

TRANSPORTATION SAFETY ANALYSIS



Transportation Corridor in Central Basehor, Kansas 155th Street, 158th Street & Parallel Road



MHS Project No. 2019.050.009

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August 2020

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EXECUTIVE SUMMARY

The City of Basehor has requested a Transportation Safety Analysis for its most heavily utilized corridors at the geographic center of the city. This report will assess the existing infrastructure in comparison to the City's goal of providing accessible roadway corridors for all ages, abilities, and transportation modes. The proposed recommendations presented in this report are in accordance with the *Together Toward Zero 2018-2022 Kansas City Regional Transportation Safety Blueprint*, the *Manual for Uniform Traffic Control Devices*, and the City's past experiences and successes.

This analysis references the *155th & Parallel Traffic Impact Analysis, 2018* prepared by Priority Engineers, Inc. and existing traffic counts conducted by the City of Basehor in August 2019. Future growth trends are outlined in the *Comprehensive Plan for the City of Basehor, Kansas, 2019*.

SECTION I. INTRODUCTION

The studied corridor consisting of 155th Street from Wolf Creek Parkway to Elm Street, Parallel Road from 155th Street to 158th Street, and 158th Street from Garden Parkway to Parallel Road is illustrated in Figure 1 and consists of 2.0 miles of existing two-lane, open ditch roadway. Due to the proximity of State Avenue (24 / 40 Highway), the Central Basehor study area is a frequented corridor for traffic traveling to residences and businesses both inside and outside of the study area.

