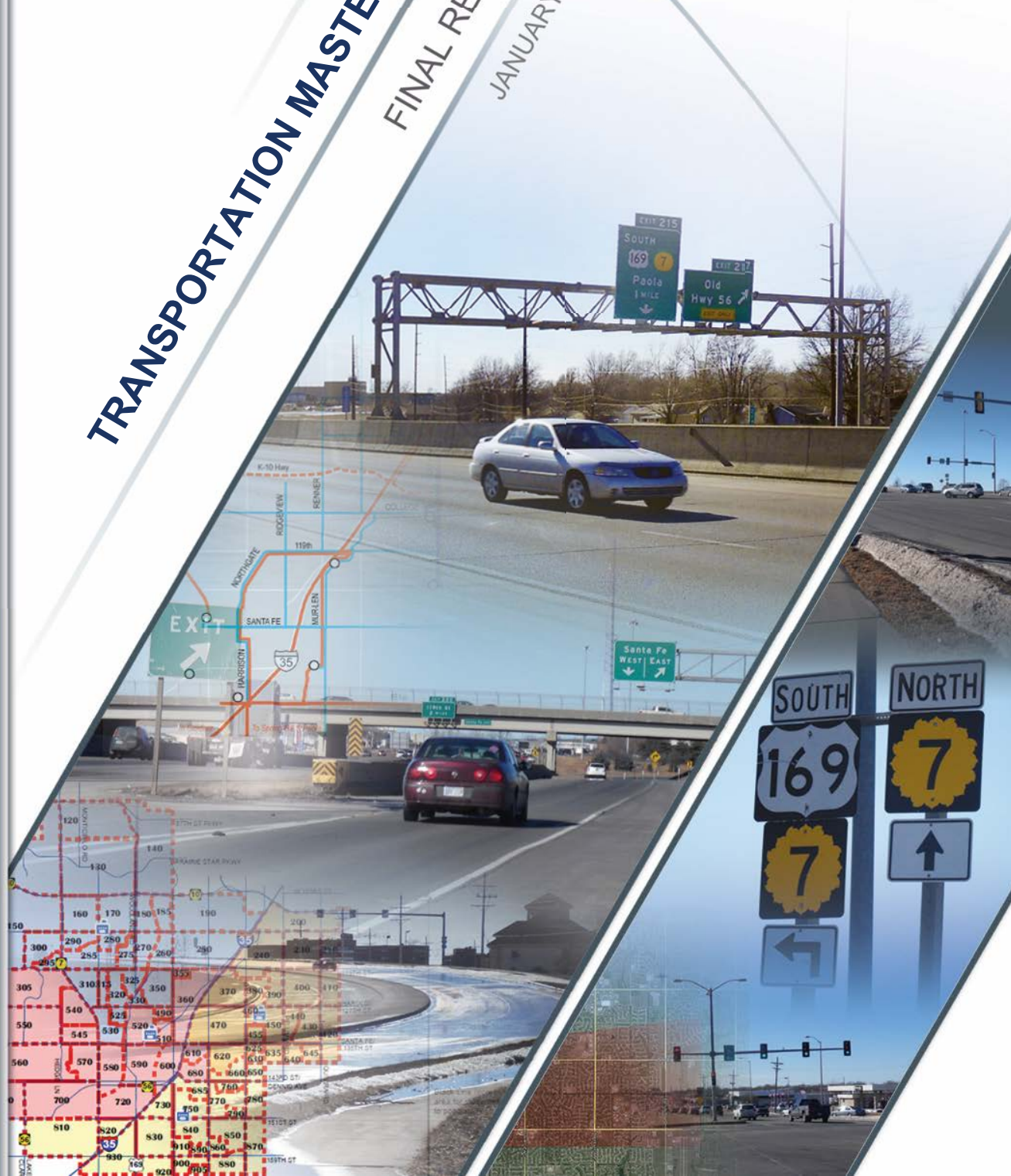




# TRANSPORTATION MASTER PLAN

FINAL REPORT

JANUARY 2017





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## EXECUTIVE SUMMARY

This plan is about the future of transportation in Olathe – a growing city, expected to continue to grow. The City’s Comprehensive Plan Document, *PlanOlathe*, has set a vision for the manner in which Olathe will grow, and the community goals to be achieved as this growth occurs. It describes an “end state” and a path toward that objective. This Transportation Master Plan (TMP) applies the guiding principles of *PlanOlathe* to the City’s transportation system at the next level of detail, describing a system that supports Olathe’s larger goals. Many different types (modes) of transportation are available in Olathe. The TMP is organized around these different modes while keeping in mind that they all must integrate into a seamless whole.

### Projected Olathe Growth, 2012-2040



**40%** increase in households  
(+20,000 households)

**151%** increase in commercial, office, industrial square footage (+45 million sq ft)

### Active Transportation

Active transportation includes walking, jogging, bicycling, and other forms of non-motorized transportation. Every transportation trip starts and ends with active transportation – for example, walking to a car to then take a shopping trip. Active transportation provides transportation choice, health benefits, and improves the environment. When incorporated in a highly connected way within a community, sidewalks, bicycle lanes, and multi-use paths provide additional transportation options for residents and visitors. The TMP recommends an ultimate network of different types of active transportation facilities, providing options for bicyclists of varying skill levels, creating safer options for pedestrians and bicyclists sharing

space with automobiles and each other and developing connections between trail systems. This network is envisioned to build out over a long period of time but is laid out in the TMP to allow continuous progress toward the ultimate goal. The TMP also contains policy recommendations regarding street design guidelines, triggers/timing for active transportation improvements, pursuit of national designations/benchmarks as a way to spur progress toward the ultimate system, and monitoring the system’s usage and status.

### Active Transportation Network – Ultimate Vision



**89** miles of bike lanes (vs. 13 today)

**53** miles of trails (vs. 29 today)

**174** miles of sidepaths (vs. 23 today)

**52** miles of shared roads (vs. 4 today)

**+ pervasive network of sidewalks**

## Transit

Public transportation in Olathe consists of fixed-route (mostly longer-distance commute) services provided by Johnson County Transit (JCT) and the City's Taxi Coupon/Voucher program. Although the JCT services are well-run for the coverage they serve, fewer than half of Olathe residents are within walking distance of a transit stop, and coverage throughout the day is limited and directional. The taxi program is constrained by city boundaries and could be improved to make purchases easier. The TMP identifies five potential strategies (each with the capability of building on the last over time) to address this gap. The strategies range from optimizing existing service, to implementing a demand-response service of increasing coverage, to creating a fixed-route system of increasing coverage. They range in annual cost from \$380,000 to nearly \$3 million, and are evaluated with respect to the current \$600,000 annual cost of the Taxi Coupon/Voucher program. The TMP also recommends other strategies and policies, such as bus stop improvements, transit-friendly site design, improved/expanded park-and-ride presence, integration with regional planning, and monitoring of emerging concepts such as microtransit.

### Existing Transit System



**56,000** annual trips on routes in and near Olathe

**187,000** estimated annual unserved trips

**5** potential strategies to fill the gap

## Roadway

As a function of Olathe's expected growth, the TMP forecasts congestion on several of the City's roadways in the two future years studied, 2025 and 2040. Based on traffic modeling, the TMP recommends 31 improvement projects (prioritized as high, medium, or low) by 2025 and seven additional projects by 2040. The TMP also recommends 53 intersection improvement projects (prioritized as near-term, 2025, and 2040). Finally, the TMP includes special recommendations at or near three interchanges (I-35/119<sup>th</sup> Street, I-35/Santa Fe Street, I-35/K-7/151<sup>st</sup> Street) as well as along K-7 between Santa Fe Street and Old U.S.-56 Highway.

### Roadway Statistics



**153,434** total daily vehicle trips in 2012

**228,577** predicted daily vehicle trips in 2040

**19,254** total daily vehicle-hours in 2012

**36,935** predicted daily vehicle-hours in 2040

**364** annual crashes at 29 key intersections

**51%** rear-end crashes

**31%** angle crashes

An important feature of the TMP is the Major Street Map, which shows the ultimate roadway network expected when Olathe builds out. Cross-sections for each roadway classification shown on the map, expressway, arterial, collector, and local streets, are included. The TMP also includes a series of roadway recommendations, including an update to the access management guidelines, broadening the transportation impact study guidelines, tracking the evolution of Connected and Autonomous



Vehicles, and using new available big data sources to monitor the City's traffic "health" while safeguarding individual privacy.

## Freight

With two major railroad lines, a major interstate, and a significant nearby rail/truck intermodal facility, Olathe experiences a great deal of rail and truck freight traffic, and this traffic is expected to grow in the coming decades. While an important and necessary component of the city's and region's economy, freight affects the city's transportation system in several ways: increased congestion due to the presence of trucks on the city's roadways, delays experienced by motorists at at-grade railroad crossings, and wear-and-tear caused by trucks on the city's transportation infrastructure.

The TMP recommendations related to rail include monitoring delays at at-grade crossings and reviewing additional crossings for potential Quiet Zone or Wayside Horn System implementation. Recommendations regarding trucks include designating truck routes and ensuring that these routes have appropriate infrastructure including pavement sections.

### Freight



**20** at-grade rail crossings in Olathe

**\$87M** expected cost of crashes and delays at railroad crossings from 2012 to 2040



# 1.0 INTRODUCTION

## 1.1 Purpose, Policy Basis, and Goals

The overall purpose of the Transportation Master Plan (TMP) is to develop a long-range (25-year) plan for transportation within the City of Olathe. The plan is intended to guide transportation policy and investment decisions to meet the mobility needs of residents and businesses. Traffic and transportation are consistently identified by Olathe residents and the City as a primary issue within the community; the plan is a key tool used to address these issues. **Figure 1-1** illustrates the study area.

*PlanOlathe* is Olathe’s Comprehensive Plan document, containing the community’s vision for growth and development. As such, it sets guiding principles for this TMP. *PlanOlathe* is divided into multiple chapters, and several of them interrelate with the TMP:

- The **Mobility** element emphasizes “a balanced multi-modal transportation system that provides effective, efficient, and safe mobility for residents.” It acknowledges fiscal and environmental constraints and supports purposeful integration of transportation and land-use decisions to be mutually supportive.
- The **Parks, Trails, and Recreation** element contains (among many other elements) support for high-quality trails to “provide connections to parks, schools, employment areas, and retail centers for recreational and non-motorized use.”
- The **Land Use and Community Character** element supports benefits such as minimizing sprawl, preserving green space, and improving connectivity between neighborhood and retail/service areas. The “mosaic of land uses should... integrate multi-modal transit opportunities.”

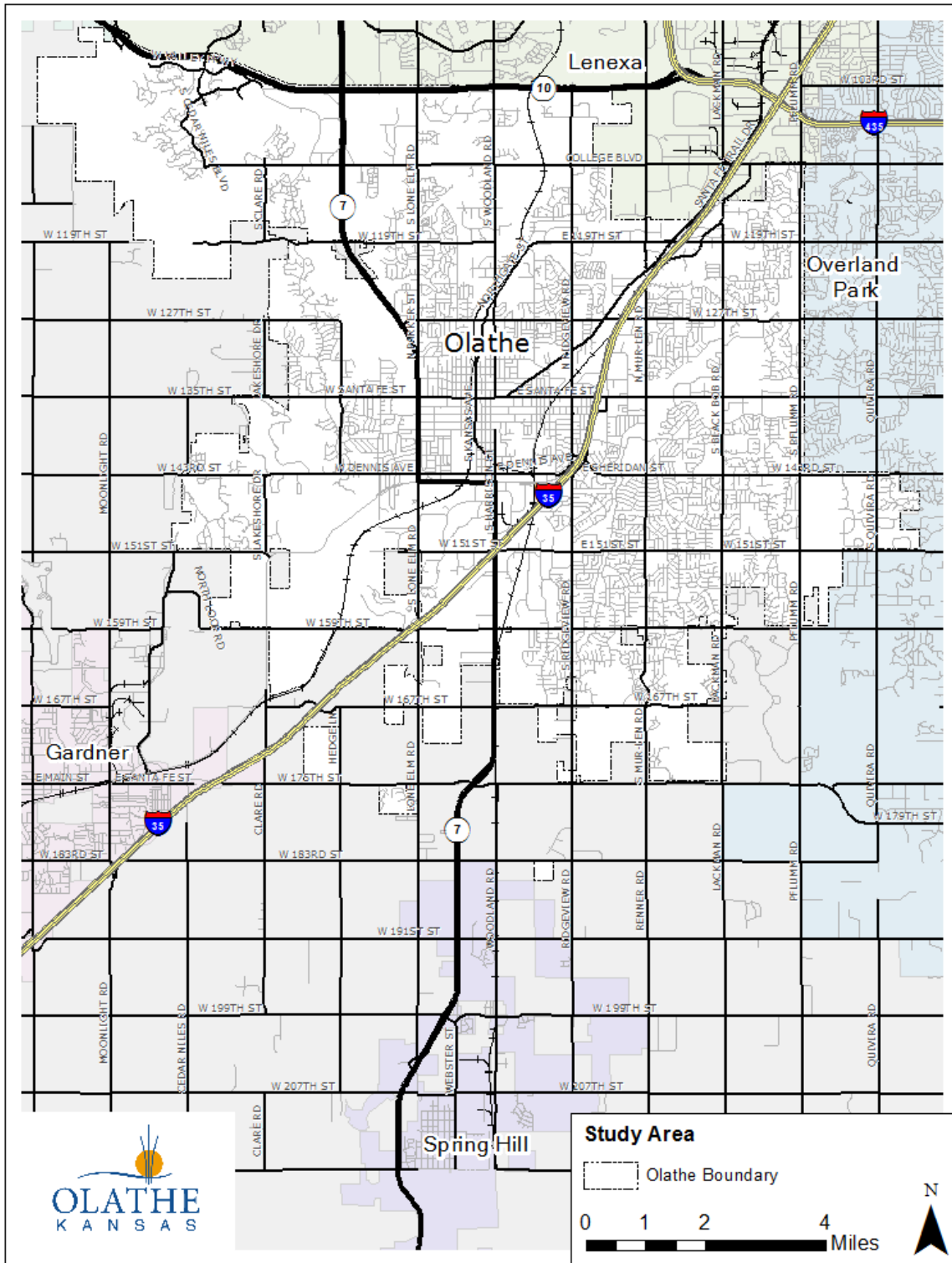
In addition, Olathe’s Organizational Scorecard – developed in 2004 to help manage progress toward strategic targets, promote continuous improvement in efficiency, and provide better service delivery and value for tax dollars invested – contains several focus areas:

- Active Lifestyles
- Economic Viability
- Utility Services
- Diversity
- Public Safety
- Transportation
- Downtown

With these focus areas as a backdrop, a set of goals was developed for transportation in Olathe. These goals frame the analysis and recommendations of the TMP:

- A. Maintain the existing transportation system (Transportation, Public Safety).
- B. Provide a transportation system that supports mobility, safety, and access for future development (Transportation, Public Safety, Economic Viability).
- C. Maximize cost-effectiveness in developing and maintaining the transportation system (Economic Viability).
- D. Provide street designs that meet the needs of people walking, driving, cycling, and taking transit (Transportation, Active Lifestyles).
- E. Support *PlanOlathe* with appropriate transportation investments and infrastructure (Downtown, Transportation, Economic Viability, Active Lifestyles).
- F. Support active transportation and improved connectivity for all modes. Eliminate gaps in connectivity (Active Lifestyles, Transportation).

Figure 1-1: Study Area



Olathe City Limit as of October 2014

## 1.2 Historical Studies

In addition to technical analysis and public/stakeholder input, the TMP is influenced by a series of regional and local plans and studies that have been developed in the last decade.

*PlanOlathe*, the City's Comprehensive Plan, was mentioned in Section 1.1. It is the guiding document for the City's future and sets the vision of establishing and maintaining a balanced multi-modal transportation system that provides effective, efficient, and safe mobility for residents.

*2005 Transportation Study*: The City completed a transportation study similar to the current TMP. Primary products included completion of a multi-modal travel demand model that was applied to develop a prioritized list of capital improvement projects (2010 and 2015), identification of future transportation improvement corridors, and development of a bicycle transportation plan.

*South Cedar Creek Connectivity Plan*: The vision of this Plan was to integrate the multi-modal transportation needs for the City's parks, residential areas, office areas, and industrial development along the South Cedar Creek Corridor and to integrate the area's stream setbacks, off-street trails, and transit to enhance accessibility to major activity centers within the planning boundary. The Plan made recommendations for a connected system that included connecting downtown to the following areas: the Great Mall/Hospital campus; Cedar Creek between Lake Olathe and Cedar Lake; and adjacent parks, including Lone Elm, Prairie Center, and Cedar Niles Park. Some of the recommendations included wider sidewalks, new bike lanes, and a trail network along various drainage areas.

*Lone Elm Vicinity Plan*: This Plan was completed to ensure consistent and appropriate growth in the study area. It evaluated the natural features, historic and cultural resources, land use patterns, infrastructure, and land use plans in the study area. The Plan examined the future of K-7 – potential expansions and realignments, designated two sites along 167<sup>th</sup> Street (I-35 and K-7) as potential interchange locations, recommended grade separations between rail lines and streets for east/west arterials (167<sup>th</sup> Street, 175<sup>th</sup> Street, and 183<sup>rd</sup> Street), and designated a conceptual layout for collector streets within the plan area.

*Transportation Outlook 2040*: The purpose of this federally designated Long-Range Transportation Plan for the Kansas City metropolitan area is to identify transportation improvements for the next 25 years. The Plan provides a regional overview of transportation needs. The Plan lists several arterial projects in the city of Olathe that may be constructed during the planning period.

*I-35 Moving Forward Corridor Optimization Plan*: This Plan, created by the Kansas Department of Transportation (KDOT) and the Mid-America Regional Council (MARC), recommends short-, medium-, and long-term improvements for I-35 through 2040. The Plan recommends ramp metering and expanded bus-on-shoulder to be implemented by the year 2020. No capacity projects are identified in the Olathe sections of I-35 by 2020. After 2020, the widening of I-35 to six lanes is proposed from 167<sup>th</sup> Street to 175<sup>th</sup> Street. Additional widening projects are proposed north of I-435.

*5-County Regional Transportation Study*: This KDOT study of transportation needs in a five-county area surrounding the Kansas City and Lawrence metropolitan areas resulted in recommendations to improve the transportation system through the year 2040. The Study recommends a set of travel management strategies, including ramp metering, variable speed limits, signal coordination, and managed lanes. Capacity projects included completing major interchange projects at I-35/I-435/K-10,

widening K-10 to add managed lanes, and widening I-35 to Edgerton. Access management projects were identified for K-7.

*K-7 Corridor Management Plan:* The planning process for K-7 through Olathe began in 2004, with the initiation of this plan, and continued into a draft environmental study. A concept for a freeway/expressway through Olathe was selected in the Corridor Management Study. During the environmental phase, the City determined that this facility type would not meet the City's needs.

*K-10 Transportation Study:* Sponsored by KDOT, MARC, and the Lawrence-Douglas County Metropolitan Planning Commission, this study identified future improvements for the K-10 highway corridor between the city of Lawrence and the Kansas City metropolitan area. It was determined that a plan was needed to coordinate land use and transportation in this area. Several elements in the plan have been implemented, including a transit service connecting the two metropolitan areas and portions of a bicycle/pedestrian trail. The Study also recommended widening K-10 to eight lanes east of K-7 and to six lanes west of K-7 to the city of Lawrence.

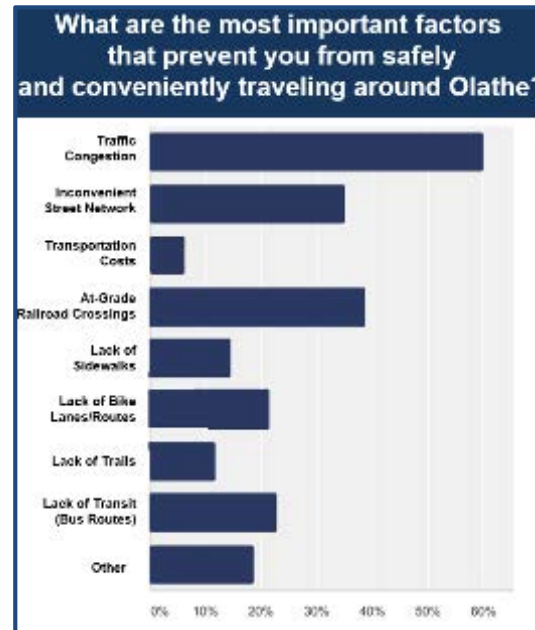
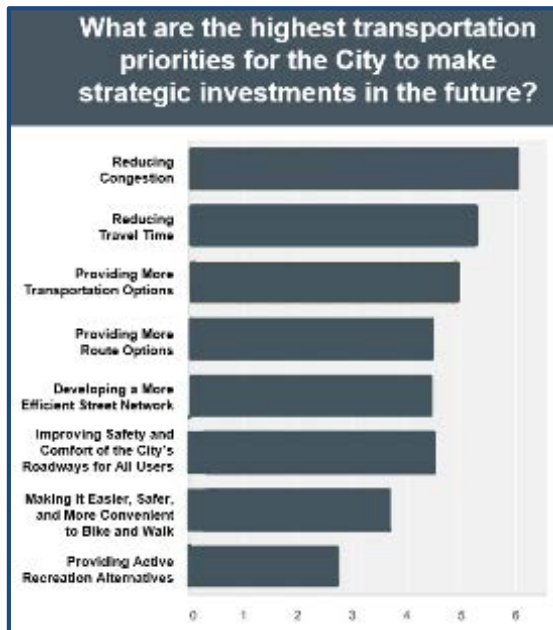
### 1.3 Public/Stakeholder Involvement

In addition to previous studies, the TMP has also been informed by input from the public and stakeholders. The primary forums have been two public meetings. Each meeting included a series of information boards, a brief presentation, and break-out sessions for more direct interpersonal interaction. The meetings are briefly summarized below:

- *November 13, 2014:* For the kickoff public meeting, the primary agenda was to review the project goals; review the planning process; provide a summary of existing conditions; and receive feedback regarding Olathe destinations, preferred travel modes, transportation priorities, and specific transportation issues.
- *March 24, 2015:* The project team presented preliminary recommendations for bikes/pedestrians and transit, summarized results from public surveys, highlighted forecasted areas of traffic congestion, and identified corridors for focused analysis.

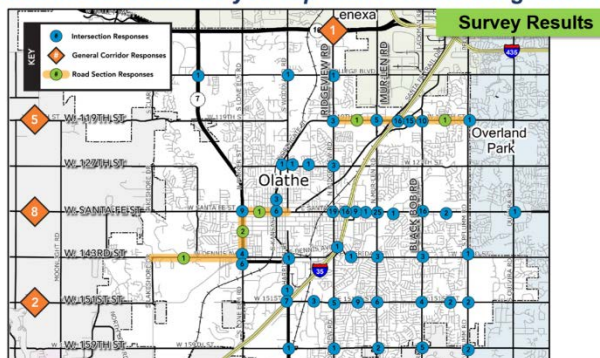


The project team also deployed a survey to ask residents about traffic congestion, safety, transportation priorities, trip purpose, transit, active transportation, transportation mode preference, and transportation safety. A total of 152 survey responses were received. When asked about the transportation priorities, reducing congestion and travel times were ranked first and second, respectively. Providing more transportation modes (Transit/Bike/Pedestrian) was ranked third. When asked to identify the most important factors that prevented respondents from safely and conveniently traveling around the City, traffic congestion and at-grade railroad crossings were included in the two highest percentage of responses.



When asked at which intersections and streets respondents experienced the highest traffic congestion, a variety of responses were received, as illustrated below.

**At which intersections do you experience traffic congestion? On which streets do you experience traffic congestion?**



In addition to these methods of reaching stakeholders and the public, project team members met with various stakeholder groups to make presentations and receive feedback on the plan. Stakeholder groups included the Olathe Latino Coalition, the Hispanic Ministry Task Force, the Olathe Economic Development Council, and the Olathe Planning Commission.

## 1.4 Anticipating Growth

Olathe has approximately 23 percent of Johnson County's population. Compared to the county on a percentage basis, Olathe has a slightly younger population, slightly more households at the poverty income level, a similar number of persons with disabilities, and slightly fewer households with less than two vehicles.

**Table 1-1: Existing Demographics (2012)**

Total Pop. / HH.	Population / Households		% of Total Population / Households	
	Olathe 125,902 Pop. 45,067 HH.	Johnson County 546,046 Pop. 216,304 HH.	Olathe	Johnson County
<b>Disabled Population*</b>				
Total	9,972	44,162	8.0%	8.1%
65 years and over	2,860	17,948	33.2%	30.9%
18 to 64 years	5,771	21,745	7.3%	6.4%
Under 18 years	1,341	4,469	3.6%	3.1%
<b>Elderly Population*</b>				
60 years and over	14,352	87,851	11.4%	16.2%
62 years and over	12,212	75,921	9.7%	14%
65 years and over	9,064	60,194	7.2%	11.1%
67 years and over	3,902	51,629	3.1%	9.5%
<b>Population Below Poverty</b>				
All Families	1,557	6,120	4.7%	4.2%
All People	8,939	34,765	7.1%	6.4%
<b>Vehicle Ownership/Availability (Households)</b>				
No vehicles	1,232	7,094	2.8%	3.3%
1 or 0 vehicles	12,791	64,527	28.7%	33.4%
2 or more vehicles	34,495	169,113	77.4%	78.7%
3 or more Vehicles	10,093	45,557	22.6%	21.3%
<b>Minority Population</b>				
White alone	106,948	476,361	85%	87.2%
Non-white	18,948	69,685	15%	12.8%

Source: 2012 American Community Survey 5-year Estimates

Notes: \* Total population does not include institutionalized population.

Forecasts of growth were prepared in order to ultimately assess traffic growth on the street system. The forecasts of growth were made using information included in the Olathe City Planning Division's Future Land Use Plan. Forecasts were made for two periods, for the years 2025 and 2040. The growth forecasts are shown for the area inside the current Olathe city limits and for an area larger than the city limits. The forecasts show steady and continued residential, commercial, and office



growth. The forecasts anticipate a much larger growth in square feet of building area for industrial/warehouse uses.

**Table 1-2: Summary of Total Growth**

Land Use	Olathe City Limits (2015)			Olathe Travel Demand Model Area		
	2012	2025	2040	2012	2025	2040
Residential (Households)	50,222	60,188	70,174	83,519	111,720	144,526
Commercial (Sq. Ft.)	8,030	10,322	12,665	11,866	16,791	22,010
Office (Sq. Ft.)	4,749	7,967	12,619	12,073	17,518	24,329
Industrial/Warehouse (Sq. Ft.)	17,239	28,186	50,156	46,271	79,316	126,641

*Notes: Square footage is calculated in 1,000s.*

*Olathe Travel Demand Model area also includes the city of Gardner, as well as portions of DeSoto, Spring Hill, Lenexa, Overland Park, and unincorporated Johnson County.*

**Residential**

The majority of household growth by 2040 is projected to be in the northwest section of Olathe (west of K-7 and north of 151<sup>st</sup> Street) as well as in the southeast areas of the city (south of 159<sup>th</sup> Street and east of K-7). A 40 percent increase, or a total of nearly 20,000 new households, is expected within the current city limits of Olathe by 2040.

