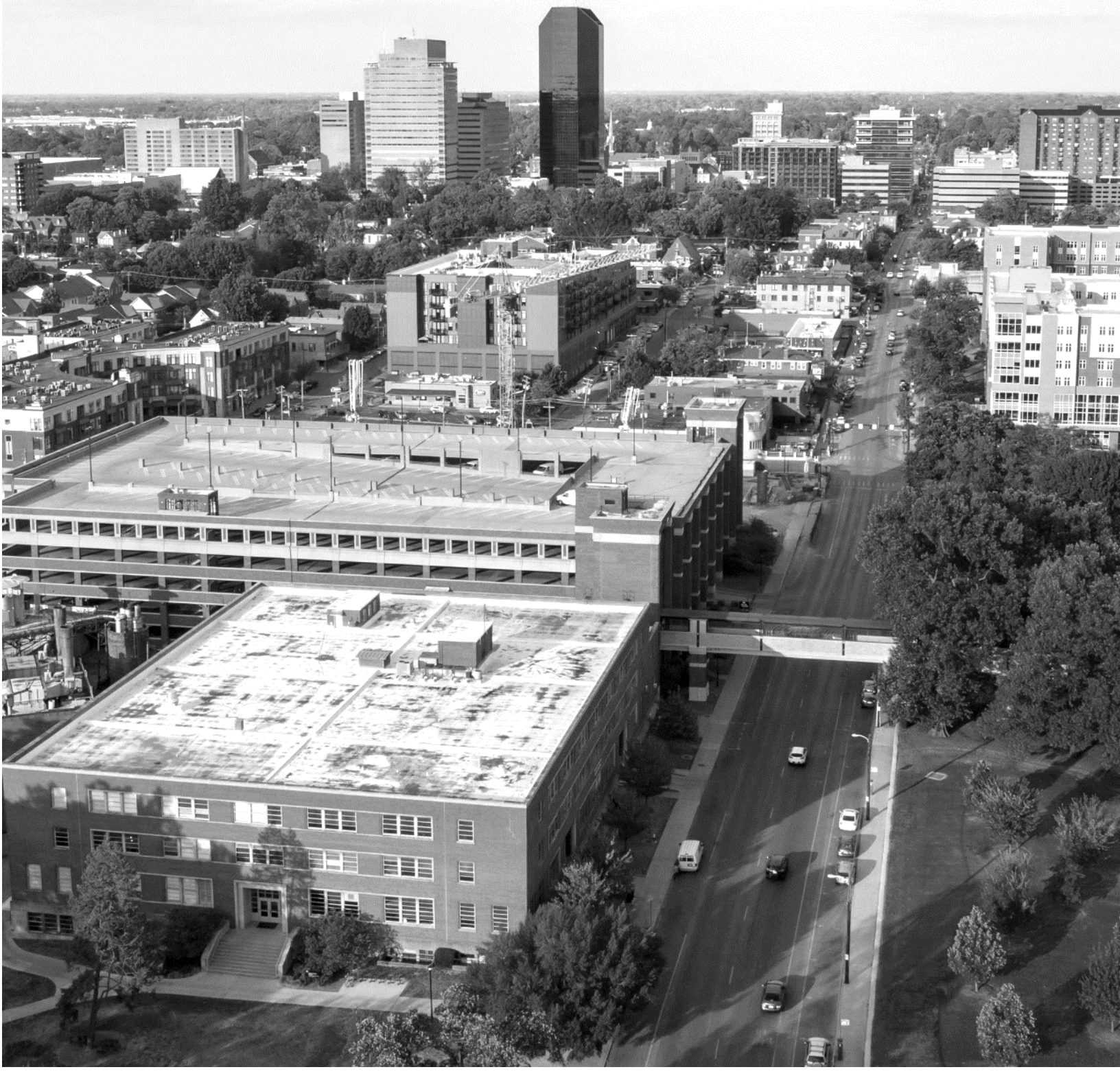
LEXINGTON - FAYETTE

SAFETY ACTION PLAN

June 30, 2023



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Glossary of Terms

Roadways

Buffered Bike Lane: Conventional bike lanes paired with a designated buffer space separating the bicycle lane from the adjacent vehicle travel and/or parking lane.

Pedestrian Head-Start or Leading Pedestrian Interval: Allows pedestrians to enter an intersection before vehicles are given a green indication. With this head start, pedestrians can better establish their presence in the crosswalk.

Permitted-Only Phasing: Displayed with a green ball or a flashing yellow arrow display. The vehicle may turn left but must yield to oncoming traffic and cyclists and pedestrians in the crosswalk.

Protected Bike Lane: Bike lanes that use planters, curbs, parked cars, or posts to physically separate bike and vehicle traffic.

Protected/Permitted Phasing: A portion of the left-turn phase first has a green arrow, allowing left turns while oncoming traffic has a red light (protected), and then has a green ball or flashing yellow arrow (permitted).

Protected-Only Phasing: Displayed with a green arrow first, followed by a flashing yellow arrow, and lastly a red arrow. The vehicle may turn left with right-of-way and will not conflict with any other movements (oncoming traffic has a red light).

Right-Turn Bypass: Allows right-turning traffic to bypass the intersection via a designated lane, providing additional capacity for the through and right-turning movements and better structure and organization of the interaction between turning vehicles and pedestrians and cyclists.

Severe Injury: An injury with a severity that is evidently incapacitating such as amputation or severely disabling

Signalized Intersection: Any at-grade junction of two or more roads at which the right-of-way for motorists, bicyclists, and pedestrians is controlled by a traffic signal.

Signed Controlled Intersection: Any at-grade junction of two or more roads at which the right-of-way for motorists, bicyclists, and pedestrians is controlled by signing (e.g. stop sign and yield sign).

Speeding: The estimated speed of the traveler was greater than the speed limit or the traveler “exceeded safe/posted speed” only in good weather.

Speed as a Factor: When the speed of the traveler was a significant factor in the severity of the crash.

Traffic Control: Markers, signs and signal devices used to inform, guide and control traffic, including pedestrians, vehicles, and bicyclists (e.g., striping, signing, signals, etc.).

Uncontrolled Intersection: Any at-grade junction of two or more roads/driveways at which

the right-of-way for motorists, bicyclists, and pedestrians is not controlled by a traffic signal or signing and right-of-way is defined by the “rules of the road.”

Unsignalized Intersection: Any at-grade junction of two or more roads at which the right-of-way for motorists, bicyclists, and pedestrians is not controlled by a traffic signal.

Principal Arterial Roadway: Provides a high level of traffic mobility for substantial statewide travel and/or serves major activity centers and the longest trip demands within urban areas. A principal arterial is usually a divided multi-lane facility.

Minor Arterial Roadway: These roadways serve trips of moderate length to smaller geographic areas and at a slightly lower level of traffic mobility than Principal Arterials. They provide connectivity to the higher arterial system. These roadways are typically multi-lane facilities.

Major Collector Roadway: Connects adjacent land uses to the arterial network and provides some access to adjacent land uses. Generally, Major Collector routes are longer, have lower connecting driveway densities, and have higher speed limits. A collector is typically a two-lane facility.

Minor Collector Roadway: Provides for internal movement within a residential area connecting local access to collector roads and/or minor arterials. They serve both land access and traffic circulation in lower-density residential and commercial areas. A residential collector is typically a two-lane facility.

Local Roadway: Provides access to specific land uses, particularly residential. Roads of these classifications are two-lane facilities.

Crashes

Animal: A vehicle collides with a domestic or wild animal.

Approach-Turn: One vehicle turns left in front of another vehicle traveling in the opposite direction.

At-Fault: In this analysis, a person is considered at-fault in a traffic crash if they were issued a citation by an officer. Note that when people walking and bicycling are at-fault but are severely injured in a crash, they are often not issued a citation.

Bicycle: Any crash involving a bicyclist.

Fixed-Object: A single vehicle collides with a fixed object. Examples: curb, tree, sign, boulder.

Head-On: A vehicle collides with the front of another vehicle traveling in the opposite direction.

Impaired: Crashes involving a person suspected of, or charged with, driving under the influence of alcohol or drugs (DUI). A person is considered suspected of a DUI when a police officer notes this on the accident report.

KABCO Injury Classification Scale: A system used to grade the severity of injuries resulting from crashes. Crashes are graded as one of the five following categories:

K = a fatality resulting from the crash
A = incapacitating injuries such as amputation, disabling, and/or more
B = the victim has minor injuries such as cuts or scrapes but are not incapacitating
C = there is possible injury but on a lesser scale
O = there were no apparent injuries at the scene

Overtaking-Turn: One vehicle turns in front of another vehicle traveling in the same direction. Example: right-turn from the left lane.

Overturning: A single vehicle tips over onto its side or roof.

Parked-Vehicle: A vehicle collides with a parked vehicle while traveling on the roadway or maneuvering into or out of a parking space.

Pedestrian: Any crash involving a pedestrian.

Pedestrian-Dash: The pedestrian ran into the roadway and was struck by a vehicle whose view of the pedestrian was not obstructed.

Pedestrian-Dart-Out: The pedestrian walked or ran into the roadway and was struck by a motorist whose view of the pedestrian was blocked until an instant before impact.

Rear-End: A vehicle collides with the rear end of another vehicle traveling ahead of it in the same direction.

Right-Angle: Two vehicles traveling in perpendicular directions collide at approximately a right angle, often referred to as a broadside or T-bone crash. This crash type can occur at uncontrolled intersections or as a result of one vehicle running a red light.

Severe: Throughout this document, serious injury crashes and fatal crashes are often referred to collectively as “severe crashes.” Serious injury crashes are crashes where one or more persons involved in the crash incurred an injury that is evidently incapacitating. Such injuries may include severe lacerations, broken bones, internal injuries, or any injury that requires transportation to a hospital for treatment.

Sideswipe-Same-Direction: A vehicle collides with the side of another vehicle traveling in the same direction, often due to improper lane changes.

Sideswipe-Opposite-Direction: A vehicle collides with the side of another vehicle traveling in the opposite direction.

1. Leadership, Commitment, and Goal Setting

Lexington-Fayette Urban County Government (LFUCG) is committed to achieving the goal of safe streets and roads for all users. This is demonstrated by the resolution later in this section (**Figure 1-1**), which states that the region's transportation leaders including LFUCG have established *"a goal of working towards zero traffic fatalities and serious injuries by the year 2050."* That resolution also provides a directive to *"identify projects, programs, strategies, policies, and ordinances that will be effective in accomplishing that goal."* The resolution acknowledges that the regional economic impact of fatal and serious injury crashes has been nearly $1 billion since 2012. It also notes the importance of implementing *"projects, strategies, and policies that are effective in reducing and eventually eliminating traffic-related fatalities and serious injuries."*

The Lexington-Fayette safety action plan (SAP) is specifically identified as a critical activity. It is noted that the SAP includes an analysis of existing conditions, historical trends, systemic needs, and specific needs. It also presents projects and strategies to address the identified needs. The full text of the resolution is on the last two pages of this section.

LFUCG's commitment and leadership in implementing safety-focused projects, strategies, and policies are also supported by many current programs and policies.

The City of Lexington formally adopted a Complete Streets Policy on December 6, 2022. The vision for that policy is *"for people of all ages and abilities to have a diversity of safe, convenient, affordable and reliable transportation options..."* and the stated intent is to *"provide an equitable, balanced, safe and efficient transportation system..."* With regard to implementation, *"LFUCG shall, to the greatest extent practical, design and operate roadways that provide safety for all users, with the goal of reducing or eliminating serious and fatal injuries of both vehicle occupants and non-motorized users."* It goes on to say*, "Complete Street design principles shall be incorporated, as appropriate, into all publicly and privately funded projects, including new construction, reconstruction, rehabilitation, repair, and maintenance of transportation facilities..."* The policy outlines over 20 design references that should be conformed to and then adds that *"where guidance conflicts, or provides a menu of options, engineering judgment shall be used to determine the preferred roadway design based upon the greatest expected degree of safety and in consideration of adjacent land use and context."* Regarding the prioritization of projects to be implemented, it states that improving safety for all modes, particularly vulnerable roadway users should be taken into consideration.

The City's 2018 Imagine Lexington Plan (approved February 28, 2019) outlines several major themes for growth and development in Lexington. Many of these themes discuss the importance of safety and outline steps to improve it. For example, in the Neighborhoods Theme, vulnerable road user safety is discussed in the goals section, and within the design section it states, *"people-first design should ensure that pedestrian and bicycle users' safety is assured by the incorporation of traffic calming measures that slows traffic and increases driver awareness."* In the Community Theme section, connectivity is discussed with the statement that the *"design of the public realm includes all users and modes of transit, resulting in the creation of safe, efficient streets."* There are many other references to safety, especially pedestrian and bicycle safety throughout the document.

The City has a Neighborhood Traffic Management Program that has been in effect for many years. Two of the program objectives specifically address safety:

- To promote safe and pleasant conditions for residents, pedestrians, bicyclists, and motorists on local neighborhood and residential collector streets

- To achieve efficient and safe movement of traffic within neighborhoods (including emergency vehicles) consistent with the intended function of the residential streets

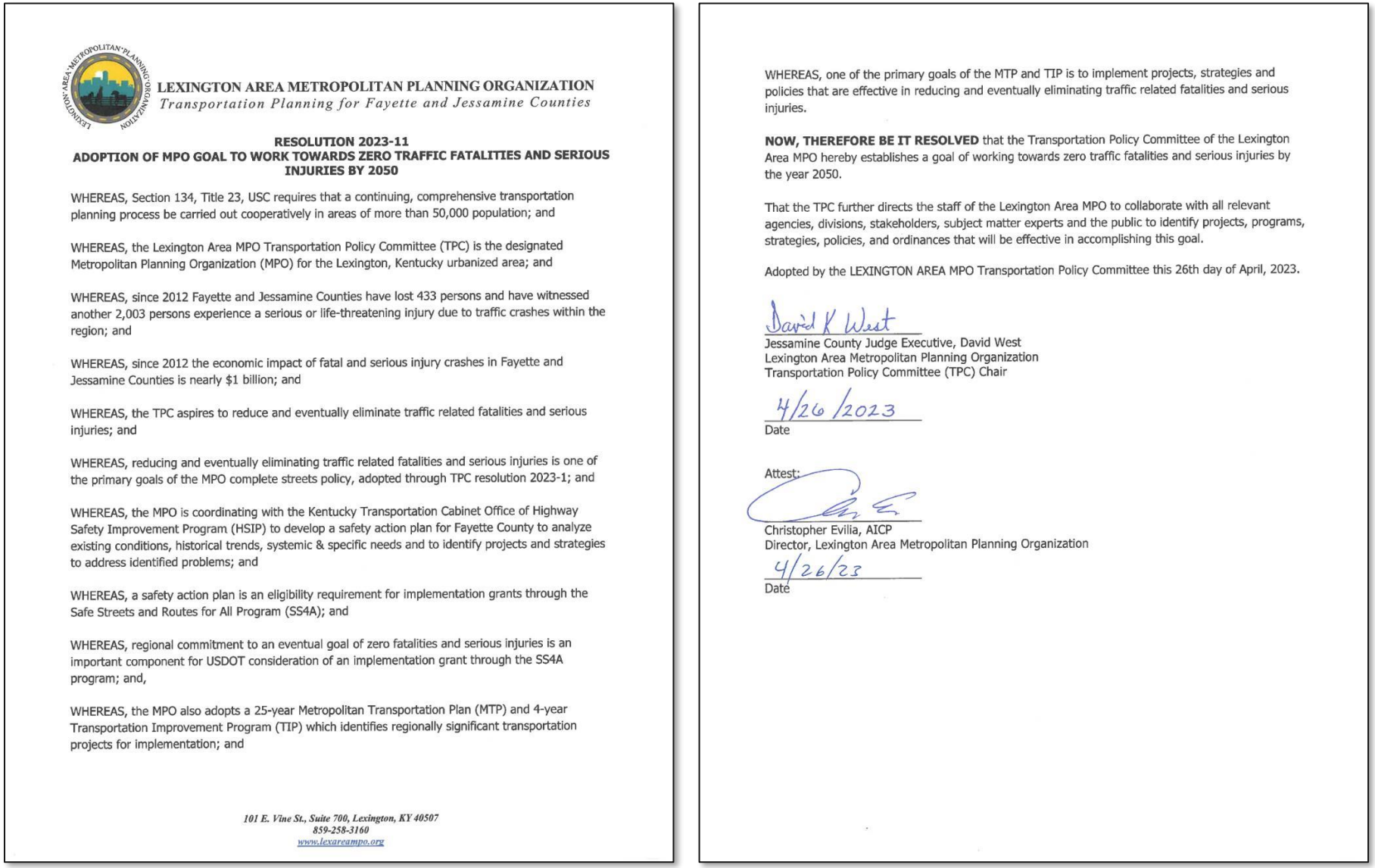
The program provides a mechanism for communities to implement traffic management on neighborhood and residential collector streets, benefiting safety for all street users.

LFUCG's Safe Streets campaign is an education and outreach initiative to make Lexington's roadways safer for all users – motorists, cyclists, and pedestrians. The campaign uses videos, social media, in-person events, yard signs, printed materials, and other approaches to educate and motivate people regarding traffic safety for all users. This program is paid for with public and private non-profit funds.

For most of the last 33 years, Lexington has had a Safety City educational program for young students. The program is managed by the Lexington Police Department. It covers various traffic safety topics including motorist, pedestrian, school bus, and bicycle safety. Students also have the opportunity (weather permitting) to drive the mini-cars and apply their knowledge. This program has educated thousands of youth in traffic safety over the years.

Finally, LFUCG has implemented or is implementing numerous safety-focused planning, design, construction, and operations projects throughout Lexington. These projects are often implemented in coordination with the Kentucky Transportation Cabinet (KYTC) if they are on state highways.

Figure 1-1. LFUCG Safety Resolution



LEXINGTON AREA METROPOLITAN PLANNING ORGANIZATION
Transportation Planning for Fayette and Jessamine Counties

RESOLUTION 2023-11
ADOPTION OF MPO GOAL TO WORK TOWARDS ZERO TRAFFIC FATALITIES AND SERIOUS INJURIES BY 2050

WHEREAS, Section 134, Title 23, USC requires that a continuing, comprehensive transportation planning process be carried out cooperatively in areas of more than 50,000 population; and

WHEREAS, the Lexington Area MPO Transportation Policy Committee (TPC) is the designated Metropolitan Planning Organization (MPO) for the Lexington, Kentucky urbanized area; and

WHEREAS, since 2012 Fayette and Jessamine Counties have lost 433 persons and have witnessed another 2,003 persons experience a serious or life-threatening injury due to traffic crashes within the region; and

WHEREAS, since 2012 the economic impact of fatal and serious injury crashes in Fayette and Jessamine Counties is nearly $1 billion; and

WHEREAS, the TPC aspires to reduce and eventually eliminate traffic related fatalities and serious injuries; and

WHEREAS, reducing and eventually eliminating traffic related fatalities and serious injuries is one of the primary goals of the MPO complete streets policy, adopted through TPC resolution 2023-1; and

WHEREAS, the MPO is coordinating with the Kentucky Transportation Cabinet Office of Highway Safety Improvement Program (HSIP) to develop a safety action plan for Fayette County to analyze existing conditions, historical trends, systemic & specific needs and to identify projects and strategies to address identified problems; and

WHEREAS, a safety action plan is an eligibility requirement for implementation grants through the Safe Streets and Routes for All Program (SS4A); and

WHEREAS, regional commitment to an eventual goal of zero fatalities and serious injuries is an important component for USDOT consideration of an implementation grant through the SS4A program; and,

WHEREAS, the MPO also adopts a 25-year Metropolitan Transportation Plan (MTP) and 4-year Transportation Improvement Program (TIP) which identifies regionally significant transportation projects for implementation; and

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WHEREAS, one of the primary goals of the MTP and TIP is to implement projects, strategies and policies that are effective in reducing and eventually eliminating traffic related fatalities and serious injuries.

NOW, THEREFORE BE IT RESOLVED that the Transportation Policy Committee of the Lexington Area MPO hereby establishes a goal of working towards zero traffic fatalities and serious injuries by the year 2050.

That the TPC further directs the staff of the Lexington Area MPO to collaborate with all relevant agencies, divisions, stakeholders, subject matter experts and the public to identify projects, programs, strategies, policies, and ordinances that will be effective in accomplishing this goal.

Adopted by the LEXINGTON AREA MPO Transportation Policy Committee this 26th day of April, 2023.

David K West
Jessamine County Judge Executive, David West
Lexington Area Metropolitan Planning Organization
Transportation Policy Committee (TPC) Chair

4/26/2023
Date

Attest:

Christopher Evilia, AICP
Director, Lexington Area Metropolitan Planning Organization

4/26/23
Date

2. Planning Structure

The current Lexington-Fayette Safety Advisory Working Group was formed in early 2023 from a prior slightly smaller working group that had been advising LFUCG and KYTC on the creation of the Lexington-Fayette Safety Action Plan since mid-2022. Current working group members represent the following agencies and entities:

- Lexington-Fayette Urban County Government (LFUCG)
  - Planning
  - Traffic and Transportation
  - Operations
  - Outreach
- Lexington Area Metropolitan Planning Organization (LAMPO)
- Kentucky Transportation Cabinet (KYTC)
  - District 7
  - Central Office
- Transit Authority of the Lexington-Fayette Urban County Government (Lextran)
- Fayette County Public Schools
- Lexington Police Department

The intent of the working group is to advise LFUCG and KYTC on the development, implementation, and monitoring of the plan. The working group has provided input and feedback on potential safety needs and possible reactive and systemic safety countermeasures. Having the many different perspectives and agencies in the meetings has facilitated effective communication and resulted in a more effective safety action plan; one that better addresses the five elements of the Safe System Approach. The dialogue will continue in the future as the plan is implemented, updated, and enhanced over time.

The current working group is a re-institution of an earlier safety-focused group that had become temporarily inactive due to the considerable activity of the Pedestrian Safety Working Group. Efforts are now underway to determine how to coordinate these two working groups so that the unique mission of each is preserved while acknowledging the substantial overlap of goals and participants. Another related safety working group was convened in 2021, which was focused on wrong-way driving in the LFUCG region. Many of the members of that group are also part of the current working group.

The LFUCG Safety Advisory Working Group met several times in 2023 to discuss the development of the plan. These meetings were in-person, but with a virtual option available if necessary. **Figure 2-1** shows an excerpt from one of the meetings. A summary of these meetings to date are as follows.

- 01-27-2023 – Overview of the process, overview of crash trends and statistics for Lexington-Fayette County, process for identifying and ranking corridors and intersections, discussion of reactive and systemic analysis methods
- 04-28-2023 – Presentation of the top reactive corridors and intersections including potential countermeasures, received feedback on many locations and countermeasures/improvements
- 05-11-2023 – Review of top reactive corridors, received feedback on additional corridors, presented the systemic safety needs/risks that were identified, discussed these needs/risks and potential countermeasures

These meetings were very useful for vetting the high-priority corridors and discussing the improvements that could be considered. The group discussed the highest-ranking corridors in detail (which are further discussed in **Chapter 7**). One result of these discussions was that New Circle Road was identified as the corridor where LFUCG could make the biggest impact in reducing fatal and serious injury crashes in the next several years. The corridor ranked second overall, but it ranked first for the number of fatal and serious injury crashes, and it ranked first for the weighted "value" of the crashes in the corridor. These discussions led to the recommendation of New Circle Road for LFUCG's 2023 Safe Streets for All (SS4A) Implementation Grant Request.

Figure 2-1. Safety Advisory Working Group

In addition to the above three meetings, there were several meetings with the prior working group in 2022. These meetings discussed the safety action plan process, elements, study area, data, and high-level community-wide findings.

A meeting was also held with the previously mentioned Pedestrian Safety Working Group. Members of this group include LFUCG (engineering, traffic, planning, parks, and outreach), Lextran, the University of Kentucky, and KYTC District 7. This meeting focused on the reactive and systemic challenges identified relative to pedestrians and bicyclists. It included a discussion of potential countermeasures that could be considered. This meeting covered motorist challenges and potential countermeasures as well. Other topics included the SS4A program and a high-level overview of Lexington's safety challenge.

Other ad hoc discussions and meetings have been held throughout the plan development process. These meetings have provided opportunities for review, comment, and feedback by the staff involved.

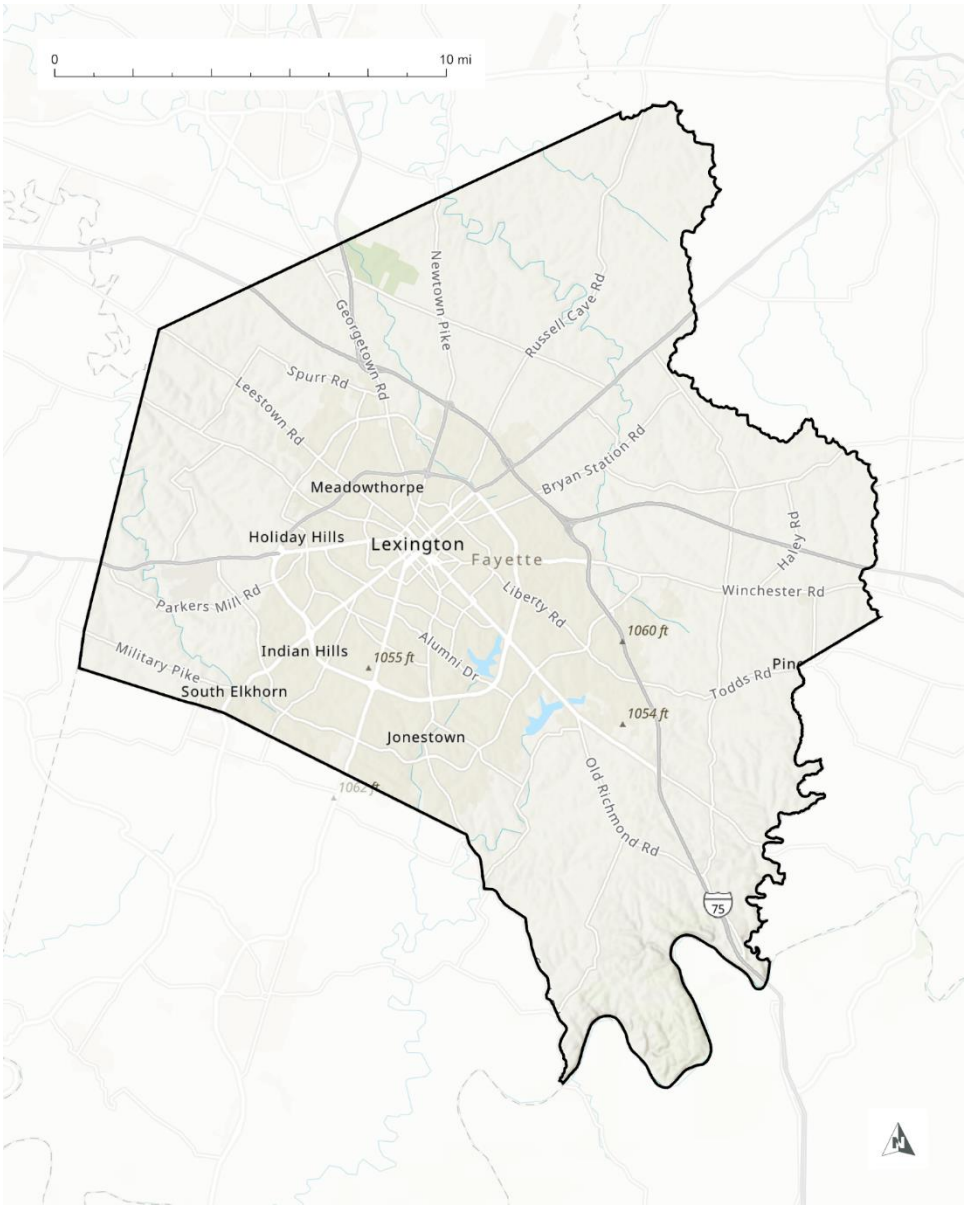
The LFUCG Safety Advisory Working Group will continue to meet through the remainder of 2023 to discuss how to implement the findings of this action plan and how to reach out more effectively to the broader community, including disadvantaged populations in the future.

3. Safety Analysis

Study Area

The study area for the safety analysis includes the entirety of Fayette County, Kentucky which is coincident with the City of Lexington boundaries, as shown in **Figure 3-1**. This study includes all state highways and local streets within the County. However, Interstate highways were not included as they do not fall under the purview of the KYTC Highway Safety Improvement Program (HSIP) which focuses on non-interstate highways. It also does not include parking lot crashes as those are privately owned facilities and do not fall under KYTC's purview. New Circle Road (KY4), even though a portion of it is a controlled access facility, was included in the analysis as it is not an interstate.

Figure 3-1. Study Area



There are over 1,700 miles of roadways in the study area, which is broken down into the following categories:

- State Maintained: 270 miles
- County Maintained: 113 miles
- City Facilities: 996+ miles

These roadways fall into many classifications ranging from local to interstates. The general layout of the Lexington roadway network is a hub-and-spoke system where New Circle Road serves as the loop facility around the majority of the urban/suburban core and the major arterials connect across and through the downtown area. Many of these arterials are state facilities that pass through the entirety of Lexington, changing typical section, context, name, and other parameters as they traverse the study area.

Crash Data

The safety analysis has been conducted for the 5 years of crash data between 2015 and 2019. (Summary statistics data for 2020 and 2021 are included in some tables within this chapter for context and to document trends throughout the study area.) The 2015-2019 period represents pre-pandemic data and thus is not affected by the changes in travel patterns and behaviors observed during the COVID-19 pandemic. This period was selected based on both the desire to study consistent crash trends over a consecutive period as well as the availability of data when the project originated.

Methodology and Data

Crash data used for analysis was obtained from the Kentucky State Police (KSP) Crash Database, through a custom field dataset provided by the Kentucky Transportation Center (KTC). This data is primarily collected by various city, county, and state police department crash investigation teams when they complete a Kentucky Uniform Police Traffic Collision Report form. This form captures critical information about the crashes including data such as location, type, severity, individuals and units involved, environmental factors, and the contributing factors of each crash. This information ultimately is entered into a database maintained by the KSP.

There are some limitations in the data available for analysis. For example, in crashes involving pedestrians and/or bicycles, it is not possible to determine whether the person injured in the crash was the pedestrian, bicyclist, or driver. It is reasonable, however, to assume that those with the least amount of protection would be injured. So, for this analysis, it was assumed that for crashes involving pedestrians or bicyclists, the pedestrian or the bicyclist was the injured party.

Pedestrian crashes refer to crashes involving at least one pedestrian and one motor vehicle. Similarly, bicycle crashes refer to crashes involving at least one bicycle and one motor vehicle. Vehicle crashes refer to crashes involving at least one vehicle and that do not involve a pedestrian or a bicycle. Please refer to the glossary of terms for a complete description of crash types.

It should also be noted that there were some crashes recorded with “unknown” or “hit and run” crash severities. These may have involved minor property damage and were generally not reported at the time of crash occurrence and/or without all of the units or individuals present. It can be assumed that most of these crashes were very low in severity and resulted in minimal property damage. For this analysis, they have been included in the property damage only (O) category of severity. There is a separate category of “hit and run” crashes as a crash data field that may have varying levels of severity;

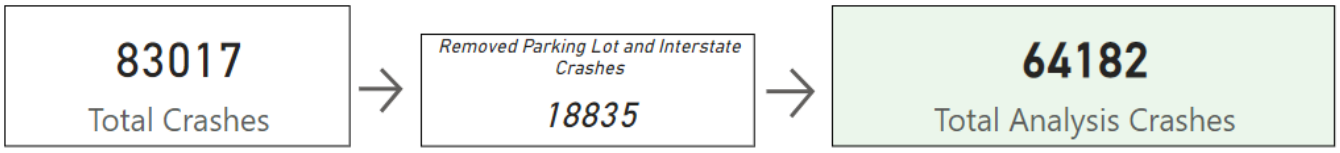
those crash severities were retained and were not grouped into the “O” severity like those mentioned above.

Historic Crash Analysis

Overview

Between 2015 and 2019, police officers responded to over 83,000 crashes in the study area. As shown in **Figure 3-2**, of the 83,017 reported crashes, approximately 18,835 took place on the Interstate (I-75/I-64) or in parking lots and so these were excluded from the analysis. Therefore, of the 83,017 total reported crashes, 64,182 were included in the analysis.