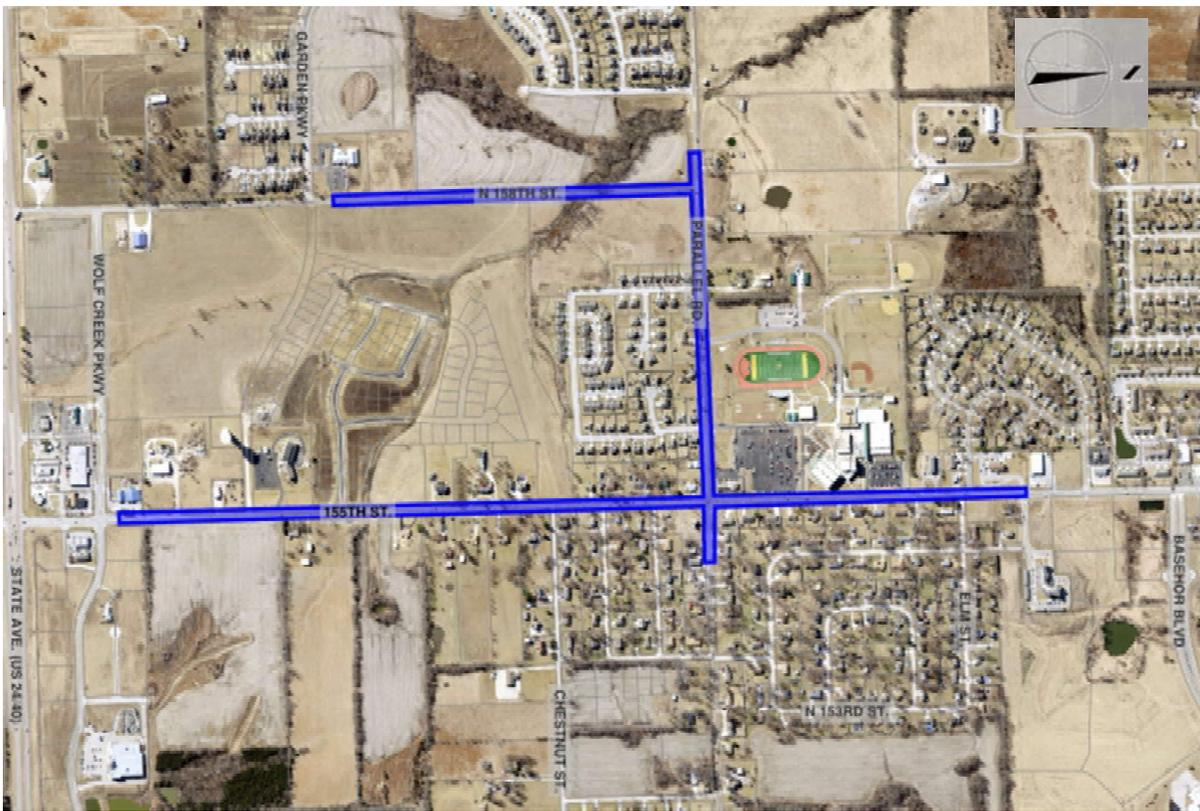


Figure 1: Site Location Map

The study area has direct access to Basehor-Linwood High School, the Basehor Community Library, the Early Learning Center, First Baptist Church, assisted living facilities, the United States Post Office, City Hall, and commercial districts. Much of the land bordered by 155th at the east and the western city limit is undeveloped. As such, the 158th Street corridor has seen rapid development in recent years with the establishment and expansion of subdivisions to the east and west of 158th Street from Parallel Road to Wolf Creek Parkway and the construction of the Garden Parkway connection between 155th Street and 158th Street. Many additional residential subdivisions are currently under review and permit by the city. The City has plans to construct a civic campus northwest of the 158th Street and Garden Parkway intersection which will include expanded city offices, an elementary school, recreation center, and outdoor recreation fields and park space.

SECTION II. EXISTING CONDITIONS

Within the study limits, 155th Street is classified as a major collector and 158th Street and Parallel Road are classified as minor collectors by the Mid-America Regional Council. Garden Parkway and Wolf Creek Parkway function as east/west minor collectors connecting residential and commercial areas to the study corridors.

Existing infrastructure includes:

- 155th Street: A 24-ft two-lane undivided major collector running north/south. 155th Street is the main commercial corridor through town and intersects three access drives to the high school. The road is an open ditch section with no sidewalks present except for the west side of 155th Street, north of the northern high school parking lot.
- 158th Street: A 24-ft two-lane undivided minor collector running north/south. This area is experiencing rapid growth with the development of surrounding subdivisions and the proposed civic campus at the intersection with Garden Parkway. The chip and seal road is an open ditch section with no sidewalks.
- Parallel Road: A 24-ft wide two-lane undivided minor collector running east/west. Parallel Road connects 155th Street and 158th Street and runs adjacent to the high school property, intersecting two school entrances. The chip and seal road is an open ditch section with no sidewalks.
- The intersection of 155th Street and Parallel Road functions as a two-way stop with north and southbound free through movements. Northbound traffic turning east has a yield offshoot from the main intersection. Westbound traffic turning north has a stop-controlled offshoot from the main intersection leg.
- The intersection of 158th Street and Parallel Road is stop controlled for northbound traffic.
- The posted speed limit for each corridor is 30 mph.
- Existing streetlights are located at 400 foot spacing along 155th Street. There no streetlights through the Parallel Road or 158th Street corridors, except single light fixtures at the intersection of 158th Street and Garden Parkway and 158th Street and Parallel Road.

- A crosswalk is delineated at 155th Street and Elm Street for pedestrians crossing north/south.
- A signed pedestrian crossing exists at 155th Street and Elm Street for east/westbound pedestrians but is not delineated with pavement markings.
- A crosswalk with a Pedestrian Crossing Sign, Pedestrian Controlled Signal Heads and Circular Warning Flashing Beacons is located crossing 155th Street just north of Elm Street.
- The northbound approach to the 158th Street and Parallel Road intersection has an advanced warning “Stop Ahead” sign equipped with perimeter lights.

The City of Basehor’s current typical section for roadways include a curb and gutter street section and sidewalks. Some areas near the study corridor have been improved including 155th Street north of Elm Street, 155th Street from State Avenue to Wolf Creek Parkway, Garden Parkway, and 158th Street from State Avenue to Garden Parkway. New developments with local roads are required to incorporate a five-foot sidewalk on one side of the roadway, therefore newer subdivisions within the study corridor have internal sidewalk circulation, with limited perimeter connection routes. Appendix A of this report contains photographs of existing site conditions.

SECTION III. DATA COLLECTION AND OBSERVATIONS

A Traffic Impact Analysis was conducted in 2018 for the 155th Street and Parallel Road intersection. Manual traffic counts were conducted during peak hours in addition to a 24-hour traffic count. The City of Basehor also maintains a record of semi-annual traffic counts, during the school year and in the summer months. Currently, the 155th Street and Parallel intersection handles 64% more traffic volume than the 158th Street and Parallel intersection. This trend is anticipated to even out as more amenities, residences, and public resources are developed along the 158th Street corridor. The existing corridor does not have an implemented congestion management plan.

