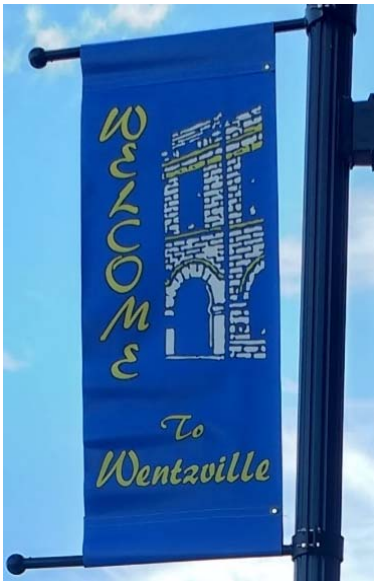
# Wentzville Historic Downtown Transportation Revitalization Project




**Prepared for: City of Wentzville** **December 2018**

CBB TRANSPORTATION ENGINEERS+PLANNERS

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The Crossroads of the Nation

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# Introduction

## Study Background


*Figure 1: Downtown Wentzville Banner*

Wentzville was founded with the expansion of the railroads in the 1850s, and Downtown Wentzville has been the central gathering place for the city ever since. In the pre-interstate era, Pearce Boulevard was a principal thoroughfare for east-west traffic, serving as a site for businesses that catered to local residents and travelers alike.

The expansion of the interstate system relocated through traffic to Interstate 70 but left behind a grid of walkable, charming, and compact blocks, featuring an eclectic collection of pedestrian-scale buildings dating from different periods of Wentzville's development. Today, these buildings house a variety of independent businesses and function as a unique commercial center within Wentzville and the St. Louis region.

Downtown Wentzville is bordered by I-70 and US 61, with the east-west railroad line bisecting the area. Pearce Blvd is the main east-west thoroughfare through the Downtown area, while Church St/Route Z connects the Downtown to the southern Wentzville area.

Wentzville is one of the state's fastest growing cities. The population of Wentzville has risen six-fold since 2000, increasing from 6,900 residents in 2000 to an estimated 41,000 residents presently. Most of Wentzville's population growth has taken place at the periphery of the city. The historic downtown area and surrounding blocks is home to about 2,300 residents, 7% of the city's populace. The Wentzville population is projected to grow to 50,000 people by 2022.

The aim of the Historic Downtown Transportation Revitalization Preliminary Design is to develop and evaluate transportation improvement alternatives toward a vibrant and integrated downtown. The scope of the transportation improvements addressed includes traffic flow, parking, business access, interstate access, walkability, safety, event traffic management, accessibility, streetscape, wayfinding, and at-grade rail crossing improvements.

*Figure 2: Wentzville Fire Hydrant Scavenger Hunt*

The planned improvements will ensure that Downtown Wentzville continues to be a vibrant and integrated part of the community. The objectives of the study include creating a financially constrained plan to prioritize future projects, position the City of Wentzville for future grant applications (Federal, Missouri, St. Charles County), start coordination with external agencies, and develop 30% plans in critical areas.

The process for the study includes public engagement, City and stakeholder coordination, traffic data collection, an infrastructure inventory, and a capacity and safety analysis. The information was used to develop recommendations that may be implemented within the City of Wentzville in the coming years.

## Study Area

The study encompasses four primary areas of focus: 1) enhance downtown circulation, parking, and railroad crossings; 2) upgrade the intersection of Pearce Boulevard and Meyer Road; 3) upgrade I-70/Route Z interchange; and 4) provide gateway treatments. The focus areas are shown in **Figure 3**. The Downtown circulation area (in blue) spans from the intersection of Pearce Blvd, to the west, to US 61, to the east. This includes, on the western end, the intersection of Pearce Boulevard and Meyer Road. The intersection of Pearce Boulevard and Meyer Road is denoted by the red dot. The I-70/Route Z interchange (in orange) covers the intersection of Church St and Mar-Le Dr/Wagner St, to the north, to the intersection of Route Z and Interstate Dr, to the south. Gateway treatments are located at several areas throughout the study area. As shown by **Figure 3**.

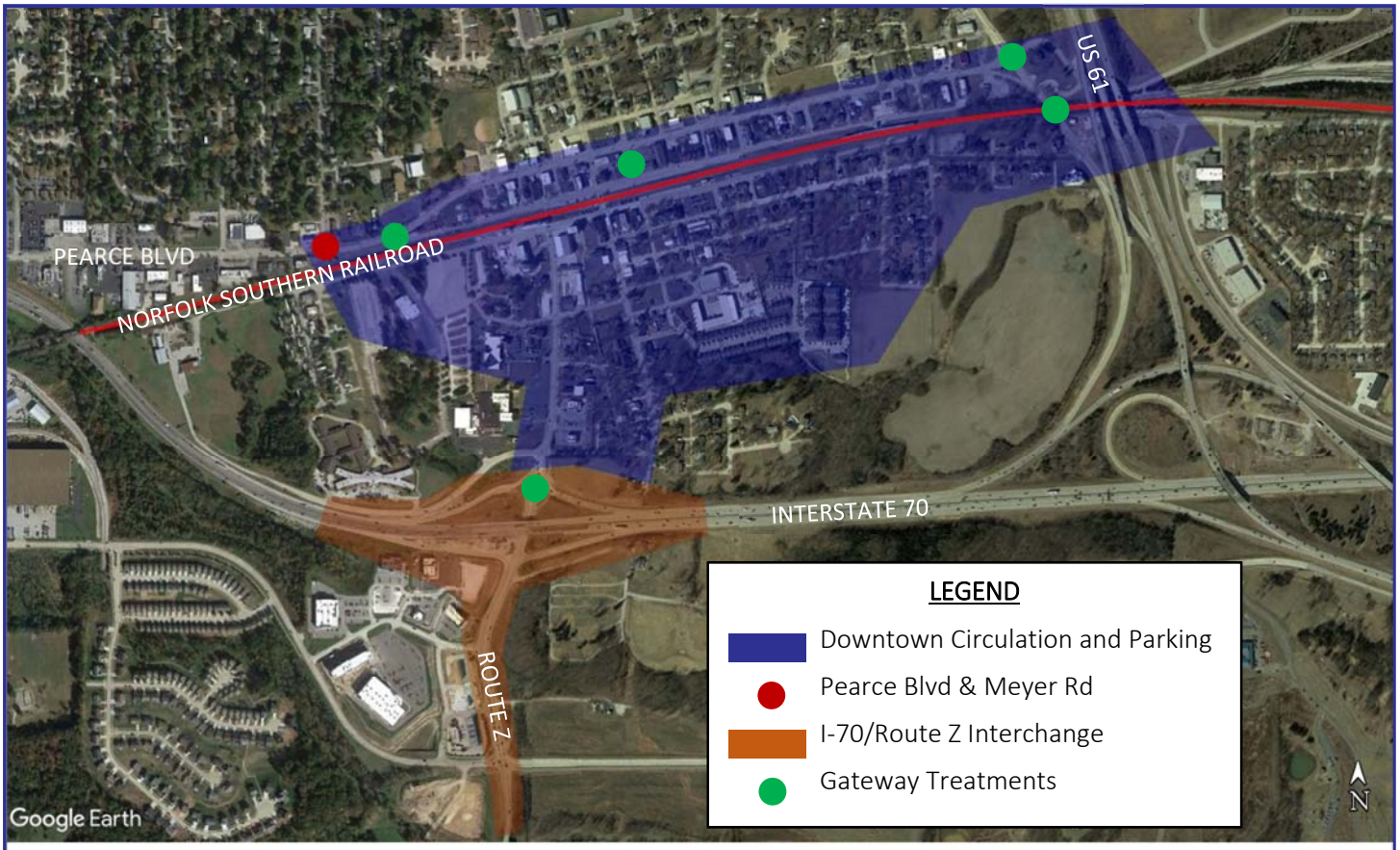


*Figure 3: Wentzville Historic Downtown Study Area*

Wentzville, Missouri is located in western St. Charles County just 40 minutes from downtown St. Louis and the Gateway Arch. What was once a small railroad town is now one of the fastest growing cities in Missouri. Wentzville has a collection of historical architecture that is unique among western St. Charles County communities because of its historic depth, variety, and extent (the historic downtown spans about fourteen blocks). This, coupled with the railroad history that still has a major presence in the city, creates an authentic sense of history and place that is unique to Wentzville.

With large growth has come development. **Figure 4** shows the three major commercial development areas in Wentzville. The 1850s to 1990s showed the development of a grid of walkable, charming, and compact blocks. In the 1990s, commercial development was extended to the west along Pearce Boulevard. Unlike the typical block and grid pattern of downtown, however, new strip centers with parking fields in front were the new commercial vogue of development. Since 2000, Wentzville has experienced an explosion in population, with new residential development occurring well beyond the traditional downtown area. New retail was also constructed, primarily along Wentzville Parkway, with a big-box format and out-lots.

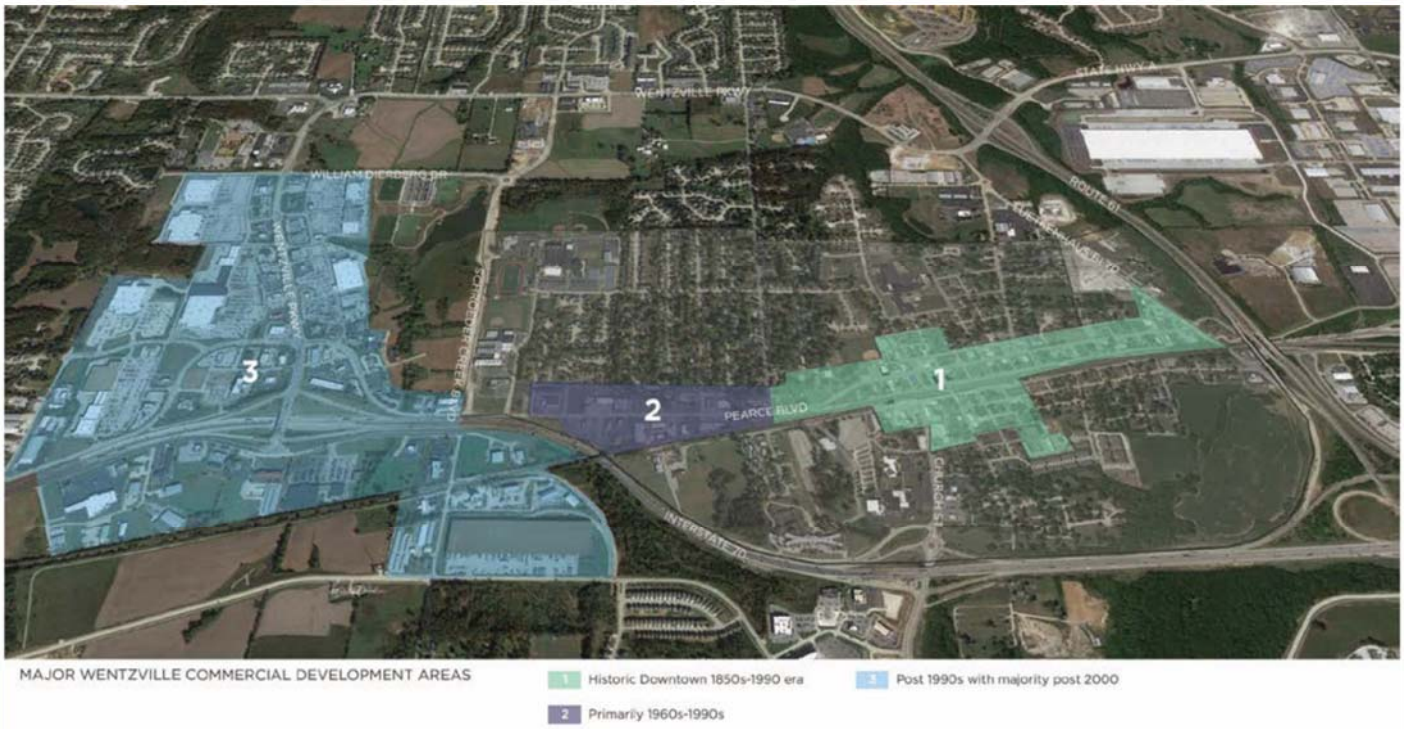


*Figure 4: Major Wentzville Commercial Development Areas*

Compared to the region, Wentzville is home to a significant concentration of manufacturing, education, retail, accommodation, and food service employment. In the Downtown Core area, 58% of households earn less than $50,000 annually, compared to 27% in the city. This suggests a need to consider social equity when discussing redevelopment opportunities within the Downtown Core.

The Downtown study area is characterized by a very high proportion of commercial land uses, which include retail, service commercial, restaurants, and offices, as well as a few scattered light industrial uses. Many of the commercial uses are independent businesses, with a small concentration of national franchises toward the west end of Pearce Boulevard. The study area is surrounded largely by residential neighborhoods. Single family housing is the predominant residential use, but a handful of apartment complexes is also present, including a senior living property. More extensive demographic, economic, and planning information can be found in Appendix A.

# Visioning/Overarching Goals

The goal of the Historic Downtown Transportation Revitalization Preliminary Design is to develop transportation improvement alternatives toward an economically vibrant downtown that is integrated with the broader community. The objectives of the study include creating a financially constrained plan to prioritize future projects, position the City of Wentzville for future grant applications, start coordination with external agencies, and develop 30% plans in critical areas.

## Economic Development

Redevelopment and new development will increase by making improvements to the downtown area. Current trends show that 15% of consumers spend more when public spaces are inviting. Shoppers tend to stay longer and spend more money.[1] Turning the downtown area into a more walkable and accessible area will increase the number of visitors and bring in more revenue to the local businesses. One case study shows how improvements can increase sales tax revenue. South Grand, in St. Louis, recently implemented a great streets project and experienced a 14% increase in sales tax revenue within the first year.[2] Property values in the area significantly increased, while the overall property value trend in the City of St. Louis was negative (**Figure 5**).

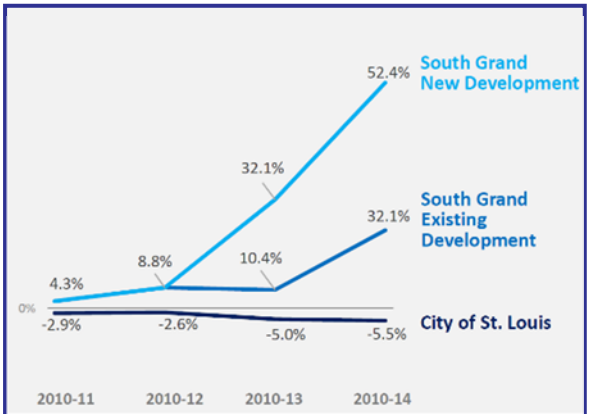


*Figure 5: Growth in Property Value*

A more vibrant downtown, where business thrives, is supported through the development of a more walkable and bikeable environment. The addition of sidewalks and pedestrian friendly crosswalks will encourage residents and visitors to visit more frequently, and the close proximity of the pathways to the storefronts will encourage window shopping and increase business for local storefronts.

There are many opportunities for redevelopment and new development in Downtown Wentzville that would be stimulated by the improvements proposed in this project. The top precedent according to a vote by community members on *what elements make a great downtown*, at the first open house, was having a variety of businesses close to each other. One participant said there used to be far more buildings that created more of an unbroken vista and that infill development here would be very attractive. **Figure 6** shows opportunities for new development and potential redevelopment, as of June 2018. As seen in the figure, there are vacant lots and buildings that could be developed. With the implementation of the project, there will be an influx in visitors to the area and an increase in revenue, which may spur new development and redevelopment and restore Wentzville Downtown as an unbroken vista of businesses.

## Placemaking

Wentzville has a collection of historic architecture that is unique among western St. Charles County communities because of its historic depth, variety, and extent (the historic downtown spans about fourteen blocks). This, coupled with the railroad history that still has a major presence in the city, creates an authentic sense of history and place that is unique to Wentzville. One of the overarching goals of the project is to build on this identity and reinforce Historic Downtown as a place for people to visit. This will be accomplished by improving the gateways, improving walkability, and providing spaces where people can spend time. There are many examples of placemaking success in the St. Louis area. These examples include Main Street St. Charles, Kirkwood, Delmar Loop, and South Grand. Effective placemaking can improve the walkability and quality of life for residents and visitors to the area.

[1] Alexander Babbage 2009

[2] https://www.ewgateway.org/library-post/south-grand-boulevard-great-streets/


*Figure 6: Development Opportunities in Downtown*

## Access, Parking, and Traffic Flow

Access, parking, and traffic flow are major concerns in the Historic Downtown. With limited railroad crossings in the downtown area, travelling between the northern and southern areas can create congestion and deter people from visiting the area. By doing so, establishments lose business and visibility from passing vehicles. Moving traffic too quickly through downtown can also result in lost vitality for the same reason. It is important to maintain access to and through downtown in a way that positively impacts business. By improving access, parking, and traffic flow, Downtown will get more visitors and visibility by way of people visiting and passing through. A real or perceived lack of parking, or parking directly adjacent to buildings, has been identified by some business owners as a deterrent to attracting customers. The study addresses these parking concerns and provides alternatives that also improve traffic flow and access.

*Figure 7: Linn Ave Railroad Crossing*

# Existing Conditions

## Problems, Needs, and Opportunities

In the downtown area, there are a number of opportunities for improvement. Starting with the core downtown area, the study identified the following physical and operational issues which will impact the success of the downtown area.

- Aesthetics: dated streetscape, lack of gateways/placemaking
- Sidewalks: There are inconsistent sidewalks along Pearce Boulevard.
- Americans with Disabilities Act (ADA) compliance: There is limited ADA compliance along Pearce Boulevard and Allen Street.
- Crosswalks: There is only one crosswalk along Pearce Boulevard that provides safe access for pedestrians to cross.
- "Front lawn" parking: Businesses along Pearce Boulevard provide "front lawn" parking within City right-of-way for customers. This parking creates a safety hazard for pedestrians who must walk behind these vehicles.
- Vehicle congestion: The existing all-way stop control at Pearce Boulevard and Meyer Road intersection creates queues during the PM peak that back up past Linn Avenue.

*Figure 8: Front lawn parking*

- Utilities: Utility poles reside within existing sidewalks, creating ADA compliance issues and degrading the visual appearance of the downtown area.
- At the I-70 and Route Z interchange, projected 2040 traffic volumes will outgrow the capacity of the existing roadway design. Traffic volumes on the I-70 westbound off ramp are expected to back up onto I-70 within the next 10 years. Vehicles heading south on Route Z, through the Route Z and Interstate Drive intersection, are expected to surpass the roadway capacity.
- US 61 access to and from the downtown area is limited. This limited access can deter motorists from driving through the downtown area.

## Previous Studies

The City has been working on these issues for many years, providing this study effort a lot of information as a base.

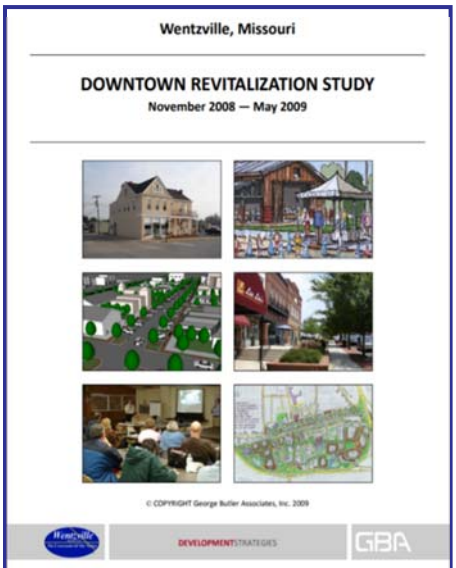

*Figure 9: Wentzville Redevelopment Plan*

Downtown Revitalization Phase One Program Summary Report: The 2002 Downtown Revitalization Phase One Program Summary Report was developed to identify physical and economic improvements that would provide for future expansion.

Wentzville Redevelopment Plan: The Downtown Redevelopment Plan was adopted by the Board of Aldermen in May of 2009. In January 2010, the Planning Zoning Commission formally adopted the plan as a part of the City's Comprehensive Plan. The plan includes design elements for new and expanding businesses, streetscape design, and public amenities. It addresses future expansion needs of the downtown area.

City Projects: The City has given the Downtown area considerable attention as the subject of sustained planning efforts over the past two decades. Downtown is widely recognized as the core of the city and an important neighborhood to preserve and support. The current Downtown Transportation Revitalization project is the next step in a series of plans that address conditions Downtown either singly or in a greater city context, including the 2003 Downtown Revitalization Program, the 2009 Downtown Revitalization Plan, the 2013 Comprehensive Plan, and the 2015 Economic Development Strategic Plan and Wentzville Village Center Plan.

The City has been working on a program of projects to revitalize the whole Downtown area, alongside the Pearce Boulevard and Allen Street revitalization. One of the projects includes improvements to Main Street, between South Church Street and Linn Avenue, completed in October 2016, to complete pavement reconstruction, storm-water improvements, and sidewalk and ADA improvements.[3] South Linn Avenue, between Main Street and West Fourth Street, has recently experienced improvements (beginning in March 2018) for pavement reconstruction, storm-water, as well as sidewalk and ADA and aesthetic enhancements.[4]


*Figure 10: Main Street at Linn Avenue*

The City is also planning for improvements to the I-70 and Route Z interchange and Route Z and Interstate Drive intersection to provide better access to the Historic Downtown from the south. Wentzville is continuing to grow, so it is vital to provide adequate roadway capacity to get people into Downtown and to provide quality transportation infrastructure for people to access.

## Existing Circulation, Parking, and Access

### Traffic Operational Analysis Methodology

Traffic operational analysis was completed utilizing the VISSIM, SYNCHRO, and SIDRA software platforms. Each software analyzes a specific aspect of the roadway. Combining the results from each package delivers a more detailed and accurate analysis of the overall level of service under which the roadway would be expected to operate.

[3] http://www.wentzvillemo.org/departments/public_works/main_street_improvement.php
[4] http://www.wentzvillemo.org/departments/public_works/south_linn_ave_revitalization.php

VISSIM is a micro-simulation traffic flow model that specializes in the analysis of complex transportation systems and was used to evaluate all aspects of the study area. It includes sophisticated driver behavior algorithms that accurately reflect lane changing and car-following maneuvers.

SYNCHRO was used to analyze signalized and unsignalized intersections. SYNCHRO is similar to the Highway Capacity Software (HCS) in that the underlying traffic flow models are analytical. However, SYNCHRO is recognized as the most widely-used tool in the traffic engineering field for analyzing and optimizing traffic flows at signalized intersections.

SIDRA intersection software was used to analyze all alternatives with a roundabout since it is the most widely recognized tool available for evaluating roundabouts. This software package calculates vehicular delay times, levels of service, volume to capacity ratios (v/c), and 95th percentile queue estimates. It should be noted that the SIDRA and SYNCHRO results should be compared on a level of magnitude basis only; their methodologies differ such that one-to-one comparisons between the software packages can produce differences in outputs.