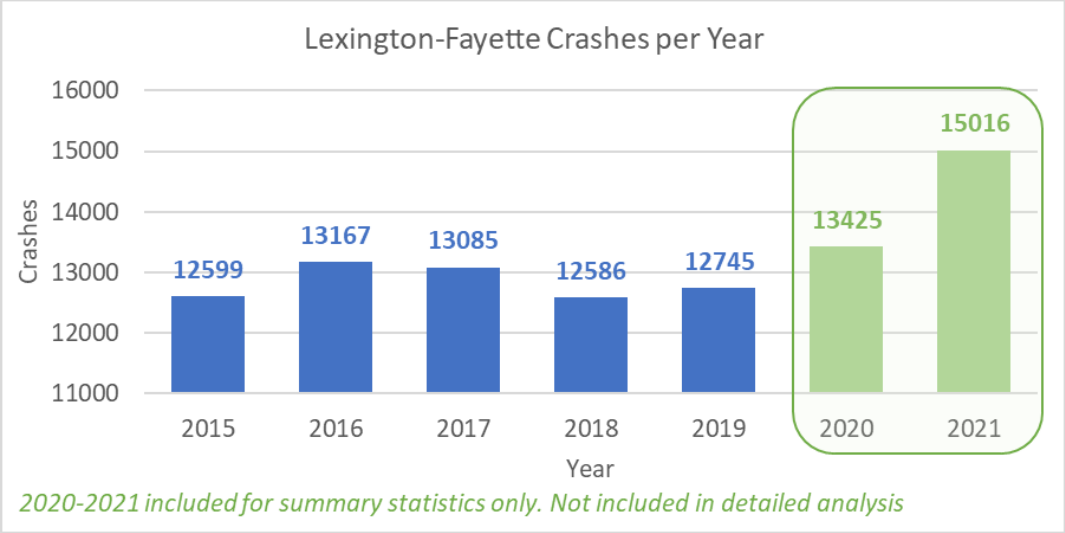
Figure 3-2. Analysis Period (2015-2019) Crashes

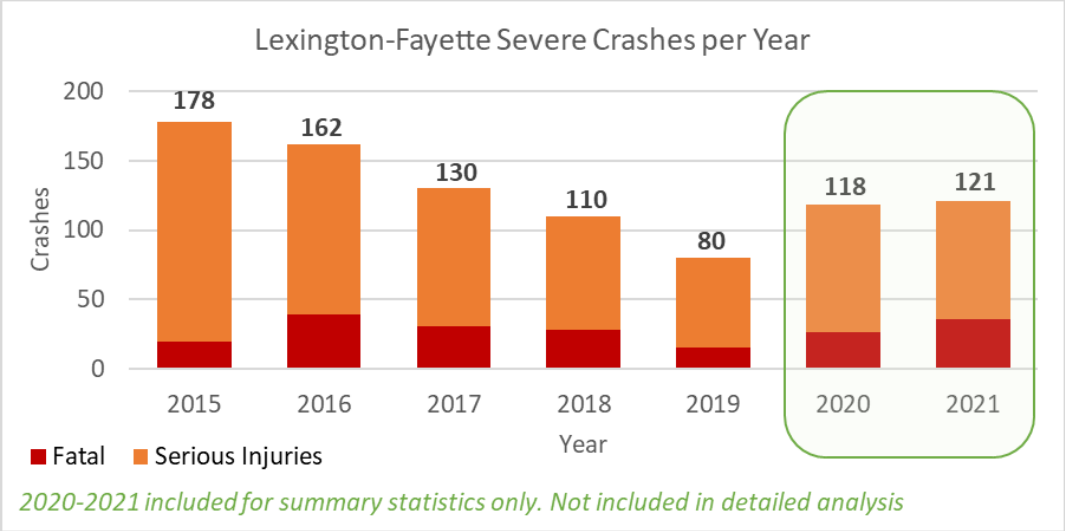


The 2015-2019 crash analysis period indicates that annual crashes remained relatively flat between 12,600 and 13,200 crashes per year (with an increase in overall crashes for both 2020 and 2021). The distribution of severe crashes (fatal (K) and serious injury (I)) crashes have decreased year-over-year (except for 2020 and 2021 which increased to average levels observed during the analysis period). This is summarized in Figure 3-3.

Figure 3-3 shows the trajectory of severe crashes through the study period. 2015 observed 178 severe crashes while 2019 had 80, a decrease of more than 50% within five years. This reduction in reported severe crashes could be attributable to several factors, ranging from a successful effort in deploying safety initiatives, changes in crash severity reporting, or potentially other unknown external factors.

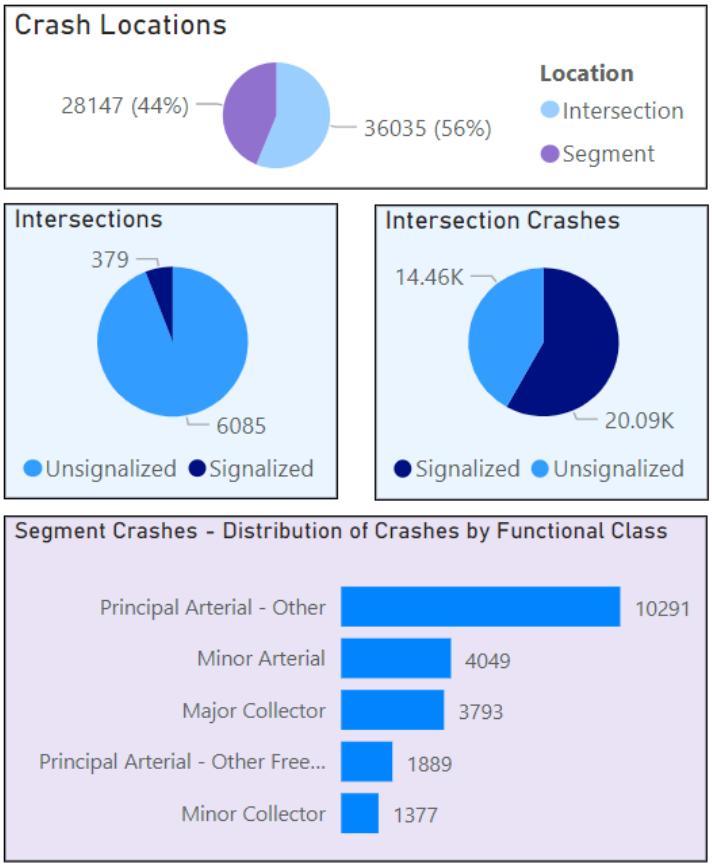
Figure 3-3. Overall and Severe Crashes per Year





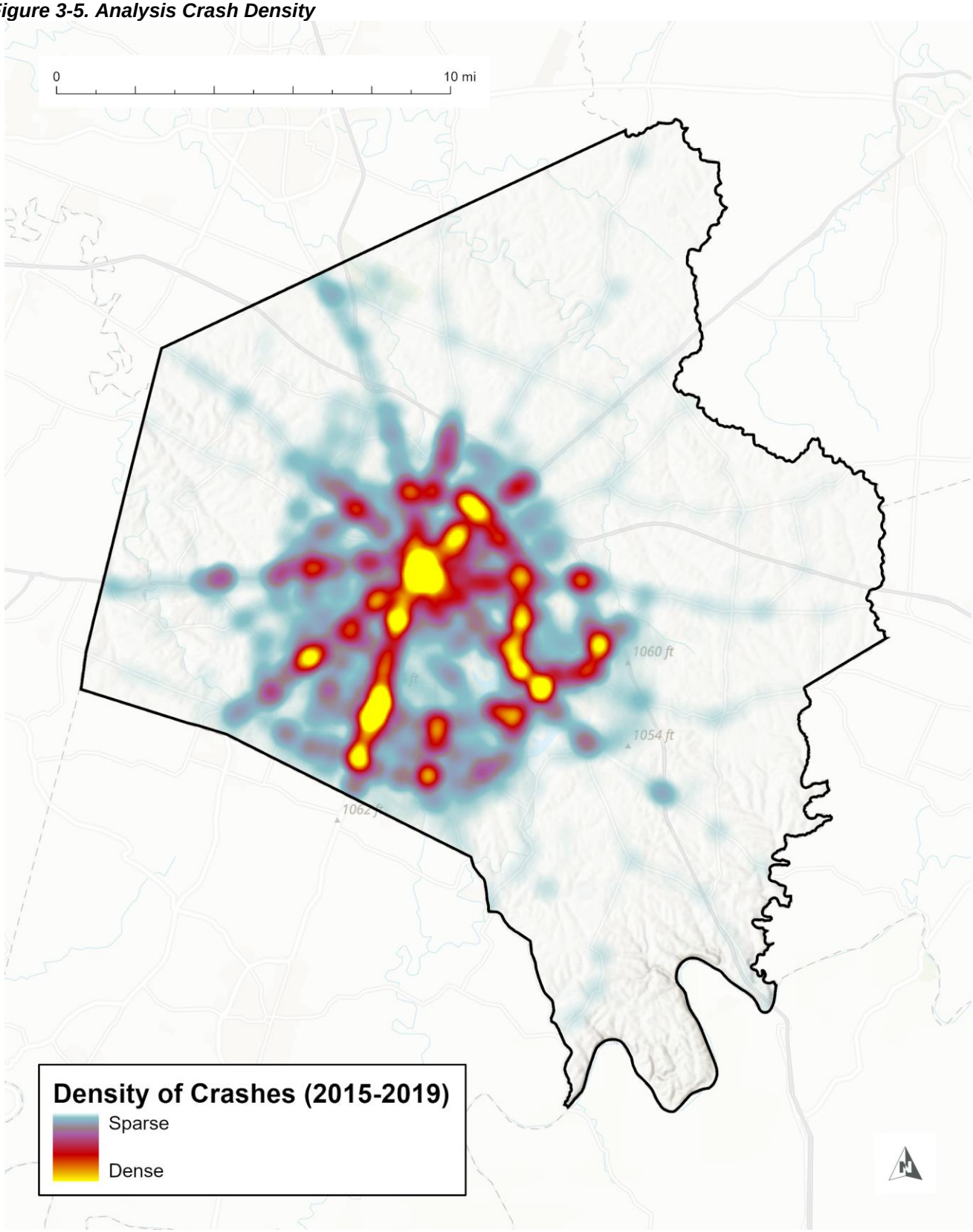
Crashes were categorized as either segment or intersection crashes, and a breakdown is included in **Figure 3-4**. Of the 64,182 crashes in the analysis, approximately 56% occurred at intersections. Of these intersection crashes more than half were at signalized intersections, which only account for about 6% of the intersections. Of the 28,147 crashes that occurred along roadway segments, 37% were along principal arterials followed by approximately 14% along Minor Arterials and Major Collectors. 30% of the roadways in the study area are classified as Arterials, thus it is not surprising that 50% of the crashes also occur along them.

Figure 3-4. Analysis Crashes by Location



The density of the analysis period crashes is shown in **Figure 3-5**. A significant majority of crashes occur inside or along New Circle Road (KY 4). This is likely due to exposure rates, as a majority of the population lives and works around this area.

Figure 3-5. Analysis Crash Density



Crash Severity

Crash severity is categorized by KABCO which results in the following severity categories:

Table 3-1. KABCO Severity Details

KABCO	Severity Description	Crashes (2015-2019)
K	Fatal	133
A	Serious Injury	527
B	Non-serious Injury	3,831
C	Possible Injury	5,608
O	Property Damage Only	54,083

Figure 3-6 shows the breakdown of study area crashes by severity. Most of the crashes were property damage only (54,083) or possible injury (5,608) which represents 93% of the crashes in the study area. There were 660 severe crashes (K and A category) which account for 1% of the total crashes.

Figure 3-6. Crash Severity Breakdown

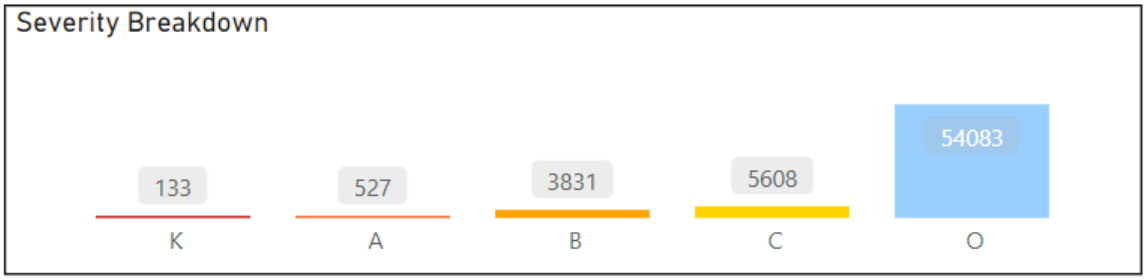
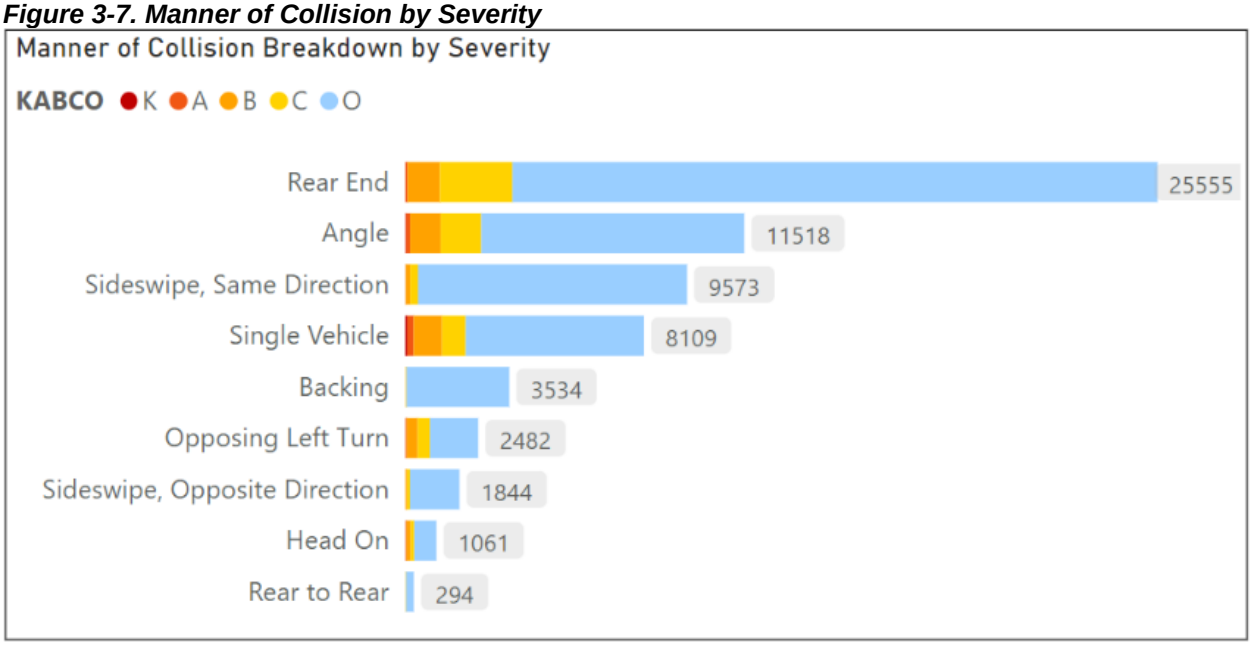


Figure 3-7 shows the breakdown of crashes by crash types by severity.

Figure 3-7. Manner of Collision by Severity



As shown, rear-ends are the most common type of vehicular crashes making up over 41% of all the crashes in the 5-year study period. Although this type of crash is very common, it tends to be less

severe and mostly involves property damage. As can be seen in **Figure 3-7**, a significant majority (99.7%) of these crashes involved only property damage (O) or minor injury (B & C). Following rear-ends, the other most common types of crashes are angle (11.5k), same direction sideswipes (9.5k), and single vehicle (8.1k) crashes. Together with rear-ends, they make up over 86% of all crashes.

The most severe crash types, those which resulted in the greatest number of deaths and/or severe injuries, were single-vehicle (289), angle (161), and rear-end (86) crashes. These crash types combined account for over 81% of all severe (K & A) crashes. The breakdown of severe only crashes by type is shown in **Figure 3-8**. The location of all severe crashes within Lexington is shown in **Figure 3-9**.

Figure 3-8: Severe Crashes by Manner of Collision

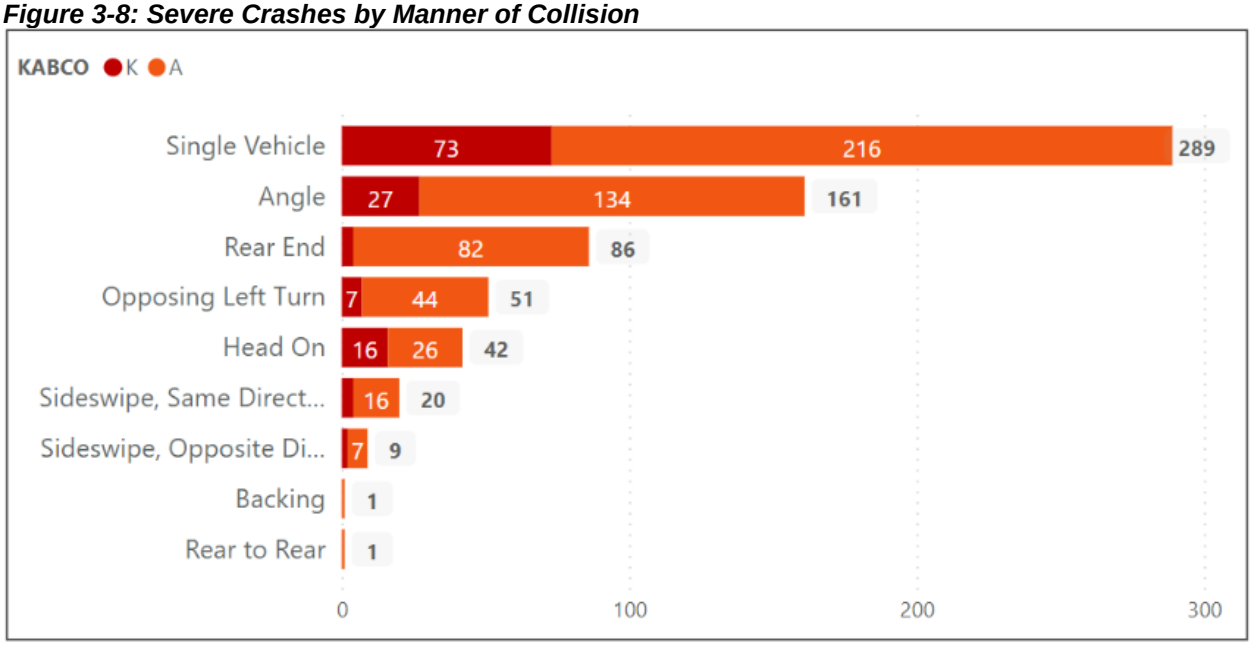
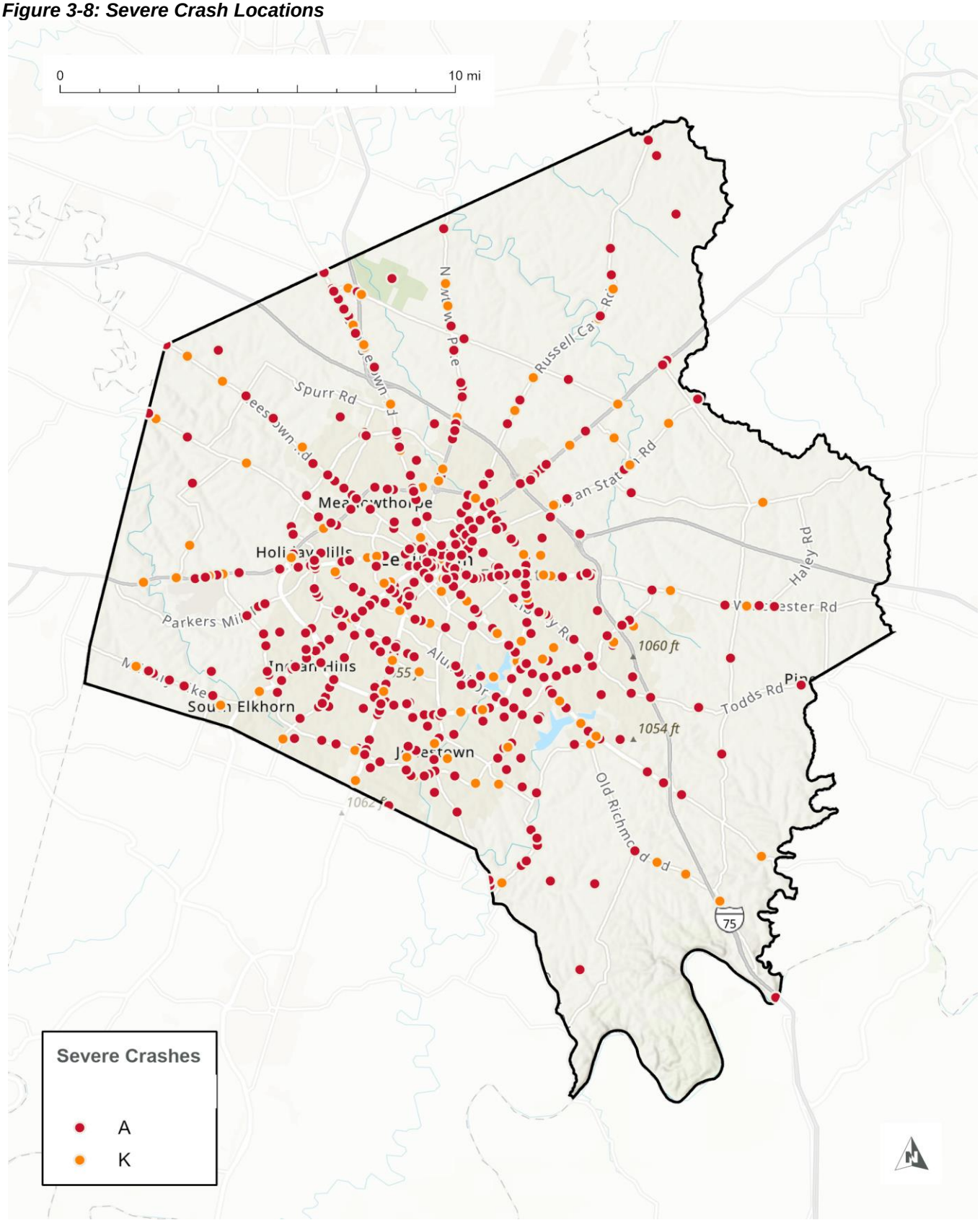


Figure 3-8: Severe Crash Locations



Crashes by Location

Crashes are categorized as being associated with either intersections or segments, which serve as mutually exclusive categories. Of the approximate 64,000 crashes in the analysis, intersections account for 56% (36,035) of the crashes and segments account for 44% (28147) of the crashes as shown in Figure 3-9. From a spatial perspective, intersections occupy significantly less area than roadway segments, but due to the nature of intersections and the presence of conflicts they account for more than half of the total crashes and 46% of the fatal crashes in Fayette County.

Figure 3-9. Crash Location Summary

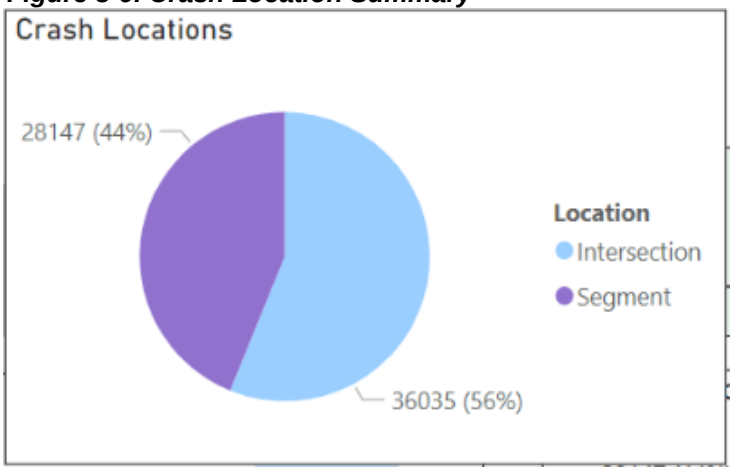
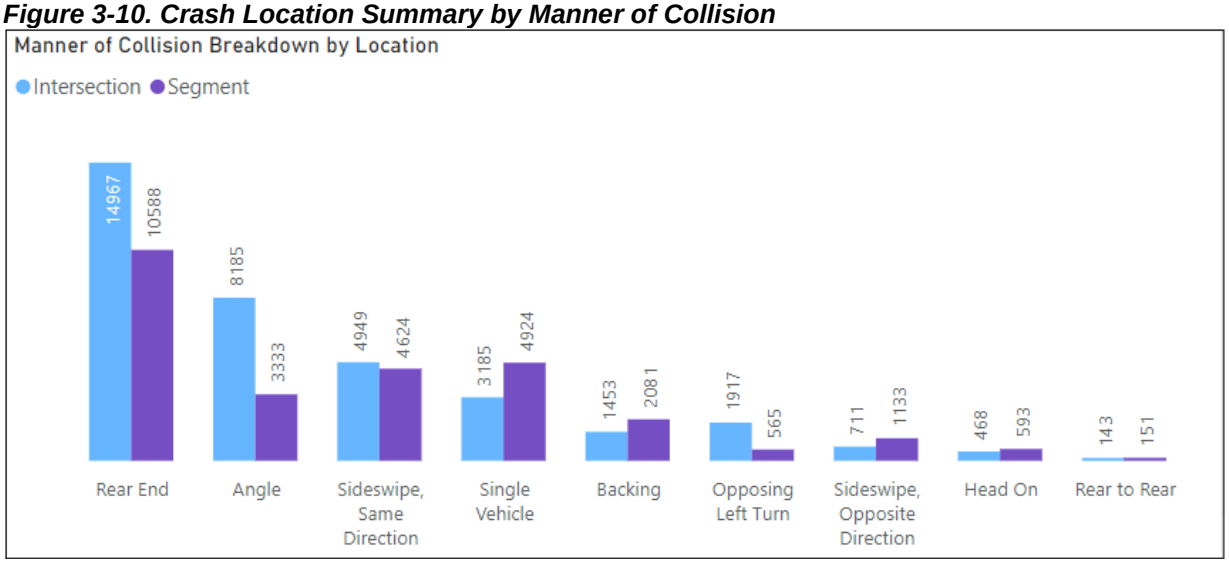


Figure 3-10 shows the manner of collision breakdown based on crash location. As shown, intersections have more rear end, angle, and opposing left turn crashes than segments.

Figure 3-10. Crash Location Summary by Manner of Collision

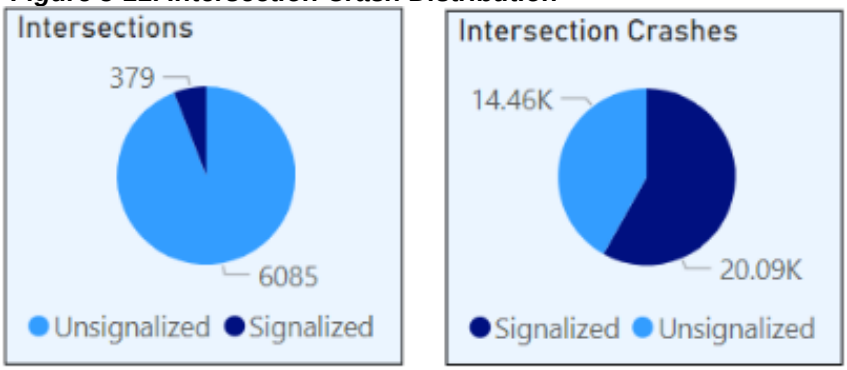


Intersection Crashes

Signalized intersections account for approximately 5% of the total intersections but are responsible for more than half of the intersection crashes. These intersections typically have higher traffic exposure and are located on more congested roadways and junction points. Of the 20,088 total crashes recorded at signalized intersections, half of them occurred at only 69 intersections with 5 intersections having

250 crashes or more. Figure 3-11 shows the breakdown of intersection crashes by signalized and unsignalized intersections.

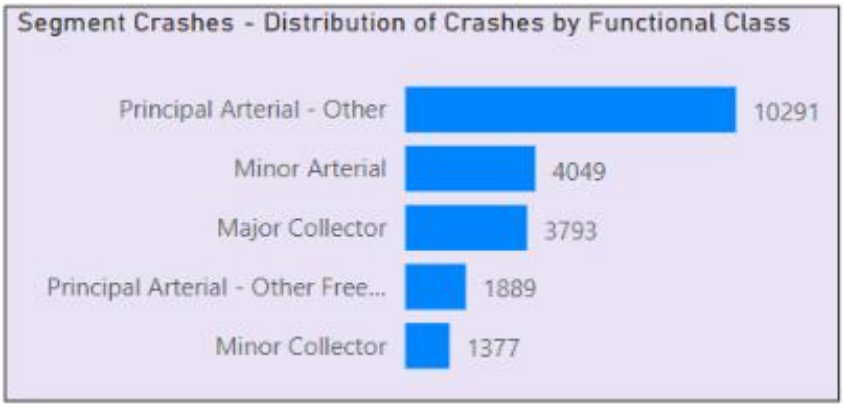
Figure 3-11. Intersection Crash Distribution



Segment Crashes

Crashes on roadway segments account for 46% of the total crashes in Fayette County. Of these segment crashes, the majority are occurring on Principal Arterials, e.g. New Circle Road, Nicholasville Road, Harrodsburg Road, Winchester Road, and others. Aside from New Circle Road, the principal arterials are primary connector facilities throughout the city and thus have a significant increase in traffic exposure and junction points. **Figure 3-12** shows the segment crashes based on functional class.

Figure 3-12. Segment Crash Distribution



Crashes by Mode

Crashes by travel mode are categorized as vehicle, pedestrian, or bicycle crashes. Vehicle crashes account for all crashes except for those involving either a pedestrian or bicycle. Unsurprisingly vehicular crashes account for the vast majority of crashes experienced in Lexington representing 63,184 or 98.4% of all crashes. Figure 3-13 and **Table 3-2** present the modal breakdown of these crashes. Vehicular-only crashes resulted in 533 severe crashes (less than 1%). Pedestrian and bicycle crashes represent 712 and 286 total crashes which result in 113 severe pedestrian (15.8%) and 14 severe bicycle (4.9%) crashes.

Figure 3-13. Modal Crash Breakdown by Severity

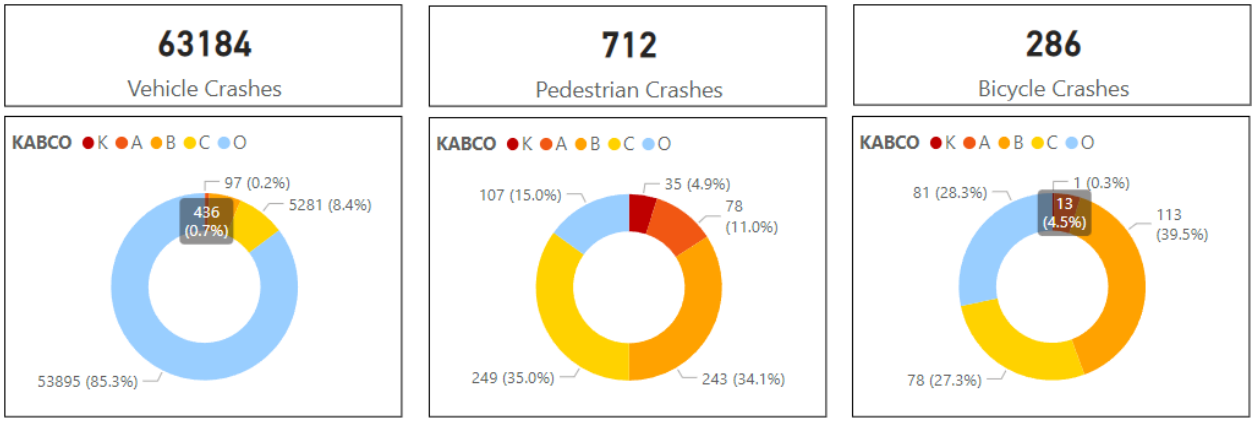


Table 3-2. Modal Crash Breakdown

Description	Mode of Travel						
	Vehicle		Pedestrian		Bicycle		Total
	#	%	#	%	#	%	
All Crashes	63,184	*98.4%*	712	*1.1%*	286	*0.4%*	64,182
Severe Crashes (KA)	533	*80.8%*	113	*17.1%*	14	*2.1%*	660
Number of Fatalities*	103	*73.6%*	36	*25.7%*	1	*0.7%*	140
Number of Injuries*	13,141	*94.2%*	599	*4.3%*	206	*1.5%*	13,946
Intersection	35,379	*98.2%*	451	*1.3%*	205	*0.6%*	36,035
Segment	27,805	*98.8%*	261	*0.9%*	81	*0.3%*	28,147

The number of fatalities and injuries is not a one-to-one match with crashes. A crash may contain multiple injuries or fatalities or a combination of both.

Approximately 1,000 crashes involved at least one pedestrian or bicycle. Of these, a significantly higher percentage resulted in a fatality or severe injury. Although bike/ped crashes only make up 1.5% of all crashes by mode, approximately 26% of all fatalities were a result of these types of crashes. Pedestrian crashes produced the greatest number of fatalities and injuries as compared to their share of total crashes. They make up approximately 1% of all crashes yet 17% of them result in a fatality or severe injury.

Assuming that most of the injuries and fatalities incurred in pedestrian or bicycle crashes are those sustained by people using these modes of travel, then 84% of pedestrians involved in a crash will sustain injuries and over 5% of them will be fatal. Similarly, for cyclists, 73% of them will be injured; however, less than 0.5% will be fatal.

Pedestrian Crash Details

Pedestrian crashes are the most severe types of crashes within the study area with the highest ratio of severe crashes. Pedestrians have little defense in vehicular crashes, especially while within the roadway network (crossing, traversing, etc.). Based on the severity and vulnerability of pedestrians in crashes, these crashes were examined more in-depth to identify any patterns or contributing factors influencing pedestrian crashes. In addition to the typical data fields, the pedestrian crash data also contains detailed information regarding the pedestrian action(s) at the time of the crash which may help further identify focus areas and potential countermeasures to address these types of crashes and crash severities.

The pedestrian actions were summarized into 10 general groupings to better categorize the behavior for analysis purposes. The breakdown of crashes and severity by each action is shown in Figure 3-14. As shown, the two primary pedestrian actions causing crashes by frequency are those categorized as crossing correctly (234) and risky activity (193), making up 60% of pedestrian crashes. After these two categories there is a significant drop in crash frequency but not severity as Crossing Against Signal, Not at Intersection, and Impaired all have a margin of severe crashes.

Figure 3-14. Pedestrian Crossing Actions by Severity

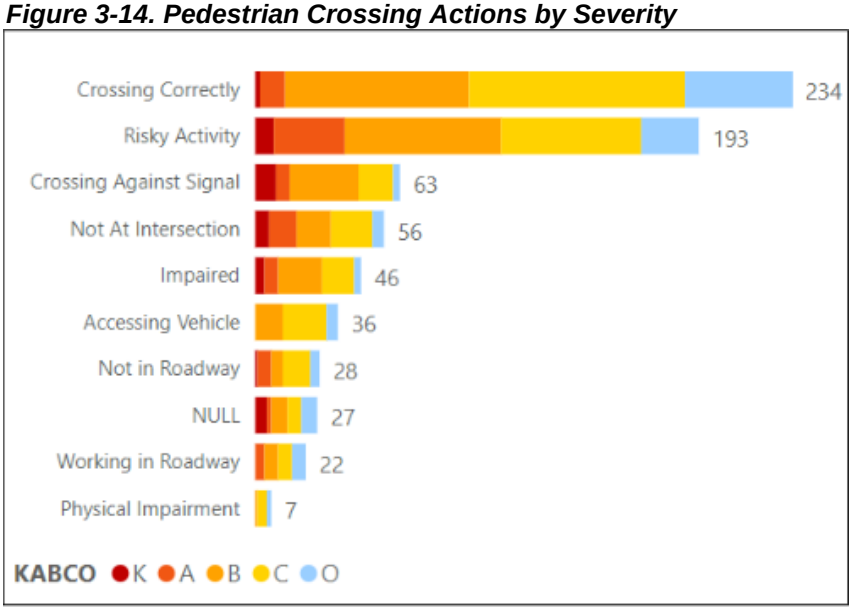


Figure 3-15 shows the breakdown of pedestrian crashes by action by location. Generally, intersections are the most prominent locations for pedestrian crashes, similar to vehicular crashes, likely due to the increase of logical conflicts. As expected, the actions typically associated with intersections (crossing correctly, crossing against signal, etc.) occur primarily at intersections. The other pedestrian actions are mostly split evenly between intersection and roadway segment locations.

