



AGENDA
CITY OF CREVE COEUR
PLANNING AND ZONING
300 NORTH NEW BALLAS RD
SEPTEMBER 5, 2023
6:00 PM

ZOOM MEETING INFORMATION

Members of the public may access live audio and/or video at the following link:

<https://us02web.zoom.us/j/89494148318>

Meeting ID: 894 9414 8318

CALL TO ORDER

ROLL CALL

Ms. Julie LaBonte (Chair)
Ms. Muriel Hall
Mr. Larry Potashnick
Ms. Marjorie Richter
Mr. AJ Wang
Ms. Rhonda O'Brien
Mr. Thomas Buelter

Ms. Stephanie Karr, Acting City Attorney
Mr. Jason Jaggi, Director of Community Development
Ms. Bethany L. Moore, City Planner
Ms. Megan Waller, Administrative Supervisor/Recording Secretary

ACCEPTANCE OF THE AGENDA

APPROVAL OF MINUTES

1. August 21, 2023 Planning and Zoning Commission Draft Meeting Minutes

PUBLIC COMMENT

An opportunity for members of the public to address the Planning and Zoning Commission regarding issues or concerns not already on the agenda for this meeting. Those wishing to speak will be asked to limit comments to three minutes and to complete a speaker card.

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UNFINISHED BUSINESS

NEW BUSINESS

1. PUBLIC HEARING: Application #23-031: A Conditional Use Permit for a Warehouse/Storage Use Located at 1145 North Warson Road

Cherie Ellis, of Straight Up Solar, has submitted an application for a Conditional Use Permit for a warehouse/storage use at 1145 North Warson Road in the "LI" Light Industrial Zoning District. The 11,890 square foot space within the existing building will be used to store solar panel module inventory. No exterior or interior changes are proposed in order for the use to take place. Under Section 405.380, Table A of the Zoning Code, NAICS 484110 requires the issuance of a conditional use permit in the "LI" zoning district subject to the recommendation of the Planning and Zoning Commission and approval of the City Council.

2. PUBLIC HEARING: Applications #23-027 and #23-028: Applications for a Rezoning From "RO" Research Office District to the Olia Village "PMD" Planned Mixed-Use Development District with a Site Concept Plan and Phase One Site Development Plan with Associated Preliminary Plat for the 96 Acre former Bayer West Campus at 10300 Olive Boulevard

Matt Pfund, of Jack Matthews Development, representing 10300 Olive, LLC, has submitted an application to amend the Official Zoning Map of the City of Creve Coeur to change the zoning of the property of approximately 96 acres located at 10300 Olive Boulevard, from "RO" Research Office to "PMD" Planned Mixed Use Development District, referred to as Olia Village. In accordance with Section 405.390 of the Zoning Code for Planned Zoning Districts, the applicant has submitted the Site Concept Plan and Phase One Site Development Plan for review and approval by the City. The proposed uses within the overall development include commercial buildings, restaurants, mixed-use buildings with ground floor retail/commercial uses and multi-family dwelling units on the upper floors within a "Main Street" type setting, hotels, apartments, office and research office buildings, as well as, attached townhomes. The existing buildings formerly used by Bayer are shown to remain and will be repurposed for office and residential uses. The submitted Site Development Plan for Phase One consists of site clearing, grading, site utilities and roadway construction. Building construction and related site improvements will be submitted for review by the City at a later date in association with each of the outlined phases as provided in the Site Concept Plan. A preliminary plat has been submitted to subdivide the property into individual lots and to establish streets and easements.

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WORK AGENDA

DEPARTMENT REPORTS

ADJOURNMENT

Pursuant to Section 610.022 RSMo., the Planning and Zoning Commission could, at any time during the meeting, vote to close the public meeting and move to closed session to discuss matters relating to litigation, legal actions and/or communications from the City Attorney as provided under Section 610.021(1) RSMo. and/or personnel matters under Section 610.021(13) RSMo. And/or employee matters under Section 610.021(3) RSMo. and/or real estate matters under Section 610.021(2) or other matters as permitted by Chapter 610.

Posted by: _____

Date/Time posted: _____

If you need special accommodations to attend a meeting, services may be arranged by contacting the Office of the City Administrator in advance.



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CALL TO ORDER

The meeting was called to order at 6:00 PM.

ROLL CALL

**Ms. Julie LaBonte (Chair)
Ms. Muriel Hall
Mr. Larry Potashnick
Ms. Marjorie Richter
Mr. AJ Wang
Ms. Rhonda O'Brien
Mr. Thomas Buelter**

The following staff were also present:

**Mr. Carl Lumley, City Attorney
Mr. Jason Jaggi, Director of Community Development
Ms. Bethany L. Moore, City Planner
Ms. Megan Waller, Administrative Supervisor/Recording Secretary**

ACCEPTANCE OF THE AGENDA

Ms. O'Brien made a motion to approve the agenda. Ms. Richter seconded. All in favor.

APPROVAL OF MINUTES

1. July 17, 2023 Planning and Zoning Commission Draft Meeting Minutes

Ms. O'Brien made a motion to approve the July 17, 2023 meeting minutes. Mr. Potashnick seconded. All in favor.

**2. August 15, 2023 Planning and Zoning Commission, City Council,
Economic Development Committee Joint Session Draft Meeting Minutes**

Mr. Potashnick made a motion to approve the August 15, 2023 meeting minutes. Mr. Buelter seconded. All in favor.

PUBLIC COMMENT

None



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UNFINISHED BUSINESS

None

NEW BUSINESS

- 1. PUBLIC HEARING. Application #23-026: Text Amendment to the Zoning Ordinance to Amend Section 405.470.A., Conditional Uses, and Table A, to include NAICS 541711, NAICS 541712 and NAICS 541720 as Conditional Uses in the “GC” General Commercial Zoning District only on properties that abut the “LI” Light Industrial Zoning District**

Those speaking to the request were sworn in.

Ms. Bethany Moore, City Planner, stated that the application is an amendment to section 405.470.A to include 3 NAICS use codes as conditional uses in the GC-General Commercial zoning district for properties that abut the LI-Light Industrial zoning district.

Ms. Moore stated that these uses are permitted in other districts. She explained that because these are more intense uses, staff finds it necessary to have close review of these applications before approval through the conditional use process.

Ms. Moore stated that the amendment would only apply to properties in the GC-General Commercial zoning district that abut LI-Light Industrial zoning district. She explained that few lots would qualify, but the amendment would allow businesses in the 39 North district a buffer zone with more areas to expand and grow.

Ms. Moore stated that the amendment does comply with the 39North Master Plan.

Ms. Moore stated that if approved, the amendment would allow these three uses under Section 405.470.A, as long as they abut the LI-Light Industrial zoning district, and all operations are conducted within an enclosed building with no outdoor storage of materials or equipment.

Ms. O'Brien asked if this amendment would include things such as sheds. Ms. Moore confirmed that yes, it could include accessory structures if they are enclosed, such as a greenhouse.

Mr. Lumley asked if the amendment to Table A would also include 541720 as a



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permitted use in LI-Light Industrial zoning district. Ms. Moore stated that it should, and that staff is unsure why it was not originally included. She explained that the commission should add this correction as part of the amendment.

Ms. LaBonte closed the public hearing.

Mr. Lumley offered the exhibits to the record.

Mr. Potashnick made a motion to recommend approval of the text amendment as outlined in the staff report with the addition of 541720 as a permitted use in the LI-Light Industrial zoning district. Ms. Hall seconded. All in favor.

RESULT: Approved

MOVER: Potashnick

SECONDER: Hall

AYES: Rhonda O'Brien, Larry Potashnick, Muriel Hall, Thomas Buelter, Marjorie Richter, Julie LaBonte

NAYS: None

2. Application #23-030: Minor Site Development Plan for the Replacement of Four Existing Scoreboards within St. Louis Abbey Priory School Campus Located at 500 S. Mason Road

Mr. George Stock, 257 Chesterfield Business Pkwy., Chesterfield, MO 63005, stated that the request is to replace four existing scoreboards on the Priory School campus.

Mr. Stock stated that the existing analog scoreboard on the football field is very dated and is located within the 100ft buffer.

Mr. Stock stated that the proposed sign will be a 32'WX22'H scoreboard with LED lighting and horns. He explained that with the replacement scoreboard, the existing PA system will also be replaced.

Mr. Stock stated that they also plan to replace two existing scoreboards on the varsity and junior varsity soccer fields and one on the baseball field.

Mr. Stock stated that the proposed football scoreboard will be relocated outside of the 100ft buffer.



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Mr. Stock stated the planned schedule for scoreboard use, and that the use will likely only deviate from the schedule for practice before scheduled games begin, music at halftime, etc. He also stated the sound decibels limitations, and that the proposed scoreboard sound levels are adjustable and controllable.

Ms. O'Brien asked if neighbors have concerns regarding sound levels, would they get in touch with someone at the school? Mr. Stock stated that yes, the neighbors could get in contact with the school.

Mr. Buelter had concerns that the new LED lighting could cause issues to the neighbors. Mr. Stock confirmed that the LED lights and sound will be pointing towards the south away from the neighbors.

Ms. Hall had concerns about the proposed horn on the scoreboards. Mr. Stock stated that the existing scoreboards have horns as well. He explained that the horns would only be used in between quarters or halves and ends of games.

Ms. Bethany Moore, City Planner, stated that the proposed site development plan is to be approved at the Planning and Zoning Commission level, and will not move on to City Council.

Ms. Moore stated that the scoreboard on the football field will be moved closer to the campus, and out of the 100ft buffer. She also stated that the sound and light will be directed away from the residents.

Ms. Moore stated that no additional lighting is proposed with the application.

Ms. Moore stated that the proposed signs will be larger than the existing.

Ms. Moore stated that two small delay of game timers are also proposed for the football field.

Ms. Moore stated that the proposed sound system for the football scoreboards shall not exceed the allowable noise level outlined by Chapter 625 St Louis County noise ordinance.

Ms. Moore stated that there is a proposed amendment to the zoning map, as a parcel



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on the campus was accidentally zoned A -Single Family Residential instead of HE-Higher Education.

Ms. O'Brien asked how sound concerns would be regulated. Ms. Moore stated regulations would be on a complaint basis, and if a complaint were received, the City would test the sound to make sure that it is compliant.

Ms. LaBonte asked if the system could be tested when the new sign is put in. Ms. Moore stated that it could be added as a condition of approval.