**Commercial Growth 2012 - 2040**

Commercial growth by 2040 is projected to be in concentrated areas throughout the city, including the intersection of College Boulevard and K-7, the intersection of Ridgeview Road and K-10, 135<sup>th</sup> Street east of Black Bob Road, and the area near the former Great Mall of the Great Plains between Lone Elm Road and K-7. Within the current city limits of Olathe, commercial space is expected to grow over 4.6 million square feet by 2040, which is nearly a 60-percent increase from 2012.

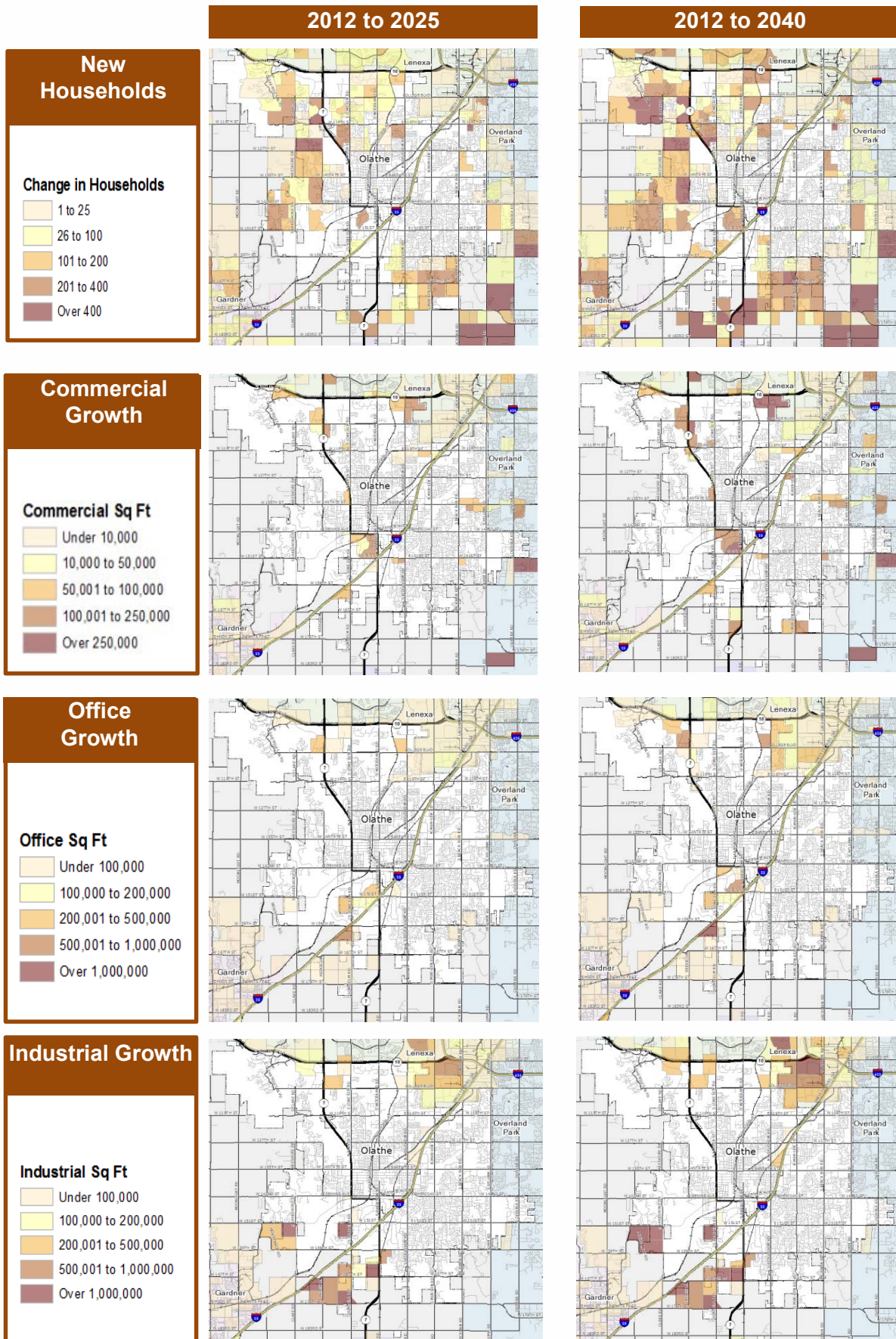
**Office Growth 2012 - 2040**

Office growth by 2040 is projected to be in concentrated corridors of Olathe, including west of K-7 and College Boulevard, between Ridgeview Road and I-35 along College Boulevard, and areas between K-7 and Lone Elm Road from Old 56 Highway to 159<sup>th</sup> Street. Within the current city limits of Olathe, office space is expected to grow nearly six million square feet by 2040, which is a 124 percent increase from 2012.

**Industrial Growth 2012 - 2040**

The majority of industrial growth by the year 2040 is expected in identified pockets of the city, including the existing warehouse districts north and south of College Boulevard and east of Ridgeview Road, near the intersection of K-7 and K-10, the land north of the New Century Airport south of 151<sup>st</sup> Street, and the area east of I-35 between 159<sup>th</sup> Street and 175<sup>th</sup> Street. In total, nearly a 200 percent increase in industrial space is expected within the current city limits by 2040 (almost 33 million square feet).

Figure 1-2: Projected Growth in Olathe



## 2.0 ACTIVE TRANSPORTATION

### 2.1 Definition and Basic Elements

Active transportation includes walking, jogging, bicycling, and other forms of non-motorized transportation. A seamless active transportation system creates greater mobility choices for the public and also promotes public health and safety, economic development, social justice, and traffic congestion reduction. It supports several elements of *Plan Olathe's* vision statement:

- Ensuring the health, safety, and well-being of all citizens
- Providing high-quality public services
- Valuing the area's cultural history and sense of community
- Supporting sustainable land development
- Promoting economic opportunity

An active transportation network should be planned and designed to allow users of all skill levels and abilities to feel comfortable and safe. This typically means that such a network provides infrastructure and facilities on-street (bike lanes, shared roadways), adjacent to the street (sidepaths and separated bike lanes), and off-street (trails).

Incorporating active transportation elements into the transportation system falls under the overall umbrella of a concept known as "Complete Streets." Complete Streets are designed to provide connectivity and safety for all users of the street – whether automobiles, pedestrians, bicyclists, or transit vehicles. Complete Streets incorporate not only facilities such as sidewalks and bike lanes, where appropriate, but also traffic calming and place-making elements such as vertical landscaping elements, pedestrian-scale lighting, and street furniture. This Transportation Master Plan does not directly address this second set of elements but focuses on the facilities aspect of Complete Streets.

The following are typical active transportation facilities:

- *Sidewalks*: Sidewalks are intended for pedestrian circulation because their width (typically five feet in Olathe) is not designed to accommodate both pedestrian and cyclist movements.



- *Trails/Multi-Use Paths*: These facilities are off-street and generally away from the street along creek/stream corridors. They tend to be paved with asphalt and have widths of 10 to 12 feet to serve both bicyclists and pedestrians. Trails are overseen by the City's Parks and Recreation Department, but they can (and should) be a vital element in connecting the remainder of the bicycle network. Thus, while they primarily serve an important recreational function, they can also serve a transportation function by filling connectivity gaps.



- **Sidepaths:** Like trails, sidepaths are off-street facilities wide enough to serve both bicyclists and pedestrians. However, they typically fall within the roadway corridor right-of-way. They are usually separated from the road by a minimum of five feet and are similar to sidewalks except for their typical widths of 8 to 10 feet. Several areas throughout Olathe have wide sidewalks, which can often function in much the same way as sidepaths.



- **Bicycle Lanes:** Bicycle lanes are on-street striped (and signed) lanes dedicated to bicycle travel, typically provided in both directions on a two-way street. They are typically five feet wide (a minimum of four feet), but emerging guidelines from the National Association of City Transportation Officials (NACTO) suggest six feet as a desirable width. A variation known as the *buffered bicycle lane* is also a nationally recognized application, in which an additional two to three feet of striped buffer is provided between the bicycle lane and on-street parking (see the image at the far right) or between the bicycle lane and adjacent traffic.



- **Shared Roadways:** These are roadways that do not include an explicit bicycle lane but that are designated to be shared with bicycle traffic, typically with signs. “Sharrow” markings may also be used, both to emphasize sharing the road and to help bicyclists position themselves appropriately laterally within the roadway (as in the image right, in which the sharrow helps cyclists avoid the “door zone”).



Other types of linear bicycle facilities are available for consideration – most notably, separated bicycle lanes (also known as cycle tracks), which include a physical barrier between automobiles and bicycles, such as delineators, raised concrete barriers, or parked vehicles. These facility types are not part of the recommended bicycle map but could be considered in special cases.

## 2.2 Existing Conditions

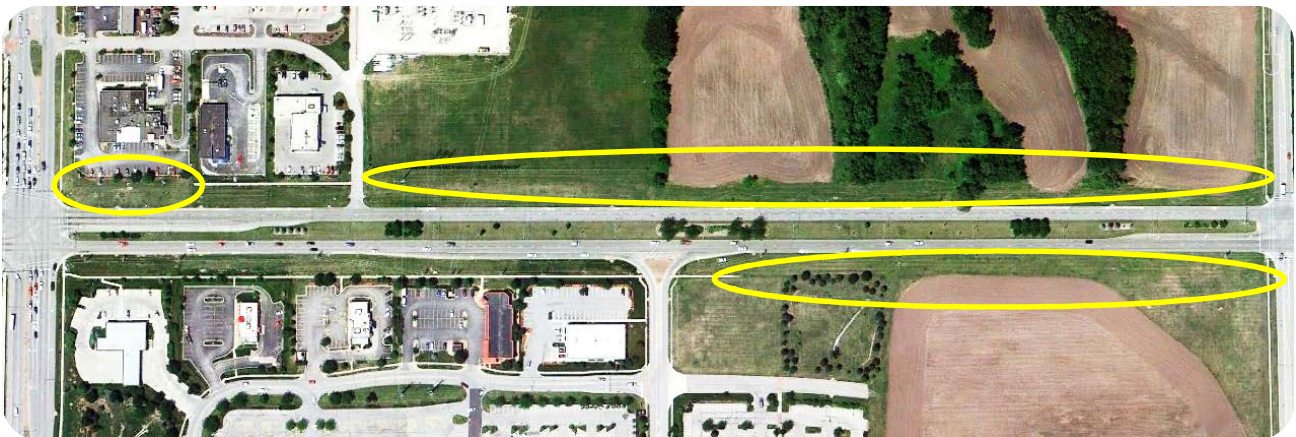
The City's existing active transportation system includes several off-road recreational trails connecting residential neighborhoods to parks and schools, as well as a few segments of bike lanes and some multi-use sidepaths. Opportunities exist to combine these elements into a comprehensive framework, allowing the system to expand its functionality, not only for recreational purposes but for true transportation purposes as well. The terrain of the developed portion of Olathe is generally flat and conducive to walking and biking, presenting a true opportunity for a more complete system.

### Existing Infrastructure

Many of the Active Transportation facility types mentioned in Section 2.1 can be found in Olathe.

*Sidewalks:* Most of the arterials within the City have sidewalks. Some gaps will need to be filled over time, including the following:

- 135<sup>th</sup> Street between Black Bob Road and Pflumm Road
- Harold Street from Walker Street to Northgate Street
- Old 56 Highway
- Lone Elm Road from Dennis Avenue to 151st Street



*Sidewalk Gaps along 135<sup>th</sup> Street*

*Sidepaths:* Olathe has approximately 19 miles of sidepaths. Examples include the following:

- Black Bob Road, 123<sup>rd</sup> Street to 155<sup>th</sup> Street
- 135<sup>th</sup> Street / Santa Fe Street, Ward Cliff Drive to K-7 / Parker Road
- 151<sup>st</sup> Street, US-169 to Harmony Lane



*Sidepath along North Side of 151<sup>st</sup> Street*

*Bike Lanes:* The City currently has over 24 miles of bike lanes, including the following:

- 127th Street between Mur-Len Road and Black Bob Road
- 143rd Street between Pflumm Road and Ridgeview Road (with discontinuities at intersections)
- Ridgeview Road / Dennis Avenue / 143<sup>rd</sup> Street between Sheridan Bridge Lane and Lakeshore Drive (with discontinuities at certain intersections)
- Woodland Road between K-10 and Northgate Street
- Lone Elm Road between 151st Street and 161st Street



*Bike Lanes along 127<sup>th</sup> Street*

*Trails:* A series of trails along Indian Creek and Mill Creek and within several parks (i.e., Waterworks Park, Haven Park, Prairie Center Park, and others) creates the backbone of the City's off-street facility network. Within parks, the City maintains roughly 8 miles of trails; outside parks, the City maintains roughly 19 miles of trails.



*Trail through Prairie Center Park*

## Plans and Policies

Several plans and policies support active transportation in Olathe:

*PlanOlathe:* The City's long-range comprehensive plan calls for a balanced transportation network in which all modes are supported for the convenience of the public. *PlanOlathe* encourages the City to focus on expanding walking and bicycling opportunities and encourages a pattern of development more supportive of active transportation and public transit.

*South Cedar Creek Connectivity Plan:* This plan identifies strategic trail projects that would leverage existing assets and expand connectivity between neighborhoods, parks, and schools and downtown Olathe and the Olathe Medical Center.

*Unified Development Ordinance:* The City's Unified Development Ordinance requires the provision of sidewalks for new development and redevelopment projects.

## Community Feedback

During the planning process, two public workshops were held and a survey was conducted to gather public input on the City's transportation system and its priorities for the future. With over 150 responses, the survey is not statistically significant, but it points to the public's general sentiment. Input from the nearly 40 workshop participants, most of whom completed the survey, supported the survey findings.

The majority of survey responses regarding the Transportation Master Plan said that people were uncomfortable walking and biking in Olathe and that, if given the opportunity, they would prefer to walk and bike more, especially to entertainment, shopping, and work. Second only to reducing congestion and travel time, most survey respondents felt that providing more transportation options should be an important priority for future strategic investments by the City. Survey responses also gave insight into the public's desire to expand the connectivity of active transportation facilities to parks and schools first, followed by commercial corridors second.

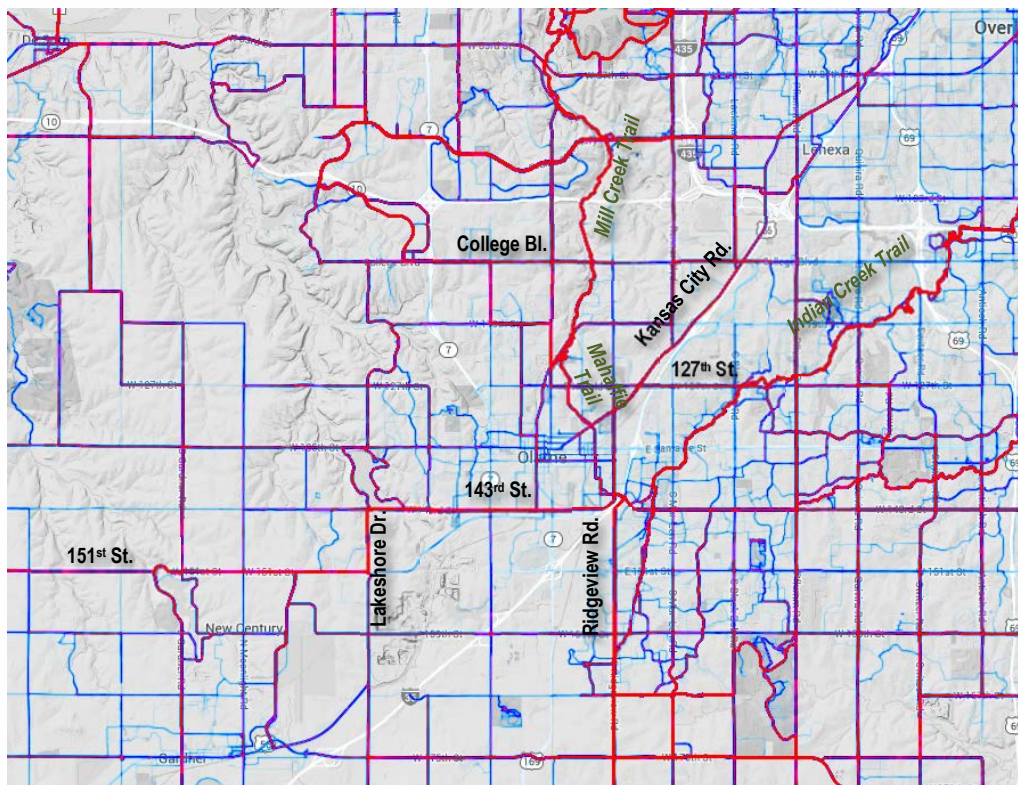
Regarding safety, survey responses suggested a special concern related to pedestrian and bicycle safety at intersections. Where automobiles, bicyclists, and pedestrians cross paths is a concern for the public. Concerns were also expressed regarding safety for cyclists on shared roadways.

## 2.3 Demand And Usage

The City does not currently perform counts of pedestrian and bicycle traffic with the exception of school zones, but one source of bicycle data is Strava Labs, which has developed a “global heat map” that gives an indication of bicycle usage around the world. It is not exhaustive, or necessarily statistically representative, because it is only able to report data by riders who use the Strava application while riding, and these rides may be oriented towards exercise or recreation, rather than transportation. However, it can be a useful source of tendency or demand data in absence of other bicycle count data. **Figure 2-1** shows the Strava heat map for the Olathe area and yields the following observations:

- The most prominent east-west bicycle route in Olathe appears to be 143<sup>rd</sup> Street, which (not coincidentally) has bike lanes. The route turns south on Lakeshore Drive, which doesn't have bike lanes but has fairly low traffic volumes, and connects to 151<sup>st</sup> Street further west (into Gardner), which has a partially paved shoulder and “Share the Road” signs.
- To a lesser extent, portions of 127<sup>th</sup> Street and College Boulevard appear to provide important east-west bicycle connections, although perhaps as connectors between trails (127<sup>th</sup> Street between the Mahaffie Trail and Indian Creek Trail, and College Boulevard between the Gary L. Haller Trail and the Cedar Creek area to the west).
- The Indian Creek Trail, which somewhat parallels I-35 on the east (offset by 1-2 miles) through much of Olathe, and Kansas City Road, which is largely adjacent to I-35 on the west, appear to provide important diagonal connections through Olathe.
- The Mill Creek Trail appears to be an important north-south bicycle connection. Further south, Ridgeview Road also appears to be an important north-south connection.

**Figure 2-1: Strava Bicycle Heat Map in/near Olathe**

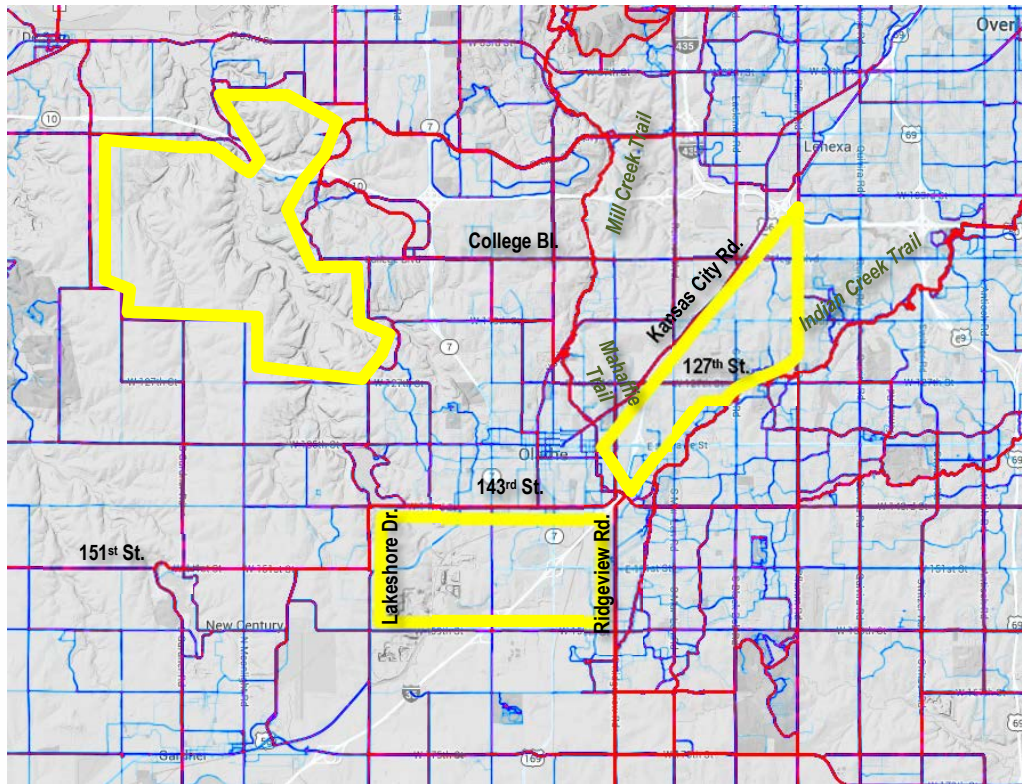




The heat map leads to some overarching conclusions as well:

- A notable confluence or hub of bicycle activity can be seen near the intersection of 143<sup>rd</sup> Street and Ridgeview Road. This might be worth considering for future planning.
- Trails appear to be used much more heavily by bicyclists than do street connections, with many of the exceptions occurring where bicycle infrastructure has been provided.
- Several gaps in usage are noticeable on the Strava map (See **Figure 2-2**). Even though some of these include undeveloped portions or topographic features, the maps provide evidence that, if facilities were available, they would be used.

**Figure 2-2: Gaps in Bicycle Usage on Strava Heat Map**



## 2.4 Analysis and Recommendations

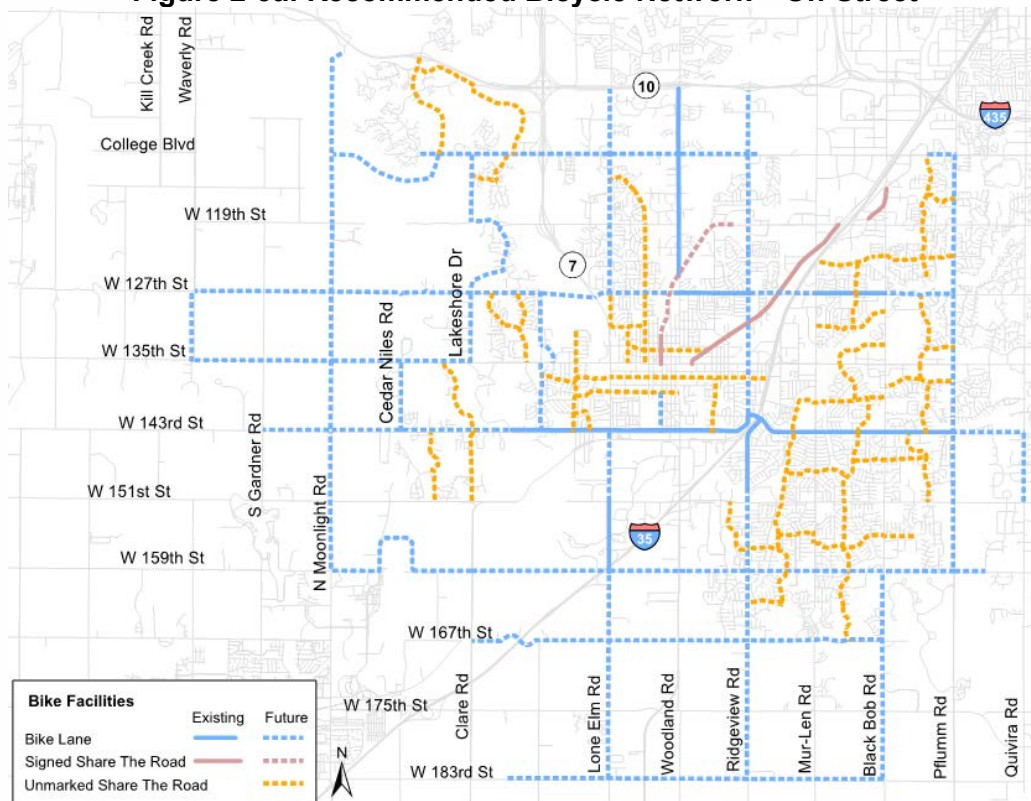
### Recommended Pedestrian and Bicycle Maps and Design Considerations

Different areas of Olathe are characterized by different street patterns and, thus, require differing strategies in expanding the City’s active transportation network. While the more interconnected grid system downtown is easy to navigate and provides multiple route options, barriers (railroads, freeways, waterways) and development patterns in other parts of the City have more complex, often curvilinear, street patterns with less direct connectivity.

Pedestrians and cyclists have varying ability levels and, therefore, a variety of facility types on which they feel comfortable. Pedestrians and novice/intermediate bicyclists are often on sidewalks and sidepaths parallel to the street network. Advanced cyclists are more comfortable on the actual street pavement and may periodically need to claim a traffic lane to place them in a safe position with respect to motorized traffic. The proposed active transportation system is designed to meet the needs of users with various levels of expertise and experience.

**Figure 2-3a** presents a map illustrating the recommended on-street bicycle network for the City of Olathe. The recommended network provides on-street striped bicycle lanes, spaced approximately two miles apart, on lower-volume arterials and in areas with minimal to moderate commercial and industrial activity. These lanes provide connections into and through Olathe for those commuting to work or traversing the city. Unmarked “Share the Road” on-street facilities are proposed to be added to the active transportation map to inform those new to Olathe that there is a system of connecting collector roadways that serve as lower-speed, lower-volume alternative routes to arterials with striped bicycle lanes.