Figure 3-15. Pedestrian Crossing Actions by Location

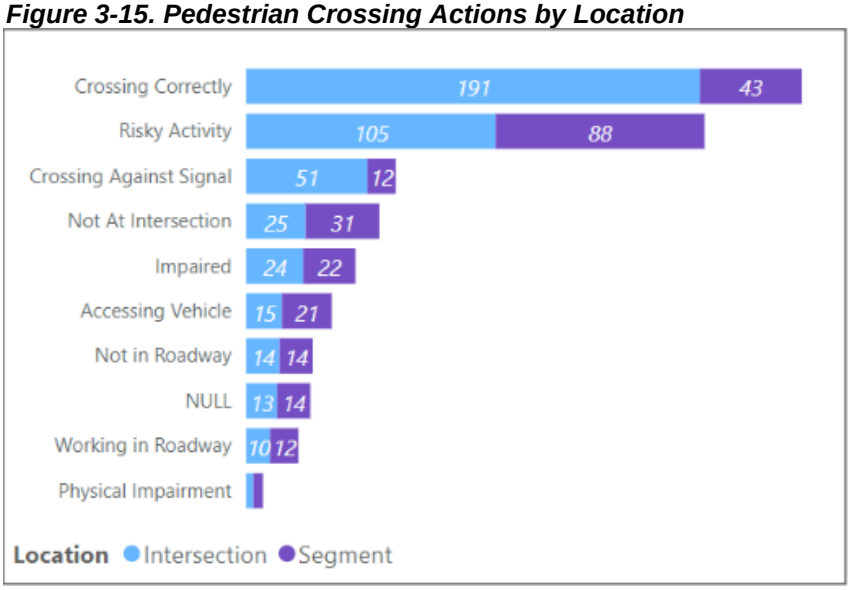
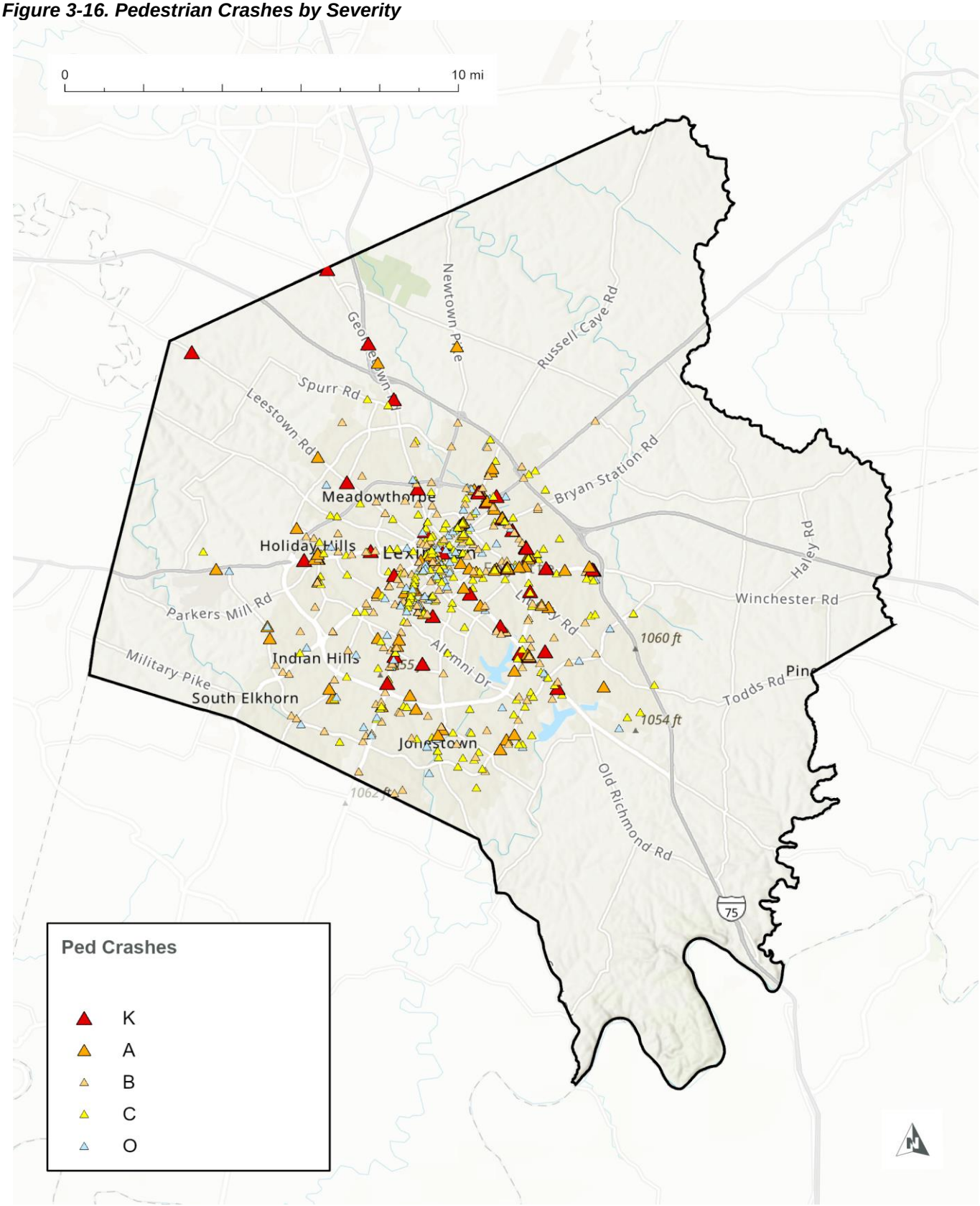


Figure 3-16 shows the location of the pedestrian crashes by severity. Pedestrian crashes occur throughout the study area but are primarily occurring on arterial facilities as opposed to collectors and local roadways. Additionally, the pedestrian crashes are more concentrated through the downtown core and college campus areas as well as along Nicholasville Road, Winchester Road, N Broadway Road, and the Northern section of New Circle Road. These areas have higher vehicular volumes, higher speeds, typically longer and potentially more complex pedestrian crossings, and more destinations for pedestrians.

Figure 3-16. Pedestrian Crashes by Severity



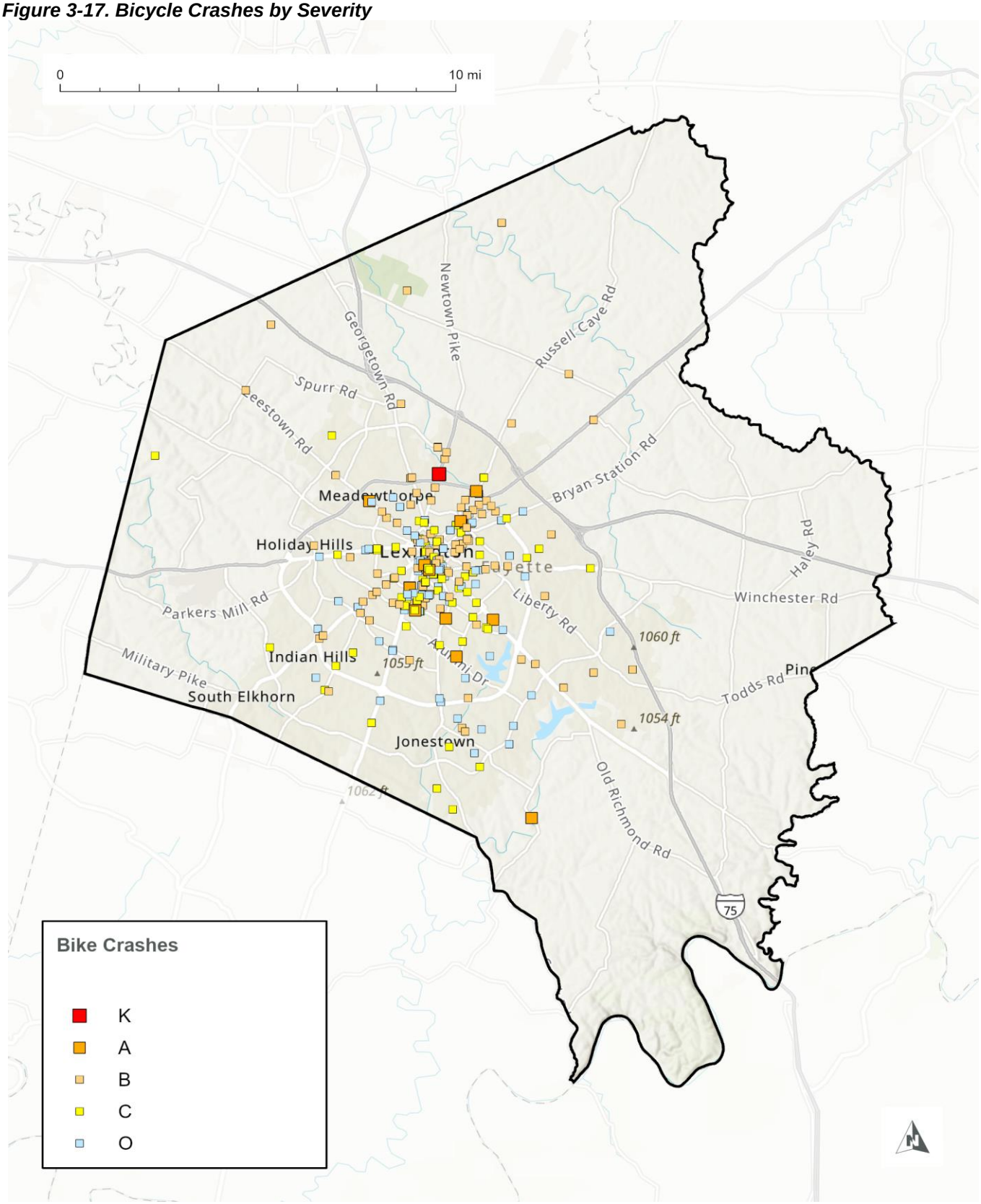
Bicycle Crash Details

Bicycle crashes, similar to pedestrian crashes, exhibit a higher severity distribution than vehicle-only crashes which is expected due to the level of protection for bicyclists as compared with vehicles. Within the study period, there were 286 bicycle crashes, of which 14 were severe (1 fatal, 13 serious injuries).

The data does not contain the same level of detail for human factor behavior that is present in pedestrian crashes for bicycle crashes; however, all crashes contain human factor data as it relates to the driver(s), which may represent both automobile and/or bicyclists. The human factor data does not indicate a significant contributing factor to these crashes as the vast majority are comprised of actions including none detected (154), failed to yield right of way (53 crashes), and inattention (35). These are all common human factors associated with all crashes.

The location of bicycle crashes by severity is shown in **Figure 3-17**. As shown, bicycle crashes are not isolated to one particular area or roadway type and occur throughout the study area. These crashes are more concentrated in the downtown core and near the college campus areas, likely due to higher exposure from either vehicular volume or bicyclist volume, or both.

Figure 3-17. Bicycle Crashes by Severity

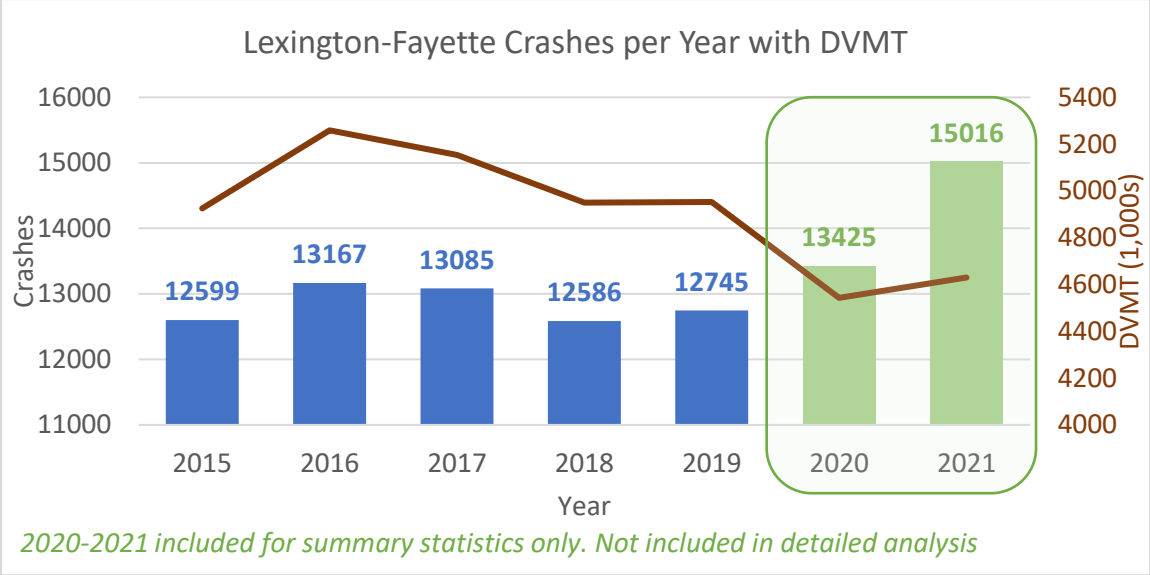


Temporal Trends

Yearly Analysis

Figure 3-18 represents the yearly distribution of crashes over the 5-year study period. As can be seen generally there were approximately 12,000 crashes reported every year in the study area with 2016 and 2017 experiencing approximately 500-600 more crashes. One possible explanation for the increase in crashes during these years could be the increase in travel as the potential for crashes increases with higher exposure rates. 2016 and 2017 both had slightly higher daily vehicle miles traveled (DVMT) as compared to the rest of the study years.

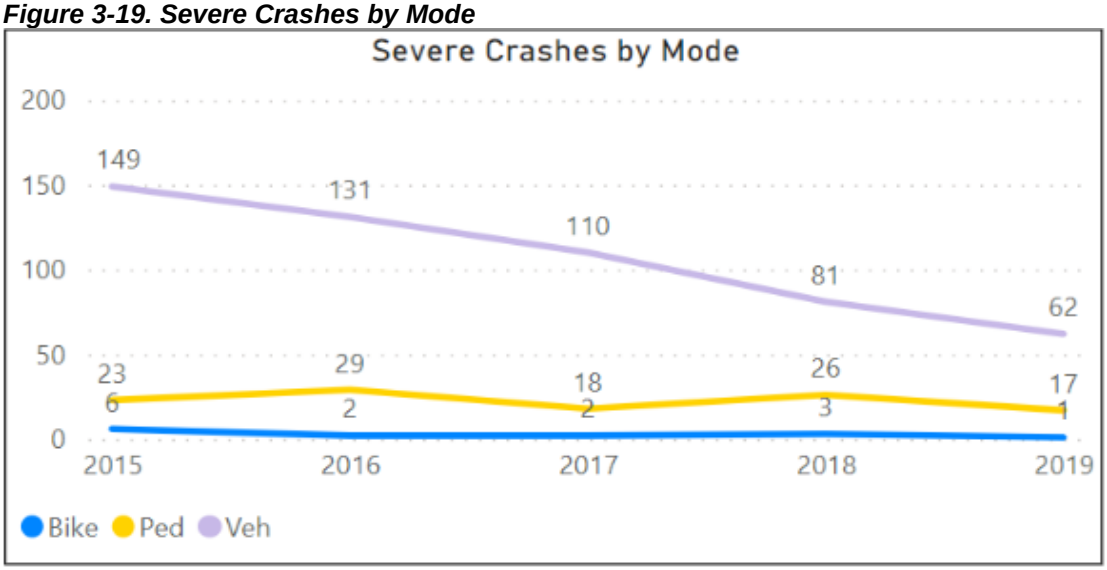
Figure 3-18. Annual Crashes by DVMT



Although the number of crashes per year over the study period has remained relatively constant, the number of severe crashes (K & A) has been decreasing year over year, as shown and discussed in the crash overview section and Figure 3-3, previously.

Pedestrian crashes did not see the same trend with crash severity. The number of pedestrian severe crashes fluctuates, but the overall severity breakdown as a percentage of the total severe crashes increases. Severe pedestrian crashes went from 13% to 21% of the total severe crashes. So, while the total number of severe crashes is decreasing significantly, pedestrian severity is emerging as a focal area. **Figure 3-19** highlights the crash severity breakdown by travel mode over the study period.

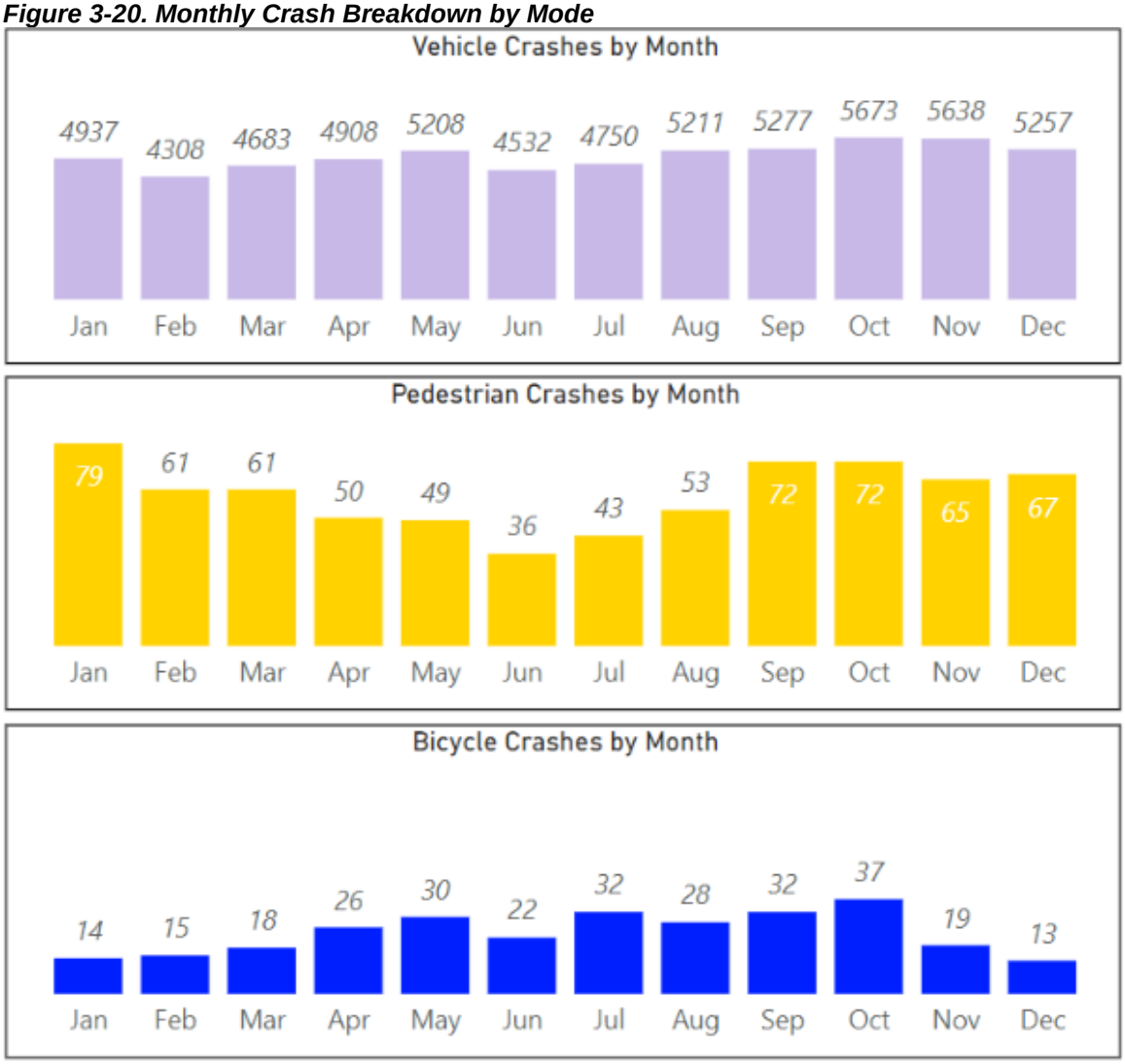
Figure 3-19. Severe Crashes by Mode



Monthly Analysis

Figure 3-20 presents the crashes by month over the 5-year study period broken down by all modes of travel. Overall the vehicular crashes are fairly flat with peaks in the spring (May) and fall (October and November). Pedestrian and bicycle crashes, while with a smaller sample size, have more distinct monthly peaking periods. The bicycle crashes peak during the summer months, likely associated with an increase in bicycle activity due to weather. Conversely, pedestrian crashes peak during the fall and winter months from September to January, which is counterintuitive to exposure and may be attributed to the academic calendar and/or seasonal lighting conditions.

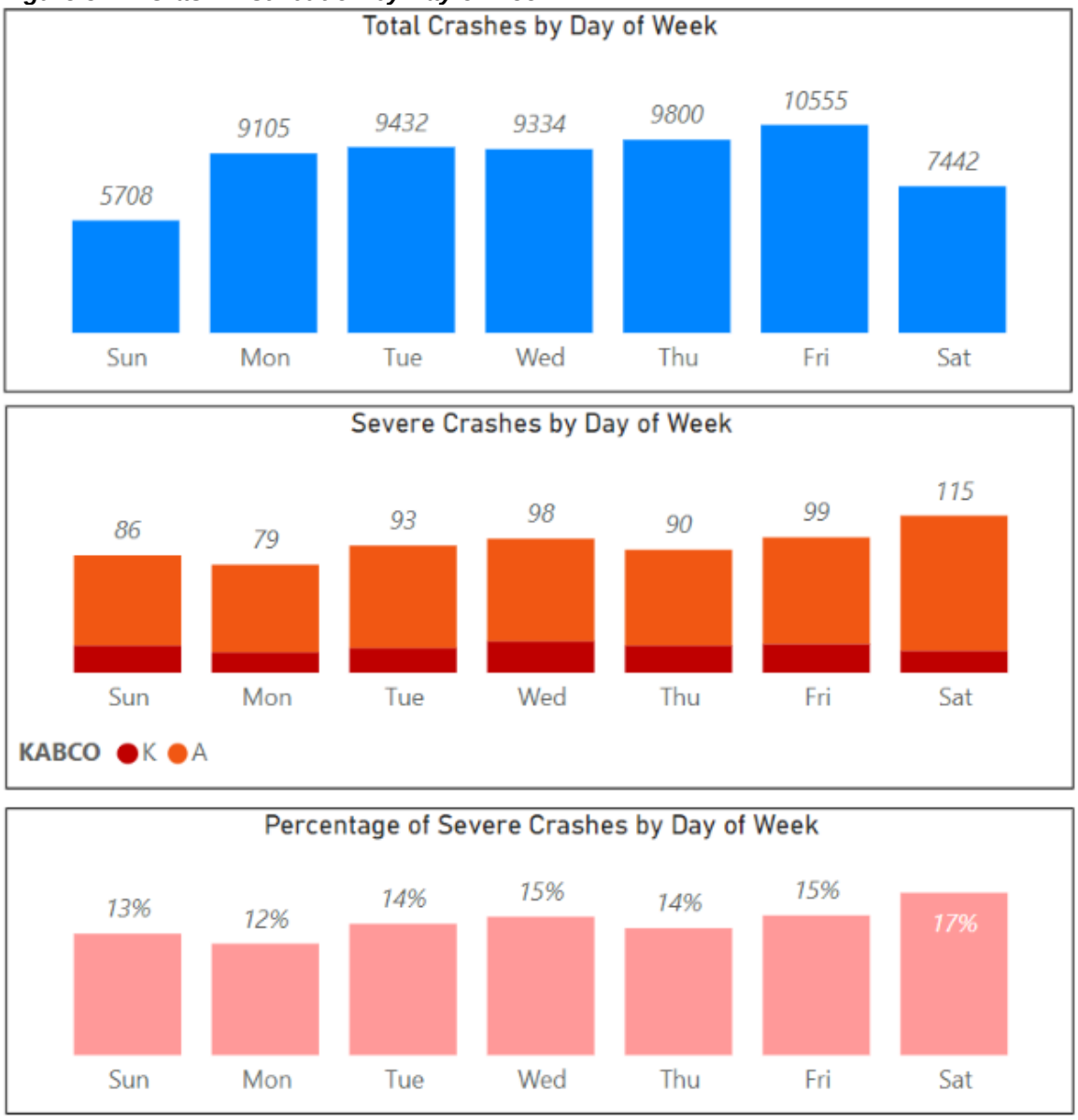
Figure 3-20. Monthly Crash Breakdown by Mode



Weekly Analysis

As seen in **Figure 3-21** crashes are fairly flat across the weekdays with a slight peak on Fridays. Weekends have the lowest number of crashes with Sunday having roughly half as may crashes as a typical weekday. The decrease in weekend crashes is most likely attributed to lower traffic exposure and non-existent peak period congestion, lowering the potential for crashes to occur. Severe crashes show a higher proportion of occurrences on Friday and Saturday. So, although, the total number of crashes is lower on the weekend, the proportion of severe crashes is higher. The likelihood of being involved in a severe crash is highest on Saturday at 17%, while the other days (including Friday) range between 12% to 15%.

Figure 3-21. Crash Distribution by Day of week



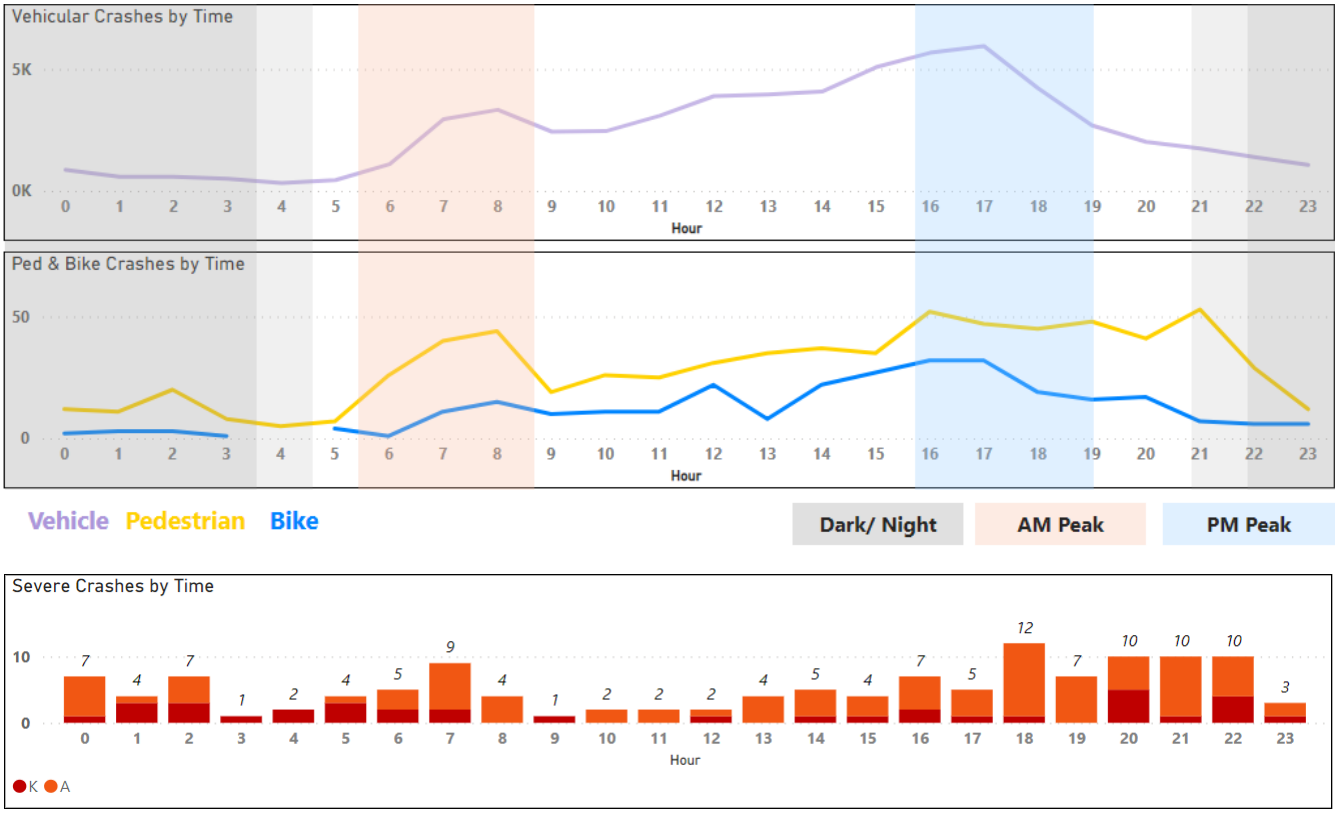
Time of Day Analysis

Figure 3-22 shows the total crashes by time of day over the 5-year period. A majority (61%) of all crashes occur during the hours of 11 AM to 8 PM which corresponds with typically higher traffic volumes. Looking at the crashes by mode share, however, offers a different result. Although a majority of vehicular crashes occur during the 11 AM - 8 PM window, a large share of pedestrian crashes occur during the morning hours of 7-8 AM coinciding with the morning rush hour. Pedestrian crashes peak again during the evening rush hour and continue into the night hours declining after 10 PM. There are, however, a fair number of pedestrian crashes occurring between the overnight/early morning hours, accounting for approximately 16% of total pedestrian crashes. Crashes involving bikes tend to follow vehicular crash patterns with a majority of them occurring between the hours of 12-8 PM.

Trends with the severity of crashes offer somewhat different results as well. Severe crashes involving only vehicles tend to be similar across all the time periods from 6 PM - 11 PM. A similar pattern can be

seen in Pedestrian crashes as well, with a notable exception of a higher crash severity during the hours of 6 pm - 2 am. As stated above, this may be due to various factors including lighting conditions and behavior patterns.

Figure 3-22. Crash Distribution by Time of Day



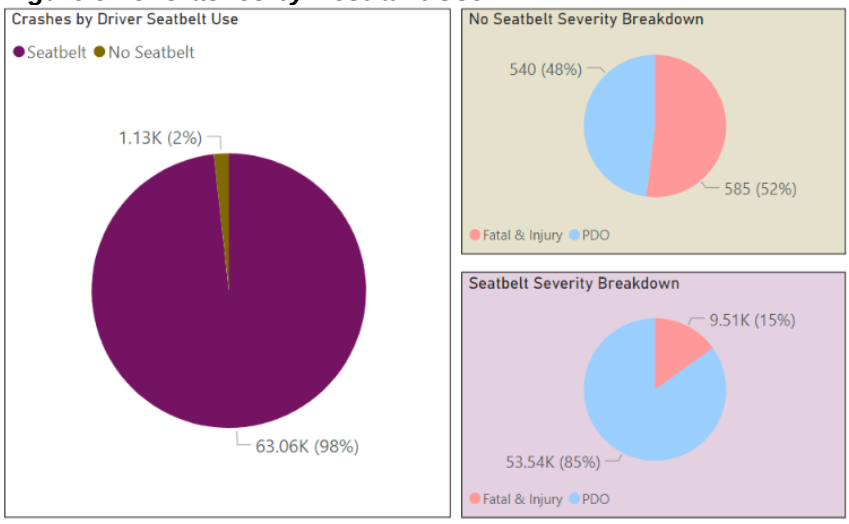
Crashes by Safety Equipment Use

The use of seatbelts has been shown to significantly decrease fatalities since its adoption across the country starting in the 1980s. Currently, over 90% of the US population uses seatbelts. In our study area over 98% of people involved in a crash were wearing seatbelts which is significantly higher than the national average. Only 1,125 crashes involved no seatbelt use. Of the crashes with no seatbelt use, as shown in **Figure 3-23**, a very high percentage resulted in injury and fatalities. There were 53 (4.7%) fatal and 71 (6.3%) severe injury crashes as compared to 80 (0.13%) fatal and 456 (0.72%) severe injury crashes for those wearing seat belts. The lack of seatbelts accounts for almost 40% of all fatal crashes.

There is an overrepresentation of drivers who are impaired (alcohol or drugs) and the lack of seatbelt use. Almost 19% of crashes where there is no seat belt use also involved impaired drivers as compared to 3% of seatbelt users. Excessive speeds, disregard for traffic control and not having the vehicle under proper control are also correlated with drivers who were not wearing seatbelts.

Strategies encouraging seatbelt use as well as discouraging impaired driving would decrease the overall severity of crashes and should be examined as countermeasures.

Figure 3-23. Crashes by Restraint Use

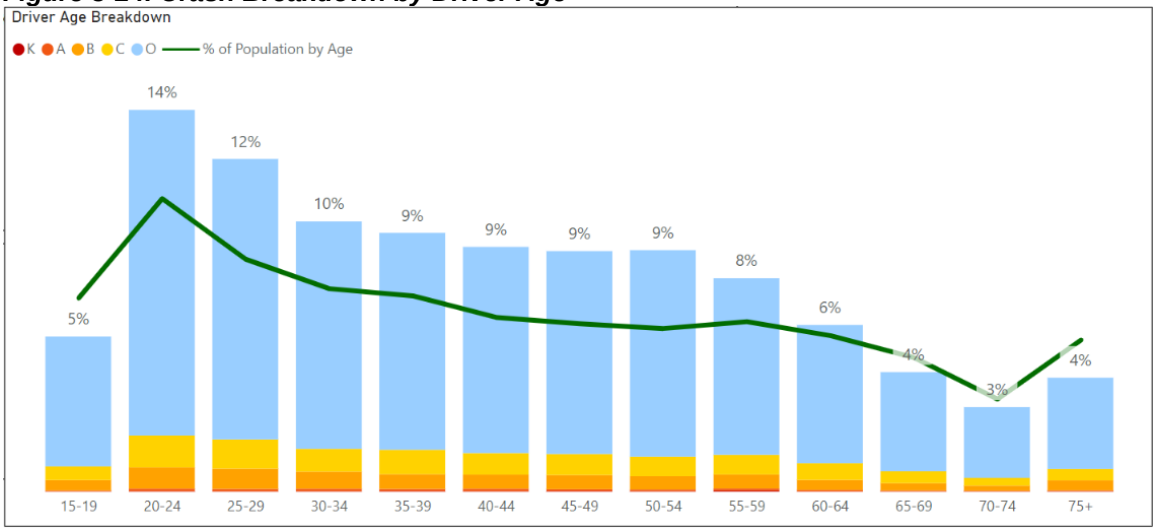


Crashes by Driver Age

There are no over-representations of age groups and crash involvement. Based on the crash data and the census population data for Fayette County, drivers seem to be involved in crashes proportionate to their population group. Young drivers are involved in more crashes but also account for a higher percentage of the population. There are fewer crashes for drivers over the age of 75, but that may be attributed to lower traffic exposure as they are more likely to take fewer trips.