Mr. Potashnick asked about a concern from a neighbor who referenced City code section 210.237. Ms. Moore stated that this is a nuisance noise section, and the City enforces the County noise section. Mr. Lumley stated that the noise ordinance is complicated in that it also varies by zoning district.

Mr. John Hanichak, 465 Twin Creek Rd., Creve Coeur, MO 63141, thanked the committee for their time.

Mr. Hanichak had concerns that the proposed horns would be intrusive to neighbors. He also had concerns that the proposed schedule will offer a lot of opportunity for the horns to be used.

Mr. Hanichak stated that he would like to see the use of the horns restricted or prohibited all together.

Mr. Potashnick asked Mr. Hanichak to clarify what he means by restricting the use. Mr. Hanichak stated that he would like the use to be restricted to no later than 5:00 PM.

Ms. Richter asked if Mr. Hanichak has had any issues with the existing horns or if he has asked that the current horns be restricted. Mr. Hanichak confirmed that he has not.

Mr. Buelter asked if there are rules in high school sports for horn requirements. Mr. Stock stated that he is unsure of the rules, but the proposed horns are standard for all scoreboards. Mr. Stock stated that the existing scoreboards have always had a horn, and the proposed horns will be no louder.

Mr. Potashnick made a motion to approve the minor site development plan subject to



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the conditions outlined in the staff report with the added condition that the sound must be tested and not exceed the existing horn volume or the county sound ordinance. Mr.

RESULT: Approved MOVER:

Potashnick **SECONDER:**

Buelter

AYES: Rhonda O'Brien, Larry Potashnick, Muriel Hall, Thomas Buelter, Marjorie Richter, Julie LaBonte

NAYS: None

Buelter seconded. All in favor.

WORK AGENDA

1. Conditional Use Permit Procedures and Short-Term Rentals Code Amendments

Mr. Jason Jaggi, Director of Community Development, stated that the Conditional Use Permit amendment is planned to come before the Commission at the September 18th meeting.

Mr. Jaggi stated that the amendment will include updating language in the ordinance. As an example, he stated that the ordinance currently asks for copies of plans on a floppy disc and will be updated to say a digital copy of plans.

Mr. Jaggi stated that Section F is a new procedure. He explained that if a motion to approve a conditional use permit fails, the Community Development Director would prepare a record of decision to be presented to the City Council at the next meeting for a vote.

Mr. Lumley stated that this new procedure is to help with documentation in court. He explained that this will create a clear, definitive document with the reasons for the negative vote.

Mr. Jaggi stated that the second text amendment application is in response to the federal court of appeals ruling on regulations on short-term rentals. He explained that the City will update the ordinance in response.

Mr. Jaggi stated that the City proposes to remove the requirement that a homeowner



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must live in the home for 180 days of the year in response to the federal decision.



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Ms. LaBonte asked about rentals of pools. Mr. Lumley stated that this is not allowed in the City by ordinance. Ms. LaBonte asked if the ordinance should specifically say that rentals of accessory structures are not allowed. Mr. Lumley confirmed that it currently does outline accessory structures, but examples could be added.

Ms. LaBonte asked for clarification on the number of people allowed to occupy. Mr. Lumley stated that this is referring to the number of people allowed to sleep in the unit typically for fire code safety.

2. Olia Village Meeting Review Procedures Discussion

Mr. Jaggi proposed discussion points for the public hearings. He suggested having the staff presentation at the September 5th meeting to consider the comprehensive plan, zoning code, etc, followed by the applicant's presentation, and public comment. He then suggested deliberation between the Commission members at the end of the first meeting.

Ms. O'Brien asked if the plans could be printed on a large scale and placed around the room. She also asked if the traffic study, tree count, trails, etc. could be discussed. Mr. Potashnick asked if the consultants could break down their findings of the traffic study so the Commission can get a good understanding of the impacts.

Mr. Buelter stated he would like to see a phasing schedule for the development.

Ms. LaBonte had concerns regarding the crosswalk across Olive Blvd. She also had concerns regarding intersections and access to the site at the existing signals.

Mr. Jaggi stated that the Commission should be prepared to make recommendations on the proposal at the September 5th meeting including changes and clarifications they would like to see so that they can be presented at the next meeting.

Mr. Potashnick suggested limiting the meeting times and expecting to continue to additional meetings given the size of the project. He also asked if staff could provide comments from initial reviews so the commission can see changes that have already been made to the project.



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Mr. Potashnick asked if staff could provide information, including resumes, of the planning consultants assisting the City. He also suggested having members from the planning consultant group at the meeting.

Mr. Potashnick had concerns regarding financial and economic reports of the project.

Ms. LaBonte suggested including subdivision trustees in the mailings.

Ms. O'Brien asked if staff could send the packet to the commission early to allow more review time.

Mr. Potashnick asked staff to put together an index of the project documents.

Mr. Jaggi thanked the members and noted staff will seek to incorporate these requests.

DEPARTMENT REPORTS

None

ADJOURNMENT

The meeting adjourned at 7:52 PM.

Submitted by:

Recording Secretary

Chair



APPLICATION TO PLANNING AND ZONING COMMISSION
#23-031: A CONDITIONAL USE PERMIT FOR A
WAREHOUSE/STORAGE USE LOCATED AT 1145 NORTH WARSON
ROAD

FOR THE MEETING OF: Tuesday, September 5, 2023

LOCATION: 1145 North Warson Road, in the LI (Light Industrial) District

REQUEST: Cherie Ellis, of Straight Up Solar, has submitted an application for a Conditional Use Permit for a warehouse/storage use at 1145 North Warson Road in the "LI" Light Industrial Zoning District. The 11,890 square foot space within the existing building will be used to store solar panel module inventory. No exterior or interior changes are proposed in order for the use to take place.

ADDITIONAL INFORMATION: Under Section 405.380, Table A of the Zoning Code, NAICS 484110 requires the issuance of a conditional use permit in the "LI" zoning district subject to the recommendation of the Planning and Zoning Commission and approval of the City Council.

Key Issues:

- Does the request further the goals and/or implement the Comprehensive Plan?
- Is the request consistent with the requirements for a conditional use permit?
- Does the request follow the design guidelines?

Creve Coeur 2030 Comprehensive Plan
References

- Mixed-Use Innovation Campus District
- Design Guidelines

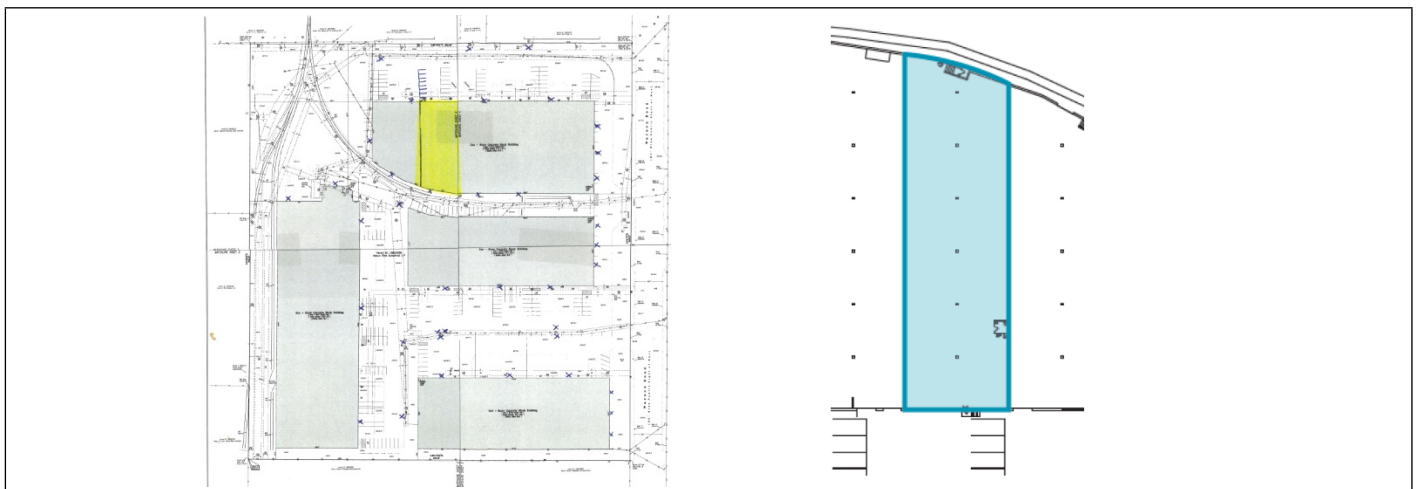
Zoning Code References

- Section 405.380: LI-Light Industrial District
- Section 405.470: Conditional Uses

APPLICANT: Cherie Ellis
Straight Up Solar
11696 Lilburn Park Road
St. Louis, MO 63146

APPLICANT'S
REPRESENTATIVE:

Tom Schenk
White Company
1600 South Brentwood Blvd., Suite 770
St. Louis, MO 63144



REPORT PREPARED BY: Bethany L. Moore, City Planner
DATE: 8/24/2023
ATTACHMENTS: Applicant's Materials
Draft Ordinance

BACKGROUND AND ZONING HISTORY

The applicant has applied for a Conditional Use Permit for an 11,890 square foot storage space to use for general storage for their business. The subject property is part of a four-building complex known as the North Warson Business Center which was developed in the 1970s in St. Louis County before becoming incorporated into Creve Coeur in the 1990s. Straight Up Solar is a solar panel installation company and will use the warehouse to store non-hazardous materials such as solar panel modules and installation equipment. The applicant will have 1-3 employees to access the space when needed within the hours of 6am to 3pm Monday-Friday. The space will not be modified on the exterior or the interior to accommodate the request. No vehicles will be parked or equipment stored outside the building. NAICS 493110, General Warehousing and Storage is a Conditional Use in the “LI” Light Industrial district requiring approval from the City Council with a positive recommendation from the Planning and Zoning Commission.