Operating conditions were graded in accordance with six levels of traffic service, established by the Highway Capacity Manual (HCM): Level A ("Free Flow"), to Level F ("Fully Saturated"). Levels of service (LOS) are measures of traffic flow, which consider such factors as speed, delay, traffic interruptions, safety, driver comfort, and convenience. Level C, which is normally used for highway design, represents a roadway with volumes ranging from 70% to 80% of its capacity. However, Level D is often considered acceptable for peak hour conditions in urban and suburban areas.

The thresholds that define level of service at an intersection are based upon the type of control used (i.e., whether it is signalized or unsignalized) and the calculated delay. For signalized and all-way stop control (AWSC) intersections, the average control delay per vehicle is estimated for each movement and aggregated for each approach and the intersection as a whole. At intersections with partial (side-street) stop control, delay is calculated for the minor movements only since motorists on the main road are not required to stop.

Several Measures of Effectiveness (MOEs) were used in this evaluation including: LOS, v/c ratios, vehicular delay, and queue lengths. Level of service is directly related to control delay. At signalized intersections, the level of service criteria differ from those at unsignalized intersections primarily because varying transportation facilities create different driver expectations. The expectation is that a signalized intersection is designed to carry higher traffic volumes and, consequently, may experience greater delays than an unsignalized intersection. Table 2 summarizes the thresholds used in the analysis for signalized and unsignalized intersections.

*Table 1: Intersection Level of Service Thresholds*

| | Control Delay per Vehicle (sec/veh) | |
|---|---|---|
| *Level of Service (LOS)* | *Signalized Intersections* | *Unsignalized Intersections* |
| A | ≤ 10 | 0-10 |
| B | > 10-20 | > 10-15 |
| C | > 20-35 | > 15-25 |
| D | > 35-55 | > 25-35 |
| E | > 55-80 | > 35-50 |
| F | > 80 | > 50 |

In addition to LOS, v/c ratios provide important measures to describe an intersection's operations. Intersection movements can have acceptable LOS (D or better) yet still have unacceptably high v/c ratios. In general, v/c ratios around 0.9 result in occasional queuing and cycle failure, v/c ratios between 0.9 and 1.0 result in frequent queuing and cycle failure, and v/c ratios over 1.0 result in general failure of the movement. Therefore, it is important to consider v/c ratios in addition to LOS and vehicular delay when evaluating an intersection's operations.

Base existing conditions models were developed for typical weekday morning and evening peak hours. Data provided by the City and traffic counts collected by CBB were utilized to develop the base models.

## Traffic Study

Traffic volume and speed data, collected by traffic count machines, were used to compute daily traffic volumes and the prevailing speeds for segments of roadways in Wentzville Historic Downtown. **Appendix C** provides tables identifying the average daily traffic volume (ADT), 85$^{th}$ percentile travel speed, 50$^{th}$ percentile travel speed, and additional data.

Most drivers will travel at an operating speed that they consider both comfortable and safe based upon street geometrics and surrounding conditions. The 85$^{th}$ percentile speed is the speed that 85% of drivers will voluntarily travel at or below in free-flow traffic conditions; it is one of the primary factors used in engineering studies to determine appropriate speed limits. Speed and volumes along each road listed in the following section can be found in **Appendix C** and **Appendix E**.

The project team collected traffic volume and speed data at selected locations to identify the prevailing traffic and pedestrian conditions and behaviors. Count types and locations were determined based on data not previously collected by the City of Wentzville or previous traffic studies. The existing traffic volumes are shown in **Exhibit 1**.

Automatic machine traffic counters were placed at eight different locations for seven days in November 2017. These counters measured traffic volumes (to be summarized both hourly and daily) and travel speeds. The machine counters ("tubes") were placed at the following locations:

- Pearce Boulevard between Allen Street and Church Street
- Pearce Boulevard between Elm Street and Talley Street
- Luetkenhaus Boulevard between Pearce Boulevard and Pitman Street
- Allen Street between Linn Avenue and Carr Street
- Main Street between Elm Street and Whitehead Street
- Route Z between I-70 eastbound ramps and Interstate Drive

Manual traffic/pedestrian counts were collected at seven intersections in November 2017. Vehicular turning movement and pedestrian volumes were counted for morning and evening peak hours. The count periods were from 7 to 9 a.m. and 4 to 6 p.m. on a weekday, along with 11 a.m. to 1 p.m. on a typical Saturday afternoon. Intersections counted were:

- Route Z and Interstate Drive
- Pearce Boulevard and Meyer Road
- Pearce Boulevard and Linn Avenue
- Pearce Boulevard and Luetkenhaus Boulevard
- Linn Avenue and Allen Street
- Linn Avenue and Main Street
- Pitman Street and Luetkenhaus Boulevard
- Pitman Street and US 61 northbound off ramp (collected March 2018)

The City collected cross-street data at the following locations between Pearce Boulevard and Allen Street, in March 2018:

- Birch Street
- Church Street
- Blumhoff Avenue
- Elm Street
- Carr Street
- Talley Street
- McRoberts Street
- Ash Street
- Locust Street
- Wilson Street
- Walnut Street
- Cherry Street
- Hickory Street

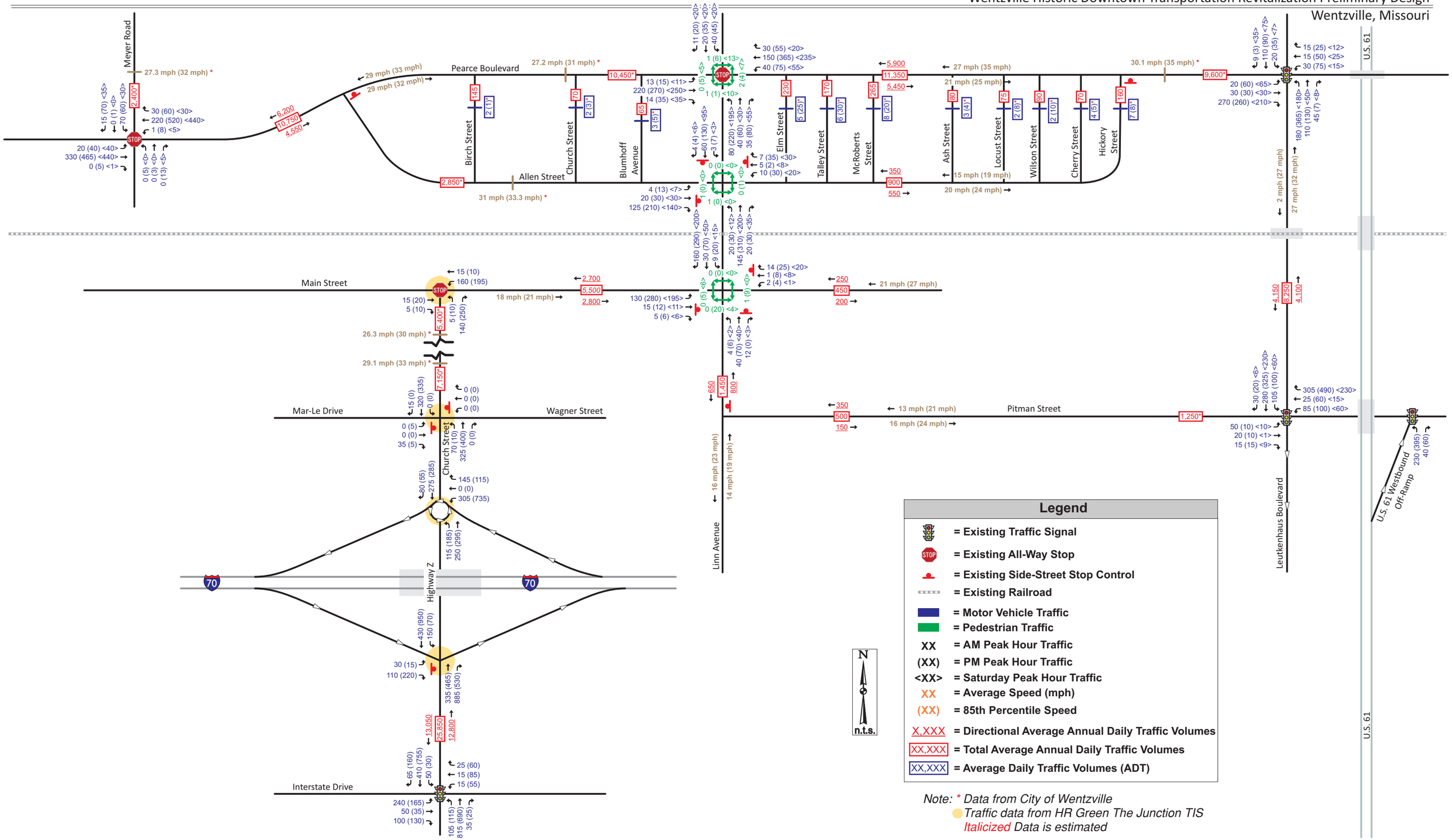


Exhibit 1: 2017 Existing Traffic Data

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## Parking Study

A parking study was performed to understand the availability of parking and how it is being used in Wentzville Historic Downtown. Hourly parking counts were performed at hourly intervals to assess the parking usage. Parking counts were performed for the following time periods:

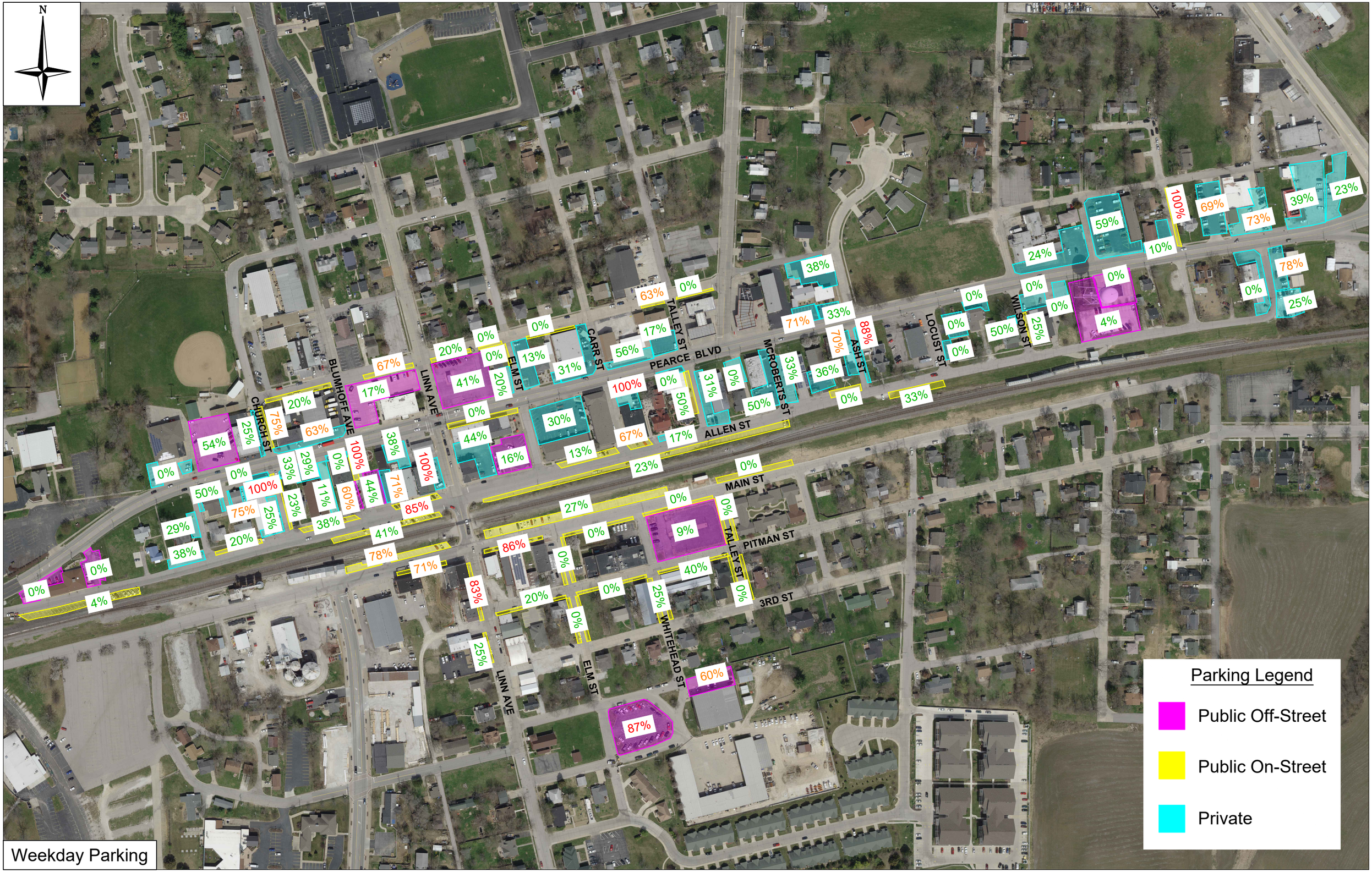
- A weekday mid-day count (from 11 am to 3 pm)
- A weekday evening count (from 4 pm to 8 pm)
- A weekend mid-day count (from 11 am to 3 pm)
- A Friday afternoon through evening count (from 2 pm to 10 pm)

Parking counts were grouped into three areas: public on-street parking, public off-street parking, and private parking. The individual areas are shown in **Figure 11**. The pink represents public off-street parking areas, the yellow represents public on-street parking areas, and the blue represents private parking areas.


*Figure 11: Existing parking facilities*

**Exhibits 2** through **4** provide a summary of the parking counts. There was a total of 1,163 parking spaces monitored during a typical weekday, Friday afternoon, and Saturday midday. The busiest hour on a typical weekday was at 12:00 p.m. when overall parking utilization reached 36% of the spaces. For a typical weekend day, the busiest time was 1:00 p.m. when overall parking usage reached 27%. Finally, the busiest time period for a Friday afternoon was at 6:00 p.m. and 7:00 p.m. when overall parking utilization reached 29%.

Parking demand is not uniform, and some parking areas were full during these periods while others remained mostly empty. Creating a more walkable downtown will be critical in better utilizing all of downtown's parking resources during peak times.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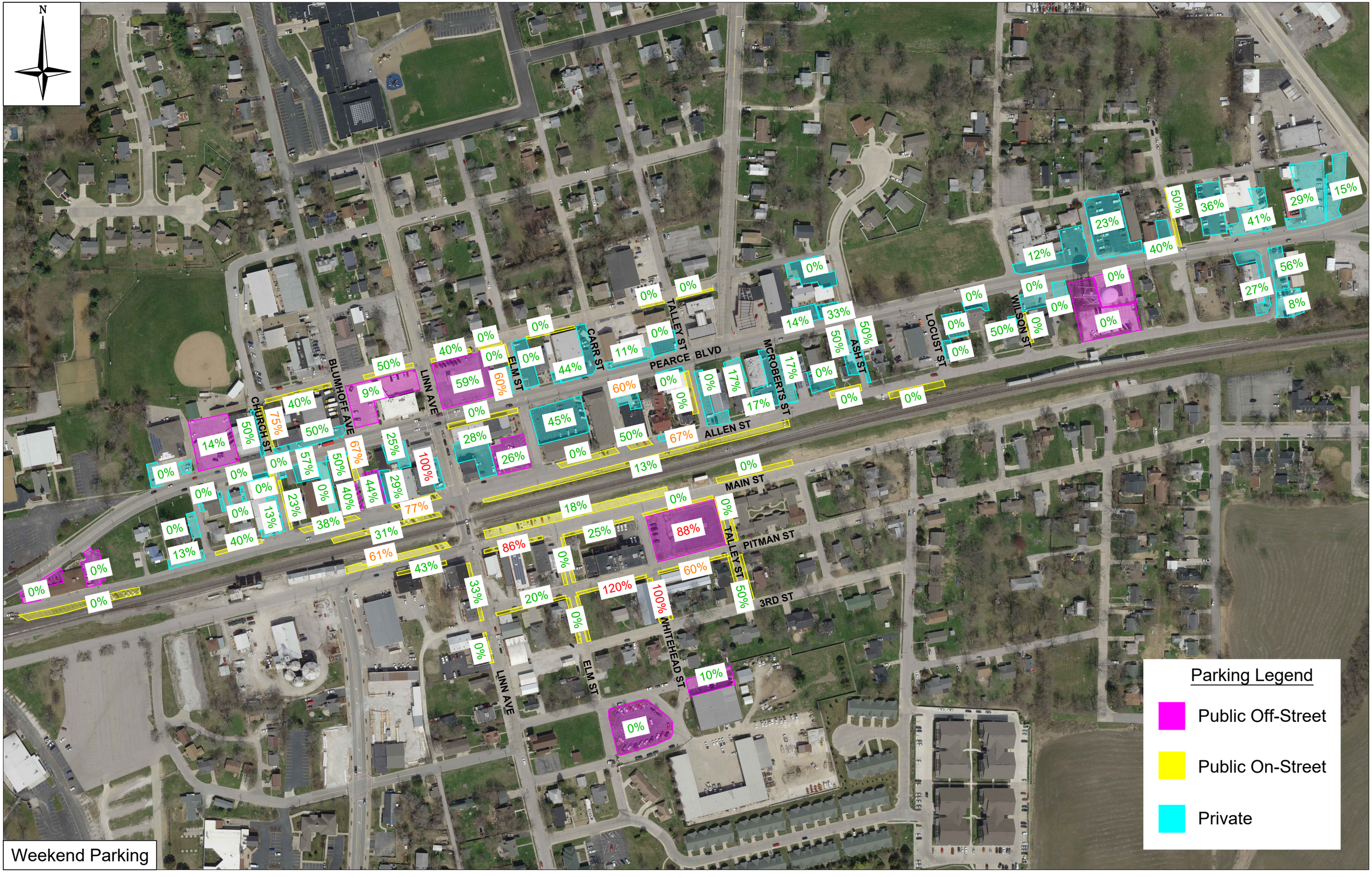
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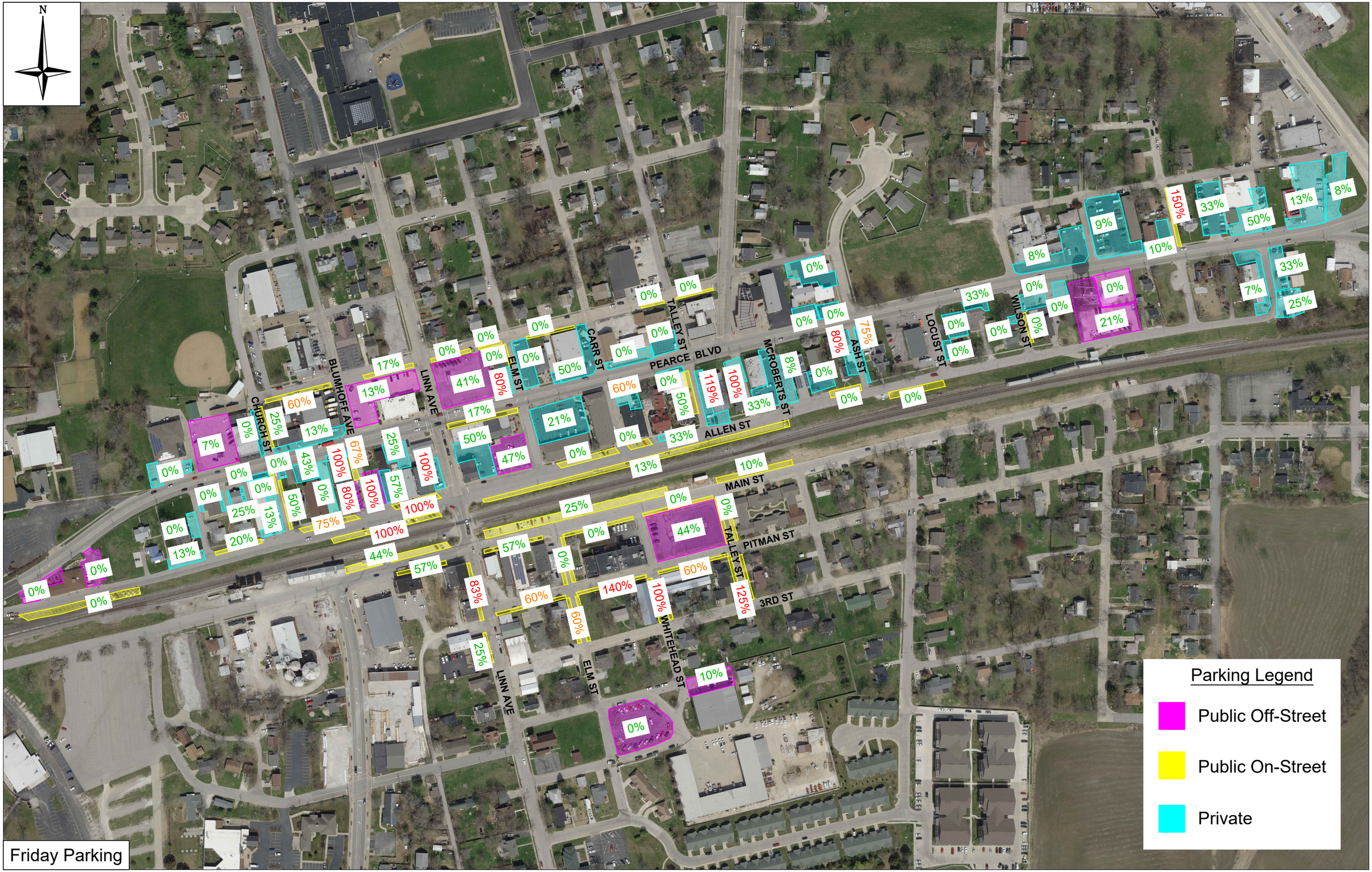


Friday Parking

Village Center Zoning Ordinances: The Historic Downtown area is categorized with three zones: Historic Downtown Core District (HD-1), Historic Downtown Corridor District (HD-2), and Historic Downtown Light Industrial/Loft District (HD-3). One of the areas this zoning affects is parking. Building constructed in the HD-1 zone are not required to provide off-street parking for visitors or occupants. Contrarily, buildings in HD-2 and HD-3 zones are required to provide off-street parking, as per zoning regulations.

## Safety Analysis

The City of Wentzville Police Department provided crash records from 2012 to 2016 for the Wentzville downtown area (blue) as well as the Highway Z/I-70 interchange area (orange) to determine any safety performance issues. In addition, MoDOT also provided crash data summaries for crashes along Highway Z from the I-70 westbound ramps to Interstate Drive Road. These two areas are shown in **Figure 12**.


*Figure 12: Study Area for Crash Analysis*

There were a total 142 crashes reported in the Wentzville Downtown area from 2012 to 2016. Specifically, 17, 26, 30, 38, 31 crashes occurred in 2012, 2013, 2014, 2015 and 2016, respectively. Of the total crashes reported in the downtown study area, 0 crashes were fatal, 14 crashes (9.8%) resulted in minor injuries, and the largest majority (128 crashes or 90.2%) were reported as property damage only, See **Figure 13**.

