Douglas County

Regional Pedestrian Plan

LAWRENCE - DOUGLAS COUNTY

MPO

METROPOLITAN PLANNING ORGANIZATION

DRAFT

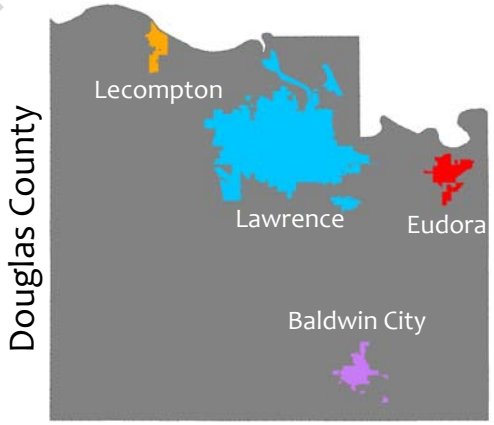
Table of contents

Regional Overview

Executive Summary	4
Introduction	6
Vison & Focus Areas	7
Benefits of Walking	8
5 E's of Pedestrian Planning	10
Current Plans and Policy Context	11
Pedestrian Progress Toolbox	14
Public Outreach	19
Survey Analysis	21
Regional Crash Analysis	27
Funding	36
Data Collection/Evaluation	37
Conclusion	39

Recommendations

Lawrence	40
Eudora	66
Baldwin City	75
Lecompton	82



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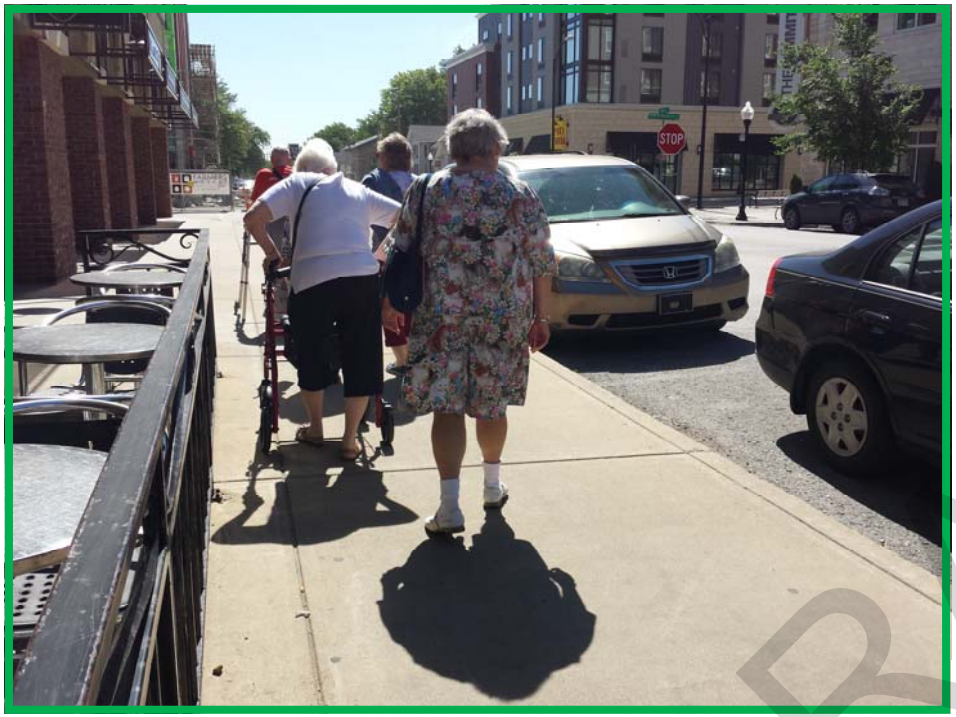
Executive Summary



This Plan represents a vision of a more accessible and safer pedestrian environment in the region. This is the first Regional Pedestrian Plan developed by the Lawrence-Douglas County Metropolitan Planning Organization (MPO). Through a public participation process that included surveys, mobile meetings, and website feedback, residents of Douglas County expressed a desire for pedestrian friendly communities. These communities should encourage people of all ages and abilities to walk for enjoyment, exercise, and daily transportation by providing a safe, convenient, and attractive pedestrian environment.

This Plan considers the many benefits of walking and identifies a diverse set of approaches encouraging more pedestrian activity. This Plan presents a toolbox of policy, program, and infrastructure ideas that cities in Douglas County can implement to improve the pedestrian environment. While there may be overlap, the needs of Lawrence, Eudora, Baldwin City and Lecompton vary in population, available funding, and local priorities. This plan offers assessments and unique recommendations for each city within Douglas County.

Recommendations for each city are as follows:

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Lawrence

- Implement the Safe Routes to School Program
- Use Traffic Calming Devices to Improve Pedestrian Safety and Comfort at Locations with Real and Perceived Risk
- Implement a Traffic Safety Campaign (Education & Enforcement)
- Encourage Pedestrian Trips through Wayfinding Signage and an Open Streets Event
- Reduce Block Length Standards in Subdivision Design Regulations
- Form or Assign Responsibilities to an Advisory Committee
- Apply for Walk Friendly Community Status
- Track and Measure Progress of Infrastructure, Amenities, and Programming
- Enforce Current Sidewalk Repair Policy or Establish New Sidewalk Repair Program
- Establish Dedicated Funding Source for Pedestrian Improvements
- Coordinate with University Staff on Pedestrian Policy and Infrastructure Plans
- Target Resources to the Priority Network
- Target Resources to Non-Existing and Non-Compliant ADA Ramps
- Target Resources to High-Demand Transit Corridors

Eudora

- Continue to Seek Funding for Safe Routes to School Program
- Encourage Pedestrian Trips Through Participation in National Walk to School Day and Other Strategies
- Use Traffic Calming Devices to Improve Pedestrian Safety and Comfort at Locations with Real and Perceived Risk
- Track and Measure Progress of Infrastructure, Amenities, and Programming
- Target Resources to the Priority Network

Baldwin City

- Encourage Pedestrian Trips Through Participation in National Walk to School Day and Other Strategies
- Consider Applying for Safe Routes to School Program Funding
- Use Traffic Calming Devices to Improve Pedestrian Safety and Comfort at Locations with Real and Perceived Risk
- Track and Measure Progress of Infrastructure, Amenities, and Programming
- Target Resources to the Priority Network

Lecompton

- Encourage Pedestrian Trips Through Participation in National Walk to School Day and Other Strategies
- Target Resources to the Historic Loop
- Target Resources to the Grand Loop
- School Crossing Improvements

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Introduction

Over the last five years, we have heard the desire for improvements to our pedestrian environment and culture. Residents have a vision for increased pedestrian friendliness along and across our roadways, bikeways, and trails. This vision and focus areas support what the community has asked for through the comprehensive regional transportation plan, Transportation 2040 (T2040)[1], Multimodal Studies[2] and other ongoing planning processes.

The Douglas County Regional Pedestrian Plan aims to help guide the planning of our diverse communities so that they develop into places where people are allowed the choice to get to their destinations on foot.

Since the adoption of Transportation 2040 (T2040) in 2013, the MPO staff has encouraged the Lawrence-Douglas County planning staff to give additional consideration to pedestrian mobility during planning processes. To ensure that all modes of transportation are given the same opportunity for safe, convenient, and enjoyable travel, an overarching pedestrian plan should be woven into roadway design, road network planning, trail development, and maintenance of infrastructure.

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[1] Transportation 2040: Moving Forward Together. http://lawrenceks.org/mpo/t2040

[2] Multimodal Planning Studies. http://lawrenceks.org/mpo/study

Vision

The residents of Lawrence, Eudora, Baldwin City and Lecompton envision communities that invite people of all ages and abilities to walk for enjoyment, exercise, and daily transportation by providing a safe, convenient, and attractive pedestrian environment.

Focus Areas

Each city within the region will have unique policy, program, and infrastructure recommendations addressing the following Focus Areas. Pages 14-19 can be thought of as a toolbox that each community can use to feasibly improve its pedestrian environment.

Safety: Improve safety by reducing the number and severity of crashes through infrastructure design along and across roadways, and by promoting safe driving, walking, and bicycling behaviors through education and enforcement.

Equity: Provide accessible pedestrian facilities for all users through public engagement, accessible design, and capital investments.

Health: Develop a pedestrian network that promotes active lifestyles and sustains a healthy environment.

Economy: Enhance economic vibrancy by creating safe and aesthetically pleasing walking environments with easy connections to commercial centers and front doors of businesses.

Connectivity: Plan and build pedestrian infrastructure creating a network to connect neighborhoods to employment, retail, community services, schools, and recreational & cultural amenities.

Multimodal Connections: Develop pedestrian facilities that provide opportunities to access other modes of transportation (transit, bicycling, carpooling, or vanpooling).

Land Use and Design: Employ land use planning and site design requirements that encourage pedestrian travel by making local trips easier and more pleasant by foot than by car.

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Benefits of Walking

Quality pedestrian environments can positively impact much more than the individuals who are walking. While health and access may be improved for pedestrians only, reduced congestion, economic gains, and improved air quality can benefit everyone in the city. Cities within Douglas County could take advantage of a number of the following benefits with enhanced pedestrian facilities.

Health and Wellness

- Only half of adults and one quarter of high school students get the amount of physical activity recommended in national guidelines.[1]
- Regular walking can help prevent or manage various conditions, including heart disease, high blood pressure, and type 2 diabetes.[2]
- Older non-drivers take 65% fewer social, family, and religious trips than older people who still drive. However, 30% of older non-drivers walk in dense areas, compared to 7% in more spread out areas.[3]

Reduced Congestion

- In 2010, road congestion caused 4.8 billion hours of travel delay, wasted 1.9 billion gallons of fuel, and resulted in total congestion costs of $115 billion in 439 U.S. urban areas.[4]
- 60% of trips under 1 mile are made by automobile.[5]

Improved Economy

- In 2011, driving a newer sedan cost an average of $8,946 per year and driving an SUV cost $11,360 per year.[6]
- Improved walking environments have been correlated to increased retail sales. While automobile drivers tend to spend more per trip, pedestrians shop more frequently and spend more per capita over a month or a year.[7]
- Neighborhood streets built in a grid to serve all users reduce the need for wide automobile lanes and complex intersections, and can lower infrastructure costs 35-40% compared to conventional suburban development.[8]

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[1] U.S. Department of Health and Human Services. Step It Up! The Surgeon General's Call to Action to Promote Walking and Walkable Communities. Washington, DC: U.S. Dept of Health and Human Services, Office of the Surgeon General; 2015. http://www.surgeongeneral.gov/library/calls/walking-and-walkable-communities/call-to-action-walking-and-walkable-communites.pdf

[2] Mayo Clinic staff (2015, March 19). Walking: Trim your waistline, improve your health. Retrieved June 13, 2016, from http://www.mayoclinic.org/healthy-lifestyle/fitness/in-depth/walking/art-20046261

[3] Surface Transportation Policy Institute. Aging Americans: Stranded Without Options Fact Sheet. 2012. www.transact.org/library/reports_html/seniors/fact_sheet.asp

[4] Texas Transportation Institute. Urban Mobility Information. Traffic Problems Tied to the Economy, Study Says. Texas A&M University. 2011. http://mobility.tamu.edu/ums/media-information/press-release/

[5] U.S. Department of Transportation Federal Highway Administration. (2009). Summary of travel trends: National household transportation survey. Retrieved January 22, 2016, from http://nhts.ornl.gov/2009/pub/stt.pdf.

[6] AAA. Cost of Owning and Operating Vehicle in U.S. Increased 1.9% According to AAA's 2012 'Your Driving Costs' Study. 2012. http://newsroom.aaa.com/2012/04/cost-of-owning-and-operating-vehicle-in-u-s-increased-1-9-percent-according-to-aaa%E2%80%99s-2012-%E2%80%98your-driving-costs%E2%80%99-study/

[7] Transportation Alternatives and Schaller Consulting. Curbing Cars: Shopping, Parking and Pedestrian Space in SoHo. 2006. www.transalt.org/files/newsroom/reports/soho_curbing_cars.pdf

[8] Costs. (2016). Retrieved July 13, 2016, from http://www.smartgrowthamerica.org/complete-streets/implementation/factsheets/costs

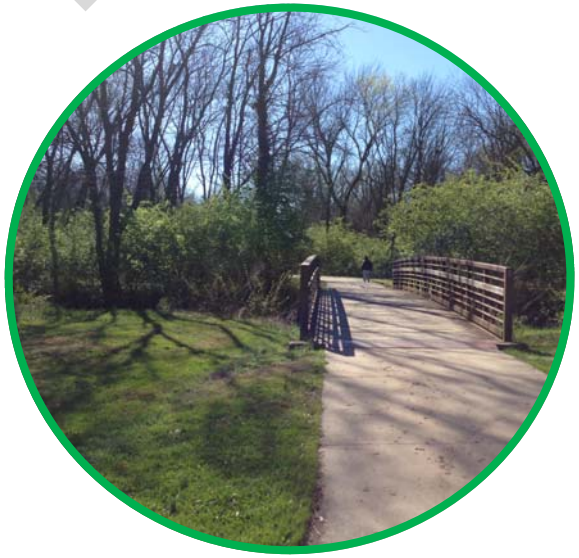
Improved Air Quality

- A leading cause of air pollution in many urban regions is household vehicle travel.[9]
- Nearly 97% of transportation greenhouse gas emissions come through direct combustion of fossil fuels.[10]
- The more people who walk instead of drive, the less pollution is emitted from automobiles. Automobile pollution contributes to ground-level ozone which can lead to shortness of breath and asthma.[11]

Equity and Access for All

- One-third of all Americans are not able to drive, either because they are too old, too young, too poor, or have some form of disability.[12]
- 1 in 20 (5.3%) Douglas County residents do not have access to a vehicle.[13]
- More than 50% of Americans 65 and older who do not drive stay home on a given day because they lack transportation options.[14]
- Safe non-motorized transportation options, combined with access to public transportation, are critical components of a transportation network that connects people—especially low-income households—with jobs, education, and essential services, providing "ladders of opportunity."[15]

The US DOT Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations states, "Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use." In this context, non-motorized transportation types are equal with other transportation modes. The Douglas County Regional Pedestrian Plan recognizes these benefits and strives to address pedestrian needs in Lawrence, Eudora, Baldwin City, and Lecompton.



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[9] Frank, L. D., Stone, B., & Bachman, W. (2000). Linking land use with household vehicle emissions in the central Puget Sound: Methodological framework and findings. Transportation Research D, 5(3).

[10] About Transportation & Climate Change: Transportation's Role in Climate Change: Overview - DOT Transportation and Climate Change Clearinghouse. (2016). Retrieved July 13, 2016, from http://climate.dot.gov/about/transportations-role/overview.html

[11] Bell, M. L., McDermott, A., Zeger, S., Samet, J. M., & Dominici, F. (2004). Ozone and short-term mortality in 95 U.S. urban communities, 1987-2000. New England Journal of Medicine, 292 (19).

[12] Rails to Trails Conservancy. Active Transportation for America: A Case for Increased Federal Investment in Bicycling and Walking. Published 1/1/2008. http://www.railstotrails.org/resource-library/resources/active-transportation-for-america/

[13] U.S. Census Bureau, 2010-2014 American Community Survey 2014 5-Year Estimates, Table B25044.