There are slightly more fatalities among the 55-59 age group. This group makes up 8% of the overall population but they experience over 17% of the total fatalities. **Figure 3-24** presents the crashes by age group.

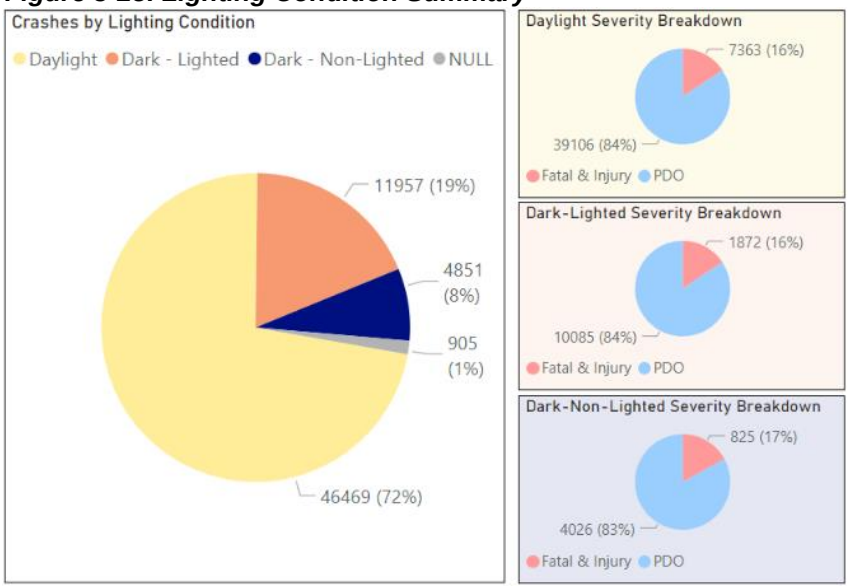
Figure 3-24. Crash Breakdown by Driver Age



Lighting Conditions

Roadway lighting condition does not seem to be significantly correlated with crash occurrence or crash severity. Crashes seem to occur in non-daylight conditions approximately 27% of the time, which considering the decrease in traffic exposure and amount of daylight in Lexington is reasonable. Additionally, when specifically examining the severity breakdown between the lighting conditions it can be observed that with lighting (daylight or roadway lighting) the percentage of severe crashes is 16% and in non-lighted conditions, this change is negligible at 17%. Figure 3-25 shows the breakdown of lighting conditions for all crashes.

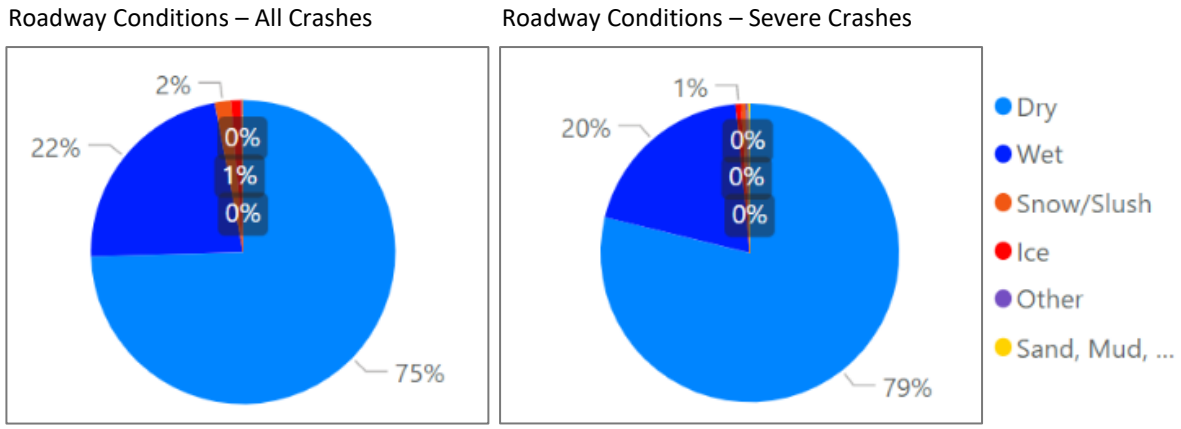
Figure 3-25. Lighting Condition Summary



Environmental/Roadway Conditions

Environmental roadway conditions do not seem to be a contributing factor to crash occurrence or crash severity. Adverse roadway conditions are defined as wet, snow, ice, or conditions not regularly experienced by the driver. Within the study period, crashes occurred under these conditions about 25% of the time which is relatively proportionate to those types of weather conditions. From a crash severity standpoint, adverse roadway conditions account for approximately 21% of severe crashes. This lower propensity for crashes could be attributed to lower exposure (vehicular, pedestrian, and/or bicycle) or more cautious, aware driving behaviors due to the conditions. **Figure 3-26** illustrates the overall crash frequency breakdown based on the roadway conditions (left) as well as the severe crash breakdown for the same factors (right).

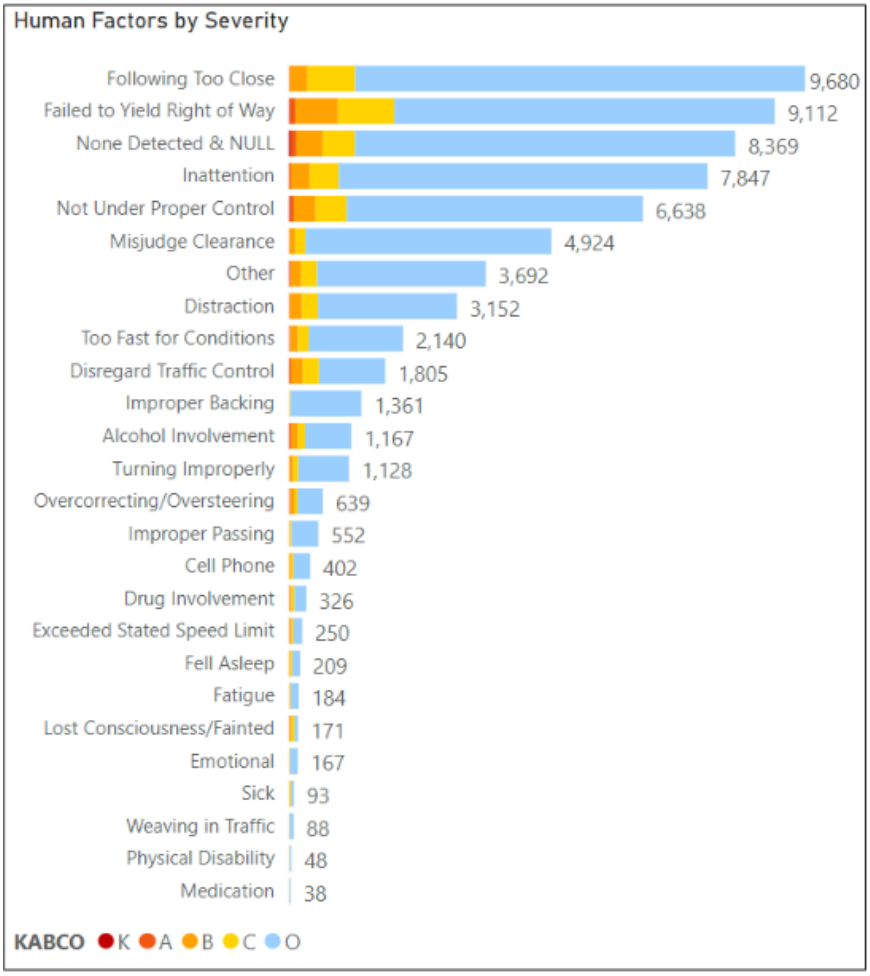
Figure 3-26. Roadway Conditions Summary



Crashes by Contributing Factor

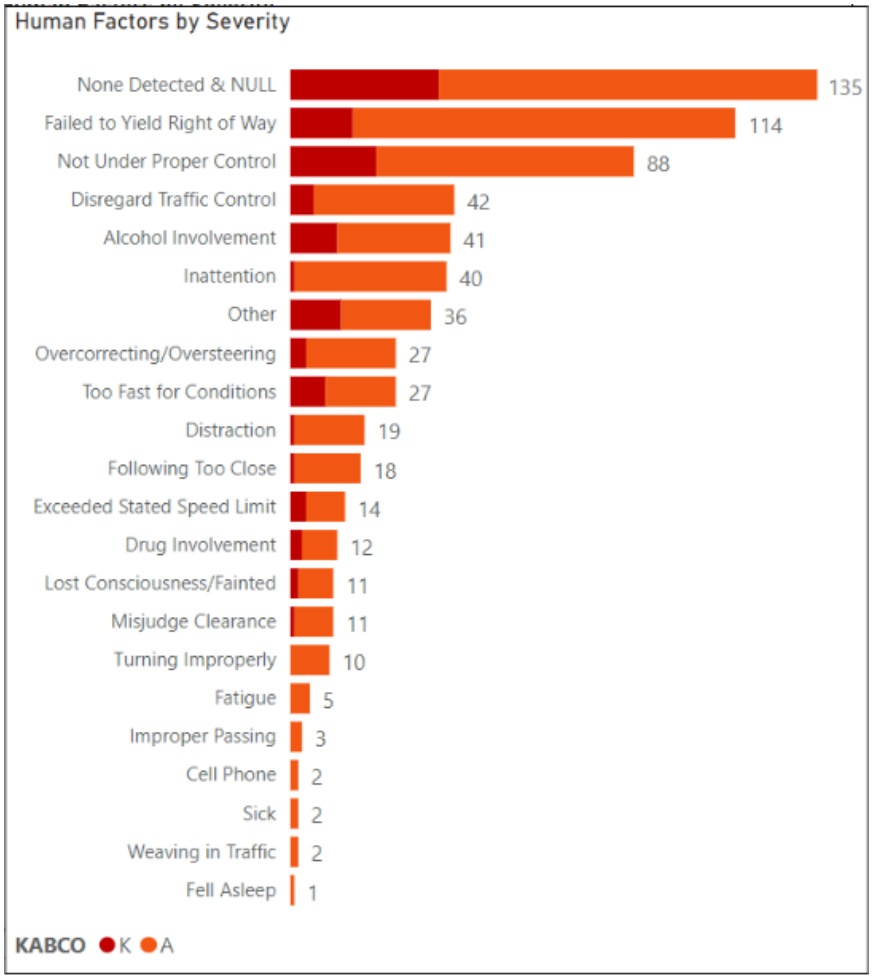
The crash data has details on contributing human factors associated with each crash to provide information regarding potential influencing factors as applicable. It is possible that multiple contributing factors could be associated with each crash; however, for this study, the top contributing factor was applied to each as that was determined to be the primary factor as judged by the officer generating the report. Many of the crashes (8,369) either did not have an influencing factor or were coded as none detected, which accounts for approximately 13% of the study area crashes. The primary influence factors by crash frequency were following too close (9,680), failing to yield to the right of way (9,112), inattention (7,847), and not under proper control (6,638). Combined these contribute to over half (approximately 52%) of all the crashes. **Figure 3-27** shows the breakdown of crashes by contributing factors with the associated severities.

Figure 3-27. Human Factor Breakdown by Crash Severity



The corresponding breakdown of severe crashes is shown in **Figure 3-28**. Of the 660 total severe crashes, 135 had no detectible contributing factor. 114 of them were due to Failure to yield the right of way and 88 were from vehicles not being under proper control. 53 were due to Alcohol or Drug Involvement. It should be noticed that although Alcohol and Drug Involvement is a contributing factor for 1,167 crashes, approximately 4.5% of them result in a Fatality or Serious Injury. Similarly speeding (Exceeding Speed Limit and Too Fast for Conditions) led to 13 fatalities and 28 severe injury crashes which are approximately 9.8% of total fatalities and 5.3% of total severe injury crashes, respectively.

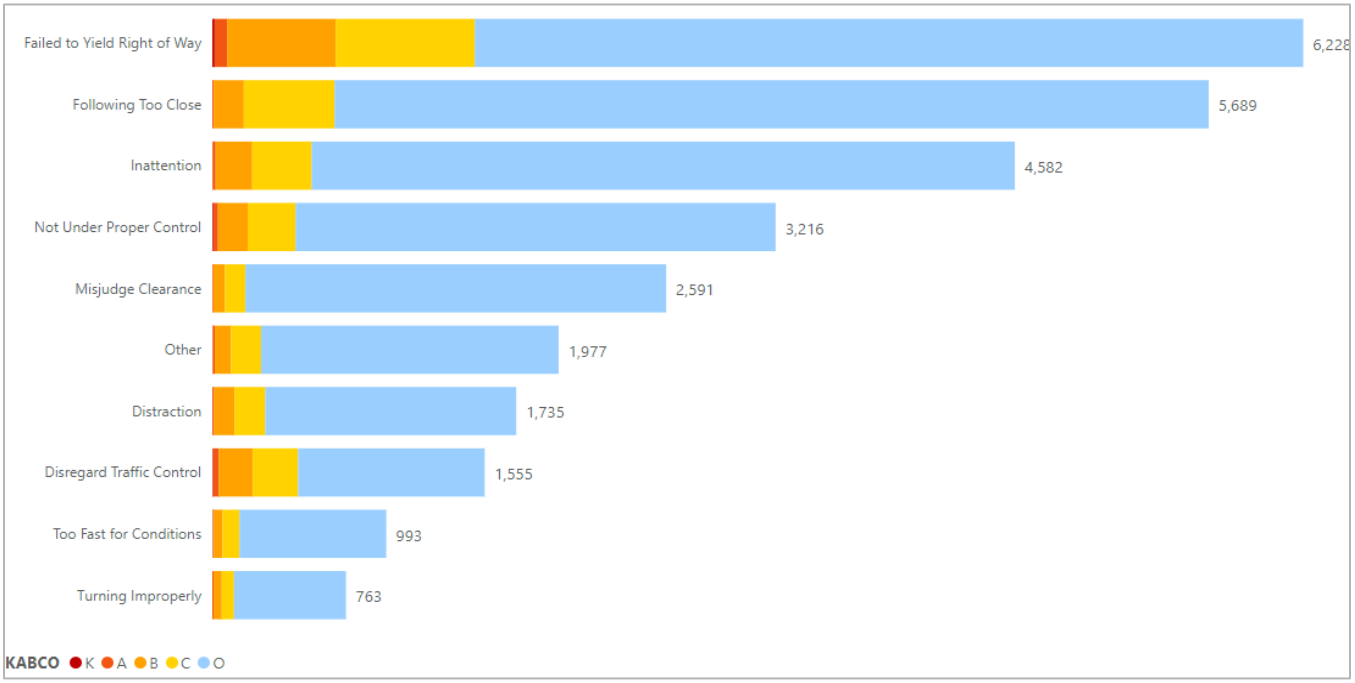
Figure 3-28. Severe Crashes Human Factor Breakdown



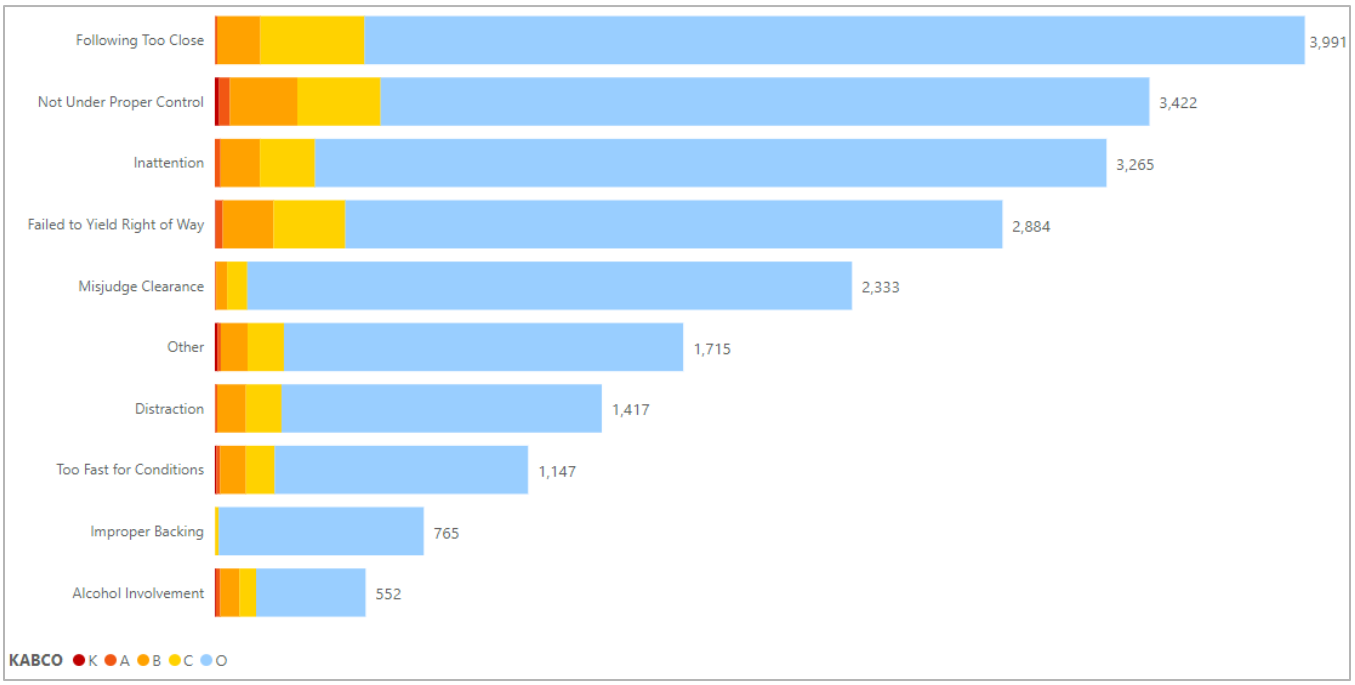
As anticipated, at intersections, Failure to Yield Right of Way is the top contributing factor followed by Following Too Closely and Inattention. Along the segment, the top contributing factor is Following Too Closely followed by Not Under Proper Control and Inattention. **Figure 3-29** shows contributing factors for crashes at Intersections and along Segments.

Figure 3-29. Top Human Factor Crashes by Severity and Location

Intersection Top Human Factor Crashes



Segment Top Human Factor Crashes



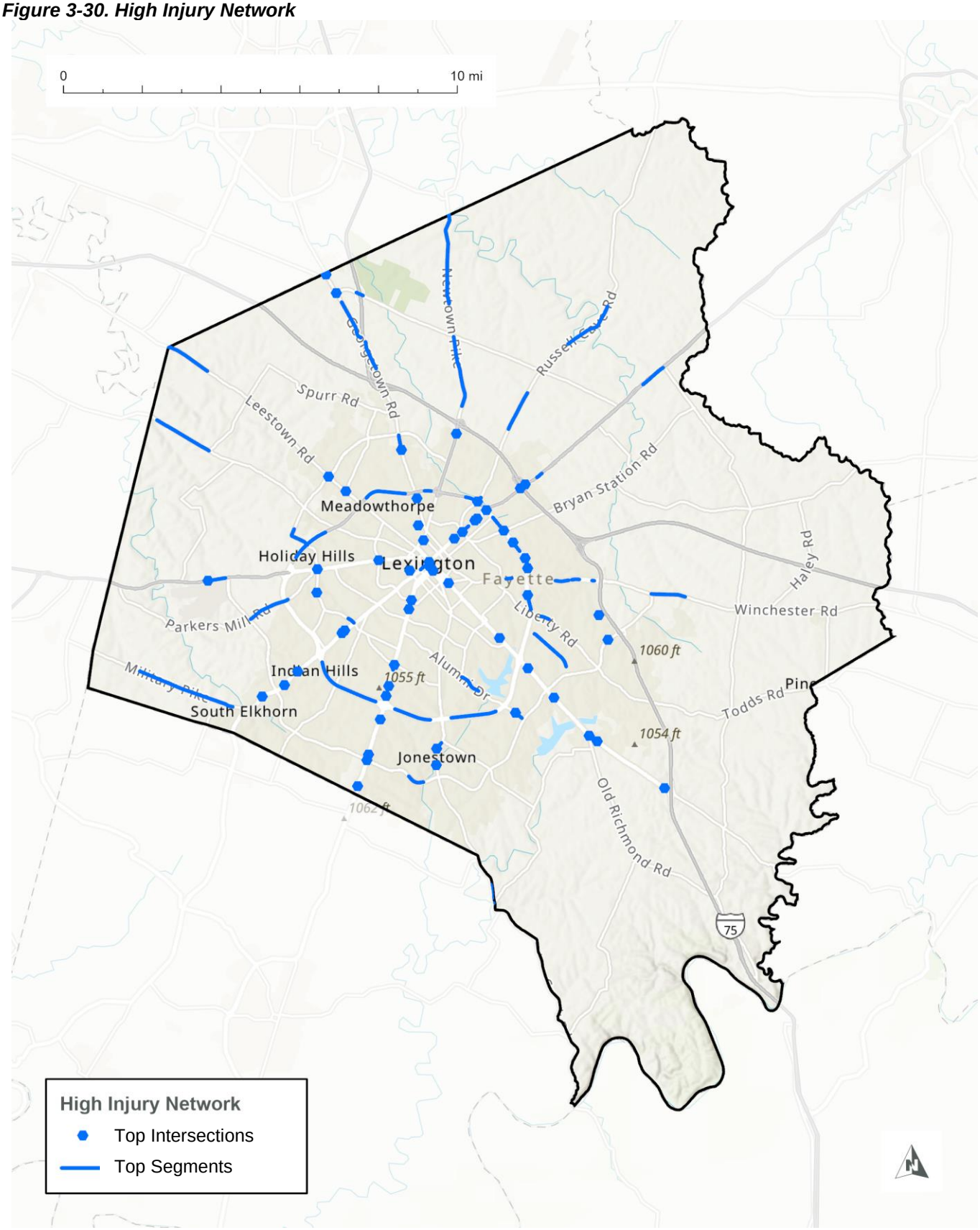
High Injury Network

The high injury network (HIN) provides an initial screening measure for safety focus areas. This network is comprised of intersections and segments which historically exhibit higher severity crashes. The methodology for developing the HIN for Lexington was based on the crash analysis method for prioritizing, ranking, and analyzing the crash data.

As discussed in further detail in **Chapter 7** of this Safety Action Plan, multiple methods were considered for analyzing and developing safety focus areas based on the crash data. The primary method used for developing corridor projects and prioritizing the analysis was a modified EPDO (mEPDO) rating system. EPDO is defined as equivalent property damage only, where crashes are assigned value based on a ratio of the comprehensive crash cost for each severity as compared against the property damage only comprehensive cost. For the modified-EPDO (mEPDO) analysis, the fatal (K) and serious injury (A) crashes were blended to create a unified value to prevent fatal crashes alone from having too significant of weight.

The HIN network used the top 100 mEPDO intersections and top 200 mEPDO segments within the study area as the base development. It was further refined by highlighting intersections and segments which experienced two or more severe (fatal or serious injury) crashes in the five-year study period. This resulted in 46 intersections and 56 segments to represent the High Injury Network for Lexington. **Figure 3-30** shows the HIN.

Figure 3-30. High Injury Network



4. Engagement and Collaboration

There is an ongoing conversation about safety in Lexington-Fayette County. This community conversation has taken numerous forms over the last several years and is part of what has led to this Safety Action Plan and its recommendations. While no new engagement was conducted as part of completing the technical work for the Safety Action Plan, there have been at least six outreach efforts working in parallel with this project. These were meaningful and actionable initiatives that are resulting in real safety progress and have directly influenced the projects and strategies in this plan.

Countywide Safety Engagement (2021-2023)

Lexington-Fayette County embarked on an update of the City's Comprehensive Plan in 2022. This effort has been ongoing while the Safety Action Plan was being developed. The initiative involved extensive public, stakeholder, and agency engagement and it resulted in substantial input related to multimodal traffic safety. Specifically it included:

- Public Engagement Using the "On the Table" Approach
- Organizational Input
- Commerce Lexington Roundtable Events
- LFUCG Divisional Input

A public input report was published in May 2022. That document can be found here: Public Input Report

On The Table

The On the Table events occurred during one week in April 2022. They were organized by CivicLex and a 36 person advisory group. Approximately 4,000 to 5,000 people participated in the events and nearly 2,500 people filled out surveys.

The traffic safety comments were common and there were approximately 500 of them. Responses addressed multimodal traffic safety including how cars interact with bicycle/pedestrian modes, safe access to transit, and vehicular safety and enforcement. Common topics included:

1. **Local and neighborhood streets** – desire was expressed for slowing of speeds and calming of traffic that uses local, neighborhood streets. Items like speed bumps and speed tables were mentioned, but more often it was a blanket statement for traffic control.
2. **Collectors and arterials** – the vast majority of comments on the larger roads had to do with reducing speeds and speed enforcement.
3. **Bicycle Safety** – Many advocated for separated bike lanes, as opposed to on-road striped lanes, citing safety concerns as a major factor. This was mentioned throughout Lexington, but also with an emphasis along the major roadways, where facilities are inadequate or do not exist. The need to fill gaps in the bicycle/trail network was also mentioned. This would eliminate places where bike lanes end and cyclists are merged back into traffic.
4. **Pedestrian Safety** - Improved and connected sidewalks were mentioned, with a focus on keeping users safe from vehicles using the roadways.
5. **Safe Access to Transit** – Safe access routes to get to and from bus stops.
6. **Decrease Traffic Speed** – Most comments were discussing traffic through neighborhoods, though some were talking about high traffic speeds along our major roadways as well. Solutions included redesigned roadways and speed tables.
7. **Traffic Enforcement** – This was seen as a primary issue for many, specifically citing red light running as a repetitive concern.

8. **Automobile Safety** – Safety of motorists was mentioned, some related to distracted driving, but a handful specifically mentioned concerns about visible roadway striping during rain events.
9. **Driver Education/Skill** – This is related largely to bicycle and pedestrian safety, with respondents recommending more education for drivers to understand how to share the road with other modes of transportation.
10. **Roadways (and streetlights)** – The conditions of roadways and the impact that has on safe travel for cars and cyclists. Several respondents specifically called out the need for new or better maintained streetlights, particularly in areas of increased safety concerns.

Some example quotes from the public engagement include:

"It would be a better neighborhood if the speed limit was lowered and traffic calming techniques were used to prevent drivers from going 50-60 miles per hour in certain sections."

"Reclaim portions of existing roads for traffic calming and create safe and enjoyable routes for walking, biking, or rolling."

"All bus stops [should] have paved sidewalks to the next street in two directions, cross walk lights at adjacent intersections."

Other Engagement

Input was also obtained from many organizations including non-profits and neighborhood organiaitons from around Lexington and from the Commerce Lexington Roundtable Events. LFUCG staff were also involved in discussions to get their input. These sources also provided traffic safety related comments.

As of June 2023, the planning work for the project is still ongoing. The initiative has included broad discussions about transportation and safety. Public engagement activities related to this effort so far have included:

- April 10-16, 2022 – On the Table Advisory Group (discussed above)
- Spring 2022 – Public Input Survey
- Summer/Fall 2022 – Discussion with the Planning Commission
- Winter 2023 – Planning Commission Public Hearing
- Early Spring 2023 – Urban County Council Process
- Spring/Summer 2023 – Discussion with the Planning Commission
- Late Spring/Early Summer 2023 – Public Input
- Summer – Planning Commission Public Hearing

The websites for the Imagine Lexington 2045 (2023 Comprehensive Plan) are located here:

- https://www.imaginelexington.com/full-comprehensive-plan
- https://www.imaginelexington.com/PublicInputReport

Safety Engagement Related to Complete Streets (2022)

The first of these engagement efforts were related to the development and adoption of a Complete Streets Policy. This policy was developed during the same time frame that this safety action plan was in development. The proposal and approval of the policy included public outreach such as a public information session on November 3, where LFUCG provided information and answered questions about complete streets and the proposal for a Lexington complete streets policy. The policy was unanimously adopted on December 6, 2022. Part of the policy was the institution of a Complete Streets Committee that would bring together a range of interested stakeholders to assist with implementing the

policy. This public engagement and council adoption has influenced the types of projects and safety countermeasures being proposed in the Safety Action Plan.

Lexington Pedestrian Safety Working Group

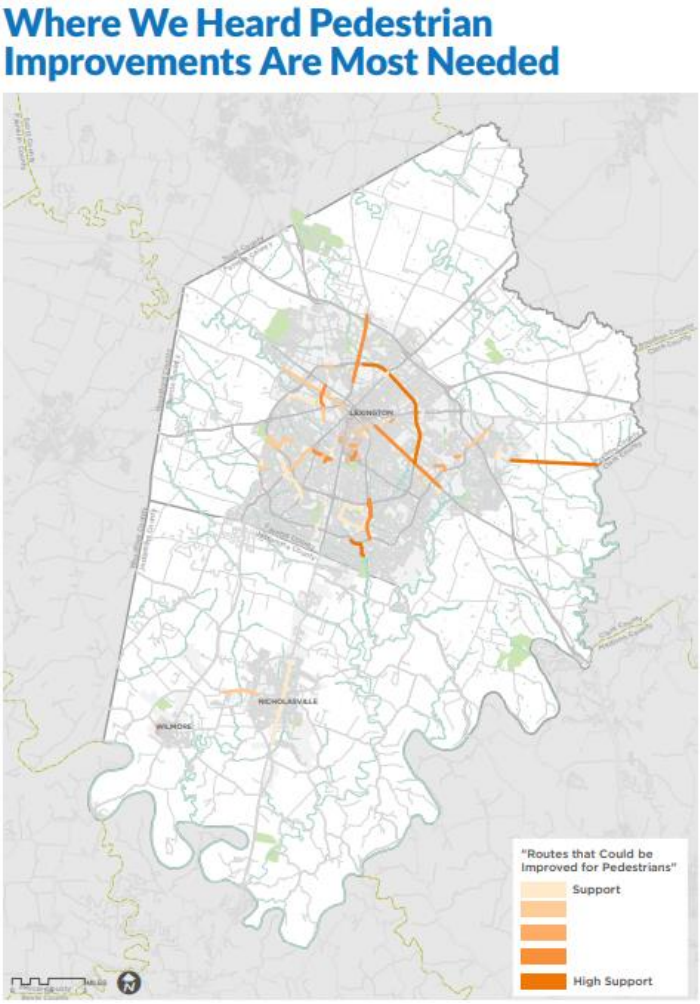
The Lexington Area MPO has pushed out informative content on safe, courteous, and predictable drivers and cyclists in common situations such as preparing to turn and encountering a cyclist and what to do when using a trail. The videos promote expectations and rules for all users when sharing streets. Additionally, the Pedestrian Safety Working Group meets regularly to discuss priorities for the region. Other visible efforts of the group include stenciling clever phrases on sidewalks to promote awareness and yard signs to place around the yard. It is a consistent message to educate on responsibilities to others and the more vulnerable user of the street.

Document link: https://www.lexingtonky.gov/safe-streets

Connecting Our Region: Lexington Area Bicycle & Pedestrian Master Plan (2015-2016)

May 16, 2017 - ConnectLex Open House. Five Focus Group Discussions. An active steering committee provided input throughout the planning process.

Fayette County residents were included in the community engagement process for the Lexington Area Bicycle and Pedestrian Master Plan (Pg E-8, 3-2 to 3-9). Participants stated dangerous driver behavior created difficulties in walking and biking for transportation and recreation in Fayette County. The project team asked the public where pedestrian improvements and, separately, where bicycle improvements are most needed in the MPO. This geographically specific input complemented the collision analysis and destination analysis to provide the framework to build out the network over the short, mid, and long terms. Policy objectives were developed with public input. The safety snapshot listed the top corridors for collisions involving pedestrians and bicyclists. The corridors with frequent crashes overlapped those identified within this Safety Action Plan and concurrent efforts to plan for safer streets, including Nicholasville Road. Other goals of the Plan include expanding education and encouragement programs, developing a process for citizens to report sidewalk access issues, establishing safe routes to school program, and expanding Bike Month Activities. Document link: https://lexareampo.org/wp-content/uploads/2018/04/BPMP-Master-Plan-Reduced.pdf



Imagine Nicholasville Road (2020-2021)

The project team hosted a web map to gather public input on concerns and opportunities along the Nicholasville Corridors. Project organizers also invited comments through in-person public and virtual meetings and online surveys. The combined transportation and land use plan assessed opportunities for Bus Rapid Transit, Transit Oriented Development, Biking, and Walking along a busy and wide connection between Lexington in Fayette County and Nicholasville in Jessamine County. Specific meetings included:

- March 2020 – Public Meeting
- Spring 2020 – Public Input Survey
- November 2020 – Public Meeting
- Winter 2020/21 – Public Review of Comments

Document links:

https://imaginelexington.com/imagine-nicholasville-road

https://drive.google.com/file/d/1zHwZcWGt-m_Mfm7WUiJYBlcyf98C21jy/view

Imagine New Circle Road

New Circle Road encircles the central neighborhoods of the city. The Imagine New Circle project includes the northeast portions of the road between Newtown Pike and Richmond Road, which lays between Downtown Lexington and I-64/I-75. The objectives of the project are to improve safety, connectivity, and development opportunities through design interventions within the right-of-way and land-use strategies. The project team worked closely with existing businesses along the corridor particularly where infill and access management solutions were illustrated. The team canvased the corridor, held meetings in neighborhoods, and hosted online surveys. A public hearing on June 8, 2023, discussed recommendations for the corridor. Engagement will continue. Specific meetings included:

- April 30, 2022 – Neighborhood meeting
- May 24, 2022 – Business Canvassing
- June 1, 2022 – Neighborhood Canvassing
- June 8, 2022 – Neighborhood Meeting
- May – August 2022 – Public Input Survey
- April 10, 2023 – Business Canvassing
- March – May 2023- Public Input Survey

Document links: https://imaginelexington.com/node/407

https://www.imaginenewcircle.org/

To continue this extensive outreach this action plan recommends that a Vision Zero Safety Coordinator position be created and funded. It also recoomends that the city's safety focused education and outreach efforts be even further expanded to increase the effectiveness within the community.

