect

3.5. Surface Transportation Block Grant Program Project Evaluation Criteria

To inform future discussions regarding how the Kansas City region can comprehensively consider the impacts of freight and provide the infrastructure necessary to accommodate existing and future freight operations, MARC STBG project evaluation criteria were reviewed to identify how freight considerations are currently being accounted for in project prioritization and selection processes.

3.5.1. Mid-America Regional Council Surface Transportation Block Grant Program

MARC provides seven separate categories of transportation-related projects that are eligible for STBG funding. Each of these categories is screened by a varying number of topics which are allocated points based on their importance. These topics are included in the list below:

- Bridge Restoration, Rehabilitation & Replacement
- Bicycle/Pedestrian
- Public Transportation
- Roadway Capacity
- Transportation Operations and Management
- Transportation Safety
- Other Projects
  - Projects relating to Public Health/Transportation Choices, Economic Vitality, Environment, Public Health, Safety and Security, System Condition and System Performance.
- One of the constants throughout the STBG grant screening process are six subtopics which are applicable to all projects and universally count for 30 points, 30 percent of the screening. These topics are interjurisdictional planning, relationship to sustainable code framework, implementation, public participation, environmental justice, energy use, and climate chance.

3.5.2. Additional Considerations

The basis for the STBG grant funding is a screening matrix, presented in the Appendix A the MARC Surface Transportation Block Grant Program 2027–2028 Project Evaluation Criteria, otherwise known as the STBG project evaluation criteria. Freight is not a category reviewed in the STBG project evaluation criteria, however, there are opportunities to review prioritization through the lens of freight as it is reviewed in multiple sections of the STBG project evaluation criteria and serves as the backbone of one of the categories, Other Eligible Projects. In addition, freight serves as a significant factor in criteria specific to Bridge Restoration, Rehabilitation & Replacement in Section 2.2 of the STBG project evaluation criteria, Economic Vitality. There are additional references to freight throughout the STBG project evaluation criteria in the Roadway Capacity Section 5.2, Economic Vitality, Transportation Operations and Management Section 6.2 and in Transportation Safety Section 7.3, though Sections 5.2, 6.2, and 7.3 all evaluate the same metrics.

Within the STBG project evaluation criteria "Other Eligible Projects," Freight is a metric for examining economic vitality, denoting two criteria, "serves regional activity or employment center" and "supports regional freight network." These two criteria are evaluated further in sections 5.2, 6.2, and 7.3. The criteria "Supports Regional Freight Network" is evaluated through seeing if the proposed location is on a designated national, regional or local freight route, if there's an ADTT (Average Daily Truck Traffic) greater than 500, or if the location is within a mile of a top twenty warehousing site (by square footage), a top twenty manufacturer by number of employees, if it's near a rail/truck or air/truck intermodal facility, if there's a foreign trade zone nearby, if there's an area with two out of the following transportation modes (air, barge, rail or truck) nearby, and if it's located within a mile of a significant freight corridor (roadway with greater than 500 trucks a day).

Similarly, the criteria "Serves Regional Activity & Employment Centers" evaluates how well a location assists nearby activity centers, with the lowest point assignment for serving any activity center, and higher point assignments being awarded for serving activity centers found in developments with walkability. The highest score is assigned to locations that implement elements and recommendations of "planning sustainable places" or that support "creating sustainable places" initiatives.

Freight criteria are further enhanced in Section 2.2 of the STBG project evaluation criteria, where economic vitality is reviewed through the Federal Aid system, however it still maintains the two criteria, "Supports the Regional Freight Network" and "Serves Regional Activity & Employment Centers." "Supports the Regional Freight Network" is evaluated through adding a point for meeting each metric below:

- Improves an identified MoDOT, Kansas Department of Transportation (KDOT), MARC freight movement issue
- Removes or substantially improves freight related land-use compatibility, noise, or safety issue
- Located on or provides access to regional freight network and provides travel time and/or reliability benefits
- Enhances access to a key freight generator (airports, major distribution centers, industrial park, etc.)
- Enhances access to an intermodal freight movement (air to truck/rail, rail to truck, etc.)
- ADTT is greater than 20 percent of average annual daily traffic (AADT)

3.6. Kansas City SmartPort Site Selection Attributes

Kansas City SmartPort industrial property sales and leasing advertisement brochures were reviewed to identify and document key property characteristics that have been deemed as attractive to freight industry facility operators and investors. Thes characteristics were considered in development of the draft when expecting freight considerations and recommendations.

3.6.1. Site Selection

- Total acreage
- Industrial zoned or existing zoning
- Rezoning or development plan approval status
- Availability of due diligence reports
- Accommodation of buildings of a certain size (100,000 ft. or larger)
- Served by rail with provider noted (Burlington Northern Santa Fe [BNSF] Railroad)
- Proximity to regional intermodal facilities
- Potential for tax abatement with specific timeframe and percentages (10-year 50 percent real estate tax abatement)
- Build-to-suit opportunity (own or lease) or purchase land outright
- Proximity to airports, major shipping hubs (United Parcel Service [UPS], Federal Express [FedEx], United States Postal Service [USPS], etc.)

- Proximity to intermodal transportation including Logistics Park Kansas City (LPKC) (BNSF Intermodal), Kansas City Southern (KCS) Railroad CenterPoint Intermodal, Norfolk Southern (rail), and Kansas City International (KCI) Airport
- Listing of major surrounding developments (Excelligence, major medical centers, Tyson Foods New Century AirCenter Airport, Amazon, etc.)
- Proximity to major automobile manufacturing operations
- Proximity to major interstate interchanges and access
- Utility overview including water, electrical, sewer, and natural gas
- Site improvements including roads and entitlements

3.6.2. Existing Parcel and Building

- Number of docks and configuration
- Number of drive-ins
- Maximum amount of buildable square footage while still maintaining adequate parking
- Building dimensions
- Clear height
- Car parking capacity
- Trailer parking capacity
- Land size in acres
- Site dimensions
- Sale price per acre

3.7. Data-Driven Freight Activity Center Identification and Needs Assessment

To understand the existing conditions in the study region, this freight plan gathered several datasets. These correlate closely with the MARC GMC FAC identification criteria and enable needs assessment in each FAC, which can then lead to freight project identification.

3.7.1. Data Sources and Methodology

The following data sources and methodology for the identification and needs assessment of FACs includes the following.

CoStar Freight Cluster Analysis Zones

This consists of 2,577 zones in the study region, including traffic analysis zones in MARC region and census tract zones in LDCMPO and PTRPC. The project team considered these zones to be too granular for FAC identification.

Geotab Truck-Based Freight Origin-Destination Analysis Zones

This consists of 44 zones in the study region, which are a mix of smaller zones for places of origin/destination with significant truck volumes as per Geotab's probe vehicle data and larger zones for other places. The project team considered the variable zone sizes as a drawback in direct use for FAC identification.

Current and/or Future Industrial Land Uses Datasets

This data was newly gathered for this technical memorandum for the MARC region, LDCMPO, and PTRPC, who in turn collected information from communities implementing land use and zoning regulations. The study region's land use datasets came in geographic information system (GIS) and portable document format (PDF). Some of the communities in the study region have both current land use and future zoning, others have only current land use, and still others lack land use and zoning designations. The project team performed the following actions with the land use datasets:

- filtered all datasets to industrial land uses
- removed substantive overlaps in the current land use and future zoning GIS data to identify distinct industrialized areas
- approximated the data in PDF to a GIS format by drawing an approximate boundary

The resultant industrial land uses GIS data for the study region consists of 4,449 polygon objects. The total industrial land area in any community is prone to a small (less than 10 percent) error; however, this GIS data is adequate to draw FAC boundaries for separate industrial land use clusters and to identify study region top FACs.

CoStar Industrial Properties Database

This data was used to identify existing industrial clusters and is based on an April 2024 snapshot of the study region. This data was used to evaluate and identify study region top FACs.

Freight Network Access

For the existing conditions analysis, the project team compiled the location of truck and rail networks, ports, and airports. For this technical memorandum, the project team collected intermodal yard locations. Using a distance criterion of 1 mile and a use criterion of 1,000 trucks per day for the truck network, the project team evaluated access quality for the industrial land use polygons inside the FACs.

Infrastructure Condition

For the existing conditions analysis, the project team compiled locations of poor condition bridges and extents of poor condition pavement. The count of bridges and miles of pavement in poor condition are used to evaluate the infrastructure condition needs of the FACs.

Bottlenecks and Truck-Involved Collisions

The project team compiled locations of 2019–2022 truck-involved collisions and potential future (2050) extents of bottlenecks based on truck delay. The count of collisions and miles of bottlenecks are used to evaluate the mobility and safety needs of the FACs.

Flooding Potential

The project team collected FEMA's 1-percent annual chance flood hazard areas and overlaid them with industrial land use polygons to estimate the percentage of industrial land area by polygon that has a potential of flooding.

Data and Methodology Limitations

The data-driven FAC identification and evaluation methods presented in this section have the following limitations:

- Top manufacturers and their jobs data were not available to the project team. Manufacturing and food processing related rentable building area was used as a surrogate metric to identify manufacturing-heavy FACs.
- Commercial and agricultural land uses are not directly used in the FAC identification, however, some of the industrial land uses in the FACs may serve these uses.
- Access to freight modes was made a part of the FAC needs assessment instead of the selection criteria, which makes the FAC identification more inclusive.
- There are site level factors such as terrain, size/shape of parcel, nearby land uses and community (presence or lack of buffers, noise, traffic conflicts, etc.), design and functionality, workforce availability, proximity to markets, cost of development, support businesses, utility (power, water supply, sewage treatment and stormwater management), and services. The project team considered these difficult to evaluate at a FAC level.

3.7.2. Identification

The FAC identification was done using a two-step process as follows:

Step 1: Draw Freight Activity Center Boundaries

Smaller Geotab zones were used because they provide relatability between the FACs and truck-based freight origin and destination patterns. Larger Geotab zones were broken down to the rest of Douglas County down to create smaller zones (zones of 10101, 10102, 10103, 10104, and

10105) representing distinct regions in Douglas County) that align with the CoStar industrial property cluster zone boundaries and the smaller Geotab zone boundaries. This resulted in a total of 121 FAC zones that logically separate the newly identified industrial land uses.