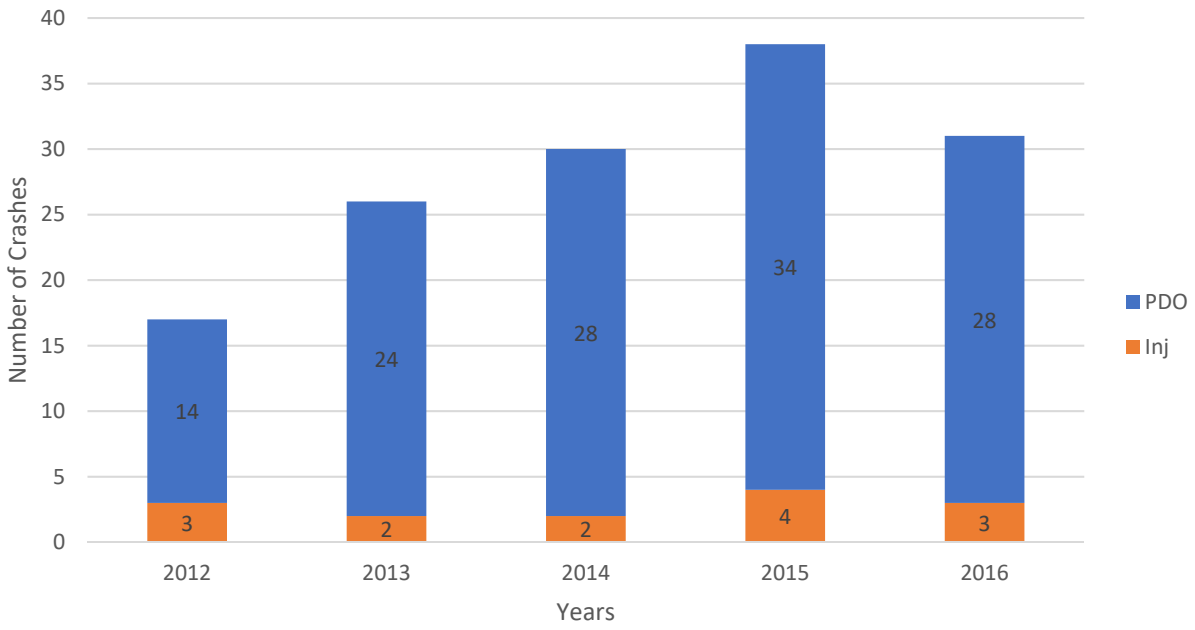


*Figure 13: Total Crashes in Downtown Area (2012-2016)*

Overall, 84.5% of the crashes occurred on nice weather days, leaving only 15.5% of crashes occurring during inclement (wet, snow, or ice/frost) weather conditions. Overall, 78% of crashes occurred during daylight hours, and 22% occurred during dark or unknown light conditions. Improvement to lighting and pavement friction would help to mitigate inclement weather and nighttime crashes.

After analyzing the crash data over five-years, it is evident that parking related crashes (parked vehicle and backing), angle and rear end are the most prominent types of crashes in the Downtown area with 28% parking related, 27% angles and 20% rear ends, see Appendix C. While rear end and angle crashes are typical for urban areas, the high percentage of parking crashes is notable.

There were a total 106 crashes reported along Highway Z in the I-70 Interchange area from 2012 to 2016. Specifically, 11, 17, 10, 27, and 41 crashes occurred in 2012, 2013, 2014, 2015 and 2016, respectively. Of the total crashes reported near the Highway Z interchange area, 0 crashes were fatal, 19 crashes (16%) resulted in injuries, and the largest majority (89 crashes or 84%) were reported as property damage only, as seen in Figure 14. The figure shows an increasing trend in crashes over the five-year period. The large spikes in 2015 and 2016 likely correspond to the construction and opening of the roundabout at I-70 and Route Z. This improvement caused an increase in vehicles using the interchange.

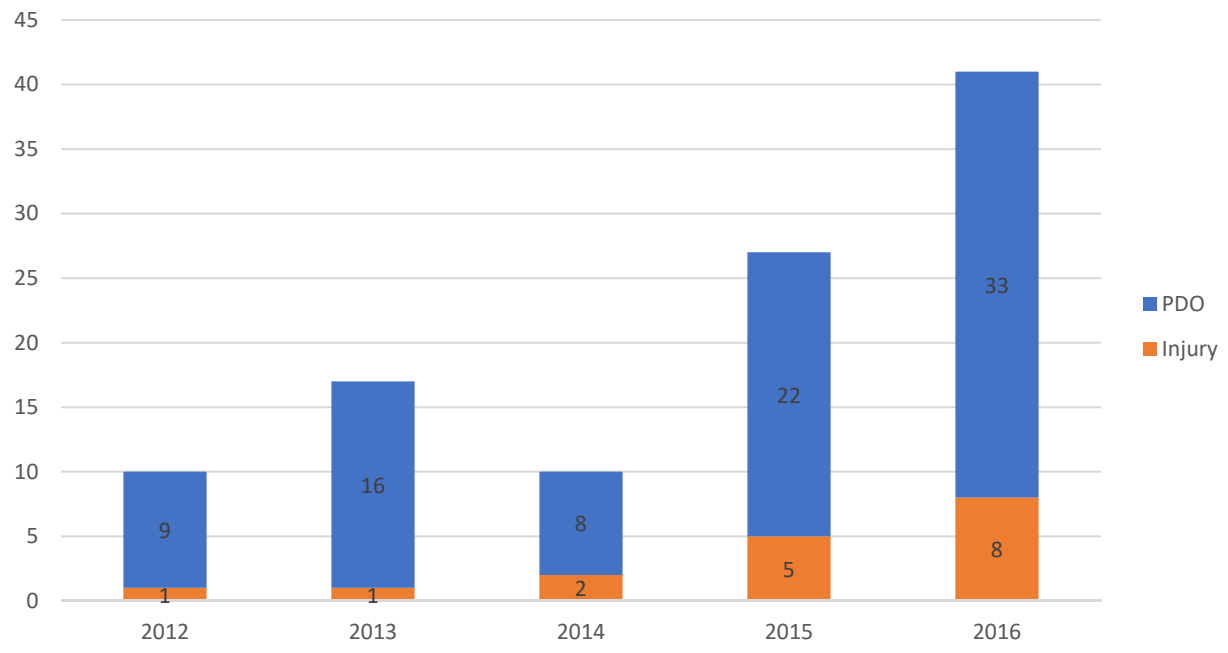


*Figure 14: Total Crashes Along Route Z Near I-70 Interchange Area (2012-2016)*

Overall 82% of the crashes occurred on nice weather days, leaving only 18% of crashes occurring during inclement (wet, snow, or ice/frost) weather conditions. Overall, 77% of crashes occurred during daylight hours and 23% occurred during dark or unknown light conditions. Improvement to lighting and pavement friction would help to mitigate inclement weather and nighttime crashes. After analyzing the crash data over five years, it is evident that rear end and angle crashes are the most prominent types with 44% of the crashes and angle crashes as the second most with 25% of all crashes, see **Appendix E**. These crash types are typical at intersections.

## Events

The Wentzville downtown area is host to special programs and events, bringing in large amounts of visitors to the area. These events include races, parades, and Wentzville Days which is the largest event in the area.[5] **Table 1** shows a list of some of the major events in the study area.

*Table 2: Events in Downtown Wentzville*

| Event | Date | Road Closures | Event Attendance |
|---|---|---|---|
| Wentzville Days Fair and Music Festival | May 18-20 | Main Street, Allen Street | 25,000-30,000 |
| Annual Run for the Wall | Memorial Day Weekend | Pearce Boulevard | 1,000 |
| Rod Run | June 5th & August 7th | Pearce Boulevard | 1,000 |
| Wentzville's Liberty Fest | July 4th | Pearce Boulevard, Luektenhaus Boulevard | 10,000 |
| Fall Festival[6] | September 21-22 | Main Street, Linn Avenue | 1,000 |
| Wentzville's Tree Lighting and Christmas Parade | 1st Week of December | Pearce Boulevard, Luektenhaus Boulevard | 5,000 |

[5] http://www.wentzvillemo.org/visitors/area_attractions/index.php
[6] http://www.stpatrickwentzville.org/fallfest

*Figure 15: Fall Festival*

Many of these events require road closures, creating traffic and parking issues. Wentzville Days, the biggest event in the downtown area, requires road closures on Allen Street, Linn Avenue, and Main Street (**Figure 16**). Other events block off Pearce Boulevard for periods of time. These closures block much of the available on-street parking as well as some of the public off-street parking lots. The closure of Linn Avenue restricts vehicular access between the north downtown area and the south downtown area.

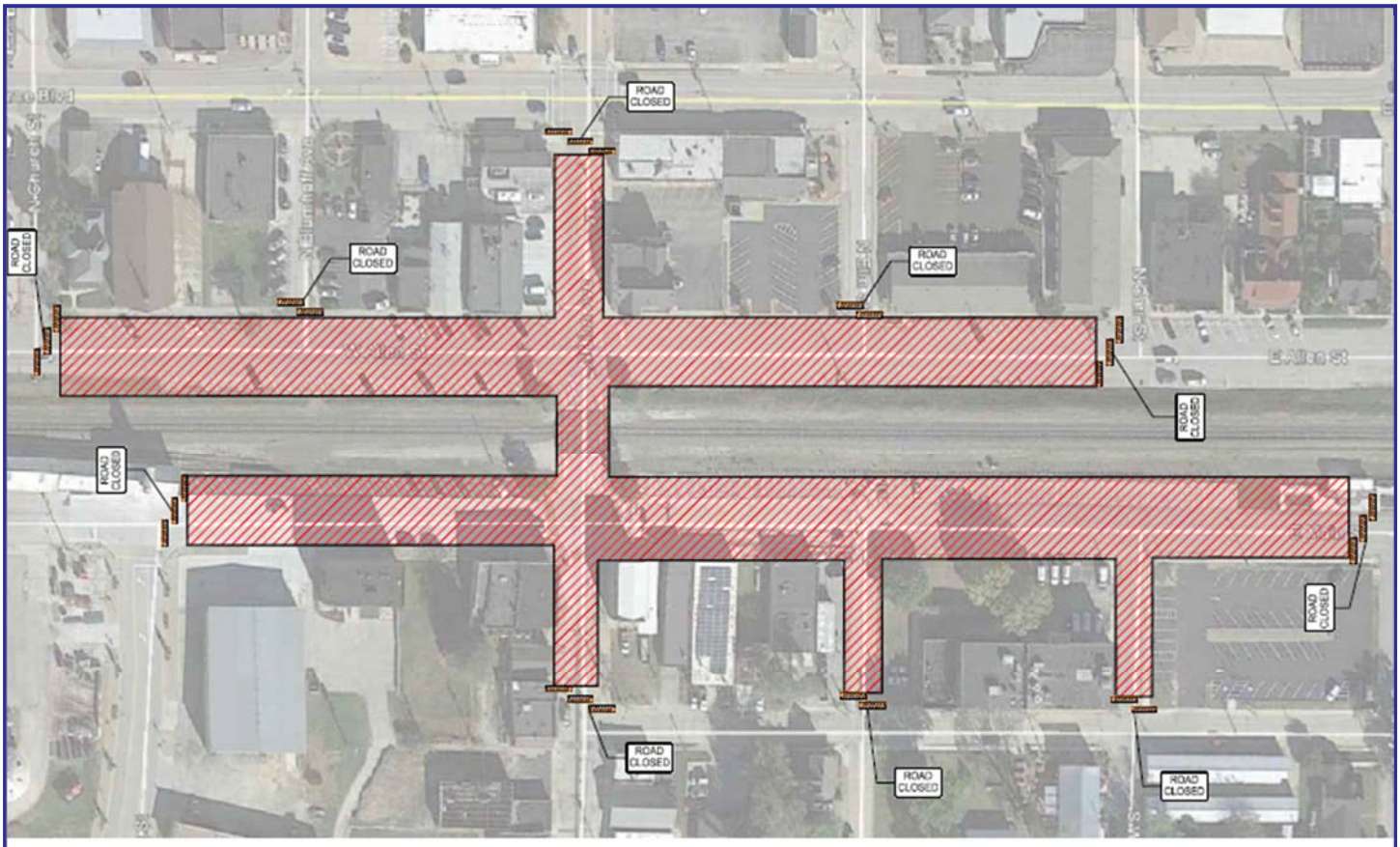


*Figure 16: Wentzville Days Road Closures*

# Walkability

## Sidewalks and Crosswalks

The existing sidewalks are inconsistent across the downtown study area. Pearce Boulevard contains "front lawn" parking, and sidewalks start and stop along both sides of the roadway. These non-continuous sidewalks provide poor walkability for pedestrians. Pedestrians are forced to walk behind parked vehicles in these "front lawn" areas. Many sidewalks lack ADA compliance (**Figure 17**). **Figure 18** shows an area north of Pearce Boulevard where there is sidewalk that leads into a "front lawn" area, creating uncomfortable situations for pedestrians.

*Figure 17: Lack of ADA compliance on Allen Street*

Crosswalks to cross Pearce Boulevard are limited to the intersection of Pearce Boulevard and Linn Avenue. This creates uncomfortable situations for pedestrians when pedestrians cross at unregulated locations.

Allen Street, on the other hand, has fairly consistent sidewalks on the north side, with occasional breaks for "front lawn" parking. Similar to Pearce Boulevard, Allen Street has crosswalks at Linn Avenue only.

Along Pearce Boulevard, utility poles are located on every block, often where a sidewalk should be located or where an ADA ramp should be placed. **Figure 19** shows a prime example at the intersection of Pearce Boulevard and Linn Avenue.

*Figure 18: Sidewalks along Pearce Boulevard*


*Figure 19: Utilities at Pearce Boulevard and Linn Avenue*

## Walking and Biking Plan

The City of Wentzville looked at walking and biking in the downtown area with the 2009 Downtown Redevelopment Plan.[7] Figures 20 and 21 are based off the Physical Design Workshop held with the implementation of this Redevelopment Plan. The following map developed by the project team shows the existing bicycle facilities, **Figure 20**. Also see **Appendix A**. The dashed red lines show proposed bike lanes, often following popular and connective routes. The solid red lines show existing bike facilities. As depicted in the figure, there are limited bike facilities in the area.

Pedestrian facilities are limited in the downtown area. **Figure 21** shows the existing pedestrian facilities. Also see **Appendix A**. The red dashes lines show existing sidewalks with variable conditions. The solid red lines show existing sidewalks built to the new standards.

[7] http://cms.revize.com/revize/wentzville/document_center/EcDev/Part%204%20-%20Physical%20Design%20Workshop.pdf

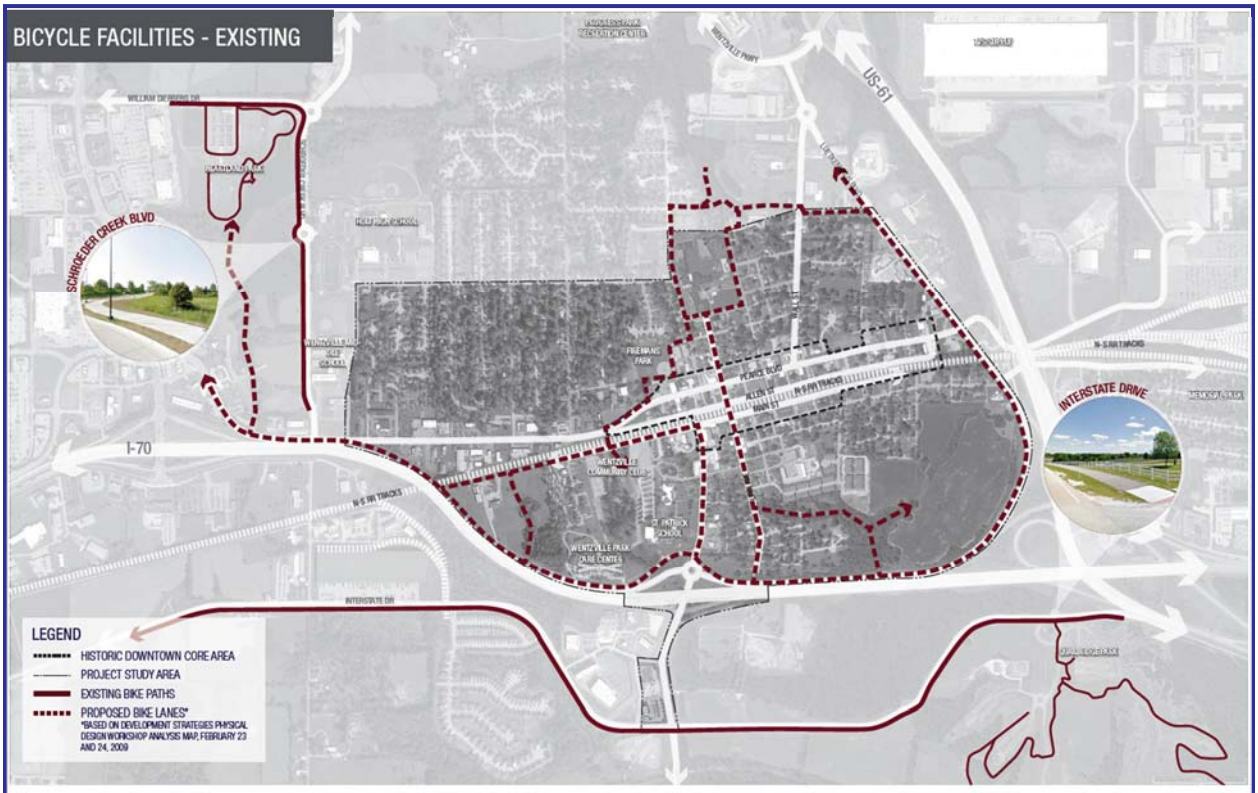


*Figure 20: Bike Facilities Inventory*


*Figure 21: Pedestrian Facilities Inventory*

## Downtown Circulation and Parking

A circulation study was completed for Wentzville Historic Downtown. Roadway design options were developed to improve traffic flow through the area. The study area for this part of the project focuses on the downtown area, shown in **Figure 22.** More information and analysis can be found in **Appendix C**.


*Figure 22: Wentzville Historic Downtown Study Area*

### Background and Study Area

Pearce Boulevard is classified as a minor arterial and the posted speed limit is 35 mph (**Figure 23**). The road is currently the main thoroughfare through the Historic Downtown area, connecting US 61 ramps in the east to businesses in the west. Pearce Boulevard is a three-lane road with a TWLTL. Within the downtown area, there is front yard parking between the curb and building fronts. Pedestrian facilities are inconsistent throughout Pearce Boulevard, and there are not many places to cross the roadway.

Allen Street is a two-lane local road with a posted speed limit of 25 mph (**Figure 24**). The road runs east and west, connecting to Pearce Boulevard to the west and Hickory Street to the east.

*Figure 23: Pearce Boulevard*

*Figure 24: Allen Street*

Linn Avenue is a two-lane road that runs north and south. It is classified as a major collector with a speed limit of 25 mph. Linn Avenue has the only railroad crossing in the Historic Downtown area.

Main Street is classified as a local road with a posted speed limit of 25 mph. It has two lanes running east-west and runs parallel to the railroad tracks. Situated along it is a mixture of residential and businesses. It will connect to The Junction TIS proposed development site on the west end.

Pitman Street is a two-lane minor collector and has a posted speed limit of 25 mph (**Figure 25**). It runs east-west, connecting to Linn Avenue on the west end and Luetkenhaus Boulevard on east end of the study area.

Luetkenhaus Boulevard runs north and south and is classified as a major collector. It has two lanes, and the posted speed limit is 35 mph. A railroad underpass along Luetkenhaus Boulevard provides another route for vehicles to travel between the north and south areas of downtown Wentzville.

North-south cross streets, between Pearce Boulevard and Allen Street, were included in the study in consideration of loading and unloading practices, traffic behavior during train arrivals, and alternative design possibilities.

## Downtown Traffic Forecasts

**Exhibit 1** (page 9) shows the 2017 volumes in the Downtown area. **Exhibit 5** shows the 2037 volumes in the Downtown area. The 2037 volumes were estimated with a 20% growth rate as well as accounting for development as described in the Junction TIS study.

*Figure 25: Main Street*

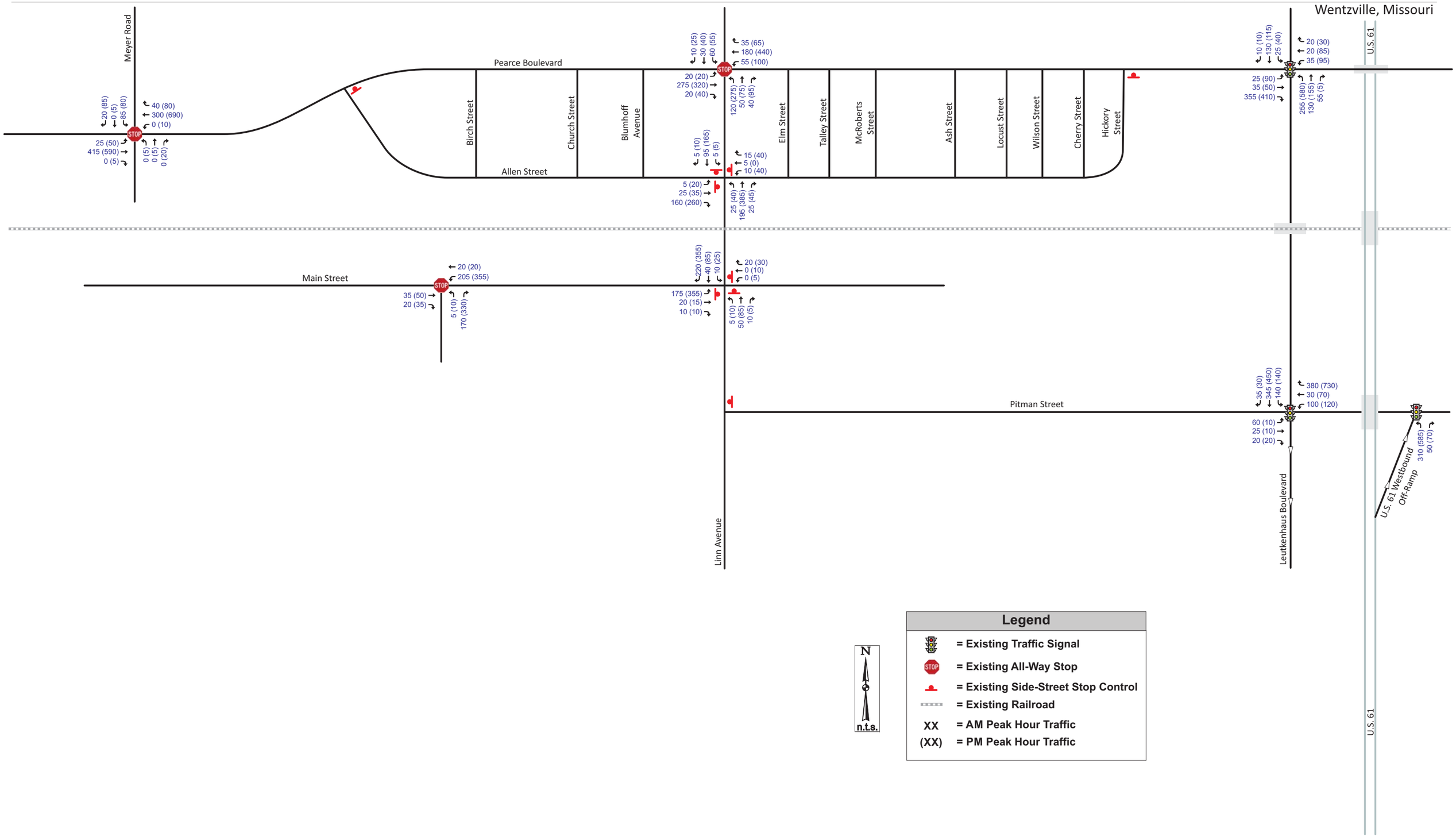


Exhibit 5: 2040 Traffic Data

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## Railroad Crossings

There is one at-grade railroad crossing in the historic downtown area on Linn Avenue, between Allen Street and Main Street. Historically, there was a second at-grade crossing at McRoberts Street.