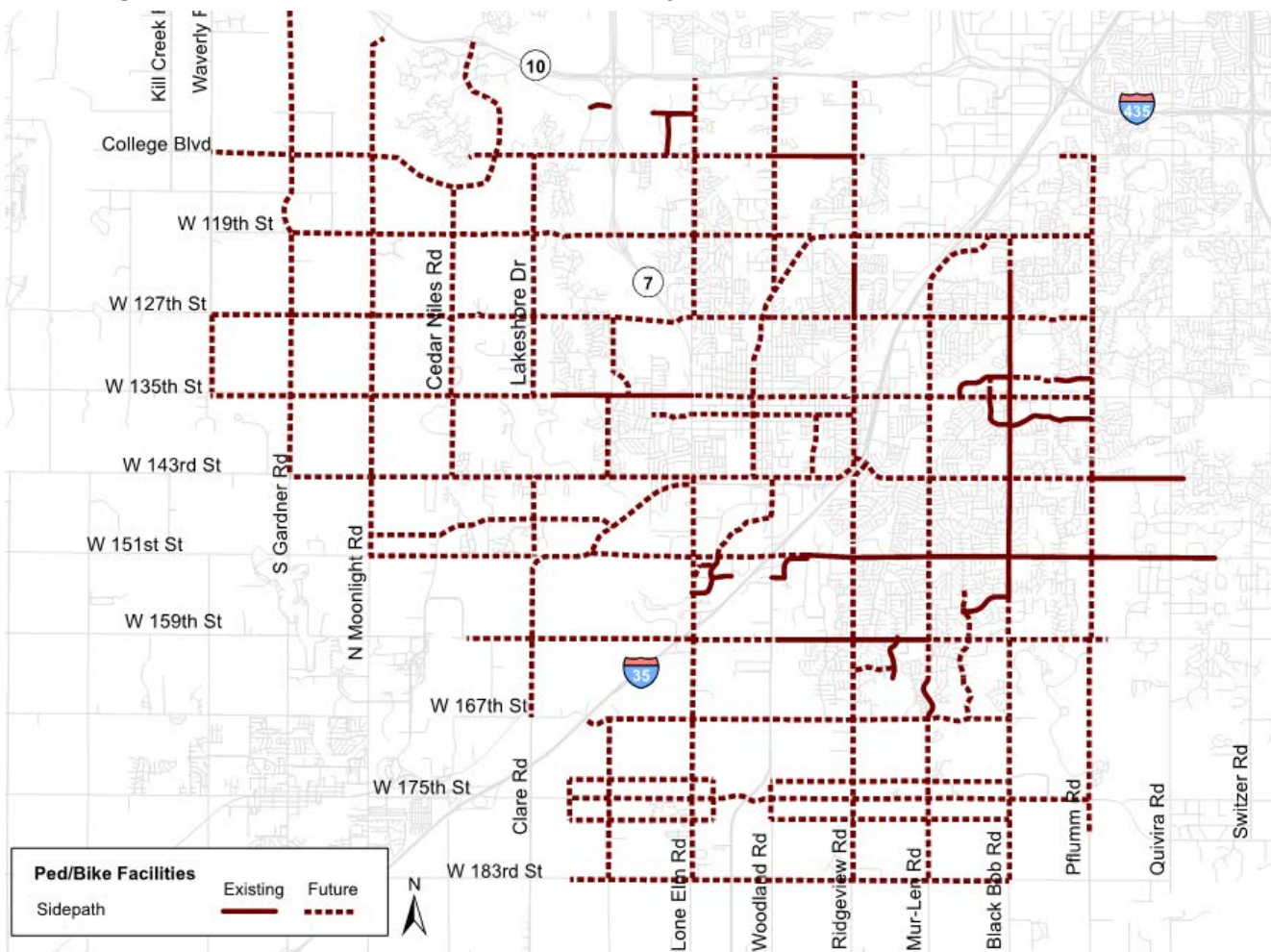
**Figure 2-3a: Recommended Bicycle Network – On-Street**



**Figure 2-3a** does not specify which bicycle lanes should be buffered; this decision should be made on a case-by-case basis at the time of design and implementation. Generally speaking, striped buffers may be used to provide increased separation between a bike lane and an adjacent lane that may present conflicts, such as a high-turnover parking lane or a higher-speed automobile travel lane.

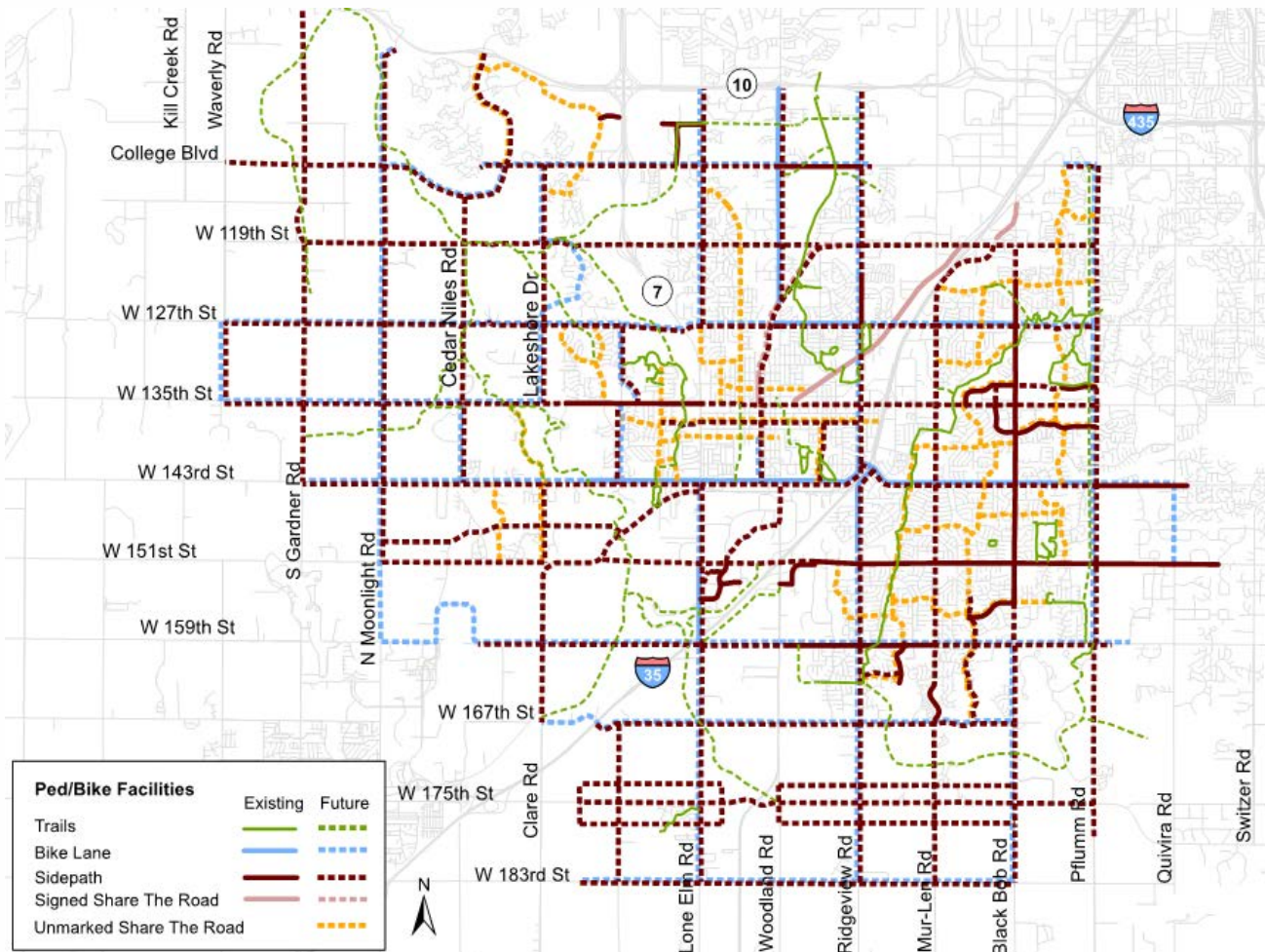
**Figure 2-3b** presents a map illustrating the recommended network of sidepaths to serve the needs of both pedestrians and novice/intermediate bicyclists. Sidepaths provide wide, safe multimodal connections for those traveling between activity centers. They provide an alternative to the trail system for adults or children who may not be comfortable alone on a trail system. The proposed sidepaths will vary from 8 feet to 10 feet in width and will typically be located on one side of all arterials and on the collectors parallel to expressways.

**Figure 2-3b: Recommended Pedestrian/Bicycle Sidepath Network (Off-Street)**



**Figure 2-3c** combines the previous two maps, illustrating the complete recommended active transportation network. This combined network connects activity centers and provides alternative options to vehicular transportation. It provides options for bicyclists of varying skill levels, creates safer options for pedestrians sharing space with bicyclists, and includes connections between trail systems (for example, between the Indian Creek and Mill Creek trails).

**Figure 2-3c: Recommended Active Transportation Network**



## Other Active Transportation Design/Planning Considerations

Several additional design elements are worth considering in the implementation of a successful pedestrian/bicycle network:

- *Intersection Treatments:* A powerful toolbox of intersection treatments exists to facilitate active transportation. Intersections represent the major conflict points between motorized and non-motorized transportation.
  - *High Visibility Crosswalks:* These can include transverse (“zebra” or “ladder”) markings, decorative pavers, and raised crosswalks.
  - *Bicycle Boxes:* These are painted storage areas, just behind the stop bar, that allow bicyclists to move to the head of the queue during a red light, and increases bicyclists’ visibility and “presence” to drivers.
  - *Right-turn Channelization:* Well designed “pork chop” islands can provide additional protection for pedestrians crossing the street while holding right-turning vehicles to reasonable speeds and maximizing their sight distance.
  - *Median Noses:* In situations where automobile turning movements permit, median noses can be extended into an intersection to allow the crosswalk to “cut through” the median, offering pedestrians further protection.
  - *Street Narrowing Treatments:* Treatments that narrow the street, properly applied, can reduce automobile speeds and enhance safety for non-motorized modes (including reducing street crossing times). Treatments include narrowed travel lanes, curb bulb-outs, and vertical landscaping elements (which can perceptually narrow the street).
  - *Pedestrian Signal Treatments:* A technique called the Leading Pedestrian Interval (LPI) allows pedestrians to enter the crosswalk on an all-red signal phase, making them more visible to automobiles once they get a green light. Other techniques, such as “Yield to Pedestrian” blank-out signs, can also increase awareness of pedestrians/cyclists at intersections.
  - *Bicycle Detection/Marking:* Adding intersection detection for bicycles can serve this mode more efficiently, and marking the location of detection can encourage bicycle usage.
- *Signage and Wayfinding:* In addition to MUTCD-required signs and pavement markings, a pedestrian/bicycle-specific wayfinding system can help guide users along preferred routes to activity centers across the city and connect into adjacent active transportation systems. Wayfinding signs not only provide directional, destination, and distance information but can also heighten awareness to the presence of active transportation users. Wayfinding is especially helpful on bicycle routes that require use of multiple facilities (e.g., transitioning from a shared road to a trail to a bike lane). It is recommended that the City implement wayfinding signage at key transition points along the bicycle network – points where the facility type changes or where one facility intersects with another.

## Policy Considerations

*Prioritization:* This plan does not identify priorities for active transportation facilities (the order in which they should be funded and built). Given the City’s budget realities and processes for programming projects, the bicycle network should be built out in conjunction with street overlays (in the case of re-

striping), road improvements (such as widening), or road construction. Each project should refer to the bicycle network map to determine whether a bicycle element is to be included (and what type).

*Complete Streets Policy/Active Transportation Plan:* Many cities are adopting Complete Streets policies or guidelines, encouraging street design that balances the needs, safety, and use of the public right-of-way for all users. Although this Transportation Master Plan includes many recommendations that fall under the Complete Streets umbrella, it is recommended that the City develop a comprehensive, standalone document that lays out these principles and how they affect not only street planning and design but development planning and design as well. The “process” benefit of a Complete Streets policy is that it presents, in one comprehensive resource, the City’s vision of what Complete Streets should look like in Olathe. Thus, the policy would provide a template or playbook for both City and development-driven road construction or improvement projects. The document can describe how and when Complete Streets principles will be applied, the process for their application, and the responsibilities of City departments with regard to Complete Streets, exception processes, design standards, and performance measurement /reporting. The ultimate benefit<sup>1</sup> of a Complete Streets policy is the transformation of a city’s streets to accomplish the following:

- Improve safety, especially pedestrian and cyclist safety.
- Improve public health by encouraging more walking and bicycling.
- Improve conditions for children by promoting physical activity, independence, and school access.
- Improve air quality and reduce traffic congestion by reducing automobile trips.
- Improve/stabilize the local economy by providing accessible and efficient connections between residences, schools, parks, public transportation, offices, and retail destinations.

Many Cities adopt Complete Streets policies as standalone policies, rather than incorporating them into existing development codes. Such a document could certainly be incorporated by reference into the Unified Development Ordinance; however, its application is broader than just new development or even redevelopment. As the City considers and develops transportation projects that are not directly tied to specific development projects, the Complete Streets Policy would guide implementation of these projects as well.

*Timing of Improvements:* One specific element of a Complete Streets Policy that would benefit the City of Olathe would be to require that active transportation connections be implemented in new residential and commercial developments at the same time as key automobile connections, in order to avoid connectivity gaps that could otherwise remain for years. Specifically, such active transportation connections could be required in the following situations:

- *Residential Developments:* Install active transportation connections when curbs, gutters, and pavements associated with these developments are constructed.
- *Commercial Developments:* Install active transportation connections when parking lots and driveway access to public streets are constructed. For example, even if outparcels directly fronting an arterial are not yet developed, but the main anchor tenants are, the active transportation connections along the arterial should be built for the entire frontage.

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<sup>1</sup> Bullet list adapted from the National Complete Streets Coalition

*National Designation.* One way for the City to “push” itself to achieve its active transportation goals is to work toward national designation as a bike- and/or walk-friendly city. Existing programs include the following:

- The League of American Bicyclists oversees the **Bicycle Friendly America** program – awarding cities Bicycle Friendly designations in categories of Bronze, Silver, Gold, Platinum, and Diamond. The designation is based on several criteria in the categories of Education, Engineering, Enforcement, Key Outcomes (Ridership, Crashes, and Fatalities), Evaluation, and Encouragement. In Kansas, the cities of Topeka, Lawrence, Manhattan, and Shawnee have all achieved Bronze ratings. Lee’s Summit, Missouri, is another nearby city that has achieved Bronze designation.
- The **Walk Friendly Communities** program, sponsored by FedEx and the U.S. Department of Transportation Federal Highway Administration, recognizes cities establishing, or recommitting to, a high priority for supporting safer walking environments. There are currently no designated Walk Friendly Communities in Kansas; Lee’s Summit (Silver) and Springfield (Bronze) are the only two communities in Missouri so designated.

Achieving these designations would take a commitment by the City to such elements as bike/ped program staffing, education programs, National Bike Month, and more. It is recommended that the City begin pursuing such designations when it is willing to commit the resources to do so.

*Subdivision Planning:* It is recommended that the City’s Unified Development Ordinance be further enhanced to address the active transportation elements of this Transportation Master Plan. Potential additions could include the following:

- Emphasizing the need for a robust collector network in subdivision/development planning, and encouraging design of these shared roads to facilitate bicycle network connectivity
- Requiring sidewalks on both sides of all new streets
- Incorporating bike parking requirements into the development approval process

*Dedicated Funding:* It is recommended that Olathe’s Capital Improvement Plan include an annual line item for bicycle/pedestrian connectivity improvements (filling gaps and expanding the system). A potential starting point for this funding is \$500,000 annually, which is slightly less than 1 percent of the City’s typical annual CIP budget.

## **Monitoring**

One final set of recommendations relates to monitoring. In order to understand active transportation usage within Olathe, it must be measured and monitored. To this end, the following recommendation is made:

- The City should establish periodic (perhaps biannual) bicycle and pedestrian counts at key locations throughout the network. For any intersection traffic counts that are manually conducted, counting bicycles and pedestrians should be a requirement in addition to counting vehicular traffic.

## 3.0 PUBLIC TRANSPORTATION

### 3.1 Existing/Planned Services, Institutions, and Policies

Olathe is served by a variety of public transportation services. The City of Olathe Taxicoupon/Voucher Programs serve low-income, elderly, and disabled citizens with safe and affordable transportation within the city limits of Olathe. This service is contracted with private taxi companies to provide eligible customers with subsidized transportation. Johnson County Transit (JCT) provides a variety of commuter-oriented routes through Olathe. These routes are part of the RideKC system, a network of transit services connecting the Kansas City region. Some of these routes in effect provide local transit service along portions of Olathe's major arterial system. JCT recently came under management of the Kansas City Area Transportation Authority (KCATA).

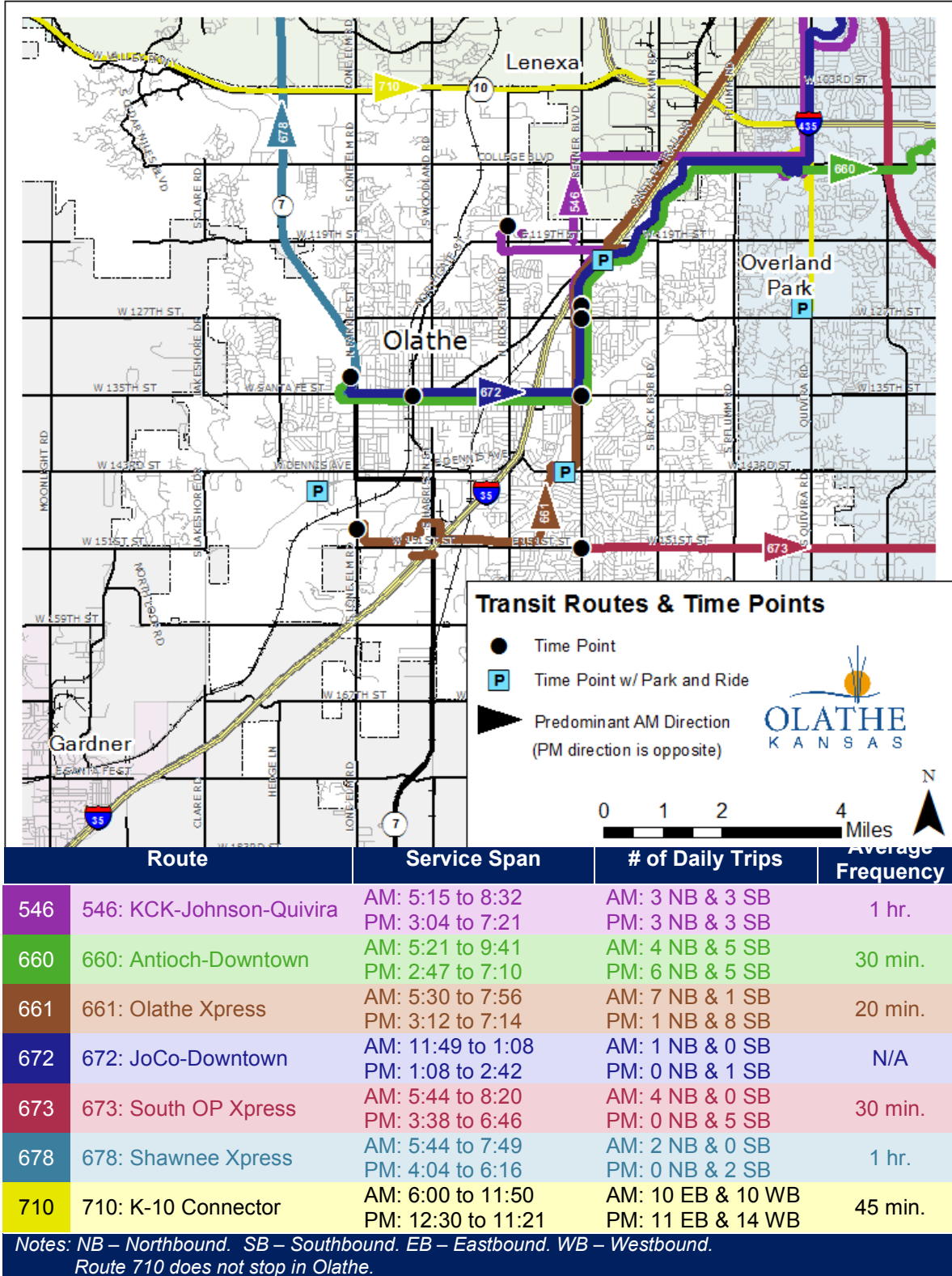
#### Fixed-Route Service (JCT)

**Figure 3-1** illustrates six existing routes connecting Olathe to other major employment centers in north and east Johnson County, Kansas, and south Wyandotte County, Kansas. Five of the six ultimately terminate in downtown Kansas City, Missouri, and the sixth route (Route 546) terminates in downtown Kansas City, Kansas (KCK). JCT routes operate during weekday peak periods, with some midday service offered through a combination of fixed routes and flex routes. Evening or weekend service is not provided. As shown in **Figure 3-1**, service spans differ by route but generally range from 5:15 to 8:30 a.m. in the morning and from 3:00 to 7:00 p.m. in the evening. Route frequencies also differ by route but range from 5-15 minutes for the peak service on Route 661 Olathe Express to one trip per hour on Route 546 (KCK-Johnson-Quivira). While the routes are operated as commuter routes, some routes operate along the major and minor arterial streets through Olathe and are used by passengers to access local destinations. Route 660 (Antioch-Downtown) offers peak-period bidirectional service along Santa Fe Street/135th Street, Mur-Len Road, and Strang Line Road in Olathe and is used by many riders as a local service. Route 546 (KCK/Johnson/Quivira) also operates on major arterials through Olathe.

One additional JCT fixed-route service is worth noting – because it runs along Olathe's northern border, it provides transfers with several routes mentioned above, and it has the potential to serve Olathe in ways discussed later in this chapter. The K-10 Connector (JCT Route 710) is an all-day, limited-access express route between Lawrence and Overland Park. The service connects the University of Kansas (KU) campus in Lawrence with Johnson County Community College (JCCC) and KU Edwards Campus in Overland Park. K-10 Connector riders can transfer onto Route 575/875 (75th Street-Quivira) at the KU Edwards Campus. Riders originating from JCCC can also transfer to northbound Route 546 (KCK-Johnson-Quivira), Route 660 (Antioch-Downtown), and Route 672 (JoCo-Downtown midday) to access Kansas City, Missouri, or Kansas City, Kansas. The K-10 Connector has a 30-minute peak frequency and a 60-minute off-peak frequency, with a service span of 6:00 a.m. to 11:20 p.m. Monday through Thursday. Night service is not offered on Fridays after approximately 6:00 p.m. for either westbound or eastbound trips. Operation varies based on the academic calendar, with a summer schedule and a reduced schedule for academic breaks.



Figure 3-1: Existing Fixed-Route Transit Service in Olathe (Johnson County Transit)



## Non-Fixed-Route Services

### Taxi Coupon/Voucher Program (City of Olathe)

The City of Olathe operates a Taxi Coupon/Voucher Program that provides door-to-door demand response transportation service within the City of Olathe for elderly and disabled citizens for a variety of trip purposes – including work, medical, shopping, banking, and other personal reasons. Service is offered and provided only within the City of Olathe municipal boundaries. The program has been funded by grants through the Federal Transit Administration (FTA) Job Access Reverse Commute (JARC) program (Section 5316), the New Freedom program (Section 5317), and the program for elderly and disabled individuals (Section 5310). In addition to FTA funds, a community development block grant (CDBG) with a 50 percent local match by the City of Olathe’s General Fund supports the program, along with funds from the Mr. Goodcents Foundation and the Health Care Foundation of Greater Kansas City. The program is administered by the City of Olathe Parks and Recreation Department, Housing and Transportation Office.

The program subsidizes transportation services for disabled, elderly, and low-income residents making work-related trips. Taxi companies provide rides at a reduced cost through an agreement with the City of Olathe. The coupons/vouchers “pay for” a one-way door-to-door trip in a taxi or wheelchair lift-equipped vehicle. Coupons/vouchers may only pay for rides within Olathe city limits. The cost of each coupon/voucher to the resident is \$3.50. Taxi companies are required to accept coupons/vouchers and provide service from Monday through Saturday, 6:00 a.m. to 7:00 p.m., as well as all operational hours that exceed the required service periods. The program recommends participants reserve a ride with a participating cab company at least one hour before the desired pick-up time.

Three distinct coupon/voucher program elements comprise the Taxi Coupon/Voucher Program, as shown in **Table 3-1**.

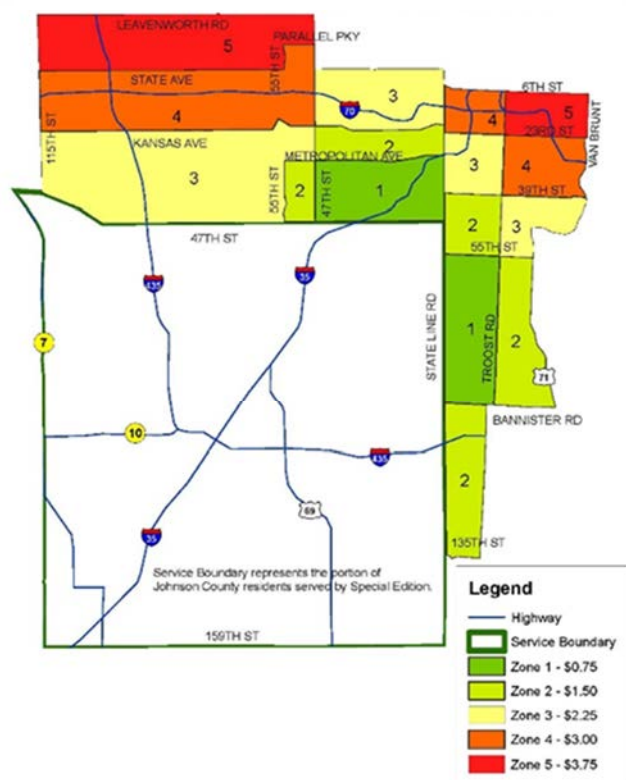
**Table 3-1: Olathe Taxi Coupon/Voucher Program Elements**

Element	Eligibility	Purpose	Monthly Purchase Limit (participants can apply for additional books)	Other Requirements
<b>Personal</b>	Elderly and/or disabled residents meeting program guidelines	Personal shopping trips or medical appointments	Two coupon/voucher books (10 one-way trips)	--
<b>Work</b>	Low-income residents meeting program guidelines	Job preparation skills, work, and work-related activities (Not allowed for personal trips or medical)	Four coupon/voucher books (40 one-way trips)	Must provide a copy of current pay stub to purchase coupons.
<b>Medical</b>	Elderly and disabled residents meeting program guidelines	Medical appointments within the city limits of Olathe	Individual coupons/vouchers or a maximum of two books (20 one-way trips)	Must show documentation of medical need. Additional individual coupons may be purchased for medical appointments with documentation from the medical provider.