5. Equity Considerations

Providing an equitable transportation system for Lexington goes hand in hand with safety as a desired outcome of the Lexington-Fayette Safety Action Plan. This plan was developed with equity considerations in mind, including extensive equity analyses and mapping to identify underserved communities, and LFUCG is committed to ensuring that the recommendations and projects that build off of this plan will feature inclusive and representative public engagement and stakeholder input.

Transportation Equity and Environmental Justice

Equity is a critical element of any transportation planning process. For too long, infrastructure investments in this country were chosen and developed without input from those lacking political power, resulting in the negative impacts of these projects largely falling on the shoulders of marginalized communities while the principal benefits were received elsewhere.

To this end, the federal government and many other agencies have adopted a policy of Environmental Justice, which the United States Department of Transportation (USDOT) defines as follows:

> *Environmental Justice (EJ) is the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, income, national origin, or educational level with respect to the development, implementation and enforcement of environmental laws, regulations, and policies.*

Federal agencies are also required to consider EJ in the allocation of funding and their policy and program actions.

Equity is a closely related concept to EJ, with an emphasis on ensuring impartial treatment of disadvantaged and underserved populations. The federal Safe Streets for All (SS4A) program's definition of equity starts as:

> *The consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment.*

Both EJ and equity require the fair treatment of all people regardless of background or financial means, with an intention to minimize the adverse effects of transportation investments on these communities. A planning effort that is mindful of equity considerations must take steps to ensure meaningful involvement of these communities in the planning and decision-making processes, and as discussed in **Chapter 4**, this Safety Action Plan is the culmination of an extensive program of public involvement. The plan is built upon upwards of six parallel LFUCG-led outreach efforts, some of which are detailed in **Chapter 4**, and discussions with those communities will continue as the recommendations of this Safety Action Plan are implemented.

Identifying Equity Populations and Equity Areas

To ensure that the needs of disadvantaged and underserved communities are addressed in this plan, the relevant population of community members and the location of those communities must first be identified.

Federally Defined Equity Areas

The first way this process identified areas of equity concern within Fayette County was to examine predefined equity areas based on existing federal government designations. The designations discussed in this section are often considered when disbursing federal grant funding.

- **Underserved Communities**

  The Underserved Community designation is a principal means by which equity areas are defined for SS4A-funded safety programs and other programs included in the federal government's Justice40 Initiative, which "seeks to deliver 40% of the overall benefits of investments in climate, clean energy, and related areas to disadvantaged communities"[1].

  Underserved Communities can be identified using several federally approved methods, and this Safety Action Plan will use the definition from the Office of Management and Budget's Council on Environmental Quality (OMB CEQ) as implemented in their Climate and Economic Justice Screening Tool (CEJST). To identify "communities that are disadvantaged because they are overburdened and underserved", the CEJST assesses each US Census Tract on the basis of eight "Categories of Burden":

  1. *Climate Change*
  2. *Energy*
  3. *Health*
  4. *Housing*
  5. *Legacy Pollution*
  6. *Transportation*
  7. *Water and Wastewater*
  8. *Workforce Development*

  Any Census Tract meeting the thresholds for at least one Category is considered an Underserved Community. Underserved Communities within Fayette County based on this definition are mapped in **Figure 5-1** and are generally located in downtown and points north along New Circle Road, with an additional cluster just to the south just outside of New Circle Road.

- **Areas of Persistent Poverty & Historically Disadvantaged Communities**

  Areas of Persistent Poverty (APP) and Historically Disadvantaged Communities (HDC) are equity area definitions associated with the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) discretionary grant program, an evolution of the prior BUILD and TIGER grant programs.

  According to the RAISE grant guidelines[2]:

  > *An **"Area of Persistent Poverty"** is defined by the Bipartisan Infrastructure Law. A project is located in an Area of Persistent Poverty if:*
  >
  > 1. *the **County** in which the project is located consistently had greater than or equal to 20 percent of the population living in poverty in all three of the following datasets: (a) the 1990 decennial census; (b) the 2000 decennial*

[1] "About – Climate & Economic Justice Screening Tool", https://screeningtool.geoplatform.gov/en/about, accessed 26 June 2023
[2] "Areas of Persistent Poverty & Historically Disadvantaged Communities | US Department of Transportation", https://www.transportation.gov/RAISEgrants/raise-app-hdc, accessed 26 June 2023

census; and (c) the most recent (2021) Small Area Income Poverty Estimates; ***OR***

2. *the* ***Census Tract*** *in which the project is located has a poverty rate of at least 20 percent as measured by the 2014-2018 5-year data series available from the American Community Survey of the Bureau of the Census;* ***OR***
3. *the project is located in any territory or possession of the United States.*

A ***"Historically Disadvantaged Community"*** *is defined by USDOT, consistent with OMB's Interim Guidance for the Justice40 Initiative. A project is located in a Historically Disadvantaged Community if:*

1. *the project is located in certain qualifying census tracts;* ***OR***
2. *the project is located on Tribal land in;* ***OR***
3. *the project is located in any territory or possession of the United States.*

APP and HDC areas within Fayette County, based on May 2023 definitions as listed in the RAISE Mapping Tool, are shown in **Figure 5-2**. As can be seen in Figure 5-2, the APP Census Tracts cover a similar area to the Underserved Communities mapped in Figure 5-1 while the HDC areas include a wider range of Fayette County, including several large Census Tracts in outlying areas to the north and south.

For all three federal Equity Area definitions, the total population residing in each and the number of traffic crashes occurring within each was tabulated and rendered in Table 5-1. Population numbers are expressed both as the number of individuals and households, while the crash count is displayed as the total number of crashes of all severities as well as the subset of crashes resulting in fatal and serious injury (FSI) outcomes. Table 5-1 also shows the percentage of the countywide total contained within each Equity Area for all metrics.

Table 5-1. Total Population and Number of Crashes in Equity Areas

Geography	**Area Tabulation**		**Total Population** (2021 ACS)		**Crashes** (2015-2019)	
	Census Tracts	Square Miles	Individuals	Households	All Severities	FSI Crashes
Entire County *All Census Tracts in Fayette Co.*	82	285.6	321,354	134,229	64,182	4,491
Subtotals in Federally Defined Equity Areas and Percent of Countywide Total:						
Underserved Communities *per CEJST definition*	23 *(28.0%)*	17.5 *(6.1%)*	74,344 *(23.1%)*	31,644 *(23.6%)*	21,843 *(34.0%)*	1,463 *(32.6%)*
Areas of Persistent Poverty *per USDOT Justice40 definition*	34 *(41.5%)*	28.2 *(9.9%)*	121,194 *(37.7%)*	51,163 *(38.1%)*	29,503 *(46.0%)*	1,932 *(43.0%)*
Historically Disadvantaged Communities *per USDOT Justice40 definition*	36 *(43.9%)*	122.4 *(42.9%)*	123,982 *(38.6%)*	52,009 *(38.7%)*	32,199 *(50.2%)*	2,308 *(51.4%)*

Table 5-2 builds upon the crash tabulation in Table 5-1 by computing crash rates for the county as a whole and each of the three Equity Areas, as well as the ratio of FSI crashes as a percentage of the total number of crashes. The FSI ratio shows that the severity of crashes within the three Equity Areas is generally comparable to the county as a whole; however, **Table 5-2** shows that the crash rate within

each of the three federally defined Equity Areas is significantly elevated compared to the countywide average crash rate, indicating that significant safety issues exist in these areas compared to the County as a whole.

Most notably, **Table 5-2** shows that designated Underserved Communities in particular see crash rates more than 40% higher than the countywide average crash rate, with almost 2 FSI crashes and 30 crashes of any type occurring per 100 residents over the 5-year period for which crash data was available. This does not necessarily mean that an individual resident of an Underserved Community has a 30% chance of being involved in a crash within a given 5-year period since many crashes will be related to the presence of pass-through traffic, but the fact remains that crash rates within all three Equity Area groupings are concerningly high. This finding is a key reason for the commitment towards a goal of zero crashes discussed in **Chapter 1**.

Table 5-2. Crash Rates within Equity Areas

Geography	Population (2021 ACS)	Crashes (2015-2019)		FSI as % of All Crashes	Crashes per 100 People	
		All Severities	FSI Crashes		All Severities	FSI Crashes
Entire County *All Census Tracts in Fayette Co.*	321,354	64,182	4,491	7.00%	20.0	1.40
Subtotals in Federally Defined Equity Areas and Level Above (▲) / Below (▼) Countywide Total:						
Underserved Communities *per CEJST definition*	74,344	21,843	1,463	6.70% **4.3%▼**	29.4 **47.1%▲**	1.97 **40.8%▲**
Areas of Persistent Poverty *per USDOT Justice40 definition*	121,194	29,503	1,932	6.55% **6.4%▼**	24.3 **21.9%▲**	1.59 **14.1%▲**
Historically Disadvantaged Communities *per USDOT Justice40 definition*	123,982	32,199	2,308	7.17% **2.4%▲**	26.0 **30.0%▲**	1.86 **33.2%▲**

Figure 5-1. Underserved Communities in Fayette County per CEJST Methodology

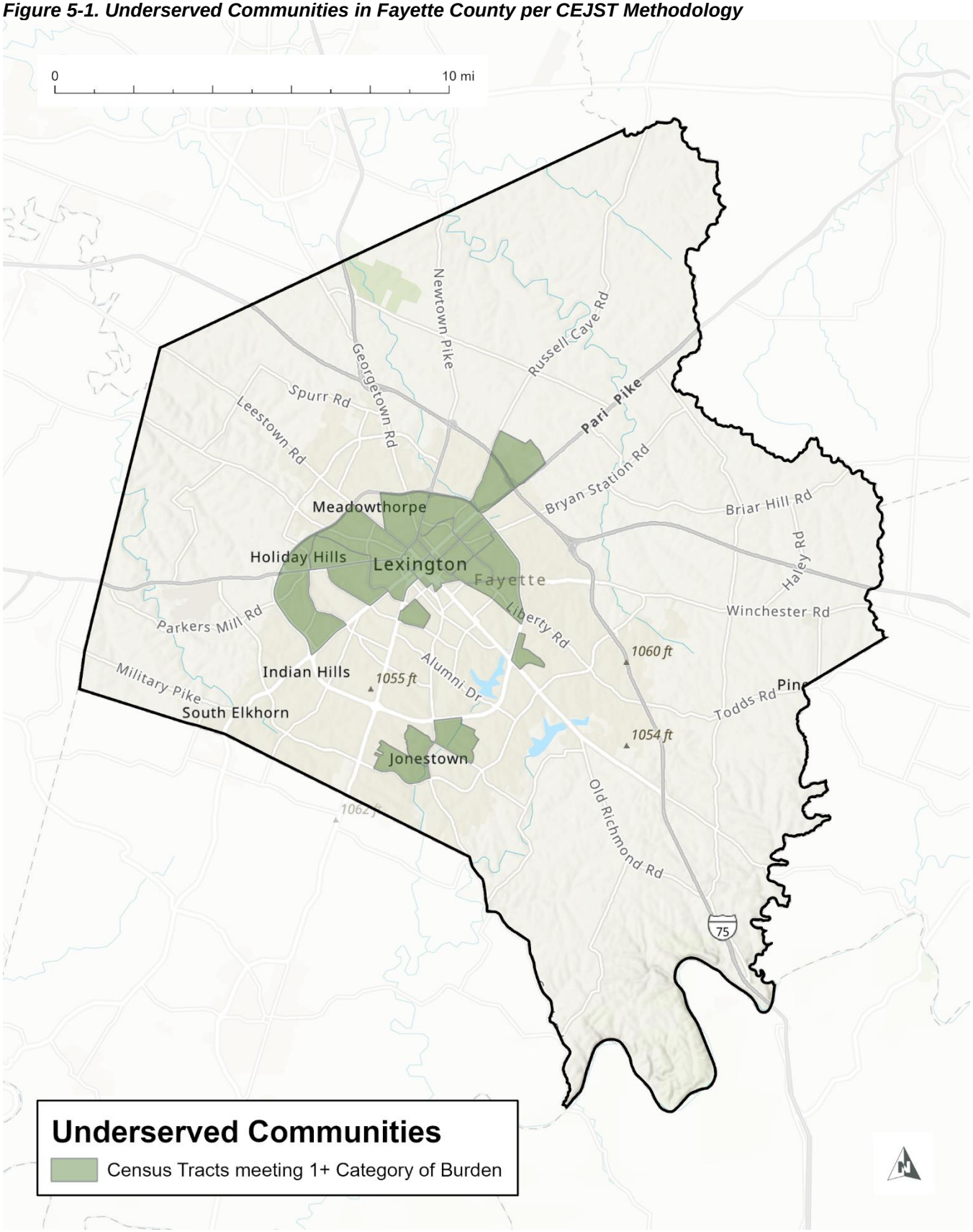
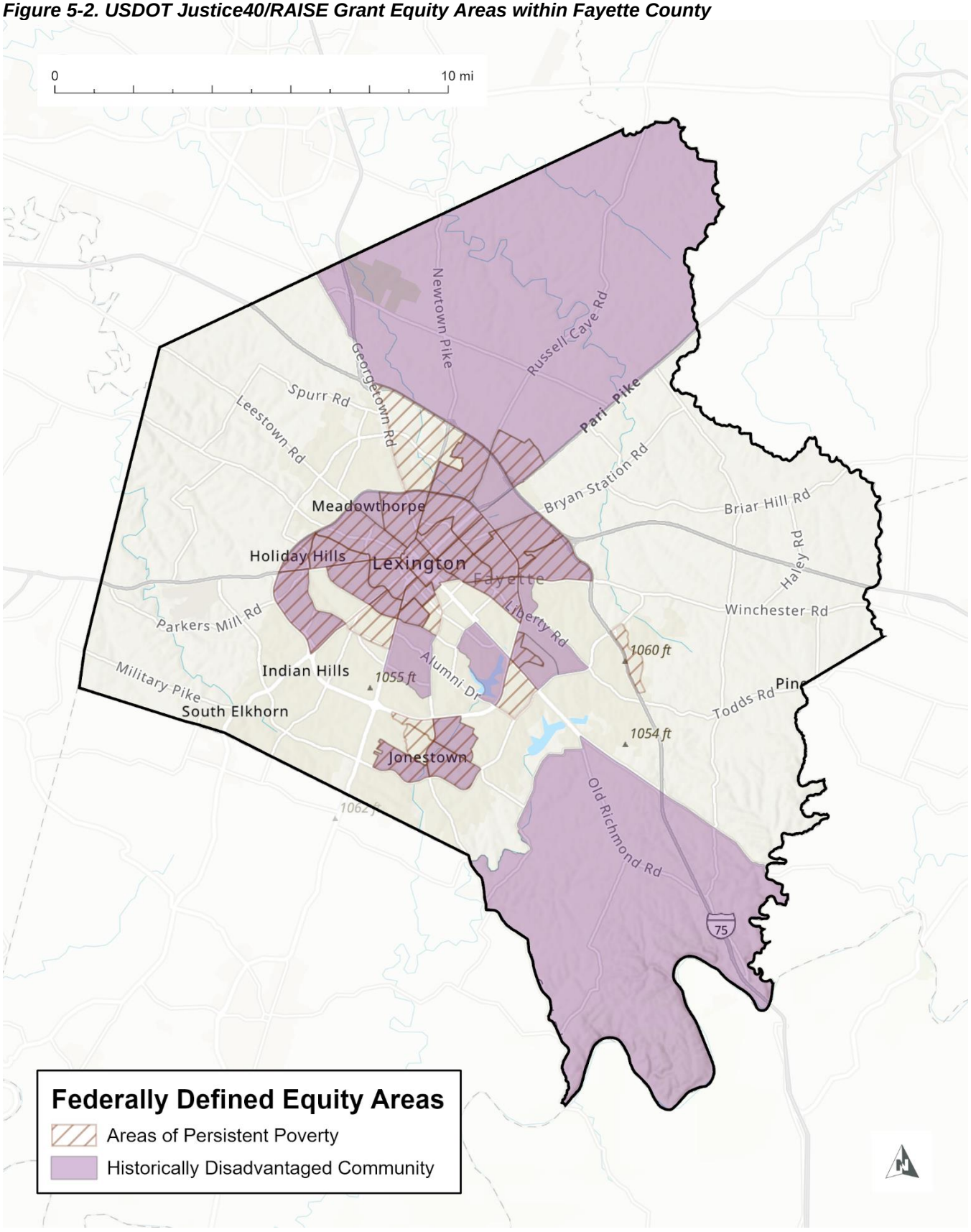


Figure 5-2. USDOT Justice40/RAISE Grant Equity Areas within Fayette County



Disadvantaged Populations & Disadvantaged Neighborhoods

Another means of identifying areas of equity concern is to directly identify the location and distribution of disadvantaged populations within the County.

The method discussed in this section considers five disadvantaged populations, based on the US Census' American Community Survey (ACS) data from 2017-2021, the most recent five-year range for which data is available. For each of these populations, a corresponding "Disadvantaged Neighborhood" was identified, defined as the set of US Census Block Groups with a qualifying population greater than the Fayette County average. This data is mapped in Figure 5-3 through Figure 5-7, with above-average Disadvantaged Neighborhoods shown in blue, and analyzed in the tables that follow.

- **Minority Population**

  Race continues to play a major role in determining which populations have access to equitable treatment and meaningful involvement in the transportation decision-making process. The minority population was defined as all those individuals identifying as non-white, including those responding "Other" or selecting two or more categories in any combination, including "White". Countywide, 27.2% of individuals meet this definition.

  The percentage of minority population within each Census Block Group as a percentage of this countywide average is mapped in **Figure 5-3**, with those block groups exceeding the countywide average and therefore comprising the Minority Disadvantaged Neighborhood noted in blue.

- **Elderly Population**

  The elderly population within a given block group was defined as the number of individuals aged 65 or older. Countywide, 13.5% of individuals meet this definition.

  The percentage of the elderly population within each Census Block Group as a percentage of this countywide average is mapped in Figure 5-4, with those block groups exceeding the countywide average and therefore comprising the Elderly Disadvantaged Neighborhood noted in blue.

- **Population Experiencing Poverty**

  Income is a significant factor impacting societal and health outcomes for individuals. Low-income block groups were determined based on the percentage of individuals with incomes below the poverty level. Countywide, 15.1% of individuals meet this definition.

  The percentage of the population experiencing poverty within each Census Block Group as a percentage of this countywide average is mapped in **Figure 5-5**, with those block groups exceeding the countywide average and therefore comprising the Poverty Disadvantaged Neighborhood noted in blue.

- **Population Impacted by Disability**

  Disability impacts were defined on a household-by-household basis. Any household with one or more residents with a disability met this threshold. Countywide, 23.8% of households meet this definition.

The percentage of households impacted by disability within each Census Block Group as a percentage of this countywide average is mapped in **Figure 5-6,** with those block groups exceeding the countywide average and therefore comprising the Disability Disadvantaged Neighborhood noted in blue.

- **Population without Car Access**

  Carless households are more likely to have difficulty accessing jobs, social opportunities, healthcare, and other social services and are also defined on a household-by-household basis. Any household with access to zero cars met this threshold, including both owner- and renter-occupied households. Countywide, 7.7% of households meet this definition.

  The percentage of households impacted by disability within each Census Block Group as a percentage of this countywide average is mapped in **Figure 5-7,** with those block groups exceeding the countywide average and therefore comprising the Carless Disadvantaged Neighborhood noted in blue.

As with the Equity Areas above, the total population residing in and the number of traffic crashes occurring within each of the five sets of Disadvantaged Neighborhoods was tabulated and rendered in **Table 5-3**. Population numbers are expressed both in the number of individuals and households, while the crash count is displayed as the total number of crashes of all severities as well as the subset of crashes resulting in FSI outcomes. **Table 5-3** also shows the percentage of the countywide total contained within each Disadvantaged Neighborhood for each metric.

Table 5-3. Total Population and Number of Crashes in Disadvantaged Neighborhoods

Geography	**Area Tabulation**		**Total Population** (2021 ACS)		**Crashes** (2015-2019)	
	Block Groups	Square Miles	Individuals	Households	All Severities	FSI Crashes
Entire County *All Block Groups in Fayette Co.*	213	285.6	321,354	134,229	64,182	4,491
Subtotals in Disadvantaged Neighborhoods* and Percent of Countywide Total:						
Minority Block Groups *Non-white population* *Countywide Average: 27.2%*	86 *(40.4%)*	63.4 *(22.2%)*	131,941 *(41.1%)*	54,646 *(40.7%)*	29,169 *(45.4%)*	1,952 *(43.5%)*
Elderly Block Groups *Population aged 65+* *Countywide Average: 13.5%*	103 *(48.4%)*	241.3 *(84.5%)*	147,305 *(45.8%)*	65,277 *(48.6%)*	33,737 *(52.6%)*	2,550 *(56.8%)*
Poverty Block Groups *Population below poverty level* *Countywide Average: 15.1%*	82 *(38.5%)*	40.1 *(14.0%)*	116,382 *(36.2%)*	51,251 *(38.2%)*	29,459 *(45.9%)*	1,966 *(43.8%)*
Disability Block Groups *Households w. 1+ disabled person* *Countywide Average: 23.8%*	101 *(47.4%)*	142.3 *(49.8%)*	140,733 *(43.8%)*	59,088 *(44.0%)*	30,401 *(47.4%)*	2,140 *(47.7%)*
Carless Block Groups *Households with zero vehicles* *Countywide Average: 7.7%*	74 *(34.7%)*	47.0 *(16.5%)*	105,141 *(32.7%)*	45,804 *(34.1%)*	26,789 *(41.7%)*	1,711 *(38.1%)*

**Note: This plan defines a Disadvantaged Neighborhood as those US Census Block Groups with qualifying populations greater than the countywide average; highlighted in blue in Figure 5-3 to Figure 5-7.*

Table 5-4 builds upon the crash tabulation in Table 5-3 by computing crash rates for the county as a whole and each of the five Disadvantaged Neighborhood groupings. As with the Equity Areas analysis

in Table 5-2, **Table 5-4** sees an FSI ratio that is generally comparable to the county as a whole across the set of five Disadvantaged Neighborhoods. However, the crash rate within each Disadvantaged Neighborhood is again significantly elevated compared to the countywide average crash rate, indicating that significant safety issues exist for all five population groups compared to the County as a whole.

Table 5-4. Crash Rates within Disadvantaged Neighborhoods

Geography	Population (2021 ACS)	Crashes (2015-2019)		FSI as % of All Crashes	Crashes per 100 People	
		All Severities	FSI Crashes		All Severities	FSI Crashes
Entire County *All Block Groups in Fayette Co.*	321,354	64,182	4,491	7.00%	20.0	1.40
Subtotals in Disadvantaged Neighborhoods* and Level Above (▲) / Below (▼) Countywide Total:						
Minority Block Groups *Non-white population* *Countywide Average: 27.2%*	131,941	29,169	1,952	6.69% **4.4%▼**	22.1 **10.7%▲**	1.48 **5.9%▲**
Elderly Block Groups *Population aged 65+* *Countywide Average: 13.5%*	147,305	33,737	2,550	7.56% **8.0%▲**	22.9 **14.7%▲**	1.73 **23.9%▲**
Poverty Block Groups *Population below poverty level* *Countywide Average: 15.1%*	116,382	29,459	1,966	6.67% **4.6%▼**	25.3 **26.7%▲**	1.69 **20.9%▲**
Disability Block Groups *Households w. 1+ disabled person* *Countywide Average: 23.8%*	140,733	30,401	2,140	7.04% **0.6%▲**	21.6 **8.2%▲**	1.52 **8.8%▲**
Carless Block Groups *Households with zero vehicles* *Countywide Average: 7.7%*	105,141	26,789	1,711	6.39% **8.7%▼**	25.5 **27.6%▲**	1.63 **16.4%▲**

**Note: This plan defines a Disadvantaged Neighborhood as those US Census Block Groups with qualifying populations greater than the countywide average; highlighted in blue in Figure 5-3 to Figure 5-7.*

Table 5-5 shows the level of Disadvantaged Populations within the County as a whole and the subtotal of those individuals who reside in the corresponding Disadvantaged Neighborhood, again defined as those Census Block Groups where the percentage of residents belonging to that Disadvantaged Population exceeds the countywide average. This table shows the level of overrepresentation of each class of Disadvantaged Population within their respective Disadvantaged Neighborhood.

Most notably, Table 5-5 shows that some 81% of the county's carless households are located within the identified Carless Block Groups, which according to **Table 5-3** made up 47.0 square miles, or only 16.5% of the County's land area, and only 34.1% of the households in the county. There may be some self-selection inherent in this phenomenon, in that households without car access are more likely to choose to live in areas proximate to jobs or transit service, but as with the other Disadvantaged Neighborhoods, consideration must be made for these Disadvantaged Populations to ensure that they have equitable transportation access.

Table 5-5. Concentration of Disadvantaged Populations within Disadvantaged Neighborhoods

Disadvantaged Group	**Disadvantaged Population** (2021 ACS 5-year estimate)	
	County-Wide Total	Total within Corresponding Disadvantaged Neighborhood*
Minority Population *Non-white population* *Countywide Average: 27.2%*	87,258 people *27.2% of county*	58,484 people *67.0% of countywide Minority population* *44.3% of total population within Minority Block Groups*
Elderly Population *Population aged 65+* *Countywide Average: 13.5%*	43,368 people *13.5% of county*	29,886 people *68.9% of countywide Elderly population* *20.3% of total population within Elderly Block Groups*
Population Experiencing Poverty *Population below poverty level* *Countywide Average: 15.1%*	48,501 people *15.1% of county*	35,889 people *74.0% of countywide Poverty population* *30.8% of total population within Poverty Block Groups*
Population Impacted by Disability *Households w. 1+ disabled person* *Countywide Average: 23.8%*	31,934 households *23.8% of county*	20,237 households *63.4% of countywide Disability population* *14.4% of total population within Disability Block Groups*
Population without Car Access *Households with zero vehicles* *Countywide Average: 7.7%*	10,282 households *7.7% of county*	8,315 households *80.9% of countywide Carless population* *7.9% of total population within Carless Block Groups*

**Note: This plan defines a Disadvantaged Neighborhood as those US Census Block Groups with qualifying populations greater than the countywide average; highlighted in blue in Figure 5-3 to Figure 5-7.*

Figure 5-3. Minority Population, by Census Block Group as Percent of Countywide Average

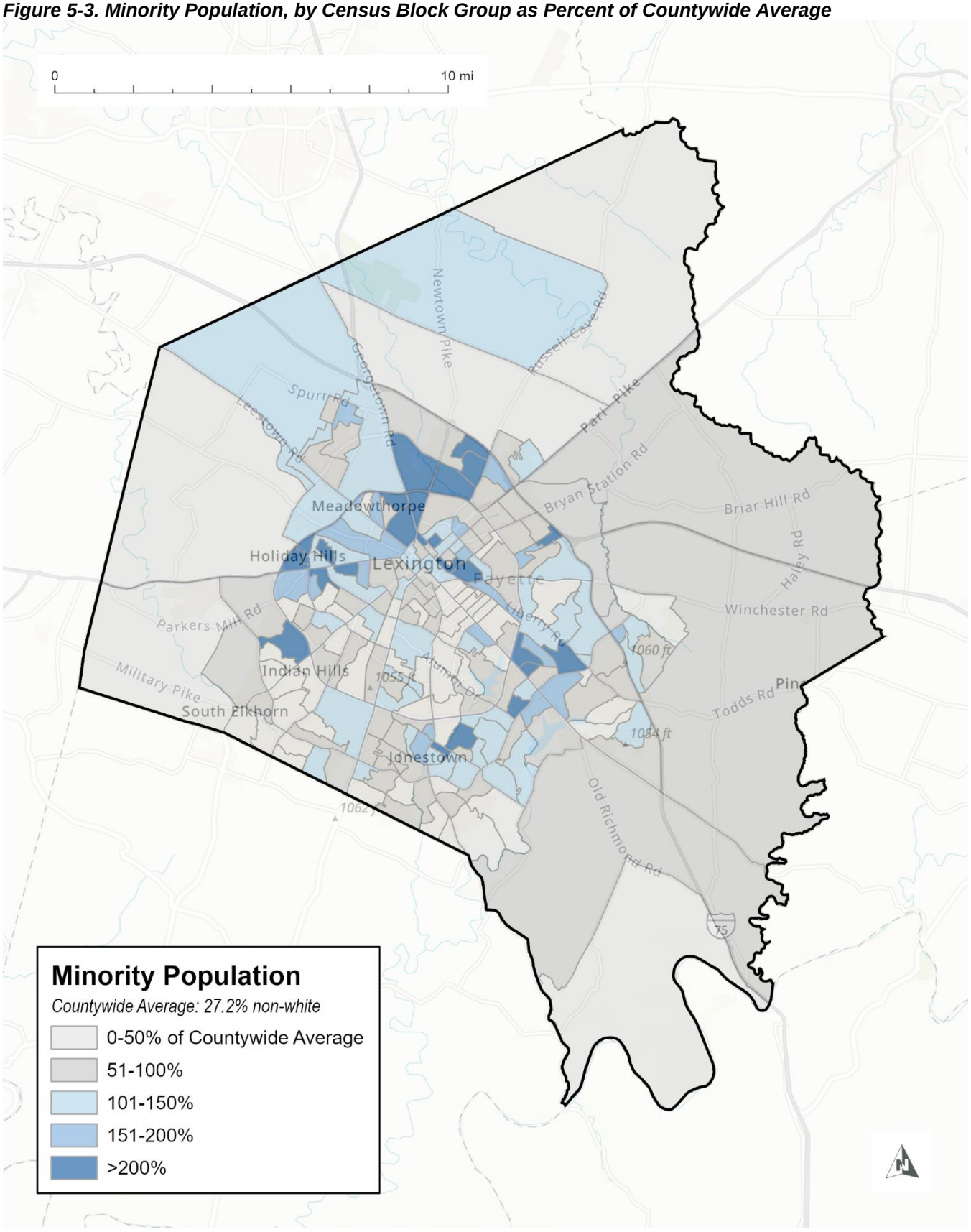


Figure 5-4. Elderly Population, by Census Block Group as Percent of Countywide Average

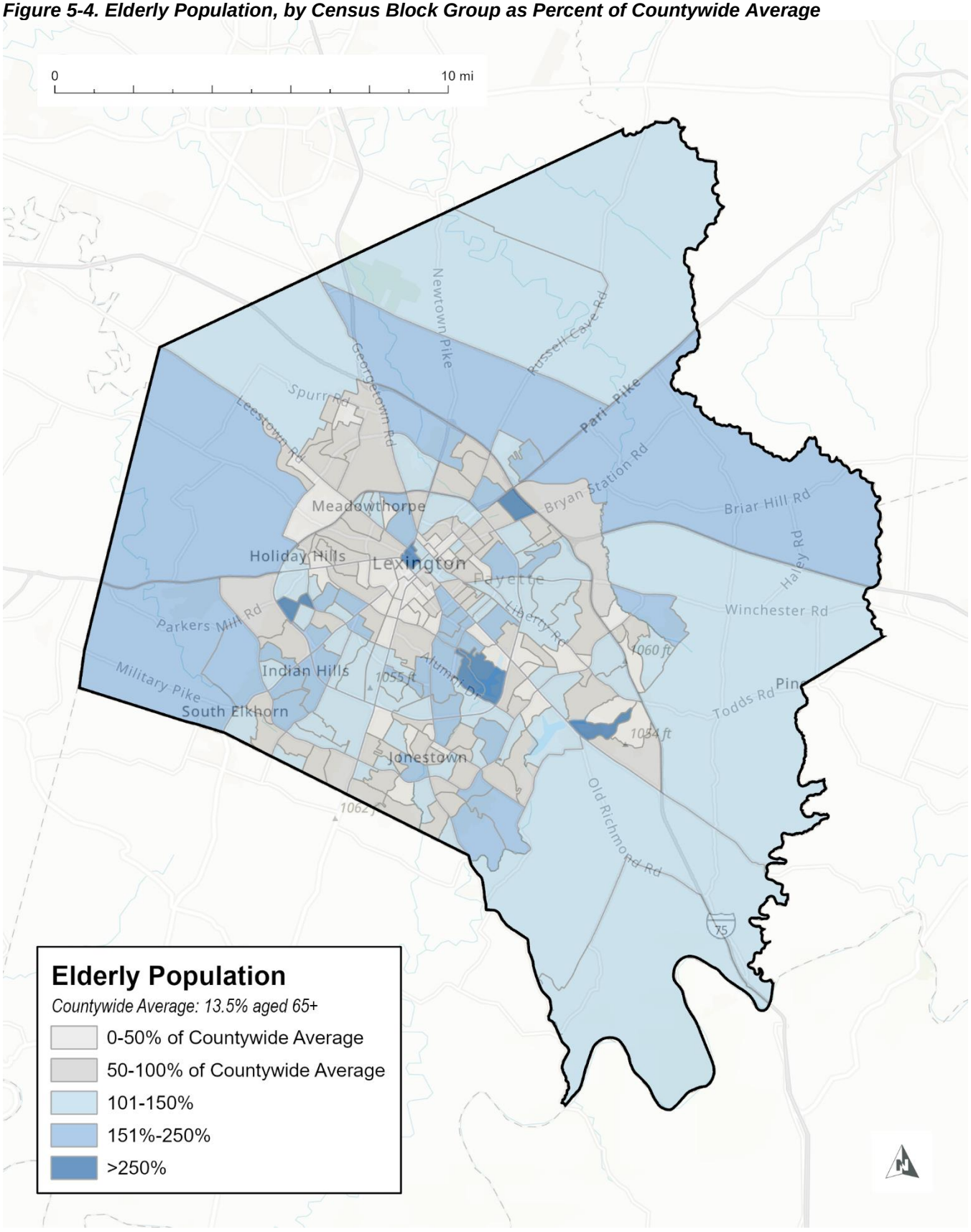


Figure 5-5. Population Experiencing Poverty, by Census Block Group as Percent of Countywide Average