## Pearce Boulevard and Meyer Road

**Figure 26** illustrates the study intersection.

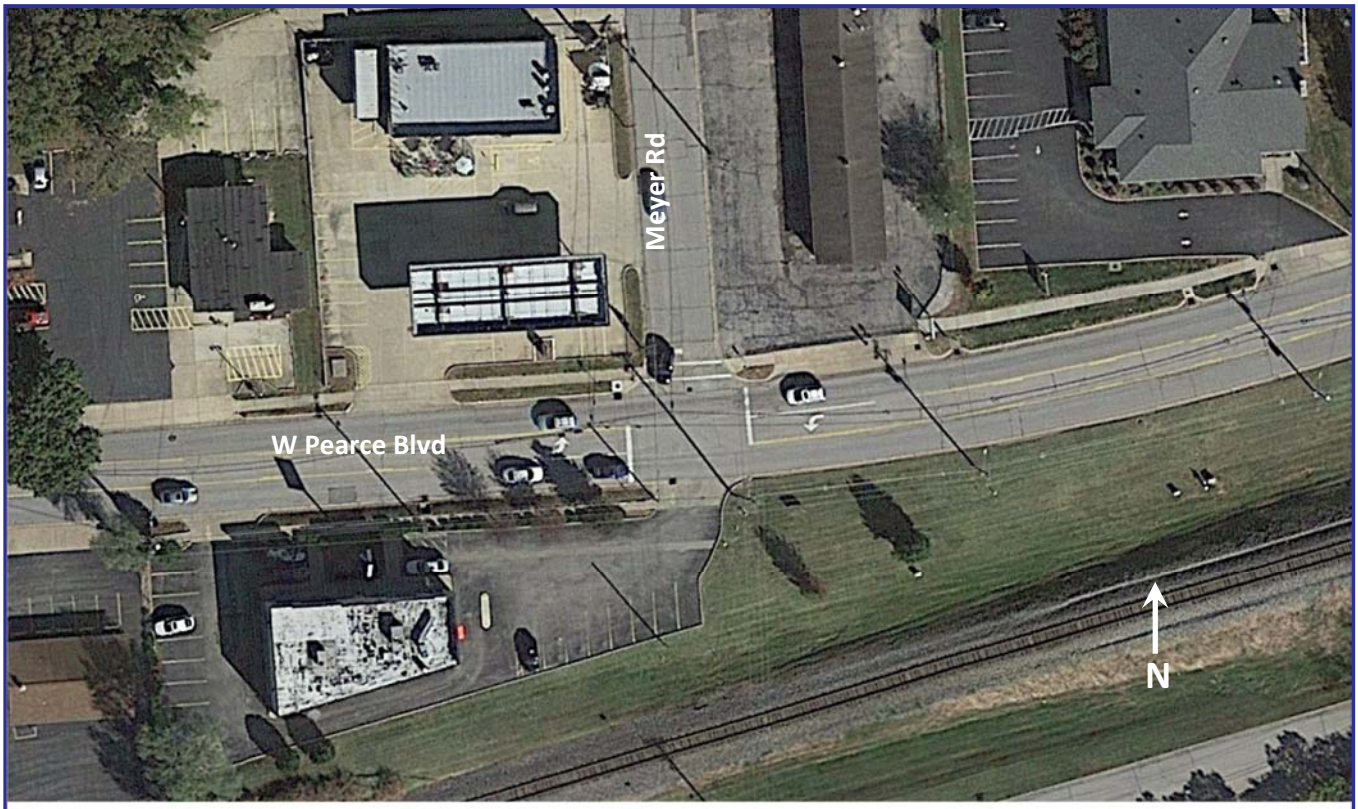


*Figure 26: Study Intersection – Pearce Boulevard and Meyer Road*

West Pearce Boulevard is a three-lane, east-west minor arterial road. The road has one eastbound lane, one westbound lane, and a two-way left-turn lane (TWLTL). Pearce Boulevard has a posted speed limit of 35 miles per hour (mph). Continuous sidewalks are provided on the north side of the road while sidewalks are only provided along the Domino's property on the south side of the road. Vertical curbs, driveway curb cuts, and sewer drainage are present throughout the length of Pearce Boulevard in the study area.

Meyer Road is a two-lane, north-south urban collector road with a posted speed limit of 25 mph. Sidewalks are not provided on Meyer Road near the study area. Along Meyer Road, rolled curbs and sewer drainage are present. The intersection of Pearce Boulevard and Meyer Road is currently controlled by an all-way stop control (AWSC). The south leg of the intersection serves as one access point for a Domino's restaurant. A Mexican restaurant (previously gas station) occupies the northwest quadrant of the intersection, and a self-service car wash occupies the northeast quadrant of the intersection. Both uses have access to Meyer Road.

Cheryl Ann Drive is a two-lane, north-south local road with a posted speed limit of 25 mph. Cheryl Ann Drive has rolled curbs, sewer drainage and is missing sidewalks. The intersection of Pearce Boulevard and Cheryl Ann Drive is currently controlled by an AWSC. The south leg of the intersection provides access to a retail strip center.

## Pearce/Meyer Traffic Volumes

**Figure 27** shows existing traffic volumes, collected in November of 2017. The heaviest movements at the intersection are the east and west approaches, along Pearce Boulevard.

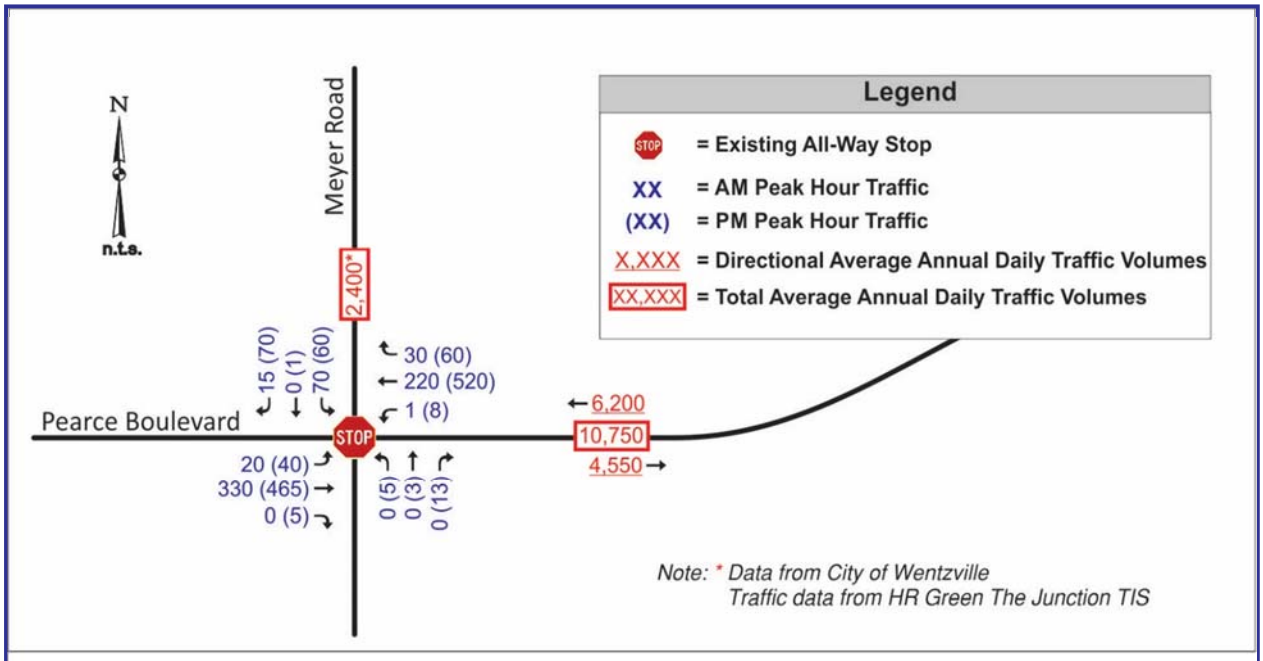


*Figure 27: Traffic Volumes – Pearce Boulevard and Meyer Road*

## I-70/Route Z Interchange

One part of the Wentzville Historic Downtown Transportation Revitalization Preliminary Design was to develop roadway design options that improve the safety along Route Z as well as withstand the increase in traffic volumes resulting from future development in south Wentzville. The study area for this portion of the project focuses on Route Z between Mar-Le Drive/Wagner Street in the north, to Interstate Drive, in the south. **Figure 28** shows the I-70 and Route Z interchange study limits.


*Figure 28: Route Z corridor study area*

## Background and Study Area

Route Z is a north-south minor arterial that connects south Wentzville to I-70 and Wentzville Historic Downtown. In the study area, Route Z maintains one northbound lane and two southbound lanes between Interstate Drive and I-70. The posted speed limit is 45 mph. Route Z changes names to Church Street at the I-70 westbound ramps roundabout intersection. Church Street is a two-lane road with a TWLTL. The posted speed limit is 20 mph.

Mar-Le Drive and Wagner Street are east-west local roads. Mar-Le Drive provides access to Main Street, a proposed site development discussed in The Junction TIS, as well as to St. Patrick School and a care and rehabilitation center. Wagner Street provides access to neighborhoods and sites for potential development. The posted speed limits on both roads are 25 mph.

Interstate Drive is classified as a major collector, running east and west. The posted speed limit is 35 mph. The road provides access to a mixture of businesses and homes.

## Route Z Traffic Volumes

Existing 2017 volumes were compared to the previously forecasted 2026 volumes developed in an analysis of the proposed roundabout intersection at Route Z/South Church Street. 2017 AM volumes are about 20% higher than the 2026 AM forecasted volumes and existing 2017 PM volumes are about equal to the 2026 PM forecasted volumes. The high traffic volumes at this location show that there was latent demand that fueled a spike in traffic growth once the recent improvements at the interchange were completed. Continuing development on the Route Z corridor south of I-70 will result in these traffic volumes continuing to grow in the future.

Figure 29 shows the estimated growth trend for Route Z. For 2040 forecasts, we assume about 50% growth of the existing 2017 volumes. This assumption is based, in part, on MoDOT collected volumes at a location on Route Z, south of I-70, between the years 2000 and 2015. The gray data points are MoDOT traffic counts collected just south of I-70, on Route Z. The black data points are MoDOT traffic counts collected farther south on Route Z. Counts found in the Junction TIS study were plotted on the same graphic (in orange). The blue represents CBB counts and forecasts.

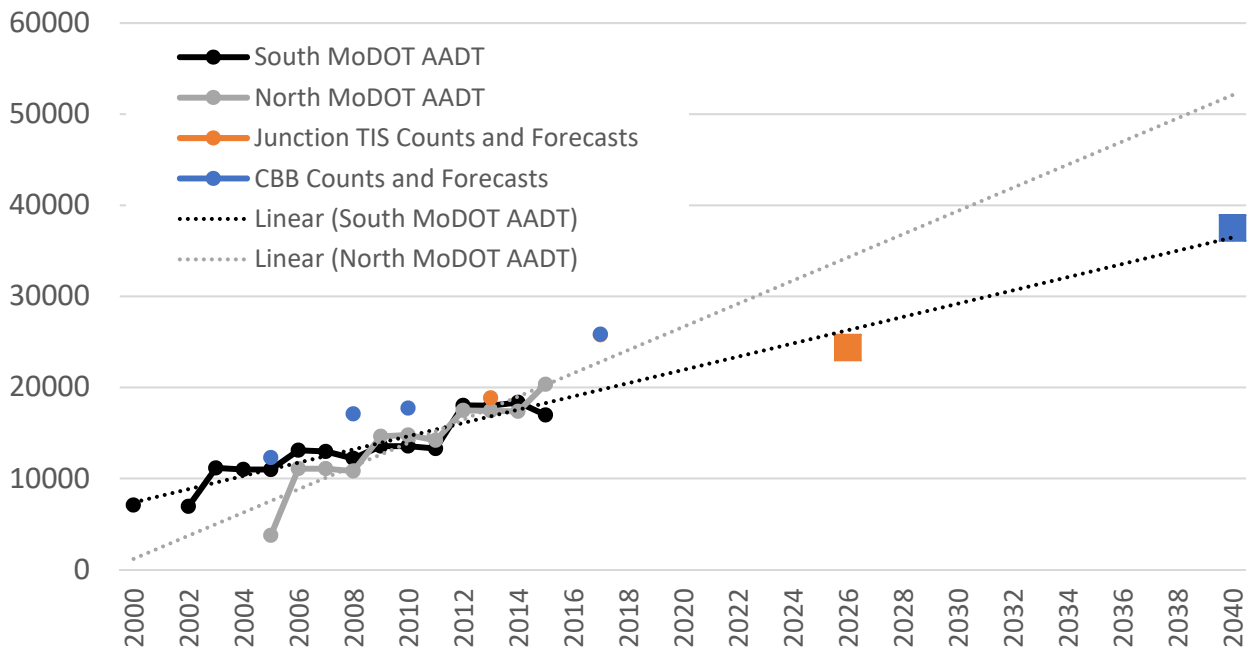


*Figure 29: Growth Trend on Route Z*

Figure 30 shows the queue growth for the westbound I-70 off ramp. The orange line represents the existing ramp length, and the grey and blue lines show anticipated average and maximum queue length if further improvements are not made at the interchange. With existing conditions on the westbound I-70 off ramp, expect significant queueing on I-70 by 2030 to 2035.

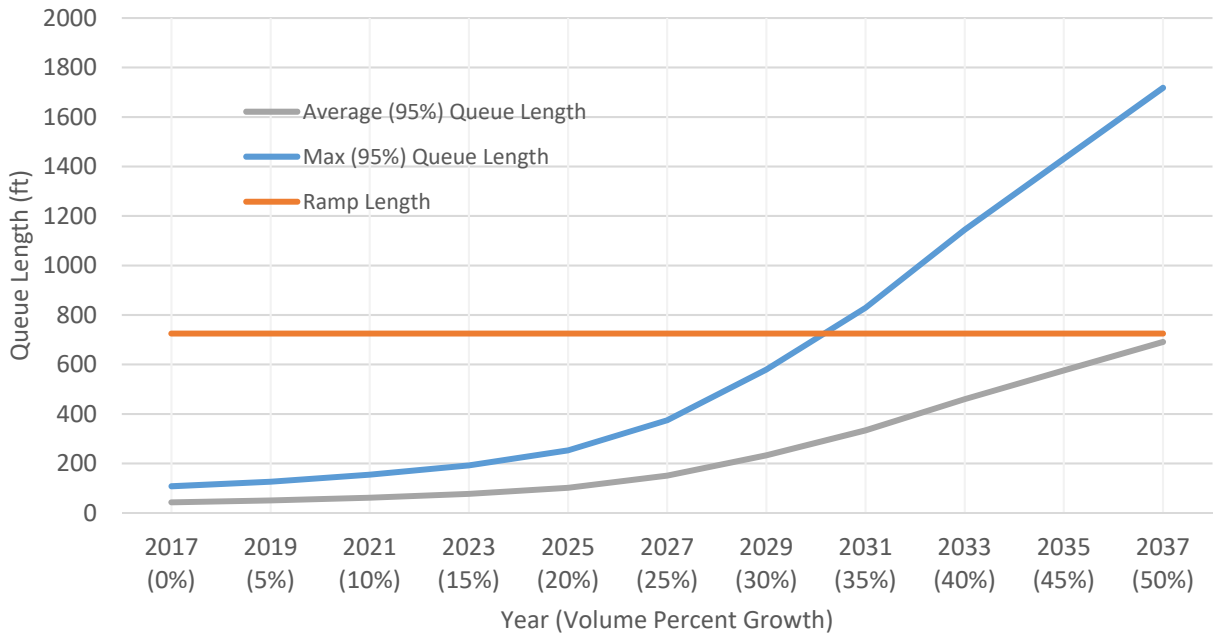


*Figure 30: Westbound I-70 off ramp queue growth*

Using the assumed traffic forecast rate of 50%, the 2017 and 2040 no-build conditions were evaluated. A proposed site development to the west of Mar-Le Drive and Main Street was accounted in traffic volumes as well as potential site development at the southeast corner of Mar-Le Drive/Wagner Street intersection. Estimated traffic forecasts from the Junction Traffic Impact Study were used in consideration of the site development to the west. For the development on the southeast corner, traffic forecasts were estimated based on information provided in Trip Generation annual, Ninth Edition, published by the Institute of Transportation Engineers (ITE). More details can be found in **Appendix E**. 2017 existing traffic volumes are shown in **Exhibit 1**. Finally, 2040 traffic volumes with the considered site development are shown in **Exhibit 6**.

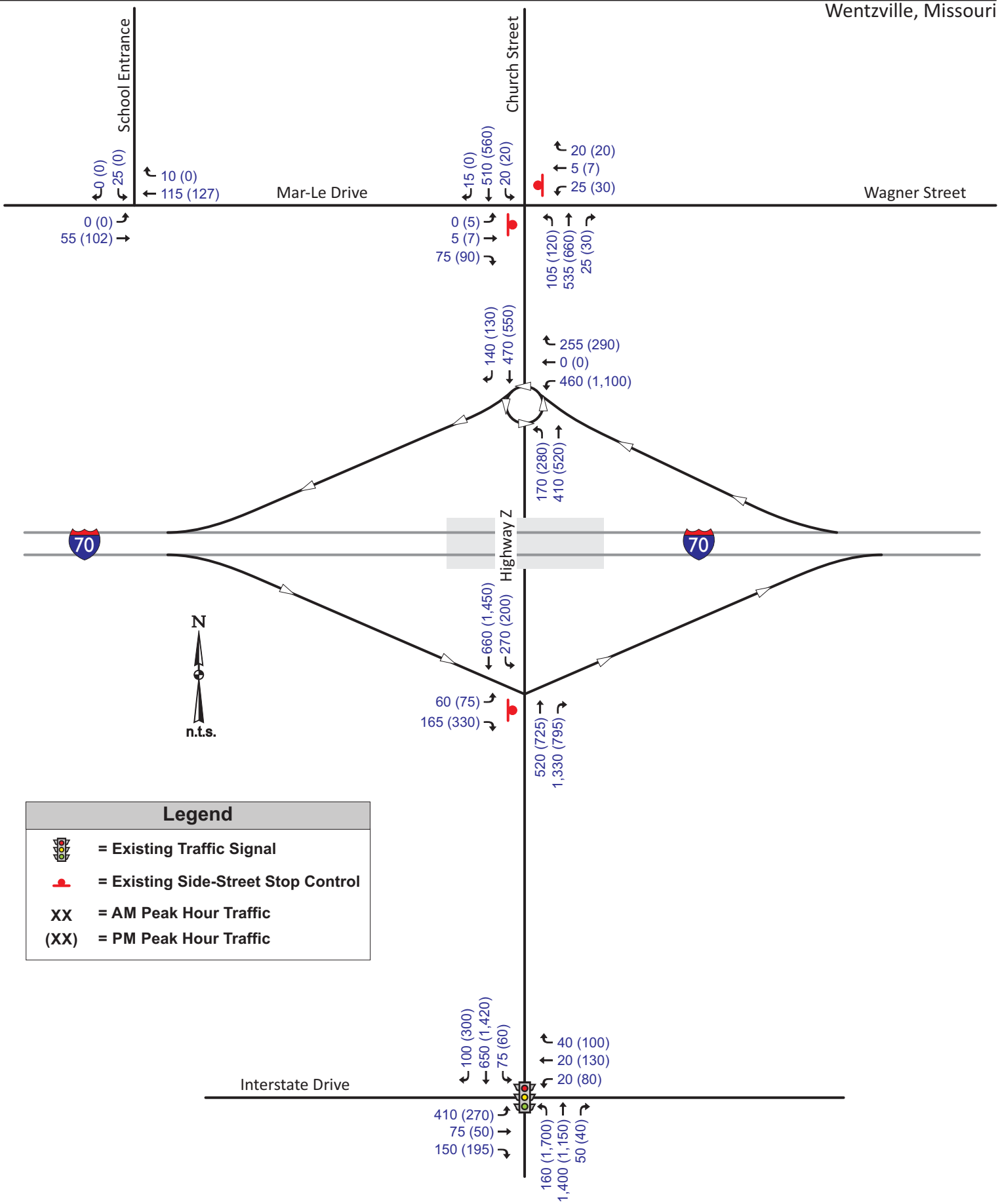


Exhibit 6: 2040 Forecasted Traffic Volumes with Site Development

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# Public Engagement

The public was engaged throughout the study to gain input related to their experiences and opinions about the problems, needs, and opportunities related to transportation, access, circulation, and parking in the study area. See **Appendix B** for more information about each of the meetings.

Steering committee meetings, open to downtown business owners and several elected officials, were held on Tuesday, February 6, 2018 and Monday, June 11, 2018 at the Wentzville City Hall. These meetings were held before the public open houses to gather comments and concerns. We would like to thank the steering committee members for their participation and insights.