*Special Edition (JCT)*

In addition to fixed-route transit service, Johnson County Transit also operates a demand-response service called “Special Edition,” which is targeted to the elderly, persons with disabilities, or individuals who qualify as low-income. Special Edition service provides eligible customers demand-response trips within the Johnson County service area and also into specific locations within Kansas City, Kansas, and Kansas City, Missouri, for medical trips only. Special Edition service is available to eligible customers from Olathe to any destination in the JCT service area or from anywhere in the JCT service area into Olathe. Special Edition trips are not available for trips that occur entirely within Olathe. **Figure 3-2** shows the JCT Special Edition service areas, including the additional zones that can be accessed outside of Johnson County for medical purposes, with an additional fee. The expanded service area extends as far north as Leavenworth Road in Kansas City, Kansas, and as far east as Van Brunt Boulevard and U.S. 71.

**Figure 3-2: JCT Special Edition Service Area**



*Catch-A-Ride (Johnson County)*

Another transportation service provided to Johnson County residents is called Catch-a-Ride. This volunteer transportation service is managed by the Johnson County Department of Human Services. Eligible riders include county residents who do not have access to transportation, are 60 years of age and older, or are disabled. Catch-a-Ride is a donation-based program with a suggested donation of \$3.

**Fares**

**Table 3-2** summarizes current fare structures for transit services in Olathe. One-way fares for transit services in the region range from \$1.50 for a JCT local route to \$2.25 for a suburban express route and \$3.50 for a commuter express route. The Taxi Coupon/Voucher Program provides ride coupons/vouchers to low-income, disabled, or elderly residents for \$3.50.

**Table 3-2: Transit Fare Comparison**

Description	Full Fare One-Way	Reduced Fare
<b>Olathe Taxi Coupon/Voucher Program</b>		
Personal, Medical, Work	\$3.50	-/-
<b>JCT Local Routes</b>		
Routes: 546, 660, 672	\$1.50	
<b>JCT Suburban Express</b>		
Routes: 661, 673, 678	\$2.25	\$1.10
<b>JCT Commuter Express</b>		
Route 710	\$3.50	
<b>Johnson County Human Services</b>		
Catch-a-Ride	\$3 suggested donation	-/-
<b>Johnson County Special Edition</b>		
0 – 10 miles	\$5.20	
10.01 – 20 miles	\$6.20	
20.01 + miles	\$7.20	

## 3.2 Demand and Usage

### Users

Transit dependent populations generally include persons with disabilities, elderly individuals, and/or persons with low relative income. **Figure 3-3** illustrates characteristics of these transit-dependent populations within the City of Olathe geographically. Refer to **Table 1-1** in Chapter 1 for more details on these demographics.

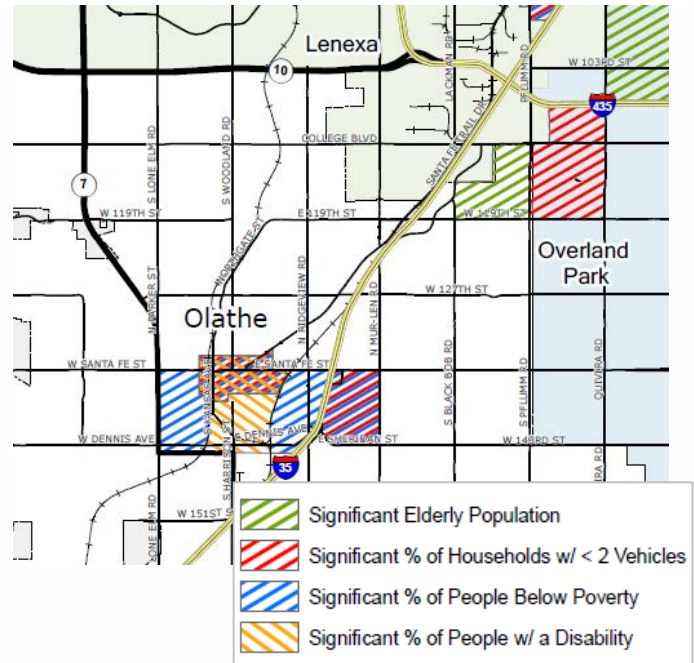
In addition to transit-dependent individuals, a level of demand exists for transit services that are geared toward work commute trips made by individuals who might choose to use public transportation to travel to and from work.

### Ridership

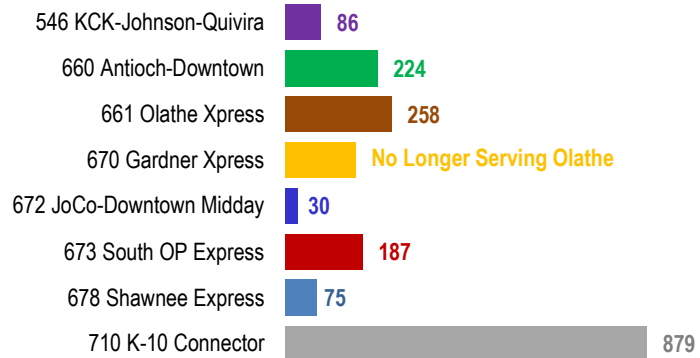
#### JCT Fixed Routes

**Figure 3-4** shows the average daily ridership on Johnson County Transit routes traveling through or near Olathe. Of those that enter Olathe, Route 661 Olathe Express has the highest daily ridership, followed by Route 660 Antioch Downtown. The K-10 Connector has more daily ridership than these two routes combined. Route 661 accounts for the vast majority of Olathe-based ridership, and Route 660 is the most used local route. Route 672 functions as one midday round trip for Route 660, with Olathe locations estimated to account for 25 to 50 percent of the ridership on these two routes.

**Figure 3-3: Transit-Dependent Populations**



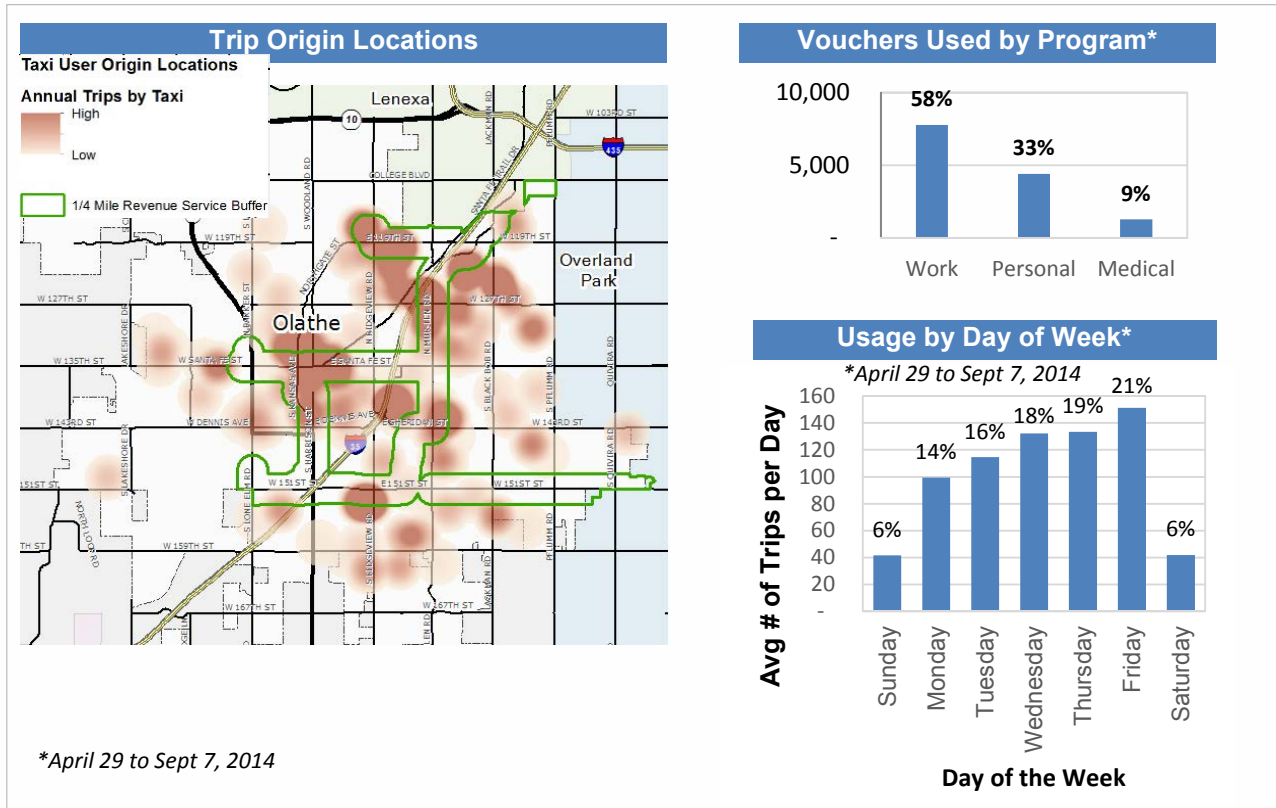
**Figure 3-4: Average Daily Ridership, JCT Routes in/near Olathe**



## Olathe Taxi Coupon/Voucher

Taxi Coupon/Voucher Program participants make an average of 100 to 140 trips per day during the week, with usage dropping off to about 40 trips per day on Saturday and Sunday. **Figure 3-5** displays usage characteristics of the Olathe Taxi Program. The majority of trips (58 percent) are for work.

**Figure 3-5: Taxi Coupon Usage**



## 3.3 Analysis and Recommendations

### Gaps/Needs

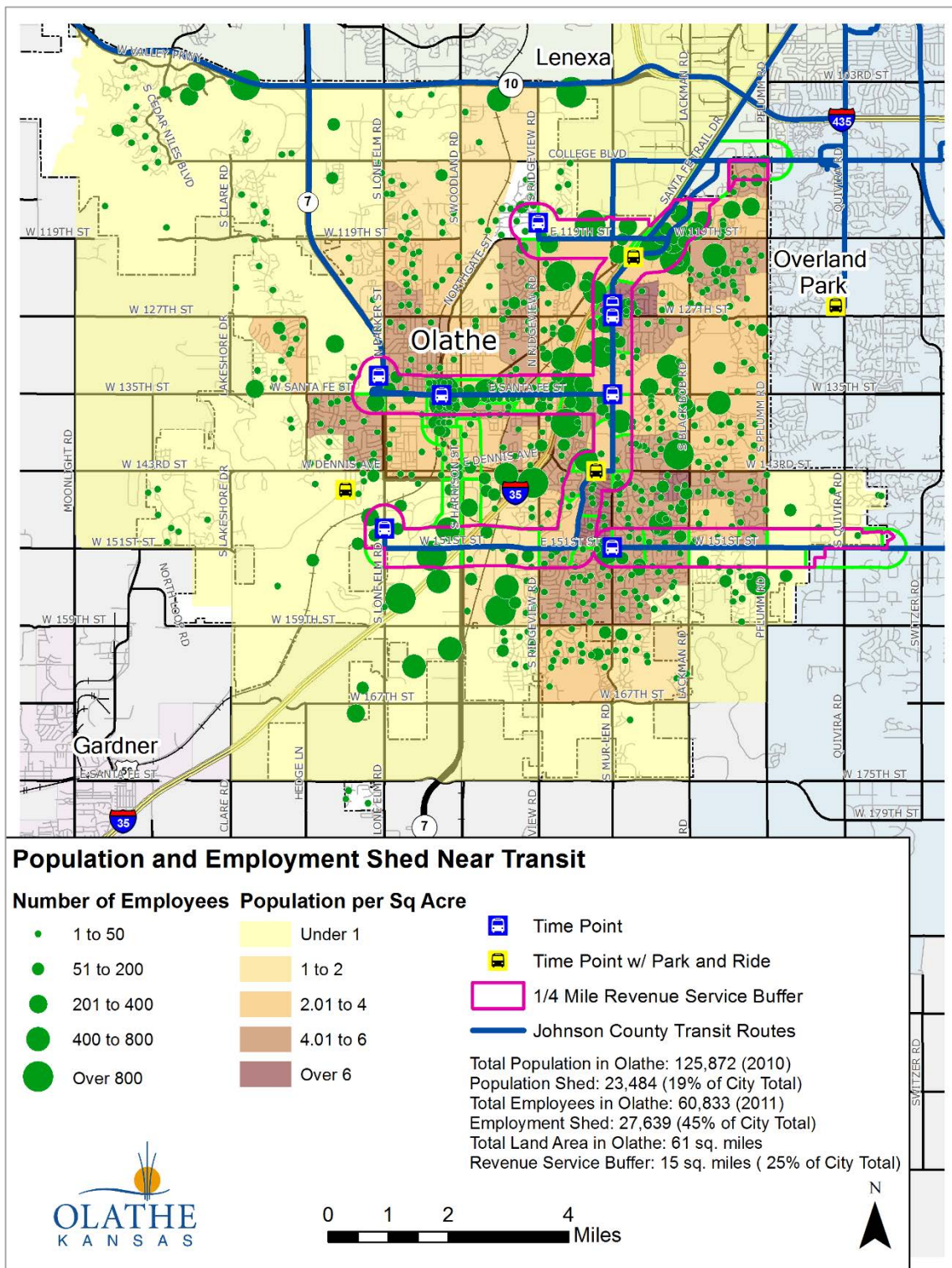
**Appendix A** contains a detailed analysis of transit gaps in Olathe. This section summarizes the key findings of that analysis.

#### *Fixed Routes*

- *Fixed-Route Geographic Coverage:* Fixed transit routes are within typical walking distances for 20 percent of Olathe's population and 47 percent of its employment. **Figure 3-6** indicates key residential and employment corridors with respect to fixed transit routes. These corridors include Black Bob Road, Pflumm Road, and 159<sup>th</sup> Street and may be opportunities for expanded fixed route coverage.
- *Fixed-Route Time-of-Day/Directional Coverage:* The distribution across the time periods and direction of travel affects the ability to commute within and through Olathe. Residents that commute in a northward direction have a much larger selection of buses before 7:00 a.m. than after. Likewise, those commuting southward have a much larger selection of buses after 7:00 a.m. than before. In the areas served by fixed route transit, most employees arrive at work between 7:00 a.m. and 8:00 a.m. Some nearby regional employment, medical, and retail centers remain challenging for Olathe residents to access. Johnson County Community College (JCCC) is connected to Olathe through a variety of JCT routes. Route schedules are oriented toward serving traditional peak commuting times and may not be suitable for students wishing to attend only one or two class periods at JCCC during the day or evening classes.
- *Non-Fixed-Route Geographic Coverage:* One limiting factor of the Taxi Program is the service area, which extends only within Olathe city limits. Taxi Program participants leaving Olathe must either (1) negotiate with the taxi driver directly to reach their final destination, or (2) take the taxi service to a connection point where JCT's Special Edition (which does not offer trips inside Olathe to Olathe residents) or fixed-route service can take them to destinations beyond Olathe's borders. The second option is complicated for riders because multiple fares are involved and because participation restrictions are different between the two services (JCT and Taxi).
- *Non-Fixed-Route Purchase/Payment Options:* Participants of the Olathe Taxi Coupon/Voucher Program may purchase coupons at the program's offices Monday through Friday 8:00 a.m. to 4:00 p.m. (which may in itself require a taxi coupon/voucher) or by mail. Riders are required to annually re-apply to the programs. These restrictions put further limitations on riders with unplanned trips.
- *Non-Fixed-Route Communication/Feedback Forums:* Regular public and stakeholder input for the Olathe Taxi Coupon Program should be increased. This can allow the program to adjust to changing demand and more actively respond to the needs of city residents and program users. Input can be collected by better leveraging the current forums of communication, such as a biennial participant survey, an annual random Direction Finder resident survey, and the City's OlatheConnect website, as well as actively engaging existing City boards, including the Olathe Persons with Disabilities Advisory Board, the Olathe Human Relations Commission, and the Board of Housing Commissioners. The Olathe Taxi Coupon/Voucher Program does not have a clear mechanism to receive regular feedback and input from Olathe residents and program users. The program does not have an independent board and currently reports to the Olathe City Council. The existing forums for public feedback may not provide an engagement level sufficient

for active program participants, and those interested in transportation in Olathe, to feel that their input regarding the program is adequately recognized.

**Figure 3-6: Population and Employment Shed near Transit**



- *Ridership Gap*: Olathe’s calculated need for annual, internal one-way transit trips is projected to reach 243,000<sup>1</sup>. Given that existing transit systems (including both JCT fixed routes and the City’s Taxi Coupon/Voucher Program) provide 56,000 annual trips, this leaves a gap of 187,000 annual one-way transit trips that the current transportation services in Olathe are challenged to address. At the current rate of \$14.58 per trip, including administrative costs, the City would require a \$3.5 million investment if the Taxi Coupon/Voucher Program were to be expanded to serve this potential demand.

## Transit Strategies

### *City-Specific Service Strategies*

Gaps in existing transportation services may be addressed through several different strategies as illustrated in **Figure 3-7**. These strategies are not intended as necessarily incremental in nature, although they could be implemented in progressive steps. Rather, the different strategies are intended to provide a snapshot of how various alternatives would address the current gap of transit need. Generally, the strategies as described entail additional amounts of investment in programs and capital costs but would achieve progressively lower costs per rider while expanding the availability of transportation options to additional Olathe residents. These strategies range from optimizing the existing Olathe Taxi Coupon/Voucher Program, to implementing various levels of general public demand-response transit, to establishing a fixed-route service providing regularly scheduled local bus service throughout Olathe. The successive levels of proposed transit service, and corresponding levels of transit investment, generally correlate with an increasing amount of ridership, thus resulting in a more efficient service and a lower overall cost per rider.

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<sup>1</sup> Potential ridership was calculated by examining transit ridership in Independence, Missouri, a peer city with a route system of one-hour frequency. The amount of transit riders per revenue hour per capita that Independence experiences was applied to Olathe’s population base to reach a projected ridership of 243,000. See the Appendix for more detail.

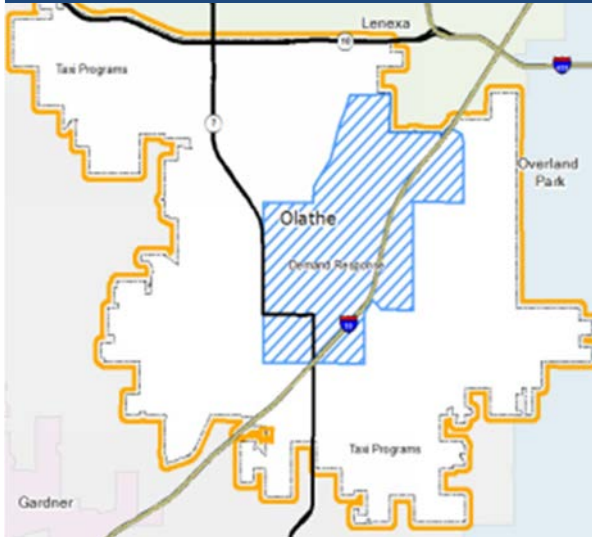


Figure 3-7: Transit Strategies

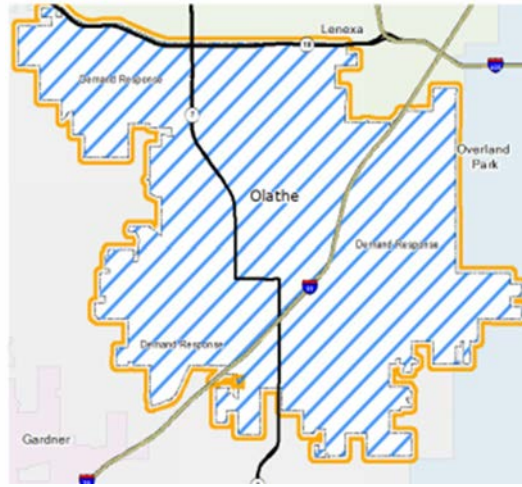
### 1. Optimize Existing Service

- Streamline user application process.
- Create additional payment options, including additional retail/online .
- Replace paper coupon vouchers with ID cards and "digital coupons."
- Optimize existing Taxi Coupon/Voucher Program website.
- Increase the percentage of shared trips.
- Form cost-share partnerships with employers.
- Attract additional private operators to participate in the Taxi Program.
- Continue developing partnerships with JCT / Special Edition and other providers.
- Create an advisory board / committee.
- Implement JCT-designated bus stops at quarter-mile intervals along existing routes through Olathe.
- Add JCT midday service.
- Adjust some JCT route schedules to better meet Olathe commuters' work schedules.

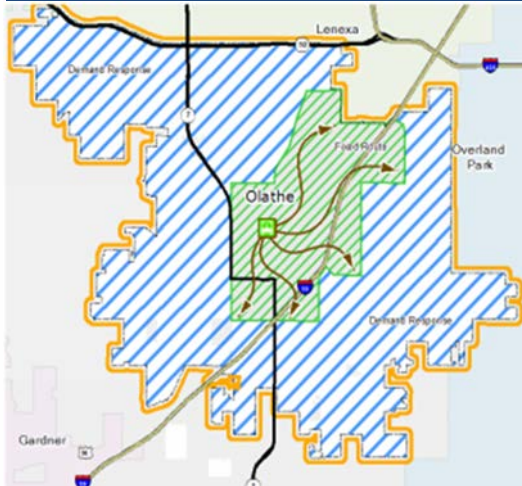
### 2. Small Area Demand Response



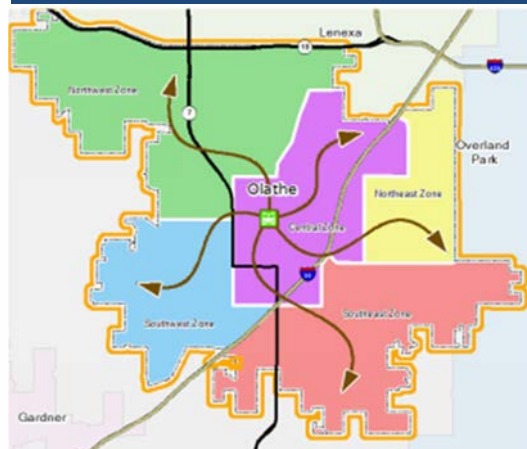
### 3. Citywide Demand Response



### 4. Citywide Demand Response, Small Area Fixed Route



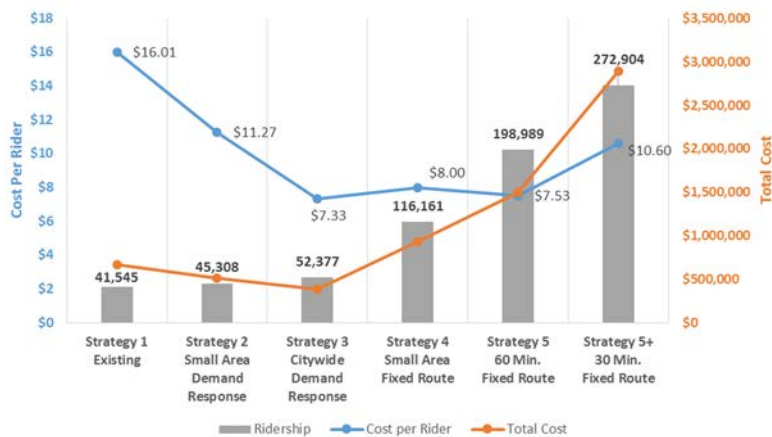
### 5. Citywide Fixed Route



- Fixed Route
- Demand Response
- Olathe Taxi Boundary
- Potential Fixed Routes
- Downtown Transit Center

The strategies described in **Figure 3-7** move across a spectrum that uses additional investment in local transit to serve increasing numbers of Olathe residents, at decreasing costs per rider. **Figure 3-8** summarizes the costs, ridership, and cost per rider of the various strategies. The cost per rider is minimized with Strategy 3, which provides citywide demand response. However, for only \$0.67 more per rider (see the blue line in the graph), one-hour fixed-route service (Strategy 5) can be implemented throughout Olathe and serve an additional 150,000 annual one-way transit trips.

**Figure 3-8: Transit Strategies – Estimated Costs**

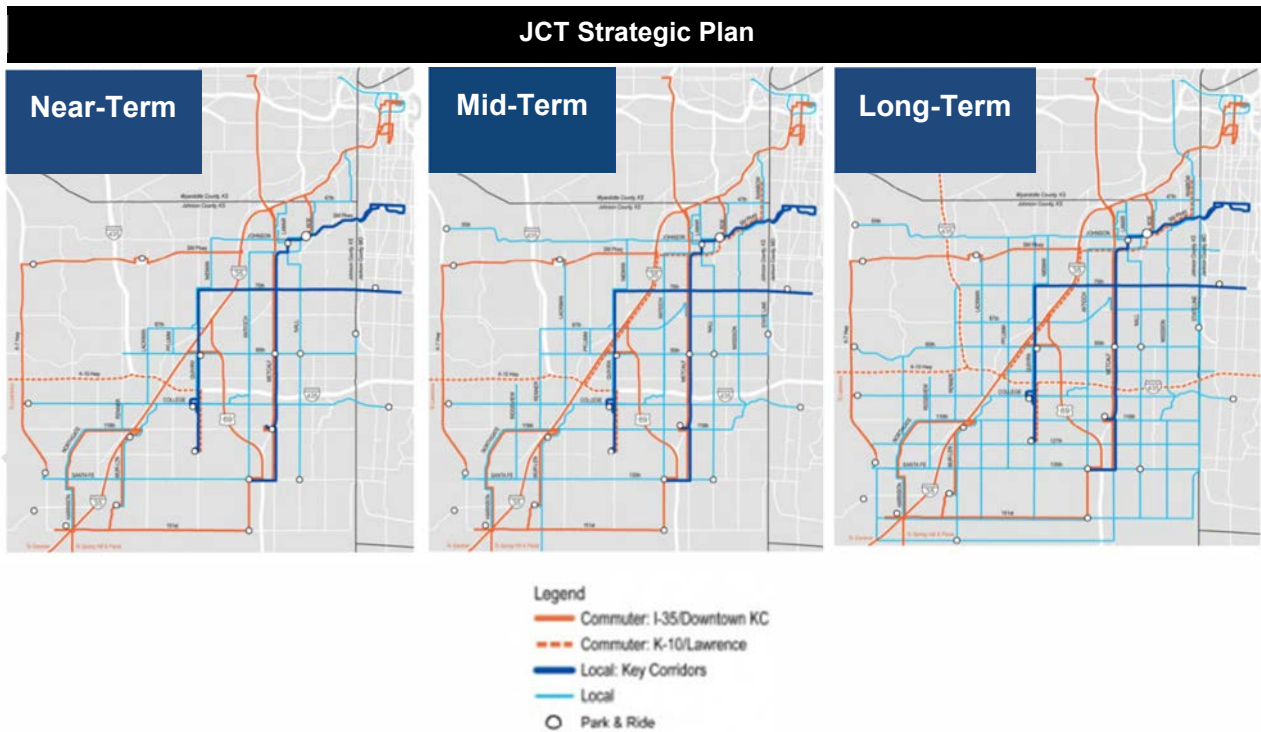


**JCT Strategies**

JCT’s near-, mid-, and long-term implementation plans are shown in **Figure 3-9**. The near-term plan identifies connector service in Olathe along Black Bob (Lackman) Road and the length of College Boulevard. The mid-term implementation plan identifies connector service on Mur-Len (Renner) Road and along Ridgeview Road. The long-term implementation plan envisions completing the regional transit grid system in southwest Johnson County with service on 127th Street, south of 151st Street, east of Ridgeview, and along Black Bob (Lackman) Road. Not shown in the JCT Long-Term Implementation Plan is the designation of Santa Fe (135<sup>th</sup>) Street between K-7 and Metcalf as a Local Key Corridor. Developing a more robust local transit system within the City of Olathe would likely require such a designation for 135<sup>th</sup> Street, along with the commensurate level of service. Collectively, these service additions would create a network of inter-community and intra-county public transit service that would allow for travel to and from Olathe and would be linked to the local transit system within Olathe. In addition, these services would provide access to regional destinations outside of Johnson County via commuter express services along I-35 and connections to major urban corridor services as described in the *Smart Moves Regional Transit Plan*. A new process called the *RideKC Regional Transit Plan* is under way to update the transit service plan for the region and, in particular, to focus on improving job access in suburban areas of the region.