[14] Surface Transportation Policy Institute. Aging Americans: Stranded Without Options Fact Sheet. 2012. www.transact.org/library/reports_html/seniors/fact_sheet.asp

[15] Safer People, Safer Streets: Pedestrian and Bicycle Safety Initiative. (2015, October 28). Retrieved July 13, 2016, from https://www.transportation.gov/safer-people-safer-streets

5 E's of Pedestrian Planning

Engineering

Engineering refers to physical infrastructure. Engineering recommendations are typically divided into short-term, medium-term and long-term priorities based on cost, ease of implementation, and other factors. Recommendations may include:

- Sidewalks, shared-use paths, and trails
- Directional and way-finding signage
- Pedestrian bridges and tunnels
- Improvements to crosswalks
- Curb ramps compliance with ADA guidelines
- Bulb-outs
- Landscaping
- Traffic calming – volume/speed causing yielding
- Signals and other traffic controls

Education

Education efforts typically focus on educating people about the rules of the road. Motorist education typically focuses on reminding motorists of the rules of the road and how to properly interact with pedestrians. Education efforts may include:

- Pedestrian education
- Driver education
- Public Service Announcements (PSAs)
- Workshops for planners, engineers, and law enforcement officials
- Signage

Encouragement

Encouragement activities focus on increasing walking through fun and interesting activities. Encouragement activities may include:

- Walk to School Day
- Workplace wellness programs
- Walking route maps or way-finding signage
- Open streets
- Walking clubs
- Fitbit or pedometer giveaways

Enforcement

Enforcement activities focus on enforcing the rules of the road for all users - motorists, bicyclists, pedestrians and transit users. Enforcement activities may include:

- Efforts to reduce speeding through holding all users responsible for following the rules of the road
- Efforts to increase yielding to pedestrians
- Crossing guards

Evaluation

Evaluation efforts seek to quantify the impact of the other "E's." Evaluation efforts may include:

- Measuring the growth of pedestrian facilities in the region
- Measuring the mode share of trips in the region or the number of users on a specific pedestrian facility thru pedestrian counts
- Measuring driver yielding behavior
- Evaluating crash data (injuries and fatalities) for patterns or frequency

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Current Plans and Policy Context

Current Local Plans, Reports, and Statutes

The Regional Pedestrian Plan included a review of many existing documents that, in part, address pedestrian issues. The following pages explain the content of several existing plans as they pertain to pedestrians.

Kansas Pedestrian Statutes

www.ksdot.org/bureaus/burRail/bike/biking/KssidewalkStatutes.asp**:** The Kansas Pedestrian Statues are the legal operational descriptions for pedestrian's rules of the road for using pedestrian environments in Kansas.

Kansas Bicycle and Pedestrian Transportation Plan (1995)

www.ksdot.org/Assets/wwwksdotorg/bureaus/burRail/bike/Documents/bikeplan1995.pdf**:** The Kansas Bicycle and Pedestrian Transportation Plan expresses the importance of bicycle and walking as elements of Kansas' transportation system as the State moves forward into the 21st Century. The primary purpose of this document, which is a portion of the Kansas Long-Range Transportation Plan, is to provide continued inclusion and planning of bicycle and pedestrian transportation facilities as components of the Kansas statewide transportation system.

Lawrence Parks Master Plan (2000) www.lawrenceks.org/lprd/masterplan**:** The Parks Master Plan provides a roadmap for recreation facilities and programs in Lawrence. During the planning process, a resident survey was conducted in 1999 that identified the most important parks and recreation facilities to the residents were walking and biking trails (48%) and the most important improvements that residents think should be made to existing parks are: linking neighborhood parks with walking and biking trails (41%). The plan's vision for Lawrence Parks and Recreation includes eight strategies, one of which includes creating additional neighborhood parks, facilities, and trails that provide safe community linkages and neighborhood connections.

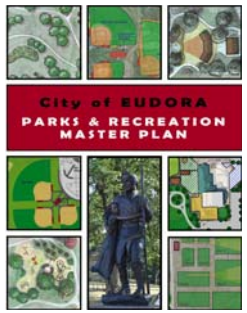
The Lawrence Parks Master Plan was in the process of an update in 2016 at the time of the writing of the Regional Pedestrian Plan.

Lawrence Complete Streets Policy (2012)

www.lawrenceks.org/assets/pds/planning/documents/CSPolicy.pdf**:** The Complete Streets Policy encourages an interdisciplinary approach to incorporate the needs of all users into the design, construction, and maintenance of public and private transportation infrastructure within Lawrence where feasible and fiscally appropriate. The Complete Streets Policy establishes guiding principles and practices to create an equitable, balanced, and effective transportation system encouraging walking, bicycling, and transit use, to improve health and reduce environmental impacts, while simultaneously promoting safety for all Users of Streets. This policy also encourages all facilities to follow the guidelines of the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and the proposed guidelines for accessible rights-of-way (PROWAG).

Eudora Parks & Recreation Master Plan (2012)

www.cityofeudoraks.gov/DocumentCenter/View/221**:** The Eudora Parks & Recreation Master Plan includes routes for bicycle and pedestrian facilities throughout Eudora to connect residents to the parks and recreation facilities throughout the community.



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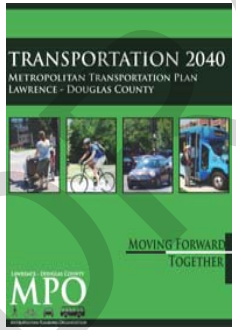
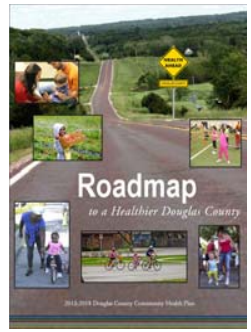
Lawrence Retiree Attraction Task Force Final Report (2012) www.lawrenceks.org/assets/boards/ratf/ss_retiree_attraction_task_force_final_report.pdf**:** The Lawrence Retiree Attraction Task Force focused on phased improvements that can be implemented to attract retirees to the Lawrence community. The report notes that seniors and retirees want walkable communities close to core services. This is found to be a weakness in the Lawrence community. The plan calls for local governments to provide opportunities for healthy lifestyles by continuing to fund expansion of the existing walking and bicycling networks. It also acknowledges that many more neighborhoods would be more walk-friendly with an increase in, and maintenance of, city sidewalks, recognizing that some of the sidewalks are unsafe due to uneven concrete or the lack of curb cut-outs.

Transportation 2040 (2013) www.lawrenceks.org/mpo/t2040**:** Transportation 2040 was adopted by the Lawrence - Douglas County Metropolitan Planning Organization (L-DC MPO) and serves as the region's Metropolitan Transportation Plan (MTP). Part of the L-DC Comprehensive Plan (Horizon 2020), T2040 Plan emphasizes multimodal planning and recommends the creation of this Regional Pedestrian Plan. The process for updating T2040 will begin in fall of 2016. A new MTP must be approved by March 21, 2018.

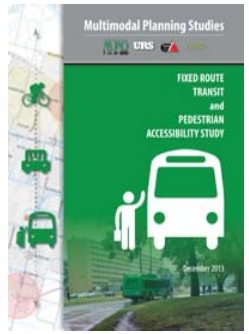


Lawrence Cultural District Task Force Recommendations (2013) www.lawrenceks.org/assets/agendas/cc/2013/12-10-13/fai_cdtf_final_report.pdf**:** The Lawrence Cultural District Task Force Recommendations recognize the importance of active transportation in the planning for the communities' existing and future cultural places. Their recommendations value the importance of active transportation on community health and desire to be able to access the districts safely by foot and bike.

Douglas County Community Health Plan (2013) www.ldchealth.org/221/Community-Health-Plan**:** The Douglas County Community Health Plan envisions an environment and culture, through policy & systems change, that makes physical activity easier & more rewarding for people of all ages and abilities. The implementation of the built environment portion of that plan (by the LiveWell Lawrence Healthy Built Environment Work Group) works to make it easier for residents to walk, bike, and wheel to everyday destinations.



Lawrence Fixed Route Transit and Pedestrian Accessibility Study (2014) www.lawrenceks.org/assets/mpo/study/reports/transit.pdf**:** The Lawrence Fixed Route Transit & Pedestrian Accessibility Study recommends improvements to the pedestrian network to improve accessibility to transit service. The study explores obstacles transit riders face along routes, locations where improvements could be made to improve and/or enable people to access routes, and possible locations for bus turnouts to improve convenience and safety for riders and to enhance traffic operations. The study completed a system wide bus stop analysis and recommended four corridors for detailed evaluation, the corridors include: 23rd Street, 6th Street, 19th Street and Naismith Drive.



2014-2024 University of Kansas Campus Master Plan (2014) www.dcm.ku.edu/2014-2024-university-kansas-campus-master-plan**:** The KU Campus Master Plan identifies one of its goals as, "Reinforce the pedestrian experience, while fully developing a multimodal transportation system, providing access to the campus and community." The Douglas County Regional Pedestrian Plan seeks to coordinate its recommendations with those that have been laid out in the KU Master Plan, facilitating pedestrian connections between the City and campus.

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Be Active Safe Routes www.ldchealth.org/266/Be-Active-Safe-Routes**:** Lawrence Be Active Safe Routes (BASR) is a local movement to make neighborhoods safe and accessible for everyone. Within BASR is the Safe Routes to School (SRTS) initiative which can increase opportunities for children to bike and walk to and from schools. SRTS can include a variety of multi-disciplinary programs aimed at promoting walking and bicycling to school and improving traffic safety around school areas through education, incentives, law enforcement, and engineering measures. The Lawrence-Douglas County Health Department, in conjunction with Lawrence Public Schools, the City of Lawrence and the Lawrence-Douglas County MPO, is facilitating this community-wide effort to create individual school and a community Safe Routes Plan.

There are current efforts in both Eudora and Baldwin City to improve the multimodal infrastructure for kids to access safe routes to and from school.

Lawrence Pedestrian-Bicycle Issues Task Force Final Recommendations (2016) www.lawrenceks.org/ped-bike**:** This task force created a set of recommendations for the pedestrian environment to be considered by the City Commission and staff. The group prioritized filling sidewalk gaps along the SRTS network, along arterial and collector streets, and investing in facilities that provide safer conditions and access for seniors and people with disabilities. Additionally, the group recommended the establishment of a sidewalk repair program by 2017, and the formation of a consolidated transportation commission that would advise the City Commission on all transportation matters, including pedestrian issues. The Task Force proposed funding pedestrian projects through the reallocation of existing resources in the short-term and dedicated pedestrian funding through renewal of the infrastructure sales tax in the long-term.

Americans with Disabilities Act (ADA, 1990) http://www.ada.gov/pubs/adastatute08.htm**:** For over 100 years, street and sidewalk infrastructure were built without mandated consideration of individuals with disabilities. Therefore, the amount of labor, time, and money required to bring the region into full compliance with the Americans with Disabilities Act (ADA) standards is substantial. In order to best serve individuals with disabilities living in communities throughout the region, we must continue to improve accessibility of the pedestrian environment.

With the signing of the act in 1990, all public agencies with more than 50 employees are required to make a transition plan which must include a schedule for providing access features to all programs and services offered by that public agency. The City of Lawrence developed a Self-Evaluation Transition Plan in 1992. This plan describes the self-evaluation of city employment, services, and facilities; as well as services provided by outside agencies to determine if all meet the standards set by the Americans with Disabilities Act. The plan also identifies the general priorities to be followed when making structural modifications to non-compliant facilities. The ADA strives to enhance mobility for people with physical, cognitive, or sensory limitations.

Effects of the ADA on the Douglas County region's pedestrian infrastructure network are:

- Curb ramps at intersections
- Accessible pedestrian signals at intersections for individuals who are blind or visually impaired
- Sidewalks with deflections or cross-slope that prevents easy travel with a wheelchair

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Pedestrian Progress Toolbox

Municipalities, organizations, non-profits, and advocates have many tools at their disposal to address pedestrian issues. The following is a list of policies, programs, and infrastructure tools that can be used to improve the pedestrian environment.

Policy and Programs

Safe Routes to Schools (SRTS) Program

Walking and bicycling to school can be an important part of a healthy lifestyle, yet most children in Kansas do not start the day with either of these activities. The Kansas Department of Transportation, with funding from the Federal Highway Administration, has developed a program that would provide reimbursements to local public authorities and school districts for projects or activities that will make walking and bicycling to school safe, enjoyable, and routine.

Through the SRTS program, funds are available for a variety of projects and programs that benefit elementary and middle school children. These programs are intended to be comprehensive, combining education, enforcement, encouragement, evaluation, and engineering.[1]

Traffic Calming Through Reduced Speeds

Pedestrian injuries are less frequent and severe on roadways with lower speeds. Many streets serving a variety of transportation modes carry traffic that travels at speeds incompatible with safe pedestrian activity. Reducing vehicle speed should include an approach that considers engineering, enforcement, and education measures. The safety benefits of reduced speeds include not only pedestrians but also motorists and cyclists. The advantage to pedestrians is the most substantial from an injury and fatality standpoint.

Risk of pedestrian injury and death increases as vehicle speed increases. For motor vehicles that are involved in a pedestrian crash at a speed of 31 mph, risk of pedestrian injury is 50%, and risk of death is nearly 25%.[2] Reducing vehicle speed is one way in which safety in the pedestrian environment can be improved.

Traffic Safety Campaign

A traffic safety campaign including motorist, bicyclist, and pedestrian education programs can improve safety for all road users. The addition of police resources and officers can help to enforce traffic laws for all users.

No single policy or action exists to make streets and roads safer and more conducive to pedestrians. Instead, safer active transportation networks will only be achieved through a change in priorities for addressing transportation demand and land use. The Public Policies for Pedestrian and Bicyclist Safety and Mobility Report found, "there is also a need to change typical road user behavior, such as distracted and aggressive driving, as well as bicyclists and pedestrians not obeying traffic control devices."[3] Often this cultural behavior is changed through education and enforcement.

Successful pedestrian safety education programs include a variety of different elements and strategies. Providing instruction on lawful and responsible behavior among bicyclists, pedestrians, and motorists is vital in an effective multimodal transportation network. Educating kids about pedestrian safety by working with school administrators and teachers to identify target ages for key educational messages can be an effective tool to connect with the target audience. In a similar way, reminding adults of important

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[1]https://www.ksdot.org/bureaus/burTrafficEng/sztoolbox/Safe_Routes_to_School.asp

[2]https://www.aaafoundation.org/sites/default/files/2011PedestrianRiskVsSpeed.pdf

[3]http://www.pedbikeinfo.org/cms/downloads/PBSPolicyReview.pdf

walking skills by working with college and high school administrators can be a good strategy as well. Including pedestrian information in driver's education courses with examples of crash reports could be a useful exercise for inexperienced drivers. Finally, identifying what safety messages are most important for different target audiences and how to effectively deliver those messages can make a difference in the success of a pedestrian education program.

Improved enforcement of traffic laws for bicyclists, pedestrians, and motorists should be encouraged. This can be done with the cooperation of the police department and city attorney by reviewing and, if necessary, modifying local and state laws that affect pedestrians, focusing on the regulations that unnecessarily restrict pedestrian traffic or that seem out of date when compared to the national models. Enforcing laws that impact the most common serious crashes involving motor vehicles with pedestrians is possible by developing a plan with the police department, traffic court, city attorney, and other local organizations which can help with traffic law enforcement efforts. Reviewing procedures for handling youthful violators can be an effective preventative enforcement effort as well. Some cities have utilized a special youth court for young people that violate traffic laws and special tickets that have multiple copies for the violator, the parents of the child, and the police station.

Encouragement Programs

Pedestrian encouragement programs enable individuals and organizations to create awareness of pedestrian issues by alerting others to the benefits of walking and the ways that walkable places foster a healthier, more livable community. These programs include employer-driven incentive strategies such as mileage reimbursements, maps of walking routes, walk to school day, walking school buses under parental supervision, and pedestrian wayfinding signs. Challenging people to walk, distributing information in maps and brochures, and providing perks such as free pedometers can redefine how people think of transportation.