- Mr. Thieman
- Mrs. Ehll
- Mr. Warren
- Mr. Nolan
- Mr. Tow
- Alderman Swanson
- Alderman Hussey

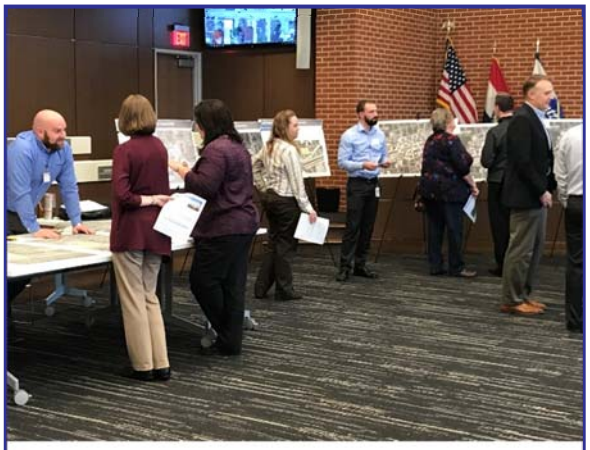


*Figure 31: Alternatives Development Workshop*

## Alternatives Development Workshop

A public workshop was held Thursday, February 15, 2018 at the Wentzville City Hall. The public workshop was attended by 50 community members. The study team prepared and displayed project boards, strip maps, and interactive exercises encompassing the relevant Wentzville Historic Downtown Transportation Revitalization Project goals, key study findings, and the study team's recommended concepts. The interactive exercises were used to gain vital feedback on recommendations. More information can be found in **Appendix B.** The information was presented at different stations:

- **What makes a great downtown? Station:** The project team provided a board showing various aspects that can make a great downtown. One project team member explained the various aspects to workshop attendees and the attendees voted on which aspects they would like to see in Downtown Wentzville. Each participant got three dots, one black dot (1st choice), one yellow dot (2nd choice), one blue dot (3rd choice).
- **Gateways Station:** The project team provided three boards on gateways. The first board showed the existing gateway conditions in the Wentzville Downtown area. The second board showed a number of different gateway precedents that workshop attendees could vote for. A project team member at the station explained each of the different gateway precedents. Each participant got three votes, ranked by 1st, 2nd, and 3rd favorite. The three highest selections were having a variety of businesses close to each other, public parking lots, and options for living downtown. The highest ranked option was "seating-landscape-pocket park." The last board showed the concepts for painting the Luetkenhaus railroad overpass. Each participant got to vote for their favorite concept. The highest rated choice was the Wentzville Days themed design.

*Figure 32: Alternatives Development Workshop*

- **Downtown Circulation Station:** The project team provided boards, a sample Pearce Boulevard strip map, and a puzzle piece activity to gather feedback on downtown circulation, parking, and an additional railroad crossing location. The boards included a board depicting the existing railroad crossings and the locations of the two proposed railroad crossings as well as three boards showing the downtown parking utilization at peak hours on a typical weekday, Friday, and Saturday.

  Meeting attendees had the opportunity to build cross sections for Pearce Boulevard and Allen Street in the puzzle piece exercise to see how different elements fit to scale.

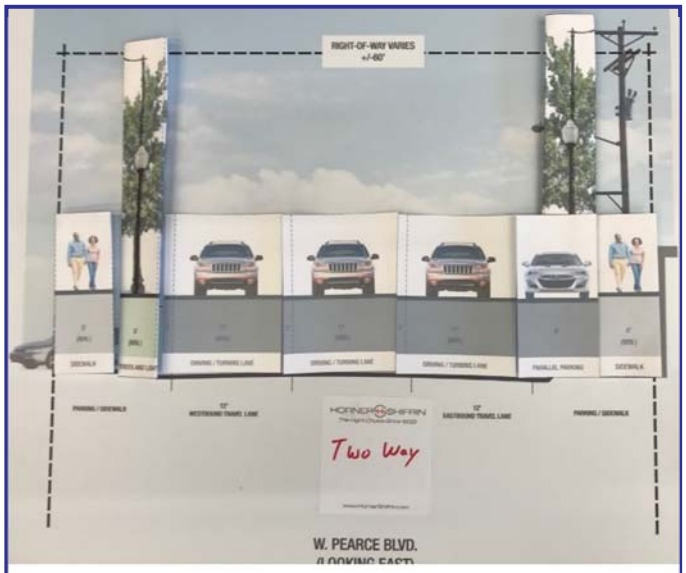



*Figure 33: Puzzle Piece Exercise – Pearce Boulevard Cross-Section Created by Attendee*

- **Pearce/Meyer Intersection Alternatives Station:** There were three boards at the Pearce Boulevard and Meyer Road intersection station. The first board explained the existing conditions of the all-way stop. The second board showed the proposed alternative of a signalized intersection along with a table showing specifics like travel time reduction and cost. The third board showed a roundabout alternative along with a similar table. There were 15 votes for the signal alternative compared to six (6) votes for the roundabout alternative.
- **Freeway Access Station:** The Diverging Diamond Roundabout (DDR) and Mar-Le Drive Offset Roundabout alternatives were presented to the workshop attendees. A project team member at the station explained the different aspects of each alternative, walked the workshop attendees through using the alternatives, and answered questions. After learning about the two different alternatives, the workshop attendees were generally more in favor of the DDR alternative.

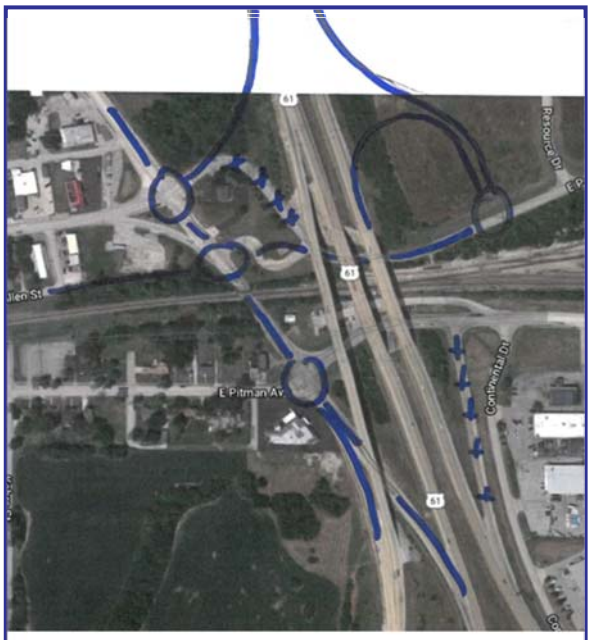



*Figure 34: Freeway Access Concept Proposed During Workshop*

Team members were available at each of the stations to answer questions about the presented information. Comment cards were provided, in addition to the interactive exercises at each of the stations, for participants to express comments, support, or concerns for any of the information presented.

The Alternatives Development Workshop was successful in gathering valuable feedback on the five different stations. The comment cards showed wide support for the diverging diamond roundabout along with concerns about parking in Downtown.

## Recommendations Open House

An open house for Wentzville residents was held on July 16, 2018, gaining 43 attendees. The study team prepared and displayed project boards and strip maps describing the relevant Wentzville Historic Downtown Transportation Project findings and recommendations. The information was presented at five stations. Team members were available at each station to answer questions about the presented information.


*Figure 35: Recommendations Open House*

1. Economic Development Station: The project team provided a board summarizing economic development in Downtown. This information can be found in **Appendix A**. One project team member explained the various aspects to workshop attendees.
2. Gateways Station: The project team provided six boards at the station. Three of the boards depicted the gateway treatments, two of the boards depicted the Elm Street pocket park concept, and one board provided an overview of the gateway treatments in Downtown. A project team member at the station explained each of the different gateway precedents. See **Appendix F** for the gateway information provided at the meeting.
3. Downtown Circulation Station: The project team provided boards, a Downtown strip map, volumes and parking exhibits, and a running model to gather feedback on downtown circulation and parking recommendations. The strip map depicts the improvements to Pearce Boulevard, Allen Street, as well as the west tie-in, the dog-bone roundabout, and the proposed signal at Pearce Boulevard and Linn Avenue. Two boards showed concepts of how Allen Street and Pearce Boulevard will each look after the improvements have been completed. A third board described the benefits the project will have on the downtown area (**Figure 38**).

*Figure 36: Gateways Station at Open House*

4. Pearce/Meyer Intersection Recommendations: A conceptual layout was provided of the Pearce Boulevard and Meyer Road intersection. The layout showed signal improvements as well as a side street stop at Pearce Boulevard and Cheryl Ann Drive. A project team member at the station explained the improvements.
5. Route Z/I-70 Interchange Recommendations: A conceptual layout was provided of the recommended diverging diamond interchange at Route Z and I-70, along with a running model of the scenario and traffic volume exhibits. A board, at the station, described the benefits of the recommended improvements (**Figure 39**). Project team members were at the station to explain the recommendations and to answer any questions.

*Figure 37: Recommendations Open House*

Comment cards were provided, in addition to the interactive exercises at each of the stations, for participants to express comments, support, or concerns for any of the information presented. The Recommendations Open House was valuable in gathering comments and concerns on the final recommendations. The public was overall supportive of the recommendations outlined at each of the stations.

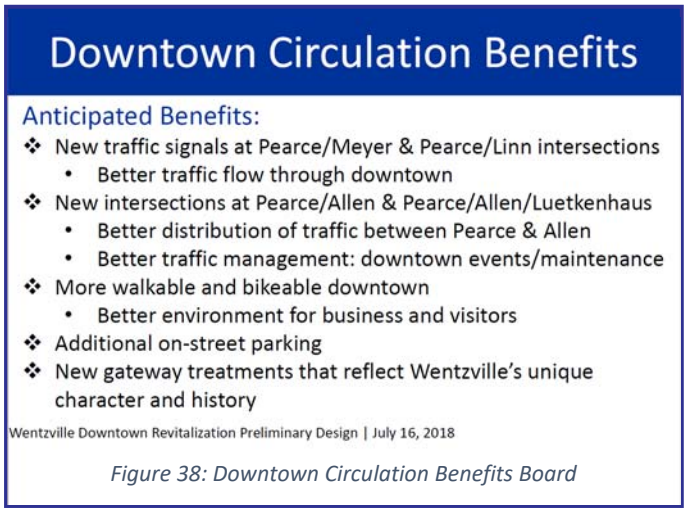



*Figure 38: Downtown Circulation Benefits Board*

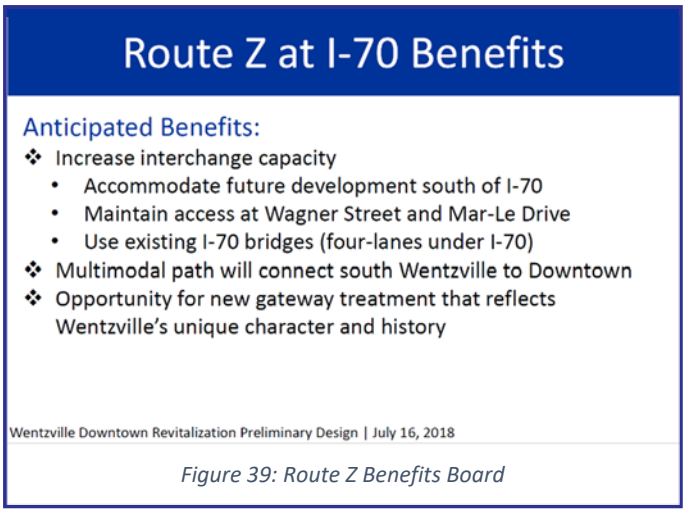



*Figure 39: Route Z Benefits Board*

## Presentations

An overview of the project was presented on two separate occasions to the Downtown Committee and Downtown Business Association, Tuesday, January 23, 2018 and Thursday, February 8, 2018, respectively. The presentation was used to inform stakeholders on the ongoing project and was followed by a question and answer period. The project team lead attended the Wentzville Downtown Business Association meeting on Thursday, July 12, 2018 to present updated materials and information on the study. Following the meeting was a question and answer session.

# Recommendations

## Downtown Circulation and Parking

A core need is to improve walkability on Pearce Boulevard. To do so, it is critical to remove the "front yard" parking, which can be replaced with on-street parking by reducing Pearce Boulevard from three lanes to two lanes. However, for this to work, capacity must be improved on other parts of the system. Specifically, Allen Street must be better connected on the ends so that it becomes a viable alternative route. Furthermore, the bottlenecks at the existing all-way stops must be removed.

The preliminary concept analysis started with redesigning Pearce Boulevard and Allen Street. The existing right-of-way on Pearce Boulevard is generally 60 feet wide between building fronts. In another light, due to railroad right-of-way agreements with the City, only parking is allowed on the south side of Allen Street. With these considerations come varying options and considerations that can be found in Appendix C. The following section discusses the recommended alternative.

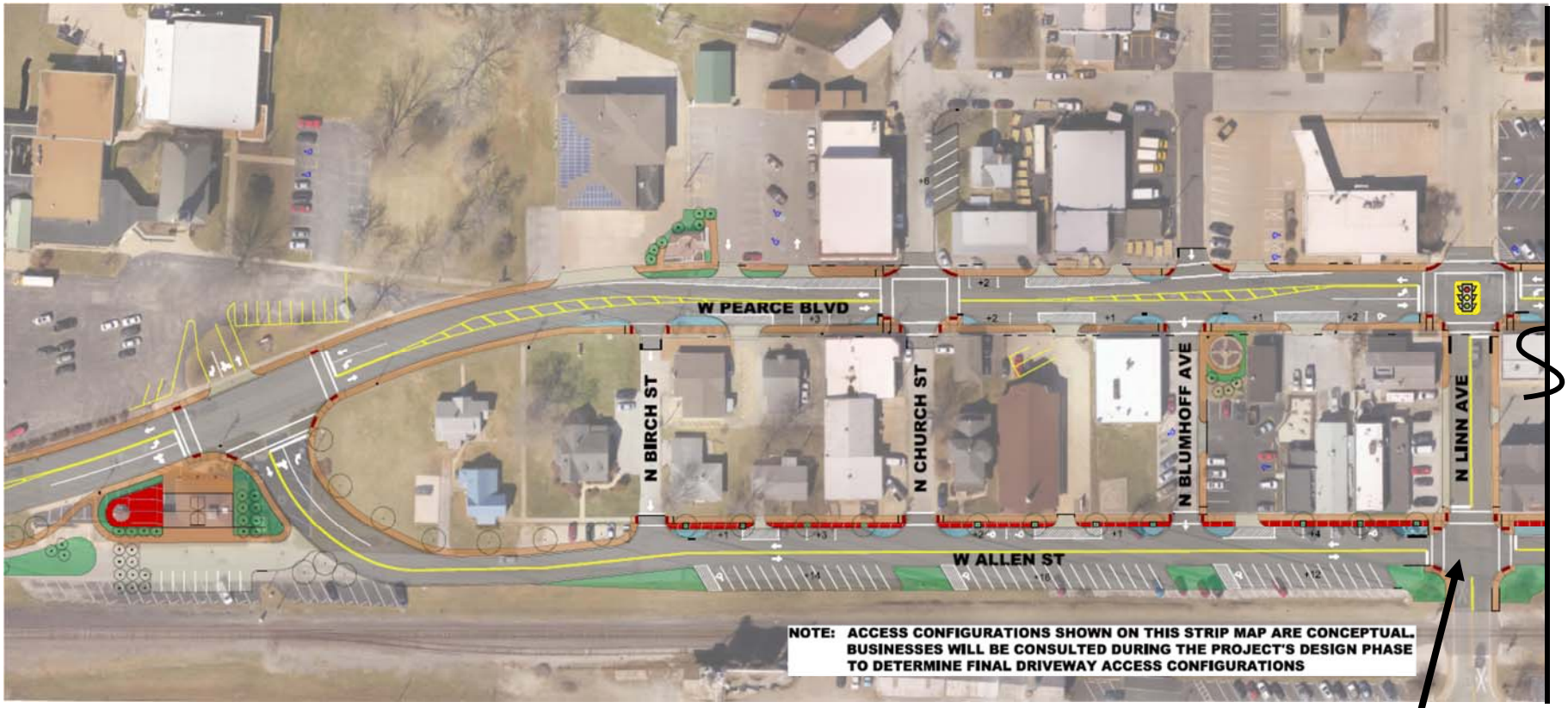
The preferred alternative for downtown includes, as a base, two-way, two-lane roadways with on-street parking for both Pearce Boulevard and Allen Street. This configuration will lower traffic speeds, reduce distance that pedestrians need to cross the street, and provide space for sidewalks and other amenities that will enhance downtown's historic character.

Allen will be better connected to the arterial system, which will allow better utilization of both Pearce and Allen for local traffic. The improved connection will also provide for better management of traffic during maintenance, road closures, and other events. The proposed west tie-in is an improved intersection at Pearce Boulevard and Allen Street. The proposed east tie-in is a dog-bone roundabout connecting Pearce Boulevard, Luetkenhaus Boulevard, and Allen Street. Furthermore, a signal will be installed at Pearce Boulevard and Linn Avenue The proposed geometric and traffic control changes to the downtown area can be seen in Exhibit 7. The following lists specific improvements.

- A better downtown environment for business and visitors by completing sidewalks; constructing a multi-use path; and installing amenities such as pocket parks, benches, and streetscape elements.
- Improved distribution and circulation of traffic on downtown streets by building stronger connections to Allen Street, which is currently underutilized. This also allows for better management of the street network during events, maintenance activities, and daily use.
- Improved traffic flow by upgrading the corridor's four-way stop controlled intersections to traffic signals. This includes the intersections of Pearce Boulevard and Meyer Road as well as Pearce Boulevard and Linn Avenue.
- Raising electric and other above-ground utilities by approximately 15 feet higher than the existing poles for better aesthetics. The taller poles will allow for longer spans, reducing the total number of utility poles by about a third.
- Upgrading technology in downtown Wentzville through new fiber optic communications and 5G light poles.
- Implementation of a "quiet zone" and improving safety through four-quadrant gates at the Linn at-grade railroad crossing.
- New on-street parking.
- New gateway treatments that reflect Wentzville's unique character and history.
- Storm sewer repairs and replacements.

Underground signal utilities (e.g. conduit and pull boxes) will be installed at the west tie-in. It is predicted that more vehicles will divert from the Pearce Boulevard and Linn Avenue intersection to start using the west-tie. The 20-year forecast shows a side-street stop to have acceptable capacity and operations (LOS D on Allen Street). However, in the case that vehicles experience excessive delay making a left-turn from Allen Street onto Pearce Boulevard, conduit will be installed to ease transition to a signal. Having underground traffic signal infrastructure in place will help in a possible signalization of this intersection or if the city wants to promote this traffic movement.

# PEARCE BOULEVARD AND ALLEN STREET
## CITY OF WENTZVILLE HISTORIC DOWNTOWN REVITALIZATION




Note: Railroad crossing proposed improvements, including quiet zone and four-quadrant gate signal.

*Exhibit 7a: Downtown Strip Map (West End)*

# PEARCE BOULEVARD AND ALLEN STREET

## CITY OF WENTZVILLE HISTORIC DOWNTOWN REVITALIZATION

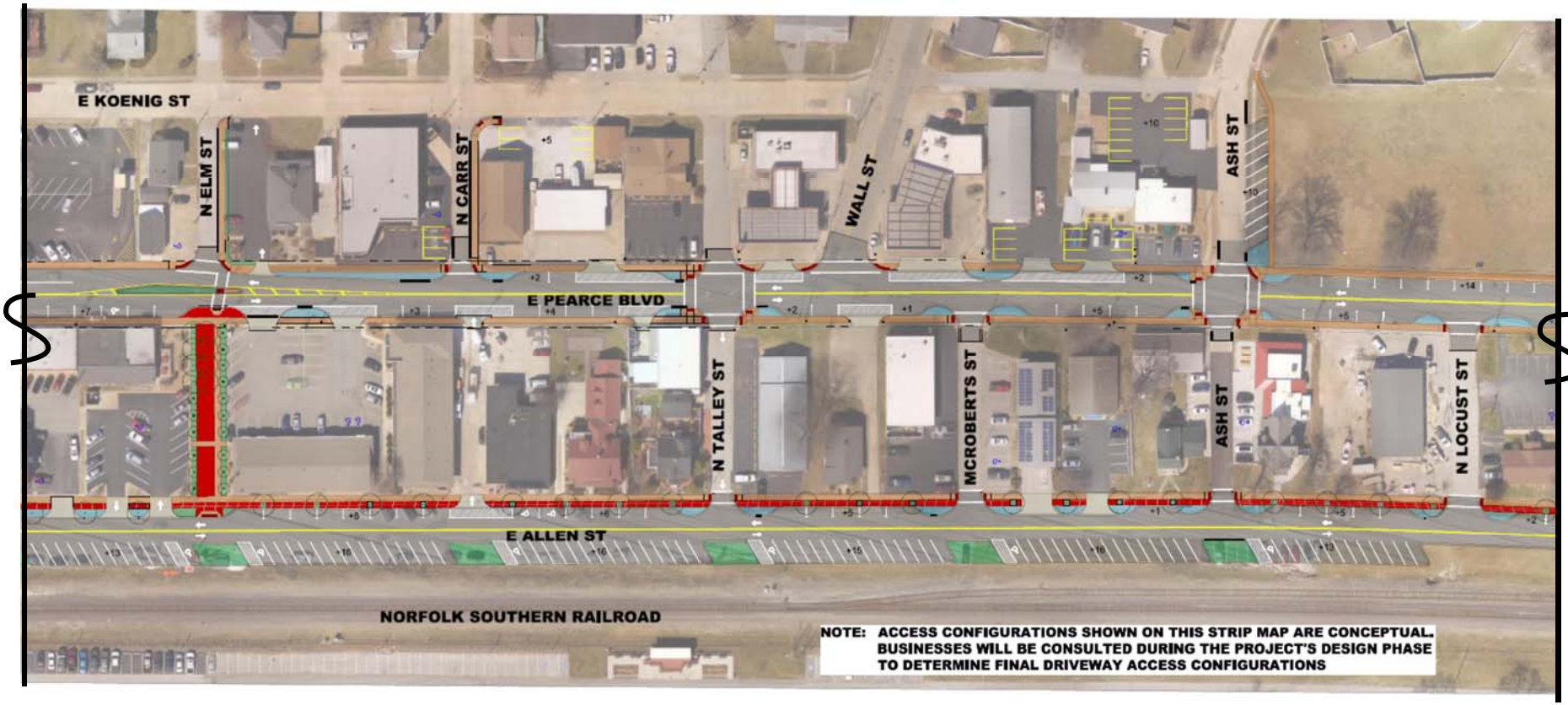



*Exhibit 7b: Downtown Strip Map (Middle)*

# PEARCE BOULEVARD AND ALLEN STREET

## CITY OF WENTZVILLE HISTORIC DOWNTOWN REVITALIZATION

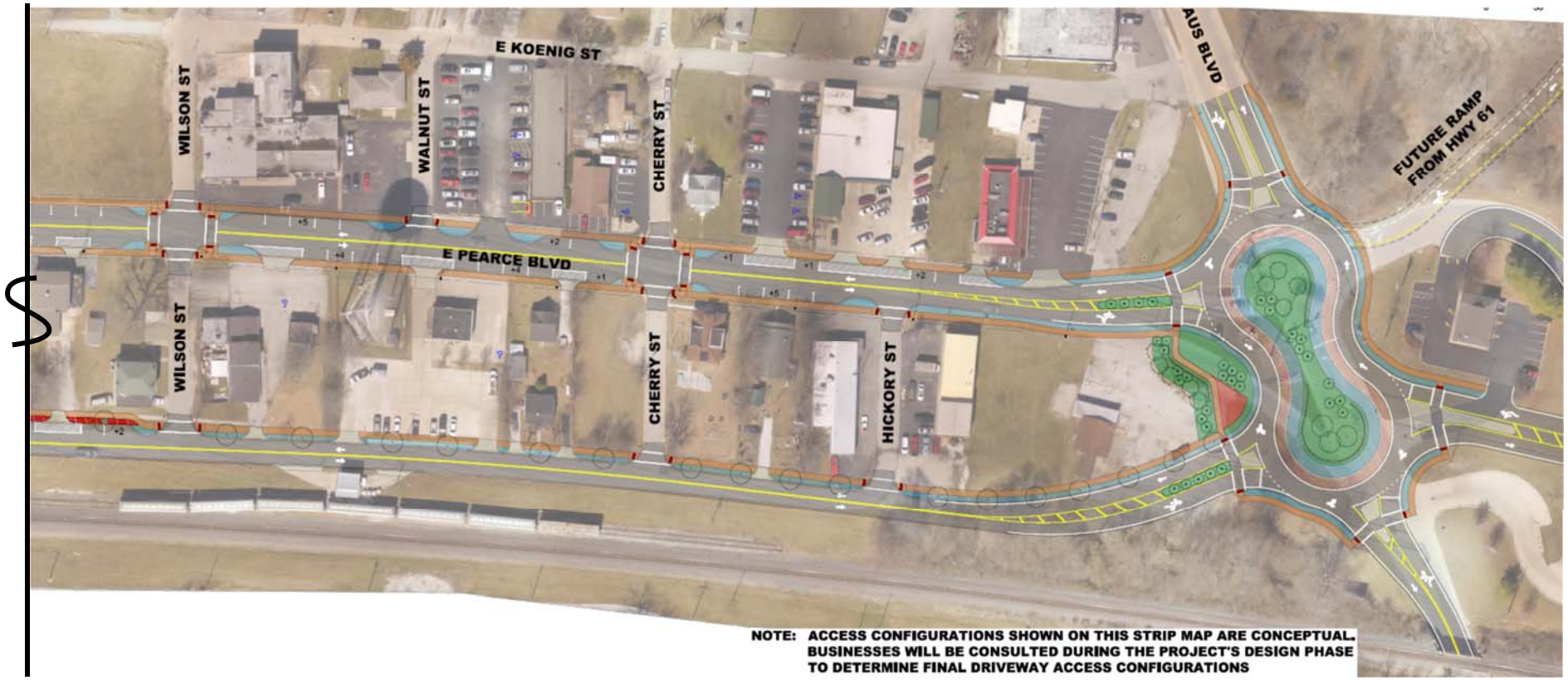



*Exhibit 7c: Downtown Strip Map (East End)*

**Figure 40** shows before and after improvements of Pearce Boulevard at Church Street. These improvements include sidewalks and crosswalks, updated light fixtures, on-street parallel parking, the removal of the two-way left-turn lane (TWLTL), and utility adjustments. **Figure 41** shows before and after improvements of Allen Street at Linn Avenue. The improvements include crosswalks and sidewalks, a sidewalk buffer area, updated lighting, and landscaping.