Considering the popularity of the K-10 Connector and its ability to connect regional education facilities such as the KU Lawrence campus, JCCC, and KU Edwards campus, modifying the route to include the city of Olathe not only has the potential to increase the ridership of Olathe residents, but it would also provide a transit connection to the Kansas State University (KSU) Olathe campus. **Figure 3-9** illustrates the potential realignment and also indicates the potential cost implications compared to the existing service. Further study of the demand, realignment cost, and operational capacity to serve the KSU Olathe campus would be required before making any change.

Figure 3-9: JCT Plans and Recommendations



#### Costs

Route Alternatives	Platform Miles	Additional Miles	Platform Hours	Annual Operating Costs	Cost Difference
Existing Route	336,902	-/-	9,375	\$1,287,917	-/-
<b>Alternative 1:</b> Realign Both Trips	341,368	4,466	-/-	\$1,299,936	+ \$12,019
<b>Alternative 2:</b> Realign Westbound Trips Only	340,585	3,683	-/-	\$1,297,829	+ \$9,912
<b>Alternative 3:</b> Realign Eastbound Trips Only	337,685	783	-/-	\$1,290,024	+ \$2,107

*\*Note: Operational details and exact costs may require further study.*

## Planning and Design Strategies

As the City considers additional investments in public transportation, the following elements should be included:

- **Bus stop improvements:** Well-developed bus stop infrastructure, along with a supportive pedestrian network, can make transit more attractive to existing and potential users. The following are recommended as minimum elements to consider at bus stops:
  - Safe location for transit vehicles to stop and pick up or drop off passengers
  - Designated, safe location for passengers to wait for the transit vehicles
  - Concrete pad sufficient for wheelchair accessibility, well-connected to sidewalk and curb
  - Bus stop sign designating routes, possibly including broader system information and timetables
  - Conformance to American with Disabilities Act (ADA) guidelines in terms of surface type, levelness, and width; wheelchair and mobility-impairment accessibility; and serving users with visual impairments

Additional elements at a bus stop can provide a higher level of comfort for passengers, may increase the attraction of transit for potential users, and may be appropriate at stops or locations that experience higher ridership, safety concerns, or traffic congestion. These additional elements can include the following:

- Protection from the elements
  - Bench(es) for users' comfort
  - Bus pull-outs where appropriate and necessitated by traffic conditions
  - Crosswalk elements at mid-block stops across the street from major destinations
- **Transit-friendly commercial and business design:** Commercial and business developments often place emphasis on patrons/employees arriving and parking in cars. Dominant parking lots are often situated between the street and the actual building entrance, with inadequate designated pedestrian connections between the two. It is recommended that the City consider and include such connections in its development reviews; potential solutions include the following:
    - Define walkways through parking lots or gates.
    - Locate and orient buildings to place parking at the rear and side of the building and to place the building adjacent to the street and the existing pedestrian network.
  - **Transit-friendly residential development design:** Typical suburban residential development design often presents challenges to transit service. Curvilinear sidewalks separated from the roadway by wide swaths of landscaping may require transit users to walk through grass/snow to access a transit stop. Gated communities may restrict access to a limited number entry and exit points. Even multifamily housing may use elevated berms or landscaping to direct and limit pedestrian access. It is recommended that the City consider transit access in development reviews. Potential solutions include the following:
    - Begin curvilinear sidewalks after bus stop.
    - Provide a gated connection near the bus stop into adjacent gated communities.
    - Install direct sidewalks to bus stops.

- *Transit-friendly design of public infrastructure:* Many of the major activity centers or residential concentrations in Olathe are on or near streets that can generally be described as wide, high-speed arterials. Crossings tend to be infrequent, and the pedestrian environment can be challenging. Developing “Complete Streets” guidelines, as recommended elsewhere in this document, would improve the experience of non-motorized users as well as their access to transit.
- *Improved and expanded park-and-ride presence:* The City’s three park-and-ride lots (see Figure 3-1) serve as the doorstep to JCT service for many transit users. Several strategies could improve their utility:
  - *Additional site:* 80 percent of Olathe’s population and 67 percent of the city’s total land area are within a 2.5-mile radius (typical market area) of the existing park-and ride lots. As can be seen in Figure 3-1, a large section of the northwestern part of the city is not particularly well-served by the existing park-and ride-lots. A lot in the northwest with access to K-7 could support Olathe residents using Route 678 (Shawnee Xpress).
  - *Visibility:* Larger, elevated monument signs visible from adjacent major streets and highways would advertise the presence of Park & Ride services to potential users and affirm that existing users can leave their cars without fear of towing.
  - *Freeway access:* The specific siting of certain park-and-ride lots adjacent to freeways makes it difficult for a route to exit the freeway, serve the lot, and then re-access the highway in an efficient fashion. For example, JCT Route 670 (Gardner-OP Xpress) bypasses serving Olathe at the Strang Line park-and-ride lot, even though the route alignment comes within 500 feet of the lot. This lot is, however, served by Route 661 (Olathe Express) with direct service to downtown and a higher number of trips than Route 670. Developing lots directly adjacent to arterial streets with highway access could allow one route to easily access multiple lots and one lot to easily serve multiple routes. In the longer term, the possibility of serving park-and-ride lots directly from a freeway could be examined; a potential location for bus slip-ramps is the I-35 interchange at 119<sup>th</sup> Street.
- *Integration with regional planning (Ride KC):* The Greater Metropolitan Area’s vision for transit service into the future is described in MARC’s *Smart Moves Regional Transit Plan*, which is currently being updated to the *RideKC Regional Transit Plan*. *Smart Moves* identifies higher-capacity transit corridors that would serve the Kansas City metropolitan area. Commuter service would connect outlying suburbs, such as Olathe, with the urbanized core using express bus service. Community-based services would provide neighborhood connections and use local fixed-route service and special transportation services to convey passengers to higher-speed transit services. It is recommended that the City actively participate in the ongoing *RideKC Regional Transit* planning process.
- *Monitoring of micro transit development and activities:* It is further recommended that the City monitor developments and opportunities for potential partnerships and implementation of “micro transit,” like the KCATA Bridj pilot program in Kansas City. Bridj uses a mobile app allowing riders to request on-demand shuttle service from wherever they are located within the service area, creating dynamic bus routes accessible by pop-up shuttle stations. New opportunities in self-driving cars and ride share technology may also emerge and should be monitored.

## 4.0 ROADWAY

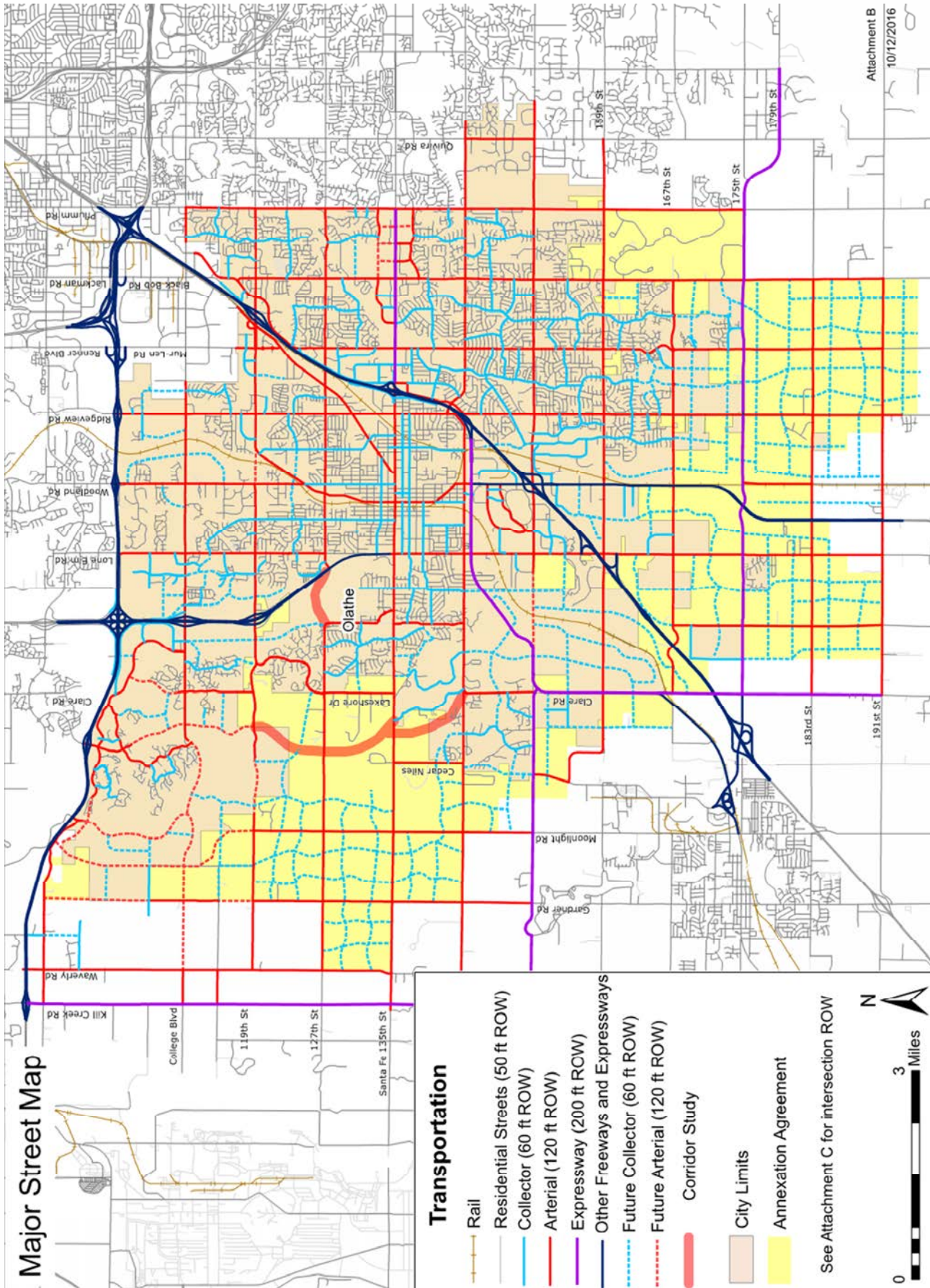
### 4.1 Network and Functional Class

The highway system in Olathe contains a range of roadway types with different characteristics in terms of volumes, lanes, speeds, functional classifications, traffic operations, safety experience, and vehicle restrictions. As development expands geographically, this network of roadways will need to expand with it. The City’s Major Street Map (**Figure 4-1**), updated for this TMP, illustrates the long-range vision for Olathe’s transportation network.

The map identifies roadway facilities according to their function within the highway network, a system known as *functional classification*. Each facility type is described in more detail below; **Figure 4-2** illustrates typical dimensions for each.

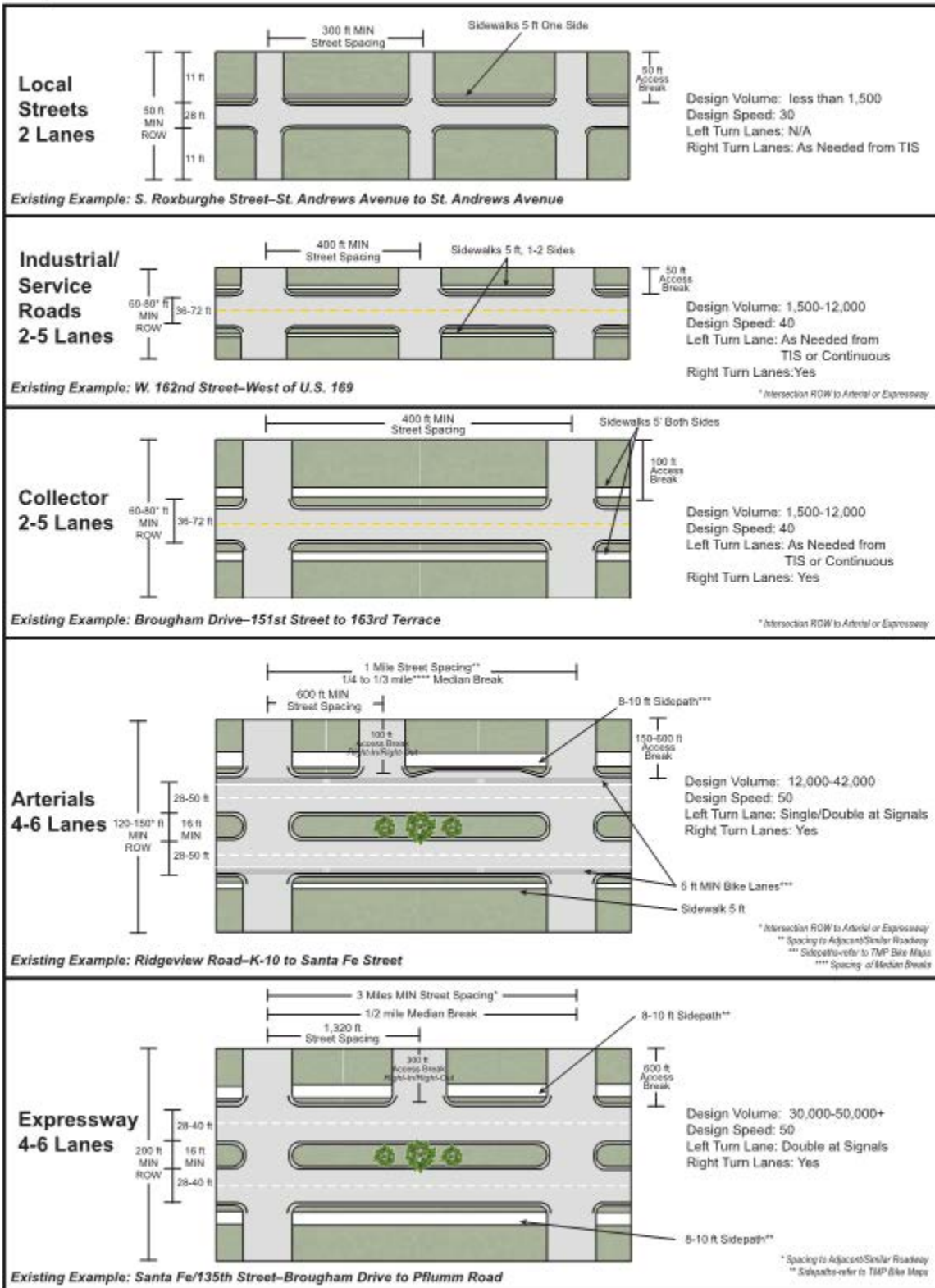
<p><b>Freeways</b></p>	<p>Freeways serve longer distance travel through the study area. They have the highest speeds, carry the higher volumes, and allow limited access via interchanges typically located one mile or more apart. Olathe is served by several freeways (I-35, K-10, and a portion of K-7) that connect the city to other parts of the Kansas City region.</p> <p>Although freeways are controlled by the state, they are vital to transportation within Olathe as well as to and from the region. Thus, it is important for Olathe to advocate for, and participate in, improvements to this system.</p>
<p><b>Expressways</b></p>	<p>Expressways are streets or highways that provide for rapid and efficient movement of a large volume of through traffic between major activity concentrations, frequently on a regional scale. No property access is allowed. Access to an expressway is provided through either interchanges or intersecting major streets.</p> <p>Currently only a few expressways exist in Olathe (Old 56 Highway and portions of both K-7 and Santa Fe (135th) Street), but the Major Street Map envisions several more in the future: Clare Road south of 151<sup>st</sup> Street, 151<sup>st</sup> Street west of Old U.S.-56, and Kill Creek Road from K-10 to 151<sup>st</sup> Street.</p>
<p><b>Arterials</b></p>	<p>Arterials provide for rapid and efficient movement of large volumes of through traffic between sections of the city and across the urbanized area. Arterials are not intended to provide primary land access service.</p> <p>Most of the City’s arterial system already exists, although much of it is in an unimproved state. The Major Street Map also shows future arterial alignments that will generally fill gaps in the network.</p>
<p><b>Collector Roadways</b></p>	<p>Collector roadways provide both land access and circulation within residential neighborhoods and commercial or industrial areas. Collectors typically function to interconnect neighborhoods. Collector roadways generally carry lower traffic volumes and accommodate shorter trip lengths than arterials.</p> <p>The Major Street Map shows numerous future collectors in growth areas of the City. The exact alignments of these roadways will be determined through the development review process, but the spacing indicated on the map (typically one-third mile) and the alignment of collectors across arterials are two key outcomes that that the map is intended to achieve.</p>
<p><b>Local Streets</b></p>	<p>Local streets typically carry no through traffic and provide access from homes or businesses to collectors or arterials. Future local streets are not mapped on the Major Street Map because their alignment and configurations are dictated through the development review process.</p>

Figure 4-1: Major Street Map



## Figure 4-2: Typical Street Widths

Street widths are back of curb to back of curb  
Drawings not to scale



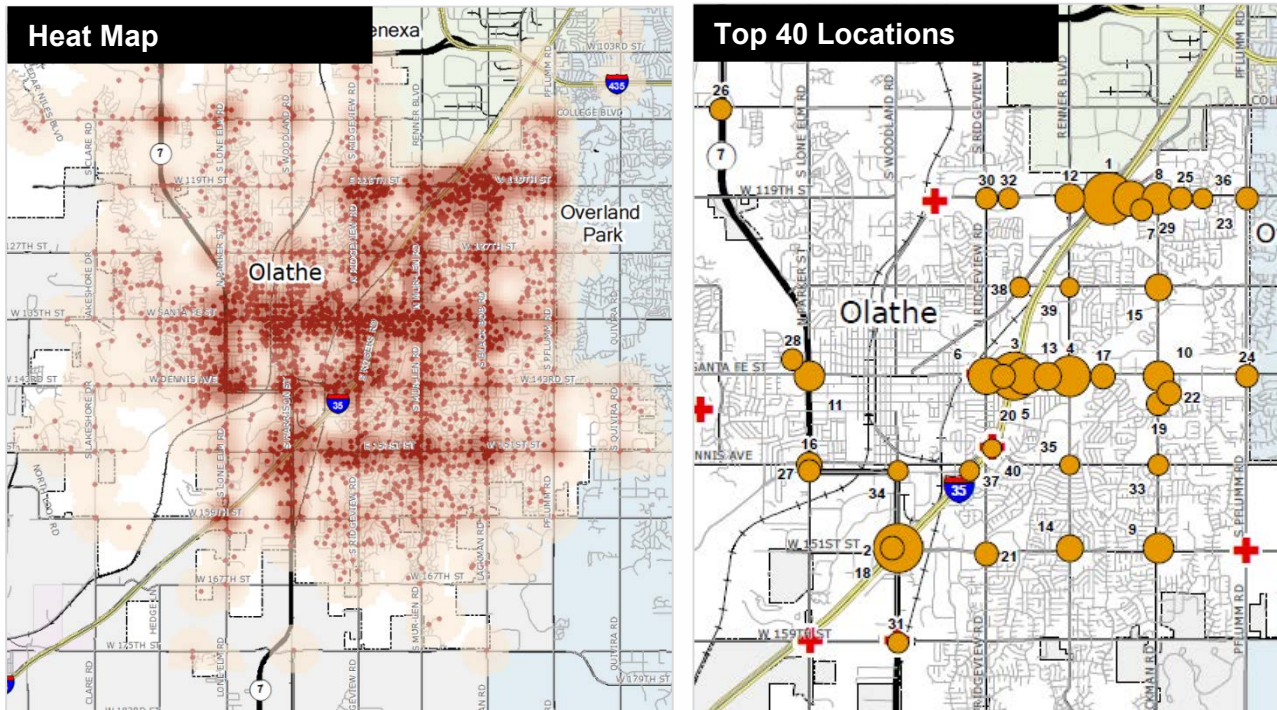


## 4.2 Safety

### Intersection Safety

The goal of the existing conditions safety analysis was to identify 20 (or more) higher-crash intersections within the City. Using the City's GIS system, the top 40 crash locations by total number of crashes were identified for a three-year period from August 1, 2011, through August 1, 2014. **Figure 4-3** contains a crash heat map and a map of the top 40 crash site locations.

**Figure 4-3: Reported Crashes, City of Olathe, 2011-2014**

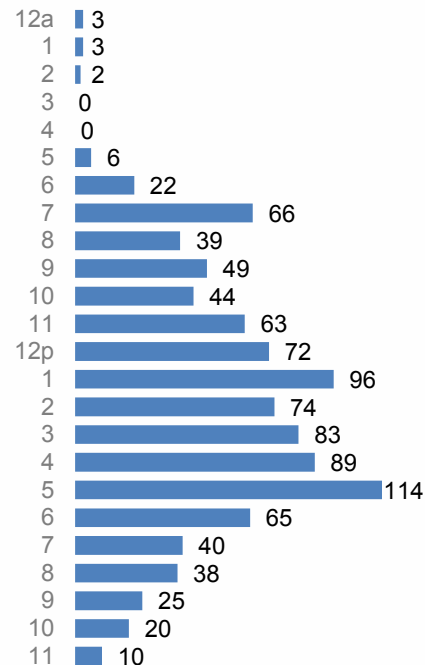


The GIS data was screened to remove crashes that did not occur as a direct result of an intersection – those in parking lots, along the roadway, and also at interchange ramp terminal intersections (which are unique intersections that are more appropriately analyzed separately). This screened list included 34 intersections, at which a total of 1,091 crashes occurred during the three-year period; as **Figure 4-4** indicates, these crashes were distributed fairly evenly over each year. **Figure 4-4** also breaks out these crashes into several categorizations, as described below:

- **Crash Severity:** Over three-quarters of crashes were Property Damage Only (PDO) crashes, and approximately 18 percent involved injuries. This data conforms to typical patterns found for crash severity throughout the United States. It is important to note that, while 186 injury crashes were reported via the crash reports some injury crashes involved more than one injury. This total included two fatal crashes.
- **Crash Type:** More than half the reported intersection crashes were rear-end collisions. Over a quarter of the crashes were angle collisions. Rear-end accidents are the most common crash type at signalized intersections.
- **Road Condition:** Over 80 percent of crashes occurred in dry conditions, and about one-eighth occurred in wet conditions. Snow, slush, and ice contributed to approximately 6 percent of the crashes.
- **Time of Day:** During the PM peak period, between 4:00 and 6:00 p.m., 294 crashes were recorded over the three-year period, representing approximately 25 percent of crashes. During the AM peak period, between 7:00 and 9:00 a.m., 178 crashes were recorded, representing approximately 15 percent of the crashes. It is common for the AM and PM peak hour periods to experience a high number of crashes due to a larger number of vehicles on the roadway.

**Figure 4-4: Crash Statistics, Top 29 Intersections**  
(Aug 2011 – Aug 2014)

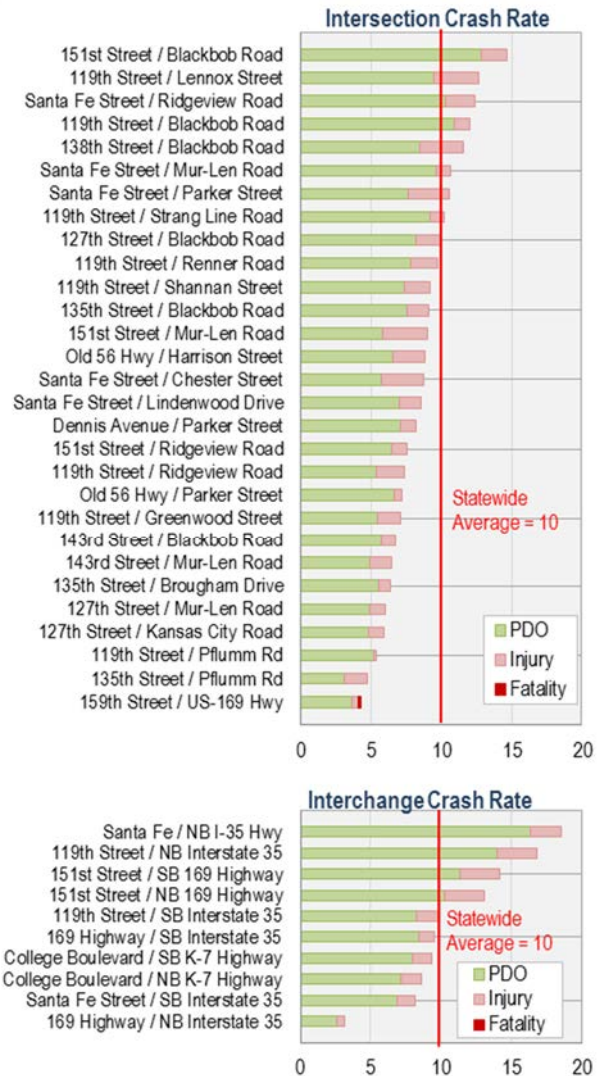
<b>Total Crashes</b>	1,091
<b>Year</b>	
2012	344
2013	384
2014	363
<b>Severity</b>	
Property Damage Only	892 (81.8%)
Injury	197 (18.0%)
Fatality	2 (0.02%)
<b>Type</b>	
Rear-End	558 (51.1%)
Angle	339 (31.1%)
Sideswipe	74 (6.8%)
Head-On	31 (2.8%)
Backed Into	14 (1.3%)
Other	75 (6.9%)
<b>Road Condition</b>	
Dry	885 (81.1%)
Wet	140 (12.8%)
Snow/Slush	39 (3.6%)
Ice/Snowpacked	26 (2.4%)
Mud/Dirt/Sand	1 (0.1%)
<b>Time of Day</b>	



Combining crash totals with traffic volume data allows the calculation of crash rates, as shown in **Figure 4-5**. On average, the at-grade intersections have a rate of 8.30 crashes per ten million entering vehicles (crashes/TMEV). In total, nine (9) of the intersections (highlighted in the Table) exceed KDOT's statewide average crash rate for intersections, which is 10 crashes/TMEV for urban intersections. The 151st Street/Black Bob Road intersection exhibited the highest intersection crash rate: 14.68 crashes/TMEV. This intersection was improved in early 2015 due to existing congestion issues and should continue to be monitored but is expected to show an improvement in crash rate.