Step 2: Identify Top Freight Activity Centers

Using the following three criteria, 37 top FAC zones were identified: (a) top 20 by industrial land area (approximate), (b) top 20 by warehousing or distribution related rentable building area, and (c) top 20 by manufacturing and food processing related rentable building area.

Figure 3 shows the distribution of industrial land use across the study region and how the top 37 FACs (white highlighted zones) align with these. The non-top FACs (grey highlighted zones) carry limited and scattered amounts of industrial land uses. The top 37 FACs contain 91,010 acres of industrial land uses, 227.0 million square feet of warehousing or distribution related rentable building area, and 70.0 million square feet of manufacturing and food processing related rentable building area, which are about 72.6 percent, 85.7 percent, and 86.8 percent of the regional total, respectively.

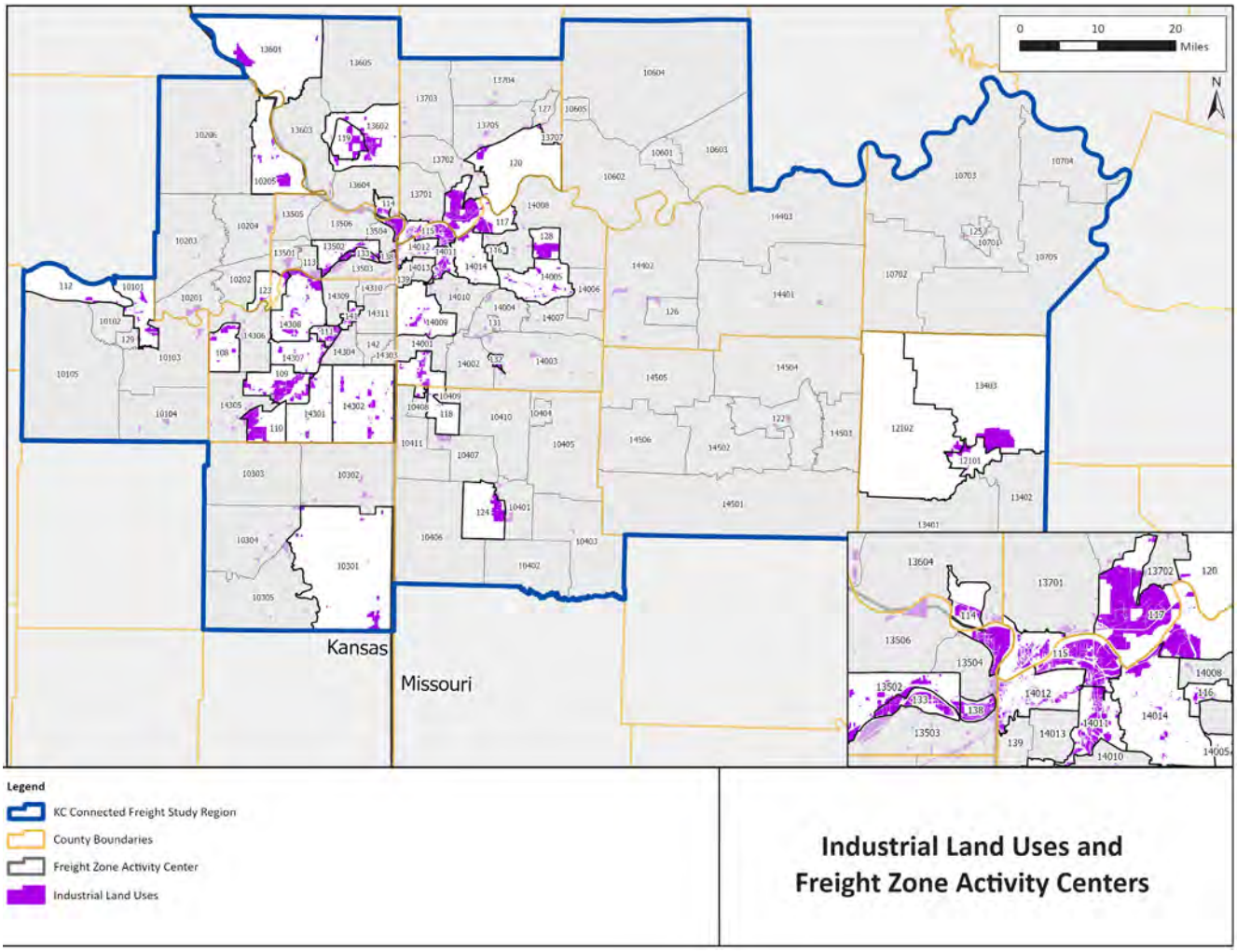

Figure 3. Study Region Freight Activity Centers

3.7.3. Needs Assessment

The project team identified the needs of the top 37 FACs or 2,728 industrial land use polygons within them in the classes of "high," "medium," "low," and "no need" based on relative thresholds. In this section, the top FACs are referred to as "FACs" for shortness.

Figure 4 shows how well the industrial land uses in the FACs are served by major freight access modes. The project team summarized the need for FACs access by aggregating the area of industrial land uses within each FAC that have 1 or fewer major freight access modes as shown in **Figure 5**. The results indicate that the criterion of 1 mile access distance may be conservative for FAC ID# 13602, which is in the vicinity of the KCI Airport. In most other cases, the need is identified for the FACs that have limited major freight access modes.

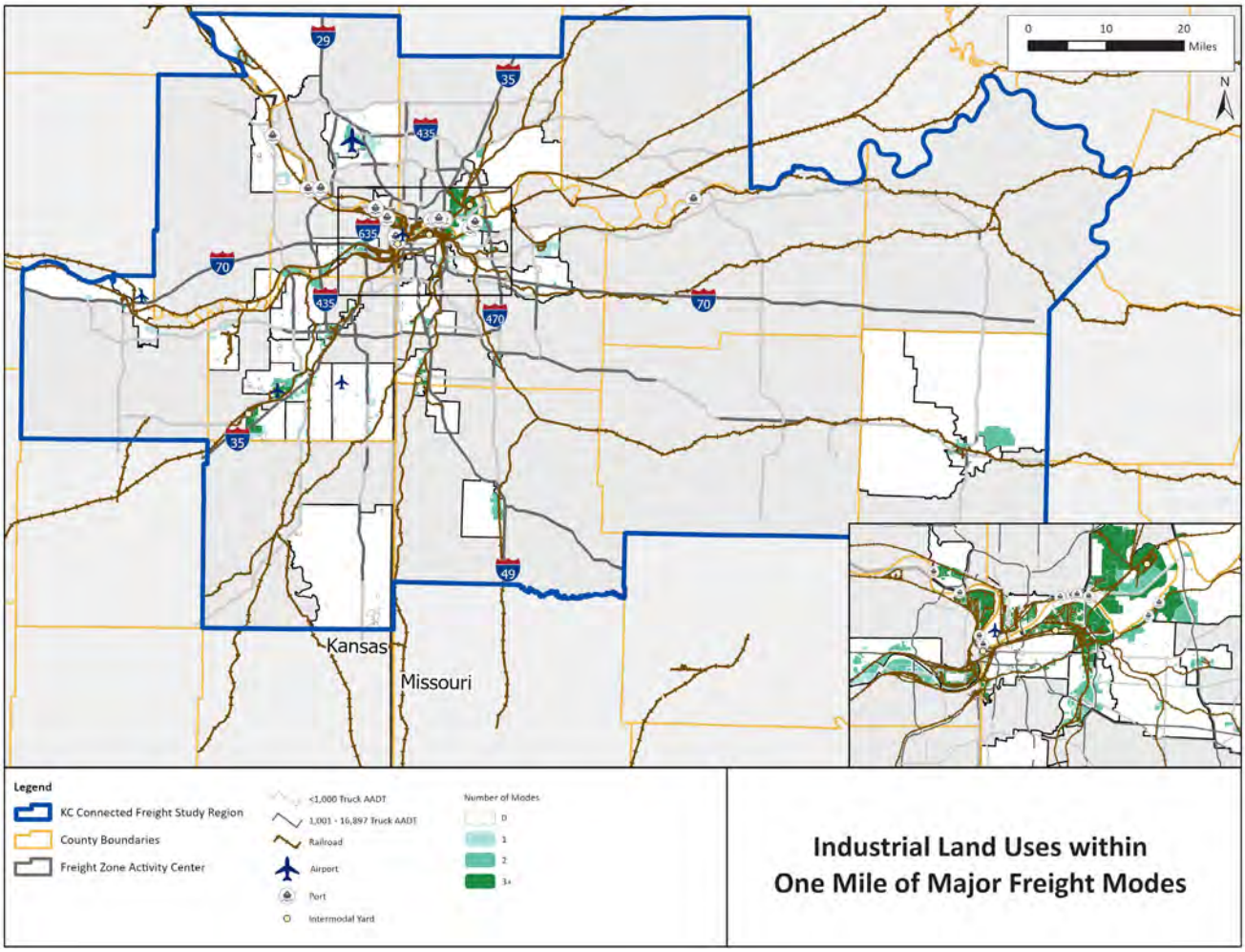

Figure 4. Freight Activity Centers and Major Freight Access Modes for Industrial Land Uses