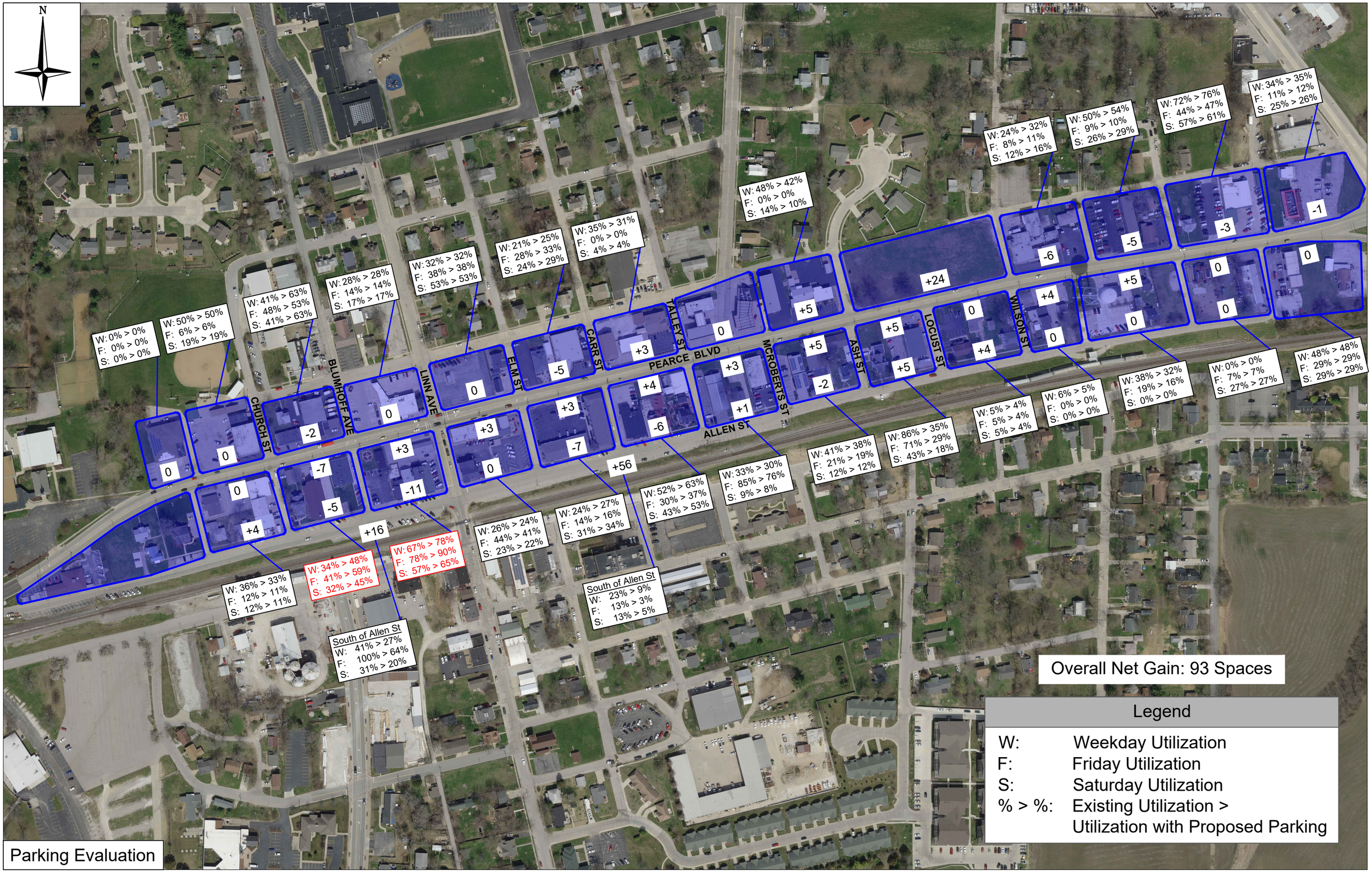
*Figure 40: Before/after improvements of Pearce Boulevard at Church Street*

*Figure 41: Before/after improvements of Allen Street and Linn Avenue*

As mentioned previously, there were several considerations for the downtown area: parking, traffic circulation, and walkability. In the proposed downtown layout, the "front lawn" parking was removed on Pearce Boulevard and on-street parallel parking was added. Continuous sidewalks were added on both sides of Pearce Boulevard and side street angled parking was added on the east side of Ash Street and the east side of Church Street.

On Allen Street, more angled parking was added on the south side with green space included for water retention. The added parking spaces provide excess parking for any parking spaces lost on Pearce Boulevard. An amenity zone was provided on the north side of Allen Street for a sidewalk and room for trees, benches, and trash receptacles.

With the proposed cross-sectional changes along Pearce Boulevard and Allen Street, existing parking will be affected. Overall, there was a net gain of 93 spaces for the Pearce Boulevard and Allen Street corridors. Along Pearce Boulevard, all the "front lawn" parking was removed and replaced by on street parking. In some areas, this front lawn parking could not be matched one for one with on street parking within the same block; however, there were 72 spaces added south of Allen Street to make up for any lost parking along the corridors. Drivers may need to walk a block to a destination instead of parking directly in front of their destinations. The parking evaluation figure can be found in **Exhibit 8**.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S: 0% > 0%
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W: 50% > 50%
F: 6% > 6%
S: 19% > 19%
0
W: 41% > 63%
F: 48% > 53%
S: 41% > 63%
-2
W: 28% > 28%
F: 14% > 14%
S: 17% > 17%
0
W: 32% > 32%
F: 38% > 38%
S: 53% > 53%
0
W: 21% > 25%
F: 28% > 33%
S: 24% > 29%
-5
W: 35% > 31%
F: 0% > 0%
S: 4% > 4%
+3
0
W: 48% > 42%
F: 0% > 0%
S: 14% > 10%
+5
+24
W: 24% > 32%
F: 8% > 11%
S: 12% > 16%
-6
W: 50% > 54%
F: 9% > 10%
S: 26% > 29%
-5
W: 72% > 76%
F: 44% > 47%
S: 57% > 61%
-3
W: 34% > 35%
F: 11% > 12%
S: 25% > 26%
-1
0
+4
-7
-5
+3
-11
+3
0
+3
-7
+4
-6
+3
+1
+5
-2
+5
+5
0
+4
+4
0
+5
0
0
0
0
+16
+56
W: 36% > 33%
F: 12% > 11%
S: 12% > 11%
W: 34% > 48%
F: 41% > 59%
S: 32% > 45%
W: 67% > 78%
F: 78% > 90%
S: 57% > 65%
W: 26% > 24%
F: 44% > 41%
S: 23% > 22%
W: 24% > 27%
F: 14% > 16%
S: 31% > 34%
W: 52% > 63%
F: 30% > 37%
S: 43% > 53%
W: 33% > 30%
F: 85% > 76%
S: 9% > 8%
W: 41% > 38%
F: 21% > 19%
S: 12% > 12%
W: 86% > 35%
F: 71% > 29%
S: 43% > 18%
W: 5% > 4%
F: 5% > 4%
S: 5% > 4%
W: 6% > 5%
F: 0% > 0%
S: 0% > 0%
W: 38% > 32%
F: 19% > 16%
S: 0% > 0%
W: 0% > 0%
F: 7% > 7%
S: 27% > 27%
W: 48% > 48%
F: 29% > 29%
S: 29% > 29%
South of Allen St
W: 41% > 27%
F: 100% > 64%
S: 31% > 20%
South of Allen St
W: 23% > 9%
F: 13% > 3%
S: 13% > 5%
Overall Net Gain: 93 Spaces
Legend
W: Weekday Utilization
F: Friday Utilization
S: Saturday Utilization
% > %: Existing Utilization > Utilization with Proposed Parking
Parking Evaluation

This project will help manage traffic and improve visitor experience in a few different areas on the days of major events in the downtown area.

- The signals at the intersection of Pearce Boulevard and Meyer Road and the intersection of Pearce Boulevard and Linn Avenue would drastically improve traffic flow along Pearce Boulevard, which is the main thoroughfare through the historic downtown area. In the case of Wentzville Days, the signals would mitigate congestion by efficiently moving vehicles through the corridor.
- Connecting Allen Street at both ends of the corridor would provide a reliever route when Pearce Boulevard is closed for parades or races. Vehicles would have improved access to the downtown area.
- The improved sidewalks, crosswalks, and ADA compliant ramps would provide access to all visitors, regardless of ability, making it a safer and more pleasant experience to maneuver around the area on event days.

## Access Management

Businesses will be consulted during the project's design phase to determine final driveway access configurations. Access configurations shown in **Exhibit 7** are conceptual.

## Railroad Crossings

One option to improve connectivity across the Norfolk Southern railroad is to install a new at-grade crossing at the intersection of Pearce Boulevard and Meyer Road. **Figure 42** shows a potential layout of the proposed railroad crossing. The proposed railroad crossing would provide better access between the north and south Wentzville historic downtown areas.

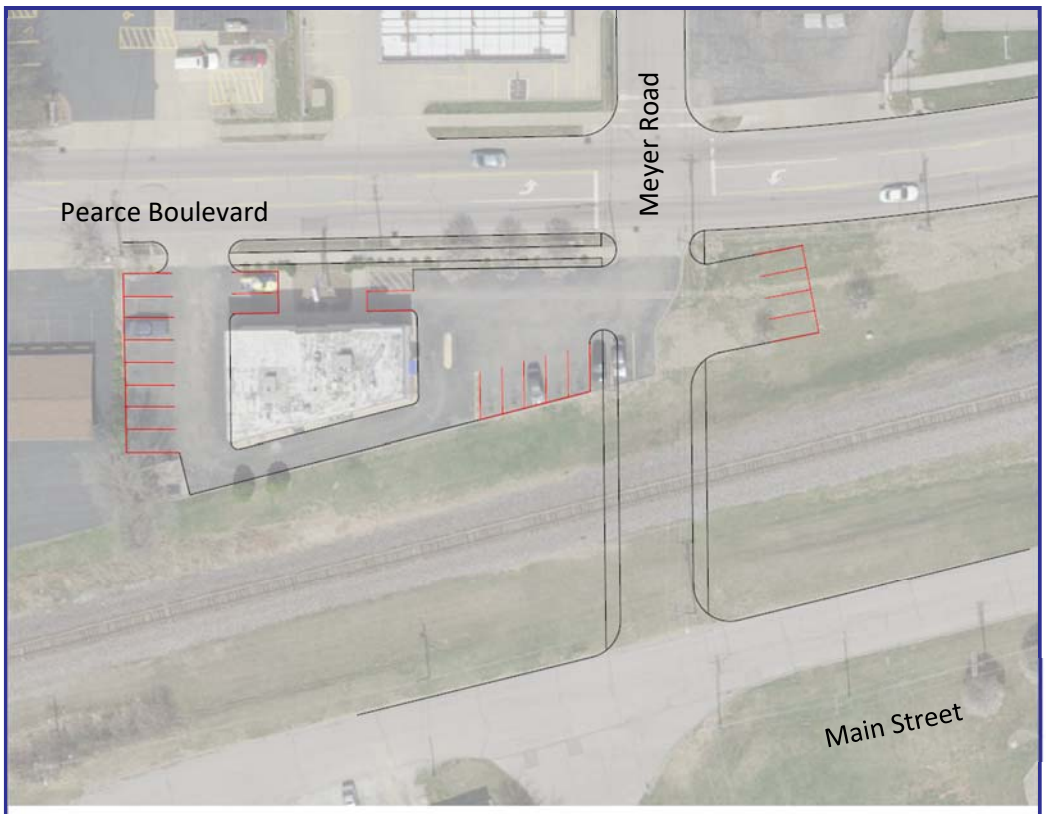



*Figure 42: Potential Layout for Proposed Railroad Crossing*

To better improve the quality of life for residents and businesses within the downtown area, the City is looking into making downtown Wentzville a quiet zone for passing trains. A quiet zone is a section of rail line that contains one or more rail crossings at which locomotive horns are not sounded unless in the event of an emergency. With the railroad running

through the Historic Downtown, trains frequent the area at all times of the day, sounding horns in warning. The locomotive horn is an effective way to deter collisions at grade crossings; however, the noise the horn creates can significantly depreciate the quality of life in communities where trains operate.[8] The noise from a train horn is over 110 dBA at 100 feet which is well above audible levels of communication, where normal conversation is 60-70 dBA and shouting is 80-90 dBA. The Historic Downtown area and surrounding blocks are home to about 2,300 residents, 7% of the city's residents. Some of these residents, as well as local businesses, reside within 150 ft of the railroad tracks which is well above safe noise levels.[9] These reoccurring noises can disrupt sleep and interfere with everyday activities. Creating a quiet zone will not only improve the quality of life of residents and businesses in the area but will also create a more welcoming environment for visitors to the area.

A four-quadrant gate signal may be required at the at-grade railroad crossing on Linn Avenue as a part of the process of creating a quiet zone in Downtown Wentzville.[10] A four-quadrant gate signal will improve the level of safety at the Linn Avenue at-grade crossing, satisfying one of the requirements to create a quiet zone.[11] Gate warning time is a variable that affects the risk level of driver behavior.[12] For a typical grade crossing, warning devices are setup to provide 20-30 seconds of warning time based on the maximum civil locomotive speed at that specific location. However, the warning time for a train travelling well below the maximum speed will provide a warning time in excess of the 20-30 second time. The lack of consistent warning time can pose a safety concern for vehicles in that drivers may become impatient and drive around the gates. The four-quadrant gate is designed to mitigate this safety concern by blocking all roadway access for motorists to cross the track.

## Freight Deliveries

Currently, some businesses along Pearce Boulevard use the TWLTL for unloading freight. Some side streets are narrow and do not provide adequate space for turning maneuvers. Large trucks are required to follow specific routes when unloading in the downtown area. Some business owners expressed concerns for freight unloading with the removal of the TWLTL in the proposed layout. For businesses that were known to have significant freight activity, loading and unloading designs were considered in the proposed layout. For example, mountable curbs could be used in selected locations to provide truck access next to businesses. Other businesses may need to change loading and unloading areas to adjacent streets. Truck loading and unloading will need to be considered as a part of the design process to determine appropriate accommodations on a business by business basis.

## Amenities and Utilities

**Utilities:** A core part of this plan is to raise the existing utility poles along Pearce Boulevard. These can be raised and spread out in the downtown area. This will enhance the beauty of Pearce Boulevard and provide a more welcoming atmosphere for residents and visitors.

**Streetscape:** There are small and easily implementable opportunities throughout the downtown core to establish an identity for residents and visitors. These include banners attached to street lights as well as landscaping and furniture. The banners can be colorful and used to advertise events or changed on an as-needed basis. Landscaping can bring consistency, beauty, and seasonality throughout downtown. Stormwater bioretention areas and street trees have been incorporated into the design of Allen Street and the three primary gateway areas as a way to beautify and add pedestrian comfort while

[8] http://www3.apwa.net/Resources/Reporter/Articles/2005/9/Is-train-horn-noise-a-problem-in-your-town
[9] https://www.fra.dot.gov/eLib/Details/L02689
[10] https://www.fra.dot.gov/Page/P0889
[11] https://www.fra.dot.gov/eLib/details/L03055
[12] Hellman, A., Carroll, A., and Chappell, D. Evaluation of the School Street Four-Quadrant Gate/In-Cab Signaling Grade Crossing System

functioning as stormwater infrastructure. An amenity zone was also provided on the north side of Allen Street for a sidewalk and room for trees, benches, and trash receptacles.

Fiber Optic Communications and 5G Light Poles: Installing fiber optic communications is one step in innovative technologies that the City of Wentzville is taking to advance the downtown area and prepare for the future. Fiber optics have low attenuation, small size, low width, and no electromagnetic interference. Compared to copper cables, fiber optic transmission is faster and does not pose a potential fire hazard. Switching to fiber optic communications will provide greater efficiency for the City of Wentzville in a safer and less hazardous way.

The signals installed along the Pearce Boulevard corridor will be tied into the Gateway Green Light (GGL) system. GGL is a cooperative effort to improve coordination of traffic signals throughout St. Charles County.[13] The state and local governments that own traffic signals in the area are working together to ensure that the timing plans for intersections on major routes are coordinated for more efficient traffic flow.

Through this project, the City may consider installing 5G light poles that will provide wireless communication. The 5G light poles will provide a platform for information gathering and sharing for smart cities applications such as V-I connected vehicle systems. These light poles will also provide better lighting in the area.

The integration of technology in the project will not only help the city become more responsive to emergencies but will also improve the competitiveness of the city as a whole. Incorporating smart cities infrastructure will position the community to be more adaptive to technological changes moving forward, which in turn will reduce costs and promote economic development opportunities throughout the community.

## Traffic Operations

Looking at the intersection of Pearce Boulevard and Meyer Road, the existing AWSC operates at LOS F during the PM peak for the eastbound and westbound approaches. The PM peak queues of vehicles at this AWSC back up through Pearce Boulevard and Linn Avenue intersection and create queuing at Linn Avenue and Allen Street as well as Linn Avenue and Main Street and Church Street and Main Street, causing poor levels of service. With the implementation of a signal at the Pearce Boulevard and Meyer Road intersection and a signal at Pearce Boulevard and Linn Avenue, the eastbound and westbound approaches would operate at LOS A. The westbound approach at Pearce Boulevard and Linn Avenue would be improved from LOS F to LOS B. The eastbound approach at Linn Avenue and Allen Street would be improved from LOS E to LOS B. The Linn Avenue and Main Street intersection would remain at LOS C, but delay would improve. **Exhibit 9** shows the overall level of service and delay at each of the intersections in the downtown area for the 2040 no-build conditions and the 2040 build conditions. A full list of analysis results can be found in **Appendix C**.

The implementation of a signal at Pearce Boulevard and Linn Avenue would improve operations at the intersection. The level of service would improve from LOS F to LOS B. As mentioned previously, the westbound approach would improve from LOS F to LOS B and the northbound approach would improve from LOS F to LOS B.

The 1-lane dog-bone roundabout distributes traffic efficiently while improving safety at the intersection. It provides sufficient capacity for the 2040 traffic projections. Every approach operates at LOS D or better with 2040 volumes. However, the queues at the northbound approach of the dog-bone roundabout are over 520 feet long for the 2040 PM conditions. The length of this queue extends past the Pitman Street and Luetkenhaus Boulevard intersection to the south.

The project team is proposing a two-lane dog-bone roundabout (**Figure 43**) that will be striped as a one-lane roundabout after construction. In the future, the roundabout can be restriped to a two-lane roundabout if traffic grows as projected and begins affecting the Pitman Street and Luetkenhaus Boulevard intersection. The two-lane dog-bone roundabout operates with LOS B or better for all approaches.