**Figure 4-5** also includes interchange crash rates ranked and calculated in the same manner as intersection crash rates. On average, the interchange ramp terminal intersections have a rate of approximately 11.0 crashes/TMEV. The four (4) highlighted interchange ramp terminal intersections exceed KDOT's statewide average crash rate for intersections. The Santa Fe Street/NB I-35 Highway/Clairborne Road intersection has the highest interchange crash rate, with 18.44 crashes/TMEV. This has been a known high congestion area and is further analyzed in the Focused Analysis section with several recommendations for improvement.

**Figure 4-5: Calculated Crash Rates for At-Grade Intersections and Interchanges**



## Roadway Segment Safety

The intersection crash analysis highlighted two linear clusters of high-crash locations along both 119<sup>th</sup> Street and Santa Fe Street, both near I-35. These two corridors were further analyzed as sections. The 119<sup>th</sup> Street section consists of five intersections from the southbound I-35 ramp to Black Bob Road, and the Santa Fe Street section consists of five intersections beginning at Chester Street continuing on to Mur-Len Road. The section analysis did not consider side-street crashes. The section crash rate calculation uses the segment length, average daily traffic, and number of attributed crashes to determine a rate in terms of crashes per million vehicle miles traveled (MVMT). **Table 4-1** shows the calculated section crash rates for all crash severities.

KDOT develops statewide average section crash rates to provide a basis of comparison when calculating crash rates along study sections. Using KDOT’s Five-Year Highway Crash Statistics (2009-2013), the study team determined that an approximate statewide average crash rate of 3.0 crashes/MVMT would apply to the two section analyses shown in **Table 4-1**. As illustrated in the table, both the 119<sup>th</sup> Street and Santa Fe Street sections exhibited crash rates above the statewide average for urban roadways. Factors contributing to the high rate include the shortness of the section, the large number of access drives along both sections of roadway, the five signalized intersections in the span of less than a mile for both sections, and the interchange area contained within both sections of roadway.

A critical crash rate factor was calculated for both the 119<sup>th</sup> Street and Santa Fe Street sections to determine if they were high-crash locations. The critical crash rate is the maximum number of crashes expected to occur along a roadway section given the statewide average section crash rates, the length of the section, and the ADT volume for the section that is being analyzed. The critical crash rate factor is the ratio of the critical crash rate compared to the actual annual crash rate. The critical crash rate establishes an upper limit to determine if a segment crash rate is significantly higher than crash rates in facilities with similar characteristics. The critical rate is determined statistically as a function of the statewide crash rate for the facility category (i.e., highway or intersection) and the vehicle exposure at the location being considered.

The section is considered a high crash section if the critical crash rate factor is greater than 1.0. As **Table 4-1** indicates, the critical crash rate factors for both sections exceed 1.0. These segments are discussed further in the “Focused Analyses” section of this chapter.

**Table 4-1: Calculated Section Crash Rates**

Route	Section	Average Daily Traffic (ADT)	Section Length (miles)	2009 – 2011 Crashes				Million Vehicle Miles Traveled (MVMT)	Section Crash Rate (crashes /MVMT)	Statewide Average Section Crash Rate *(Crashes /MVMT)	Statewide Critical Crash Rate (C)	Critical Crash Rate Factor (A/C)
				PDO	Injury	Fatality	Total					
119 <sup>th</sup> St	I-35 SB Ramp to Black Bob Road	38,010	0.61	219	43	0	262	25.39	10.32	3.00	3.55	2.91
Santa Fe (135 <sup>th</sup> St.)	Chester Street to Mur-Len Road	36,650	0.78	346	53	0	399	31.30	12.75	3.00	3.49	3.65

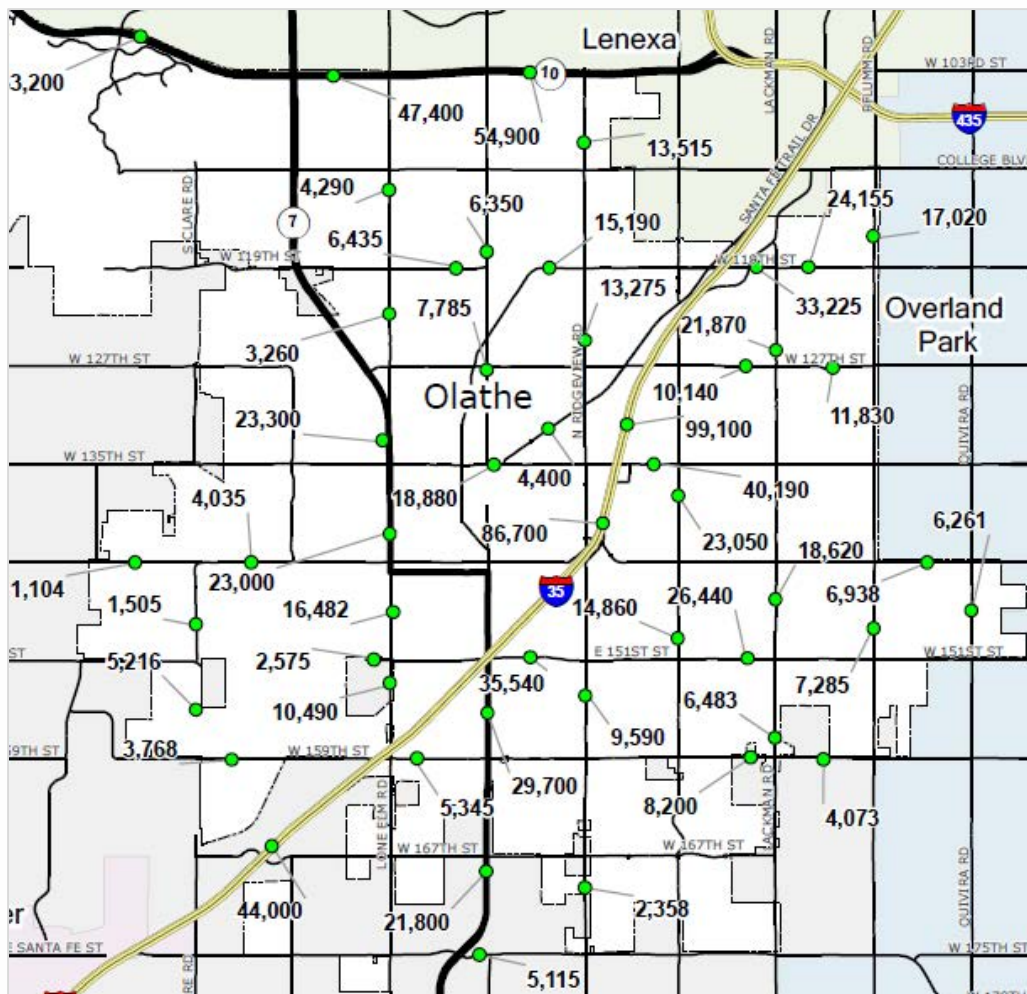
\*Statewide average section crash rate was based on an assumption of rates for varying 4-lane, 6-lane, and access options from KDOT’s Five-Year Crash Statistics (2009-2013).

## 4.3 Roadway Segment Needs and Priorities

### Existing and Future Traffic Volumes

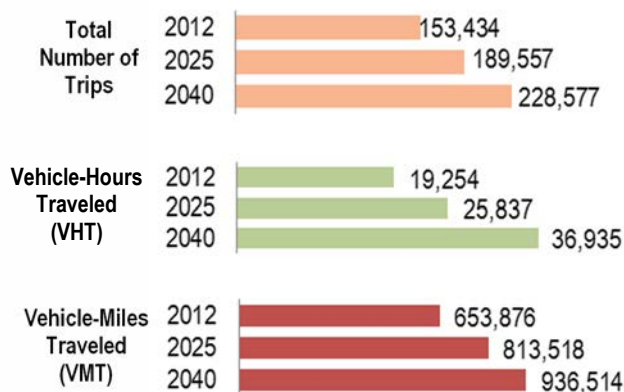
Daily traffic volumes within the study area are heaviest along major highways, such as I-35, I-435, and K-10, as well as major streets, such as 119<sup>th</sup> Street and Santa Fe (135<sup>th</sup>) Street. **Figure 4-6** illustrates the daily traffic volumes on major roadways within the study area. The highest traffic volume in the city is 116,000 on I-35 north of 119<sup>th</sup> Street. The daily volume on I-35 just north of Santa Fe (135<sup>th</sup> Street) is 99,000. The highest arterial street volumes are on Santa Fe (135<sup>th</sup>) Street just east of I-35 (40,190) and on 151<sup>st</sup> Street just east of I-35 (35,540).

Figure 4-6: Daily Traffic Volumes



The Olathe Travel Demand Model (TDM, see **Appendix B**) forecasted increases in the total number of hours, miles, and number of vehicle trips from current levels to the years 2025 and 2040 as shown in **Figure 4-7**. Volumes and miles are expected to increase by 23 to 24 percent between 2012 and 2025 and by 15 to 20 percent between 2025 and 2040. Vehicle-Hours Traveled (VHT) are expected to increase at a steeper rate, by 34 percent between 2012 and 2025 and by 43 percent between 2025 and 2040. This steeper increase in hours of travel indicates rising congestion levels, as the same trips are expected to take longer times if network capacity remains unchanged.

**Figure 4-7:**  
**Forecasted Travel Trends within Olathe,**  
**2012-2040** (Source: Olathe TDM)



## Roadway Segment Traffic Operations – 2025

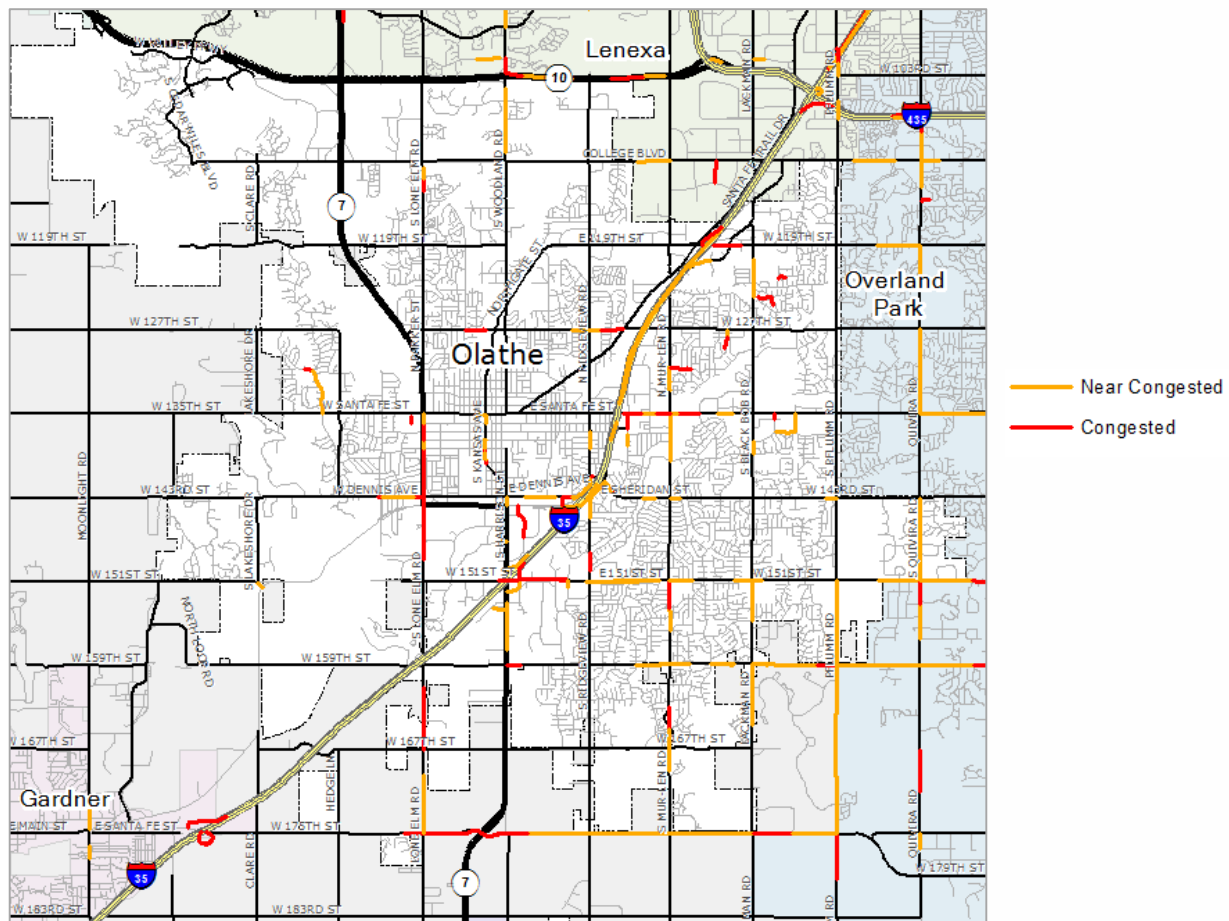
For the Year 2025 Travel Demand Model forecast, a street network was used that had projects included in the City of Olathe Capital Improvement Program (CIP), as well as future land-use data from the Olathe Comprehensive Plan. The list of committed CIP projects is shown in **Table 4-2**. **Figure 4-8** illustrates the

**Table 4-2: Committed Projects**

Project	From	To	Type
College Blvd	Woodland Rd	Lone Elm Rd	Widen to 4 Lanes
127 <sup>th</sup> St	Pflumm Rd	Black Bob Rd	Widen to 4 Lanes
143 <sup>rd</sup> St	Quivira Rd	Pflumm Rd	Widen to 4 Lanes
159 <sup>th</sup> St	Lone Elm Rd	Old US 56	Widen to 4 Lanes
I-435	Gateway Project	Phase 1	
I-435	I-35	Quivira Rd	Add Lanes
I-35	95 <sup>th</sup> St	119 <sup>th</sup> Street	Add Lanes

model-forecasted areas of congestion along the major roadways in Olathe for the year 2025. For the purposes of this figure, “Near Congested” is defined as occurring when traffic typically travels less than the speed limit during peak periods and experiences unstable flow, potentially including stoppages of momentary duration. “Congested” is defined as occurring when traffic operates at substantially reduced speeds, with stoppages potentially occurring for short or long periods due to downstream congestion; the section may serve as a “storage area” during parts or all of the peak hour.

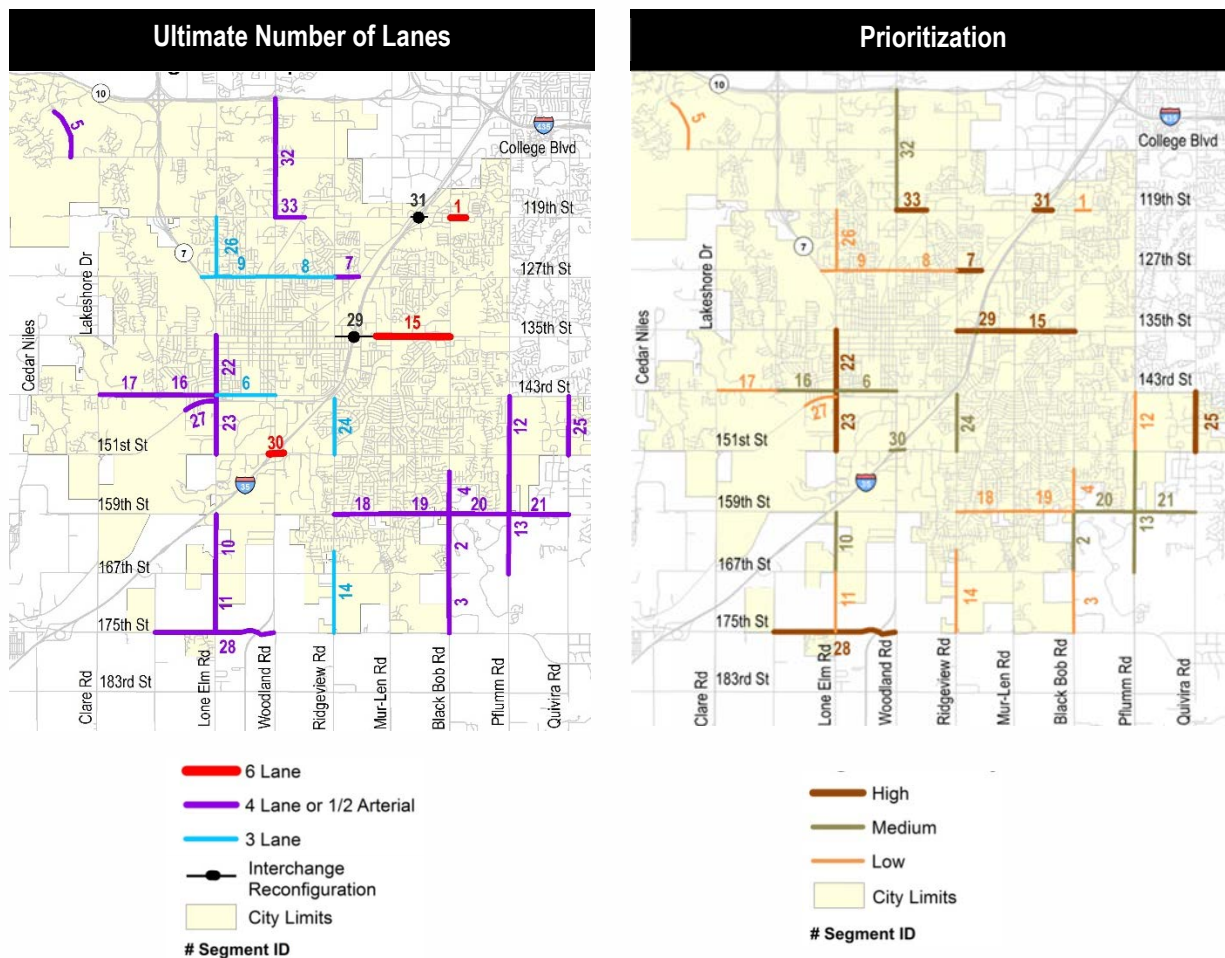
**Figure 4-8: Forecasted 2025 Congestion**



The Year 2025 forecasts show moderate levels of congestion on I-35 north of Santa Fe Street. The interchange areas of I-35 at 119<sup>th</sup> Street, Santa Fe Street, and 151<sup>st</sup> Street are forecasted to be congested. Congested traffic levels are forecasted on Santa Fe Street from I-35 to Brougham Drive, on 119<sup>th</sup> Street from I-35 to Orchard Drive, and on 151<sup>st</sup> Street from I-35 to Brentwood Road. Continued development southward is projected to result in near-congested traffic levels on sections of Mur-Len Road, Black Bob Road, and Pflumm Road. 175<sup>th</sup> Street also is forecasted to reach near congested levels, with a section at US-169 shown to be congested. Sections of K-7 (Parker) are forecasted to be congested. Traffic growth on Lone Elm is forecasted to result in sections that are near and at congested level. Two short sections of 127<sup>th</sup> Street are also forecasted to be congested: one is between Kansas City Road and Ridgeview, and the other is on a short section at and near the Burlington Northern railroad crossing.

To address the critical areas of future congestion and safety concerns, roadway segment improvements are identified in the left half of **Figure 4-9** and are prioritized in the right half of the figure using the methodology described in **Appendix B**, which categorizes them as high, medium, or low priority.

**Figure 4-9: Recommended Improvements and Prioritization, 2016-2025**





**Table 4-3** is a more detailed representation of the prioritized list of roadway segments (with ID numbers corresponding to those in **Figure 4-9**).

**Table 4-3: Roadway Segment Project Prioritization, 2016-2025**

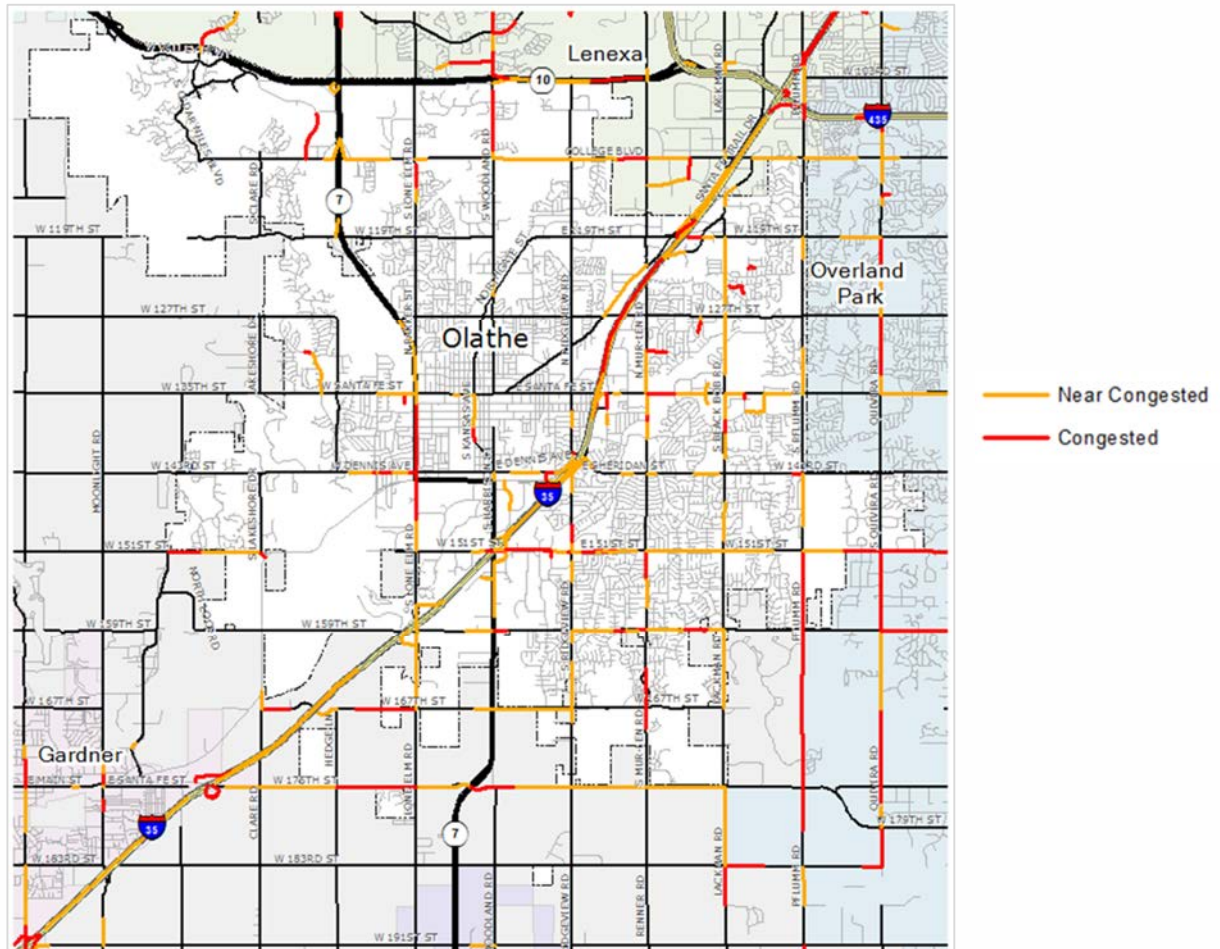
ID	Segment	Description	Mobility	Safety	Summary Rating	Priority
<b>Inside Olathe</b>						
* 15	<b>Santa Fe, Lindenwood to Black Bob</b>	6 lane	●	●		High
* 22	<b>K-7 Hwy, Santa Fe to Old 56 Hwy</b>	Add turn lanes; modify access	●	◐		High
23	Lone Elm Rd, Old 56 Hwy to 151st	4 lane	●	○		High
25	Quivira Rd, 143rd to 151st	1/2 arterial	●	○		High
* 29	<b>Santa Fe St, Ridgeview to Lindenwood</b>	Intchg Reconfig	●	○		High
33	119th St, Woodland to Nelson	New 4 lane road	◐	●		High
* 31	<b>119th St, Renner to NB I-35 Ramps</b>	Intchg Reconfig	◐	◐		High
* 2	<b>Black Bob Rd, 159th to 167th</b>	4 lane	◐	○		Med
7	Harold St, Ridgeview to Kansas City Rd	4 lane	◐	●		Med
13	Pflumm Rd, 151st to 175th	1/2 arterial	◐	○		Med
24	Ridgeview Rd, 143rd to 151st	3 lane	◐	●		Med
6	Dennis Ave, Parker to Harrison	3 lane	○	●		Med
10	Lone Elm Rd, 159th to 167th	4 lane	◐	○		Med
16	Dennis Ave, Hedge to Lone Elm	2-lane urban	◐	○		Med
20	159th St, Black Bob to Pflumm	4 lane	◐	○		Med
21	159th St, Pflumm to Quivira	4 lane	◐	○		Med
30	151st St, SB I-35 Ramps to Mahaffie	6 lane	◐	○		Med
32	Woodland, K-10 to 119th	4 lane	◐	○		Med
12	Pflumm Rd, 143rd to 151st	1/2 arterial	○	◐		Low
26	Lone Elm Rd, 119th to Harold	3 lane	○	◐		Low
1	119th St, Black Bob to Shannan	6 lane	◐	○		Low
* 4	<b>Black Bob Rd, N. of 153rd Terr to 159th</b>	4 lane	◐	○		Low
5	Cedar Creek Pkwy, College to South terminus	New 2-lane road	◐	○		Low
8	Harold St, Northgate to Ridgeview	3 lane	◐	○		Low
9	Harold St, K-7 to Northgate	3 lane	◐	○		Low
18	159th St, Ridgeview to Mur-Len	4 lane	◐	○		Low
19	159th St, Mur-Len to Black Bob	4 lane	◐	○		Low
3	Black Bob Rd, 167th to 175th	4 lane	○	○		Low
14	Ridgeview Rd, 164th to 175th	3 lane	○	○		Low
17	Dennis Ave, Lakeshore to Hedge	2-lane urban	○	○		Low
27	Old 56, Robinson to Lone Elm	4 lane	○	○		Low
<b>Outside Olathe</b>						
28	175th St, Hedge to Woodland	4 lane	●	○		High
11	Lone Elm Rd, 167th to 175th	4 lane	◐	○		Low

\* In Current CIP

## Roadway Segment Traffic Operations - 2040

**Figure 4-10** illustrates the model-forecasted areas of congestion along the major roadways in Olathe for the year 2040. For the Year 2040 forecast, the street network used assumed that the projects recommended for 2025 (**Table 4-3**) would be constructed by 2040.

