

Wentzville Parkway and Parkway Ridge Traffic Study

Sponsor Wentzville

Project No. RB23-000012

Project Type Study

TOTAL FUNDING

Total	County	Sponsor	Federal	Other
\$100,000.00	\$50,000.00	\$50,000.00	\$0.00	\$0.00

Project Description

The Wentzville Parkway and Parkway Ridge Blvd Traffic Study is a comprehensive traffic analysis of Wentzville Parkway from Parkway Ridge Blvd to Leutkenhaus Blvd and Parkway Ridge Blvd from Wentzville Parkway to Main Plaza Drive. The purpose of this study is to determine what improvements are needed in the area for connectivity, reduction of traffic congestion and overall traffic flow. To properly plan, design and fund improvements in the area the future traffic needs of these roadways must be considered.

Immediately to the east of the proposed study area, MoDOT is in the conceptual plan stage for improvements at the Hwy 61 and Hwy A / Wentzville Parkway Interchange. MoDOT is looking at a possible Diverging Diamond Interchange for these improvements. With this concept plan, the full access to and from Leutkenhaus Blvd is remaining in place, and additional lanes of traffic are introduced to Wentzville Parkway.

Immediately to the west of the proposed study area, the City has developed plans for the Highway 61 Outer Road Phase 2A Project. This project includes improvements to widen Wentzville Parkway to include a center turn lane and to set the stage for the future connection to the Highway 61 west outer road. That project, which includes both County and federal funding participation, is expected to be constructed in 2024.

The proposed study area lies between these two roadway widening projects. Left unchanged, the proposed study area could become a stretch of Wentzville Parkway with lane transitions and left-turn capacity issues that do not adequately serve neither the current or future businesses in this area nor the thousands of vehicles passing through each day.

The City has recently seen an increased interest for development in this area. As a result, the City retained CBB to complete a Traffic Needs Analysis that is attached to this application. The conclusion to that analysis is that there are needed improvements when this area is developed. However, the scope of work required to make those improvements may not be feasible for any one of the potential developments to complete.

With the MoDOT interchange improvements to the east and the City's completed improvements to the west on Wentzville Parkway, the City would like to seek systematic approach to the area between these projects so that all aspects of these projects are taken into account to create a coordinated plan.

This funding application, if successful, would allow the City to seek the services of a traffic engineer to analyze this area for the needed improvements, develop conceptual plans and cost estimates, and draft future MoDOT and St. Charles County Road Board funding applications for implementation of the improvements.



Road Board Application

PROJECT INFORMATION

Permit #: RB23-000012 **Project Type:** Study
Name: Wentzville Parkway and Parkway Ridge Traffic Study
Limits: Wentzville Parkway - Parkway Ridge Blvd to Leutenhaus Blvd
 Parkway Ridge Blvd - Wentzville Parkway to Main Plaza Drive
Lane Miles: 1.1
Federal Functional Classification: 5 - Local
Anticipated useful life of the proposed improvements (years): 30 **Estimated date of completion:** 12/31/2024

Study Information

Traffic Volume ADT:	Existing / Projected	24000	Future	48000
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CONTACT INFORMATION

Sponsoring Agency: City of Wentzville
Contact Person Name: tony gambaro
Title:
Telephone Number: 636-639-2053
E-mail Address: tony.gambaro@wentzvillemo.gov

SIGNATURE

 4-4-2021
 signature date

CITY OF WENTZVILLE



WENTZVILLE PARKWAY AND PARKWAY RIDGE BLVD TRAFFIC STUDY

ST. CHARLES COUNTY ROAD BOARD
2024 - 2026 TIP FINANCIAL WORKSHEET

Wentzville Parkway and Parkway Ridge Blvd Study

FUNDING FOR IMPROVEMENTS					
	County	Sponsor	Federal	Other	Total
Design	\$50,000.00	\$50,000.00	\$0.00	\$0.00	\$100,000.00
Utility Relocations	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Right-of-Way	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Construction	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
TOTAL	\$50,000.00	\$50,000.00	\$0.00	\$0.00	\$100,000.00
PERCENT (%)	50.00%	50.00%	0.00%	0.00%	100.00%
FINANCIAL PLAN					
Design	County	Sponsor	Federal	Other	Total
2024	\$50,000.00	\$50,000.00			\$100,000.00
2025					\$0.00
2026					\$0.00
Utility Relocations	County	Sponsor	Federal	Other	Total
2024					\$0.00
2025					\$0.00
2026					\$0.00
Right-of-Way	County	Sponsor	Federal	Other	Total
2024					\$0.00
2025					\$0.00
2026					\$0.00
Construction	County	Sponsor	Federal	Other	Total
2024					\$0.00
2025					\$0.00
2026					\$0.00

City of Wentzville

Wentzville Parkway and Parkway Ridge Blvd Study

Tentative Project Schedule

TASK	DUE DATE
Request for Qualifications (Design)	January 2024
Selection of Design Consultant	February 2024
Conceptual Plans	September 2024
Application for Federal Funding	October – December 2024
Application for SCCR Funding (Design, ROW, Const)	December 2024 – March 2025



TECHNICAL MEMORANDUM

Date: January 17, 2023

To: Mr. Gregory Wallace, PE
City of Wentzville

From: Srinivas Yanamanamanda, P.E., PTOE, PTP
Brian Rensing, PE, PTOE, RSP2I

CBB Job Number: 2022-105

Project: Traffic Study Needs Analysis
Wentzville Parkway and Parkway Ridge Boulevard
City of Wentzville, Missouri

As requested, CBB has prepared a needs assessment related to the evaluation of potential developments in Wentzville, Missouri. The intersection of Wentzville Parkway and Parkway Ridge Boulevard is located to the west of the interchange with US-61 and to the east of Bridle Spur Drive/Meyer Road. The location of the site in relation to the surrounding road system is depicted in **Figure 1**.