Identifying organizations and groups with an interest in encouraging pedestrian transportation, and collaborating with them to develop programs, is vital to sustain ongoing and future pedestrian efforts for encouragement.

Pedestrian Inclusion in Development Review

Ensuring pedestrians considerations are discussed early in the planning/design process for developments can prevent difficulties further along in the process. Instead of repairing and/or retrofitting areas within a city where pedestrian facilities were not originally anticipated but are now needed, it may be easier and less expensive to establish standards which consider space for pedestrians at the earliest stages of the planning process before infrastructure is built. These standards and guidelines should not be onerous, but they do need to set minimum expectations for improving the pedestrian experience with new roadways and reconstructions. A wide range of possible options for enhancing multimodal friendliness exists through design. The following treatments may be appropriate in some locations:

- Street crossing treatments
- Sidewalk design
- Landscaping and amenities
- Establishing subdivision regulations that limit negative impacts on pedestrian mobility such as blocks exceeding 600 feet, curvilinear streets, or streets with cul-de-sacs. Pedestrian easements or cut-throughs can be used to improve pedestrian connectivity when long block lengths are unavoidable
- Establishing a development code that mandates maximum setbacks for new developments to bring buildings closer to the sidewalk where they can easily be reached on foot, and encouraging walking paths within new developments
- Adjusting traffic signal timing, creating a Leading Pedestrian Interval allowing pedestrians to begin crossing 3-6 seconds before motor vehicles are given a green light, or disallowing right turns on red in certain locations

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Creation of a Pedestrian Advisory Committee

To improve multimodal planning and infrastructure, cities can establish a pedestrian advisory committee, a combined bicycle and pedestrian advisory committee, or can assign pedestrian planning and implementation responsibilities to an existing committee/ advisory group. The committee could coordinate pedestrian planning activities, oversee all pedestrian programs and policies, address pedestrian improvement needs, recommend funding for implementation, prioritize pedestrian improvements, and help to coordinate pedestrian planning with other modes of transportation. A pedestrian advisory group could also better act as a liaison between the general public and decision makers.

Evaluation Tools

Walk Friendly Communities (WFC)[1] is a national recognition program to encourage cities across the U.S. to establish or recommit to a high priority for supporting safer walking environments. The program recognizes communities that have shown a commitment to improving pedestrian safety, mobility, access, and comfort through comprehensive programs, plans, and policies. Communities can apply to the program to receive recognition in the form of a Bronze, Silver, Gold, or Platinum designation. There is no cost to apply for a WFC designation, though it is estimated to take approximately 20–60 hours of staff time to complete an application. This designation could be used as an objective way to measure the pedestrian friendliness of a city using a widely-accepted national standard.

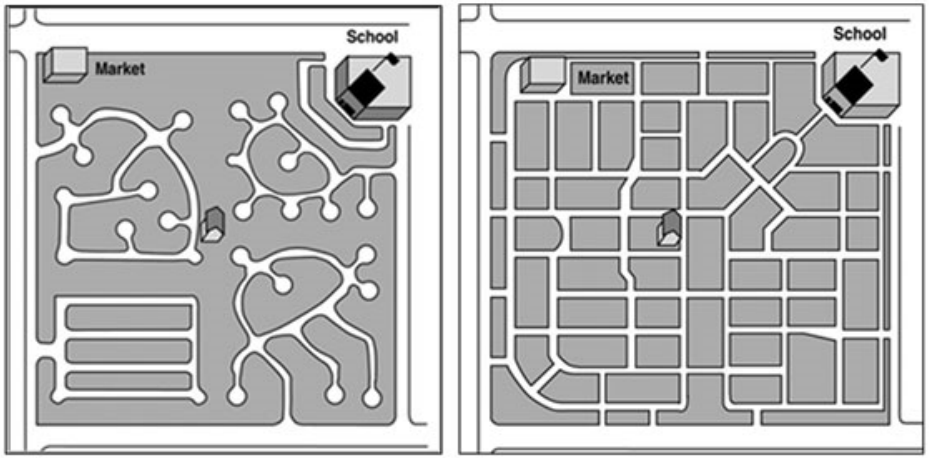
Another way to evaluate progress would be to track and measure the annual expense and number of pedestrian improvements made by public projects and programming. Furthermore, analyzing crash data would help to identify recurring safety issues. Also, collecting pedestrian count data would help provide insight on trends within the region. This combined knowledge would be useful in warranting future projects and estimating demand for facilities.

Pedestrian Infrastructure Design

Directness

Distance is critical to the walking trip. Directness measures how well a community provides direct pedestrian connections to destinations such as transit stops, schools, parks, commercial centers, or activity areas. The grid street pattern, in which a pedestrian can go north, south, east, or west to easily get to a destination, typifies the ideal system, offering the pedestrian many potential routes. Common curvilinear subdivisions often lack direct connections because they contain cul-de-sacs that back up against commercial centers, transit stops, schools, or parks and require a circuitous route, which deters potential pedestrians. Consider the images in Figure 1.1 which all have the same direct distance between the origin and destination. As cul-de-sacs and curvilinear streets become incorporated into the design, pedestrians must walk much longer actual distances to reach their destination.

Figure 1.1. The grid pattern on the right provides a more direct connection between destinations than the example on the left. Images taken from FHWA training materials. [2]



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[1] www.walkfriendly.org

[2] https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/network_report/page02.cfm

In The Smart Growth Network's Pedestrian and Transit Friendly Design Manual, block lengths of less than 300 feet are recommended for high degrees of walkability and 300-600 feet for average walkability.[3] If long block lengths are unavoidable, pedestrian easements or cut-throughs should be considered to provide improved connectivity.

Continuity

Continuity is a measure of the completeness of the sidewalk system and avoidance of missing segments. Under ideal circumstances, the pedestrian sidewalk appears as a single continuous network, with connections between sidewalks in the public right-of-way and a specific site. As sidewalks begin to appear only on one side of the street, or have gaps that deter pedestrians, the quality of the network design deteriorates. Segments without sidewalks on either side of the street create significant safety risks for pedestrians.

Safety

Crashes between pedestrians and motor vehicles can be caused by many factors. Regular analysis of pedestrian crash data should be performed to identify locations and countermeasures that address the specific location. The Federal Highway Administration recognizes that speed is a critical component of a safe road system, especially when roads contain a mix of user types (pedestrians, bicyclists, motor vehicles).[4] Another part of the solution may be to change the geometry of the roadway or intersection through engineering design.

Visual Interest, Amenities, and Personal Comfort

To promote pedestrian activity, the pedestrian system needs to be aesthetically appealing and comfortable for all users. The attractiveness of the pedestrian network can be visually engaging, with enhancements like street lighting, fountains, and benches, or can cause discomfort and intimidation associated with the absence of amenities. The speed, volume, and noise of adjacent traffic, along with the buffer area between cars and pedestrians, can influence how comfortable one feels walking in a certain area. Areas to examine regarding visual interest, amenities, and personal comfort include the following elements:

Image 1.1: Bulb outs are one example of engineering design that reduces travel distance for pedestrians crossing the street.

- **Scale** - Does the urban environment reflect a human scale environment (pedestrian scale)? Are the colors , materials, and form of the pedestrian facilities and features appropriate to the area and do they functionally unite the pedestrian network?
- **Attractiveness** - Does the area include landscaping, vertical treatment, and sidewalk furnishings that improve the character and pedestrian scale of the urban environment?
- **Design** - Does the area include the site details, such as public art, that enhance the pedestrian scale of the street and become urban amenities?

[3]http://www.fta.dot.gov/documents/ptfd_primer.pdf

[4]https://www.fhwa.dot.gov/publications/publicroads/13sepoct/02.cfm

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- **Lighting** - Does the lighting improve the safety, aesthetics, and character of the area?
- **Maintenance** - Is the area well-maintained, clean, and free of overgrown vegetation?
- **Adjacent Land Uses** - Are the land uses along the pedestrian network attractive and inviting such that they encourage pedestrian activities or are they unappealing, such as unmaintained buildings and parking lots? Is there a mix of land uses that leads to natural security (eyes on the street)?
- **Adjacent Motor Vehicles** - What is the volume of motor vehicles near the walking path? Do they cause too much noise or are they too physically close?

Street Crossings

Street crossings place the pedestrian in the middle of the street and exposed to potential conflicts with automobiles. Good pedestrian network design may be unique at each crossing. Finding the correct treatment to use can become very complex. There are some key elements that needing examination when considering changes to a street crossing.

For an average pedestrian walking at 3 miles per hour (4.4 feet per second), it takes approximately 3 seconds to cross one 12' traffic lane. Bike lanes and on-street parking can increase crossing time. When determining the total time necessary for a walk signal phase, an additional 3 second cushion of safety is recommended. Older adults, children, and mobility impaired pedestrians take longer to cross. Potential tools to improve pedestrian safety at intersections include reducing lane width to 11 feet[1], Leading Pedestrian Intervals, and disallowing right turns on red in certain locations. The American Association of State Highway and Transportation Officials (AASHTO) and the National Association of City Transportation Officials (NACTO) provide guidance on engineering standards at crossings.

Table 1.1 : Street Crossing Elements Defined

Element	Description
Number of Lanes	The greater the number of traffic lanes to be crossed, the greater the exposure of pedestrians to vehicles. In addition, wider streets tend to carry higher volumes of traffic at higher speeds.
Crosswalks	Pedestrian crosswalks should be adequately marked and signed at non-signalized locations. In some situations, the sidewalks may be raised for added visibility.
Signal Indication	Traffic signal heads should be easily visible to pedestrians and motorists. The length of the signal walk phase should be sufficient to cross the street safely.
Lighting Levels	The intersections and crosswalks should be well lit so that the pedestrian is visible at night on major streets where pedestrian volumes are moderate or high.
Pedestrian Signal Indication	Pedestrian signal indications should be provided at every signalized crossing, with push buttons only used if the pedestrian volume is low enough to support it and must be placed in accessible locations. Consider audible signals if pedestrians with visual impairments are present.
Median Refuge Areas	Painted medians offer minimal refuge. Raised medians of significant width and height provide increased safety for the crossing pedestrian.
Amenities	Amenities include such elements as signing and design features that indicate the presence of a pedestrian crossing.
Sight Distance	Sight distance measures the unobstucted view between the motorist and the pedestrian. Good sight distance is important for pedestrian safety.
Corner Ramps	Existing sidewalk ramps may be either ADA standard or non-standard. They are also differentiated as to whether they provide visual directness for the pedestrian and notify the driver which direction the pedestrain will cross. New sidewalk ramps should be ADA compliant.
Bulb-Outs	Bulb-outs are extentions of the pedestrian network into the street. These bulb-outs generally extend to align with the width of the parking lane. They reduce the time to cross the street from corner to corner and therefore reduce the pedestrian's exposure to the automobile. They provide the pedestrian with a better line of sight to the vehicle stream and also provide improved line of sight from the driver to the pedestrian. Their phyciscal presence reduces the driver's lateral clearance and helps regulate and slow traffic.
Restricting Right Turn on Red	One of the greatest increases in pedestrian acccidents has been associated with right turns on red. Research has determined that an extremely high number of drivers do not stop at the crosswalk before making their turn and instead continue after looking to the left for approaching vehicles. Many jurisdictions have installed signs that do not permit right turns on red in high pedestrian use areas.

[1]The American Association of Highway and Transportation Officials' (AASHTO) policy on geometric design of highways and streets lists 11 foot lanes as an acceptable width for Arterial, Collector, and Residential streets, October 15, 2014. http://safety.fhwa.dot.gov/geometric/pubs/mitigationstrategies/chapter3/3_lanewidth.cfm

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Accessibility and Quality

Pedestrians using wheelchairs or other mobility devices can face significant challenges while using the pedestrian network. Network segments with a slope of greater than 8.3% may force a pedestrian to use another route. An example sign is shown at the right, indicating to pedestrians an upcoming steep grade. The Federal Highway Administration suggests periodic landing levels for steep grade segments as one potential solution. Other solutions include handrails or signs that indicate the sidewalk grade and inform users of alternate routes with lesser grades.[2]

Similarly, routes with a high number of deflections or other defects can impede the easy travel of a wheelchair and cause trips and falls. In areas with decorative brick or pavers, options could be to use concrete with brick trim or create pathways with smoother, larger pavers that are easier to navigate but retain the historic feel that contributes to cultural enrichment[2].

Image 1.2: Sidewalks in Downtown Baldwin City, KS creatively use brick and concrete to preserve the historic nature of the area and allow for easy wheelchair travel

Large parking lots in front of businesses could improve access and safety for customers by adding walking or wheeling pathways leading directly to the entrance.

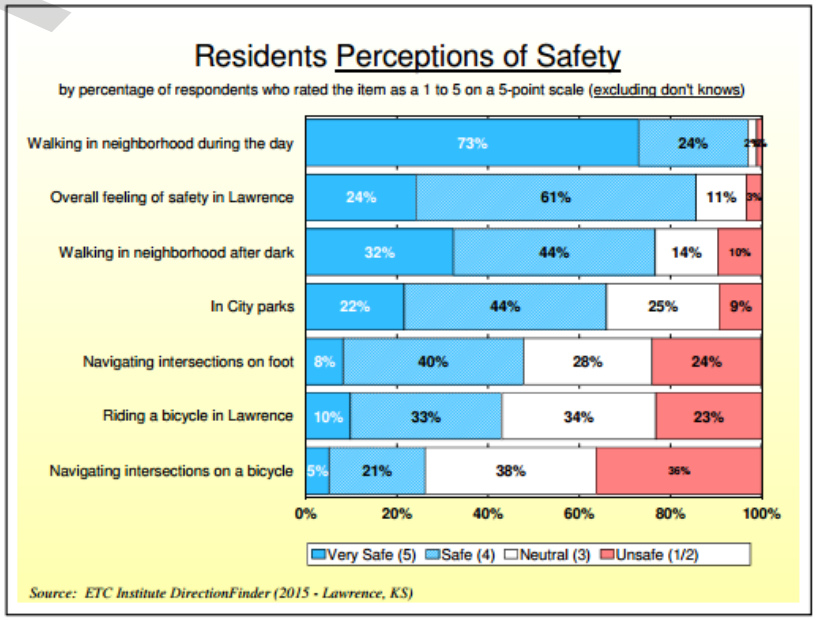
Security

To encourage pedestrian activity, the pedestrian network should reduce both actual and perceived threats to security. This can be done through:

- Street lighting for walking at night
- Improved visual line of sight, especially at intersections
- Separation from vehicles

Figure 1.2 demonstrates that in the 2015 Lawrence Citizen Survey Report, 97% of respondents felt very safe or safe walking in their neighborhood during the day, and 76% felt very safe or safe walking in their neighborhood after dark. Nearly 1 in 4 residents felt unsafe navigating intersections on foot (24%).

Figure 1.2: Perceptions of Safety



[2]https://www.fhwa.dot.gov/environment/bicycle_pedestrian/publications/sidewalk2/sidewalks204.cfm

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Public Outreach

A significant step in the development process of the Douglas County Regional Pedestrian Plan included public involvement. The MPO's public participation process reflects the MPO's rigorous approach to public involvement with timely public notice, complete information, and full public access. The public participation process included opportunities for input via the following outreach tools:

- Public website
- Steering committee
- Mobile meetings
- Survey

Project website

Throughout the life of the project, a dedicated website was available for members of the public to find general information and updates on the development process of the regional pedestrian plan and contact information for questions. The website was hosted through the official City of Lawrence website at www.lawrenceks.org/mpo/PedPlan.