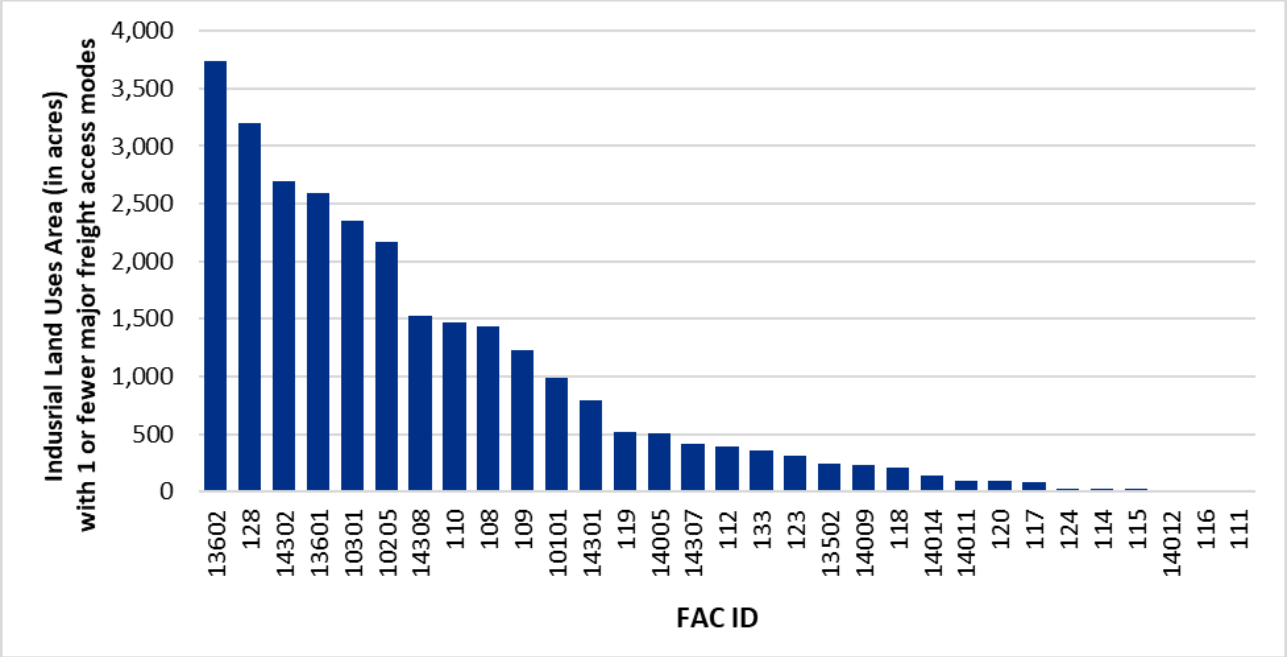

Figure 5. Freight Activity Centers and Area of Industrial Land Uses with One or Fewer Major Freight Access Modes

Figure 6 and **Figure 7** show bridge condition needs by FAC, while **Figure 8** and **Figure 9** show the pavement condition needs in the FACs. Poor condition bridges and pavement identified in this analysis may not always fall on the interregional connection or local access routes for the industrial land uses; however, the shortlisted locations could become relevant during development of a specific industrial site.