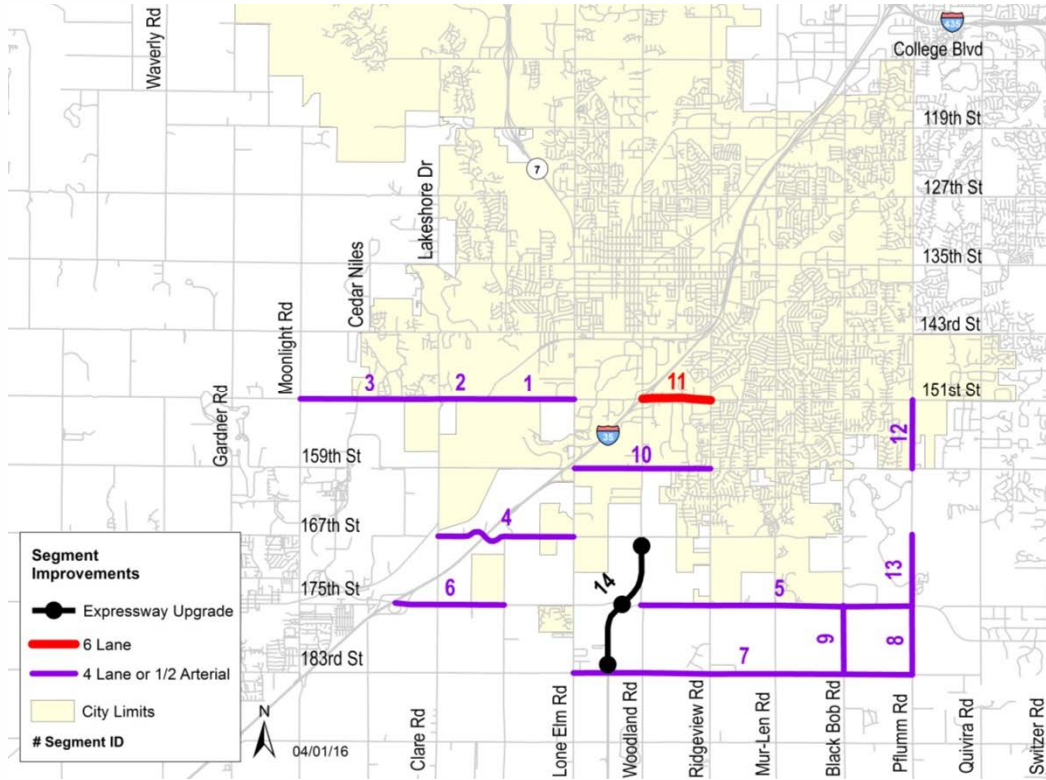
**Figure 4-10: Forecasted 2040 Congestion**



The year 2040 forecasts show moderate levels of congestion on I-35 north of 119<sup>th</sup> Street and between Old 56 and 151<sup>st</sup> Street. I-35 is forecasted to be congested between 119<sup>th</sup> Street and Santa Fe. Even with the year 2025 projects, many of the section-line arterial streets are forecasted to be nearly congested. The congested locations include K-7 (Parker Street); Pflumm Road south of 151<sup>st</sup> Street; Woodland Road from K-10 to College Boulevard; and shorter segments of 151<sup>st</sup> Street, 159<sup>th</sup> Street, 167<sup>th</sup> Street, and 175<sup>th</sup> Street. Projected traffic growth on Lone Elm Road results in sections that are forecasted near and at congested levels.

Based on the forecasted 2040 congestion, a list of additional projects was developed to address roadway needs for Year 2040 and beyond, as illustrated in **Figure 4-11** and shown in **Table 4-4**.

**Figure 4-11: Roadway Project Prioritization, 2025-2040**



**Table 4-4: Roadway Segment Project Prioritization, 2025-2040**

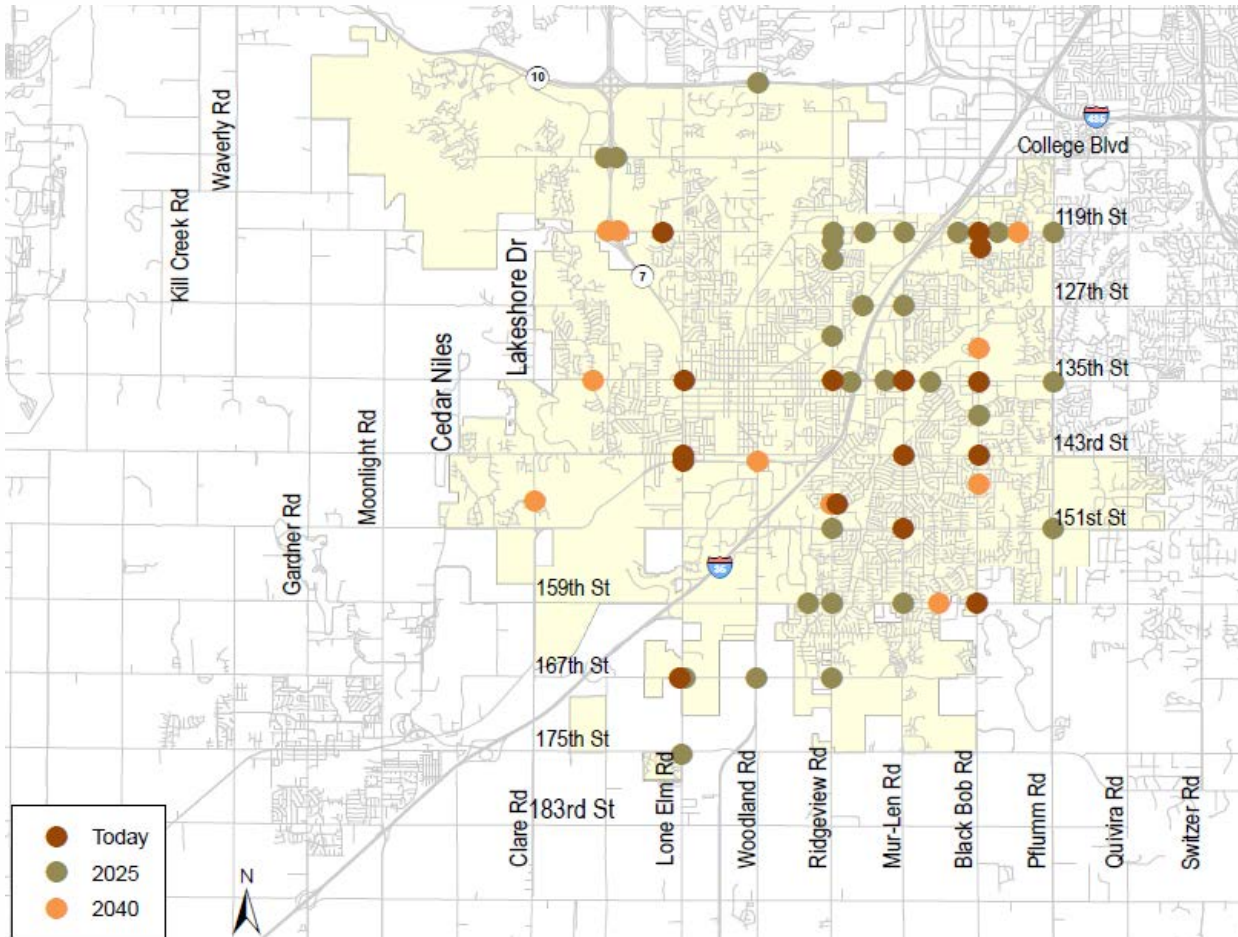
ID	Segment	Description	Mobility	Safety	Summary Rating
<b>Inside Olathe</b>					
5	175th St, Woodland to Pflumm	4 lane	●	○	▬▬▬▬▬▬
10	159th St, Lone Elm to Ridgeview	4 lane	●	●	▬▬▬▬▬▬
11	151st St, I-35 interchange area to Ridgeview	6 Lane	●	●	▬▬▬▬▬▬
1	151st Viaduct, Old 56 to Lone Elm	4 lane	●	○	▬▬▬▬▬▬
2	Old 56, Lakeshore to 151st	4 lane	●	○	▬▬▬▬▬▬
4	167th St, Clare to Lone Elm	1/2 arterial	●	○	▬▬▬▬▬▬
12	Pflumm Rd, 151st to 159th	Finish 1/2 arterial	●	○	▬▬▬▬▬▬
<b>Outside Olathe</b>					
3	151st St, Moonlight to Lakeshore	1/2 arterial	●	○	▬▬▬▬▬▬
6	175th St, I-35 to Hedge	4 lane	●	○	▬▬▬▬▬▬
7	183rd St, Lone Elm to Pflumm	1/2 arterial	●	○	▬▬▬▬▬▬
8	Pflumm, 175th to 183rd	Finish 1/2 Art	●	○	▬▬▬▬▬▬
9	Lackman, 175th to 183rd	4 lane	●	○	▬▬▬▬▬▬

See **Table 4-4** for a description of the Mobility and Safety ratings.

## 4.4 Intersection Needs and Priorities

In addition to analyzing road segments, the TMP examines key intersections throughout Olathe. **Figure 4-12** illustrates these intersections, prioritized over three different time horizons. The City of Olathe will continue to monitor intersection needs since these can quickly change as development occurs. Some of the intersection improvements may be included as part of future corridor improvements.

**Figure 4-12: Intersections Needing Improvements, 2016-2040**



## 4.5 Focused Analyses – Roadway Segments

The segment analyses described in previous sections revealed several locations that had multiple existing and future traffic/safety issues and grouped together naturally as corridors or complex junctions. These sections have been subjected to more detailed analysis and conceptual improvement development than the segments in **Section 4.3** and are described below. In general, most of these analysis areas will need detailed study in the future to determine the exact scope of necessary improvements, but the concepts identified in the TMP serve to establish order-of-magnitude costs for the levels of improvement needed to address existing and forecasted issues. These costs were developed as part of the segment prioritization process.

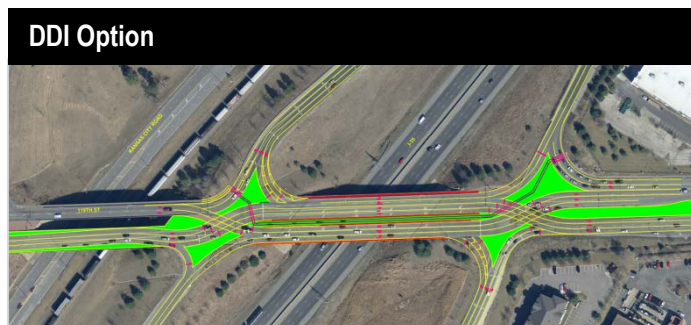
### I-35/119<sup>th</sup> Street

119<sup>th</sup> Street serves a major development district within the City and, as a result, carries a large amount of traffic to and from I-35. The 119<sup>th</sup> Street bridge carries eight lanes (including dual left-turn lanes for traffic accessing I-35) in a traditional diamond interchange configuration. Currently, 119<sup>th</sup> Street has some of the highest traffic volumes within the City, and the interchange experiences a high number of traffic-related crashes.



Development is heavy on both sides of I-35, and the City's Travel Demand Model (TDM) anticipates further traffic growth, particularly to/from the west side of I-35. The current traditional diamond configuration would require capacity improvements such as additional lanes to accommodate such demand – necessitating widening or replacing the bridge structure, at a significant cost. Alternative configurations to the current diamond configuration were reviewed that could improve capacity while reducing or eliminating the need to widen the bridge:

- *Single-Point Urban Interchange (SPUI)*: To operate efficiently under 2025 volume, the SPUI would require dual left-turn lanes at the interchange with three through lanes along 119<sup>th</sup> Street in each direction. Although this would mean that the bridge could continue to carry eight lanes, the configuration of the SPUI would require significant bridge/structural replacements or modifications. A typical benefit for SPUI interchanges includes increased spacing to adjacent intersections. At the current interchange, the adjacent intersections of Renner Road and Strang Line Road currently have sufficient spacing from the I-35 ramp terminals, thus lowering some of a SPUI's inherent benefits at this location.
- *Diverging Diamond Interchange (DDI)*: One advantage of a DDI is that it can improve left-turn capacity to and from the ramps without additional lanes on the bridge. Preliminary operational analysis was completed for both existing and 2025 traffic volumes and indicates that a DDI configuration would



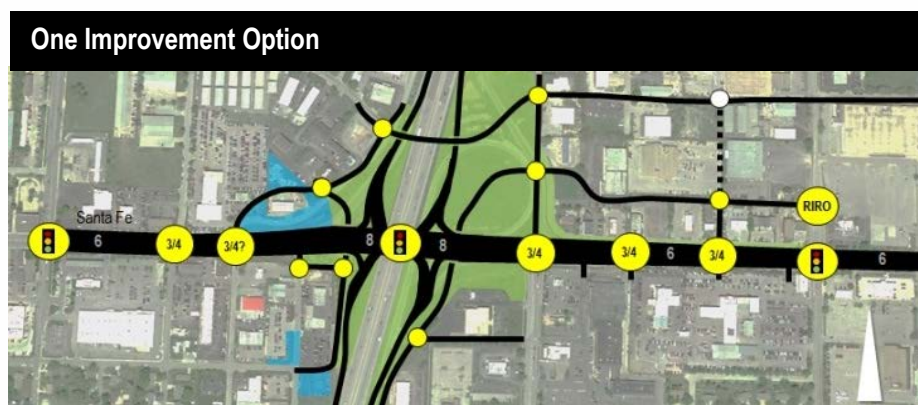
operate acceptably with the following lane configuration across the I-35 bridge: three lanes in the westbound direction (one through, one shared through/left, and a dedicated left-turn lane) and four lanes in the eastbound direction (two through, one shared through/left, and a dedicated left-turn lane). The exit ramps can be expected to operate efficiently with the following configurations: four lanes on the southbound I-35 exit ramp (dual right-turn and dual left-turn lanes) and three lanes on the northbound exit ramp (one left-turn and dual right-turn lanes). With these configurations, the ramp intersections are expected to operate at an acceptable LOS D or well beyond 2025. Thus, a DDI could provide operations that are acceptable at future traffic projection levels while offering the advantage of being constructible within the existing bridge's footprint. Reconfiguring ramps at the intersections and relocating pedestrian traffic into the median would be necessary, but it is anticipated that extensive retrofit or replacement of the bridges could be avoided. In addition to the cost savings and improved capacity, the DDI interchange configuration reduces conflict points at the interchange ramps, which may provide additional safety benefits.

More detailed conceptual operational analysis and schematics of the interchange improvements can be found in **Appendix C**.

### Santa Fe Street near I-35

The Santa Fe Street corridor from Ridgeview Road to Lindenwood Drive, which includes Santa Fe Street's interchange with I-35, is one of the busiest in Olathe. The corridor carries around 40,000 vehicles per day or more, and is unique among the interchanges in Olathe in that it has a great deal of local business access, along with major intersections fairly close to the interchange ramp terminals.

It is not the TMP's intent to develop a detailed solution for this corridor, but several high-level concepts and variations were developed to provide reasonable planning-level cost estimates. One of these concepts is shown at the right, and some of its elements can be used to describe the issues that a successful concept would likely need to resolve:



- *Basic through capacity:* The corridor currently carries two through lanes in each direction but will need to expand to three in each direction.
- *Spacing:* Intersection spacing near the interchange causes operational and safety issues. For example, the presence of Clairborne Road within less than 700 feet of the I-35 centerline severely constrains the ability of a standard diamond interchange to safely and efficiently move traffic. The northbound-to-eastbound off-ramp is the exemplar of this issue, creating a difficult merge within about 100 feet. The concept above addresses this issue by replacing the existing interchange with a Single-Point Urban Interchange (SPUI), in which all interchange ramps are brought to a single intersection, increasing spacing to the adjacent intersections.
- *North-south frontage roads:* Although I-35 has frontage roads north and south of the Santa Fe Street interchange, these frontage roads lose continuity at Santa Fe Street. The concept above addresses this issue by using the additional space afforded by the SPUI configuration to create underpasses connecting the frontage roads. An option like this would restore a more ordered grid pattern locally and would allow some vehicles to bypass the interchange area completely.
- *Access:* Retaining access to businesses adjacent to Santa Fe Street is important, but widening to increase capacity threatens to impinge on either parking lots on the south side or the frontage road on the north side. The concept above addresses this issue by creating a “backage” road behind the first row of existing businesses on the north side. This would allow the existing frontage road to absorb the Santa Fe Street widening while preserving access for all businesses. West of I-35, realignments and land swaps could improve access for businesses on both sides of Santa Fe Street.
- *East-West circulation alternatives:* An additional concept that could provide relief to the Santa Fe Street corridor is to provide a nearby alternative crossing of I-35. The above concept addresses this by extending 133<sup>rd</sup> Street across I-35, ultimately connecting with Ridgeview Road on the west side. If this were done, and the piece of 133<sup>rd</sup> Street between Black Bob Road and Greenwood Street were completed, 133<sup>rd</sup> Street would become a continuous collector from Ridgeview Road to Metcalf Avenue and would cross both I-35 and U.S.-69. Thus, part of the solution for a local problem could also provide regional benefits.

Several variations are possible using these general themes, but the option presented here is representative enough to be used for high-level costing purposes. To hone in on the best solution, the City should pursue a corridor study of Santa Fe Street near I-35, one that addresses traffic operations, multimodal connections, business access, and economic development opportunities.

### I-35/Old U.S.-56

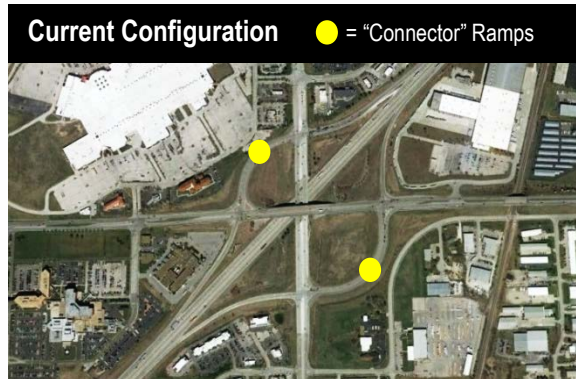
One focus area that generated interest at the start of the TMP process was the interchange of I-35 and Old U.S.-56. Because this interchange provides only two of four connections – movements to and from the north are provided, while movements to and from the south are not – the City was interested in evaluating the “completion” of the interchange.



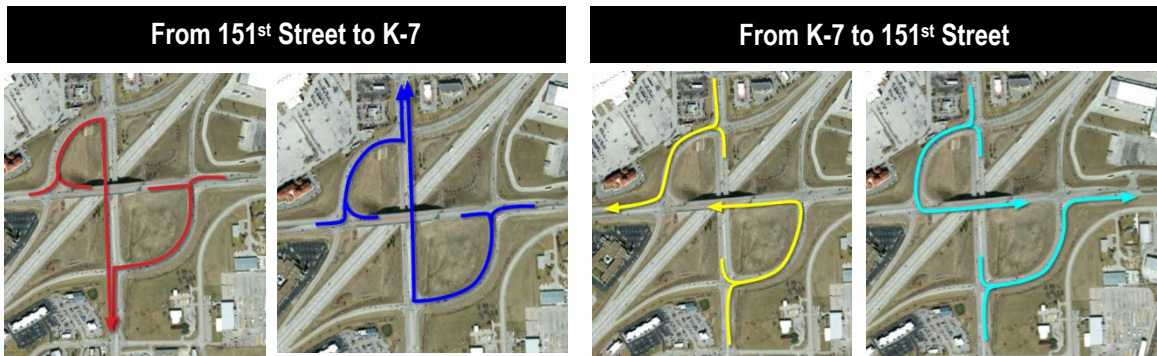
When the traffic model was run to determine the future demand for these “missing” movements, very little traffic was found to use these ramps in the future. This is largely due to the fact that I-35 is a diagonal freeway, and very few areas are served by the I-35 Old 56 interchange for which the 151<sup>st</sup> Street interchange is not a suitable alternative. Also, with the anticipated 151<sup>st</sup> Street extension across the railroad tracks and creek, demand for Old U.S.-56 is not expected to substantially increase. Thus, this connection was not subjected to further detailed analysis.

### I-35/K-7/151<sup>st</sup> Street

I-35 cuts diagonally through the intersection of 151<sup>st</sup> Street and K-7, thus creating a unique three-level interchange configuration. Currently, two signalized intersections connect the I-35 exit ramps to K-7, and two signalized intersections connect the I-35 entrance ramps with 151<sup>st</sup> Street. In between, two “Connector” ramps link K-7 to 151<sup>st</sup> Street. The current configuration is shown at right.



At the ramp terminal/“Connector” ramp intersections, all movements are currently allowed, resulting in redundant paths for certain movements. Illustrations of the redundant paths between 151<sup>st</sup> Street and K-7 are shown below.





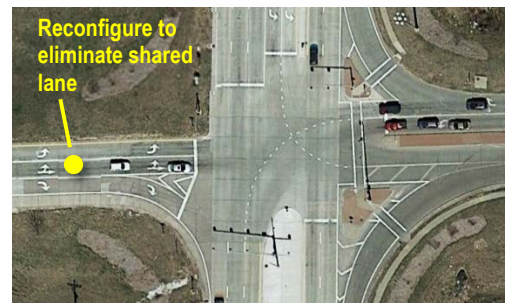
As Olathe continues to grow and expand – particularly to the south and west – K-7, 151<sup>st</sup> Street, and I-35 will experience traffic growth (as forecasted by the TDM), ultimately exceeding the interchange’s capacity. The following interchange improvements are recommended to accommodate future traffic from the two future analysis years:

- *Eliminate redundant movements where possible:* To accommodate increased traffic along 151<sup>st</sup> Street while maintaining the existing bridge across I-35, the redundant left-turn movements from 151<sup>st</sup> Street onto the “connector” ramps could be eliminated, in addition to the redundant left-turn movements from the “connector” ramps to 151<sup>st</sup> Street. The consequent removal of phases at the signalized intersections would allow additional green time for remaining phases, thereby increasing capacity. These redundant movements can be accommodated more efficiently elsewhere.
- *Add capacity where needed:* Capacity improvements fall into four categories:

*Direct ramp(s) from K-7 to I-35.* Based on future traffic forecasts, a dedicated northbound entrance ramp from K-7 to northbound I-35 (see graphic at right) would substantially improve traffic operations – by eliminating the need for traffic to “crossover” 151<sup>st</sup> Street via the “Connector” ramps, thereby reducing green time at the intersection. The ramp could potentially be installed between the existing bridge columns and the abutment. A collector-distributor (C-D) ramp would then be used to merge ramp traffic from both K-7 and 151<sup>st</sup> Street before merging with I-35 further downstream. A similar improvement could be mirrored and provided for southbound K-7 to southbound I-35 (dashed in graphic), but would probably not be needed as soon as the northbound ramp based on traffic forecasts.



*Off-ramp lanes and signal phasing.* Geometric improvements to provide dedicated (instead of shared) left-turn lanes at the I-35 exit ramps with K-7 would allow simultaneous left turns rather than split phasing, improving signal efficiency and thereby capacity. The current configuration of the northbound off-ramp is shown at right.



*151<sup>st</sup> Street intersection turn lanes.* Additional right-turn lanes should be added for eastbound and northbound traffic at the intersection of 151<sup>st</sup> Street with the east “Connector” ramp.

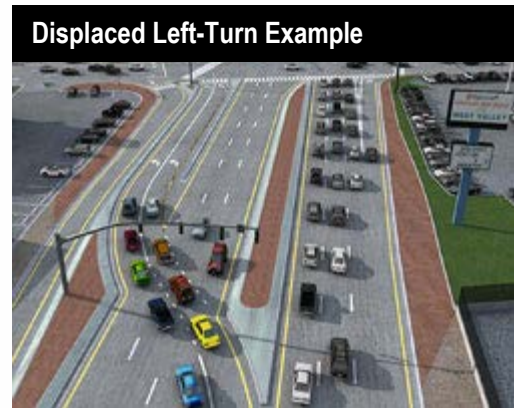
*Wayfinding.* Signing and wayfinding should accompany the improvements described above to help guide motorists through the interchange.

## K-7, Harold Street to Old U.S.-56

As mentioned in **Chapter 1**, K-7 was once envisioned to be converted to a freeway along this segment, but that concept is no longer considered an appropriate solution for the area. However, growth areas on the west side of the City will continue to increase traffic pressure on K-7, and strategies to facilitate future traffic demand must look at capacity enhancements both to K-7 and alternative routes.

The following improvements are recommended along the K-7 corridor itself:

- *K-7/Santa Fe intersection improvements:* This intersection is very busy, with many heavy movements – including north-south movements as well as movements between the north and west. This intersection is (and will be) a key bottleneck in the K-7 corridor. Although driveways are fairly set back from the intersection, existing development precludes radical solutions such as a traditional grade-separated interchange. However, alternative intersection configurations could potentially provide a solution. A Displaced Left Turn (DLT) configuration, also known as a Continuous Flow Intersection (CFI), could have application on one or more legs of the intersection. As shown at right, the DLT moves left turns to the left side of the road in advance of the intersection at a separate signal, allowing them to move simultaneously with “opposing” through movements at the main intersection – removing a signal phase and thereby increasing efficiency. Given spacing and storage requirements and constraints, it appears that this treatment could only be used for southbound-to-eastbound left turns, which would improve intersection Levels of Service for the near- and medium-terms (2025) but would not be inadequate to address long-term (2040) capacity issues.



Given the amount of space that appears to have been reserved near the intersection, a very tight grade-separation may be a viable long-term solution. The “windmill” interchange schematically shown above would be one possible implementation.

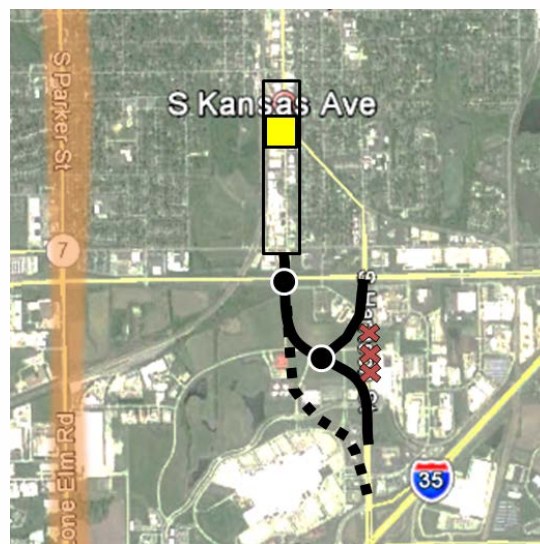
- *Widening from Santa Fe to Dennis Avenue:* As traffic grows on K-7, the four-lane undivided section between Santa Fe and Dennis Avenue will experience additional traffic pressure, especially at intersections and driveways due to lack of a left-turn lane. Thus, widening this 3,200-foot segment to a five-lane section (four lanes plus a center turn lane) would provide additional capacity. Widening might require slivers of right-of-way along some of the corridor and would probably also require undergrounding utilities.