Steering Committee

A steering committee was formed by the MPO to provide input on and guide the development of the Regional Pedestrian Plan. The Steering Committee met regularly over the course of this plan's development to review recommendations, provide local knowledge, and highlight pedestrian issues and desires. The steering committee included staff members from local municipalities, Douglas County, LiveWell Healthy Built Environment Work Group, Public Transit Advisory Committee, Regional Transit Advisory Committee, KDOT, KU, and public schools, as identified in Table 1.2.

Table 1.2 : Regional Pedestrian Plan Steering Committee

Regional Pedestrian Plan - Steering Committee	
Name	Organization
Bob Mikesic	Independence Inc. - Staff
Drew White	Independence Inc. Accessibility Taskforce
Allison Smith	KDOT
Erin Paden	Lawrence - Douglas County Bicycle Advisory Committee
Bob Schumm	Lawrence - Douglas County MPO Policy Board
Edwin Rockroth/Dave Crawford	Lawrence - Douglas County Traffic Safety Commission
Gary Webber	Lawrence Pedestrian Coalition
Kris Adair	USD 497
Marilyn Hull	Livewell Healthy Built Environment Work Group
Alan Black/Marian Hukle	Public Transit Advisory Committee
Heather Thies	Regional Transit Advisory Committee
Donna Hultine/Bonnie Johnson	University of Kansas
Danica Hoose	University of Kansas - Student
Justin Eddings	City of Eudora
Christi Darnell	Baldwin City
Lynley Sanford	Lecompton
Staff	
Chris Tilden	Lawrence - Douglas County Health Department
Charlie Bryan	Lawrence - Douglas County Health Department
David Woosley	Lawrence Public Works
Chuck Soules	Lawrence Public Works
Jessica Mortinger	Lawrence - Douglas County MPO
Bob Nugent	Lawrence Transit

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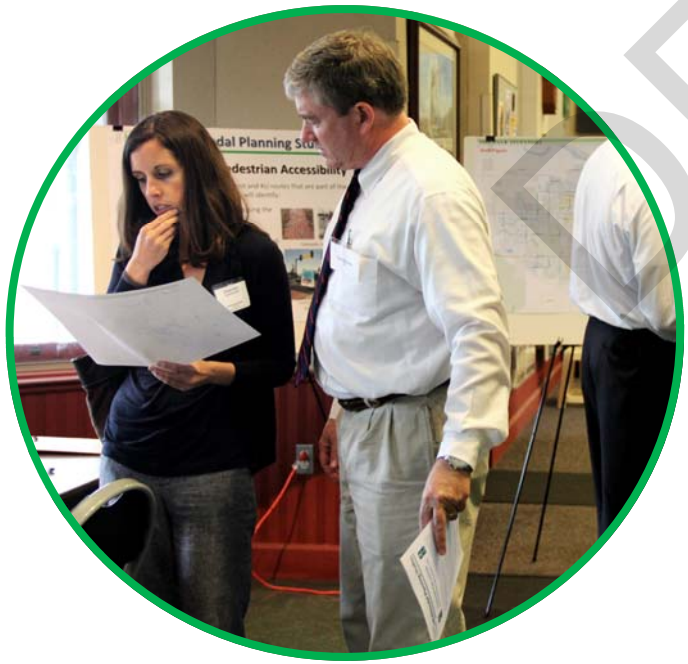
Mobile Meetings

Mobile meetings were held at various times and locations as an opportunity for people to ask questions and receive general information on the project. Paper versions of the survey were distributed at the meetings. Those meetings were held at the following locations/dates:

- Safe Routes for All Town Hall, Liberty Hall in Lawrence (3-25-15)
- Eudora Health and Bicycle Fair, Eudora Police & Fire Station (3-28-15)
- Baldwin City Annual Community Wellness Festival, at Baker University (4-18-15)
- Earth Day Celebration, South Park (4-11-15)
- Baldwin City PTO School Carnival (4-23-16)
- Aunt Netter's, Lecompton (4-29-16)



Surveys

The goal of the surveys was to determine a consensus on the community's thoughts of walking and what types of improvements and destination types respondents felt were most important for the Douglas County region.

The first survey contained 16 multiple choice, fill-in-the-blank/box, personal information, ranking and rating questions and was active on the MPO webpage at www.lawrenceks.org/mpo/PedPlan/survey from March 16th, 2015 to April 25th, 2015. The public was informed that the survey was available through an email distribution list, a press release, and links on the City of Lawrence's Facebook and Twitter. In addition to the online surveys, paper copies of the surveys were completed at mobile meetings. Responses to these questions have been incorporated into the recommendations of the Regional Pedestrian Plan. There were a total of 401 pedestrian surveys taken. Of those surveys 336, about 84%, were taken online and 65 of the surveys, about 16%, were paper versions.

Because of the low response rate from smaller communities in Douglas County in the initial 2015 survey, additional surveys were made available online for Eudora, Baldwin City, and Lecompton from April 22nd, 2016 to May 28th, 2016 online at www.lawrenceks.org/mpo/tellus. Paper surveys were also distributed at Aunt Netter's in Lecompton on April 29, 2016. For clarity in the following data results, each graphic will be identified by Survey 2015, Eudora Survey 2016, BC Survey 2016, or Lecompton Survey 2016.

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Survey Data Analysis

Survey Respondent Demographics

The survey collected responses from 401 respondents. Of the 352 survey respondents that chose to indicate their gender about 42 percent were male and about 58 percent were female, shown in Figure 1.3. This survey was taken throughout Douglas County, although the overwhelming majority of respondents were from Lawrence, demonstrated in Figures 1.4 and 1.5. This was considered while creating a regional plan that addresses the needs of the entire county, including Eudora, Baldwin City, and Lecompton.

Figure 1.3 (Survey 2015) : What is your gender?

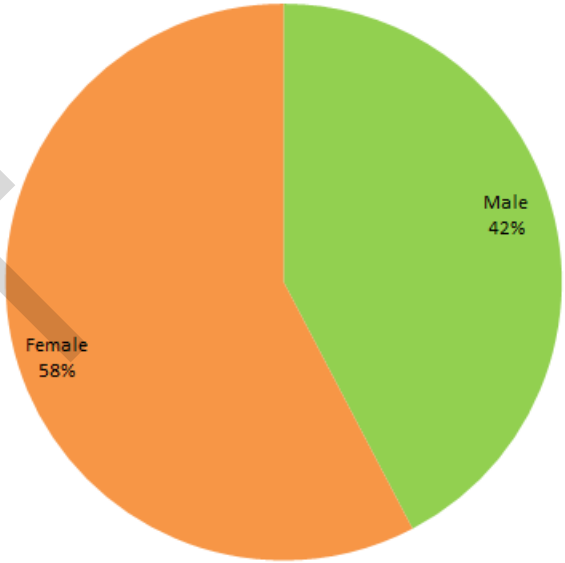


Figure 1.4 (Survey 2015) : Douglas County zip code map

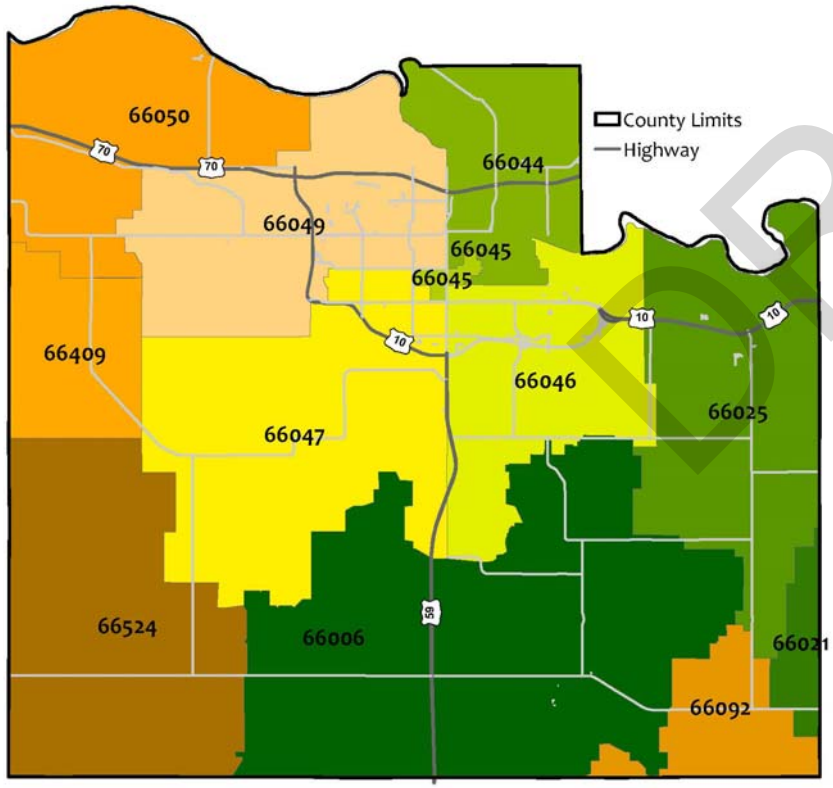
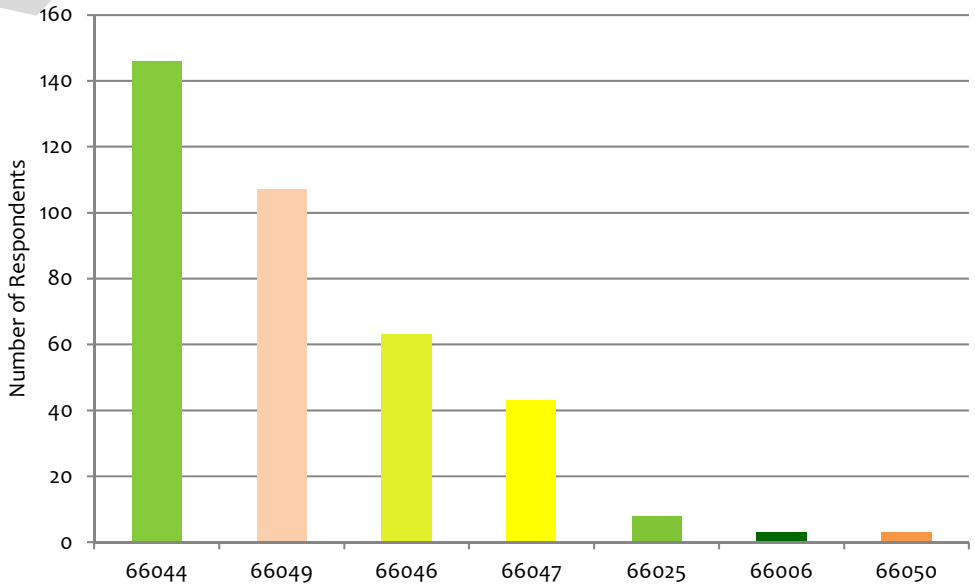


Figure 1.5 (Survey 2015) : What is your zip code?



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How often do you walk?

Figure 1.6 demonstrates that over 56% of respondents walk frequently (several times a week to every day) or regularly (once or twice a week) as a means of transportation. Almost 28% of surveys indicated they walk infrequently, very infrequently or never as a means of transportation to destinations.

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Around 4 out of every 5 respondents indicated they walk frequently or regularly for enjoyment or recreation. 6% or less indicated they walk infrequently, very infrequently, or never for enjoyment or recreation, shown in Figure 1.7.

Figure 1.6 (Survey 2015) : How often do you WALK as a means of TRANSPORTATION to destinations?

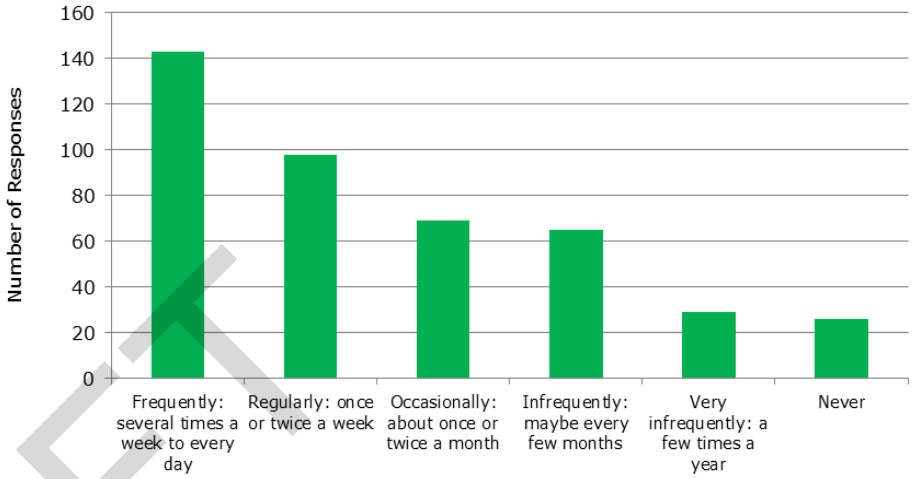
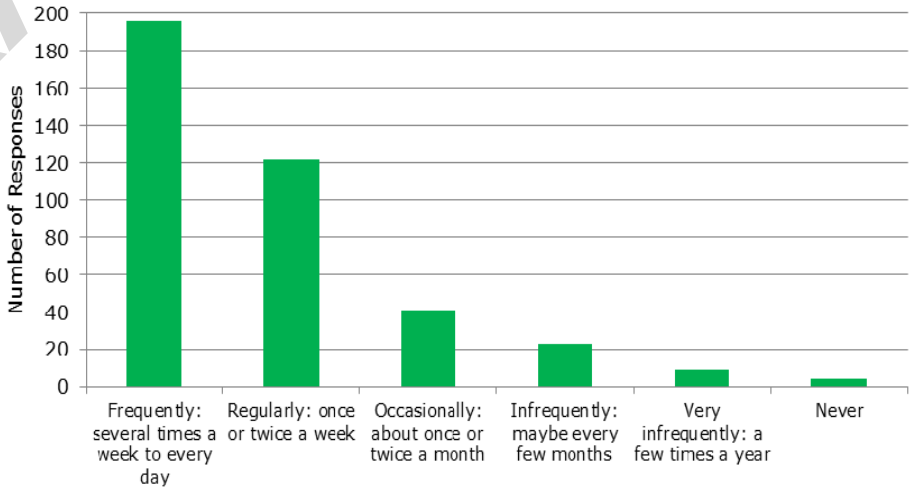


Figure 1.7 (Survey 2015) : How often do you WALK for ENJOYMENT or



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Why do you walk and for how long?

Figure 1.8 shows that the top five reasons why respondents walk were regular exercise or workout, leisure, shopping, trips to parks or recreational facilities, and walking their pets. Half of the survey respondents are willing to spend 20 minutes or less walking to a destination. Only 19.9% of respondents indicated they would be willing to spend more than 30 minutes walking to a destination.

Figure 1.8 (Survey 2015): If you WALK/RUN, which describes why you do it? Check all that apply.