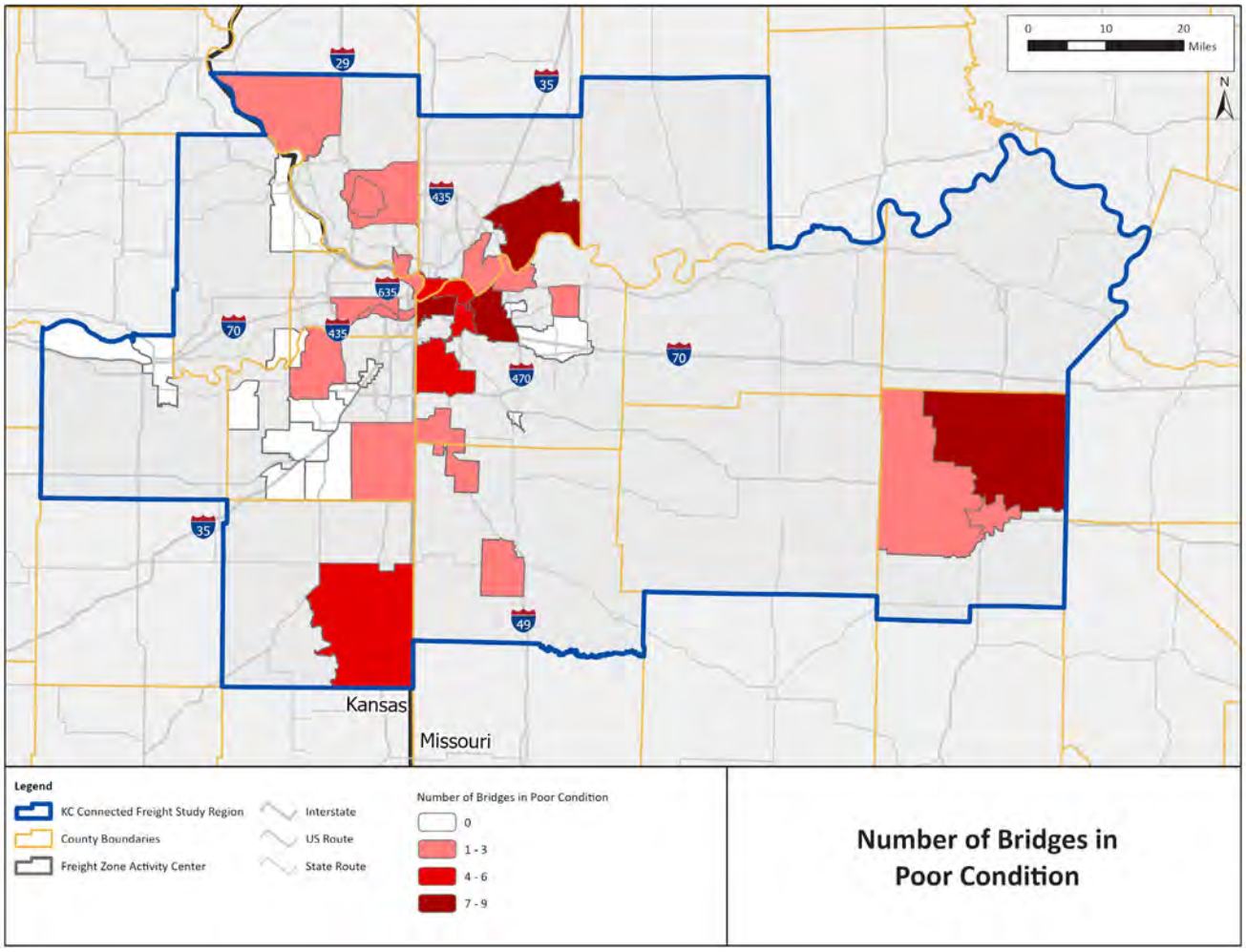

Figure 6. Freight Activity Centers and Number of Poor Condition Bridges

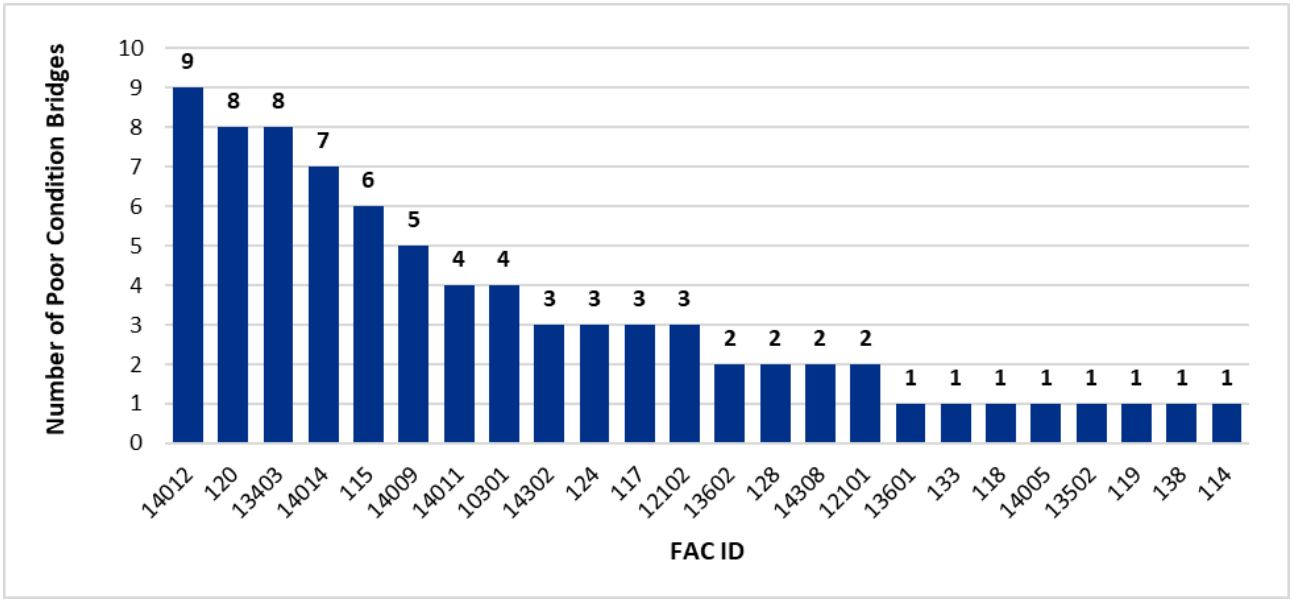

Figure 7. Number of Poor Condition Bridges by Freight Activity Center ID

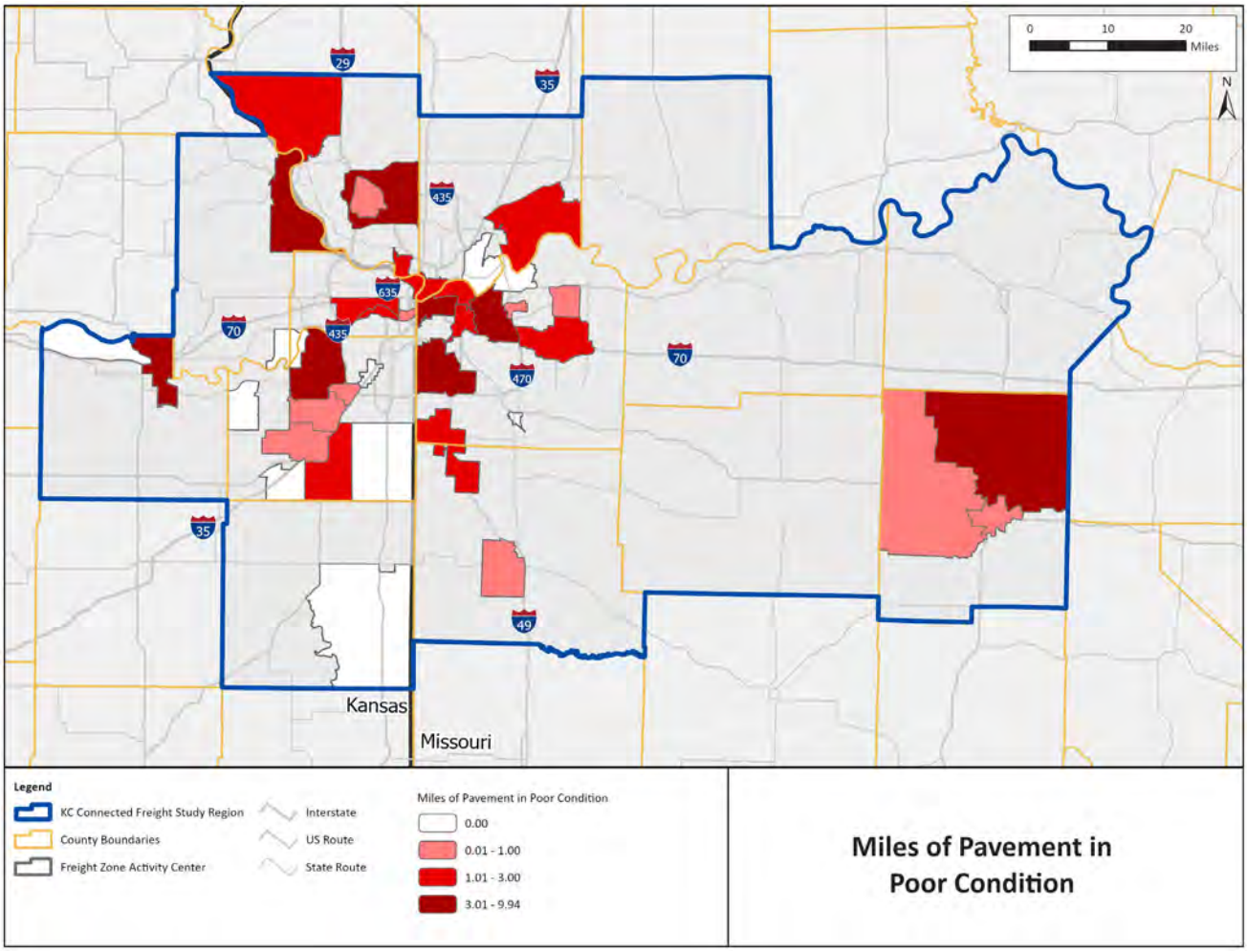

Figure 8. Freight Activity Centers and Number of Miles of Poor Condition Pavement

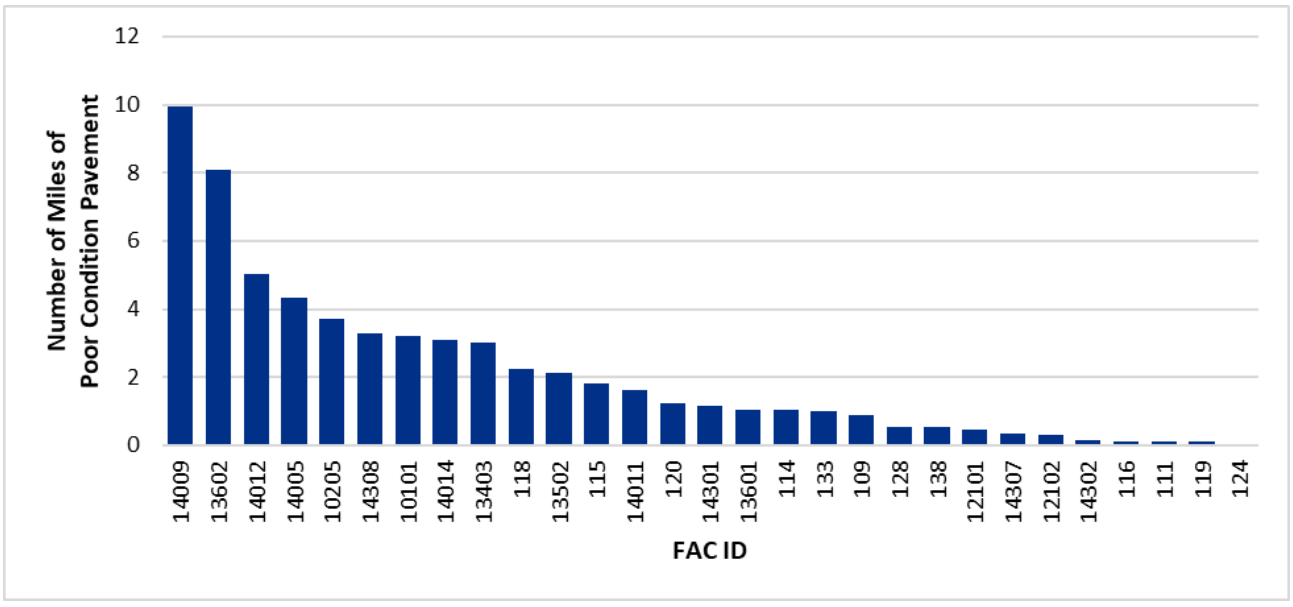

Figure 9. Number of Miles of Poor Condition Pavement by Freight Activity Center ID

The analysis identified freight mobility and safety needs for the FACs based on the future (2050) anticipated miles of truck bottlenecks during AM and PM peak hours and the current number of truck-involved crashes information (**Figure 10**, **Figure 11**, and **Figure 12**). Industrial sites located in one FAC may be impacted by the mobility and safety needs not only in its own FAC but connections to other FACs that serve as a source or marketplace for goods. However, the freight mobility and safety needs were broken down into the FAC buckets in this analysis to aid potential packaging of freight mobility and safety improvements with large-scale industrial site developments in the FAC. **Figure 13** and **Figure 14** show the statistical summaries by FAC ID for easy identification.

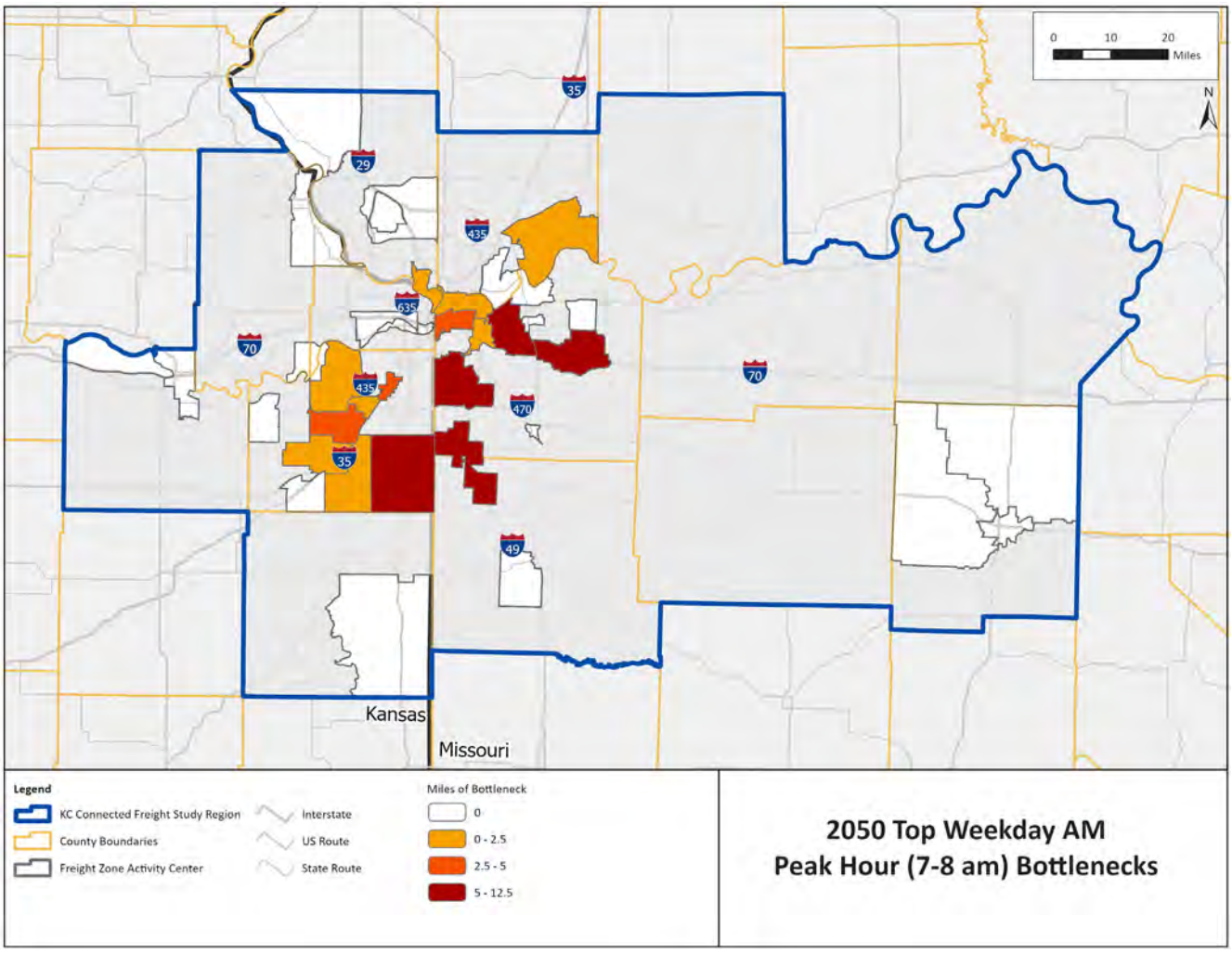

Figure 10. Freight Activity Centers and Number of Miles of Future (2050) AM Peak Truck Bottlenecks