LAND USE AND ZONING OF SURROUNDING PROPERTIES

The adjacent zoning and land uses are as follows:

DIRECTION	USE	ZONED	SEPARATED BY
North	Industrial	“LI” Light Industrial	N/A
South	Residential	“AR” Attached Single-Family Residential	N/A
East	City of Olivette	Mixed Use	N. Warson Road
West	Industrial	“LI” Light Industrial	N/A

COMPREHENSIVE PLAN REVIEW

The subject property is located within the Mixed-Use Innovation Campus District (MUIC) located on the east end of Olive Boulevard. The Comprehensive Plan recommends that a variety of active, office and residential uses be allowed and encouraged with side and rear lot parking. The MUIC is intended for the development of specialized office, laboratory, institutional, and research buildings for high-tech and biotech industries, supported by vibrant, ground floor mixed-use development, multi-family housing, and other community amenities. The focus of the MUIC is to develop the SLEDP 39 North plant science and agricultural technology district. The property was developed in St. Louis Country prior to incorporation into the City of Creve Coeur and has remained largely unchanged since. Since the proposed use will only be taking up a portion of the existing building and making no exterior or interior changes, this use is compatible in terms of the Comprehensive Plan guidelines. Therefore, the proposed use would satisfy the goals and objectives of the Comprehensive Plan as much as such a use could.

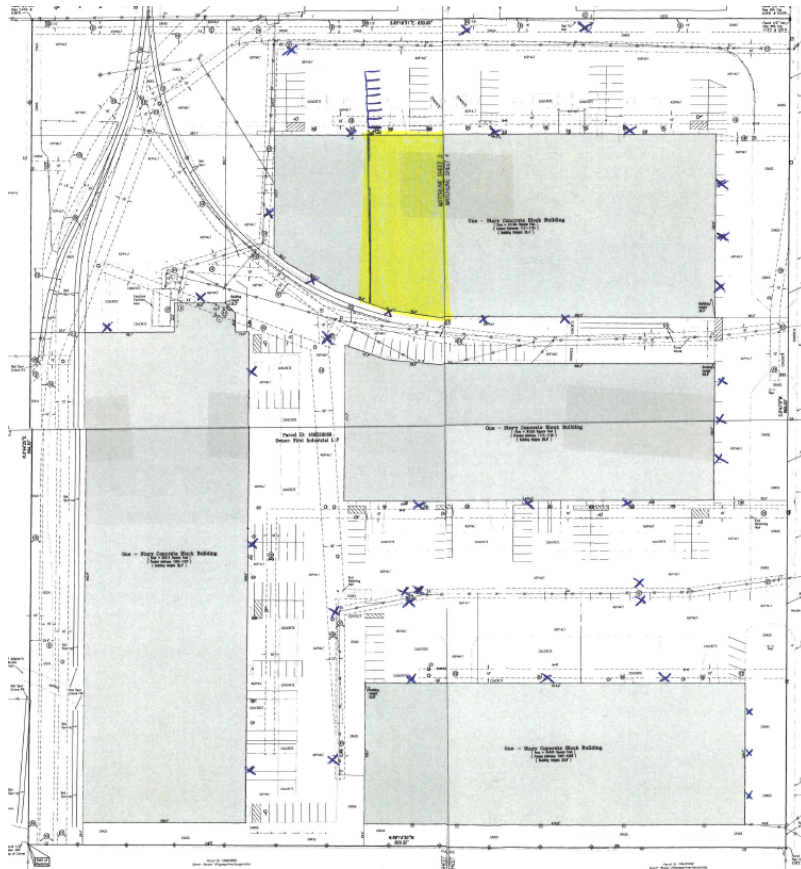


Figure 1: Site Plan.

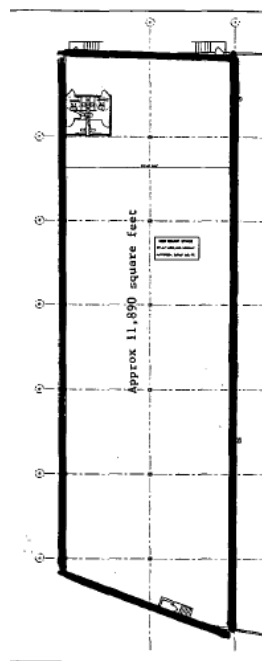


Figure 2: Proposed Floor Plan.

ZONING REVIEW

As the proposed use is utilizing an existing space within a multi-tenant building, and will not be making any changes to the exterior of the building or site, and the space will only be periodically accessed to retrieve materials, staff does not have any concerns with this use or the condition of the property.

Parking:

There are 205 total parking spaces on site that are shared between the four industrial buildings on the lot. NAICS 493110, General Warehousing and Storage, requires parking to be determined based on the square footage of the building. The total square footage of the building that the applicant is proposed to lease space in is 91,743 square feet while the tenant space is 11,890 square feet. Section 405.820, Required Off-Street Parking Spaces, requires that 1 parking space be provided per 2,500 square feet for buildings over 40,000 square feet which would require this use to have 5 parking spaces available for this type of use. Given that there are 205 parking spaces on site and the storage use would not require employees to be at the space consistently during the hours provided, only as needed to access the materials, staff is not concerned with the amount of parking provided on site and is satisfied that the parking requirements of Section 405.820 have been met.

Landscaping:

Due to the fact that the subject property was developed under St. Louis County standards before it was incorporated into the City of Creve Coeur, there are some non-conformities on the site. One of the non-conformities is that the required amount of street trees is not met. Given that no construction will be taking place that will result in any interior or exterior changes and the fact that the use will be fairly passive, staff is not requiring the installation of street trees as part of this Conditional Use Permit,

RECOMMENDATION

Based on the above analysis, the request for a conditional use permit meets the requirements of the Zoning Ordinances and goals of the Comprehensive Plan. If approved by the Planning and Zoning Commission, Staff recommends the following conditions below which are included in the draft ordinance:

1. The Conditional Use Permit shall be for the operation of a 11,890 square foot general warehousing and storage space located at 1145 North Warson Road.
2. The hours of operation shall be: 6:00 a.m. to 3:00 p.m. Monday through Friday.
3. Additional business hours may be permitted with the Zoning Administrator's approval.
4. All signs and banners shall be in conformance with Article VII, Sign Regulations, of the Zoning Code.
5. Any future enlargement, extension, expansion or exterior alteration in the use of the structures or site must be approved by the City Council upon receipt of the recommendation of the Planning and Zoning Commission as an amendment to the Conditional Use Permit before a Building Permit for the enlargement, expansion or exterior alteration may be issued.
6. Failure to comply with any one or all of the conditions of this permit shall be adequate cause for the revocation of said permit by the City Council, provided, however, no permit shall be revoked without prior notice to the owner of the intention of the City Council to revoke this permit and reasonable time granted to the owner to correct or remedy any such breach of conditions, except for repeated breaches or violations.
7. No conditional use permit granted by the City Council shall be valid for a period longer than one year from the date it grants the conditional use permit, unless within such period: (1) a building permit is obtained and construction is begun; or (2) if a building permit is not required, an occupancy permit is obtained and the use of the building commenced. The City Council may grant extensions to the one (1) year period of not more than one hundred and eighty (180) days each, without notice or hearing, provided that a written request for such extension is filed

by the original applicant and approved by the City Council prior to the date the conditional use permit is scheduled to expire.

MOTION

If the Commission wishes to vote on a recommendation to the City Council based on the current proposal, the following would be an appropriate motion:

“I move to recommend approval of the conditional use permit for Straight Up Solar according to the draft ordinance attached to the staff report on Application #23-031, for the meeting of September 5, 2023.” (Conditions in the draft ordinance may be added, eliminated, or modified by preceding motion)

APPENDIX 1: COMPREHENSIVE PLAN

Included and attached by reference. See body of report for specific excerpts.

APPENDIX 2: ZONING CODE

Included and attached by reference. See body of report for specific excerpts.

APPENDIX 3: AERIAL PHOTO



APPENDIX 4: SITE PHOTOGRAPHS		Photo Date:8/28/23
		Description:
		Description:
		Description:

	Description:
	Description:



White Company

Commercial Real Estate Services

July 28, 2023

Ms. Bethany L. Moore
City Planner
City of Creve Coeur
300 N. New Ballas Road
Creve Coeur, MO 63141

RE: 1145 N. Warson Road – Straight Up Solar

Dear Ms. Moore,

Please see the attached application and back up information for the above referenced space and the corresponding Conditional Use Permit.

Straight up Solar is a full service, turnkey, electronic power control and solar installation company located in Missouri and Illinois. They provide full solar services from design-to-build (engineering, procurement, construction, installation) for solar systems, battery storage, smart panels, and EV charging stations.

Straight up Solar is requesting a CUP to use the above referenced space in its “as-is” condition as overflow warehousing of solar panel modules and associated equipment. The warehouse space will be accessed from time to time by 1-3 employees, when needed, M-F from 6am- 3pm.

We appreciate your consideration of this request. If you have any questions regarding this request, please let us know.

Regards,
Tom Schenk
White Company
314-280-1562

ITEMS CORRESPONDING TO SCHEDULE B-II

- 9 Easement granted to Union Electric Company, according to instrument recorded in Book 8303, Page 805. This item is shown hereon.
- 10 Easement granted to Union Electric Company, according to instrument recorded in Book 3608, Page 517 and Book 5110, Page 120. This item is shown hereon.
- 11 Easement granted to the Metropolitan St. Louis Sewer District, according to instrument recorded in Book 5644, Page 108. This item is shown hereon.
- 12 An easement disclosed by an instrument recorded in Book 6334, Page 2085. In favor of: Laclede Gas Company. That portion beneath building was released by Partial Release of Easement recorded in Book 13757, Page 2063. This item is shown hereon.
- 13 An easement disclosed by an instrument recorded in Book 6342, Page 1643. In favor of: The Metropolitan St. Louis Sewer District. Said Easement was partially vacated by Ordinance No. 9397 recorded in Book 10407, Page 1189. This item is shown hereon in part; however, the vacation description per Ordinance No. 9397 refers to a description in B.7964 P.315, and has not been shown.
- 14 Notice of Encroachment upon the Storm Sewer Easement recorded in Book 6342, Page 1643 and reported next above. License for the said encroachment and an Indemnity Agreement recorded in Book 6881, Page 2073. This item is shown hereon.
- 15 Rail Easement to Industrial Properties, Inc., according to instrument recorded in Book 6364, Page 1461. This item is shown hereon.
- 16 Easement granted to the Metropolitan St. Louis Sewer District, according to instrument recorded in Book 6626, Page 1133. This item is shown hereon.
- 17 Easement granted to Union Electric Company, according to instrument recorded in Book 13757, Page 2053 and Book 21889, Page 366. This item is shown hereon.
- 18 Easement granted to Southwestern Bell Telephone Company, according to instrument recorded in Book 20602, Page 4934 and Book 21131, Page 517. This item is shown hereon.