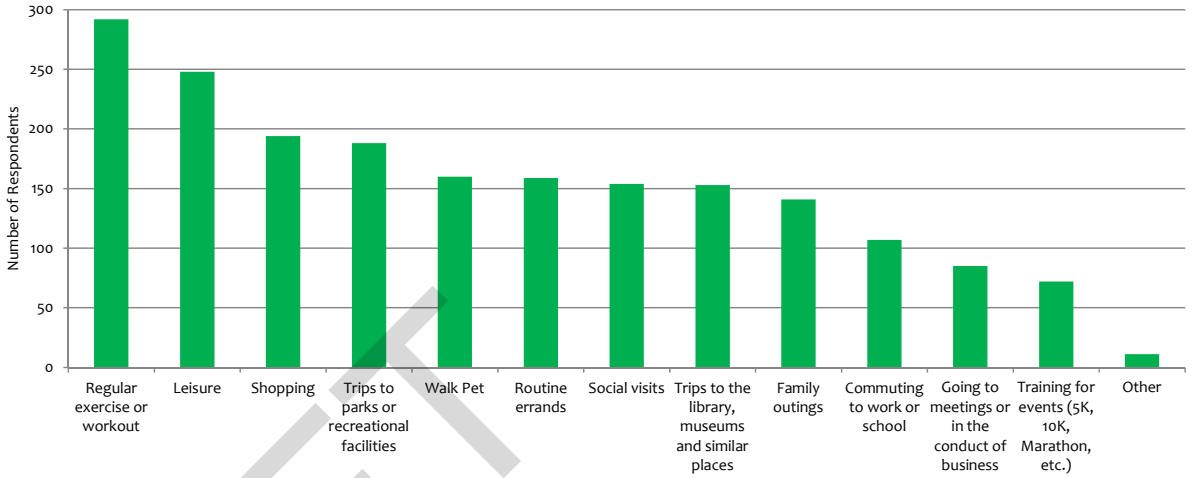
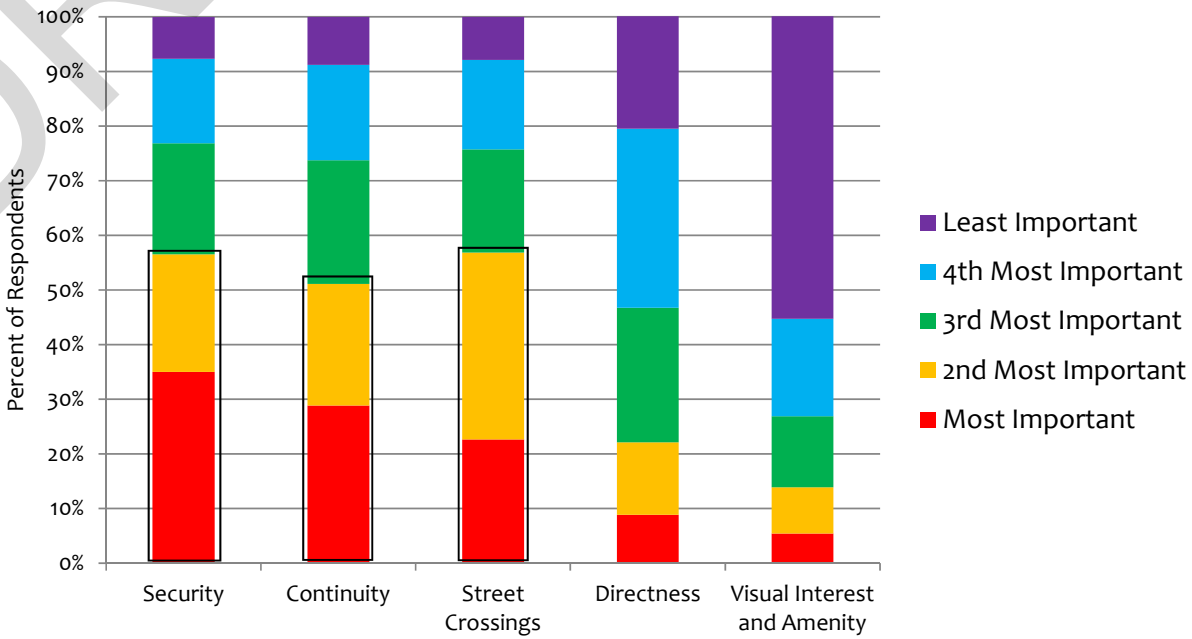


Figure 1.9 (Survey 2015): How long are you willing to walk to a destination?

Ranking Pedestrian Factors

Respondents were asked to rank pedestrian factors: continuity, directness, security, street crossings, and visual interest and amenity, 35% of respondents indicated security as the most important. Continuity was next at 28.8% followed by street crossings at 22.6%. If you consider the most important and 2nd most important responses, the categories with the highest combined percentages were street crossings at 56.8%, security at 56.5%, and continuity at 51.1%, highlighted with boxes in Figure 1.10. 55.4% of respondents ranked visual interest and amenity as the least important factor.

Figure 1.10 (Survey 2015): Rank the following pedestrian factors in order of importance



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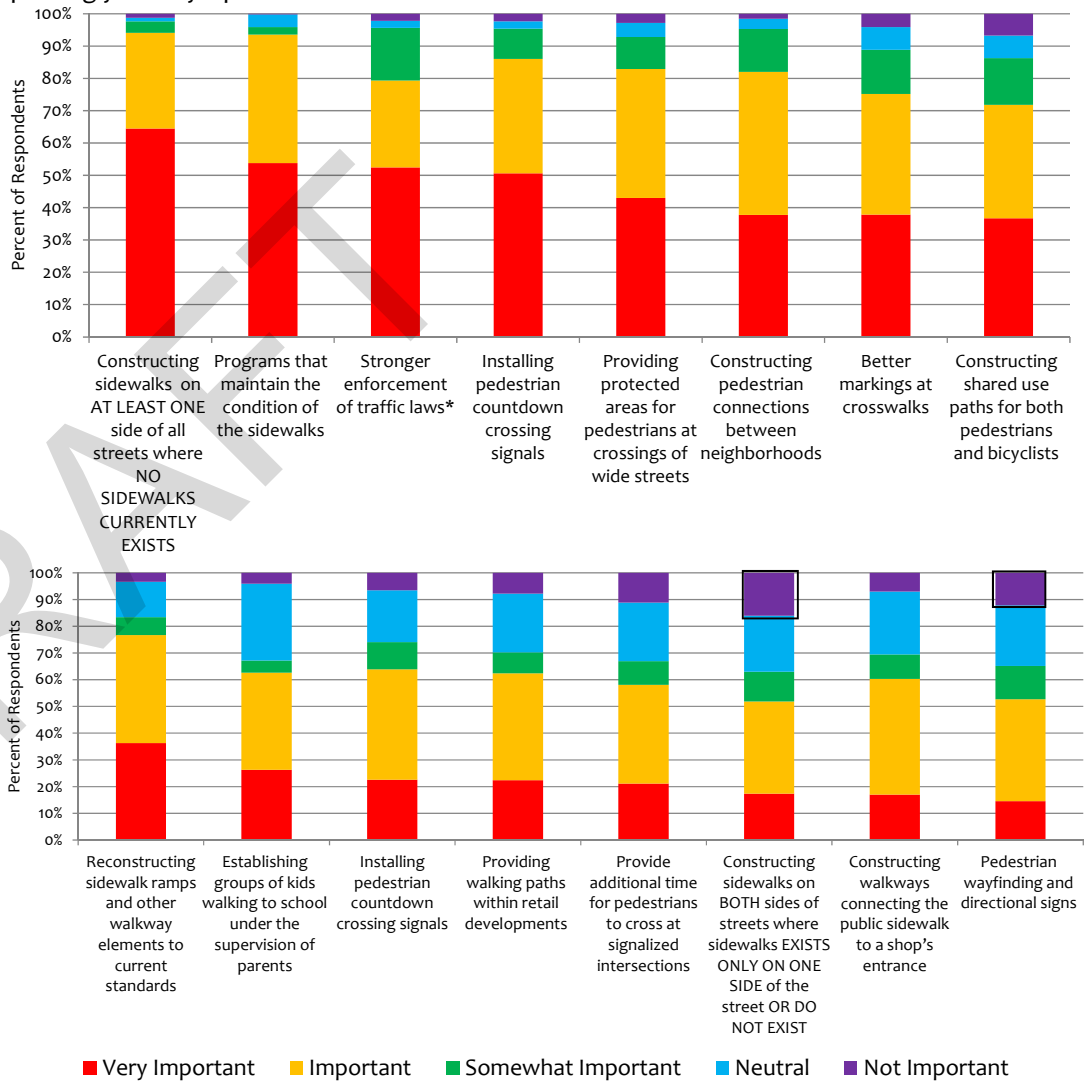
Rating Pedestrian Actions

Respondents were asked to choose how important they thought sixteen different actions would be to improve the city's pedestrian environment. Each action was rated on a scale of 1-5 (1 being not important and 5 being very important). Figure 1.11 shows that the action that was indicated as very important by the largest proportion of survey respondents was constructing sidewalks (5-6 foot wide paved surface) on at least one side of all streets where no sidewalks currently exist at 64.4%, followed by programs that maintain the condition of sidewalks at 53.7%. About 30 to 40 percent of respondents marked important on every pedestrian action.

Constructing sidewalks on both sides of streets where sidewalks exist only on one side of the street or do not exist had the highest number of people say the factor was not important at 16.2% followed by pedestrian way finding and directional signs at 12.2% shown to the right in Figure 1.10. It should be noted that stronger enforcement of traffic laws was not available as an option on paper copies of the survey due to staff error.

Figures 1.11 (Survey 2015) : How important do you think the following actions would be in improving your city's pedestrian environment?



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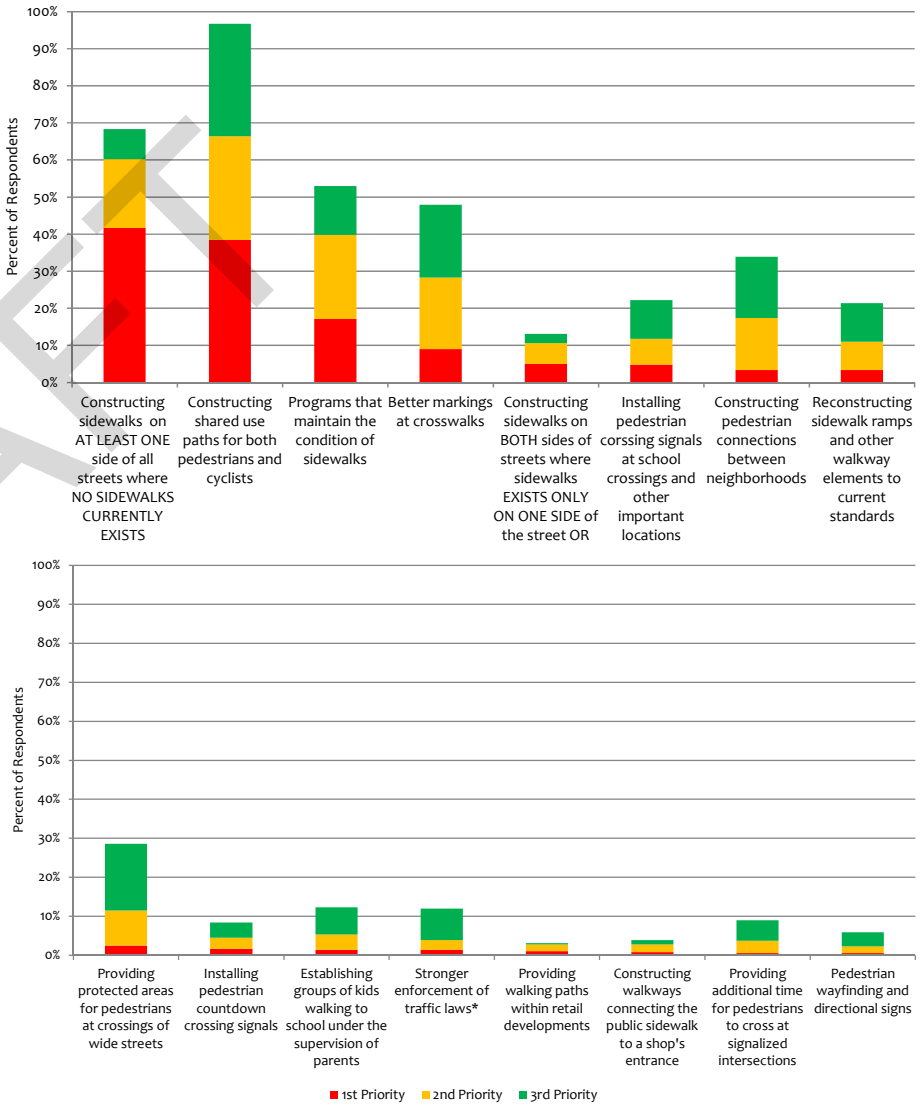
Survey Respondent Priorities

Survey respondents were also asked to rank the top three actions out of those sixteen that would best improve their city's pedestrian environment. Figure 1.12 is organized by actions that were chosen as most important by respondents. The pedestrian action that had the highest percentage of respondents marked as the most important was constructing sidewalks on at least one side of all streets where no sidewalks currently exist. 41.7% of respondents chose this action followed closely by constructing shared use paths for both pedestrians and cyclists at 38.4%.

All other categories had less than 20% as the top priority. A combined 96.7% of responses marked constructing shared use paths for both pedestrians and cyclists as a top three pedestrian action. This combined percentage was significantly higher than any other pedestrian action.

Figure 1.12 (Survey 2015): Please rank the top three actions from the previous list that would best improve your city's pedestrian environment.



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Destination Types

Survey respondents in Lawrence were asked to rank the top three destination types that need to be focused on to improve pedestrian access the most. Figure 1.13 shows that K-12 schools were chosen as the first selection by 57.8% of survey respondents. Neighborhoods came after that with 14.3% of responses as the first selection. The top three destinations with the highest combined percentages of first, second, and third priorities were K-12 schools, neighborhoods, and access to transit/bus stops.

Surveys for Eudora and Baldwin City residents asked for the top three destination types to focus on, but did not ask for rankings. Figures 1.14 and 1.15 demonstrate that schools, neighborhoods, and parks are a top 3 priority for residents in Baldwin City and Eudora.

Lecompton had too few respondents to the survey to present data in this format.

Figure 1.13 (Survey 2015): Please rank the top three destination types you think we need to focus on improving pedestrian access the most.

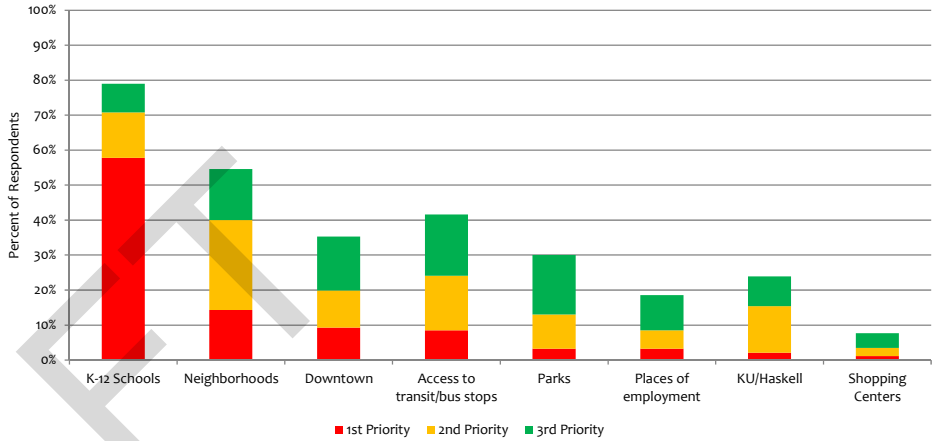


Figure 1.14 (Eudora Survey 2016): Please pick the top three destination types you think we need to focus on improving pedestrian access the most.