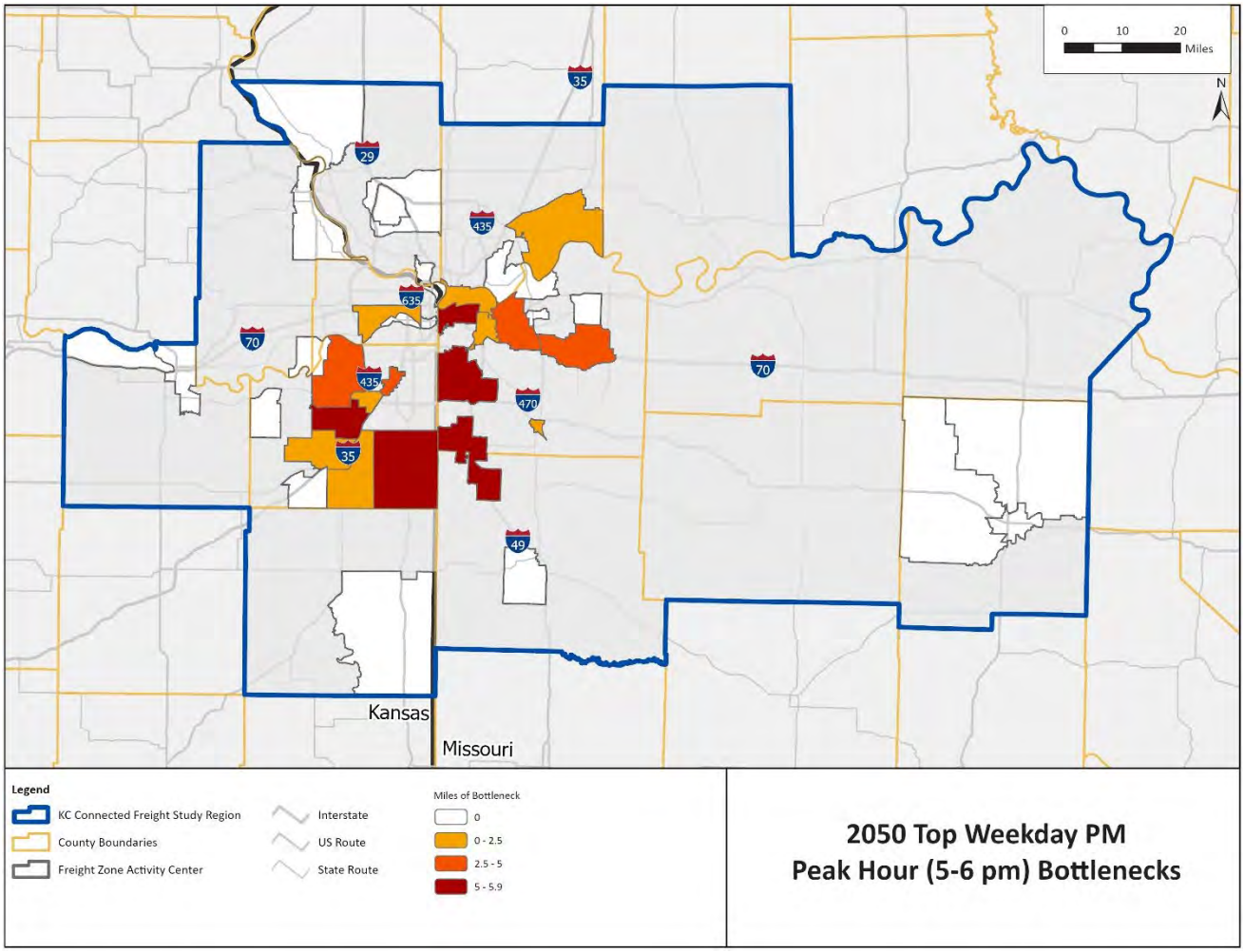

Figure 11. Freight Activity Centers and Number of Miles of Future (2050) PM Peak Truck Bottlenecks

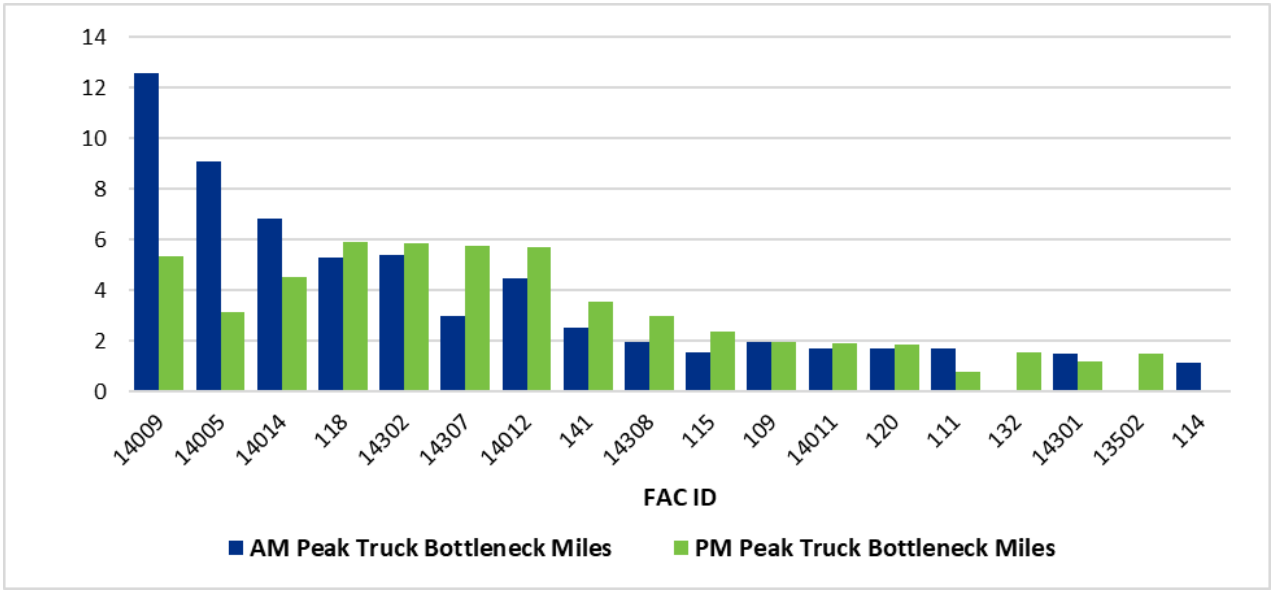

Figure 12. Number of Miles of AM and PM Peak Truck Bottlenecks by Freight Activity Center ID

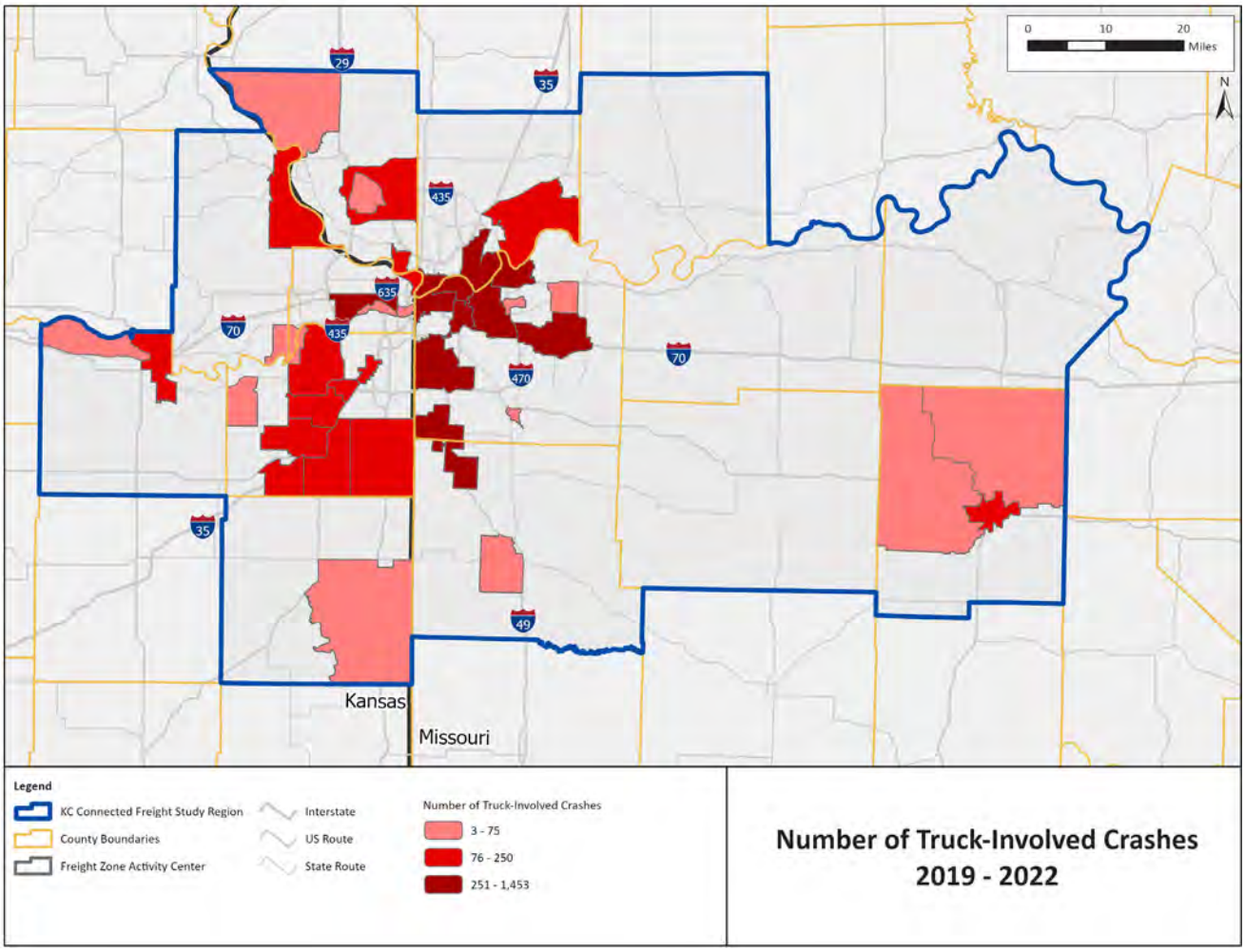

Figure 13. Freight Activity Centers and Number of Truck-Involved Crashes, 2019–2022