The 155th Street corridor is not currently suited for pedestrian or bicycle travel and has no dedicated non-vehicular facilities. The corridor is inundated with many residential drives, commercial entrances, and local street connections.

Congestion at 155th and Parallel is greatest during school pick-up, drop-off, and events which are commonplace during the school year between the hours of 6:00 am and 8:00 pm. Cars stack on northbound 155th Street from the school entrance through the Parallel Road intersection, waiting to turn left into the school parking lot. Eastbound traffic at the intersection also experiences delays waiting for a break in north and southbound traffic through the intersection.

At the time of this report, permits are in process for 350 additional single-family homes and 64 apartments that will be in very close proximity to the study corridor. Due to recent residential construction and growing number of public facilities traffic on adjacent streets has noticeably

increased over the past 12 months. The City continues to monitor traffic and has provided short-term enhancements for improving vehicular and pedestrian safety where warranted, such as installing an advanced warning sign for northbound traffic approaching the 158th Street and Parallel intersection, as well as, installation of pedestrian beacons north of Elm Street. In the past five years, the City of Basehor Police Department responded to 19 non-fatal crash incidents at the 155th Street and Parallel Road intersection and 6 non-fatal crash incidents at 158th Street and Parallel Road.

There is currently no pedestrian or dedicated bicycle infrastructure linking the high school and civic campus library through the 158th Street and Parallel Road corridor. Pedestrians attempting to walk along 158th Street or Parallel road encounter a roadway with no shoulder, deep ditches, and no pedestrian crossings. Vehicles traveling through the corridor are not alerted to the potential presence of pedestrians, causing an unsafe situation for both driver and pedestrian. Of additional note, the low point on 158th Street, north of the library and approximately 730 feet south of Parallel Road, is located within the mapped FEMA Flood Hazard Zone A (Flood Panel 20103C0239G). During rainfall events, storm water often overtops the roadway. It is estimated that the pipes are sized to convey the 10-Year storm.

SECTION IV. TRAFFIC ANALYSIS

A summary of Average Daily Traffic Volumes for each roadway is found in Table 1. The traffic count was conducted in August 2019 by the City of Basehor. School was not in session during the traffic count. Appendix B contains exhibits with 24-hour turning volumes at major intersections within the corridor.

Table 1: Average Daily Traffic

Roadway	<i>Average Daily Traffic (vehicles)</i>
155 th Street	7,432
158 th Street	2,326
Parallel Road	1,880

A Level of Service study was conducted by Priority Engineers in 2018 for the 155th Street and Parallel Road intersection. The current intersection functions at a “B” level of service, with eastbound traffic experiencing the greatest delay of 20.8 seconds per vehicle. Eastbound traffic functioned at a “C” level of service and was anticipated to function at an “F” level of service by 2023 during peak hour traffic.

The City of Basehor is growing. The 2010 U.S. Census Bureau documented an average growth rate of 7.2% from 2000-2010. The estimated 2020 City population is 6,000 residents, an average growth of 2.6% since 2010. Assuming the City's average growth rate of 5% from 2000-2020 is maintained, the City's population is anticipated to reach 20,000 residents by 2045. The continued growth both within and in adjacent rural areas will result in a growing school population and traffic volumes within Central Basehor.

SECTION V. CONCLUSIONS AND RECOMMENDATIONS

The City of Basehor has experienced unique growth since 2000, growing from a population of 2,238 in 2000 to over 6,000 residents in a twenty-year span. The City has identified the need to facilitate and adapt existing infrastructure to accommodate the existing swell in population while also planning for a future with full build-out of developable land.

There are many opportunities for the City of Basehor to improve vehicular and pedestrian safety through the Central Basehor corridor consisting of 155th Street, 158th Street, and Parallel Road. An emphasis should be placed on providing alternative modes of transportation and increasing pedestrian safety and maneuverability throughout the corridor, focusing on existing and proposed locations where sidewalks or trails intersect vehicular travel lanes. As existing roadway improvement opportunities are undertaken, the following recommendations should be considered during design and implemented as appropriate:

- A separate shared-use path and sidewalk adjacent to a curbed roadway would provide separation between pedestrians, bicyclists, and vehicular traffic. Adding additional accessible facilities would increase the accessibility of roadway corridors for all ages, abilities, and transportation modes.
- Add pedestrian warning signs and crosswalk pavement markings to provide dedicated road crossing locations throughout project, with emphasis on access to the high school and other activity centers.
- Provide crosswalk visibility enhancements within heavily saturated corridors (155th Street) and at crucial school crossing locations highly frequented by pedestrians. Install a Pedestrian Crossing Sign and Pedestrian Controlled Signal Heads and Circular Warning Flashing Beacons similar to those currently present within the City.
- At a time when a crosswalk receives 20 or greater pedestrians per hour, the City should consider the installation of Pedestrian Hybrid Beacons.
- The City should consider implementing a comprehensive access management plan to restrict driveway and street connections within heavily developed corridors.
- Additional streetlights should be installed to increase foot-candle spread on all travel ways (vehicular and pedestrian). Spacing between lights should be a minimum of 150 feet and a maximum of 250 feet. Streetlights should also be installed at intersections.
- Dedicated left turn lanes would improve traffic circulation throughout the corridor and prevent abrupt stopping situations, reduce rear-end crashes, and allow for crossing pedestrians to better view traffic movements.
- A roundabout would aid in mitigating congested traffic, crash severity, and visibility of pedestrians and bicyclists at the intersection of 155th Street and Parallel Road.
- At larger intersections, where pedestrians may need to pause to rest or may not completely cross the street prior to the pedestrian signal head cycling to a wait status, install pedestrian refuge islands that provide separation from vehicular traffic.
- All new improvements should be constructed to ADA / PROWAG standards for maximum accessibility for residents.

Where full corridor reconfiguration is not viable, the City may choose to implement any of the following short-term strategies where appropriate:

- Install advanced warning signs for traffic movements or stop conditions and for pedestrian crossing locations.
- Connect missing sidewalk links. Where sidewalks terminate and push pedestrians and bicyclists onto the adjacent roadway, continue the sidewalk to an ending point to a less traveled corridor or fill the gap between existing sidewalk sections.
- Maintain clear pavement markings.
- Provide paved shoulders.

Overall, the City of Basehor should continue to evaluate and maintain a transportation comprehensive plan that considers vehicular and pedestrian transportation modes and promotes “safe destinations”. Establishing best practices and design standards that incorporate pedestrian, bicycle, and roadway safety would strengthen the City’s systematic safety strategy. Plans for residential and commercial development should be reviewed to ensure the internal pedestrian facilities are contiguous with the City’s planned pedestrian and bicycle corridors.

APPENDIX A

SITE PHOTOGRAPHS



Photo 1: Approaching 155th Street and Parallel Road intersection, northbound. High School and School District offices visible on left. Residential driveways on right.



Photo 2: Approaching 155th Street and Parallel intersection, eastbound. Eastbound and westbound traffic is stop controlled.



Photo 3: Approaching 155th Street and Parallel intersection, westbound. Eastbound and westbound traffic is stop controlled.



Photo 4: 155th Street corridor, looking south from high school southern entrance. Many residential driveways and commercial entrances directly access 155th Street.



Photo 5: Southern high school entrance, just north of 155th Street and Parallel Road intersection, looking north. No turn lanes into high school, causing stacking.



Photo 6: Parallel Road at school district office, looking west. No pedestrian/bicycle access to high school property or between high school and public library.



Photo 7: Approaching 158th Street and Parallel intersection, westbound.



Photo 8: 158th Street and Parallel intersection, looking south toward library. Northbound traffic is stop controlled. 158th Street corridor is programmed for substantial development with 350 single-family homes and 64 apartments in process.



Photo 9: 158th Street and Parallel intersection, northbound. An advanced warning “Stop Ahead” sign has been installed for vehicular traffic. No pedestrian facilities exist.



Photo 10: Crosswalk with Pedestrian Warning Signs, Pedestrian Controlled Signal Heads, and Circular Warning Flashing Beacons at 155th Street, just north of Elm Street.