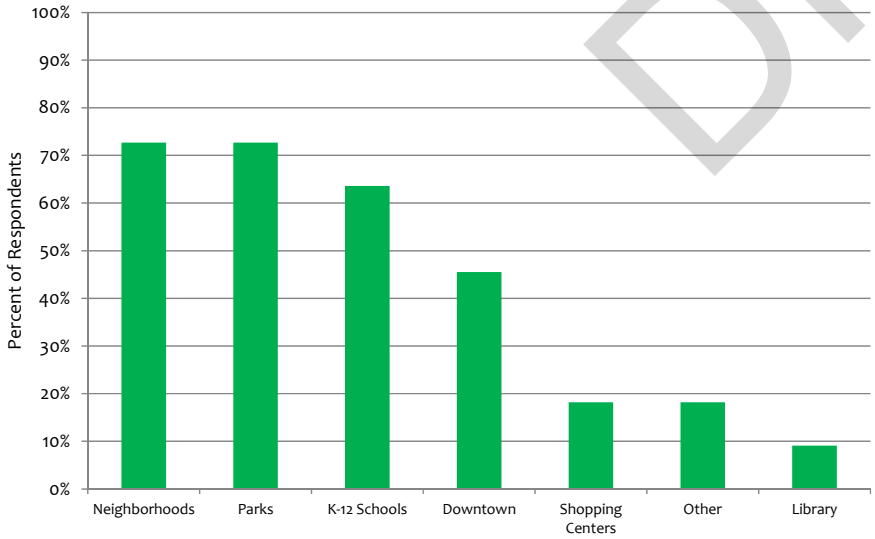
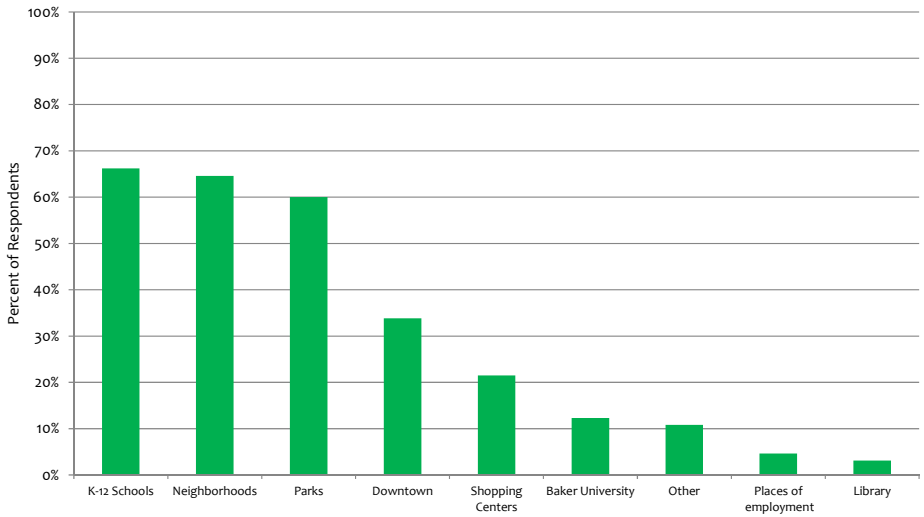


Figure 1.15 (BC Survey 2016): Please pick the top three destination types you think we need to focus on improving pedestrian access the most.



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Regional Pedestrian Plan Crash Analysis

A key element of livable communities is a safe and convenient place for people to bike and walk as part of their daily activities. Pedestrian facilities must accommodate a wide variety of user types, needs, and abilities. Pedestrian routes should be safe for walking. Existing safety issues may include hazards, lighting, vehicular conflicts, or conflicts with other sidewalk users. Routes should also provide access to various destinations via a reasonably direct route and allow for fluidity of traffic movement at intersections.

Unless otherwise stated, this analysis used the available data reported by Law Enforcement Officers on the Kansas Motor Vehicle Accident Report Form from 2009-2013 provided by the Kansas Department of Transportation.

Douglas County - Pedestrian Incidents by City & Geographic Area

In Figure 1.16, data shows a trend of pedestrian incidents in Lawrence increasing in number over time. Injuries make up the largest proportion of injury types in Douglas County, 95.6% of all incidents. Property damage incidents were 3.9% of all incidents, while fatalities were 0.3% of all incidents. Figure 1.17 on the following page shows where the highest number of incidents took place and where incidents overlap with minority and low-income populations. The vast majority of pedestrian incidents took place in Lawrence, while a handful occurred in Eudora, Baldwin City, and unincorporated areas of Douglas County.

Data shows pedestrian-related crashes occurred within urban areas – 93% of all incidents – more often than within rural areas, which only accounted for 7% of all incidents.

Figure 1.16: Douglas County Pedestrian Incidents by City (2009-2013)

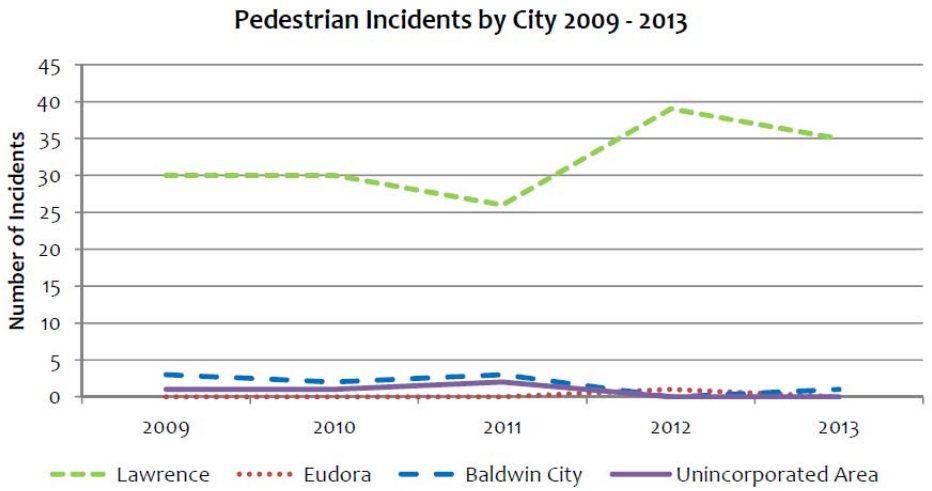

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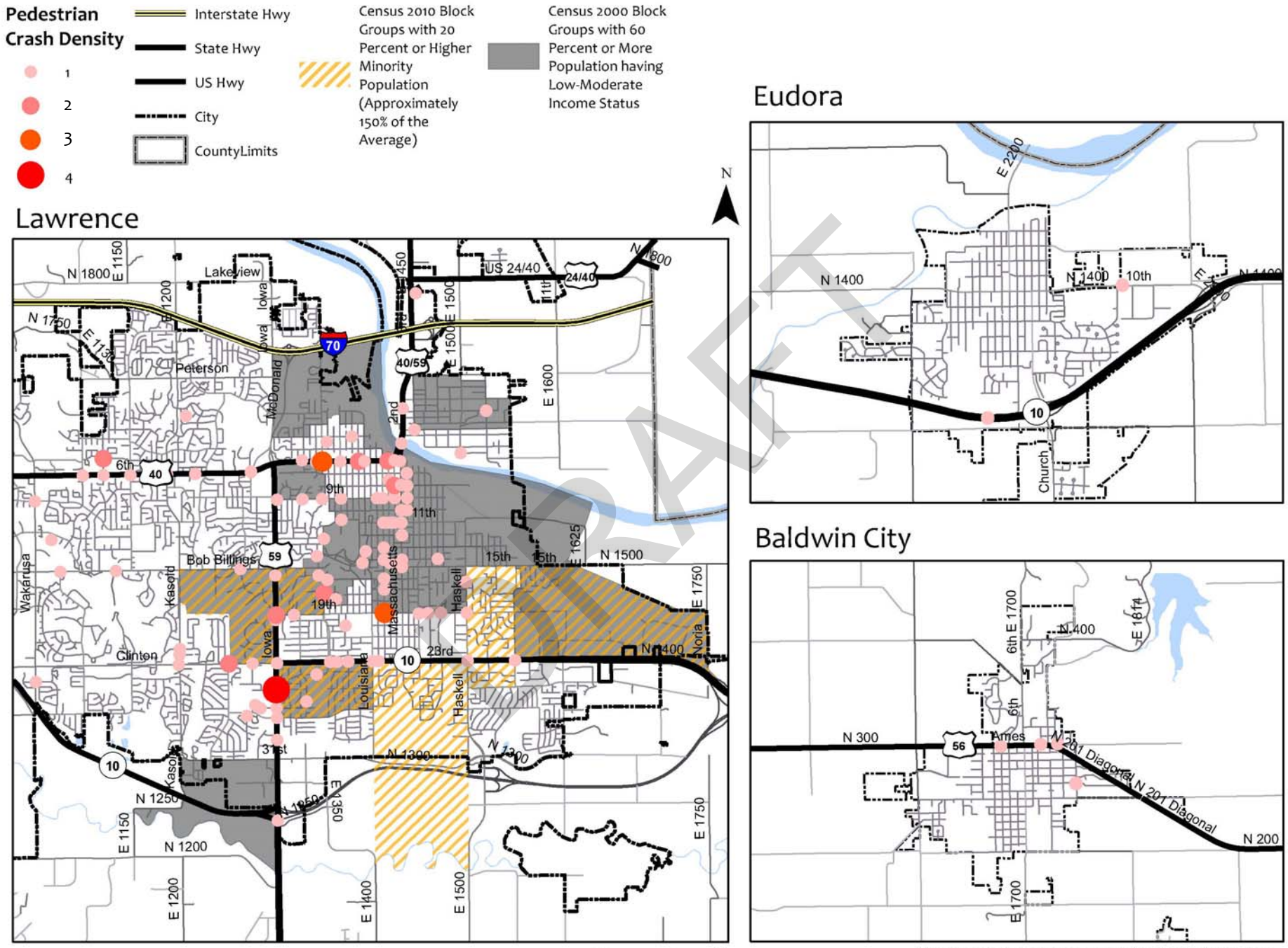
Figure 1.17: Douglas County Pedestrian Crash Density with Environmental Justice (2009-2013)**



Pedestrian Crash Density

An analysis of the spatial distribution of crashes shows that certain corridors have more issues than others, most notably 6th Street, 19th Street, and Iowa Street in Lawrence and along Highway 56 in Baldwin City. These corridors could merit conducting roadway audits and site-specific analyses to determine whether infrastructure access, roadway operations, or behavioral issues such as failure to yield, speeding, or crossing at night without lights are associated with increased crash numbers in these areas. A roadway safety audit was conducted by the City of Lawrence Public Works Department for the 19th Street corridor on March 26th, 2015. The audit suggested updates to crosswalks, pedestrian countdown signals, and replacement of sidewalk along the corridor. Site-specific issues can be found in the detailed report at www.lawrenceks.org/assets/mpo/corridor/19thStRSA.pdf.

"Crash" versus "Accident"

The word "crash" may be new to some people as a way to describe the event in which a bicyclist or pedestrian collides with a motor vehicle, in a way that can result in bodily harm and/or property damage. Historically, these events were called accidents. The term accident implies heavy doses of chance, unknown causes, and the connotation that nothing can be done to prevent them. Crashes are preventable. Bicyclist and pedestrian crashes are not random events. They fall into a pattern of recurring crash types and occur because the parties involved make mistakes. The mistakes can be identified and counteracted through a combination of education, skill development, engineering, and enforcement measures that can substantially reduce crash occurrences. There is a continuing need to establish the mindset that bicyclists and pedestrians are worthy and viable users of our transportation system.

Pedestrian Crash Type and Severity

A comparison of the crash severity of pedestrian and motor vehicle crashes in Douglas County notes some striking differences. Table 1.3 shows that pedestrian crashes had a significantly higher proportion of injuries at 95.7% while 20.6% of motor vehicle crashes involved an injury. The majority of motor vehicle crashes, about 79.2%, were property damage only incidents. The percentage of crashes with fatalities for both pedestrian and motor vehicle crashes were 0.4%, and 0.2%, respectively.

Table 1.3 : Douglas County Pedestrian/Motor Vehicle Crash Severity (2009-2013)

	Total	5-Year Average	5-Year Average (%)
Property Damage Only - Pedestrian	10	2	3.9%
Injury - Pedestrian	243	49	95.7%
Fatality - Pedestrian	1	0	0.4%
Total	**254**	**51**	
Property Damage Only - Motor Vehicle	12019	2404	79.2%
Injury - Motor Vehicle	3131	626	20.6%
Fatality - Motor Vehicle	35	7	0.2%
Total	**15185**	**3037**	

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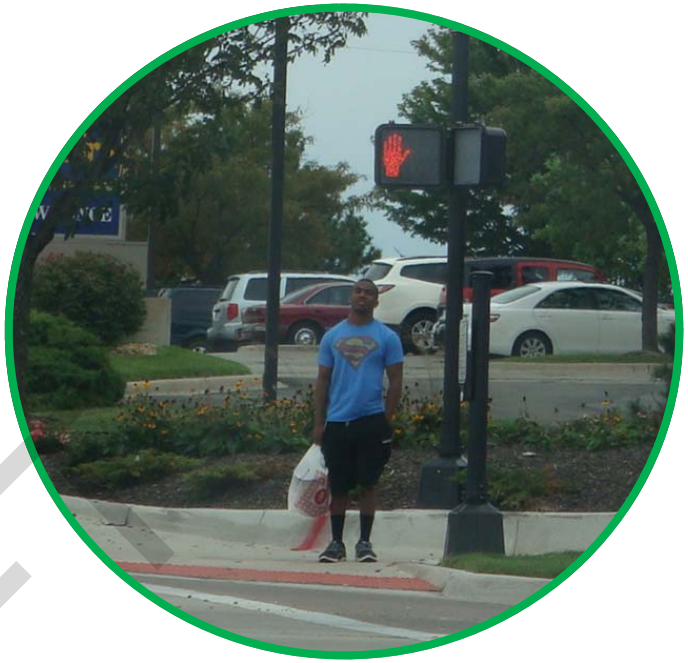
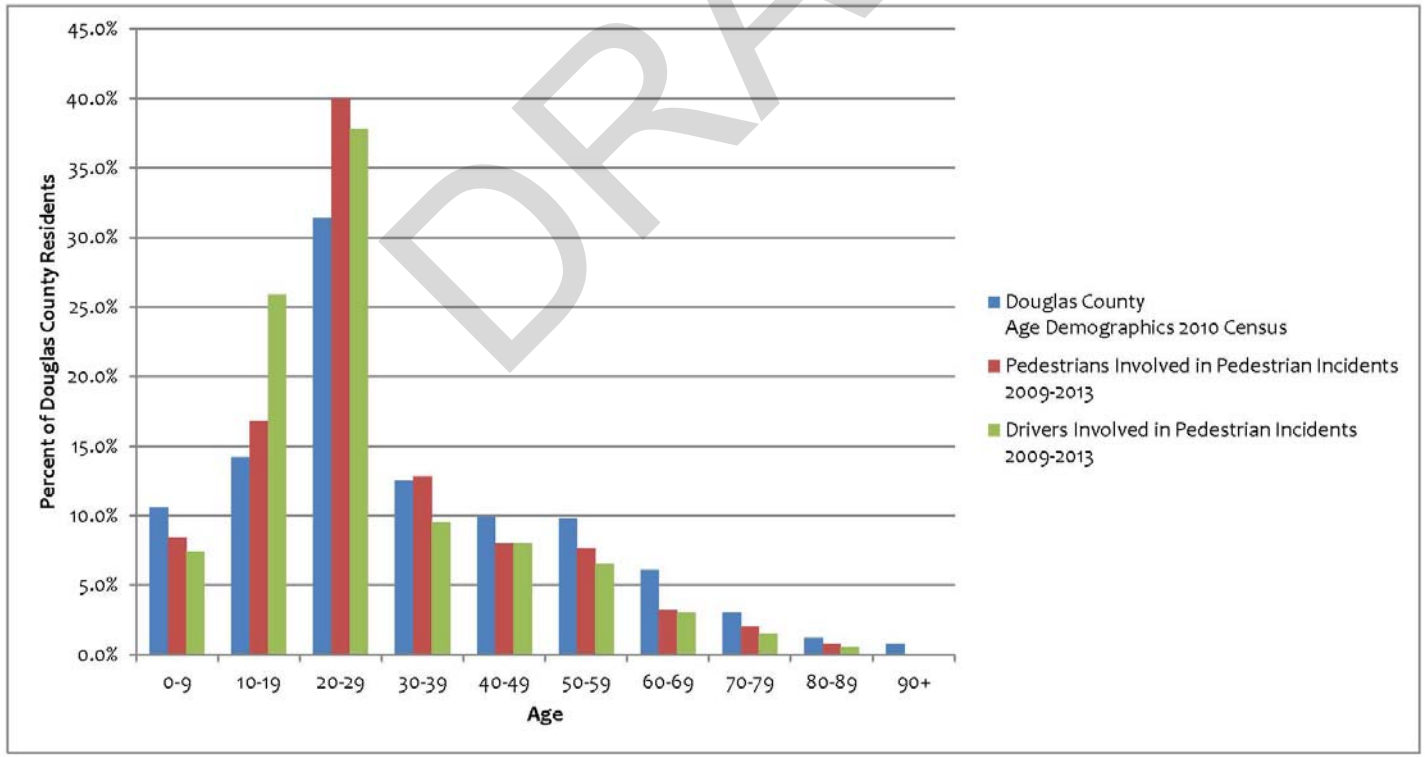
Douglas County - Age of Pedestrians and Drivers



Data in Figure 1.18 shows that the age group highest at risk for pedestrian crashes both as a pedestrian and a driver is the age group 20-29. In Douglas County, a large percentage of the overall population is within this age group. To understand if these proportions of incidents were notably higher than we would expect, we compared the county demographics with the number of pedestrian incidents in each age group. While the age group 20-29 accounts for 31.4% of the population, that age group is involved in a higher percentage of pedestrian incidents, both as the pedestrian and as the driver. This suggests that education targeted at this age group may be appropriate. The single Douglas County pedestrian fatality was in the 80-89 age group.