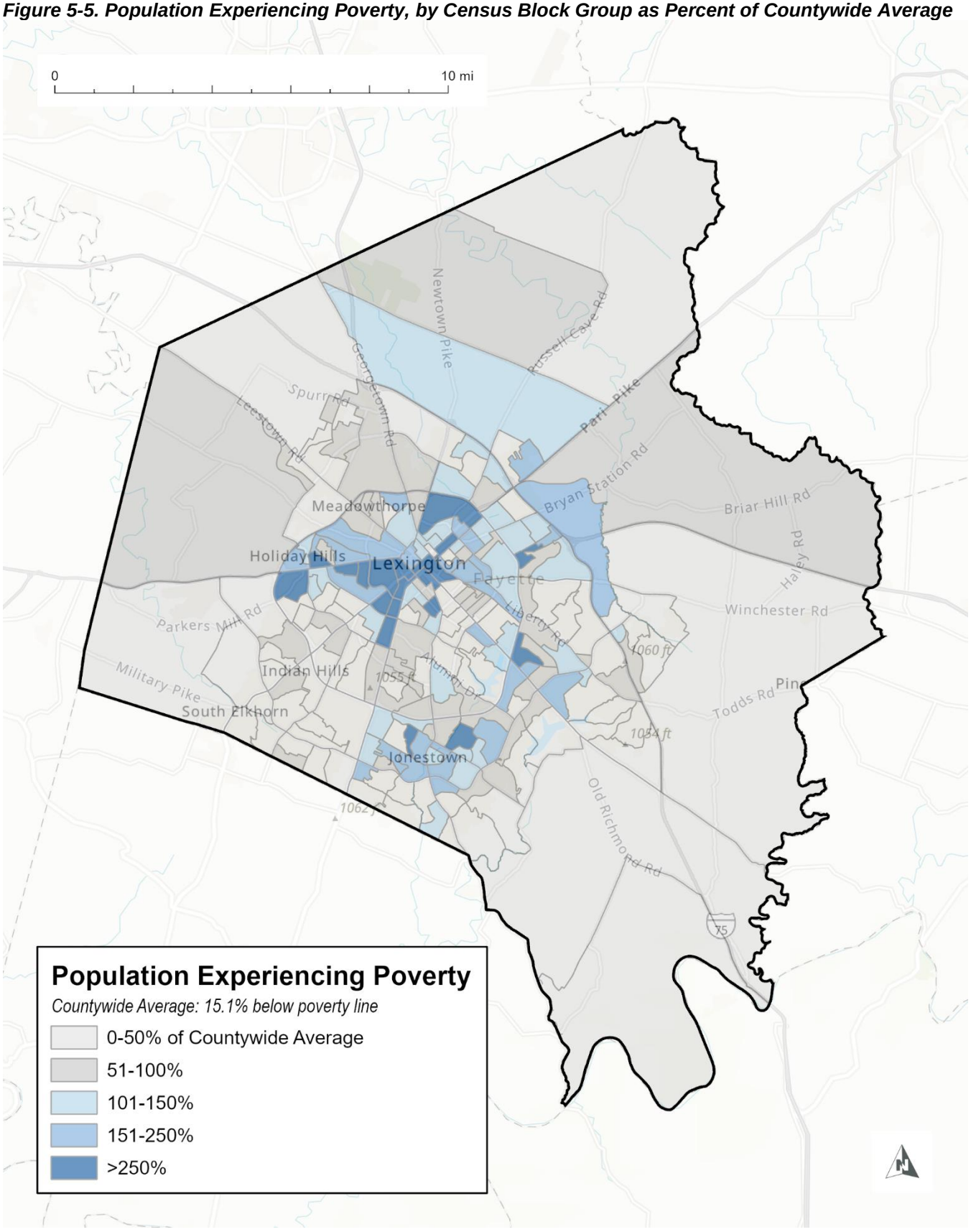


Figure 5-6. Population Impacted by Disability, by Census Block Group as Percent of Countywide Average

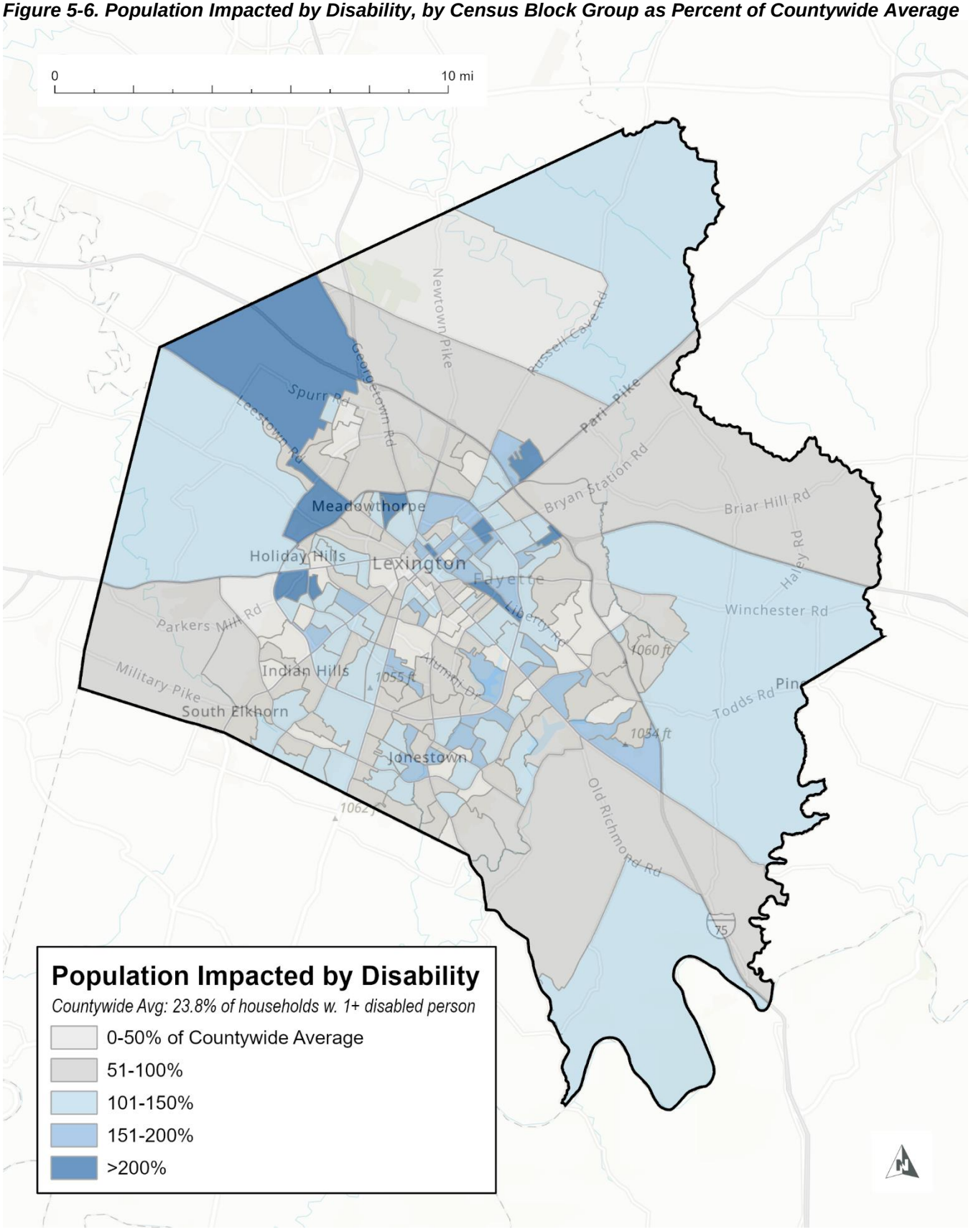
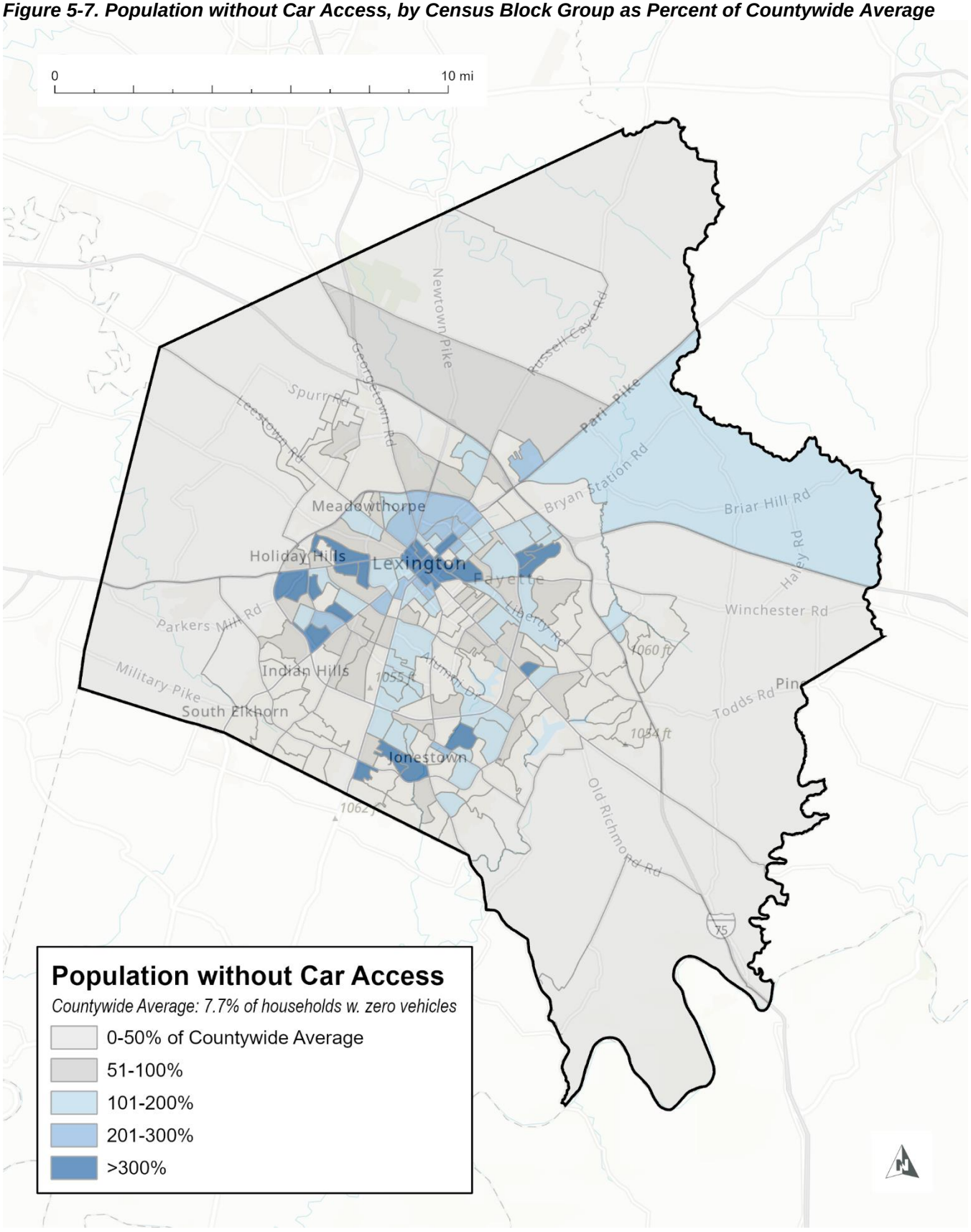


Figure 5-7. Population without Car Access, by Census Block Group as Percent of Countywide Average



Incorporating Equity throughout the Safety Action Plan Process

Incorporating equity considerations into the Safety Action Plan, or indeed any transportation decision-making process, must be a continuous effort, beginning with the initial development of a plan and continuing with the selection and prioritization of projects and on into the development and implementation of individual projects.

Initial Plan Development

As discussed in **Chapter 4**, safety conversations have been ongoing in Lexington-Fayette County for several years, including multiple outreach efforts working in parallel with the development of this Safety Action Plan. Equity considerations have been an element of those earlier public outreach efforts, building off of ongoing conversations LFUCG has had with groups representing Equity Populations or Equity Areas.

In many cases, those organizations have been directly included as stakeholders for those studies, as noted in **Chapter 4**, while in others a more traditional public engagement process has been undertaken that incorporated outreach and promotion of public meetings within areas that have now been demonstrated to be Equity Areas or Disadvantaged Neighborhoods based on the mapping in the previous section. And throughout the process, LFUCG staff has been mindful of its obligation to be an advocate for Disadvantaged Communities and residents and workers within Equity Areas when direct stakeholders are not available to participate and encourages its partner agencies and consulting staff to do the same.

Although the Safety Action Plan before you has been published, the safety conversation within Lexington-Fayette County is ongoing. Society's awareness of previously unrecognized and underserved disadvantaged groups continues to evolve, and the needs of those groups will be reflected in subsequent efforts that build on this plan, just as this plan built upon previous work to improve safety within the community while being mindful of equity impacts.

Selection and Prioritization of Projects

The assessments conducted in this chapter have served to identify the extent and location of equity populations within Lexington-Fayette County, through both Equity Areas and Disadvantaged Neighborhoods. **Chapter 7** of this Safety Action Plan will leverage the safety analyses conducted in **Chapter 3** to determine a slate of recommended projects, including corridor and intersection projects from both a historical (reactive) and systemic (proactive) lens.

Equity must be a consideration in the project selection and prioritization process, in conjunction with the magnitude of the identified historical and systemic safety issues. In this way, the worst-performing intersections and corridors can be expected to be selected and prioritized accordingly, but further down the list the chosen projects should also be selected based on the needs of underserved communities. These needs are most overtly felt in areas where historical transportation planning decisions have resulted in undue impacts from noise, pollution, or safety risks, as well as those areas where investment in safety improvements has been lacking in the past.

The most basic way to determine which projects are most strongly correlated with equity considerations is to map the proposed project locations against the location of Equity Areas. Per SS4A guidance, the principal Equity Area definition to use when identifying these equity populations is that of Underserved Communities, in this case based on CEJST methodology as used to evaluate SS4A and Justice40

programs. **Figure 5-8** and **Figure 5-9** show the locations of recommended corridor and intersection projects, respectively, that will be developed and prioritized in **Chapter 7**, overlaid on the CEJST-defined Underserved Communities Census Tracts from **Figure 5-1**. As discussed above, projects that address historic or systemic safety issues that are within or adjacent to Underserved Communities will be given increasing consideration in later stages of the selection process.

Project Development and Implementation

The inclusion of equity considerations will not stop once a project is selected for implementation. It is critical to ensure that equity populations continue to be engaged as this plan moves from development into implementation, and LFUCG commits to continue these conversations with impacted equity populations as well as the partner organizations noted in **Chapter 4**.

To this end, the Disadvantaged Neighborhoods maps and datasets contained in this chapter (**Figure 5-3** through **Figure 5-7**) should be used to cross-reference the location of selected projects with the specific Disadvantaged Population(s) affected by a given project, and efforts should be made to include that community and its representative organizations in the project development and implementation process as early as possible.

Figure 5-8. Location of Priority Corridors Relative to Underserved Communities

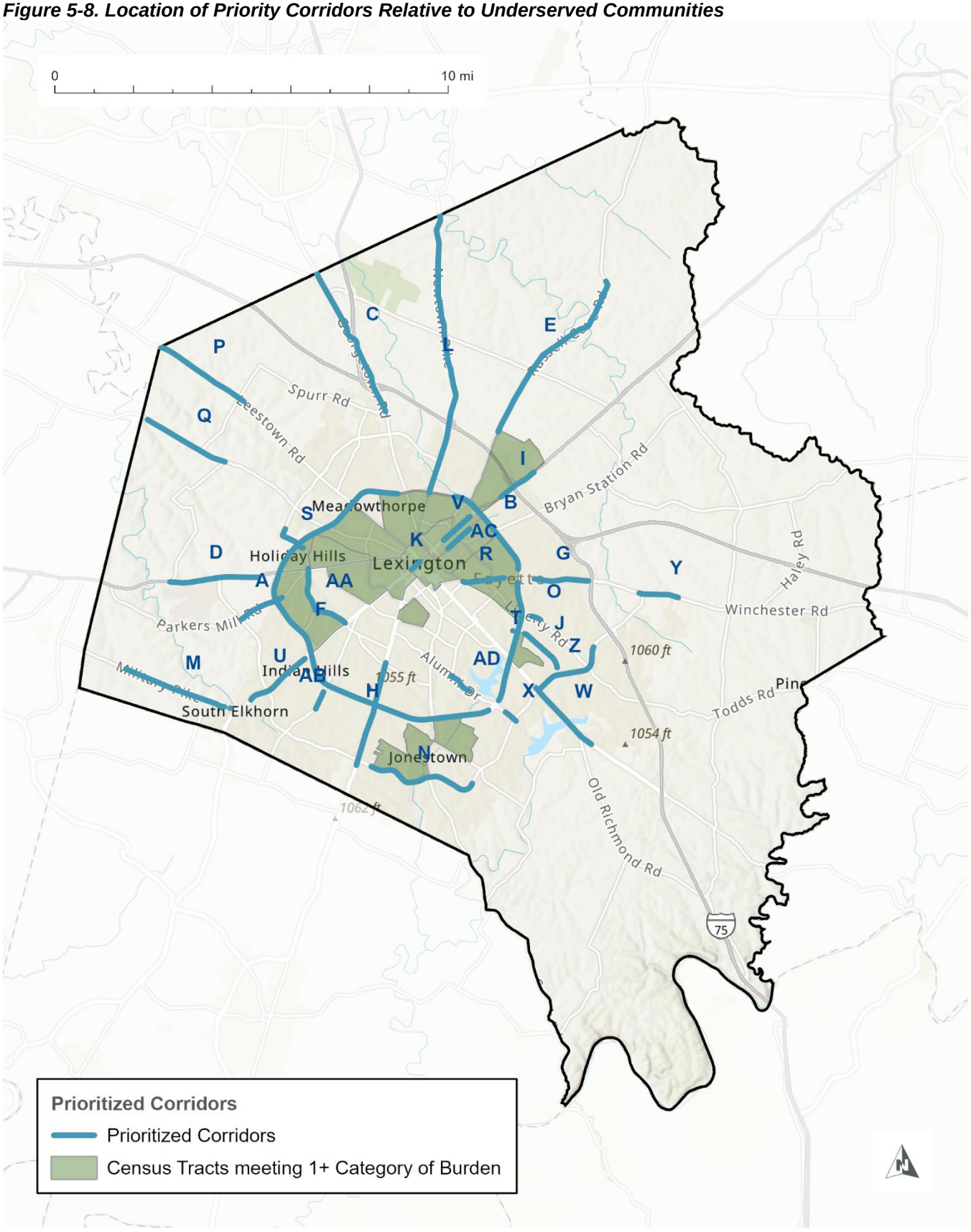
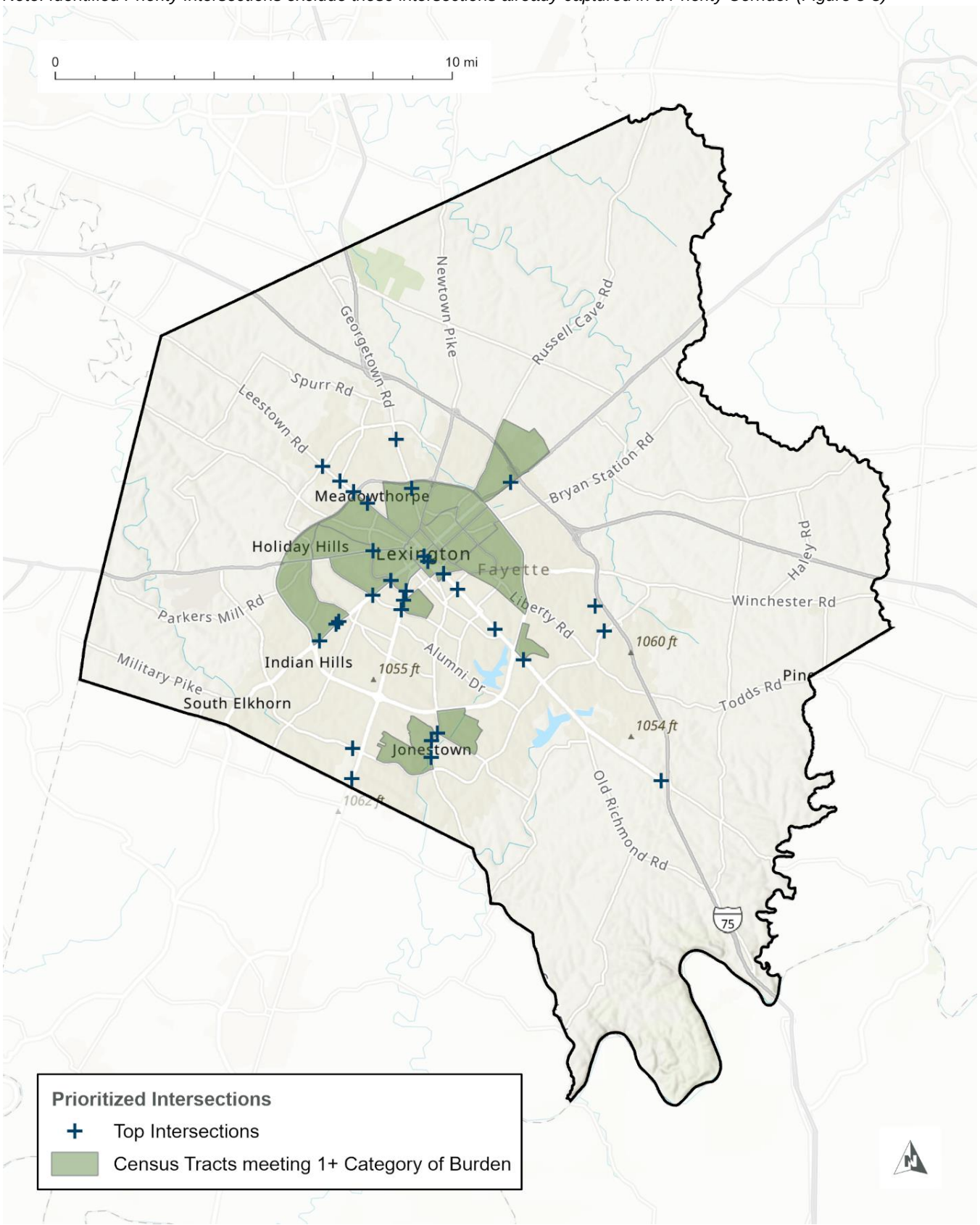


Figure 5-9. Location of Priority Intersections Relative to Underserved Communities
Note: Identified Priority Intersections exclude those intersections already captured in a Priority Corridor (Figure 5-8)



6. Policy and Process Changes

As outlined in **Chapter 1**, LFUCG has made safety a top priority by implementing policies, programs, and projects that seek to create a safe transportation system for all users across the City. This emphasis shows up in many of the City's plans, design guidelines, and codes or standards. However, LFUCG desires to continue to improve these documents and to bring safety into those that do not yet address it. This section includes a review of several important LFUCG documents as well as some regional planning documents to examine how safety is addressed in each. Recommendations are made for better integrating safety into several of the documents.

Imagine Lexington (2018 Comprehensive Plan)

Link: Full Comprehensive Plan | Imagine Lexington

The comprehensive plan presents development strategies, policies, procedures, and guidelines for the Lexington area. It also provides goals and objectives for maintaining and improving Lexington. Transportation safety (network and users) is directly or indirectly mentioned in many of the key design policy criteria as well as in several of the sustainability, connectivity, and growth policy criteria. Safety improvements and examples are integrated throughout the document. The plan specifically addresses pedestrian and bicycle improvements considering the topics of roadway design, connectivity, and travel speeds. Additional resource information is included throughout to provide reference to safety-related research and countermeasure materials, such as traffic calming examples from the National Association of City Transportation Officials (NACTO) Urban Street Design Guide as well as safety research results from pedestrian and bicycle studies.

The comprehensive plan is now being updated and the new plan will continue to integrate traffic safety in meaningful ways. Similar to the 2018 document, the new plan was developed based on extensive public engagement. The plan properly incorporates safety considerations, the impacts, and potential improvement concepts as is appropriate for a comprehensive plan.

LFUCG Complete Streets Policy

Link: LFUCG Complete Streets Policy

LFUCG adopted this policy on December 6, 2022. It includes safety as a key objective. No changes are recommended to this policy.

2045 Metropolitan Transportation Plan (MTP)

Link: Lexington Area Metropolitan Transportation Plan 2045

The LAMPO MTP was adopted on April 24, 2019. It presents historic traffic safety trends in the MPO region (Fayette and Jessamine counties), providing details regarding crash severities, crash types, and vulnerable road user crashes. It also discusses national safety targets. The MTP begins the safety section by stating that the MPO has made transportation safety a top priority and that it is committed to the mission and goals of the KYTC SHSP to reduce highway fatalities and serious injuries. The MTP outlines a series of projects and strategies for transportation improvements, of which safety is a key priority and is mentioned throughout, reinforcing the goals mentioned in the previous sections.

Based on the information presented within the document and the overall purpose of the document, there are no recommended changes to this plan. The MTP will be updated and as such the goals for the safety portion should be updated accordingly.

City of Lexington Subdivision Regulations

Link: Land Subdivision Regulations | City of Lexington

The City's subdivision regulations were last updated February 1, 2023. This document outlines the rules, regulations, and guidelines related to residential development within Lexington. It details various aspects of the development process and the polices and procedures associated. The document has mentions of transportation safety as it relates to the roadway connections, design, and traffic calming measures. It does not provide specifics as it relates to these concepts, but rather mentions them for adherence and awareness while providing references to other materials which may provide additional details.

The document refers to several other Lexington-Fayette plans/policies such as the Comprehensive Plan and the Neighborhood Traffic Management Manual for compliance, which will provide readers with additional information regarding safety impacts as they relate to the development process. Additionally, throughout the document various stages require the review and approval of local groups (Traffic Engineering, Division of Planning, etc.) which will create the opportunity for discussion of safety for each project. As this document is amended and/or updated in the future it would be beneficial to fully integrate current safety best-practices into the detailed requirements.

Neighborhood Traffic Management Program (NTMP)

Link: LFUCG Neighborhood Traffic Management Program

The current edition of the Neighborhood Traffic Management Program (NTMP) was published in April 2016. The NTMP provides a framework for neighborhood residents and LFUCG staff to collaborate on potential roadway mitigation measures to improve the livability within their area. This document establishes the process, requirements, and options available for potential treatments to provide residents with an understanding and method of changing the landscape as appropriate. The overall focus of many of the mitigation measures is targeted at reducing travel speeds and improving safety. Safety is a critical piece as mentioned in both the first goal and objective of the document. Many of the traffic management options are proven countermeasures often deployed in safety improvement projects – ranging from signing, striping, control, traffic calming, and speed reduction options. Appendix 1 provides details on traffic management techniques.

While safety is mentioned as an evaluation consideration and is discussed in the advantages/disadvantages area; a future update to this document should consider providing additional safety information regarding crash reductions, real-world applications or examples, and/or reference to safety studies (FHWA resources, CMF clearinghouse, Highway Safety Manual, etc.) related to the techniques for further investigation by the resident applicants.

LFUCG Roadway Manual

Link: LFUCG Roadway Manual

The roadway manual was last published on January 1, 2005. This manual provides information on roadway design practices, requirements, and policies for use for new or existing facilities within Lexington. The elements of design are consistent with industry-standard practices and relies heavily on previously developed materials from FHWA, AASHTO, KYTC, etc. As a reference, it may be beneficial when updating this document to include a reference to the current version of the highway safety manual at the time of development. This can be instructive in the roadway design process in determining lane

width and other roadway features. This manual also contains an abbreviated version of the NTMP as a subsection, including appendix 1.

As stated above for that document, while many of the techniques have a safety focus it would be beneficial to provide additional quantitative safety benefit information and additional resources for reference.

7. Strategy and Project Selections

Analysis Criteria

The historic crash analysis examined the common crash categories based on crash frequency and crash severity. This is helpful for illustrative and summary statistics but does not take into account other aspects of the data which may help identify and prioritize areas of crash hotspots in more refined detail than crash frequency.

The main focus of this study and the vision zero initiative is to reduce and eliminate severe crashes (fatal and serious injury). To consider the impact of crash severity more adequately, several methods were used to help identify focus areas as detailed below.

- Crash Rate – crash rate takes into consideration traffic exposure in addition to crash frequency to help identify locations that may exhibit a crash history disproportionate to the traffic volume. This method essentially normalizes the crashes in areas by traffic exposure. *By default, this does not directly apply any weight to crash severity, but additional analysis for severe crash rates can be calculated.*
- Equivalent Property Damage Only (EPDO) - generates a weighted score for locations based on values assigned to crash severity which combines the frequency and severity breakdown indices into a singular metric. *Unlike crash rate, EDPO does not normalize for volume but focuses on severity.*

EPDO was the primary method of analysis used for this study as it more adeptly considers the main focus of reducing and eliminating fatal and serious injury crashes. EPDO takes into consideration both crash severity and crash frequency. Crashes are assigned a weighted value based on the crash severity and how the cost associated with that severity is relative to the cost associated with the lowest severity, property damage only (O) crashes. The basic assumption is that the cost of crashes is an indicator of emphasis, and this method, therefore, normalizes the crash severities to an equivalent plane.

Societal crash costs have been utilized to determine potential crash benefits for HSIP projects in recent years, these costs were used to determine the EPDO weights for each severity. **Table 7-1** shows the breakdown of societal costs and EPDO values for each severity as used in this study.

Table 7-1. EPDO Analysis Valuation

Crash Severity	Societal Crash Cost	EPDO Value
K	$ 10,260,398	957.9
A	$ 594,641	55.5
B	$ 180,063	16.8
C	$ 113,815	10.6
O	$ 10,711	1.0

As shown in **Table 7-1**, the societal costs of a fatal (K) crash in comparison with other crash severities is quite significant (approximately 900 times more impactful). While this is the purpose of the EPDO weighting, it was determined that this method may be weighing too significantly toward the fatal crashes and creating an over-prioritization on areas that may have fewer crashes. To resolve this, a modified EPDO methodology was developed to blend the fatal (K) and serious injury (A) crash values to reduce

the impact that fatal crashes were having on the EPDO scores, while still prioritizing severe crashes in the analysis. The blended KA value was based on the ratio of K and A crashes and societal costs. The modified EPDO (mEPDO) crash costs and values are shown in **Table 7-2**.

Table 7-2. Modified EPDO Analysis Valuation

Crash Severity	Societal Crash Cost	EPDO Value
KA	$ 2,542,437	237.4
B	$ 180,063	16.8
C	$ 113,815	10.6
O	$ 10,711	1.0

This methodology was evaluated by the project team and key stakeholders and determined to provide a more appropriate examination of the priority crash issues throughout the study area. The mEPDO methodology was applied to the road segments and intersections throughout the study area to develop a data-driven analysis and prioritization of safety recommendations.

Reactive Analysis Results

The aforementioned modified EPDO (mEPDO) methodology was applied to roadway segments and intersections which provided an initial list of locations for investigation. Spatial examination of the segments and corridors with associated mEDPO values helped to generate a list of logical corridor areas for focus on safety improvements. Corridors consisted of a combination of adjoining or neighboring roadway segments and/or intersections that exhibited high mEPDO values and generally exhibited similar characteristics (relatively homogeneous roadway type, context, function, etc.). Intersections with high mEDPO values which were not contained within the prioritized corridor list were included in a standalone intersection list for isolated safety projects. The following subsections detail those lists in further detail.

Prioritized Corridors

Table **7-3** presents the list of prioritized corridors for safety improvements throughout the Lexington-Fayette County area. This list illustrates the location, extent, and high-level crash details on each of the corridors. A map of these corridors is shown in **Figure 7-1** to provide spatial context. Together these corridors contain 11,086 (21.9% of total) crashes of which 260 were severe crashes (34.9% of total) demonstrating the potential for impact if safety improvements were implemented in these locations.

Table **7-3** and **Figure 7-1** highlight the prioritized corridor projects within the study area, identified in **Figure 7-1** by Corridor ID.