LEGEND OF SYMBOLS & ABBREVIATIONS

Monument As Noted	N.	North
Chiseled Cross	S.	South
Bollard or Gate Post	E.	East
Power Pole	W.	West
Guy Wire	°	Degrees
Electrical Pedestal	"	Feet or Minutes
Electrical Transformer	"/	Inches or Seconds
Electrical Metering	V.O.	Vacation Ordinance
Air Conditioner	Calc.	Calculated
Light Standard	Rec.	Record
Yard Light	Inst.	Instrument
Sign	No.	Number
Handicap Parking	G.L.	Grass & Landscape
Handicap Parking (Sign Only)	R/W	Right of Way
Fire Hydrant	Qtr.	Quarter
Yard Hydrant	Sec.	Section
Water Meter	T.	Township
Water Valve	R.	Range
Pet Waste Container	B.	Book
Irrigation Control	P.	Page
Grate Inlet	①	Shown Exception
Storm Vault	---	Right of Way Line
Gas Meter	PL	Property Line
Gas Valve	----	Easement
Manhole	----	Setback
Clean Out	----	Overhead
Communications Vault	+	Fence
Communications Pedestal	OE	Overhead Electric
Television Accessory	UE	Underground Electric
Traffic Box	W	Water
	STM	Storm
	G	Gas
	S	Sewer
	C	Communications

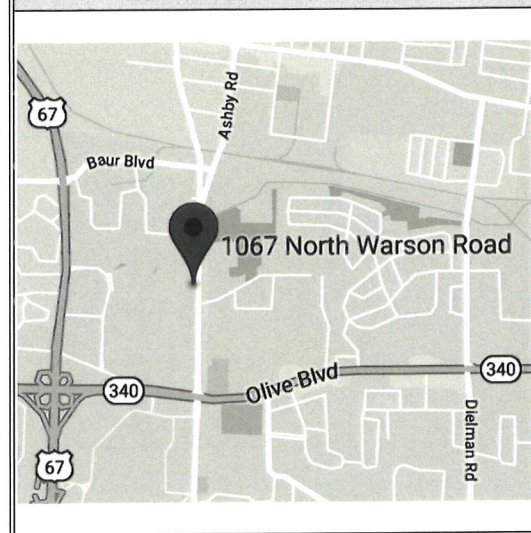
FLOOD NOTE

BY GRAPHIC PLOTTING ONLY, THIS PROPERTY IS IN ZONE(S) X OF THE FLOOD INSURANCE RATE (FIRM). MAP No. 29189C0192K, WHICH BEAR(S) AN EFFECTIVE DATE OF 02/04/2015 AND IS NOT IN A SPECIAL FLOOD HAZARD AREA, BY CONTACT DATED 11/13/2018 TO THE NATIONAL FLOOD INSURANCE PROGRAM <http://www.fema.gov/>. WE HAVE LEARNED THIS COMMUNITY DOES CURRENTLY PARTICIPATE IN THE PROGRAM. NO FIELD SURVEYING WAS PERFORMED TO DETERMINE THIS ZONE AND AN ELEVATION CERTIFICATE AND/OR ENGINEERING (FLOOD) STUDY MAY BE NEEDED TO VERIFY THIS DETERMINATION OR APPLY FOR A VARIANCE FROM THE FEDERAL EMERGENCY MANAGEMENT AGENCY.

ZONING INFORMATION

Information not yet provided to surveyor per Table A item 6(a).

VICINITY MAP - NOT TO SCALE



MISCELLANEOUS NOTES

- MN1 Some features on this plat may be shown out of scale for clarity.
- MN2 Dimensions on this plat are expressed in feet and decimal parts thereof unless otherwise noted. Bearings are referred to an assumed meridian and are used to denote angles only. Monuments were found at points where indicated.
- MN3 The basis of bearings for this survey is S.0°47'0"W., which is the assumed bearing of the W. line of Warson Road, as shown hereon.
- MN4 At the time of the ALTA Survey, the subject property accessed the public right of way via 2--driveways along Warson Road, as shown hereon.
- MN5 At the time of the ALTA Survey, there was no evidence of cemeteries or burial grounds on site.
- MN6 At the time of the ALTA Survey, the subject property contained a gross land area of 17,2306--Acres, or 750563--Square Feet, (more--or--less), pursuant to Table A Item 4.
- MN7 At the time of the ALTA Survey, striped parking was as follows: 196--Regular Spaces, 9--Accessible Spaces, 205--Total Spaces, as shown hereon pursuant to Table A Item 9.
- MN8 At the time of the ALTA Survey, there were no division or party walls designated by the client with respect to adjoining properties pursuant to Table A Item 10a.
- MN9 At the time of the ALTA Survey, the distance to the nearest intersecting street, Grandview Drive, was 158', as shown hereon pursuant to Table A Item 14.
- MN10 At the time of the ALTA Survey, there was no observable evidence of recent earth moving work, building construction, or building additions pursuant to Table A Item 16.
- MN11 At the time of the ALTA Survey, there were no known proposed changes in street right-of-way lines available from the controlling jurisdiction and no evidence of recent sidewalk construction or repairs pursuant to Table A Item 17.
- MN12 At the time of the ALTA Survey, the surveyor was not provided with information to make wetland determinations, and no wetlands markers were observed at the site, pursuant to Table A Item 18.

UTILITY NOTES

- UN1 The location of Utilities shown hereon are from observed evidence of above ground appurtenances. The surveyor was not provided with surface markings or underground plans to determine the location of any subterranean uses.
- UN2 From observed above ground appurtenances only as shown hereon, electric, gas, storm drainage and water lines and/or service is available for the surveyed property within utility easements near and along the property's perimeter.
- UN3 Before digging in this area, call the Missouri One Call System at 1-800-DIG-RITE for field locations (request for ground markings) of underground utility lines.

LEGAL

THE USE OF THIS DOCUMENT'S FORMAT IS STRICTLY PROHIBITED AND CONTINGENT UPON THE WRITTEN CONSENT AND PERMISSION OF BOCK & CLARK CORP.
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RECORD DESCRIPTION

A TRACT OF LAND BEING PART OF SECTION 36, TOWNSHIP 46 NORTH -- RANGE 5 EAST, CITY OF CREVE COEUR, ST. LOUIS COUNTY, MISSOURI AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHWEST CORNER OF PROPERTY CONVEYED TO WARSON VILLAGE APARTMENTS ASSOCIATES, L.L.C. AS DESCRIBED IN THE DEED RECORDED IN BOOK 10552, PAGE 1310 OF THE ST. LOUIS COUNTY RECORDS; THENCE NORTH 00 DEGREES 44 MINUTES 25 SECONDS EAST 904.30 FEET TO A POINT ON THE SOUTH LINE OF THE RESUBDIVISION OF SECTIONS 2, 3, AND 4 OF LINDBERGH WARSON INDUSTRIAL CENTER ADDITION 1, A SUBDIVISION ACCORDING TO THE PLAT THEREOF RECORDED IN PLAT BOOK 100, PAGE 52 OF THE ST. LOUIS COUNTY RECORDS; THENCE EASTWARDLY ALONG SAID SOUTH LINE SOUTH 89 DEGREES 16 MINUTES 51 SECONDS EAST 830.00 FEET TO A POINT ON THE WEST LINE OF WARSON ROAD, 80 FOOT WIDE; THENCE SOUTHWARDLY ALONG SAID WEST LINE SOUTH 00 DEGREES 47 MINUTES 00 SECONDS WEST 905.03 FEET TO A POINT ON THE NORTH LINE OF AFORESAID WARSON VILLAGE APARTMENTS ASSOCIATES, L.L.C. PROPERTY; THENCE WESTWARDLY ALONG SAID NORTH LINE NORTH 89 DEGREES 13 MINUTES 50 SECONDS WEST 829.32 FEET TO THE POINT OF BEGINNING.

THE LANDS SURVEYED, SHOWN AND DESCRIBED HEREON ARE THE SAME LANDS AS DESCRIBED IN THE TITLE COMMITMENT PROVIDED BY First American Title Insurance Company, Commitment/File No: NCS-930545--CH12, DATED October 4, 2018, at 8:00 AM.

ALTANSPPS LAND TITLE SURVEY

TriGate St. Louis

B&C Project No. 201805103-001
1067-1151 Warson, Bldgs A - D, St. Louis, MO

Based upon Title Commitment/File No: NCS-930545--CH12
of First American Title Insurance Company
bearing an effective date of October 4, 2018, at 8:00 AM

Surveyor's Certification

To: TPP 218 North Warson, LLC, a Delaware limited liability company; Crossfirst Bank, a Kansas corporation; First American Title Insurance Company; and Bock & Clark Corporation.

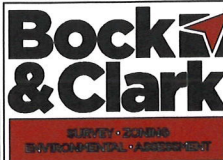
This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2016 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 6a, 6b, 7a, 7b1, 7c, 8, 9, 10a, 13, 14, 16, 17, 18, and 20 of Table A thereof. The field work was completed on November 14, 2018.