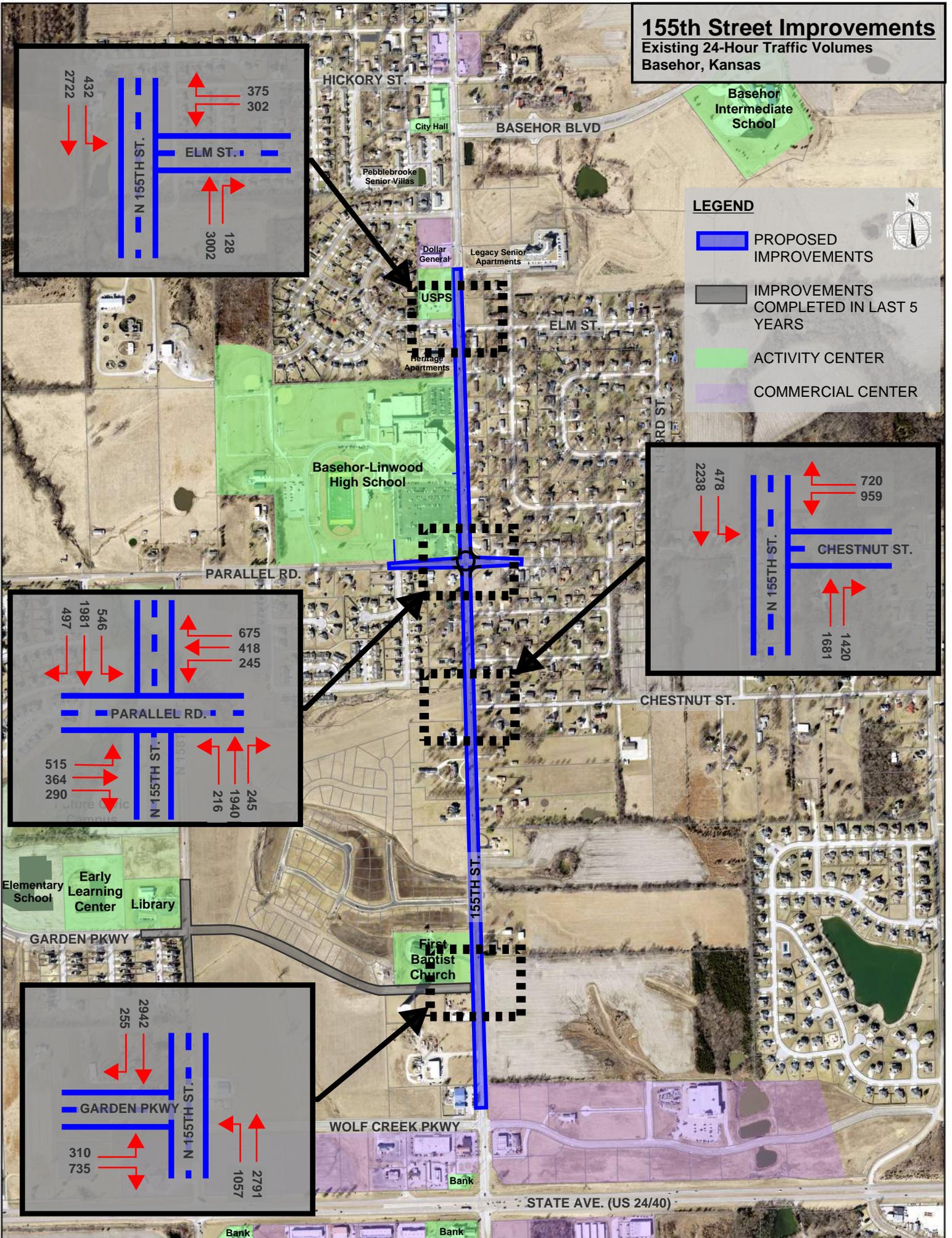
Photo 11: Pedestrian warning signs without crosswalk pavement markings crossing 155th Street at Elm Street.