Figure 1: Site Location Map



EXISTING CONDITIONS

Area Roadway System: Wentzville Parkway, owned and maintained by the City of Wentzville, is a loop road which generally runs east-west adjacent to the study intersection. Within the study area, Wentzville Parkway is classified as a principal arterial, and it intersects US 61 approximately 0.25 miles to the east. In the study area, Wentzville Parkway generally provides a five-lane cross section (two lanes in each direction plus a center left-turn lane) with sidewalks present on both sides of the roadway. Separate left-turn lanes are provided on Wentzville Parkway at the signalized intersections with Parkway Ridge Boulevard/QT gas station. The posted speed limit within the study area is 40 miles per hour (mph). The eastbound and westbound approaches of Wentzville Parkway approaches provide one left-turn lane, one through lane and one shared through/right-turn lane.

Parkway Ridge Boulevard: Parkway Ridge Boulevard, south of Wentzville Parkway, is a local road that currently provides access to a Petromart gas station, as well as approximately 9.36 total acres of vacant parcels yet to be developed. The northbound approach of Parkway Ridge Boulevard provides a shared through/left-turn lane and a separate right turn lane.

Parkway Ridge Boulevard, north of Wentzville Parkway, is a local loop road that currently provides access to a QT gas station, a credit union and approximately 14.08 total acres of vacant parcels yet to be developed. The southbound approach provides a shared through/left-turn lane and a separate channelized right turn lane.

TRAFFIC ANALYSIS

Peak Hour Traffic Volumes: Video, turning movement traffic counts were conducted at the intersection of Wentzville Parkway at Parkway Ridge Boulevard during the weekday AM commuter peak (7:00 to 9:00 AM) and weekday PM commuter (2:00 to 6:00 p.m.) peak periods during the second week of November 2022. The area school academic calendars were reviewed to ensure that the data was collected during normal school operations.

Based on the traffic data collected, the weekday AM peak hour occurred between 7:30 and 8:30 a.m. and the PM peak hour occurred between 4:30 and 5:30 PM. The existing peak hour volumes are summarized in **Exhibit 1**.

Study Procedure: The 2022 Existing volumes for the study intersection was evaluated using SYNCHRO 11, which is based on procedures outlined in the *Highway Capacity Manual* to determine estimates of capacity and operational performance of signalized and unsignalized intersections. This manual, which is used universally by traffic engineers to measure roadway capacity, establishes six levels of traffic service: 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. Level D is generally considered acceptable for peak period conditions.



Exhibit 1: Existing Traffic Volumes



It must also be acknowledged that the perception of acceptable traffic service varies widely by area. Specifically, more delay is usually tolerated in urban and suburban areas compared to rural areas. Based on the character of this area, we believe that LOS D would be a desirable target for *overall* peak period traffic operations. However, due to the importance of Wentzville Parkway as a through route and the closely spaced intersections to the east (Luetkenhaus Boulevard and US 61) the westbound queues also have an impact on operations in this area. Therefore, the queue impacts could be considered just as important as the level of service.

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 intersections, the average control delay per vehicle is estimated for each movement and aggregated for each approach and then 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.

Level of service is directly related to control delay. At signalized intersections, the level of service criteria differs from that 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 3** summarizes the thresholds used in the analysis for signalized and unsignalized intersections.

Table 1: Level of Service Thresholds

LEVEL OF SERVICE (LOS)	CONTROL DELAY PER VEHICLE (SEC/VEH)	
	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

Operating Conditions: The study intersection was evaluated using the methodologies described above. **Table 2** summarizes the average delays and 95th percentile queues for the study intersection during the AM and PM peak hours for the 2022 traffic volumes.



Table 2: 2022 Capacity Analysis Summary

Intersection / Approach	AM Peak Hour	PM Peak Hour
Wentzville Parkway at Parkway Ridge Boulevard		
Eastbound Wentzville Parkway	B (11.8) 95 th Queue = 330'	B (13.9) 95 th Queue = 435'
Westbound Wentzville Parkway	B (11.8) 95 th Queue = 280'	B (11.8) 95 th Queue = 435'
Northbound Parkway Ridge Blvd	A (9.1) 95 th Queue = <25'	C (27.8) 95 th Queue = 40'
Southbound Parkway Ridge Blvd	E (58.9) 95 th Queue = 180'	F (84.0) 95 th Queue = 210'
Overall	B (15.6)	B (16.3)

X (XX.X) - Level of Service (Vehicular delay in seconds per vehicle)

As can be seen, the southbound Parkway Ridge Boulevard approach currently operates at poor levels of service (LOS E or worse) during the AM and PM peak hours. It should be noted that the existing signal timing provides a minimal amount of green time to the side street to minimize congestion and queuing between the closely spaced signals along Wentzville Parkway.