[13] https://www.sccmo.org/210/Gateway-Green-Light

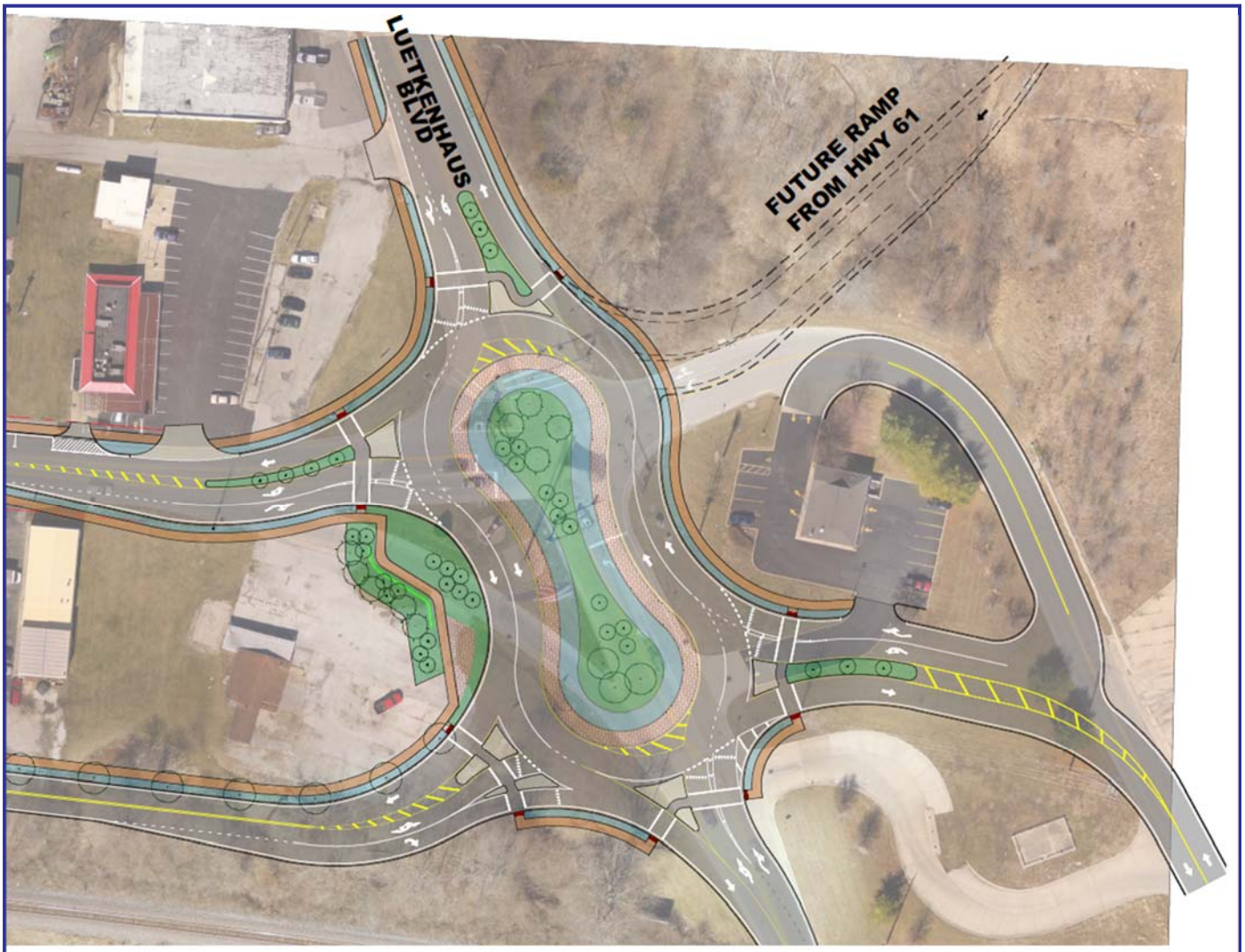


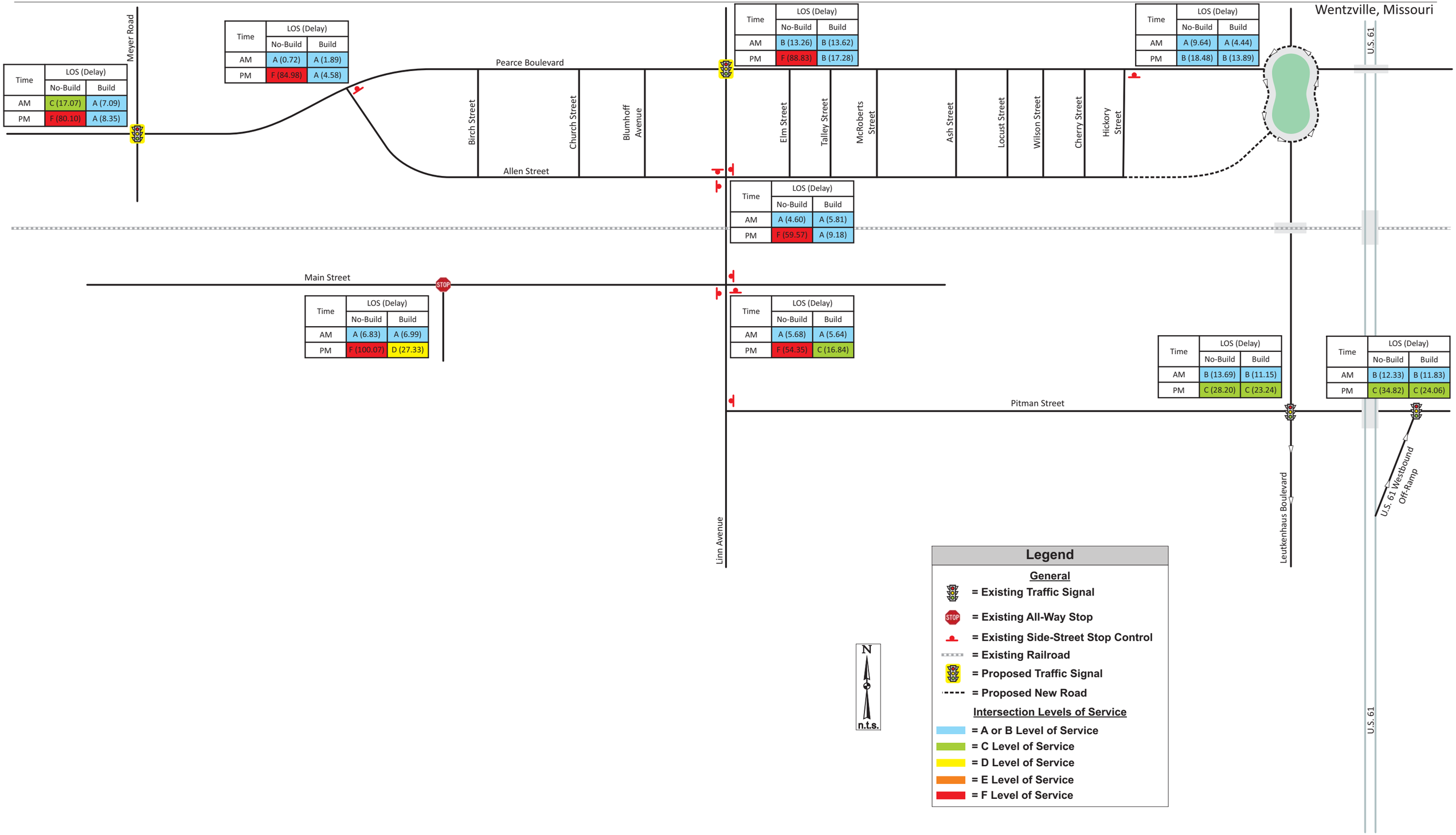

*Figure 43: Two-Lane Dog-Bone Roundabout*

## Estimate of Probable Cost

The estimated cost of the proposed improvements is broken down by component in **Table 3**.

*Table 3: Estimated Component Costs*

| Project Elements | Cost |
|---|---|
| Pearce Boulevard – pavement rehabilitation, sidewalks | $9,993,617 |
| Allen Street – pavement reconstruction, sidewalk | |
| Traffic Signal at Pearce Boulevard & Linn Avenue | $436,500 |
| Dog-bone roundabout connecting Pearce, Luetkenhaus, and Allen | $3,595,845 |
| Old City Hall Site (Site Preparation) | $250,000 |
| Fiber, 5G light poles | $100,000 |
| Relocating utility poles | $1,328,000 |
| At-grade rail crossing upgrades | $500,000 |
| **Total Project Cost** | **$16,203,962** |




| Meyer Road | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | C (17.07) | A (7.09) |
| PM | F (80.10) | A (8.35) |

| Pearce Boulevard / Birch Street | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | A (0.72) | A (1.89) |
| PM | F (84.98) | A (4.58) |

| Pearce Boulevard / Elm Street | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | B (13.26) | B (13.62) |
| PM | F (88.83) | B (17.28) |

| Pearce Boulevard / Hickory Street | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | A (9.64) | A (4.44) |
| PM | B (18.48) | B (13.89) |

| Allen Street / Elm Street | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | A (4.60) | A (5.81) |
| PM | F (59.57) | A (9.18) |

| Main Street / Meyer Road | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | A (6.83) | A (6.99) |
| PM | F (100.07) | D (27.33) |

| Main Street / Elm Street | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | A (5.68) | A (5.64) |
| PM | F (54.35) | C (16.84) |

| Pitman Street / Leutkenhaus Boulevard | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | B (13.69) | B (11.15) |
| PM | C (28.20) | C (23.24) |

| Pitman Street / U.S. 61 Westbound Off-Ramp | | |
|---|---|---|
| Time | LOS (Delay) | |
| | No-Build | Build |
| AM | B (12.33) | B (11.83) |
| PM | C (34.82) | C (24.06) |

Exhibit 9: 2040 Traffic Data - Levels of Service

Job# 090-17
12/11/18

## Pearce Boulevard and Meyer Road

The recommended alternative for the intersection of Pearce Boulevard and Meyer Road is a signal-controlled intersection, as shown in **Figure 44** below. Note that a new traffic signal at West Pearce Boulevard/Meyer Road would be coordinated with the existing traffic signal at the intersection of West Pearce Boulevard/Schroeder Creek Boulevard through the St. Charles County Gateway Greenlight Program. Cheryl Ann Drive and Pearce Boulevard would be converted from AWSC to a side-street stop-control.

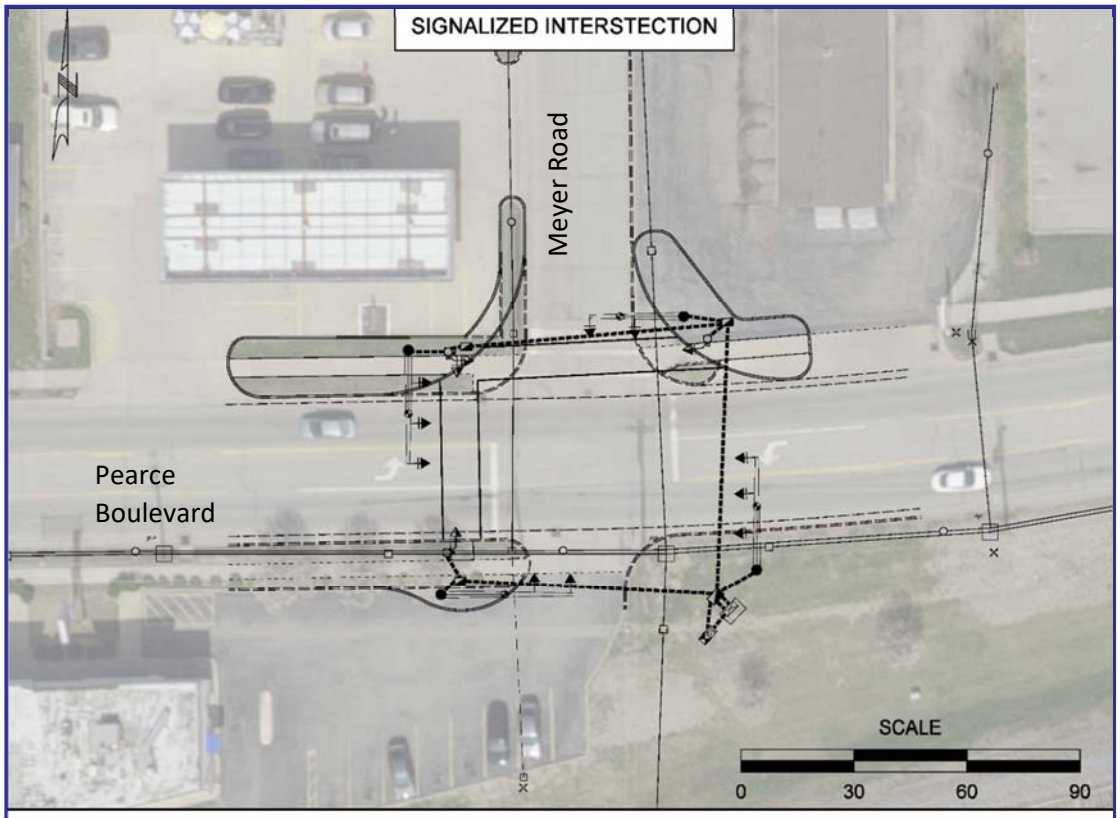



*Figure 44: Traffic Signal Alternative – Pearce Boulevard and Meyer Road*

**Tables 4** and **5** show the VISSIM and Synchro results for the recommended alternative. **Appendix D** provides the complete results for the existing AWSC, the signal alternative, and the roundabout alternative, respectively. The signalized intersection would improve delay for all approaches at the intersection with LOS B or better for all approaches during peak periods.

*Table 4: VISSIM Results for Signalized Intersection at West Pearce Boulevard and Meyer Road*

| Intersection/Movement | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| | LOS | Delay | Ave. Queue | Max Queue | LOS | Delay | Ave. Queue | Max Queue |
| *Pearce Boulevard and Meyer Road - Signal* | | | | | | | | |
| Eastbound Pearce Blvd | A | 4.09 | 5.80 | 155.21 | A | 6.56 | 14.86 | 271.55 |
| Westbound Pearce Blvd | A | 3.46 | 3.45 | 95.95 | A | 6.74 | 17.84 | 223.25 |
| Northbound Meyer Rd | -- | -- | 0.00 | 0.00 | B | 13.23 | 1.37 | 46.91 |
| Southbound Meyer Rd | B | 10.30 | 3.59 | 77.59 | B | 14.10 | 8.26 | 119.44 |
| **Overall Intersection** | **A** | **4.60** | **--** | **--** | **A** | **7.57** | **--** | **--** |

*Table 5: Synchro Results for Signalized Intersection at West Pearce Boulevard and Meyer Road*

| Intersection/Movement | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| | LOS | Delay | V/C Ratio | Max Queue | LOS | Delay | V/C Ratio | Max Queue |
| *Pearce Boulevard and Meyer Road - Signal* | | | | | | | | |
| Eastbound Pearce Blvd | A | 6.2 | 0.32 | 81 | A | 6.5 | 0.42 | 137 |
| Westbound Pearce Blvd | A | 5.6 | 0.26 | 57 | A | 8.3 | 0.57 | 184 |
| Northbound Meyer Rd | -- | 0.0 | -- | -- | B | 12.4 | 0.04 | 10 |
| Southbound Meyer Rd | A | 9.4 | 0.29 | 27 | B | 11.0 | 0.40 | 45 |
| **Overall Intersection** | **A** | **6.4** | **0.32** | **--** | **A** | **7.9** | **0.57** | **--** |

### Pearce/Meyer Recommendations

The following summarizes the findings and recommendations for the Pearce Boulevard and Meyer Road intersection:

- Under existing conditions, the AWSC intersection at Meyer Road along Pearce Boulevard, results in delays for through traffic along Pearce Boulevard.
- Converting this intersection to a signal-controlled intersection or roundabout results in similar overall improvement of traffic flow along Pearce Boulevard and lower delays for all approaches.
- Order of magnitude cost estimate for conversion to signal at the Meyer intersection is estimated to be $709,162.

## I-70/Route Z Interchange

The offset roundabout and diverging diamond roundabout are the two preferred alternatives for the Route Z/I-70 interchange (see **Appendix E**). Both alternatives manage 20-year volumes while using the existing I-70 bridge.

The offset roundabout alternative can be seen in **Exhibit 10**. The alternative proposes an offset roundabout to the west of the existing Mar-Le Drive/Wagner Street and Church Street intersection. The proposed roundabout has two-lanes, connecting the St. Patrick School entrance, eastbound Mar-Le Drive, the westbound I-70 on ramp, and the westbound I-70 off ramp and Church Street intersection. Mar-Le Drive no longer connects at the existing Mar-Le Drive/Wagner Street and Church Street intersection. Following this, the westbound I-70 off ramp connects to Route Z/Church Street at a signalized intersection, and the eastbound I-70 ramps and Route Z intersection is converted to a signalized intersection. Additionally, there is a fifth lane added underneath the I-70 overpass bridge, behind the west bridge piers.

The diverging diamond roundabout interchange alternative can be seen in **Exhibit 11**. The two-lane roundabout will be located at the Mar-Le Drive/Wagner Street and Church Street intersection, and the westbound I-70 ramps and Route Z/Church Street intersection. The eastbound I-70 ramps and Route Z intersection is a typical diverging diamond interchange ramp terminal. There are two northbound and two southbound lanes under the I-70 bridge.

The offset roundabout alternative and diverging diamond roundabout alternative have similar proposed roadway geometrics south of Route Z and I-70 eastbound ramps intersection. Through lanes are added to each direction, north and south, along Route Z between the I-70 eastbound ramps intersection and Interstate Drive intersection. It is also assumed that Route Z will be widened to two lanes in each direction south of the Route Z and Interstate Drive intersection. The Route Z and Interstate Drive intersection sports separate through and right-turn lanes on the westbound approach, an additional left-turn lane on the eastbound approach, and an additional through lane at the north and south approaches.


Exhibit 10: Offset Roundabout, Alternative 2


Exhibit 11: Diverging Diamond Roundabout, Alternative 3

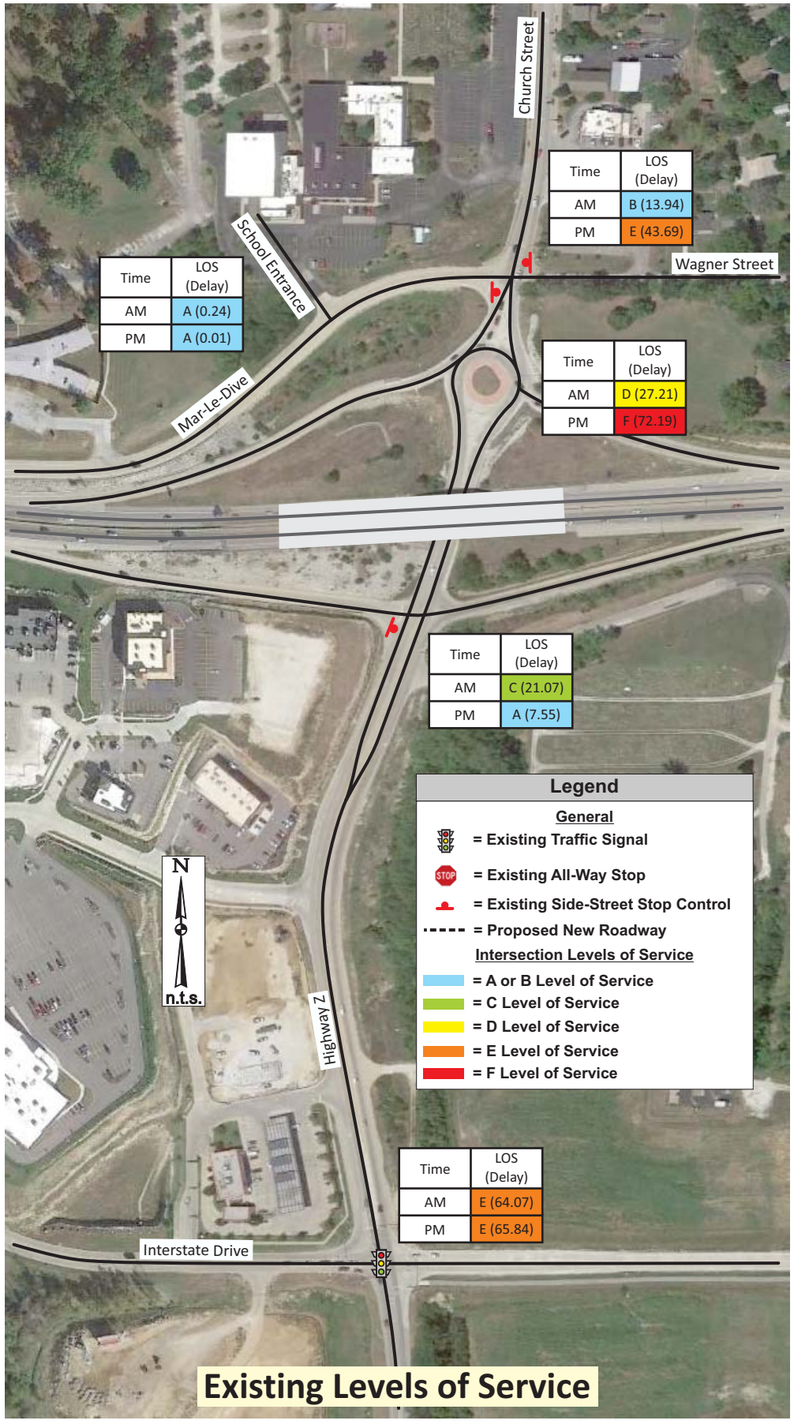
Table 5 shows the estimated costs for the two alternatives.

*Table 6: Estimated Component Costs*

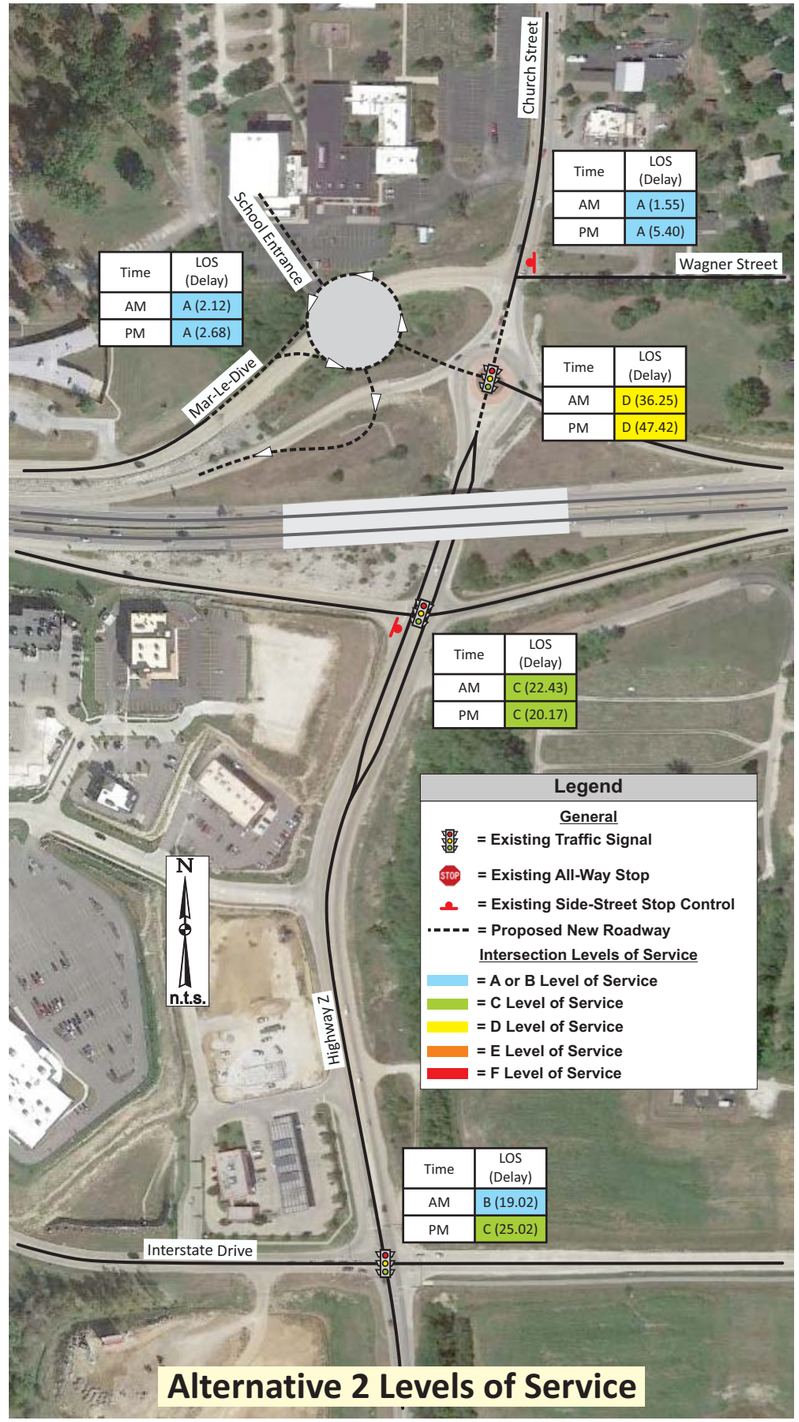
| Project Elements | 5-Lane Offset Roundabout | Diverging Diamond Roundabout |
|---|---|---|
| Route Z/I-70 Interchange | $5-7M | $5-7M |
| Route Z/Interstate Dr | $1-1.5M | $1-1.5M |
| **Total Project Cost** | **$6-8.5M** | **$6-8.5M** |

Exhibit 12 shows the intersection level of service and delay for the existing conditions and two build alternatives in 2040. As can be noted, the Church Street and Mar-Le Drive/Wagner Street and Church Street and I-70 WB Ramps intersections are LOS E or worse in the PM. Route Z and Interstate Drive is LOS E during the AM and PM peak hours. The offset roundabout (Alternative 2) improves all intersections to LOS D overall or better. The diverging diamond roundabout (Alternative 3) has LOS E at the proposed Church Street and Mar-Le Drive/Wagner Street/I-70 WB Ramp intersection during the PM peak. The delay for these approaches, though, is significantly reduced.