- *K-7/Old US-56 improvements:* The proximity of Old US-56 to 143<sup>rd</sup> Street/Dennis Avenue (450 feet) creates queuing storage issues between intersections that will continue to increase as traffic grows. In the past, this intersection was grade-separated, but its diamond configuration was not suited for the close proximity to Dennis Avenue. The folded diamond sketched at right, in which all movements would be at unsignalized right-turns on K-7 and the movements on Old US-56 would be at signalized T-intersections, could eliminate the queuing problem between intersections and increase throughput capacity on both roadways.



Since options are limited at some of the key bottlenecks along K-7, and since K-7/Lone Elm Road is essentially the only continuous north-south roadway serving western Olathe, considering the possibility of connecting and improving parallel routes also forms part of the long-term recommendation for K-7:

- *Kansas Avenue Extension:* This improvement would involve connecting, improving, and extending South Kansas Avenue to connect with Old U.S.-56. A grade separation would be needed over the BNSF Railroad connector (as indicated by the yellow square in the graphic at right). This extension could swing to the east once it intersected with Old U.S.-56 and could join with a realignment of Harrison Street in the Great Mall area (which is currently the subject of redevelopment planning). This connection would create a higher-capacity, more direct connection from downtown Olathe to I-35 and destinations further south. This connection could probably be developed as a three-lane road largely within existing right-of-way (although utility lines on the west side might be affected). However, if additional capacity were needed, right-of-way could become a concern.



- *West side Connector:* Hedge Lane was once a potential road to provide north-south connectivity west of K-7, but the section north of Santa Fe Street has been realigned and repurposed and cannot function as a north-south connection. Thus, alternatives further west need to be investigated. The graphic at right shows a connection from the intersection of Clare Road and 127<sup>th</sup> Street, following various potential alignments, ultimately intersecting 151<sup>st</sup> Street, along a future westward extension. Further north, this extension could follow Clare Road, and a new connection could be formed between the intersection of Clare Road/119<sup>th</sup> Street and Valley Road/College Boulevard.
- *East-West Connector at 127<sup>th</sup>:* The figure at right also shows several options for creating east-west connections to a western north-south arterial. A direct extension of 127<sup>th</sup> Street to Harold Street would be difficult due to the presence of Ernie Miller Nature Center, but a northern alignment could skirt the edge of the park. A connection near 124<sup>th</sup> Street might also be an alternative worth considering. Various options are shown in the graphic.



All of these options would need to be studied in much greater detail and should be wrapped into a study of north-south travel options on Olathe’s west side. With the opening of Olathe West High School in 2017, access and circulation in this area will increase in importance.

## 4.6 Policy and Other Issues

### Policies

As Olathe continues to grow and evolve, several policy updates are worth considering:

- *Access Management:* The City's Access Management Plan was last revised in 2003. Since that time, national guidelines have advanced (the second edition of TRB's Access Management Manual was published in 2014), and so have state guidelines (KDOT updated its Access Management policy in 2013). The City should evaluate the need for modifications to its Plan to incorporate these updated documents. Key potential update items include performance measurement, multimodal considerations, network/local circulation issues, auxiliary lanes, and interchange area access management.
- *Transportation Impact Studies:* The City's current Transportation Impact Study Guidelines may need some revisions to refer to the bicycle maps included in the TMP. Also, some studies may want to consider additional items – such as safety, multimodal LOS, alternative peak-hours (such as an elementary school, in which very few trips occur during the p.m. peak hour), queueing analysis, truck trip generation, and parking generation. The City may wish to develop a checklist that can be discussed with developers up front regarding what elements are appropriate for a given study.
- *Traffic Calming:* The City currently has a Neighborhood Traffic Safety Program (NTSP) under which residents can report speeding problems or other neighborhood traffic issues. If these concerns are recommended for the program, engineering evaluations are made, and certain resources may be deployed, such as education efforts, public information, radar trailers, signing, additional enforcement, or traffic calming methods. Follow-up studies are conducted to determine the impact of any implemented actions.
- *Complete Streets:* **Section 2.4** discusses recommendations regarding the establishment of a Complete Streets policy for the city of Olathe. The City currently works to consider the needs of all users when planning and designing streets, trails, developments, and sidepaths/sidewalks and is increasingly focusing on the presence of transit and the need to improve connections along these routes. A Complete Streets policy would formalize these practices and would have additional benefits as described in Chapter 2.
- *Design Standards:* **Section 4.1** includes dimensions for various roadway functional classes within the City. The City is in the process of updating design standards to reflect these dimensions.

## **Intelligent Transportation Systems (ITS)**

Communications exist to connect traffic signals and other field devices to a central location at the Traffic Operations Center (TOC) on Rogers Road near I-35. The City currently runs coordinated signal timing plans on a Time-of-Day (TOD) schedule for most signals/corridors within the City. Closed Circuit Television (CCTV) cameras are used to monitor traffic conditions and incidents.

As technology evolves, the City should keep abreast of technologies such as autonomous and connected vehicles to understand the impacts they may have on the City's transportation system going forward.

## **Monitoring**

With an ever-increasing emphasis on well-planned, cost-effective infrastructure investments at the national, state, and local levels, transportation performance measurement is becoming more of a priority for municipalities. Systematic, regular monitoring of transportation assets provides an excellent means for public works departments to remain accountable to their elected officials and citizenry. Modern data-collection and analysis technology has expanded the possibilities, and lessened the expense, of this type of monitoring.

With this in mind, it is recommended that Olathe establish an annual congestion and safety monitoring program. It is envisioned that this could take the form of an annual report to Council that reports Level of Service for the top 20 most congested intersections in the City and crash statistics for the top 20 high-crash locations in the City. This report could then examine mitigation measures and make recommendations, as appropriate, for intersections where such measures can be identified.

Smartphones, GPS, and other technologies are making citywide data-gathering more affordable and useful. For the longer term, it is recommended that the City begin to monitor traffic conditions citywide using such technologies. Speed data can be used to detect incipient congestion and peak trends – this data could be rolled into annual reports and aggregated to citywide congestion statistics. Such data is available from several private vendors and is anonymized to preserve individual privacy; it is recommended that the City initiate discussions with those vendors and begin gathering and analyzing this data.

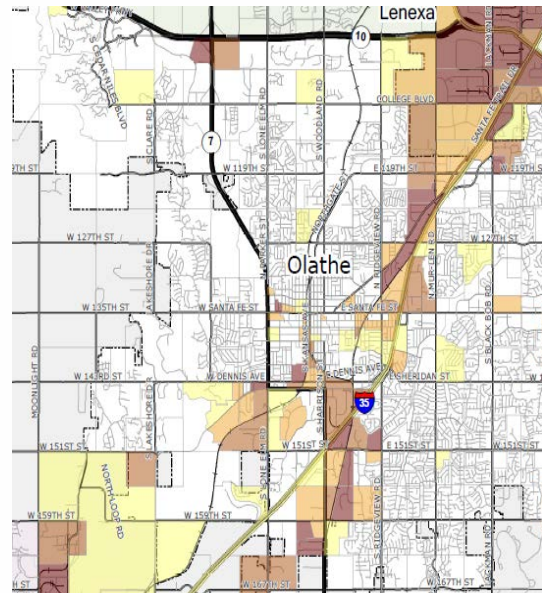
## 5.0 FREIGHT

Two major railroad lines and a major interstate cut diagonally through Olathe; this has always contributed to the city's significance as a home for freight-generating land-uses. As **Figure 5-1** illustrates, this diagonal corridor is home to most of the industrial land in the city. The 2013 opening of BNSF's Kansas City Intermodal Facility (KCIMF), roughly 10 miles southwest of Olathe in Edgerton, means Johnson County is now becoming more of a hub for industrial/warehouse development. Although the majority of the truck traffic generated by the KCIMF will remain on the interstate system, spinoff industrial development is expected to occur in Olathe and surrounding cities, bringing new truck traffic to Olathe's roads.

Train traffic is also expected to increase (both frequency and train length) along the rail lines through Olathe, further increasing delays for drivers on Olathe roads at at-grade crossings.

The TMP's primary focus with regard to freight is the examination of the effects these additional train and truck movements will have on other transportation modes within the City.

**Figure 5-1: Industrial Density in Olathe**  
(darker colors = more dense)



## 5.1 Rail

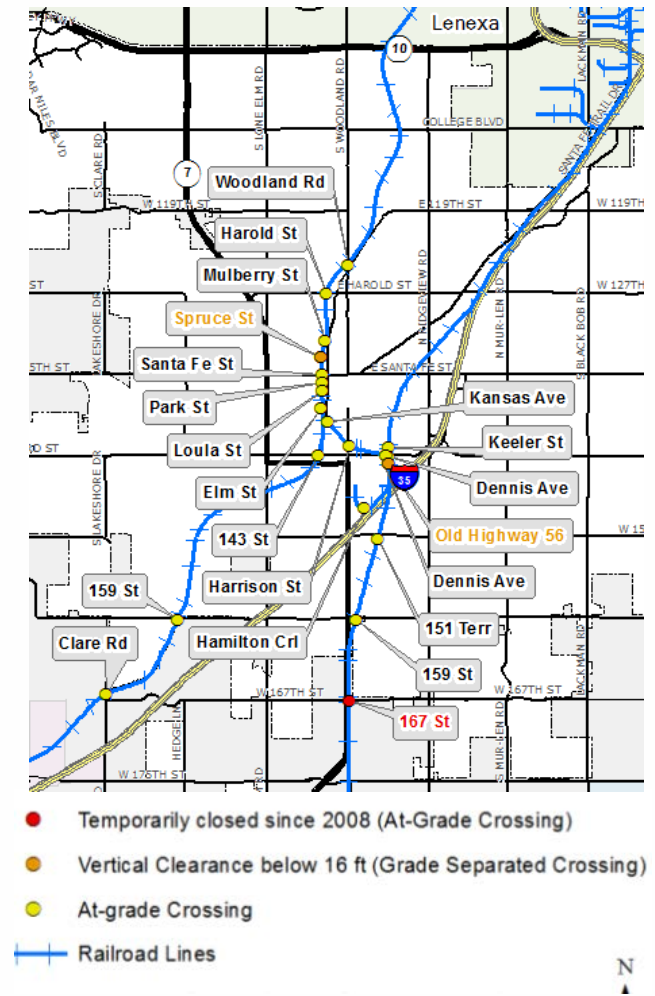
### Existing Infrastructure

**Figure 5-2** illustrates existing rail lines and grade crossings in the study area. Two major BNSF lines run through Olathe:

- The West Tracks (Emporia Subdivision) carry freight from Los Angeles and Long Beach, California, to Chicago, Illinois. As **Figure 5-2** illustrates, these tracks cross 11 Olathe streets, 10 at grade.
- The East Tracks (Fort Scott Subdivision) carry freight from the coal fields in Montana and Wyoming to power plants in the Southern United States. In 2008, the City completed a \$43 million “Raise the Rails” project that elevated 1.57 miles of double-track grade separating over four fairly major roads in western Olathe between I-35 and Downtown, including Santa Fe Street. The tracks remain at grade at several Olathe streets, including Dennis Avenue, 151st Terrace, and 159th Street.

These two mainline tracks are cross-connected in the center of Olathe by the “Southgate Spur,” which carries seven to eight trains per day. The single-track spur is at grade for its entire one-mile (approximate) length, crossing Kansas Avenue, Harrison Street, Keeler Street, and Dennis Avenue.

**Figure 5-2: Key Rail Grade Crossings**





## Existing Quiet Zones

Quiet Zones have been recently implemented on each of the two mainlines:

- The West Tracks enter Olathe at Clare Road at the southwest city limits, traverse the center of the city, and exit at K-10 on the north (9.75 miles in length). This line has a locomotive horn quiet zone from one-fourth mile north of 159th Street to the northern city limits (8.23 miles), with grade separations at Lone Elm Road, K-7, West Spruce Street, College Avenue and K-10.

Supplementary Safety Measures (SSMs) were implemented at all at-grade crossings within this railroad corridor to allow for the establishment of this quiet zone. Three crossings were closed: West Cedar Street, West Poplar Street, and West Prairie Street. Non-traversable medians were installed at West Dennis Avenue, West Loula Street, West Mulberry Street, West Harold Street, and Woodland Road. Four-quadrant gate systems were installed at West Elm Street, West Park Street, and West Santa Fe Street.

Only one property damage only incident has been reported in Olathe on this line by the Federal Railroad Administration's "Highway-Rail Grade Crossing Accident/Incident Report" since the December 1, 2011, establishment of the quiet zone: a stalled unoccupied vehicle on the tracks at the West Loula Street crossing was impacted by a BNSF freight train at 1:45 a.m. on February 27, 2013.

- The East Tracks enter Olathe south of 159th Street, and traverse Olathe to the Lenexa city limits near 114th Terrace (5.95 miles in length). This line has a locomotive horn quiet zone from one-fourth mile north of East Dennis Avenue to the Lenexa city limits (3.71 miles). This line has grade separations at 151st Street, I-35, Old U.S.-56, East Park Street, East Loula Street, Santa Fe Street, Ridgeview Road, East 127th Street, and East 119th Street. The line has an at-grade crossing at 159<sup>th</sup> Street. SSMs were implemented at all at-grade crossings north of East Dennis Avenue to allow the quiet zone to be established on this line. The West Cedar Street crossing was closed, and the double mainline track was elevated over West Loula Street, West Park Street, Santa Fe Street, and Ridgeview Road.

This line has no at-grade crossings within the quiet zone; thus, there have been no at-grade crossing accidents.

## Quiet Zone Alternatives

An alternative to using the on-board locomotive horn is installing the Wayside Horn Systems (WHS). WHS is an actuated system that provides a locomotive horn sound at each approach. Using an at-grade crossing locomotive sound system decreases decibel levels within undesired areas versus an on-board locomotive horn. While the WHS allows the engineer to avoid blowing the on-board locomotive horn, it does not technically make the crossing a Quiet Zone.

To use a WHS, a crossing must be equipped with a flashing-lights-and-gates signal system with constant warning time train detection circuitry and power out indicators. The system must have a fail-safe indication system to notify the locomotive engineer when the WHS is not functioning properly, so the on-board locomotive horn can be sounded. Requirements exist for sound levels, coverage, and duration. A WHS can be installed at a stand-alone crossing or can be included within a Quiet Zone addressing other crossings that are being treated with Supplementary Safety Measures (SSMs).

The WHS is a traffic control device owned and maintained by the jurisdiction with route responsibility. Hardwire interconnection with the train signaling system is required. While costs can vary greatly by the geometry and configuration of the track and streets, a current estimate of installation costs would be in the range of \$120,000, with the annual expenses to be in the range of \$10,000 to \$20,000.

### Existing Rail Volumes and Exposure

As **Table 5-1** indicates, the West Tracks (Emporia Subdivision) carry 88 trains per day, and the East Tracks (Fort Scott Subdivision) carry 38 trains per day. Information on train volume growth is not typically available and fluctuates with the economy, but FRA indicates an expected overall 22 percent growth in U.S. freight rail tonnage between 2010 and 2035, increasing to 35 percent by 2050. These order-of-magnitude growth rates can be applied to trains through Olathe to develop a sense of rail’s future impact.

**Table 5-1** also includes the concept of *exposure*, which is the product of daily train and automobile volumes at an at-grade crossing. Higher exposure rates tend to increase the probability of crashes, although other factors such as crossing geometry or crossing protection also play a role. As the table indicates, the crossing at Santa Fe Street has more than double the exposure of the next highest crossing. This is because automobile traffic volumes crossing the tracks at Santa Fe Street are much higher than volumes at all the other crossings.

**Table 5-1: Volumes and Exposure – Select At-Grade Crossings**

Cross-Street	Rail Subdivision	Functional Classification	ADT	Trains/Day	Exposure*
Santa Fe St	Emporia 7100	Arterial	14,424	88	1,269,312
Harold St	Emporia 7100	Arterial	5,964	88	524,832
143rd St	Emporia 7100	Arterial	5,904	88	519,552
Loula	Emporia 7100	Local	3,699	88	325,512
Dennis Ave	Fort Scott 1001	Arterial	6,644	38	252,472
Woodland	Emporia 7100	Arterial	2,065	88	181,720
Elm	Emporia 7100	Local	1,931	88	169,928
159th Str (east of K-7)	Fort Scott 1001	Arterial	3,130	38	118,940

\* Exposure is the product of trains/day and ADT (Trains per day X ADT).

## Delay at At-Grade Crossings

**Table 5-2** contains a summary of delay, safety, costs, and potential desirability of grade-separating each major at-grade railroad crossing within Olathe. The components were calculated as follows:

- Delay was calculated based on automobile traffic volumes, train frequency, train length, train speed at the crossing, and crossing signal timing. The delay was extrapolated to an annual value.
- The cost of delay was based on an average wage rate of \$15/hour and assumed an average occupancy of 1.7/persons per vehicle.
- Crashes were predicted based on annual crash predictions included in the FRA grade crossing database.
- Crash costs were developed based on an average cost per crash of \$482,600 (a figure published by the Nebraska Department of Roads).
- Grade separation cost estimates were based on preliminary engineering estimates of probable construction costs. It is important to note that the stretch of track from Harold Street to Dennis Avenue would all have to be grade-separated as a single project, similar to the “Raise the Rails” project on the eastern tracks.
- To calculate Benefit-Cost Ratios (BCRs), it was assumed that all the delays and crashes caused by the presence of the tracks would be eliminated – this is the “benefit” portion. This benefit was divided by the estimated construction cost. No standard “warrants” exist for grade separating railroad crossings (although research is currently under way to develop some); however, the BCR is one indicator of whether a crossing is needed. A BCR greater than 1.0 is a fairly good justification. As **Table 5-2** indicates, the only crossing that would meet this criterion would be 159<sup>th</sup> Street west of K-7. In fact, the City currently has a construction project in progress on 159<sup>th</sup> Street that includes a grade-separated crossing and a higher-capacity connection to I-35.

**Table 5-2: Delay and Crash Costs – Select At-Grade Crossings**

Cross-Street	Estimated Cumulative Delay & Crash Cost (\$millions)			Estimated Structure Cost (\$millions)	Benefit-Cost Ratio (BCR)		
	2012-2025	2025-2040	2012-2040		2012-2025	2025-2040	2012-2040
Harold Street	\$8.3	\$10.1	\$19.9				
Woodland Street	\$3.3	\$6.7	\$10.7				
Santa Fe Street	\$10.0	\$14.5	\$23.6				
Loula Street	\$2.3	\$3.2	\$5.9				
Elm Street	\$1.4	\$2.5	\$4.3				
Dennis Avenue	\$3.7	\$5.2	\$8.7				
<b>Subtotal</b>	<b>\$28.4</b>	<b>\$41.6</b>	<b>\$72.0</b>	<b>\$106.0</b>	<b>0.3</b>	<b>0.4</b>	<b>0.7</b>
159 <sup>th</sup> Street (east of K-7)	\$9.3	\$9.9	\$11.9	\$26.6	0.4	0.4	0.4
159 <sup>th</sup> Street (west of I-35)*	\$1.7	\$4.9	\$6.7	\$4.5	0.4	<b>1.1</b>	<b>1.5</b>
167 <sup>th</sup> Street (east of K-7)	\$1.0	\$2.5	\$3.6	\$3.9	0.3	0.6	0.9

\*Crossing in the process of being grade-separated. See text.

## Vertical Clearance Constraints

Two railroad overpasses in Olathe, indicated in **Table 5-3**, have a vertical clearance lower than the 16-foot standard, and these heights can impede truck traffic:

- Old U.S.-56 has a vertical clearance of 14 feet 6 inches. This allows for all standard height trucks to pass safely and would not presently warrant replacing the grade separation to solely address this vertical clearance constraint.
- The Spruce Street underpass has an 11-foot 4-inch vertical clearance, which can present issues for solid waste trucks, delivery trucks, and fire department trucks using this locally functionally classified street. Raising the girders on the railroad bridge over Spruce Street could be accomplished by additional ballast on the rail approaches to the bridges. The need and value of increasing the vertical clearance should be evaluated in relation to the trash and fire equipment trucks that would use this underpass. This underpass is the only grade separated crossing of the busy Western tracks from K-7 on the south to College Boulevard on the north, a rail corridor length of 3.5 miles. The length and time of travel required to divert emergency fire equipment when at-grade crossings are blocked is also an item to be considered in evaluating the need to raise the vertical clearance at the Spruce Street underpass.

**Table 5-3: Vertical Clearance Lower than 16 Feet**

Rail-road	Route Crossing Under	Location	Smallest Vertical Clearance	Average Daily Traffic	Functional Classification of Route	Avg Trains/Day
BNSF	Old Highway 56	0.5 mile East of K-7 (Harrison St.)	14'6"	12,000	Urban Minor Arterial	38
BNSF	Spruce Street	0.7 mile East of K-7	11'4"	3,933	Urban Collector	88

## Recommendations (Rail)

Based on the information presented in this section, the following items are recommended:

- Begin monitoring delays at all key at-grade crossings using modern technology.
- Review three additional at-grade crossings for potential Quiet Zone implementation:
  - *West Rail Line*: Clare Road
  - *East Rail Line*: 151<sup>st</sup> Terrace and 159<sup>th</sup> Street

## 5.2 Trucks

### Existing Truck Infrastructure and Policies

Although there are no specifically designated truck routes in Olathe, City Code 10.24.020 specifically prohibits truck traffic on the streets shown in **Figure 5-3**, with certain exceptions such as moving vans and local deliveries. In the northern part of the city, these prohibitions are generally designed to restrict “through” trucks to state facilities (K-7 and K-10), discouraging “cut-through” movements on both east-west arterials (College Boulevard, 119<sup>th</sup> Street, Harold Street) and north-south arterials (Lone Elm Road and Woodland Road). Ridgeview Road between K-10 and Santa Fe Street is not subject to this prohibition, in recognition of the industrial areas it directly serves. In the southwest portion of the city, the restrictions are generally oriented toward encouraging use of Old 56 Highway as opposed to Dennis Avenue and Lakeshore Drive.

Vertical clearances related to grade-separated rail crossings were discussed in Section 5.1.

### Truck Volume Growth

Truck volumes are expected to continue to grow, as warehouse development (largely related to KCIMF in Edgerton) continues. The Olathe Travel Demand Model’s land-use component assumes an additional 33,033,914 square feet of industrial development by 2025, and a further growth of 47,732,733 square feet by 2040. **Figure 5-4** illustrates truck productions expected to develop by 2040 in the modeled area. The highest truck productions are expected to be located along major highways, including I-35.

Figure 5-3: Prohibited Truck Routes

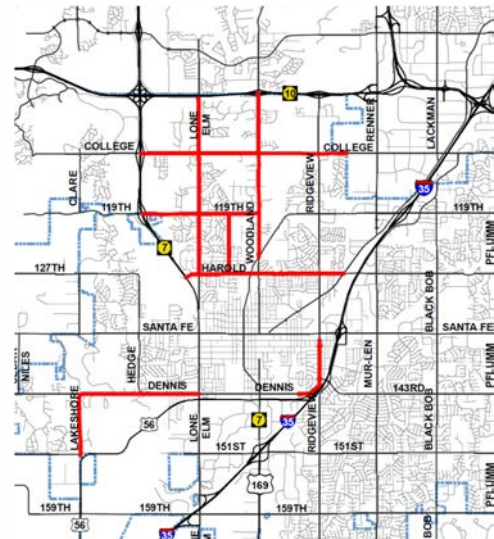
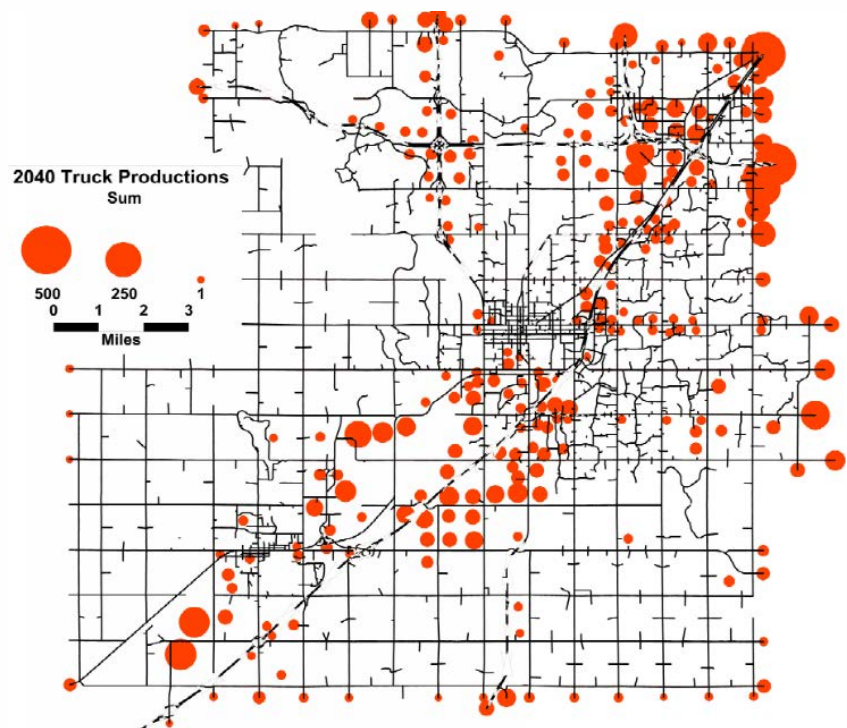


Figure 5-4: 2040 P.M. Peak-Hour Truck Productions



**Figure 5-5** illustrates truck peak hour flow expected in 2040. The majority of truck traffic is expected to move along Olathe's major highways, I-35, I-435, K-10, and K-7. Arterials with notable forecasted truck traffic include 119<sup>th</sup> Street, Santa Fe Street, 151<sup>st</sup> Street, and 175<sup>th</sup> Street.

### Recommendations (Trucks)

Based on the information presented in this section, the following items are recommended:

- Consider designating truck routes in the southern portion of the city, encouraging trucks to use corridors adjacent to appropriate land uses (industrial and commercial). Along these facilities ensure adequate infrastructure including bridges, intersection curb radii, grades, and active transportation accommodations.
- Roadways anticipated to experience heavy truck traffic should have pavement design performed by a geotechnical engineer to ensure the longevity of the infrastructure investment.
- In industrial areas anticipated to experience significant truck traffic, wider industrial and collector roads may be desired to accommodate truck staging, particularly if on-site storage may be insufficient. Parking prohibitions (on one or both sides) may be necessary to maintain an orderly flow of traffic.

**Figure 5-5: 2040 Truck Peak-Hour Flow**