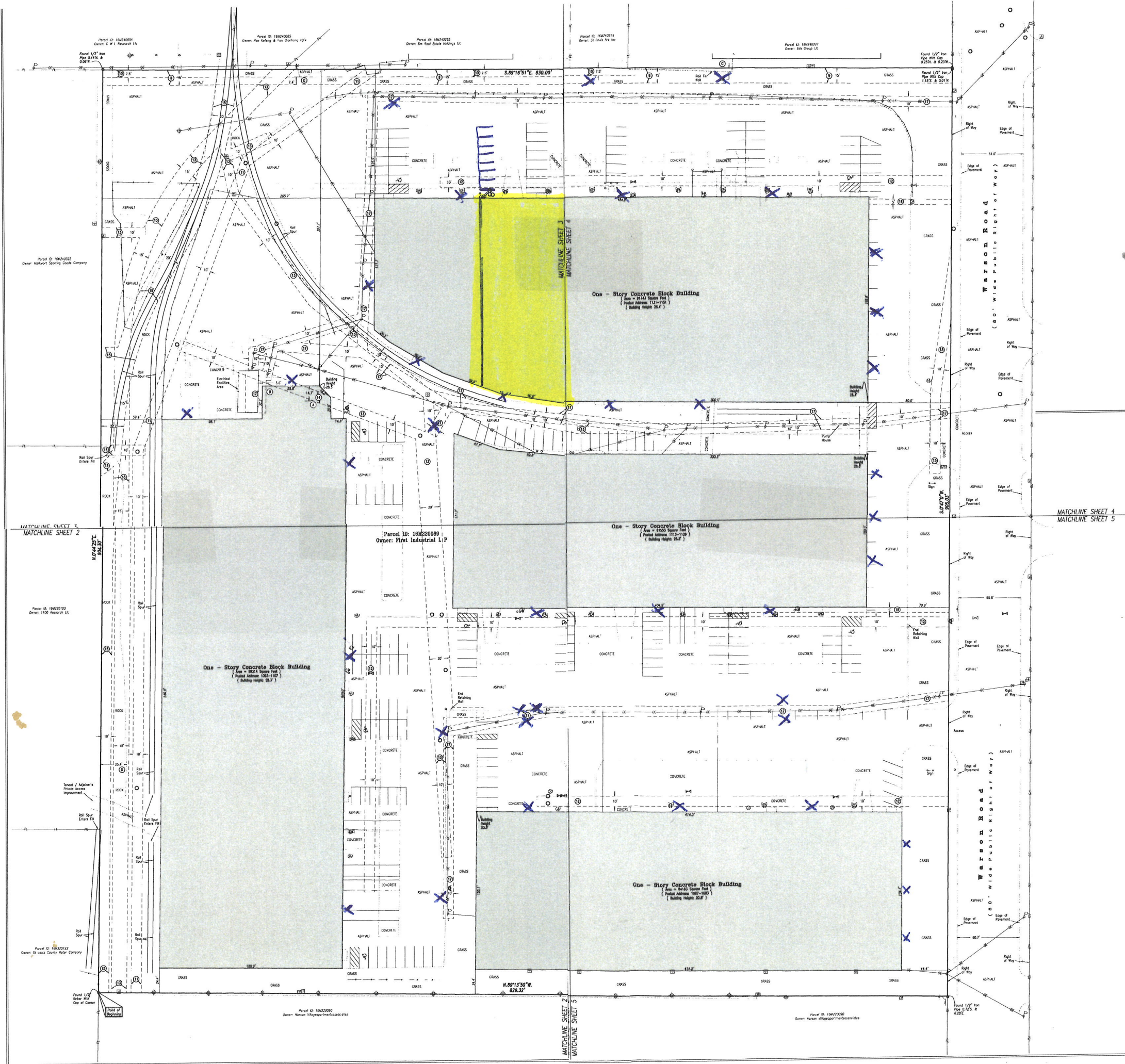
Zachary Winters
Registration No.: 2000016646
in the State of Missouri
Fieldwork Completed: November 14, 2018
Date of Last Revision: November 20, 2018 (12)
Date Printed: November 20, 2018 (12)
Bock & Clark NSN Project No.: 201805103-001

Survey Performed By:
Civen, Inc.
212 1/2 W. 5th St.
Ste. 209
Joplin, MO 64801
Phone: (877) 982-4836
Fax: (877) 992-4836
Email: zach.winters@civen.com
CCK: 2007015029

Sheet 1 of 5



National Coordinators
1-(800)-SURVEYS (787-8397)
Bock & Clark Corporation
3550 W. Market Street, Suite 200,
Akron, Ohio 44333
maywehelpyou@bockandclark.com
www.bockandclark.com



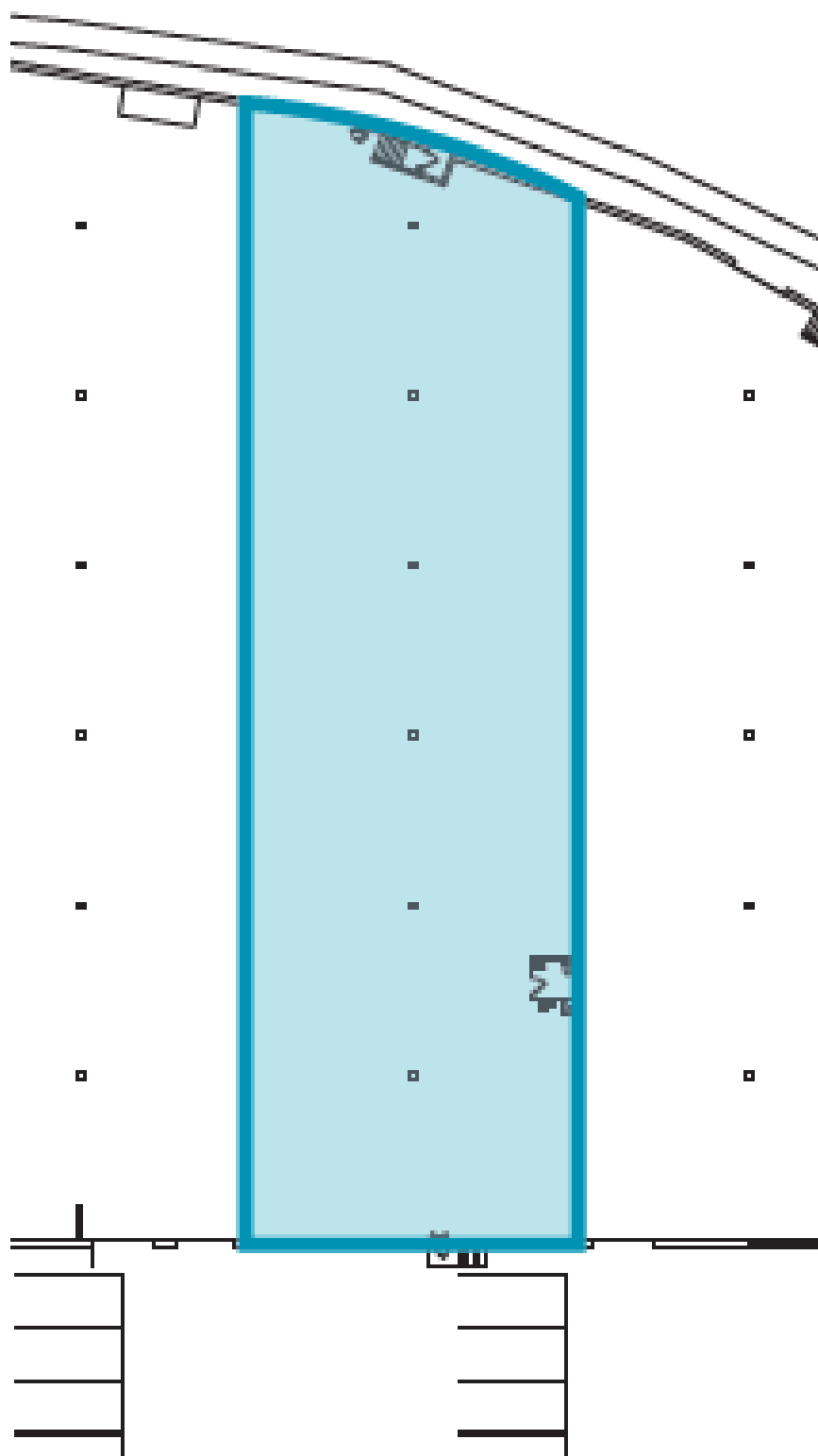
X - approximate location of exterior lights

LEGEND OF SYMBOLS & ABBREVIATIONS	
Monument As Noted	N. North
Chained Cross	S. South
Ballard or Gate Post	E. East
Power Pole	W. West
Guy Wire	D. Degrees
Electrical Pedestal	F. Feet or Minutes
Electrical Transformer	I. Inches or Seconds
Electrical Metering	V.O. Vacation Ordinance
Air Conditioner	C.O. Calculated
Light Standard	Rec. Record
Yard Light	Inst. Instrument
Sign	No. Number
Handicap Parking	G.L. Gross & Landscape
Handicap Parking (Sign Only)	R/W. Right of Way
Fire Hydrant	Qtr. Quarter
Water Meter	Sec. Section
Yard Hydrant	T. Township
Water Valve	R. Range
Pet Waste Container	B. Book
Irrigation Control	P. Page
Grade Inlet	S. Shown Exception
Storm Vault	Right of Way Line
Gas Valve	Property Line
Manhole	Easement
Clean Out	Setback
Communications Vault	Overhead
Communications Pedestal	Fence
Telecommunications Accessory	Overhead Electric
Traffic Box	Underground Electric
	Water
	Storm
	Gas
	Sewer
	Communications

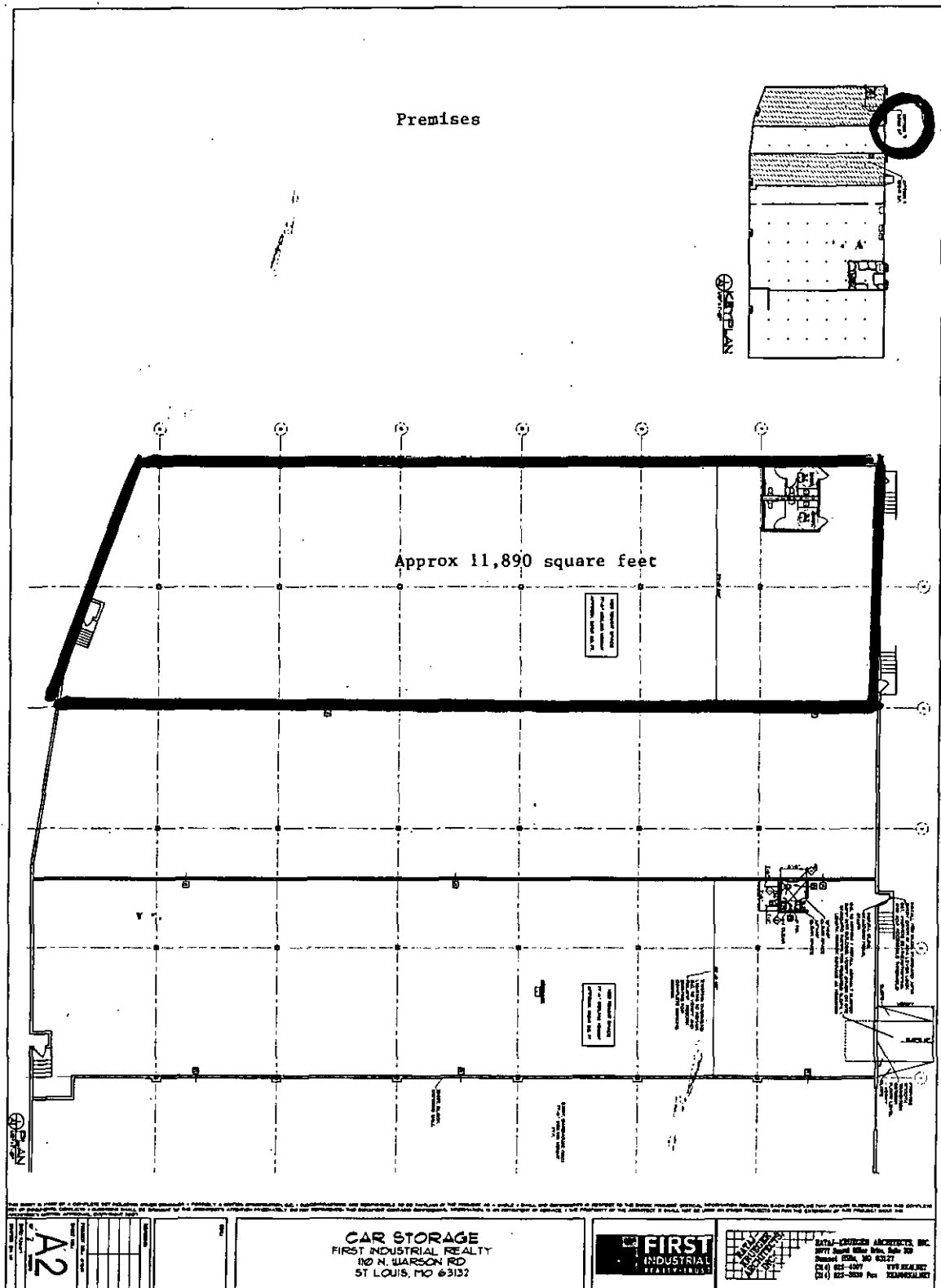
Scale: 1" = 30'