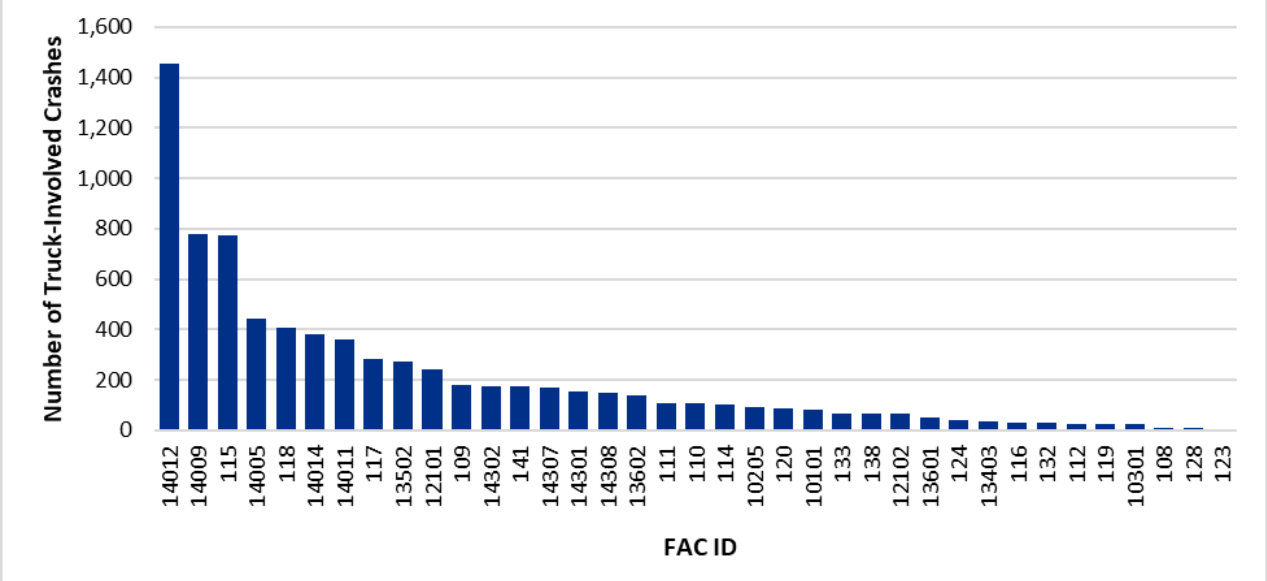

Figure 14. Number of Truck-Involved Crashes by Freight Activity Center ID

To assist with industrial site identification and development, the project team also identified flooding hazards to industrial land uses as shown in **Figure 15**. Categories of flooding hazard are identified based on the percentage of industrial land use polygon area that can potentially be flooded under a 1-percent annual chance flood event. **Figure 16** shows the industrial land use area totals by FAC that likely have a 1-percent annual chance of flooding.

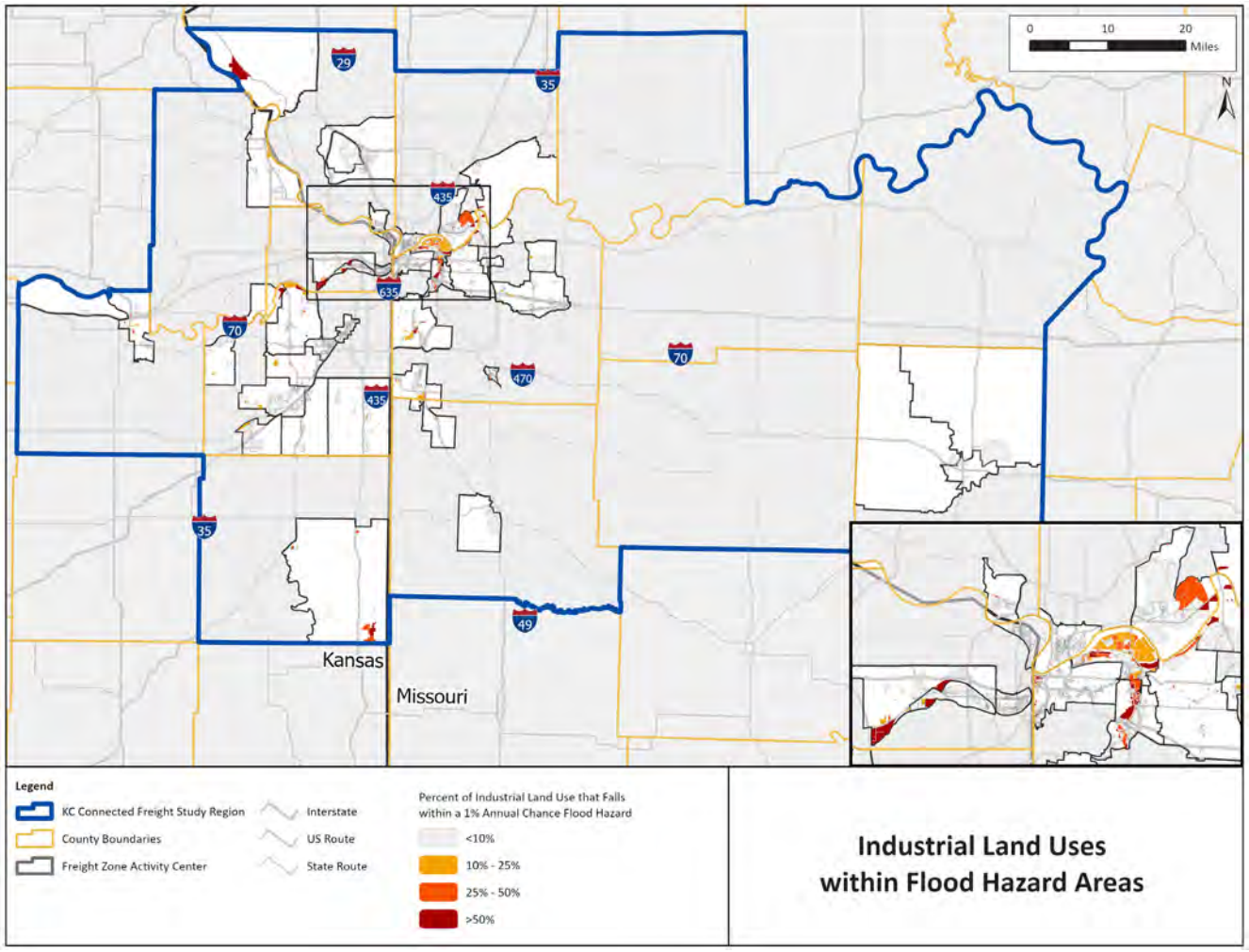

Figure 15. Freight Activity Centers and Flooding Hazards for Industrial Land Uses

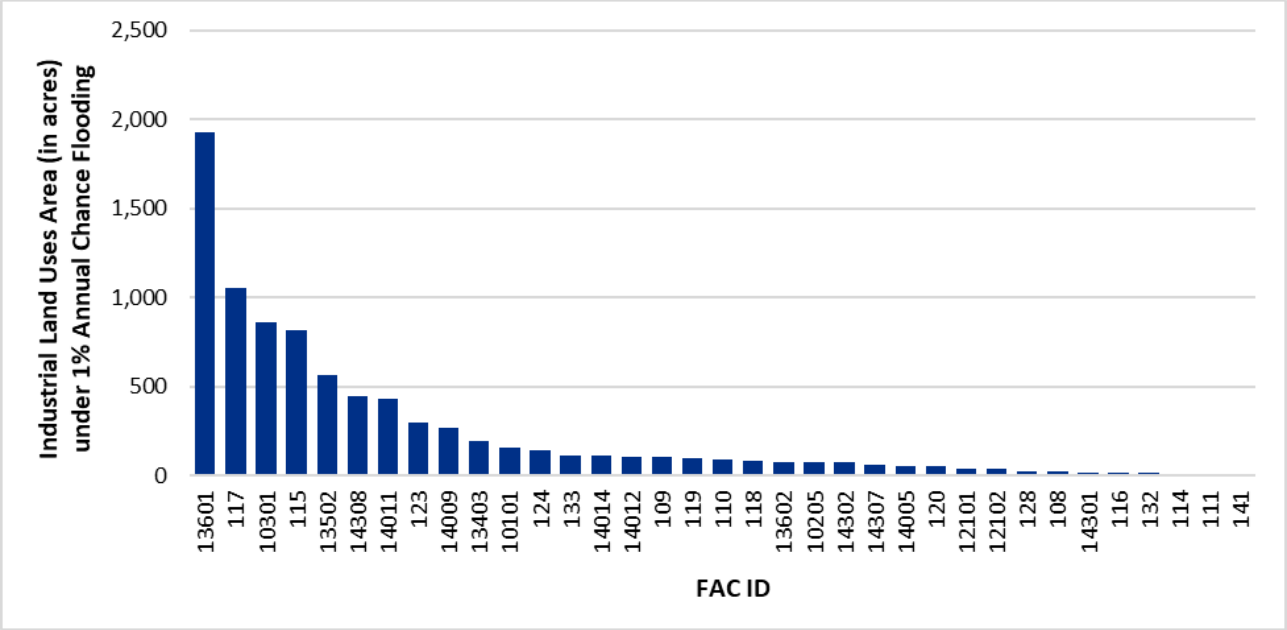

Figure 16. Freight Activity Centers and Area of Industrial Land Uses, 1 Percent Annual Chance of Flooding

3.7.4. Summary

Using the bins defined in the maps for bridge condition, pavement condition, truck bottlenecks, and truck-involved collisions, the project team rated infrastructure needs for FACs as high (H), medium (M), low (L), and not applicable (N/A) categories. For access to major freight modes, the project team rated the FACs using industrial land use total area with 1 or fewer major freight access modes as the criterion, and relative thresholds of above the 85th percentile (high), 50th to 84th percentile (medium), below 50th percentile (low), and zero (not applicable). Similarly, for flooding, the FACs were rated using industrial land use total area under 1-percent annual chance flooding as the criterion, and the same relative thresholds as that for access to major freight modes. The ratings were combined into an overall score by assuming a score of 5 for each "H" rating, 3 for "M" rating, 1 for "L" rating, and 0 for "N/A" rating. Overall needs ratings for each FAC are also based on the relative thresholds applied to the overall score of the FAC. **Table 5** shows the needs assessment results for the top 37 FACs.