Although the analysis indicates the westbound Wentzville Parkway approach operates at LOS B, the westbound through queue is estimated to extend 280 to 435 feet during the peak hours. There is approximately 575 feet of storage is available in the westbound through lanes before impacting Luetkenhaus Boulevard. Additionally, when the westbound through queue extends beyond approximately 200 feet, the existing raised median along Wentzville Parkway for the Petromart blocks entry into the westbound left-turn lane, which can extend the westbound through queue longer than calculated herein.

Since the existing westbound left-turn volume is relatively low (56-62 vph) the existing left-turn queue is relatively short when in the left-turn bay, but additional development on the south side of the intersection could have negative impacts to the left-turn queue with respect to queuing out of the turn bay and into the through lane as well as through queue not allowing free flow entry into the westbound left-turn lane.

Since the existing westbound queues extend beyond the existing westbound left-turn lane and near adjacent intersections, the City should require each development to perform traffic analyses to determine the impacts to the left-turn lane and the queues and impacts to the adjacent intersection. Either physical road improvements and/or signal timing adjustments maybe needed depending on the amount of additional traffic from new developments.



POTENTIAL FUTURE DEVELOPMENT

It is our understanding that future development is expected the area of Parkway Ridge Boulevard and Wentzville Parkway and that the intersection is expected to be a key means of access for development, especially left-turn access. Based on information from the City, it is our understanding that approximately 14 acres on the north side of Wentzville Parkway is available for development with the potential to develop in several 1 to 5 acre parcels. The south side development has a total of approximately 10.5 acres available for development with the potential to develop in several 1 to 3 acre parcels. Assuming a 25% coverage for buildings, a total of approximately 150,000 Square Feet (SF) of buildings could be built on the north side of Wentzville Parkway and approximately 110,000 SF could be developed on the south side of Wentzville Parkway.

The number of trips that each development will generate is dependent on the specific land use. Development such as a retail center has a higher trips per 1,000 SF of building verses an industrial park that has fewer trips per 1,000 SF of building. We also understand that multifamily residential units are likely on the north side at around 16 units per acre for about half the development area as well as a day care center and coffee shop are possible on the south side of the intersection.

Table 3 summarizes a generic lower trip generation forecast. As can be seen, the lower estimate could generate between 340 and 430 total trips during the peak hours.

Table 3: Low Trip Generation Estimate for Total Potential Developments

Land Use	Size	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Low Trip Generation Estimate - North Side Development							
Industrial Park (ITE 130)	75,000 SF	20	5	25	5	20	25
Multifamily Housing Low-Rise (ITE 220)	112 Units	15	45	60	45	25	70
Low Trip Generation Estimate - South Side Development							
Day Care Center (ITE 565)	11,000 SF	60	60	120	60	60	120
Coffee Shop with Drive Thru (937)	2,200 SF	95	95	190	45	45	90
Industrial Park (ITE 130)	96,800 SF	30	5	35	10	25	35
Total Low Trip Scenario		220	210	430	165	175	340

*Trips rounded to nearest 5



Table 4 summarizes a generic higher trip generation forecast. As can be seen, the higher estimate could generate 805 to 1,475 total trips during the peak hours.

Table 4: High Trip Generation Estimate for Total Potential Developments

Land Use	Size	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
High Trip Generation Estimate - North Side Development							
Shopping Plaza w/Supermarket (ITE 821)	75,000 SF	165	100	265	335	360	695
Multifamily Housing Low-Rise (ITE 220)	112 Units	15	45	60	45	25	70
High Trip Generation Estimate - South Side Development							
Day Care Center (ITE 565)	11,000 SF	60	60	120	60	60	120
Coffee Shop with Drive Thru (937)	2,200 SF	95	95	190	45	45	90
Shopping Plaza no Supermarket (ITE 821)	96,800 SF	105	65	170	245	255	500
Total High Trip Scenario		440	365	805	730	745	1,475

*Trips rounded to nearest 5

As previously noted, the existing conditions are borderline acceptable due to poor level of service on the side-streets and the existing long westbound queues and blocked entry into the westbound left-turn lane. Therefore, any additional development on either the north or south side of the intersection should be evaluated and addressed as each parcel develops.

As a result, the City should require each development to perform a traffic impact study to document the anticipated trip generation, queues, queues of the westbound left-turn bay, impacts to the queues and operating conditions, as well as the need for potential for improvements to mitigate the impacts. Depending on the trip levels and impacts, improvements could range from signal timing changes to physical roadway improvements to mitigate the impact of the developments.

We trust that you will find this information useful in evaluating the traffic study needs analysis associated with Wentzville Parkway and Parkway Ridge Boulevard. Please contact CBB in our St. Louis office should you have any questions or comments concerning this material.