Bock & Clark
ALTA/NSPS LAND TITLE SURVEY
PREPARED FOR
TriGate St. Louis
BAC Project No. 201805103-001
1067-1151 Worson, Bldg A - O, St. Louis, MO
1-(800)-SURVEYS (787-8397)
mgs@bclark.com bclark.com www.bclark.com

Survey Performed By:
Drew H. Smith
172 S.W. 5th St.
St. Louis, MO 63101
Date of Last Revision: November 20, 2018 (2)
Date Printed: November 20, 2018 (2)
Book & Clerk: 201805103-001
Clerk: 201805103-001
Sheet 5 of 5



Depiction of Premises



BILL NO. _____

ORDINANCE NO. _____

**AN ORDINANCE AUTHORIZING A NEW CONDITIONAL USE PERMIT FOR
STRAIGHT UP SOLAR AT 1145 N. WARSON ROAD WITHIN THE NORTH
WARSON BUSINESS CENTER, ZONED LI-LIGHT INDUSTRIAL DISTRICT**

WHEREAS, Section 405.380(C), NAICS 484110 General Warehousing and Storage, requires the issuance of a conditional use permit as provided in Section 405.1070, Conditional Use Permits; and

WHEREAS, Cherie Ellis, of Straight Up Solar, has submitted an application for a general warehousing and storage use at 1145 N. Warson Road, Creve Coeur, MO, 63141, within the North Warson Business Center, zoned LI-Light Industrial District; and

WHEREAS, a public hearing was held by the Creve Coeur Planning and Zoning Commission on Tuesday, September 5, 2023, beginning at 6:00 p.m. or immediately following the close of the previous public hearing, on said application for the conditional use permit as provided by Section 405.1070(D)(2); and

WHEREAS, notice of publication for said public hearing had been previously published at least 15 days prior to the hearing, in the St. Louis Countian, a newspaper of general circulation in the City of Creve Coeur; and

WHEREAS, the Planning and Zoning Commission reviewed and, by a ____ vote, recommended approval of the request, subject to the conditions contained herein, at its meeting on September 5, 2023; and

WHEREAS, all parties desiring to be heard, either for or against said application, were given an opportunity to be heard, and a copy of the proposed ordinance has been made available for public inspection prior to its consideration by the Council; and this Bill having been read by title in open meeting two times before final passage by the City Council, and

WHEREAS, the City Council finds that the application and evidence presented clearly indicate that the proposed conditional use, when subject to certain conditions set forth herein:

1. Complies with all other applicable provisions of this Chapter including environmental performance standards presented in Section 405.550, the criteria in Section 405.470 and the standards of this Chapter in regard to yard and setback, parking and loading areas, screening and buffering, refuse, storage and service areas and signs.
2. Will contribute to and promote the community welfare and convenience at the specific location.
3. Will not cause substantial injury to the value of neighboring property.
4. Meets the applicable provisions of the City's Comprehensive Plan and any applicable neighborhood or sector plans and complies with other applicable zoning district regulations and provisions of this Chapter, unless good cause exists for deviation there from.
5. Will provide, if applicable, erosion control and on-site stormwater detention in accordance with the standards contained in this Chapter.
6. Will be compatible with the surrounding area and thus will not impose an excessive burden or have a substantial negative impact on surrounding or adjacent users or on community facilities or services.

BILL NO. _____

ORDINANCE NO. _____

NOW, THEREFORE, be it ordained by the City Council of the City of Creve Coeur, Missouri, as follows:

SECTION 1: A Conditional Use Permit is authorized to be issued pursuant to Section 3 hereof for the operation of Straight Up Solar general warehousing and storage at 1145 N. Warson Road, Creve Coeur, MO, 63141, within the North Warson Business Center, zoned LI-Light Industrial District, whose legal description is as follows:

A tract of land being part of Section 36, Township 46 North - Range 5 East, City of Creve Coeur, St. Louis County, Missouri and being more particularly described as follows: Beginning at the Northwest corner of property conveyed to Warson Village Apartments Associates, L.L.C. as described in the deed recorded in Book 10552, Page 1310 of the St. Louis County records; thence North 00 degrees 44 minutes 25 seconds East 904.30 feet to a point on the South line of the "Resubdivision of Sections 2, 3, and 4 of Lindbergh Warson Industrial Center Addition 1", a subdivision according to the plat thereof recorded in Plat Book 100, Page 52 of the St. Louis County records; thence Eastwardly along said South line South 89 degrees 16 minutes 51 seconds East 830.00 feet to a point on the West line of Warson Road, 80 foot wide; thence Southwardly along said West line South 00 degrees 47 minutes 00 seconds West 905.03 feet to a point on the North line of aforesaid Warson Village Apartments Associates, L.L.C. property; thence Westwardly along said North line North 89 degrees 13 minutes 50 seconds West 829.32 feet to the point of beginning.

SECTION 2: The Conditional Use Permit granted shall be subject to all applicable statutes, ordinances, rules and regulations, and the following conditions:

1. The Conditional Use Permit shall be for the operation of an 11,890 square foot general warehousing and storage space located at 1145 North Warson Road.
2. The hours of operation shall be: 6:00 a.m. to 3:00 p.m. Monday through Friday.
3. Additional business hours may be permitted with the Zoning Administrator's approval.
4. All signs and banners shall be in conformance with Article VII, Sign Regulations, of the Zoning Code.
5. Any future enlargement, extension, expansion or exterior alteration in the use of the structures or site must be approved by the City Council upon receipt of the recommendation of the Planning and Zoning Commission as an amendment to the Conditional Use Permit before a Building Permit for the enlargement, expansion or exterior alteration may be issued.
6. Failure to comply with any one or all of the conditions of this permit shall be adequate cause for the revocation of said permit by the City Council, provided, however, no permit shall be revoked without prior notice to the owner of the intention of the City Council to revoke this permit and reasonable time granted to the owner to correct or remedy any such breach of conditions, except for repeated breaches or violations.
7. No conditional use permit granted by the City Council shall be valid for a period longer than one year from the date it grants the conditional use permit, unless within such period: (1) a building permit is obtained and construction is begun; or (2) if a building permit is not required, an occupancy permit is obtained and the use of the building commenced. The City Council may grant extensions to the one (1) year period of not more than one hundred and eighty (180) days each, without

BILL NO. _____

ORDINANCE NO. _____

notice or hearing, provided that a written request for such extension is filed by the original applicant and approved by the City Council prior to the date the conditional use permit is scheduled to expire.

SECTION 3: The City Administrator of the City of Creve Coeur is hereby authorized and directed to issue a Conditional Use Permit in accordance with the provisions of this ordinance, said permit to expressly provide for the conditions and stipulations hereinabove set out in Section 2 of this ordinance. Exercise of the rights granted pursuant to the issued permit shall constitute acceptance of all conditions and stipulations set forth herein.

SECTION 4: This ordinance shall become effective in accordance with Section 3.11 (g) of the City Charter.

ADOPTED THIS ____ DAY OF _____, 2023.

NICOLE GREER
PRESIDENT OF CITY COUNCIL

APPROVED THIS ____ DAY OF _____, 2023.

DR. ROBERT HOFFMAN
MAYOR

ATTEST:

KELLIE HENKE
CITY CLERK



CREVE COEUR

300 North New Ballas Road • Creve Coeur, Missouri 63141
(314) 432-6000 • www.crevecoeurmo.gov

**APPLICATIONS TO PLANNING AND ZONING COMMISSION
#23-027 AND #23-028 FOR A REZONING FROM “RO” RESEARCH OFFICE
DISTRICT TO THE OLIA VILLAGE “PMD” PLANNED MIXED-USE
DEVELOPMENT DISTRICT WITH A SITE CONCEPT PLAN, PHASE ONE SITE
DEVELOPMENT PLAN AND ASSOCIATED PRELIMINARY PLAT FOR THE 96
ACRE PROPERTY AT 10300 OLIVE BOULEVARD**

FOR THE MEETING OF: September 5, 2023

LOCATION: 10300 Olive Boulevard, former Bayer West Campus, located south of Olive Boulevard and west of Lindbergh Boulevard

REQUEST: Matt Pfund, of Jack Matthews Development, representing 10300 Olive, LLC, has submitted an application to amend the Official Zoning Map of the City of Creve Coeur to change the zoning of the property of approximately 96 acres located at 10300 Olive Boulevard, from "RO" Research Office to "PMD" Planned Mixed Use Development District, referred to as Olia Village. In accordance with Section 405.390 of the Zoning Code for Planned Zoning Districts, the applicant has submitted the Site Concept Plan and Phase One Site Development Plan for review and approval by the City. The proposed uses within the overall development include commercial buildings, restaurants, mixed-use buildings with ground floor retail/commercial uses and multi-family dwelling units on the upper floors within a “Main Street” type setting, hotels, apartments, office and research office buildings, as well as attached townhomes. The existing buildings formerly used by Bayer are shown to remain and will be repurposed for office and residential uses. A subdivision of the property is also proposed.