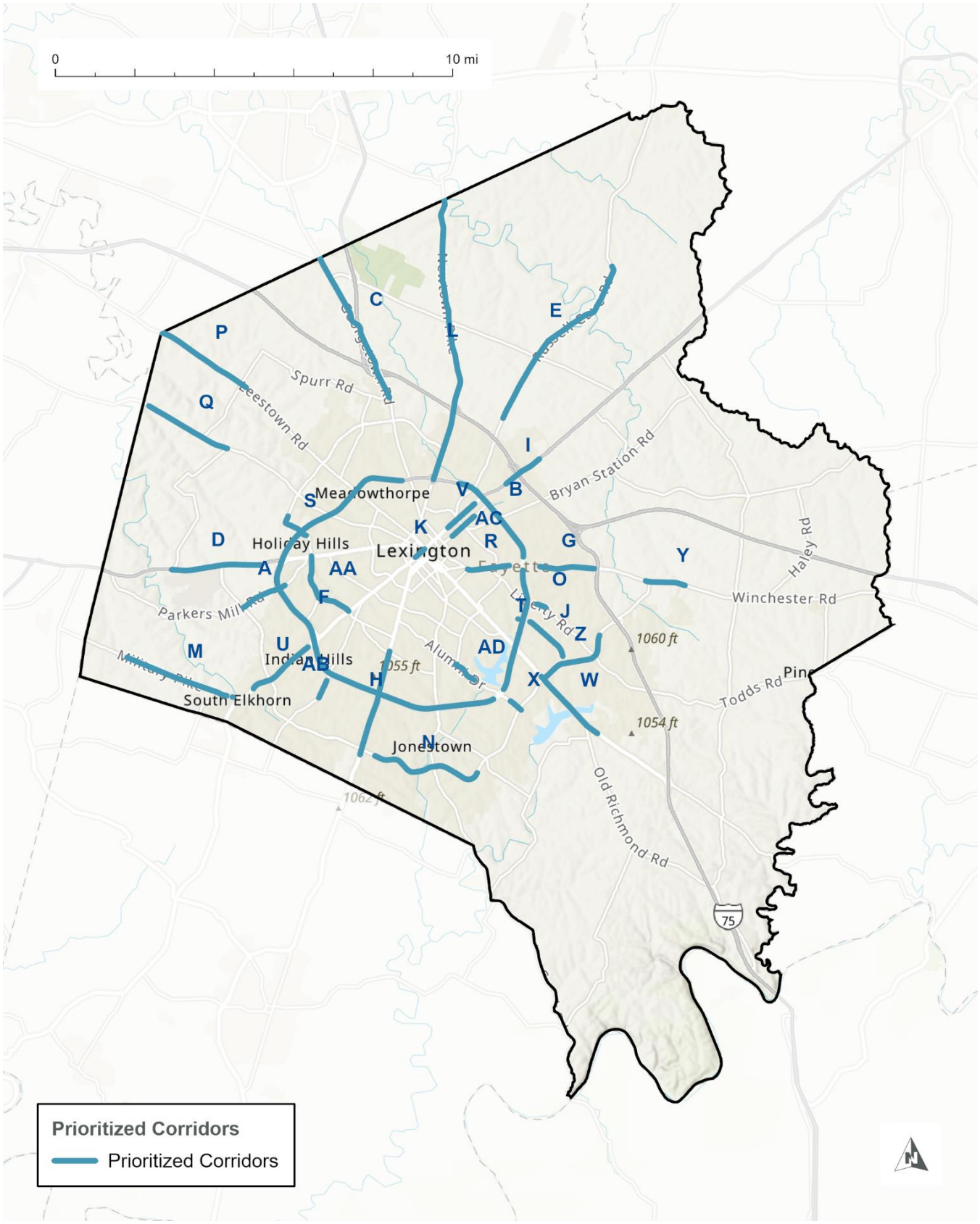
Table 7-3. Prioritized Corridor Projects

Avg Rank	Corridor ID	Corridor Name	Start	End	Length	Type	Total Crashes	Total KA Crashes	Total mEPDO
1	V	N Broadway	W 6th St	Northland Dr	1.0	Intersection Corridor	417	16	5440.8
2	B	NE New Circle Rd	Boardwalk	Winchester Rd	2.8	Corridor	1837	39	16092.8
3	C	Georgetown Rd	Spur Rd	KY 1963 (Lisle Rd)	4.0	Corridor	375	14	4526
4	L	Newtown Pike	New Circle Rd	New Zion Rd	7.1	Corridor	468	15	5171.4
5	F	New Circle (Access Controlled)	Georgetown Rd	Alumni Dr	7.4	Access Controlled	1361	17	8373.4
6	H	Nicholasville Rd	Collins Ln	Toronto Rd	2.6	Intersection Corridor	2324	21	12713.2
7	AA	Lane Allen Rd/ Alexandria Dr	Harrodsburg Rd	Versailles Rd	1.9	Local	265	10	3293.8
8	U	Harrodsburg Rd	Stedman Dr	New Circle Rd	1.7	Intersection Corridor	329	11	3709.8
9	E	Russell Cave Rd	Faulkner Ave	KY 1876 (Greenwich Pike)	4.8	Corridor	69	6	1828.6
10	W	Richmond Rd	Hays Blvd	Man O' War Blvd	2.1	Intersection Corridor	651	11	4701.2
11	I	Paris Pike	Lin Wal Rd	Kingston Rd	1.1	Corridor	442	10	3919.4
12	M	Military Pike	Keene Rd	James Ln	2.6	Segment	46	5	1370.8
13	T	E New Circle Rd	Winchester Rd	Alumni Dr	2.9	Corridor	1393	9	6416.4
14	N	Man O' War Blvd	Victoria Way	Trent Blvd	2.1	Local	666	9	4301
15	D	Versailles Rd	KY 1969 (Rice Rd)	Wellesley Heights Way	2.3	Corridor	331	8	2936
16	R	Winchester Rd (Inside NCR)	Walton Ave	Brown Ave	1.1	Corridor	231	6	2386.4
17	Q	Old Frankfort Pike	Redd Rd	Bradley Ln	2.8	Corridor	24	3	853.4
18	G	Winchester Rd (Outside NCR)	Fortune Dr	I-75 Interchange	1.3	Corridor	326	7	2767.8
19	O	Liberty Rd	Fortune Dr	Burkewood Dr	0.3	Segment	29	3	794.4
20	K	S Broadway	W Maxwell St	W Main St	0.3	Corridor	339	6	2456.6
21	AB	Clays Mill Rd	Keithshire Way	Stone Rd	0.7	Local	143	5	1564.8
22	AC	N Limestone Rd	W 6th St	Fairlawn Ave	0.8	Local	177	5	1807.4
23	J	Palumbo Dr	Old Todds Rd	Codell Dr	1.2	Local	70	2	1021.6
24	AD	Alumni Dr (West)	Lakeside Dr	Chinoe Rd	0.6	Local	70	3	887.6
25	A	Parkers Mill Rd	Man O War Blvd	Cape Cod Cir	1.2	Corridor	99	3	1168.8
26	P	Leestown Rd	Sunnybrook Ln	Browns Mill Rd	2.6	Corridor	76	3	897.4
27	S	Alexandria Dr (East)	Our Native Ln	New Circle Rd	0.7	Local	41	2	663.4
28	X	Alumni Dr	Man O War Blvd	Yellowstone Pkwy	0.3	Local	389	5	2141.2
29	Z	Man O' War Blvd (East)	Richmond Rd	Pink Pigeon Pkwy	2.0	Local	1051	4	3813.4
30	Y	Winchester Rd (East)	Man O War Blvd	Bahama Rd	0.9	Segment	47	2	672.8

Planned Highway Project along/ adjacent to corridor

Locally Owned Corridors

Figure 7-1. Prioritized Corridors



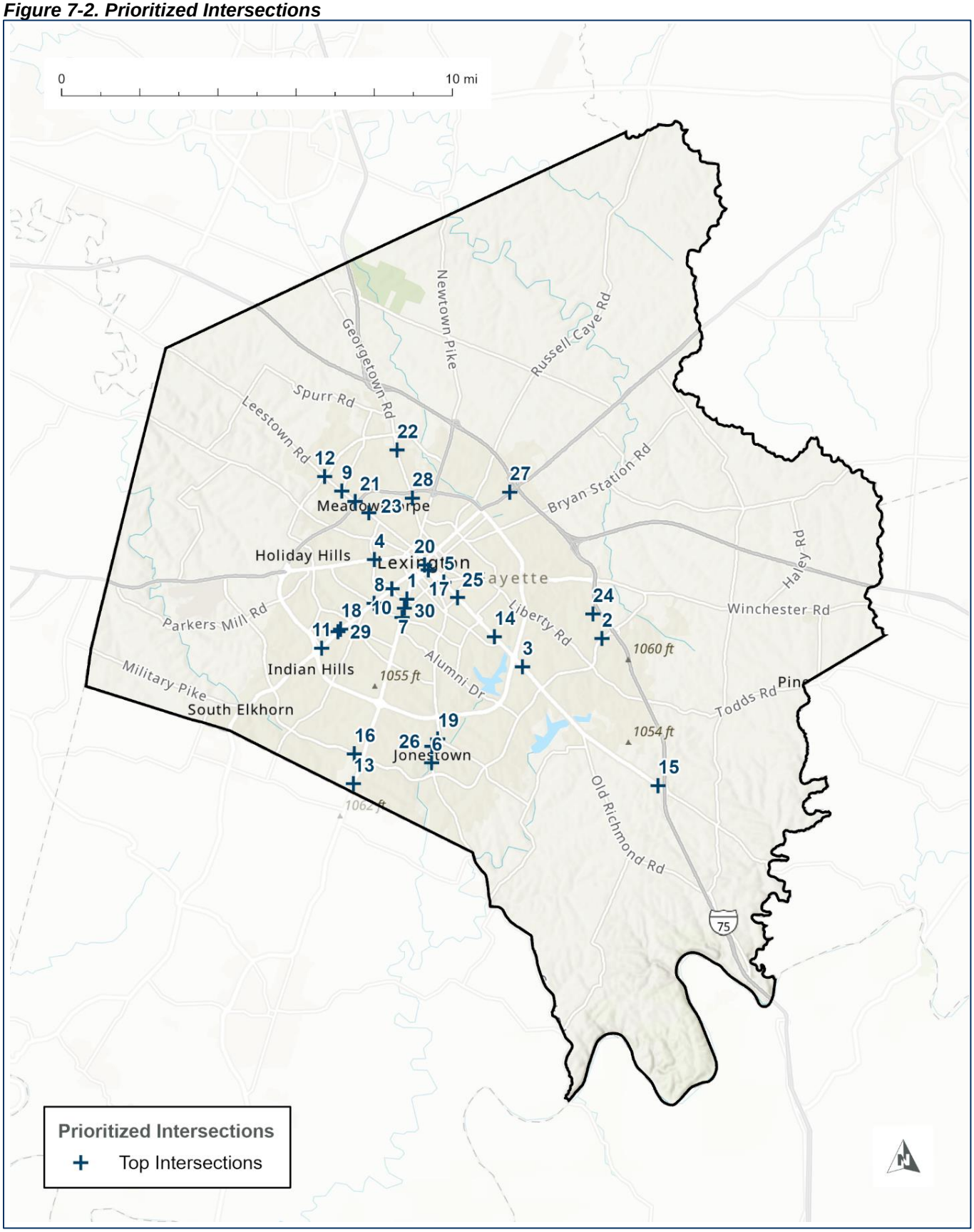
Prioritized Intersections

Table 7-4 presents the list of the top intersections as ranked by mEPDO which were not contained within the identified corridors. Intersections, unlike corridors or roadway segments, can cause isolated crash issues as they are the junctions between roadways and contain significantly more conflict points. The prioritized intersections consist of the top 30 intersections which include all intersections with mEPDO values greater than 500, which is where the curve of the mEPDO values and rankings begins to flatten. This list of intersections represents the majority of focal areas that can yield the greatest impact on safety. The prioritized intersections represent 2,714 (4.2% of total) crashes, of which 56 were severe crashes (8.5 % of total severe). **Figure 7-2** illustrates the location of these intersections within the study area.

Table 7-4. Prioritized Intersections

Int Rank	Int ID	Intersection	Control	KA Crashes	Total Crashes	mEPDO Value
1	123468	S Limestone & Virginia Ave	Signalized	4	243	1655.6
2	121751	Man O War Blvd & Sir Barton Way	Signalized	3	250	1291.2
3	120712	Richmond Rd & Old Todds Rd	Signalized	3	111	1055.4
4	125458	Versailles Rd & Red Mile Rd/Forbes Rd	Signalized	3	104	1019.6
5	124254	E Main St & E Vine St/Midland Ave	Signalized	3	95	922.6
6	116398	Tates Creek Rd & Wilson Downing Rd	Signalized	2	107	892.2
7	123099	S Limestone & Transcript Ave	Signalized	2	83	860.6
8	123310	Harrodsburg Rd & Waller Ave/Mason Headley Rd	Signalized	1	165	848.8
9	128035	Leestown Rd & Greendale Rd	Signalized	3	51	843.2
10	123903	S Broadway & Red Mile Rd/Virginia Ave	Signalized	1	151	751.2
11	121383	Harrodsburg Rd & Pasadena Dr	Signalized	1	168	738.8
12	128468	Leestown Rd & Citation Blvd/Alexandria Dr	Signalized	2	66	720
13	115616	Nicholasville Rd & Southpoint Dr	Signalized	2	73	702.6
14	121793	Richmond Rd & Lakeshore Dr	Signalized	2	52	655.4
15	115560	Athens Boonesboro Rd & Recreation Dr	Unsignalized	2	28	616
16	116743	Man O War Blvd & Nichols Park Dr	Signalized	1	130	605.6
17	124908	Vine St & S Limestone	Signalized	2	42	601.6
18	122111	Harrodsburg Rd & Springridge Dr	Signalized	2	29	597.4
19	117279	Tates Creek Rd & Redding Rd/Armstrong Mill Rd	Signalized	1	138	586
20	125148	W Vine St & S Mill St	Signalized	2	43	566.6
21	127693	Leestown Rd & Ky 4 Ramp (Outer Loop)	Signalized	1	82	553.2
22	129419	Georgetown Rd & Capstone Dr	Signalized	2	16	550.2
23	127333	Leestown Rd & Boiling Springs Dr	Signalized	1	68	544.6
24	122844	Sir Barton Way & Old Rosebud Rd	Signalized	2	26	542.8
25	123513	E Main St & Ashland Ave	Signalized	1	84	520.8
26	116983	Tates Creek Rd & Parliament Way	Unsignalized	2	14	520.4
27	128005	N Broadway & Haggard Ln	Signalized	1	73	515.6
28	127802	Georgetown St & Keller Ct	Unsignalized	2	8	506.2
29	121995	Harrodsburg Rd & Longview Dr	Unsignalized	2	16	504.6
30	122655	Nicholasville Rd & Waller Ave/Cooper Dr	Signalized	0	198	500.8

Figure 7-2. Prioritized Intersections

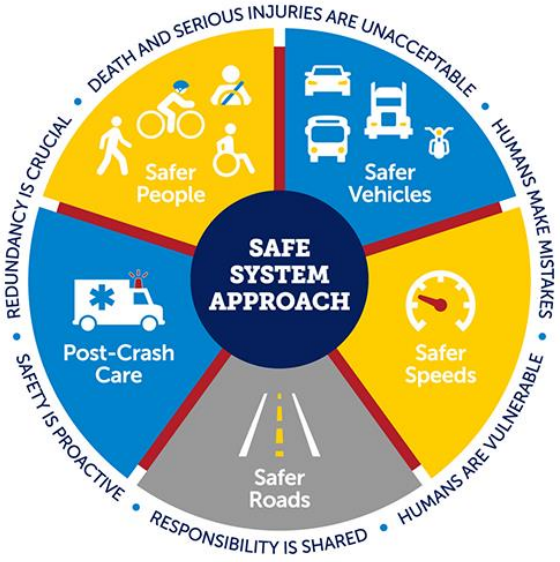


Recommended Strategies and Countermeasures

Although not all crashes can be mitigated, a significant portion of them can potentially be mitigated or their severity reduced by some type of engineering countermeasure (e.g., roadway design feature, intersection improvements, operational changes, etc.), human factor solutions (such as education campaigns or rewarding better behavior), or a combination of both.

Engineering countermeasures represent the traditional types of improvements implemented as safety solutions; however, there are additional categories of solutions (as referenced above), which fall outside the traditional engineering countermeasure. The safe systems approach to roadway safety examines five critical areas of safety to develop countermeasures and improvements to improve safety performance. These areas are shown in **Figure 7-3** and include safe vehicles, safe speeds, safe roads, post-crash care, and safe road users. Engineering countermeasures often address several of these categories, but do not always intersect with all; therefore, additional countermeasures will be examined as part of this action plan to address the safety issues more holistically in the Lexington-Fayette area.

Figure 7-3. Safe Systems Approach



https://www.transportation.gov/NRSS/SafeSystem

Engineering countermeasures can be classified as Reactive or Systemic.

- **Reactive** countermeasures are those that focus on improving "hot-spots" or intersections/segments which have been shown to have a safety problem.
- **Systemic** countermeasures seek to address "global/systemwide" problems throughout the study area. They can also address safety problems at many locations or within a sub-area of the overall.

Engineering Strategies

Toolbox of Proven Countermeasures

Both reactive and systemic strategies rely heavily on the implementation of documented, proven countermeasures that can address safety concerns. These countermeasures are based upon

research, before-after, and case study data which show positive safety benefits geared for specific design or operational issues. **Table 7-5**, **Table 7-6**, and **Table 7-7** detail the toolbox of proven pedestrian, segment, and intersection countermeasures to be utilized for the Lexington-Fayette area as appropriate. The countermeasures described or shown detail the concept, which may vary in actual application and can often be customized to best fit the context for a segment or intersection.

Table 7-5. Pedestrian Countermeasures

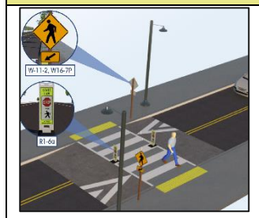
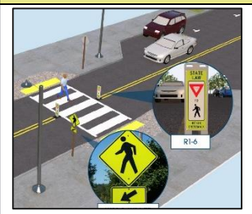
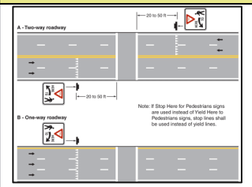
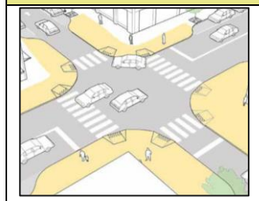
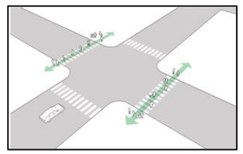
Pedestrian Countermeasures							
Countermeasure Reference	**Description**	**Safety Impact**	**Links**	**Countermeasure Reference**	**Description**	**Safety Impact**	**Links**
Raised Crosswalk				**Crosswalk Visibility Enhancements**			
	Ramped speed tables spanning the roadway, often placed at midblock crossings	Ped Crashes ↓ 45%	FHWA *Local Use:* *Pine Bloom Dr*		Combination of high-visibility crosswalks, lighting, and signing and pavement markings. Can be implemented alone or in combination.	Ped Crashes ↓ 40%	FHWA *Local Use:* *S. Limestone*
Medians and Pedestrian Refuge Islands				**Advanced Stop/Yield Lines**			
	Median with Marked Crosswalk | Ped Crashes ↓ 46% Pedestrian Refuge Island | Ped Crashes ↓ 56%		FHWA *Local Use:* *Alumni Dr*		Provide notice to drivers of upcoming pedestrian crossings	Ped Crashes ↓ 25%	FHWA *Local Use:* *Eastern Blvd*
Curb Extensions (Bulb Outs)				**Leading Pedestrian Interval**			
	Extends curbs to provide additional refuge, shorten crosswalks, slow vehicle traffic	Decrease turning speed Decrease crash severity	NACTO *Local Use:* *Sixth St*		Provide pedestrians 3+ sec head start to improve visibility to turning traffic	Ped Crashes ↓ 13%	FHWA
Pedestrian Beacons							
	Ped Hybrid Beacon (PHB) | All Crashes ↓ 12%, Ped Crashes ↓ 43% Rectangular Rapid Flashing Beacon (RRFB) | Ped Crashes ↓ 47%		FHWA *Local Use:* *Eastern Blvd*				

Table 7-6. Segment Countermeasures

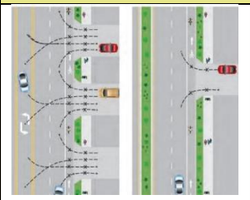
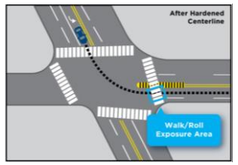
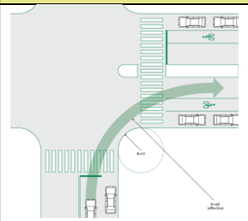
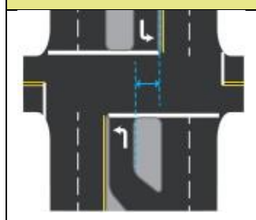
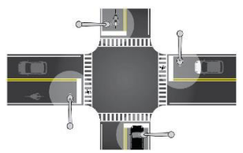
Segment Countermeasures							
Countermeasure Reference	**Description**	**Safety Impact**	**Links**	**Countermeasure Reference**	**Description**	**Safety Impact**	**Links**
Roadway Right-Sizing (Road Diet)				**Center Turn Lanes**			
	Reallocate space within roadbed to calm traffic speeds and improve safety for all users	All Crashes ↓30%	FHWA *Local Use: Euclid Ave*		Provide painted median separation area to be used for two-way left-turning traffic to remove from travel lanes.	All Crashes ↓24%	Road Safety Toolkit *Local Use: Versailles Rd*
Curbed Median				**Consolidate Driveways (Access Management)**			
	Provide curbed median separation between opposing travel lanes to provide separation, reduce minor driveway left-turn risks	All Crashes ↓28% Angle Crashes ↓55%	*Local Use: Versailles Rd*		Reduce the number and proximity of access points to focus turning traffic to fewer locations. Reduces turning conflict potential	Severe Crashes ↓25-31%	FHWA *Local Use: Harrodsburg Rd*
Dynamic Speed Feedback Signs				**Shoulder Treatment - Safety Edge**			
	Provides positive and negative feedback to drivers on speed. Reminder of speed limits and speed changes.	All Crashes ↓5%	FHWA		Shoulder installation to improve recoverability for roadway departures.	Run off Road Crashes ↓21% Head On Crashes ↓19% Severe Crashes ↓11%	FHWA
Enhanced Curve Delineation				**Buffered Bike Facilities**			
	High visibility markings and delineators around curves.	Severe Crashes ↓18%	FHWA		Provides greater shy distance between motor vehicles and bicycles.	Add additional space between vehicle and bicycle traffic	NACTO
Protected Cycle Tracks				**Conventional Bike Lanes**			
	Physically separate slower moving, vulnerable users from motor ways.	Prevents conflicts. Improves perceived comfort and safety	NACTO		On streets with < 3,000 ADT and posted speed > 25mph, creates separation.	Increase bicyclist comfort and predictability between motorist and cyclist.	NACTO *Local Use: University Dr*

Table 7-7. Intersection Countermeasures

Intersection Countermeasures							
Countermeasure Reference	**Description**	**Safety Impact**	**Links**	**Countermeasure Reference**	**Description**	**Safety Impact**	**Links**
Hardened Centerlines				**Tighten Intersections/Sharpen Corner Radii**			
	Provide hardened median further into intersection to tighten left-turning movements. Consolidate conflict points.	Ped Crashes ↓70.5%	Seatle DOT		Reduce effective corner radii to slow turning vehicles. Reduce or consolidate conflict points. Improve pedestrian crossing distances.		FHWA
Restricted Crossing U-Turn (RCUT)				**Modern Roundabouts**			
	Convert existing traditional intersection into RCUT (signalized or unsignalized). Eliminating and reducing conflicts.	Severe Crashes ↓22-54%	FHWA *Local Use: Richmond Rd*		Converting existing traditional intersection (stop or signal control) into single lane roundabout. Slowing traffic while eliminating and reducing conflicts.	2-way Stop to RAB – Severe Crashes ↓82% Signal to RAB - ↓78%	FHWA *Local Use: Alumni Dr*
Cycle Length and Clearance Intervals				**Left-Turn Phasing – Protected Only**			
	Shorter cycle lengths improve driver compliance, lessen red-light running.		NACTO		Eliminates conflicts in areas where sight distance, spacing, judgement is difficult.	All Crashes ↓18-42%	FHWA
Positive Left-Turn Lane Offset				**Intersection Lighting**			
	Provides increased visibility by preventing turning vehicles from blocking sightlines.	Left-turn crashes ↓36%	FHWA *Local Use: US 25*		Increased visibility at nighttime can improve safety for all modes of travel.	Nighttime Ped Injuries ↓42% Nighttime Crashes ↓33-38%	FHWA
Protected Intersection				**Intersection Treatments for Conventional Bike Lanes**			
	Physically separates modes, increases legibility, and increases visibility of each.	Users more visible to each other. Improves bike comfort.	NACTO *Example Use: Madonna Rd*		Provide opportunity for cyclist to position themselves to approach and travel through intersections.	Predictability. Reduces conflict between turning motorists and bicyclists.	NACTO

Reactive Strategies

Reactive safety strategies use the historic crash data and crash trends to identify countermeasures to directly address safety concerns. As previously discussed, prioritized lists of corridors and intersections have been identified for safety focus and future safety improvement projects.

Corridor Improvements

The prioritized corridors represent longer roadway segments and/or intersections grouped to generate cohesive safety project areas. The grouping was to incorporate adjacent or nearby segments/intersections which also exhibited crash issues and were generally homogenous concerning operations, function, context, and layout. Each of the corridors from the prioritized list was studied to generate potential countermeasures for implementation. **Table 7-8** provides a high-level set of improvements associated with each of the prioritized corridors.

Table 7-8. Potential Corridor Improvement Countermeasures

Avg Rank	Corridor ID	Corridor Name	Start MP	End MP	Length	Potential Improvement Concepts
1	V	N Broadway	W 6th St	Northland Dr	1.0	Raised Median. Access Mgmt. Pedestrian (Crosswalks, Slower Speeds, Gateway). Roundabout at Loudon.
2	B	NE New Circle Rd	Boardwalk	Winchester Rd	2.8	RCUT Intersections. Pedestrian Improvements (Slower Speeds, Gateway, Midblock crossings, Crosswalks). Narrow Typical Section.
3	C	Georgetown Rd	Spur Rd	KY 1963 (Lisle Rd)	4.0	Rumblestrips (Edge/Center). Signage/Marking Upgrades. Roundabouts at key locations.
4	L	Newtown Pike	New Circle Rd	New Zion Rd	7.1	Queue Warning System (S of I-75). Speed Feedback System (N of I-75). Signage/Marking Upgrades (N of I-75).
5	F	New Circle (Access Controlled)	Georgetown Rd	Alumni Dr	7.4	ATDM Strategies - Dynamic Message System. Ramp Metering. Advisory Variable Speed System.
6	H	Nicholasville Rd	Collins Ln	Toronto Rd	2.6	Continue current detailed study. Consider Innovative intersection concepts at key locations.
7	AA	Lane Allen Rd/Alexandria Dr	Harrodsburg Rd	Versailles Rd	1.9	Roundabouts at key intersections. Pedestrian and bicycle continuity/connectivity. Improved Signage. Traffic calming.
8	U	Harrodsburg Rd	Stedman Dr	New Circle Rd	1.7	RCUT Intersections or Roundabouts (Turbo). Access Mgmt. Pedestrian and bicycle connectivity via current SUP project.
9	E	Russell Cave Rd	Faulkner Ave	KY 1876 (Greenwich Pike)	4.8	Widen shoulders/safety edge. Rumblestrips (edge/center). Roundabouts at key locations.
10	W	Richmond Rd	Hays Blvd	Man O' War Blvd	2.1	Continue ongoing RCUT project.
11	I	Paris Pike	Lin Wal Rd	Kingston Rd	1.1	Median improvements with access management. Improve pedestrian crossings
12	M	Military Pike	Keene Rd	James Ln	2.6	Select shoulder widening/safety edge. Rumblestrips (edge/center). Advanced Warning and Intersection Signage. Roundabout at Keene Rd.
13	T	E New Circle Rd	Winchester Rd	Alumni Dr	2.9	Continue ongoing project.
14	N	Man O' War Blvd	Victoria Way	Trent Blvd	2.1	Innovative Intersections (Displaced left, RCUT, etc.) at high-capacity intersections. DMS installations (speed, incident, queue). Advanced signage.
15	D	Versailles Rd	KY 1969 (Rice Rd)	Wellesley Heights Way	2.3	DMS installations (advisory speed, queue warning, incident). Convert Versailles intersection into innovative intersection (Displaced left)
16	R	Winchester Rd (Inside NCR)	Walton Ave	Brown Ave	1.1	Improved Signage – Speed Advisory, Pedestrian Warning. Add pedestrian crossing signal at Strader Dr. Widen sidewalks and/or SUP. Access Mgmt.
17	Q	Old Frankfort Pike	Redd Rd	Bradley Ln	2.8	Select shoulder widening/safety edge. Rumblestrips (edge/center). Upgrade advanced and curve warning signs. Speed feedback system.
18	G	Winchester Rd (Outside NCR)	Fortune Dr	I-75 Interchange	1.3	Upgrade pedestrian facilities. Add raised median.
19	O	Liberty Rd	Fortune Dr	Burkewood Dr	0.3	Continue ongoing project.
20	K	S Broadway	W Maxwell St	W Main St	0.3	Consider raised median with turn lanes. Access Mgmt.
21	AB	Clays Mill Rd	Keithshire Way	Stone Rd	0.7	Improve shopping center access – convert to roundabout or consider eliminating left-turns out with median improvements.
22	AC	N Limestone Rd	W 6th St	Fairlawn Ave	0.8	Traffic Calming & pedestrian focused improvements – raised crosswalks, speed tables, mini roundabouts throughout corridor.
23	J	Palumbo Dr	Old Todds Rd	Codell Dr	1.2	Speed feedback system. Improved signage for entrances and speeds.
24	AD	Alumni Dr (West)	Lakeside Dr	Chinoe Rd	0.6	Rumblestrips (center). Speed feedback system. Curve warning and advanced signage. Widen sidewalks to connect with current SUP project.
25	A	Parkers Mill Rd	Man O War Blvd	Cape Cod Cir	1.2	Select shoulder widening/safety edge to maintain consistent typical. Rumblestips (center).
26	P	Leestown Rd	Sunnybrook Ln	Browns Mill Rd	2.6	Select shoulder widening/safety edge. Speed management via speed feedback system and/or speed study. Upgrade advanced warning signage.
27	S	Alexandria Dr (East)	Our Native Ln	New Circle Rd	0.7	Improve curve signage and advanced warning of curve. Transverse rumble strips for speed management.
28	X	Alumni Dr (East)	Man O War Blvd	Yellowstone Pkwy	0.3	Intersection improvements for left-turn treatments, clearance intervals, coordination between New Circle and Man O' War
29	Z	Man O' War Blvd (East)	Richmond Rd	Pink Pigeon Pkwy	2.0	Innovative solutions – DMS for queue warning and/or conversion to superstreet to eliminate conflicts and congestion (long-term solutions)
30	Y	Winchester Rd (East)	Man O War Blvd	Bahama Rd	0.9	Continue ongoing project – widening as needed. Potential for roundabout or continuous-T at Bahama Road.

Planned Highway Project along/adjacent to corridor

Locally Owned Corridors

Intersection Improvements

The prioritized intersections are locations which exhibited high mEPDO values but were not within the areas of the prioritized corridors. These intersections represent standalone areas with a historical crash problem. **Table 7-9** shows the list of corridors in a matrix format that highlights potential countermeasures for implementation for each. The improvement concepts are not mutually exclusive, and often it is not anticipated that all improvements will be made; rather this provides a list of improvements which would be applicable and improve safety based on the experienced crashes.

Table 7-9. Potential Intersection Improvement Countermeasures

Int Rank	Int ID	Intersection	Control	Potential Countermeasures																
				Innovative Concept	Road Diet or Right-sizing	Positive Offset Left-Turn Lane(s)	Tighten Intersection	Advanced Warning	Backplates	Markings/Striping	Lighting Improvements	Protected-Only Left-Turns	Timing/Detection	Clearance Intervals	Access Management	Right-In, Right-Out	Median Improvements	Turn Radii	Ped Phasing	Ped Access	Bike Imp.
1	123468	S Limestone & Virginia Ave	Signalized					X						X					X	X	
2	121751	Man O War Blvd & Sir Barton Way	Signalized	DLT			X														
3	120712	Richmond Rd & Old Todds Rd	Signalized	Quadrant															X		
4	125458	Versailles Rd & Red Mile Rd/Forbes Rd	Signalized				X								X					X	
5	124254	E Main St & E Vine St/Midland Ave	Signalized					X													
6	116398	Tates Creek Rd & Wilson Downing Rd	Signalized						X			X	X	X							
7	123099	S Limestone & Transcript Ave	Signalized						X										X		
8	123310	Harrodsburg Rd & Waller Ave/Mason Headley Rd	Signalized			X	X					X	X	X	X						
9	128035	Leestown Rd & Greendale Rd	Signalized						X						X	X	X				
10	123903	S Broadway & Red Mile Rd/Virginia Ave	Signalized								X		X	X					X		
11	121383	Harrodsburg Rd & Pasadena Dr	Signalized										X		X						
12	128468	Leestown Rd & Citation Blvd/Alexandria Dr	Signalized																X	X	
13	115616	Nicholasville Rd & Southpoint Dr	Signalized					X							X	X	X				
14	121793	Richmond Rd & Lakeshore Dr	Signalized					X				X	X								
15	115560	Athens Boonesboro Rd & Recreation Dr	Unsignalized	RCUT											X						
16	116743	Man O War Blvd & Nichols Park Dr	Signalized			X			X				X	X				X		X	
17	124908	Vine St & S Limestone	Signalized												X						
18	122111	Harrodsburg Rd & Springridge Dr	Signalized																		
19	117279	Tates Creek Rd & Redding Rd/Armstrong Mill Rd	Signalized							X					X		X				
20	125148	W Vine St & S Mill St	Signalized							X									X	X	
21	127693	Leestown Rd & Ky 4 Ramp (Outer Loop)	Signalized																		
22	129419	Georgetown Rd & Capstone Dr	Signalized						X	X			X								
23	127333	Leestown Rd & Boiling Springs Dr	Signalized							X										X	
24	122844	Sir Barton Way & Old Rosebud Rd	Signalized													X					
25	123513	E Main St & Ashland Ave	Signalized							X					X						
26	116983	Tates Creek Rd & Parliament Way	Unsignalized												X	X	X				
27	128005	N Broadway & Haggard Ln	Signalized																		
28	127802	Georgetown St & Keller Ct	Unsignalized																		
29	121995	Harrodsburg Rd & Longview Dr	Unsignalized												X	X	X				
30	122655	Nicholasville Rd & Waller Ave/Cooper Dr	Signalized										X	X		X	X		X		X

Several of the concepts identified and illustrated in **Table 7-8** for corridors and **Table 7-9** for intersections are general safety improvement concepts, which will be further detailed in the systemic strategies section including the function and high-level safety benefits.

Systemic Strategies

Systemic improvements are improvements implemented across an area to mitigate high-risk roadway features. They are not site-specific but seek to lower crash frequency and severity across a region or sub-area. These improvements should be considered at any location where safety improvements are being implemented as well as incorporated within any new infrastructure project.

The crash data was analyzed to determine risk factors that seemed to contribute to crash clusters, frequency, and severity throughout the study area network. The data was matched against roadway and intersection data features to examine these factors more. The analysis resulted in four major groupings of risk factors to be explored systemically.