APPENDIX B

ADT EXHIBITS

155th Street Improvements

Existing 24-Hour Traffic Volumes
Basehor, Kansas



LEGEND

 PROPOSED IMPROVEMENTS

 IMPROVEMENTS COMPLETED IN LAST 5 YEARS

 ACTIVITY CENTER

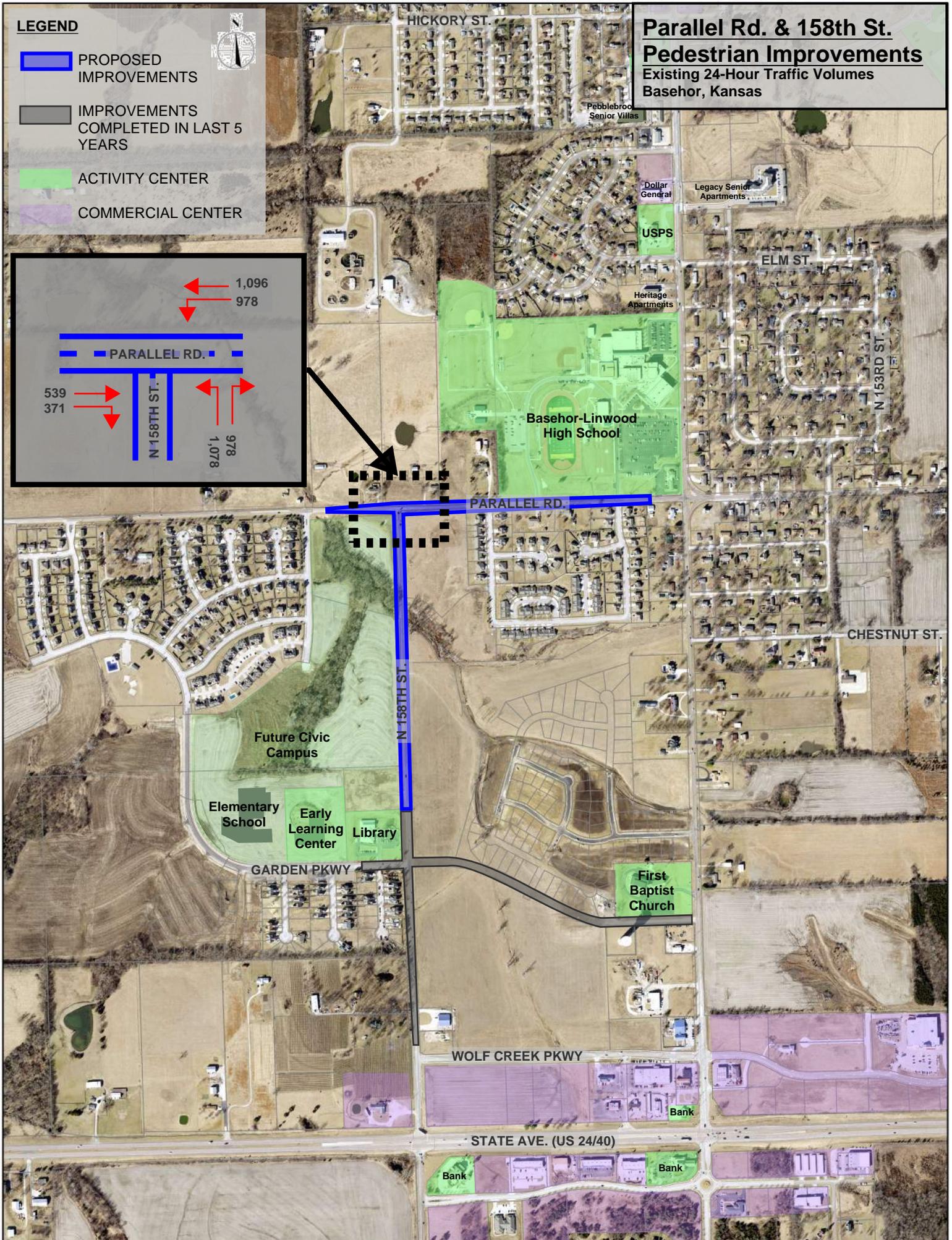
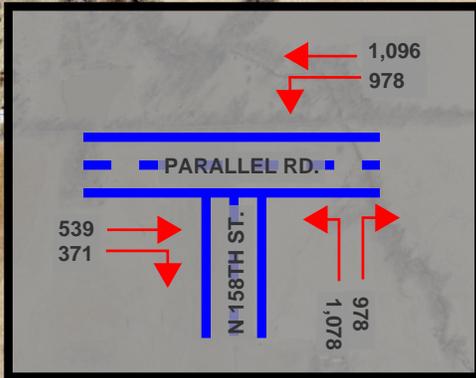
 COMMERCIAL CENTER



Parallel Rd. & 158th St.

Pedestrian Improvements

Existing 24-Hour Traffic Volumes
Basehor, Kansas



APPENDIX C

CRASH DATA

Crash Data Received from City of Basehor Police Department

2020 – thru 7/31/20 = 1 at 155th & Parallel; 0 at 158th & Parallel

2019 = 5 at 155th & Parallel; 2 at 158th & Parallel

2018 = 4 at 155th & Parallel; 1 at 158th & Parallel

2017 = 2 at 155th & Parallel; 1 at 158th & Parallel

2016 = 2 at 155th & Parallel; 1 at 158th & Parallel

2015 = 5 at 155th & Parallel; 1 at 158th & Parallel