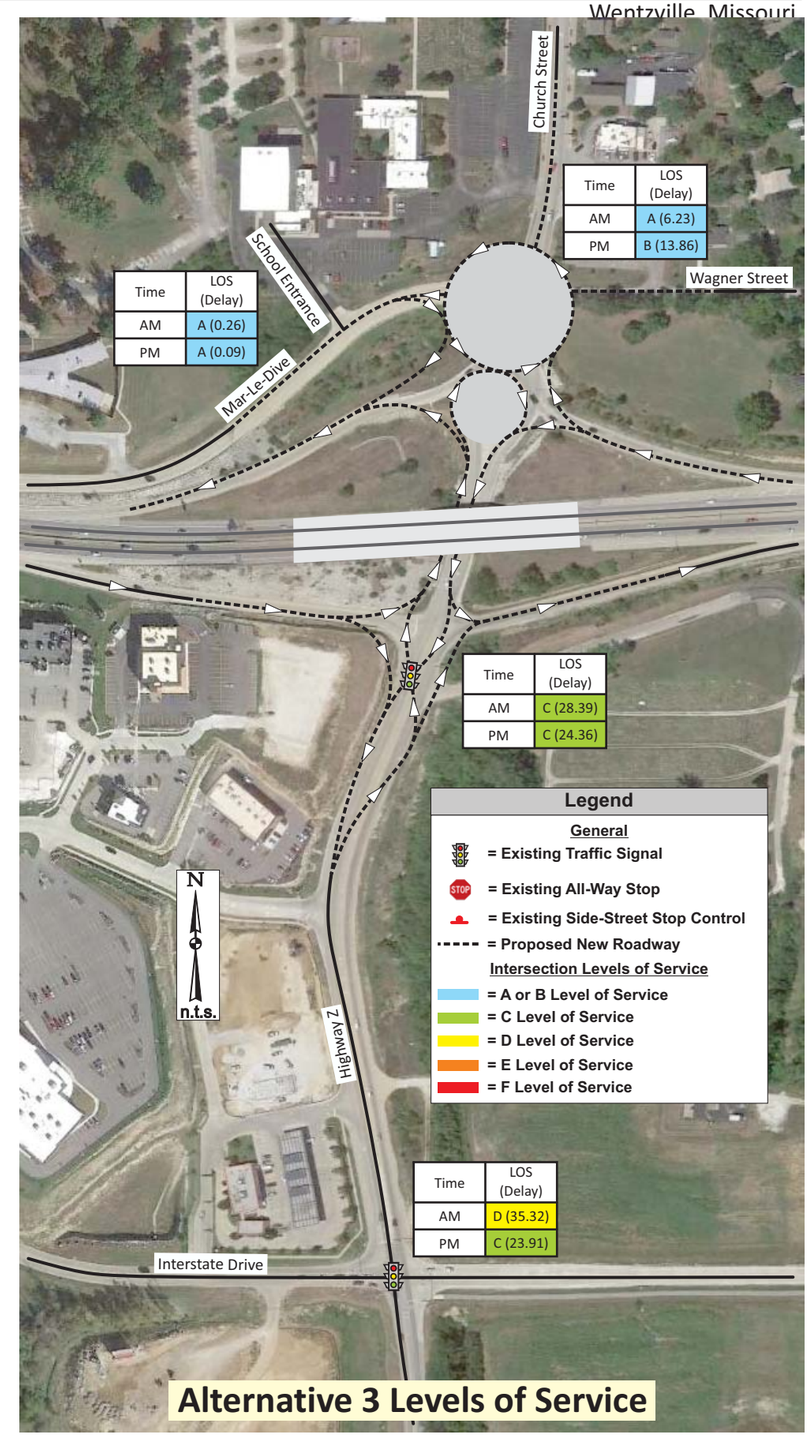
The preferred alternative is the diverging diamond roundabout. It provides sufficient capacity for future traffic, there are no queues on I-70 with estimated 2040 volumes, and the geometry uses part of the existing roundabout. Additionally, Wentzville residents at the alternatives workshop on Thursday, February 15, 2018 were more in favor of the Diverging Diamond alternative than the Offset Roundabout alternative.




Existing Levels of Service




Alternative 2 Levels of Service




Alternative 3 Levels of Service

Exhibit 12: Route Z Intersection LOS and Delay

## Gateways

A key element of this program is constructing gateway treatments (**Appendix F**). These treatments help to enhance the historic character of downtown Wentzville and are critical in placemaking. **Figure 45** (below) illustrates how the proposed gateway treatments work with the existing monument signs, which encircle the downtown core and project study area. Three primary gateway treatments were identified as opportunities for immediate investment. Each of the three areas are located at the cusp of the historic downtown area and serve as existing thresholds which have not yet been celebrated as major entries into downtown. The first is the old City Hall site, to the west, near the intersection of Pearce Boulevard and Allen Street (see **Figure 46**). The second is a counterpoint on the eastern end of downtown (see **Figure 47**). Finally, the third option is where Route Z reaches Interstate 70 (see **Figure 48**). These three areas are explored further within this document.

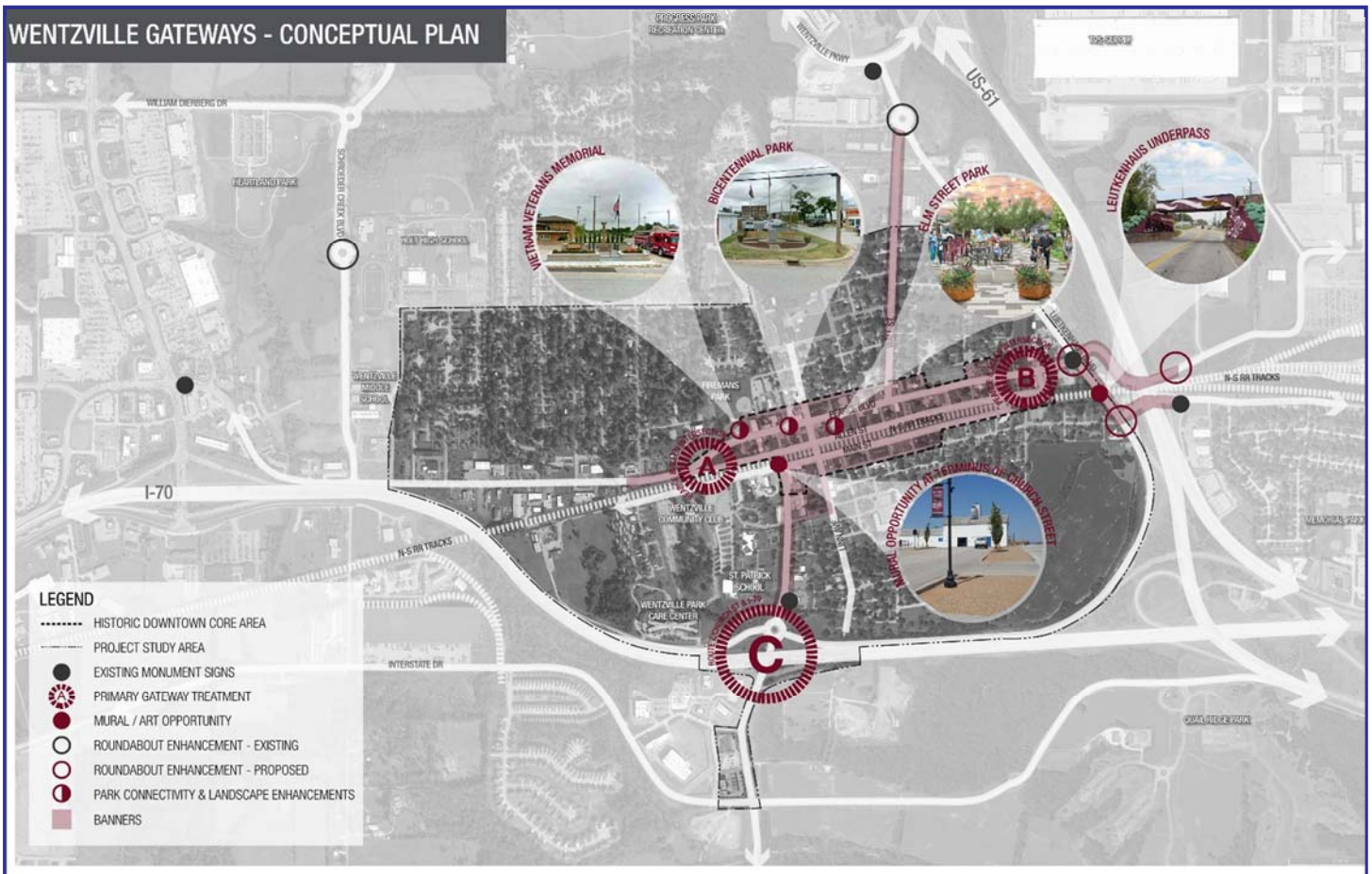



*Figure 45: Overall Gateway Master Plan*

The proposed west gateway treatment (**Figure 46**) repurposes the old City Hall lot into a welcoming entry into downtown and local amenity for adjacent residential areas. The primary feature could be something like a replica train station with outdoor seating and the capacity to house a welcome center, meeting space, and the Wentzville Historical Society. The architecture of the station reflects the historic form of Downtown Wentzville, and the surrounding landscape functions both as stormwater infrastructure and an aesthetic enhancement.


*Figure 46: Western Gateway Treatment*

The proposed configuration of the eastern end of downtown at the intersection of Pearce Boulevard and Allen Street is a unique dog-bone shaped roundabout (**Figure 47**). This configuration affords a gracious amount of room for aesthetic plantings within and along the perimeter. The center of the dog-bone is proposed to be a gentle berm, with ornamental stone walls and signage on both ends. The purpose of the berm is to increase visibility of plantings, focus driver's attention, prevent cross-over collisions, and shield on-coming headlights. Within the berm are ornamental evergreen trees which will be used for holiday celebrations.


*Figure 47: Luetkenhaus Roundabout Gateway Treatment*

The entry plantings draw visitors into downtown by extending into the medians between Pearce Boulevard and Allen Street. A small pocket park with seating and entry signage is proposed in the space between these two streets. Here, pedestrians will have a refuge while enjoying the walkable downtown area or to stop and eat meals purchased at local businesses.

The Route Z Gateway treatment focuses on calling attention to downtown Wentzville from drivers on the Interstate 70 corridor (**Figure 49**). The expansive area created by the diverging diamond roundabout requires an equally large element in order to remain proportional and visible from the highway. Therefore, the proposed design is a tall flagpole centered within the roundabout and above an elevated plinth. The grade change within the roundabout will expose the southern half of the plinth and create an opportunity for it to be utilized as a sign wall with letters large enough to be visible from the Interstate. Above the wall would be a planted area with hardy native perennials and evergreen trees.


*Figure 48: Route Z Gateway Treatment*

Pedestrian connectivity from downtown south and beyond the Interstate is critical for Downtown Wentzville. Pedestrian comfort and safety will be a motivating factor for potential visitors and an improved sidewalk with marked crossings, ample lighting, shade from street trees, and seasonal plantings will make the trip an enjoyable experience.

The first public engagement meeting on February 15th presented attendees with the opportunity to voice their opinions on gateway treatments. The results were generally anticipated with images containing the existing signage, murals, and the railroad underpass scoring highly. However, the highest scoring image was that of a pocket park in Toronto (see **Figure 49** below). The small pocket park included lighting, seating, and planting. Within downtown are a series of existing small parks, including the Vietnam Veterans Memorial Park and Bicentennial Park, which can be better utilized with improved connectivity. In addition, the repurposing of Elm Street as a park between Pearce Boulevard and Allen Street, has been proposed. The concept is explored further within this document.

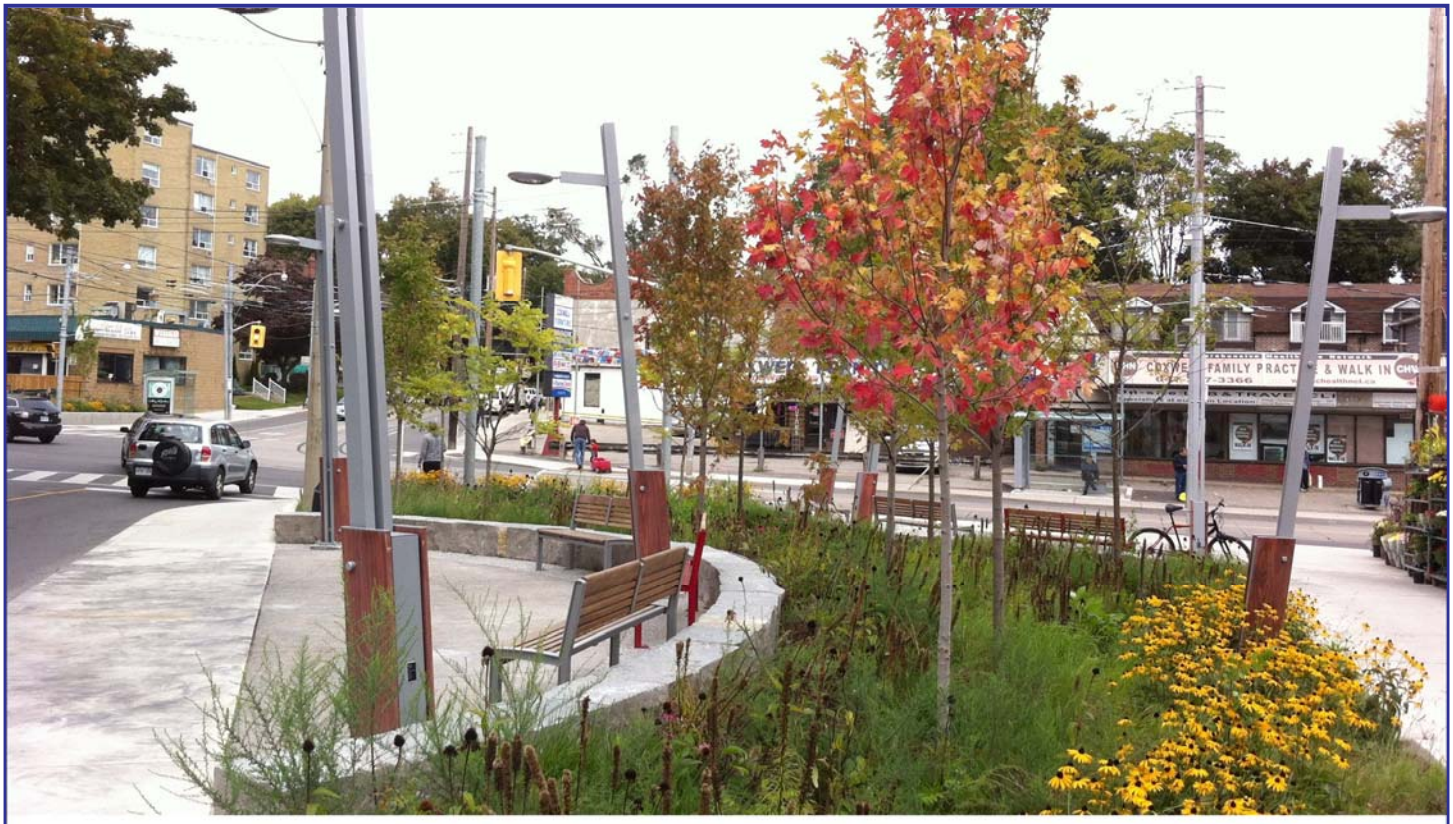



*Figure 49: Precedent image of the Fairford Parkette in Toronto, ON*

Finally, there are small and easily implementable opportunities throughout the downtown core to establish an identity for residents and visitors. These include banners attached to street lights. These banners can be colorful and used to advertise events or changed on an as-needed basis. Landscaping is another element which can bring consistency, beauty, and seasonality throughout downtown. Stormwater bioretention areas and street trees have been incorporated into the design of Allen Street and the three primary gateway areas as a way to beautify and add pedestrian comfort while functioning as stormwater infrastructure.

The outcome of the gateway public engagement process was a new focus on enhancing public spaces within downtown that provided refuge and places to gather. Elm Street was identified as a strong candidate for transformation into a pocket park because of its low vehicular traffic and lack of access to adjacent property (Figure 50). In addition, the streetscape enhancements along Pearce Boulevard and Allen Street resulted in a shift to the available public parking which required instances where visitors would need to cross between blocks.


*Figure 50: Elm Street Site Concept*

A new walkable green space is the perfect north-south connection between these two streetscape enhancements. This Elm Street connection is more than just a path. It has been envisioned as a gathering space that includes a sculptural play area for children, outdoor dining with support for food trucks, as well as a tranquil and shaded seating grove (**Figure 51**).


*Figure 51: Before/after improvements of Elm Street*

The Elm Street Pocket Park also strengthens downtown's identity as a unique experience. The collection of small parks from the east and west gateways, through to the Vietnam Veteran's Memorial, Bicentennial Park, and the Elm Street Pocket Park make downtown Wentzville a truly unique destination. The pocket park is estimated to cost $556,000.

Additional less-intensive, gateway opportunities exist within the study area. One prominent mural opportunity exists at the terminus of Church Street at West Main. A large, white building façade completely dominates the viewshed as visitors from Interstate 70.

The Luetkenhaus Railroad underpass is another excellent mural opportunity. The underpass is above a frequently traveled north/south vehicular connection between the two halves of downtown. The broad side of the bridge trestle and fluted concrete abutments are highly visible and the aging railroad structure is in need of fresh paint and routine maintenance.

The design team and project steering committee vetted many potential mural options before presenting four finalists to the public at the February 15th, 2018 public workshop. Here, the attendees voiced their preference to the concept shown above, which borrows from the existing downtown "Wentzville Days" logo of a historic steam locomotive and musical notes (**Figure 52**). The dark maroon and black colors are also indicative of existing downtown branding and graphic standards. The design on the trestle remained simple so that each paint application would have little impact on the railroad. In addition, the bottom 36" of the concrete abutment is left bare for protection against collision and salt spray damage in the winter.

In addition to the painting, the landscape areas adjacent to the concrete abutment are suggested to be cleared of overgrowth and debris and replanted with ornamental shrubs and trees.

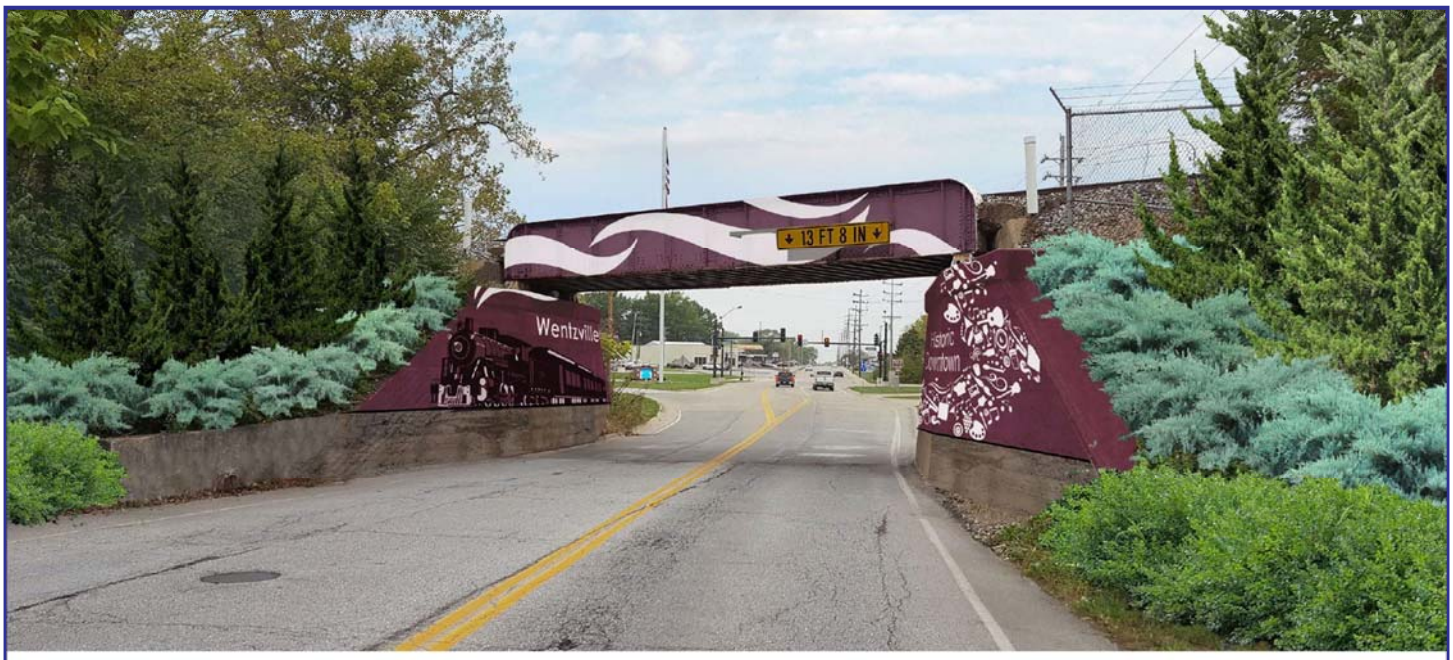



*Figure 52: Luetkenhaus Railroad Overpass Gateway Treatment*

The City has started communication with Norfolk Southern. The railroad bridge is in the 5-year plan for replacement, though not officially scheduled as of this report. The railroad bridge will be painted after the bridge replacement.