Figure 1.18: Age of Pedestrians and Drivers Involved in Pedestrian Incidents Compared to Douglas County Demographics



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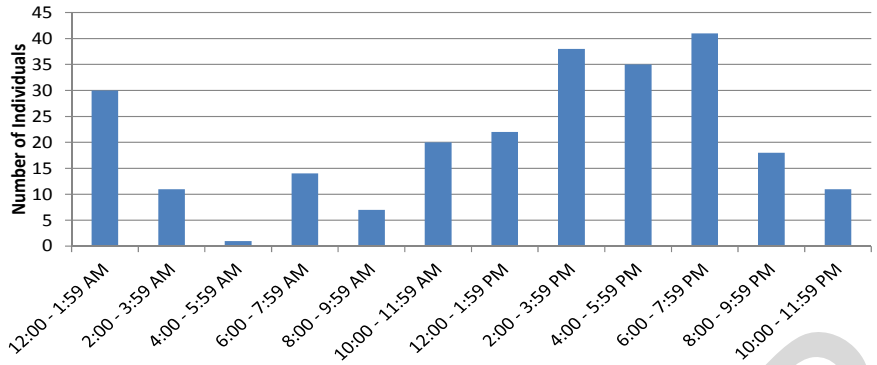
Douglas County - Time of Day

Figure 1.19 shows that peak travel times between 2:00-7:59 PM accounted for the largest proportion of pedestrian crashes and should be the focus of enforcement and other activities. This trend demonstrates an increase in crashes during hours that coincide with the end of a typical school day and the afternoon commute.

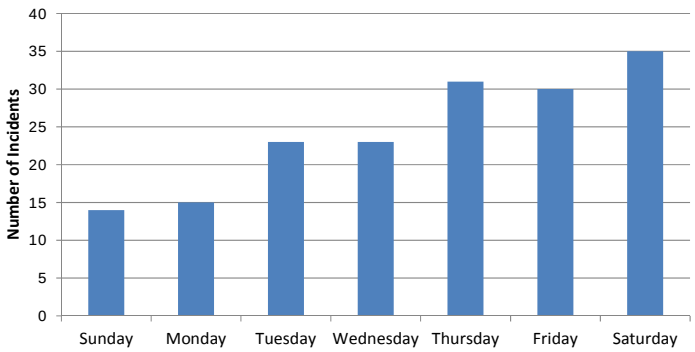
Figure 1.19: Individuals involved in Pedestrian Crashes by Time of Day (2009-2013)



Douglas County - Day of the Week

Figure 1.20 shows that Sunday and Monday have the fewest number of incidents while Thursday, Friday, and Saturday have a higher number of pedestrian incidents.

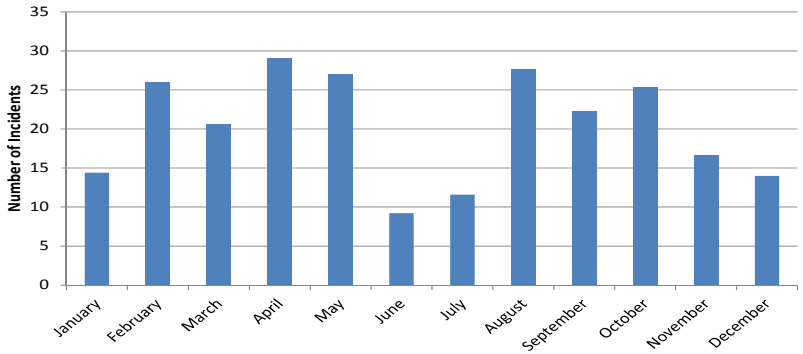
Figure 1.20: Pedestrian Incidents by Day of the Week (2009-2013)



Douglas County - Month of the Year

Figure 1.21 demonstrates that the months of February, April, and May had the highest number of pedestrian incidents. However, it is important to note that February has fewer days than any other month; Overall, summer months June and July had the lowest numbers of incidents than other months. The low attendance of universities during the summer months is likely to account for this dramatic decrease in pedestrian incidents for June and July. The winter months December and January had significantly lower numbers than the rest of the year. This could be attributed to the weather conditions that change pedestrian behaviors, as well as a decrease in university attendance. The data demonstrated on page 29 about age of both pedestrians and drivers, coupled with this data, suggests that targeted education at the university-level in Douglas County at the beginning of each semester may improve pedestrian safety, given that a large number of young drivers come to town during that time. However, the data may also suggest that a higher number of crashes happen simply because there are more people in town. A comparison with monthly weather conditions (temperature, precipitation, snowfall) is inconclusive due to various factors in the cause of pedestrian incidents.

Figure 1.21: Pedestrian Incidents by Month of the Year (2009-2013)



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Douglas County – Light, Weather and Surface Conditions

Shown in Figure 1.22, the majority of pedestrian incidents occurred in Daylight, 58%, followed by "Dark: Lights on" at 30%. Only 6 percent of incidents occurred in "Dark: no lights" and the Dawn, Dusk and Unknown categories each accounted for less than 3% of all incidents.

Figure 1.22: Number of Pedestrian Incidents by Light Conditions (2009-2013)

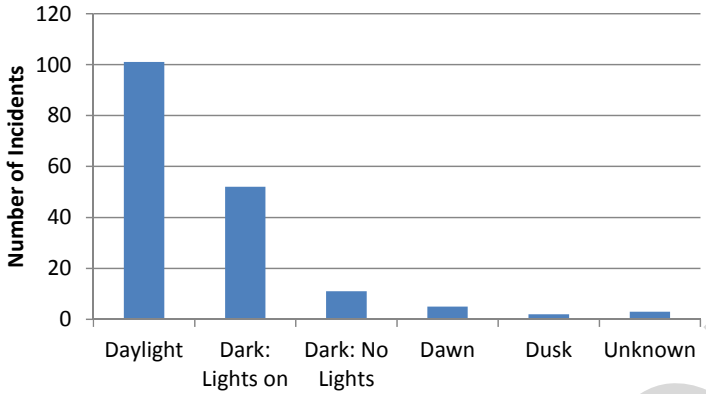


Figure 1.23 demonstrates that in terms of weather conditions, the majority, 87%, of pedestrian crash incidents occurred in clear conditions. Rain was the next significant category, with an occurrence in 11% of pedestrian crash incidents. The remaining categories combined for less than 2% of all incidents. Since the majority of pedestrian crash incidents occurred in clear weather conditions, this suggests inclement weather had very little effect on the likelihood of a pedestrian crash.

Figure 1.23: Number of Pedestrian Incidents by Weather Conditions (2009-2013)

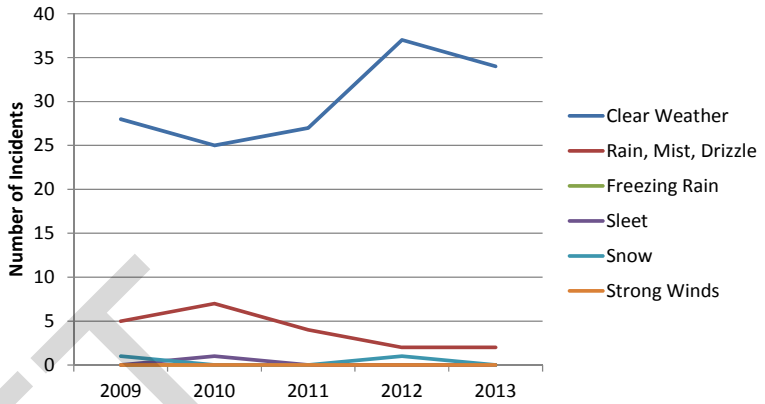
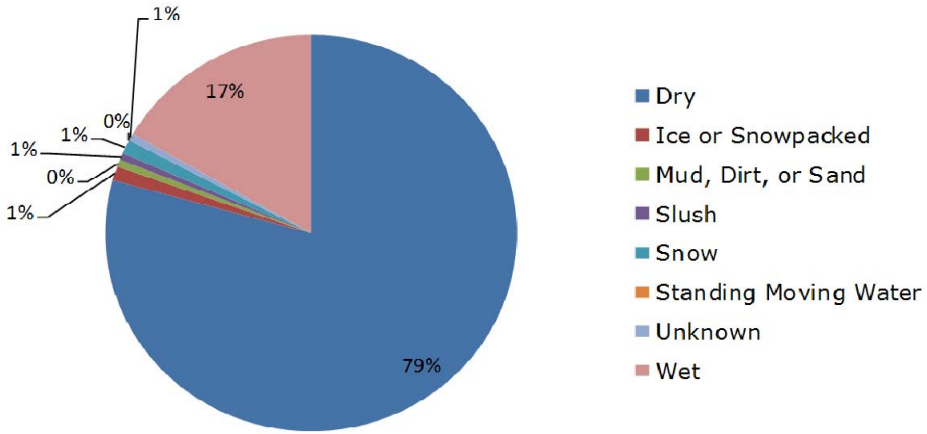


Figure 1.24 indicates that 79% of pedestrian crash incidents occurred under dry surface conditions, followed by wet conditions at 17%. The rest of the categories combined accounted for less than 5% of all incidents. Since the number of pedestrian crash incidents is substantially higher in dry conditions, this suggests inclement weather discouraged pedestrians from walking, or encouraged more caution from drivers and pedestrians alike.

Figure 1.24: Pedestrian Incident Surface Conditions (2009-2013)



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Douglas County - Location of First Harmful Event and Pedestrian Action

Figure 1.25 demonstrates that the majority of pedestrian crash incidents by location of first harmful event occurred "in crosswalk or bikeway" – 48%, or "not in intersection" – 32%. A smaller proportion of incidents occurred "not in roadway" – 7% or "not in crosswalk or bikeway" – 6%.

Figure 1.26 shows the greatest number of pedestrian-related contributing circumstances for pedestrian crashes were "playing, running, or walking in roadway" - 35%, and "entering or crossing roadway" - 28% of all incidents. A smaller proportion of pedestrian-related actions include "going to and from school" – 17%.

Figure 1.25: Location of First Harmful Event in Pedestrian Crashes

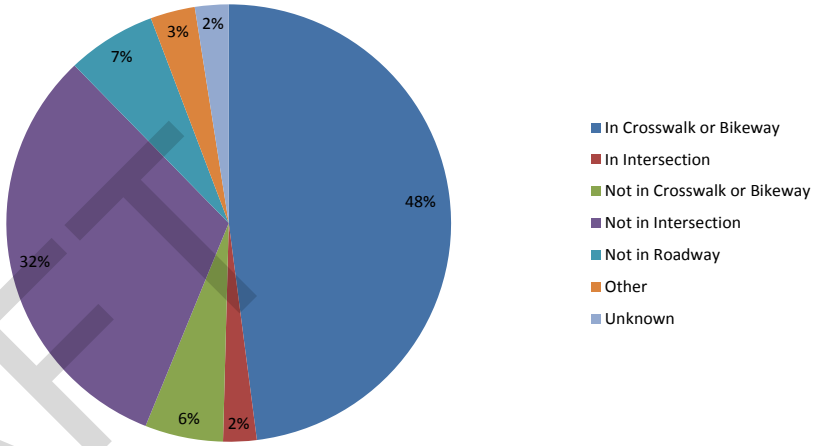
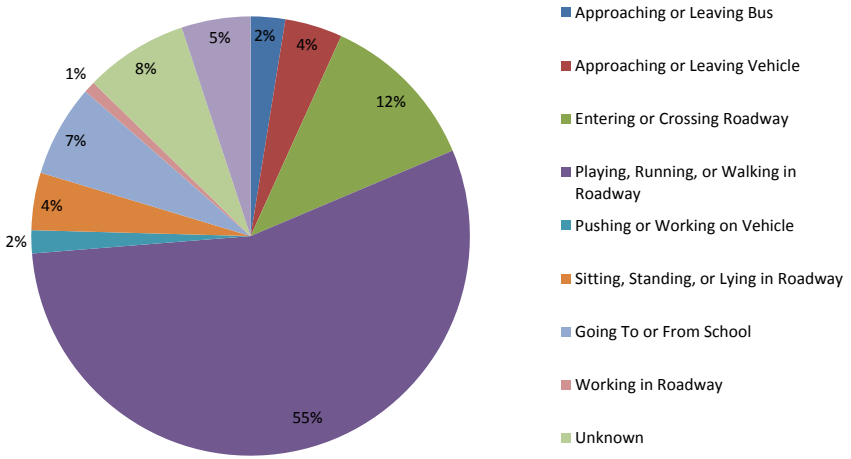


Figure 1.26: Pedestrian Incidents by Pedestrian Action (2009-2013)



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Douglas County – Driver/Pedestrian Impairment

Figure 1.27 shows that over 86% of pedestrian incidents by driver impairment were unimpaired. Only 4% of pedestrian incidents involved drivers impaired by alcohol. Figure 1.28 demonstrates that over 93% of pedestrian incidents by pedestrian involvement were unimpaired while the remaining 7% occurred when alcohol was involved.