Table 5. Data-Driven Freight Activity Center Identification and Needs Rating

Freight Activity Center (FAC) Description					Top FAC IDing					Needs Assessment for Top FAC							
FAC ID	Freight Analysis Zone ID	Freight Analysis Zone Name	Notable Cities/Land Use in Freight Analysis Zone	Planning Agency	"Existing" Total Industrial Rentable Building Area (Square Feet)	Distribution or Warehousing Rentable Building Area Rank	Manufacturing or Food Processing Rentable Building Area Rank	"Existing and/or Future" Industrial Land Use Area (Square Feet)	Industrial Land Use Area Rank	Access to Major Freight Modes Rating	Bridge Condition Rating	Pavement Condition Rating	Mobility Rating	Safety Rating	Flooding Rating	Overall Need Score	Overall Need Rating
108	108	Middle West Johnson County (KS)	Prairie Center	MARC	6,556,360	95	3	62,488,399	28	M	N/A	N/A	N/A	L	L	5	L
109	109	South Central Johnson County (KS)	Olathe	MARC	18,579,453	7	10	282,512,998	3	M	N/A	L	L	M	M	11	L
110	110	South West Central Johnson County (KS)	Gardner	MARC	15,256,272	6	66	205,953,071	4	M	N/A	N/A	N/A	M	M	9	L
111	111	North Central Johnson County (KS)	Lenexa	MARC	23,415,596	3	9	77,740,288	21	L	N/A	L	L	M	L	7	L
112	112	Northwest Douglas County	Lecompton	L-DC MPO	3,373,781	30	14	19,524,457	67	M	N/A	N/A	N/A	L	N/A	4	L
114	114	Southeast Platte County - Northwest Wyandotte County	Fairfax and Riverside	MARC	21,436,550	8	1	100,956,063	18	L	L	M	L	M	L	10	L
115	115	Southwest Clay County - Northwest Jackson County	North Kansas City	MARC	43,547,981	1	2	193,281,660	5	L	M	M	L	H	H	18	H
116	116	North Central Jackson County	Independence	MARC	6,243,695	10	57	12,905,217	73	L	N/A	L	N/A	L	L	4	L
117	117	South Central Clay County - North Central Jackson County	Claycomo	MARC	31,754,025	2	4	443,848,636	1	L	L	N/A	N/A	H	H	12	M
118	118	Northwest Cass County - Southwest Jackson County	Belton and Grandview	MARC	20,465,934	5	5	104,654,924	15	L	L	M	H	H	M	18	H
119	119	Central Platte County	Kansas City International Airport	MARC	3,474,279	22	42	145,094,605	8	M	L	L	N/A	L	M	9	L
120	120	Southeast Clay County	Liberty	MARC	5,482,060	15	31	48,721,231	37	L	H	M	L	M	L	14	M
123	123	Southwest Wyandotte County - Northwest Johnson County (KS) - Southeast Leavenworth County	Bonner Springs	MARC	4,968,725	18	43	37,845,170	45	M	N/A	N/A	N/A	L	M	7	L
124	124	Central Cass County	Harrisonville	MARC	1,323,713	47	70	116,536,935	12	L	L	L	N/A	L	M	7	L
128	128	North East Central Jackson County	Buckner	MARC	950,233	80	25	139,552,760	9	H	L	L	N/A	L	L	9	L
132	132	South Central Jackson County	Lee's Summit	MARC	3,277,309	31	20	34,638,035	47	N/A	N/A	N/A	L	L	L	3	L
133	133	Middle East Central Wyandotte County	Santa Fe / Kansas City	MARC	6,708,818	19	8	65,197,461	27	M	L	L	N/A	L	M	9	L
138	138	Middle East Wyandotte County	Armourdale / Kansas City	MARC	7,109,366	14	12	31,339,050	53	N/A	L	L	N/A	L	N/A	3	L
141	141	North East Central Johnson County (KS)	Overland Park	MARC	6,127,184	13	29	29,792,180	57	N/A	N/A	N/A	M	M	L	7	L
10101	101	Rest of Douglas County		L-DC MPO	3,823,847	27	17	79,536,125	20	M	N/A	H	N/A	M	M	14	M
10205	102	Rest of Leavenworth County		MARC	1,202,831	49	37	102,983,905	16	H	N/A	H	N/A	M	L	14	M
10301	103	Miami County		MARC	109,340	99	81	102,222,178	17	H	M	N/A	N/A	L	H	14	M
12101	121	Northwest and Central Pettis County	Sedalia	Pioneer Trails RPC	3,096,934	39	22	126,301,807	10	N/A	L	L	N/A	M	L	6	L
12102	121	Northwest and Central Pettis County	Sedalia	Pioneer Trails RPC	1,724,328	58	19	29,987,924	56	N/A	L	L	N/A	L	L	4	L
13403	134	Rest of Pettis County		Pioneer Trails RPC	170,654	66	81	282,782,127	2	N/A	H	H	N/A	L	M	14	M
13502	135	Rest of Wyandotte County		MARC	5,282,417	20	15	76,501,842	22	M	L	M	L	H	H	18	H
13601	136	Rest of Platte County		MARC	65,076	81	81	112,872,358	13	H	L	M	N/A	L	H	15	M
13602	136	Rest of Platte County		MARC	7,983,332	11	26	162,843,375	6	H	L	H	N/A	M	L	15	M
14005	140	Rest of Jackson County		MARC	5,208,713	16	36	111,107,783	14	M	L	H	H	H	L	20	H
14009	140	Rest of Jackson County		MARC	6,534,550	12	23	72,131,875	25	L	M	H	H	H	M	22	H
14011	140	Rest of Jackson County		MARC	12,191,950	9	7	89,320,148	19	L	M	M	L	H	M	16	M
14012	140	Rest of Jackson County		MARC	19,750,306	4	6	39,167,740	43	L	H	H	H	H	M	24	H
14014	140	Rest of Jackson County		MARC	3,228,509	38	16	40,226,625	41	L	H	H	H	H	M	24	H
14301	143	Rest of Johnson County (KS)		MARC	5,477,098	25	11	57,925,870	29	M	N/A	M	L	M	L	11	L
14302	143	Rest of Johnson County (KS)		MARC	958,763	46	56	117,716,340	11	H	L	L	H	M	L	16	M
14307	143	Rest of Johnson County (KS)		MARC	5,476,294	17	18	50,419,498	36	M	N/A	L	H	M	L	13	M
14308	143	Rest of Johnson County (KS)		MARC	5,521,182	24	13	157,785,779	7	M	L	H	M	M	H	20	H

4. Local Government Land Use and Infrastructure Recommendations to Manage Freight Impacts

4.1. Local Government Transportation Infrastructure, Site, and Economic Development Recommendations Related to Land Use

The land use and infrastructure recommendations outlined below were created based on the reviews conducted in Section 2 and Section 3 of this document. These considerations are intended to guide local governments in developing an efficient freight system and accommodating new or expanded FAC developments. Incorporating these elements into local freight planning efforts will ensure expansion of existing FACs or location of new FACs in local communities will provide economic benefits while protecting quality of life for all citizens. All recommendations for consideration by local governments when expecting freight are sorted into the three broad categories and subcategories of FAC accommodating land use and infrastructure characteristics.

1. Transportation Infrastructure
    - Capacity (network)
    - Accessibility, Connectivity, and Siting
    - Safety
2. Site Considerations
    - Service Infrastructure (utilities, public amenities, water, sewer, etc.)
    - Environmental (water, waste, emissions)
    - Offsite Impacts (adjacent developments)
3. Economic Development
    - Workforce, Economy, and Quality of Life

4.1.1. Transportation Infrastructure

Kansas City regional transportation infrastructure is of key importance to maintaining and expanding a freight ecosystem and network that retains and encourages FAC private investment. Transportation infrastructure considerations include ensuring the multimodal truck, rail, maritime, and aviation freight networks have capacity to meet existing and future FAC demands. Secondly, accessibility and connectivity provide the ability for freight providers and the community to reach key regional, national, and international destinations utilizing direct and

efficient roadway, rail, maritime, and aviation connections. Finally, the freight network must be safe, providing for minimal risk, injuries, and loss of life that has negative impacts on the overall economy and quality of life for industry and residents of the Kansas City region.

Capacity (Network)

- Prioritize transportation system capacity projects on corridors that benefit the existing FACs.
- Prioritize transportation system capacity projects that alleviate FACs with higher mileage of AM and PM capacity bottlenecks.
- Local governments should work with any technical committees dedicated to enhancing planning and/or coordination of freight plans and programs of municipalities, counties, Metropolitan Planning Organizations (MPO), Regional Planning Organizations (RPO), Councils of Governments (COG), MoDOT, and KDOT by continuing the working relationships of integrating local plans into state planning efforts.
- Work with MARC (in coordination with LDCMPO and PTRPC) to create and maintain a GIS layers database in Planning Sustainable Places Atlas that includes truck counts, freight land use clusters, transportation network connectivity to federal, state, and local routes, locations of industrial and commercial businesses, and square footage of businesses, warehouses, and other freight facilities.
- Continue a local focus on providing utility and transportation access to the FACs identified in this technical memorandum to help increase economic activity and transportation efficiency at these sites, such as access between intermodal and private distribution centers, rest and parking areas for drivers, and fixing choke points and bottlenecks.
- Develop local transportation plans for areas adjacent to freight intermodal facilities, existing, and future FACs by incorporating freight related transportation needs into planning efforts for freight related land use development plans. This includes traffic impact analyses and necessary modal access.
- Prioritize projects at the local level that are designed to improve freight mobility and eliminate freight bottlenecks.
- Locate industrial development along strategic investment corridors and along key nodes that have adequate capacity.
- Land use development and/or redevelopment decisions should consider the effects of off-site regional traffic impacts and those land use assumptions of adjoining jurisdictions.
- Improve and expand airport services, equipment, and facilities when necessary to attract new corporate aviation users and freight service.

- Develop flexible curbside policies to support local businesses with pick-up and drop-off needs.
- Review and as needed, refine policies that govern transportation and its relationship to land use.
- Adjust parking requirements as new transportation technologies such as micromobility and autonomous vehicles change the demand for driving and parking.
- The capacity of arterial roads should be enhanced by limiting the number and location of driveways and street intersections and by other access control measures.
- Developments should be designed and sited to recognize and minimize the impact of the traffic generated on area roads.
- Protect, expand, and control access to the regional highway system.
- Continue to preserve right-of-way for future roadway connections as a component of future development and redevelopment consistent with street classifications.

Accessibility, Connectivity, and Siting

- Prioritize local transportation projects that enhance connectivity to existing FACs that are adjacent to or contiguous to previously developed industrial and commercial properties that are compatible with surrounding community character.
- Prioritize local transportation projects on corridors that enhance connectivity to existing and FACs that utilize brownfields as opposed to greenfield development.
- Prioritize local transportation projects that provide additional modal connectivity to FACs with access via one or fewer modes.
- Prioritize local bridge maintenance/rehabilitation projects that coincide with FACs that have a higher number of bridges in poor condition.
- Prioritize pavement maintenance/rehabilitation projects that coincide with FACs that have a higher number of miles of pavement in poor condition.
- Prioritize local transportation projects that enhance connectivity to industrial and commercially zoned properties that have minimal environmental constraints or high-quality environmental characteristics (streams, ponds, riverbanks, forests, slopes, scenic viewsheds, etc.)
- Work with regional and state planning partners to establish state general revenue funds for railroads and rail access.
- Work with regional and state planning partners to implement a short line infrastructure tax credit to support investment in rail.
- Locate industrial development along strategic investment corridors and along key nodes.