1. Roadway Departure
2. Speed
3. Intersection
4. Pedestrian

Roadway Departure

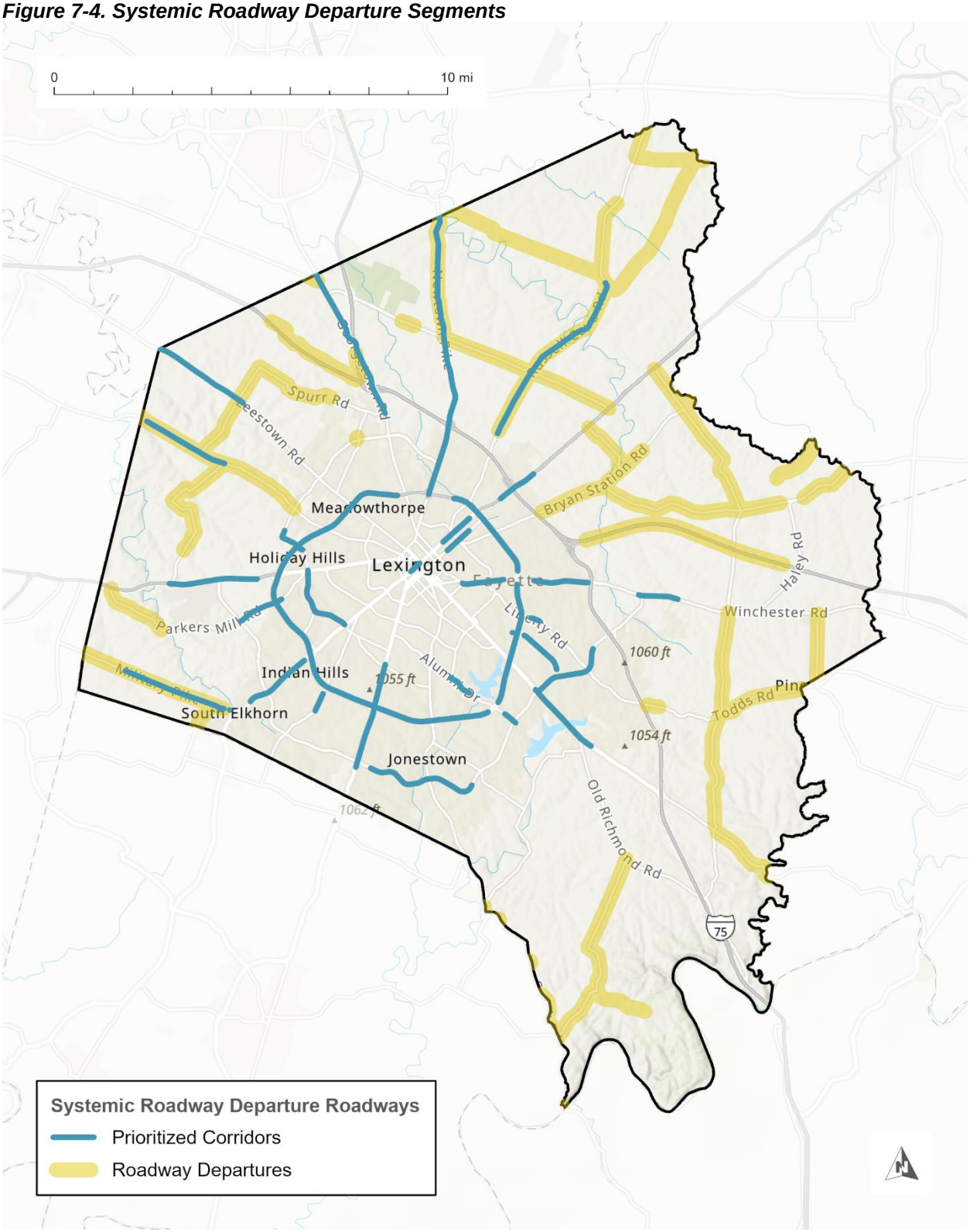
Crash analysis indicated that there were 3,391 (5.3% of total crashes) roadway departure crashes, of which 105 were severe crashes (15.9% of the total severe crashes). Further detailed crash analysis and spatial analysis examined these types of crashes to determine potential risk factors influencing the crash history. The following risk factors indicate geometric conditions indicating risks associated with roadway departure crashes:

- 2-lane highways
- Narrow lane width (9-10 foot lanes)
- Roadways with posted speed limit of 55mph
- Roadways with shoulders less than 4 feet

These types of facilities are present within the Lexington-Fayette area as Lexington transitions between urban, suburban, and rural roadway facilities. Several roadway corridors which exhibit these characteristics and exhibit historic safety issues are highlighted in the list of prioritized corridor projects. However, in addition to those there are 94.7 miles of roadway departure corridors within the study area which exhibit the same characteristics, yet do not yield the crash experience elevating them to the prioritized list. **Figure 7-4** illustrates the roadways containing these risk factors for examination in future analysis.

Systemically, as highway projects and additional funding is available, these risk factors should be eliminated to reduce the potential for future crashes and hotspots to occur. Potential countermeasures which may help negate the risk factors include: shoulder widening, roadway safety edge, rumble strips (edge and center), speed management (traffic calming, speed feedback, enforcement), improved signing/striping/advanced warning.

Figure 7-4. Systemic Roadway Departure Segments



Speed

Generally, traffic speed is a primary contributing factor to roadway safety as it can significantly increase the chances of a crash as motorists have less time to react as well as increase the severity of crashes as the force applied is greater. Correlating traffic speeding trends with crashes, as opposed to isolated incidents of crash data, can sometimes be difficult as the datasets are not typically cohesive.

Through meetings with the Safety Action Committee and other stakeholder groups, it became apparent that speed is viewed as a significant issue within the safety community, and was investigated further to determine potential risk factors associated.

Historic speed data from HERE was provided by KYTC for the Lexington-Fayette roadway network. This data includes percentile speed information as it relates to the time of day for each available roadway segment within the study area network. The speed data was connected to the crash data based on location and overlayed in a spatial analysis, providing indications of areas of potential speed-related risk factors. The consistent features of these areas were detailed as risk factors which were summarized into the following main categories:

- Roadways with 4 or more lanes with a posted speed of 45mph
- Roadways with 2 lanes with a posted speed of 35mph

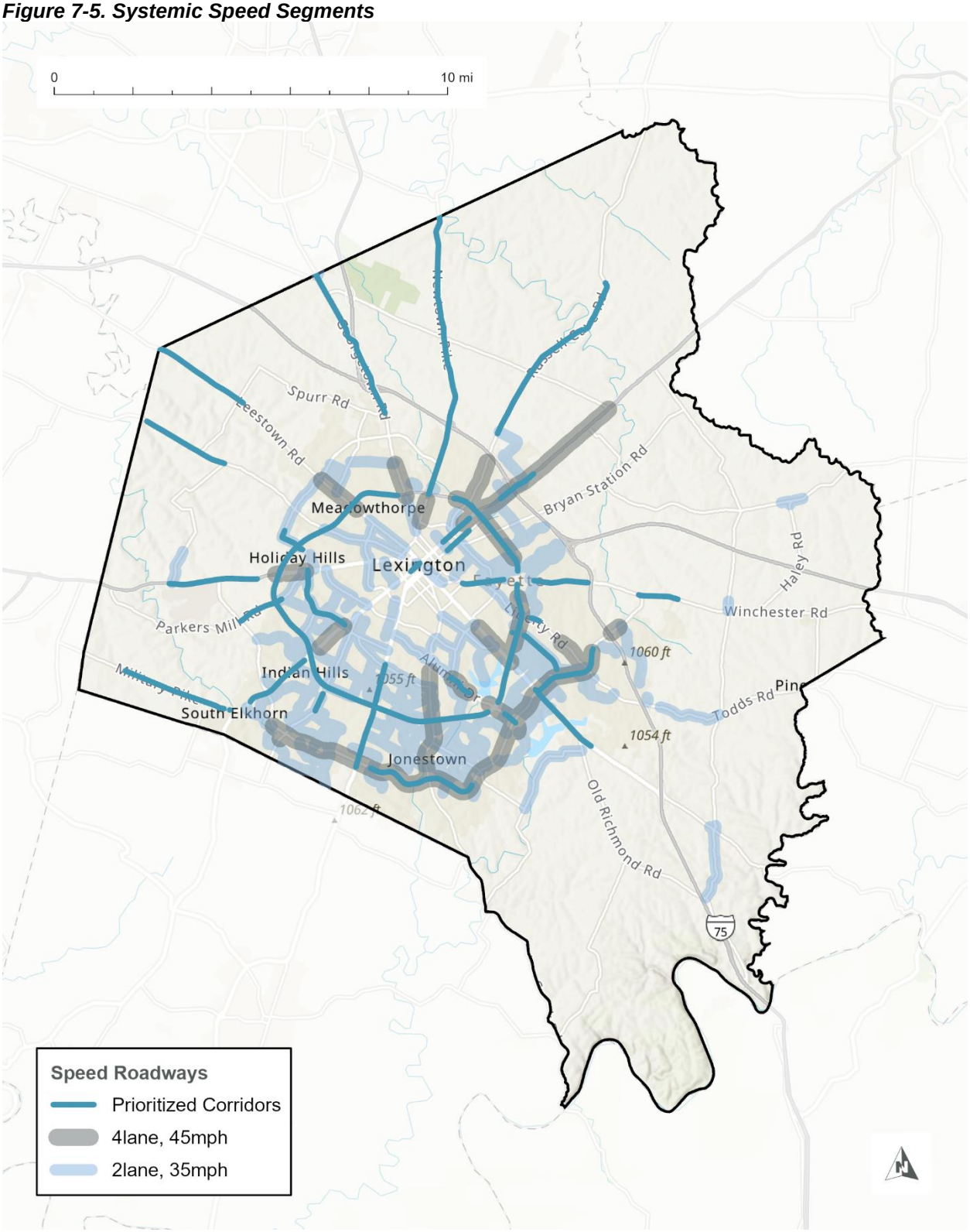
Figure 7-5 highlights the roadway segments which exhibit the categorical characteristics for consideration for additional investigation and systemic countermeasure deployment as opportunities become available.

Lexington has been proactive in the initiative to address speed-related crashes by lowering the speed limits of roadways in the downtown core from 35mph to 25mph in 2018 (within our analysis period), which may already be yielded behavioral changes and positive safety impacts. Additionally, the implementation of speed feedback systems (speed trailers, sign post installations) is heavily utilized in Lexington to increase driver awareness and potentially reduce speeds.

Potential engineering countermeasures to influence speed are primarily related to traffic calming measures and driver awareness features. Engineering countermeasures can have some impact on speed-related crashes, but non-engineering countermeasures such as education or enforcement can often move the needle more effectively.

A safety education campaign related specifically to speeding to better inform drivers and/or remind drivers of the impact speeding can have on crashes and the amplified risk of crashes may serve as a more effective method of reducing travel speeds than engineering countermeasures alone. Many organizations and municipalities have implemented traffic speed safety campaigns to raise awareness, increase the visibility of the issue, and educate road users of the hazards to positively impact safety. Some examples include USDOT – Safer Speeds and NHTSA – Speeding Catches Up with You.

Figure 7-5. Systemic Speed Segments



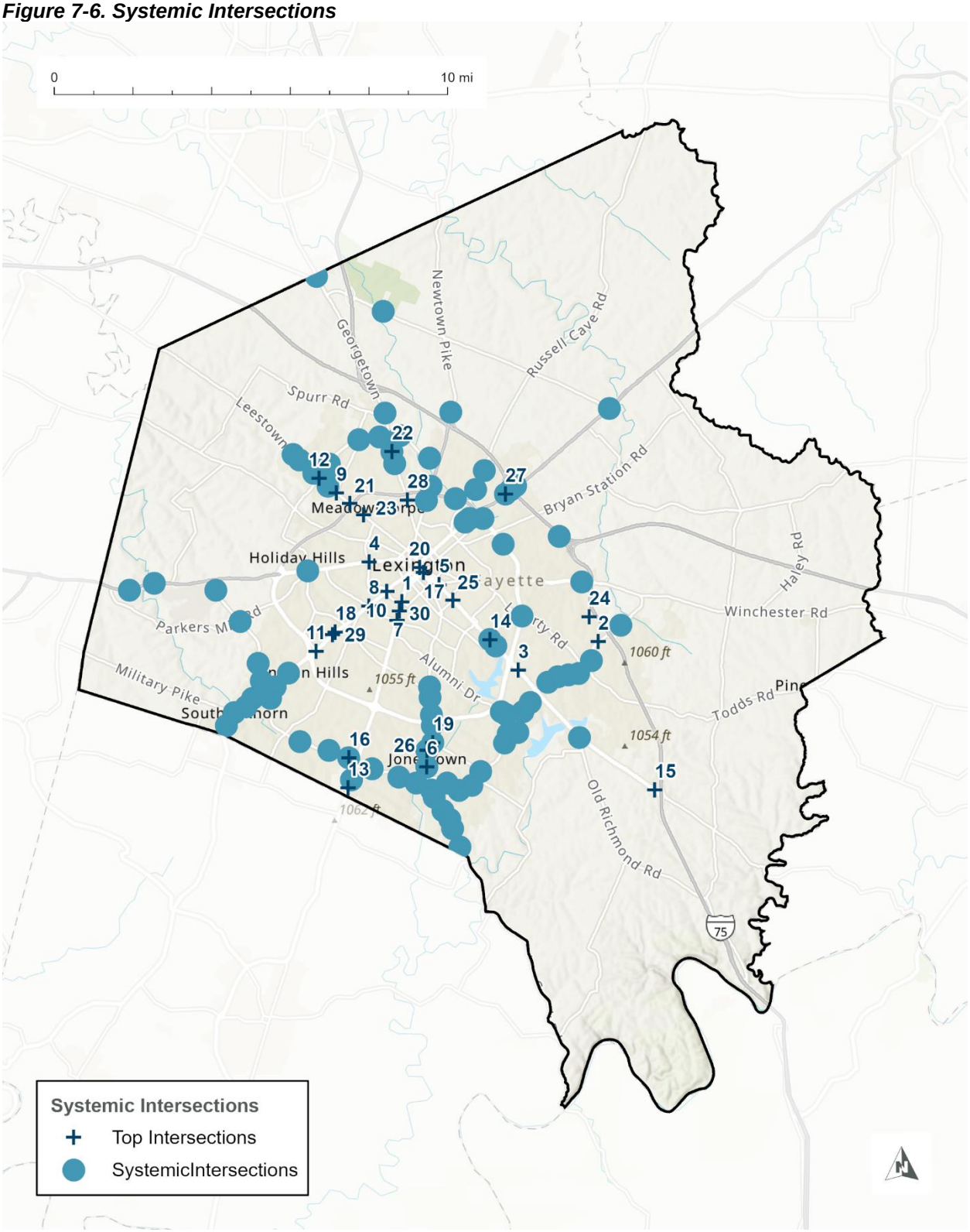
Intersection

As discussed in the Data Analysis section (**Chapter 3**) and previously in this chapter, intersections present a more significant contributor to crashes than roadway segments. Occupying significantly less area while resulting in more crashes (especially multi-unit crashes) and typically result in crashes of higher severity, due to the presence of the majority of conflict points within a roadway system. Due to the nature of intersections, they also often introduce the more significant traffic operational impacts to the roadway system as they impact traffic movement.

From a systemic perspective intersections were studied to determine potential risk factors which may have a negative impact on safety performance without the inverse positive performance on operations (or necessity of). The historic crash analysis provided indications of potential risk intersection risk factors which may be contributing to crashes. This included two main categories of intersections as well as additional considerations:

- Intersections with 4-lane major roadway, 2-lane minor roadway, and posted speed of 45mph
    - 4 approaches (Category 1)
    - 3 approaches (Category 2)
- Intersections with geometrical issues including:
    - Intersection size – stop bar locations as correlated with cross street movements/turning movements
    - Corner radii
    - Crosswalk alignments
    - Left-Turn Treatments

Figure 7-6. Systemic Intersections



Pedestrian

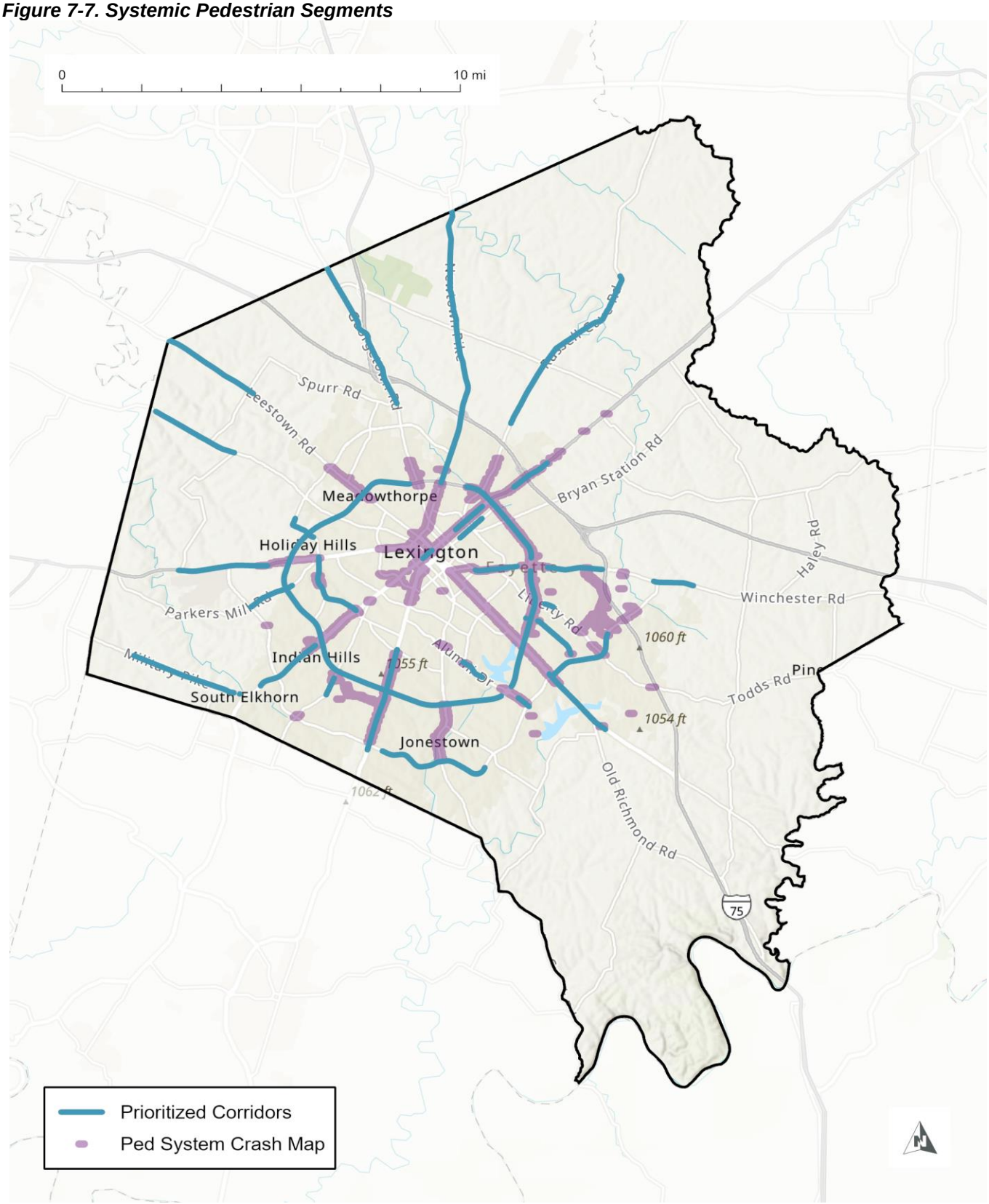
Pedestrian crashes represent 17% (113 crashes) of all severe crashes in Lexington while only representing 1.1% (712 crashes) of the crashes within the 2015-2019 study period. Due to the high severity ratio and frequency of pedestrian crashes, the data was examined to determine potential risk factors correlating with pedestrian crashes to address with the aforementioned reactive corridor and intersection projects as well as identify potential areas exhibiting similar features. Analysis tools identified the following factors contributing to pedestrian crashes:

- Commercial Land Uses
- Roadways with 4 or more lanes
- Roadways with long intersection spacing and/or limited number of crosswalks
- Roadways with speed limits of 45mph or 35mph

Roadway corridors which exhibit these characteristics within the Lexington-Fayette area are shown in **Figure 7-7**. Several of the segments shown overlap with the list of prioritized corridors documented and detailed previously in this chapter. Additional areas which exhibit these features and have a history of pedestrian crashes are primarily related to the following areas: University of Kentucky campus, Transylvania University campus, downtown core, Winchester Road, North New Circle Road, North Broadway corridors.

Systemic pedestrian improvements should include improving pedestrian access and crossings which can include any or all of the following: sidewalk connectivity, increased lighting, crosswalk striping and signage improvements, leading pedestrian intervals, rapid flashing beacons, additional crossing locations, and pedestrian crossing refuge. These improvements will yield positive safety benefits to pedestrian, improve driver awareness, and potentially compliance from all users to utilize the facilities as designed.

Figure 7-7. Systemic Pedestrian Segments



8. Progress and Transparency

This Safety Action Plan sets a safety baseline and recommends several courses of action to improve the safety performance of the roadway system. It is important for the success of the plan that LFUCG measure progress in attaining the goal of moving toward zero deaths and serious injuries by 2050. It is also important that the baseline and progress be easily accessible and understandable to the public.

The proposed metrics are discussed below, along with how they will be made public. The concluding section presents needs and recommended actions to implement this portion of the safety action plan.

Safety Performance Metrics

LFUCG proposes to use several overall high-level safety performance metrics to track safety improvements in the region. Those same metrics are also proposed to be used but with an equity focus to measure progress in serving disadvantaged populations in the community. Several additional project-level performance metrics are proposed for consideration, but only if SS4A funding becomes available to support that level of progress tracking.

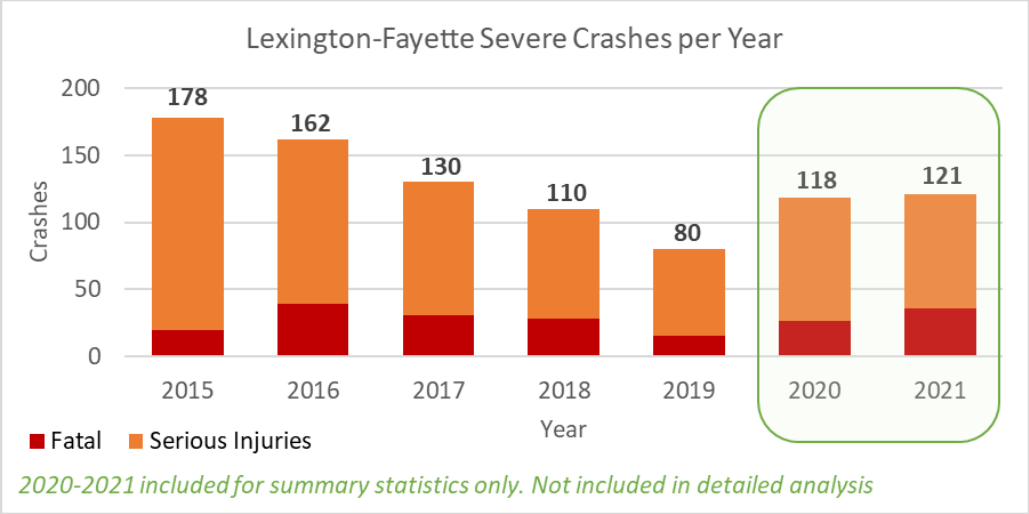
High-Level Safety Performance Metrics

Three high-level performance metrics were selected. They offer a way to track progress over the coming years as the action plan is implemented.

Annual Fatal and Serious Injury Crashes – Total and Rate

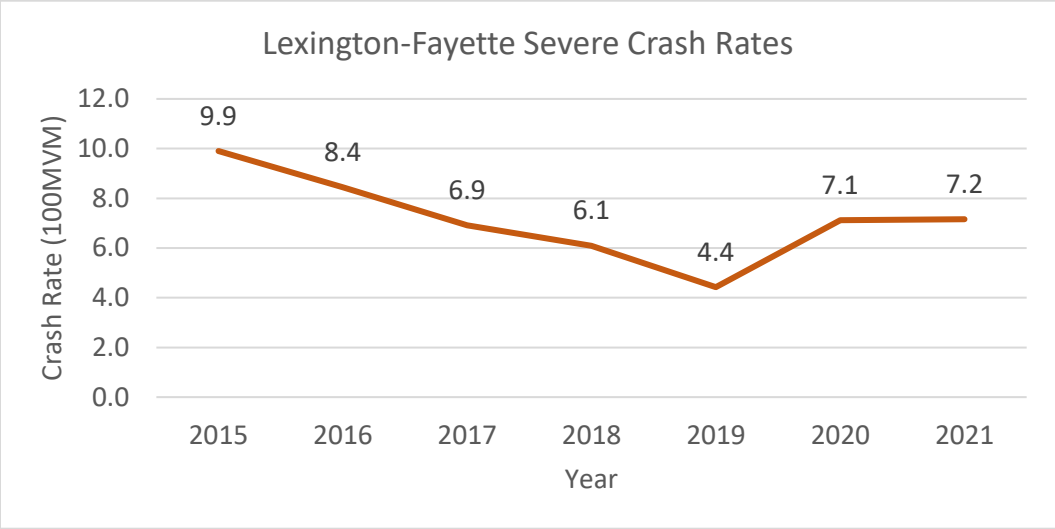
This is the core metric for tracking the success of the action plan in moving Lexington toward zero fatalities and serious injuries by 2050. The historical trend was down from 2015 to 2019, but the numbers increased in 2020 and 2021 (**Figure 8-1**). These two years were affected by the pandemic period travel changes, which included lower volumes, but higher speeds in many locations. The 2022 and 2023 values for this metric will not be affected by the plan as no new projects or strategies will be implemented in this timeframe. However, there are several ongoing projects in the City that would be complete in time to impact the 2024 results. Furthermore, if SS4A funding is received, the county-wide education program would begin sometime in 2024.

Figure 8-1. Severe Crashes per Year in Lexington-Fayette County



The second part of this metric is to track the crashes by crash rate. This is accomplished by dividing the number of severe crashes by the vehicle miles traveled in the county for the year.

Figure 8-2: Severe Crash Rates by Year



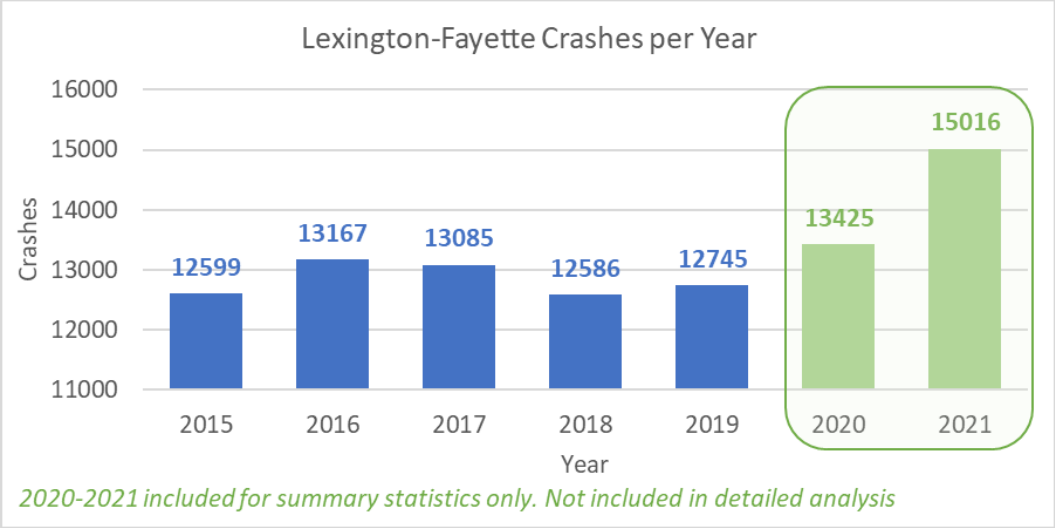
Annual Pedestrian and Bicycle Fatal and Serious Injury Crashes

Nearly 1 out of 5 severe crashes (20%) was a pedestrian or bicycle crash during the analysis period. Preventing these vulnerable road user crashes is a key goal of the safety action plan. This metric will be tracked separately for pedestrian and bicycle crashes as the countermeasures to prevent them are often different. There have not been any clear recent trends up or down for these two crash types, as seen in **Chapter 3**. If several of the pedestrian focused potential projects listed in the action plan are implemented it is expected that these numbers would decrease. This includes improvements to the high priority corridors of New Circle Road (Northeast) and Broadway.

Annual Crashes by Severity – Totals and Rates

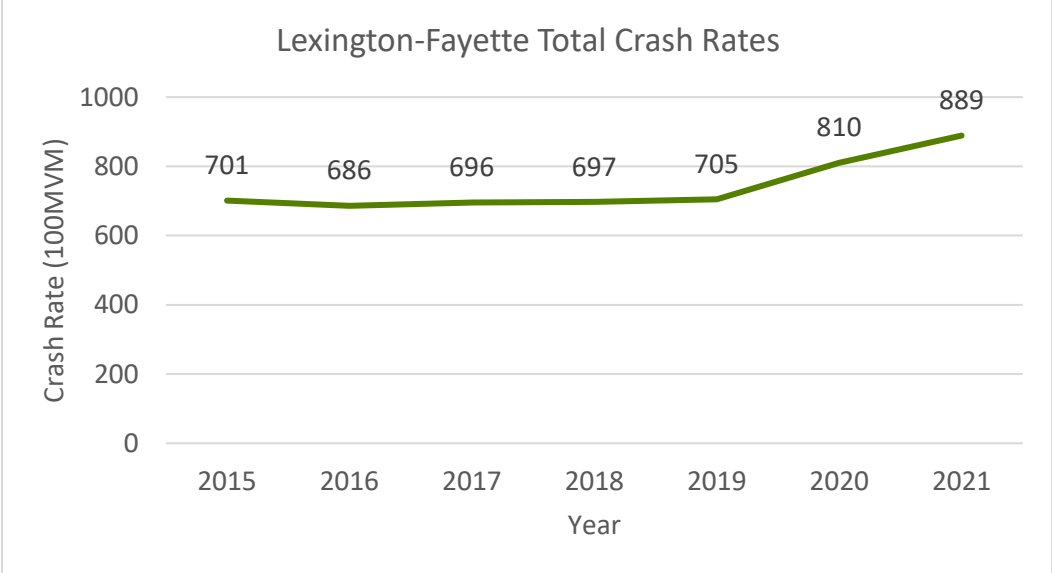
While the clear focus of this plan is on severe crashes, it is useful to track how total crashes change over time. This metric will present annual crashes by severity: Fatal, Serious Injury, Injury, Possible Injury, and Property Damage Only. It will also present the combined total crashes. This metric will help track general crash occurrence trends and the possibility that lower severity crashes may increase as higher severity crashes decrease. As shown on **Figure 8-3** total crashes were relatively flat from 2015 to 2019, but they increased during both 2020 and 2021.

Figure 8-3. Total Crashes per Year in Lexington-Fayette County, All Severities



Crash rates were also relatively flat during the first five years, but they increased considerably during the pandemic years. It will be important to track these over time to determine how they change once the action plan beings to be implemented.

Figure 8-4. All Crashes Crash Rate



Equity Focused Performance Metrics

LFUCG proposes to apply the same high-level performance metrics listed above to portions of the City that are designated as underserved or disadvantaged and compare them to the remainder of the City. This will provide a clear comparison of the change over time in these areas. With this information, the public and decision makers will be able to asses the overall program effectiveness and trends and whether or not historically underserved populations in the City appear to be benefiting at least as much as the rest of the City from the projects and strategies that are implemented. It is important to note that there are many factors that influence

traffic safety, so potential trends and correlations could be due to other factors, but this will at least provide high-level data to assess progress.

- Equity Focused Annual Fatal and Serious Injury Crashes – Total and Rate
- Annual Pedestrian and Bicycle Fatal and Serious Injury Crashes
- Annual Crashes by Severity – Totals and Rates

Project-Level Safety Performance Metrics

The action plan recommends focused improvements based on the historical crash analysis as well as systemic safety improvements for several key emphasis areas. The project level metrics could be used to track safety progress in addressing these identified needs. Project-level metrics could include:

- Number of projects implemented to address the top 25 corridors and intersections
- Number of projects implemented to address the identified systemic emphasis areas
- Crash trends for the corridors or intersections where projects have been implemented focusing on:
  - Severe Crashes
  - Pedestrian and Bicycle Crashes
  - Crash Trends in Disadvantaged Portions of the Community (where projects have been implemented)
- Crash trends for locations where systemic improvements have been implemented focusing on:
  - Severe Crashes
  - Emphasis Area Severe Crash Types (intersection crashes, roadway departure crashes, pedestrian crashes, etc.)
  - Crash Trends in Disadvantaged Portions of the Community (where systemic projects have been implemented)

LFUCG is not able to take on this level of progress tracking with their current staffing. However, if successful in obtaining funding for a Vision Zero Coordinator, LFUCG would consider tracking these or other more detailed performance metrics.

Public Access and Transparency

This Safety Action Plan has been made publicly available by posting it on the LFUCG website at: XXXXX. Annual performance updates will be posted to the LFUCG website as well.

If the implementation grant is funded and the Vision Zero coordinator position is filled, then it is expected that a more active approach to tracking and transparency will be implemented. In this case, it is expected that a webpage will be created with the performance metric data and that quarterly updates will be posted to that website.

Needs and Recommendations

It is agreed that a transparent and easily accessible public performance tracking process has great value for moving forward with improving safety in Lexington. The City is committed to doing this. However, LFUCG has limited staff resources to implement substantial ongoing progress tracking. Current staff can provide annual updates of basic performance metrics and

outcomes, there is no capacity at present for more frequent updates or more detailed progress tracking.

Therefore, it is recommended that the City pursue five years of grant funding to help bolster the safety program implementation and progress tracking through the institution of a Vision Zero Coordinator position. This will help the City more effectively implement the program and make the results of the program available to the public. Once the program has been implemented and progress is being reported, it is expected that the public and elected officials will see the value of having additional staff resources dedicated to focusing on traffic safety. Therefore, at the end of the five years it is expected that the Vision Zero Coordinator position could become a permanent city or MPO planning position.