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Figure 1.27: Driver Impairment - Pedestrian Incidents (2009-2013)

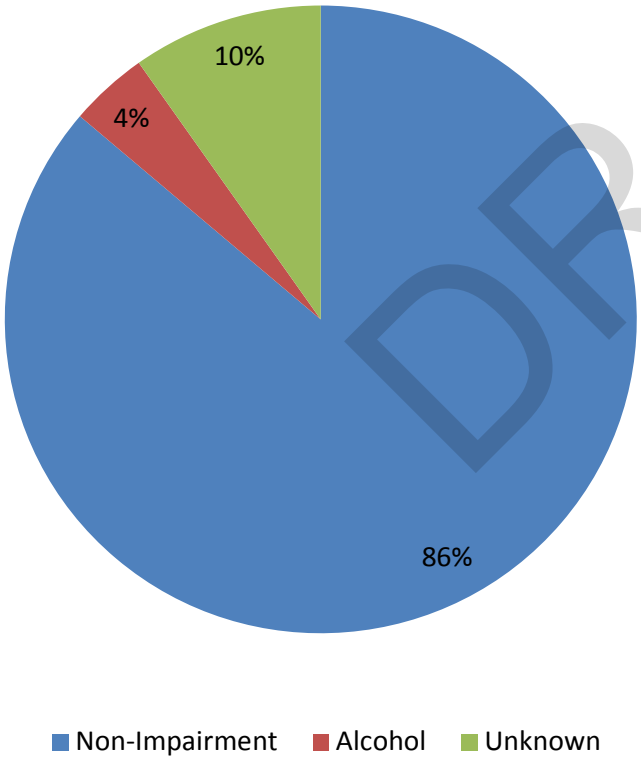
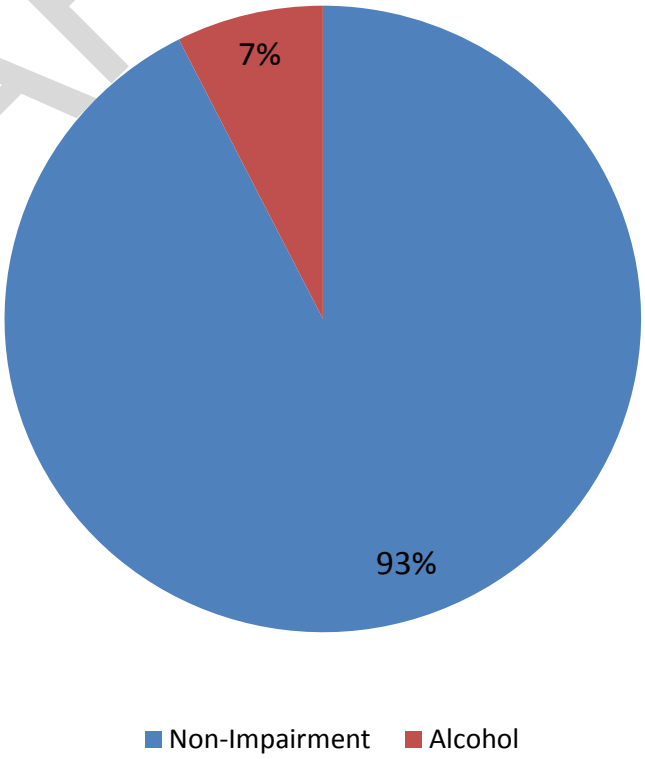


Figure 1.28: Pedestrian Impairment - Pedestrian Incidents (2009-2013)



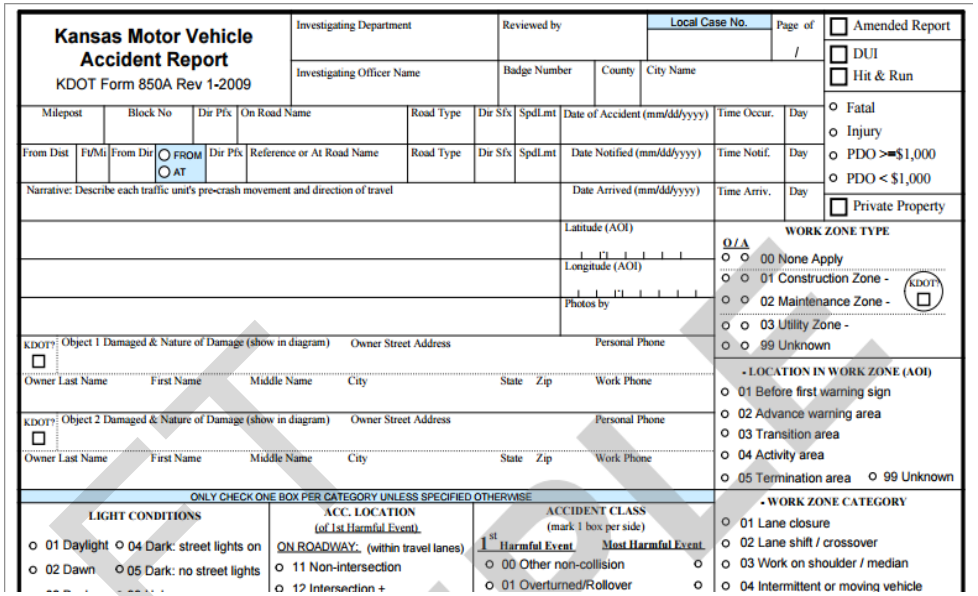
Strengths and Limitations of the Regional Pedestrian Crash Data

The data that is currently collected and was made available to the MPO staff during this study process contains valuable information about the demographics of individuals involved in the crash, specific locations of crashes occurring at an intersection or midblock, existence of traffic controls at crash locations, and travel speeds of motorists in crashes resulting in injuries or fatalities. Figure 1.28 shows the information collected through a Kansas Motor Vehicle Accident Report Form. However, missing or incomplete motor vehicle accident report forms limit the ability of the MPO to accurately analyze and plan for improvements to the pedestrian network.

State crash reports are only filed if the crash includes a motor vehicle. There is a local Lawrence ordinance that requires any injury accident over $50 to be reported to the Lawrence Police Department. However, the ordinance doesn't have a standard for how that is documented. Some officers take the verbal report and thank the caller; others at their discretion file an information report. Information reports are unable to be easily queried for bicycle/pedestrian related information.

KU collects crash data when reported to KU Public Safety using the state crash reporting form. Some of the data years are missing and currently the data is not believed to be geocoded or mapped although there are research efforts ongoing that might be working on this.

Figure 1.29: Kansas Motor Vehicle Accident Report Form[1]



Kansas Motor Vehicle Accident Report
KDOT Form 850A Rev 1-2009

Investigating Department | Reviewed by | Local Case No. | Page of / | ☐ Amended Report
Investigating Officer Name | Badge Number | County | City Name | ☐ DUI | ☐ Hit & Run
Milepost | Block No | Dir Pfx | On Road Name | Road Type | Dir Sfx | SpdLmt | Date of Accident (mm/dd/yyyy) | Time Occur. | Day | ○ Fatal | ○ Injury | ○ PDO >=$1,000 | ○ PDO < $1,000
From Dist | Ft/Mi | From Dir | ○ FROM ○ AT | Dir Pfx | Reference or At Road Name | Road Type | Dir Sfx | SpdLmt | Date Notified (mm/dd/yyyy) | Time Notif. | Day | ☐ Private Property
Narrative: Describe each traffic unit's pre-crash movement and direction of travel | Date Arrived (mm/dd/yyyy) | Time Arriv. | Day
Latitude (AOI) | Longitude (AOI) | Photos by
KDOT? ☐ Object 1 Damaged & Nature of Damage (show in diagram) | Owner Street Address | Personal Phone
Owner Last Name | First Name | Middle Name | City | State | Zip | Work Phone
KDOT? ☐ Object 2 Damaged & Nature of Damage (show in diagram) | Owner Street Address | Personal Phone
Owner Last Name | First Name | Middle Name | City | State | Zip | Work Phone

WORK ZONE TYPE
O/A
○ ○ 00 None Apply
○ ○ 01 Construction Zone - KDOT?
○ ○ 02 Maintenance Zone - ☐
○ ○ 03 Utility Zone -
○ ○ 99 Unknown

- LOCATION IN WORK ZONE (AOI)
○ 01 Before first warning sign
○ 02 Advance warning area
○ 03 Transition area
○ 04 Activity area
○ 05 Termination area ○ 99 Unknown

- WORK ZONE CATEGORY
○ 01 Lane closure
○ 02 Lane shift / crossover
○ 03 Work on shoulder / median
○ 04 Intermittent or moving vehicle

ONLY CHECK ONE BOX PER CATEGORY UNLESS SPECIFIED OTHERWISE

LIGHT CONDITIONS
○ 01 Daylight ○ 04 Dark: street lights on
○ 02 Dawn ○ 05 Dark: no street lights

ACC. LOCATION (of 1st Harmful Event)
ON ROADWAY: (within travel lanes)
○ 11 Non-intersection
○ 12 Intersection +

ACCIDENT CLASS (mark 1 box per side)
1st Harmful Event | Most Harmful Event
○ 00 Other non-collision | ○
○ 01 Overturned/Rollover | ○

Douglas County Public Works receives copies of accident reports worked by the Douglas County Sheriff's Office for roads outside incorporated areas except state highways. They map the data and could query it from their database. Their data is missing accidents on roads worked by the Kansas Highway Patrol. The County submits all their reports to the State.

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[1] Kansas Motor Vehicle Accident Report Form[1] http://www.nhtsa-tsis.net/statecatalog/states/ks/docs/KS_2010_Crash_Coding_Manual_8_18_10.pdf

Crash Data Conclusion

The preceding crash data shows that certain demographics and locations within the region should be targeted to reduce the amount of pedestrian injuries and deaths. Drivers and pedestrians in the age group of 20-29 are involved in a larger percentage of incidents than one would expect when compared with countywide demographics. This data reveals the need to target this age demographic for safety education.

Additionally, the comparison of injury and fatalities between pedestrian and automobile accidents suggests more could be done to educate drivers and pedestrians alike of the serious risks of injury that pedestrians face when involved in a crash.

Funding

Over the last 150 years, the majority of the pedestrian network (i.e. streets, storm sewers, sidewalks, cross walks, curb ramps and other infrastructure) has been built and paid for by individual property owners one piece at a time as development occurred. However, homeowners and business owners are expected to maintain the section of sidewalk in front of their property where roads are typically maintained by municipalities. The difference between how we think about maintenance funding of infrastructure for one travel mode versus another has created inequities and problems with creating a truly pedestrian transport network. Thus, pedestrian elements should be included in street projects.

Without short-term and long-term funding solutions for capital improvements, pedestrian infrastructure, amenities, and planning will remain at minimal investment levels when compared to the overall transportation network. The need to fund active transportation is fundamental to creating viable pedestrian networks and in creating urban areas with a high quality of life.

Local Dedicated Funding

Local governments should consider funding sources that provide consistent funds to improve the pedestrian network. Cities should also consider additional set-aside funding for maintenance of existing infrastructure and construction of new infrastructure to complete and maintain a quality pedestrian network or enforce current laws to prompt property owners to make improvements. Developers should continue to be responsible for providing pedestrian facilities on their sites. Merely including pedestrian improvements in roadway projects fails to build a well-planned network for pedestrian users. Instead, this strategy only improves segments when they correspond with needs in the vehicular network.

Private Funding

Private grants and fundraising can be utilized as a way to provide additional resources for pedestrian programs and built environment improvements. Grants focusing on providing pedestrian access to services and promote a healthy lifestyle should be explored as possible pedestrian improvement funding sources.

Federal Funding

Under the Fixing America's Surface Transportation (FAST) Act[1], funding for bike, pedestrian, or other alternative projects is provided through set-asides in the Surface Transportation Block Grant Program (STBGP). Because the urbanized area of Douglas County does not have over 200,000 people, the LDC-MPO is not directly allocated this set-aside funding. Instead, KDOT is given this funding and can choose to transfer 50% of these STBGP funds for all project types, not specifically bike, pedestrian, or other alternative projects. No set-aside funds have been transferred at the time of the

[1] www.congress.gov/114/bills/hr22/BILLS-114hr22enr.pdf

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development of this Plan. Municipalities across the state can submit project applications to KDOT to receive available set-aside funding.

While the FAST Act creates a priority safety fund to reduce bicycle and pedestrian fatalities, only states in which 15% or more of overall fatalities are bicyclists or pedestrians with be eligible to receive these funds. Kansas is not currently eligible to receive these funds because bicycle and pedestrian deaths do not make up 15% of the overall fatalities in the state. Complete impacts of the FAST Act are unknown at this time as it was approved by Congress and signed into law in December 2015.

Data Collection/Evaluation Plan

Future Data Collection and Evaluation

Future data collection could include automatic electronic counting methods and/or routine origin-destination surveys, although limits to using these methods are often a lack of time and money. The primary goal of this data collection is to observe trends that would inform future planning processes for the pedestrian transportation network. Additional data should also be collected for the continued improvement of measuring Pedestrian Level of Service.

The pedestrian network in Douglas County needs to be evaluated on much more than crash data and new sidewalk construction. The vision and focus areas listed on page 2 need to be regularly assessed to determine if our pedestrian networks are improving across the many factors that we determined to be important to the system.

Each city within the region will have its own unique challenges and capabilities in regards to addressing the seven focus areas. The following sections of this plan will explore recommendations for each city within Douglas County to improve the pedestrian environment.

Pedestrian Count Data

Since 2009, the MPO has been conducting annual manual bicycle and pedestrian counts with trained volunteers as part of the National Bicycle & Pedestrian Documentation Project. These field observations are labor-intensive, but can provide more complex information than automated counting methods. The project aims to establish a consistent methodology for counting and surveying bicyclists and pedestrians and develop a National database of bicycle and pedestrian activity. The Institute of Transportation Engineers (ITE) and transportation professionals nationwide have helped to develop the methodology, which requires the following features:

- Consistent days and times
- Consistent methods and materials, including training of volunteers
- Centralized data collection and analysis practices

Lawrence Bicycle and Pedestrian count locations were developed consistent with the methodology developed for the NBPDP by Alta Planning and based on the following criteria:

- Representative locations throughout the city
- Bicycle and pedestrian activity areas or corridors (downtowns, near schools, parks, etc.)
- Locations near proposed major bicycle or pedestrian improvements
- Key corridors that can be used to gauge the impacts of future improvements
- Places where counts have been conducted historically
- Locations where collisions between motor vehicles and bicycles and/or pedestrians are more prevalent

Pedestrians are counted when they pass a location's screen line. Counts are conducted during three 2-hour time slots: 10am-12pm and 5pm-7pm on weekdays and 12pm-2pm on a Saturday. Dates for

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conducting counts are chosen based on the National Bicycle and Pedestrian Documentation Project's recommended September count weeks. Coordinated count dates allow for comparison with other cities. Pedestrian traffic counts are more variable due to weather and events than motor vehicle volumes; thus, some years display notably lower pedestrian counts than others. The bicycle and pedestrian count forms for Lawrence, Eudora, and Baldwin City can be found at www.lawrenceks.org/mpo/bicycle_planning.

Walk Friendly Community Program

Cities in the region may consider applying for a Walk Friendly Community designation as a way to evaluate continued progress and commitment to a quality pedestrian environment. Recognition is in the form of a Bronze, Silver, Gold, or Platinum designation. By applying for a WFC designation, each community will receive specific suggestions and resources on how to make needed changes for and improved pedestrian environment.

Conclusion

This Pedestrian Plan provides the primary basis for pedestrian planning, pedestrian prioritization, and pedestrian policy. When the Metropolitan Transportation Plan Transportation 2040 (T2040) is updated, this Plan and any subsequent work will be incorporated into the existing pedestrian projects and policies in the Pedestrian Chapter.

The Pedestrian Plan is an important document because it enables city staff to make consistent decisions that affect the pedestrian environment in a positive way. It sets the stage for policy discussion regarding sidewalk requirements, helps protect streets with developed pedestrian infrastructure, prioritizes streets with underdeveloped pedestrian infrastructure for upgrades, and lists specific projects recommended by the public.

The following sections take a focused look at each city within Douglas County, assessing the current environment and making recommendations for improvements. Each city in the County provided unique technical and citizen input that informed recommendations for policies, programs, and infrastructure improvements. Different tools from the Pedestrian Progress Toolbox were suggested to address distinct challenges and opportunities in each community. Tools recommended for each city aim to address the focus areas within the countywide vision on page 7.

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