ADDITIONAL INFORMATION: The submitted Site Development Plan for Phase One consists of site clearing, grading, site utilities and roadway construction. Building construction and related site improvements will be submitted for review by the City at a later date in association with each of the outlined phases as provided in the Site Concept Plan. A preliminary plat has been submitted to subdivide the property into individual lots and to establish streets and easements.

Key Issues:

- Does the request further the goals and/or implement the Comprehensive Plan?
- Does the request meet with the criteria for Planned Zoning Districts as provided in Section 405.390?
- Does the project provide Public Benefits and meet the Design Criteria as a Planned Mixed-Use Development District?

Creve Coeur 2030 Plan References

- Mixed Use Innovation Campus District (MUIC)
- 39 North Master Plan
- Comprehensive Plan and 39 North Master Plan Amendment for the Former Bayer West Site

Zoning Code References

- Section 405.390 Planned Zoning Districts

APPLICANT’S REPRESENTATIVE: Matt Pfund
Jack Matthews Development
90 Edwardsville Professional Park
Edwardsville, IL 62025

PROPERTY OWNER: 10300 Olive, LLC
90 Edwardsville Professional Park
Edwardsville, IL 62025

REPORT PREPARED BY: BETHANY L. MOORE, CITY PLANNER
JASON JAGGI, AICP DIRECTOR OF COMMUNITY DEVELOPMENT

ATTACHMENTS: Applicant’s Materials received July 7, 2023, August 11, 2023, and August 30, 2023
PGAV Project Review dated August 15, 2023
PGAV Residential Market Analysis dated August 30, 2023
Lochmueller/Trekk Design Group Traffic Study Reviews

BACKGROUND SUMMARY

The 96-acre subject property is the former Bayer West campus purchased by the applicant in September 2022 when Bayer downsized due to the need for less office space post pandemic. Bayer still owns and operates the eastern half of the original Monsanto campus. The subject property includes five existing structures that will be reused in combination with new structures as part of the proposal for a planned mixed-use development with a combination of multifamily, townhouses, hotel, retail and office space.

The buyers of the property initially approached the City in the Fall of 2022 to discuss their plans for the site. Upon discussion with the applicant, staff determined that the best way to review the proposal would be through a comprehensive plan amendment and text amendment process to create a new mixed-use type of planned zoning district. Several work sessions were held with City Council and the Planning and Zoning Commission in order to consider these aspects in advance of a formal review of this specific proposal. On January 1, 2023, a joint Planning and Zoning Commission and City Council Work Session was held to identify Planning goals for the upcoming year in which the Comprehensive Plan update and the Planned Zoning District ordinance amendments were included as a priority for 2023. On February 21st and March 6th, the Planning and Zoning Commission held work sessions to discuss the Comprehensive Plan update and the Planned Zoning District ordinance amendments. On March 27, 2023, the City Council was updated and discussed the Comprehensive Plan update and Planned Zoning District ordinance amendments. The text amendment to modify Section 405.390 *Planned Zoning Districts*, received City Council approval on July 10, 2023 upon Planning and Zoning Commission recommendation of approval at the June 5, 2023 meeting. The City's Comprehensive Plan, *Creve Coeur 2030*, which includes the 39 North Master Plan, was also amended after the Planning and Zoning Commission granted approval on June 5, 2023 as the Comprehensive Plan and 39 North Master Plan did not foresee that the Bayer West campus would be sold and redeveloped.

PROJECT OVERVIEW

The project consists of a mixed-use planned development arranged within four (4) distinct components. These four components are as follows, with a general description of each:

- Category A: Main Street Development
This component features a “Main Street” style of development with vertical mixed-use buildings, shared parking garages, and on-street parking within a pedestrian-friendly environment. The proposed uses within this category include office, ground level retail, services, and restaurants, hotels, multi-family residential above commercial and a central urban park. The height of buildings within this category varies between 1 and 8 stories.
- Category B: Mixed-Use Development
This component is highly variable and features traditional “big box” commercial and in-line single story retail with supporting surface and structured parking, reutilization of the existing Bayer office buildings into residential and office/research uses, along with a new office building on the eastern end of the site. The proposed uses within this category include retail, services, restaurants, multi-family residential and general office. The height of buildings within this category varies between 1 and 5 stories.
- Category C: General Office Development
This component consists of office/research uses on the eastern end of the site with the potential for accessory lab/greenhouse research space. Parking will be provided primarily on shared surface lots. One primary office/research building with a height of 3 stories is proposed with two single story accessory structures for labs and/or greenhouses.

- Category D: Residential Development
This component features an attached single family residential (townhouse) development consisting of 65 units. The townhomes would be 2 stories in height.

The developer is proposing to construct the project in five (5) phases. The first phase consists of site work such as clearing, grading, utility and roadway construction that would begin later this year, or soon after approval of the rezoning by the City Council. The last phase would be the townhouse component, which is anticipated to be completed by December 2028.

The proposal includes the dedication of new public streets; the construction of a trail system, sidewalks, and a shared use path arranged to facilitate future connections to planned facilities within the 39 North District. New wet and dry detention basins will be provided to capture stormwater runoff and to also serve as an amenity for the development. Significant areas of undeveloped common ground are proposed, primarily along the west, south and eastern portions of the site. The access points into the existing site from Olive and Lindbergh will be retained with improvements such as traffic signal timing adjustments and an intersection reconfiguration to Olive Boulevard at Pavilion Drive, opposite the main entrance to the development, as required by the Traffic Impact Study.

Additional details are discussed in the Site Concept Plan portion of this staff report.

PROJECT PROPOSAL AND ZONING STRUCTURE

The project includes rezoning of the 96-acre property from the “RO” Research Office zoning district to a new “PMD” Planned Mixed Use Development District. This rezoning allows a proposal of this size and complexity to be reviewed by the City under its own specific zoning district. A Site Concept Plan, which serves as the basis for the project moving forward, has also been submitted in accordance with Section 405.390 *Planned Zoning District*. The rezoning and Site Concept Plan require approval by the City Council upon recommendation of the Planning and Zoning Commission. Once approved, any major changes to the overall development project will have to be approved as an amendment to the Site Concept Plan.

The submitted Site Concept Plan includes the following components: Site Overview, Parcel Plan, Setback and Buffer Plan, Phasing Plan, Grading Plan, Utility and Drainage Plan, Street Plan, Pedestrian Plan, Site Sections, Tree Conservation Plan, Overall Concept Planting Plan and preliminary renderings of the site. The project will be built in five phases. More specific details for each building or lot are to be provided at the Site Development Phase for each. A Site Development Plan for Phase One of the development along with associated preliminary plat to subdivide the property into individual lots and establish streets and easements, have also been submitted. The Phase One Site Development Plan includes site clearing, mass grading, site utilities, and roadway construction. Site Development Plans within the Planned Mixed Use Development District require Planning and Zoning Commission review and recommendation to City Council for approval by resolution.

PLANNING AND ZONING COMMISSION REVIEW TIMELINE

Due to the size of this proposal, this application has been noticed for Public Hearings before the Planning and Zoning Commission for two meetings, September 5th and September 18th and no decision is requested for today’s meeting. After the Planning and Zoning Commission review is completed and the Commission has made a recommendation on the application, the application will be forward to the City Council for their review and final determination.

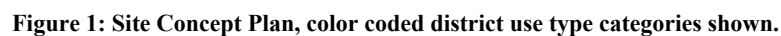




Figure 3: Preliminary Main Street elevations.



Figure 4: Main Street conceptual rendering.

LAND USE AND ZONING OF SURROUNDING PROPERTIES

The adjacent zoning and land uses are as follows:

DIRECTION	USE	ZONED	SEPARATED BY
North	Commercial, Multi-Family	“CB,” “GC,” and “AR”	Olive Boulevard
South	Single-Family Residential, Commercial	“A” Single-Family Residential and GC District	N/A
East	Bayer East Campus	“RO” Research Office District	N. Lindbergh Boulevard
West	Single Family Residential	“A,” “B,” and “C-RDD” Single Family Residential	NA

COMPREHENSIVE PLAN REVIEW

The subject property is located on the former Bayer West campus and is the subject of a Comprehensive Plan Amendment that was approved by the Planning and Zoning Commission on June 5, 2023. The City’s Comprehensive Plan, *Creve Coeur 2030 and 39 North Master Plan*, did not anticipate the sale and redevelopment of the subject property and therefore the amendment was needed to establish recommendations and future land use and redevelopment goals for the site.



Figure 5: 39 North District map with project location outlined in red.

The subject property represents 17% of the 39 North District. The 39 North Master Plan is a component of the Comprehensive Plan that outlines the goals of the district to bring together AgTech businesses in the area connected by a walkable and bike-friendly environment within a mixed-use district with supporting retail and gathering spaces (Pg 2).

The goal of the adopted amendment is to encourage redevelopment that contributes to the continued growth of the 39 North innovation district and serves the broader community. The four stated Objectives of the amendment are as follows:

- Support a quality development that is commensurate with the size and location of this site within the local and regional context.
- Consider a mix of appropriate uses that provides a higher density component within an overall pedestrian friendly development.
- Respect the existing topography and natural features of the site.
- Maintain appropriate buffering to the adjacent, existing single family residential uses.

The specific recommendations of the Comprehensive Plan Amendment and Staff’s analysis of how this proposal meets with these recommendations are as follows:

Future Land Uses

Potential developments should take into account the site’s location within the 39 North AgTech Innovation District, the size of the subject property within the greater context of the 39 North District, provide a mix of uses to support the employment base such as housing, retail, hotel, office and commercial uses and services, reuse the existing buildings along with new construction within a

coordinated development that accommodates for phasing and a cohesive design theme throughout in terms of architectural style, colors and materials. The applicant's proposal includes a coordinated, phased development with a mix of uses including residential, commercial, office, and hotel uses that will support the growing 39 North District through additional amenities and housing for employees as well as for the surrounding Creve Coeur residents.