- Promote infill development, where appropriate, to support more compact urban form and avoid needless costly sprawl.
- Promote higher densities and mixed uses in the center of town, commercial and industrial centers, employment centers, and a variety of densities in fringe areas.
- Promote compact, contiguous development to ensure the efficient use of land and to enhance opportunities for alternatives to commuting by car.
- Promote redevelopment that maximizes existing infrastructure.
- Industrial uses should have access to arterials, highways, or interstates within 1/8 mile.
- Encourage preservation of right-of-way or easements to protect trail networks and connections between public lands.
- Encourage development of buffered commercial and industrial uses within walking distance of residences.
- Improve communications with railroad companies to coordinate compatibility between the rail system and land use and transportation systems.
- Leverage the development potential of land adjacent to airports.
- Areas within unincorporated county areas that are currently developing or are expected to develop near cities should be planned in cooperation with nearby cities.
- Use the connectivity requirements of zoning and subdivision regulations to require through streets to adjoining properties, where appropriate.
- Coordinate new development in urban fringe locations to provide pedestrian connections (sidewalks, walking/biking trails) or greenway connections within the development and future adjacent developments.
- Direct the clustering of industrial and commercial uses toward strategic intersections, corridors, and areas adjacent to such existing uses. Such uses should be unified developments, should be compatible with any adjacent industrial or commercial development, and should be appropriately transitioned from any nearby residential development. Such areas should contain compatible environmental characteristics and adequate infrastructure.
- Location criteria for commercial, business park and industrial development should require access to an existing federal or state highway interchange or intersection to limit unnecessary vehicle trips on roads, encouraging access via rail and/or existing airports.
- Promote the assembling of small tracts to form large cohesive parcels that allow for planned commercial centers, business, or industrial parks to occur.

- Maintain any airport overlay zones to protect both the airport and the properties surrounding the airport.
- Industrial uses, other than those of an agricultural nature or operations which need to be in remote locations, should be encouraged to locate within existing cities.
- Commercial or industrial land uses should be encouraged to locate in areas where they are not likely to interfere with or become a nuisance to agricultural operations.
- Separate or buffer proposed industrial uses from surrounding non-industrial uses. Locate heavy industrial uses away from existing or projected residential growth areas.
- Provide direct access onto major thoroughfares and carefully control the number of access points using frontage roads for adjacent industrial and residential land uses.
- Limit development within the 100-year and 500-year floodplains.
- Limit development on slopes over 15 percent grade to mitigate erosion, sedimentation, landslides, and scenic degradation.

Safety

- Prioritize transportation safety projects that address a known issue on a corridor that serves FACs.
- Prioritize truck crash mitigating safety projects that coincide with FACs that have a higher number of truck crashes.
- Partner with MARC, LDCMPO, and PTRPC to develop a commercial vehicle crash database to extract commercial vehicle crash data from the statewide database to identify patterns or safety situations to address.
- Encourage local projects that incorporate complete streets components including sidewalks, bike lanes, bus stops, mid-block crossings, etc. or complete a missing link in the local and regional sidewalk and multimodal trails system.
- Make buildings and development sites safer and healthier by design.
- Minimize truck traffic on local streets outside industrial areas.
- Locally reduce the number of at-grade rail crossings where feasible by giving priority to mitigating or removing them.
- Consider developing at-grade rail crossing studies: A traffic separation study will evaluate the need for improving rail at-grade crossing warning systems or reducing and eliminating at-grade crossings to address potential safety conflicts; thus, allowing partnerships with railroads to prioritize grade crossing improvements.
- Design streets that increase safety, walkability, and bikeability that consider the surrounding context.

- Locally reduce the risk to non-motorized transportation users. Clearly sign and mark bicycle and pedestrian facilities where the Strategic Freight Network and state/local bike routes overlap.
- Evaluate net benefits and costs of new development projects in terms of walkability, bikeability, and provision of adequate night-time lighting.
- Enhance internal walkability in industrial and commercially zoned areas.
- Explore rail routing options for hazardous materials shipments to avoid highly populated areas.

4.1.2. Site Locations

When considering where to expand existing and locate new FACs, there are many site characteristics that should be considered to ensure minimization of expenditures related to provision of utilities and necessary infrastructure, protection of the environment, and impacts to adjacent developments. The following considerations and recommendations associated with these FAC siting characteristics should be applied when local governments are expecting freight investment in their communities.

Service Infrastructure (Utilities, Public Amenities, Water, etc.)

- Commercial and industrial development is best suited in cities or where there is existing commercial/industrial zoning.
- Consider requiring industrial facility developers to provide full infrastructure availability and sewer connections.
- Ensure provision of a high-capacity electrical power supply.
- Ensure provision of reliable telecommunications and internet connectivity.
- Development should be located where public infrastructure (water, sewer, roads) is already adequate or can be most cost effectively extended.
- Industrial businesses should be discouraged from locating where there are no public sanitary sewers to serve them.
- Require that all utility infrastructure be provided by the developer.
- Locate or require the design of industrial development to have access to or develop adequate policy and fire protection.
- Development should be planned so that it is coordinated with future orderly urban expansion, especially with regards to public utilities.

Environmental (Water, Waste, Emissions)

- Avoid or prioritize flood mitigation projects that coincide with FACs that have a higher percentage of industrial land uses with a 1 percent or higher chance of experiencing a flood hazard shown.
- Identify local anti-idling policies to enact in FACs around the region (railyards, queuing areas).
- Support preservation and reclamation of streamway and greenway corridors.
- Minimize adverse impacts on valued natural resources and wildlife.
- Develop new or amended ordinances to further restrict development in the FEMA regulatory floodplain.
- Increase the riparian buffer along waterways for new development.
- Identify and protect buildings, districts, and sites of historical, architectural, archaeological, or cultural significance.
- Support resilient, ecologically healthy development that balances growth and the natural environment.
- Limit unnecessary development of new impervious surfaces and incorporate green infrastructure solutions for stormwater management.
- Development should be sensitive to the natural environment, incorporating or connecting with existing natural resources (open space, woodlands). Scattered development that interrupts open spaces does not contribute to the continuation of existing natural areas should be discouraged.
- The suitability of undeveloped land should be determined considering wetlands, floodplains, steep slopes, bodies of water, woodlands, geology, and open spaces.
- Preserve viewsheds and character along major corridors.
- Drainage easements should be granted for all major drainage ways.

Offsite Impacts (Adjacent Developments)

- Encourage mitigation of negative impacts to residential areas located near industrial areas through adequate buffering, appropriate lighting, and attractively designed sites.
- Encourage protecting and preserving open space and parkland to meet the community's needs.
- Ensure industrial access does not go through adjacent residential areas and buffers are typically present within residential areas.

- Design infill and redevelopment to avoid negative impacts and ensure compatibility and appropriate transitions between land uses.
- Encourage preservation of right-of-way or easements to protect trail networks and connections between public lands.
- Preserve what remains of rural resources by incentivizing preservation and discouraging development of higher intensity uses on prime agricultural land.
- Respect unique community and neighborhood identities, settings, and histories.
- Protect industry from encroachment by residential development and ensure neighborhoods will not be undermined by the impact of incremental expansion of business into residential areas.
- Development in predominantly rural areas should be designed with compatible elements (larger setbacks, low densities, buffering, landscaping) that blend the development into the surrounding rural character.
- Consider the impacts of noise and light pollution on surrounding sensitive receptors and wildlife habitats.

4.1.3. Economic Development

Freight expansion and new investments in the Kansas City region can improve economic opportunities for individuals and families and improve quality of life. Improvements to the regional economy can be realized through intentional efforts at the local government and regional scale that will promote accessibility to jobs while protecting the characteristics that draw and retain residents and jobs in the Kansas City region. The following recommendations and considerations should be considered by local governments when expecting freight.

Workforce, Economy, and Quality of Life

- Work with MARC and regional partners to utilize technological solutions to address truck parking such as real time parking availability, reservation systems, cashless payment, and navigation using smart phone technology.
- Prioritize local projects that enhance job accessibility with a focus on provision of access to minority populations.
- Incorporate local chambers and economic development organizations into local planning efforts and processes.
- Increase and/or raise awareness of training opportunities for careers in logistics and transportation by partnering with local technical training programs and colleges to promote training opportunities.
- Focus on providing development ready sites to attract businesses and jobs.

- Establish affordable housing incentives for new developments.
- Encourage public transportation between housing developments and activity centers to FACs reduce the cost burden on the workforce.
- Explore funding options for the acquisition and assemblage of property in potential development areas.
- Consider defining and enhancing community gateways and focal points to create a sense of place when feasible.
- Development should incorporate placemaking strategies when feasible.
- Adopt climate change action to reduce risks to vulnerable populations such as planting more vegetation in areas that experience urban heat island effects.
- Locally encourage alternative options (compressed natural gas/liquified natural gas) for trucks including fueling stations.
- Include vulnerable population representation in all existing plans and in future planning efforts.
- Promote the use of streetscape and tree canopy improvements to provide a pleasant pedestrian experience.
- Promote citywide and regional sustainability efforts through collaboration education, and incentives.
- Cooperate with the private sector to foster the revitalization of existing commercial and industrial areas to greater vitality.
- Provide strategic technical assistance and information for commercial, and industrial and retail rehabilitation.
- Participate in shared regional data and administrative systems to promote real estate development and reinvestment activity.
- Support and promote regional-based airport commercial and industrial development if adequate infrastructure is provided that includes light-industrial and transportation-based industry, business parks, offices, and residential uses.
- Continue to look for opportunities to establish Foreign Trade Zones in the region.
- Retain existing rail corridors and halt track removal.
- Continue direct support for short-line railroad infrastructure improvements and provision of rail spurs to regional FACs.
- Raise awareness of environmental justice concerns in rail expansions by implementing policies that require National Environmental Protection Act evaluations for mitigating the

impacts to Environmental Justice communities on new rail corridors, as well as rail corridor improvements.

- Create rail focused business parks that increase the opportunity for intermodal movements.
- Provide multimodal connectivity between FACs and complementary businesses and services.