Transportation and Connectivity

Safe pedestrian access within the site and from the site to surrounding areas shall be provided with a pedestrian crossing from the site across Olive Boulevard to the larger 39 North district specifically mentioned. Any future development shall evaluate the traffic impacts that such developments will have on the two major state thoroughfares, Olive Boulevard and Lindbergh Boulevard, providing direct access to the site. The proposed development provides significant pedestrian safety features throughout the site including sidewalks, multiple crosswalks within the development and a dedicated pedestrian trail. Staff is continuing to work with the applicant to facilitate a pedestrian connection across Olive Boulevard to better connect the development to the rest of the 39 North District, but currently the north side cannot accommodate this improvement. The applicant has conducted a Traffic Study to assess and mitigate the increase in traffic volume that the site is anticipated to create. The City's traffic consultant has reviewed the submitted traffic study, along with MoDOT comments, and provided his assessment.

Recreation and Open Space

Due to the size and existing conditions of the site such as its topography, large wooded areas, and environmental requirements, internal trails connecting the entire site together and to local amenities such as city parks and the future 39 North Greenway system are encouraged. Public plazas for community gatherings and active streetscapes that encourage outdoor dining and events should be incorporated. The project proposal incorporates the existing pedestrian path around the former Bayer West campus into an expanded pedestrian trail with connections throughout the site to the development. Staff is continuing to work with the applicant to encourage connections to the path outside the development. The design of the Main Street element of the project with the park at one end and the wide pedestrian friendly street flanked with wide sidewalks aims to create an environment of outdoor dining and active streets that can easily host community events and gatherings as recommended in the Comprehensive Plan amendment.

Site Development Standards

Any development on the site should include well designed, cohesive buildings with quality building materials, high density developments located closer to Olive Boulevard and Lindbergh Boulevard to lessen the impacts on the residential areas to the west and south with appropriate buffering in place that preserves the existing trees and vegetation already serving that purpose. The development should include stormwater mitigation that is sensitive to the existing topography and environment while incorporating low impact BMPs in compliance with MSD standards. The application includes a cohesively designed dense development that places more active and disruptive uses next to Olive Boulevard and interior to the site while observing multiple layers of buffering between the new development and the existing residential uses to the south and west. The project includes new storm water management facilities, including detention basins, that are sensitive to the surrounding development and underground when feasible. Staff have encouraged the use of native landscaping in order to increase the connection to 39 North through incorporating the landscaping palette and designs of the 39 North Old Olive Great Streets Plan. The applicant is still exploring the proposed tree removals at staff request in order to comply with the requirements of Section 410.320 of the Subdivision Ordinance.

Staff finds that the proposed Site Concept Plan for the Olia Village development is substantially aligned with the goals and objectives of the Comprehensive Plan amendment. The project would offer housing options that would support the growing 39 North district as well as a variety of amenities including shops and restaurants for residents and workers alike. The plan also incorporates additional office and research space that could assist with the expansion of the 39 North employment base. The plan includes pedestrian paths within the site which would promote walkability and the applicant is still working with staff on plans to accommodate connectivity to the broader 39 North district across Olive Boulevard. The Main Street aspect of the development serves to provide a gathering place for the area that would be supported

by a small park and wide, active streets promoting outdoor dining. The existing topography guides the development with respect to maintaining a significant portion of the naturally wooded buffer along the western and southern portions of the site and protecting the existing natural waterways. The project has considered the sensitivity of the adjacent single-family residential areas that border the majority of the western and southern borders of the development by providing a minimum 35-foot residential buffer yard with an additional 15-foot residential building setback and additional 40-foot commercial setback lines proposed beyond the buffer.

ZONING REVIEW

As previously stated, Planned Zoning Districts are regulated within Section 405.390 of the Zoning Ordinance. This section describes, in considerable detail, the characteristics that a proposed planned development should have, as well as certain standards of review that must be performed by the Planning Commission and City Council.

The purpose of the Planned Zoning District is to allow a development project that is proposed on a single lot or multiple lots to be constructed in one (1) or more phases that is unable to meet the established zoning criteria due to project size, phasing, configuration, site conditions, or particular design features. The Planned Zoning District provides a mechanism to facilitate innovative design, solve problems on difficult sites, meet market niches, encourage housing in different forms and price ranges, promote well-designed developments, and encourage infill and redevelopment within the City.

The following are Objectives for the use of Planned Zoning Districts:

1. Fulfillment of the goals and objectives of the Comprehensive Plan;
2. Creation of a more desirable environment than would be possible through application of conventional City land use regulations;
3. Promotion of a creative approach to the use of land and related physical facilities resulting in better design and development including aesthetic amenities;
4. Combination and coordination of architectural styles, building forms and building relationships;
5. Preservation and enhancement of desirable site characteristics such as natural topography, vegetation and geologic features, preferably by means of natural erosion control and stormwater control best management practices;
6. Use of design, landscape or architectural features consistent with the City's design guidelines;
7. Mutually desired elimination of obsolete or deteriorated structures or incompatible uses through redevelopment.

A review of the specific components of Section 405.390 as they relate to this application are as follows:

Eligibility

The following criteria must be met as determined by the Zoning Administrator as provided within Section 405.390(C) Eligibility. The Zoning Administrator finds that the application meets these Eligibility criteria and is an appropriate use of the Planned Zoning District procedure as follows:

1. Is located on one (1) or more lots totaling at least three (3) acres in size.

Criterion met. The project, located on the former Bayer West campus, is comprised of approximately 96 acres on one parcel.

2. Cannot be approved under the provisions of another Zoning District.

Criterion met. None of the existing zoning districts within the City of Creve Coeur would be able to accommodate such a proposal based upon the scope of the proposed Site Concept Plan and intended land uses.

- 3. The subject property is zoned for the eligible type of planned zoning district pursuant to Section 405.390.F. In the event the existing zoning district is not eligible for the requested planned zoning district, an application to rezone to a qualifying zoning district must be submitted in conjunction with the planned zoning district application.**

Criterion met. The subject property is currently zoned “RO” Research Office which is eligible for rezoning to “PMD” Planned Mixed-Use Development which is one of the three types of planned zoning districts listed under Section 405.390(F).

- 4. The proposed development must substantially comply with the provisions of this Section 405.390 and be generally consistent with the applicable provisions of the City's Comprehensive Plan.**

Criterion met. The proposed development substantially complies with the provisions of Section 405.390, which will be explored in greater detail further in this staff report. The City’s Comprehensive Plan was amended when the former Bayer West campus was sold to create guidelines for the redevelopment of this property that aligned with the overall goals for the 39 North District and the *Creve Coeur 2023* Comprehensive Plan as the Comprehensive Plan did not foresee this property being sold and redeveloped. The proposal is generally consistent with the applicable provisions of the City’s Comprehensive Plan as was discussed in the previous section.

Public Benefit

As a component of the Planned Zoning District, the project must provide public benefits as determined by the City Council upon the recommendation of the Planning and Zoning Commission. Such public benefits to the City can include, but are not limited to, the following uses as provided in Section 405.390.E. Staff is of the opinion that this application provides several public benefits as described in the ordinance as follows:

- 1. Provision of public or quasi-public parking facilities;**

The project incorporates numerous parking garages, surface lots, and on-street parking that will be privately maintained and open to the public.

- 2. Provision of on-street and off-street pedestrian facilities linking surrounding business, office and residential uses;**

The project incorporates sidewalks throughout the development linking the various components within the development. In addition, the applicant is working on a final layout with staff for a shared use path within the development that will provide future connections to planned trails to adjacent areas within the 39 North District and beyond. Additionally, the applicant is working with staff to provide sidewalk connections to Lindbergh Boulevard. Finally, the developer is willing to provide a trail connection on the Vantage Credit Union property, if desired.

- 3. Consolidation and/or elimination of overhead utility wires;**

There are no known existing overhead utility lines within or adjacent to this site. It is staff’s understanding that all new utilities that will serve the development will be placed underground.

- 4. Inclusion of landscaped gardens, plazas or parks available for public use;**

The development proposes a 0.7-acre urban park, with plaza areas and sidewalk seating amenities within the Main Street district which are available for public use.

5. Provision of alternative street connections or the dedication of land for additional street right-of-way;

The development will utilize the existing access points to the public roadways, Olive and Lindbergh. Modifications to some of these intersections are proposed as recommended in the Traffic Impact Study.

6. Fountains, statuary, public art;

The project proposes public art, primarily within or adjacent to the urban park.

7. Architectural distinction and significance that would make building(s) noteworthy;

The preliminary renderings indicate that the buildings would provide architectural distinction within this area of Creve Coeur and within each of the components of the development, subject to final review of each building at the Site Development Plan stage.

8. Extensive use of high-quality building materials that would add to the assessed valuation of the structures.

The exterior site and building materials are indicative of a high-quality development that would add value to the development and individual structures, subject to final review at the Site Development Plan stage. The use of brick, stone, metal panels and fiber cement are proposed.

Design Criteria

An application for rezoning to the PMD District must satisfy specific design criteria as determined by the City Council upon recommendation by the Planning and Zoning Commission. The following is staff analysis of the Planned Mixed-Use Development (PMD) Design Criteria, Section 405.390(F), and the extent to which those items are present with this proposal:

- 1. Proposed development adjacent to any single-family residential development shall meet a sky exposure plane requirement. The sky exposure plane will be measured from a line located thirty-five (35) feet above the property line and will have a slope of thirty degrees (30°) rising towards the center of the site.**

Criterion not fully met. This information has not yet been provided due to the preliminary nature of the Site Concept Plan which represents an overview of the project. Nonetheless, the Commission should require a preliminary analysis from the applicant to demonstrate general compliance for those buildings within the development that are subject to this requirement. Upon satisfaction of compliance at this conceptual stage, staff would recommend a condition of approval that this requirement will be verified for compliance at the Site Development Plan application review.

- 2. Any tract or site abutting or adjoining a single-family residential development shall provide a buffer yard of thirty-five (35) feet on all sides that abut the single-family development, except if the abutting or adjoining proposed uses are residential of equal or less density relative to the existing residential uses then such buffer yard shall be twenty-five (25) feet. The buffer yard shall be landscaped and shall not contain impervious surfaces, with the exception of trails, footpaths, walkways, pedestrian accommodations and/or amenities, retaining walls and/or other screening devices and/or stormwater management systems as deemed appropriate by the Planning and Zoning Commission and City Council. The required buffer yard may be modified due to unique site characteristics and taking into consideration the proposed uses adjacent to the existing single-family residential developments.**

Criterion met. Sheet C-103 of the Site Concept Plan shows that the required 35-foot buffer yard is provided along the western and southern boundaries of the subject property where it abuts single-family residences. The buffer yard will include most of the existing wooded areas and vegetation. In some places the buffer will also include the proposed pedestrian trail and the retaining wall required for the site due to mitigate the elevation changes on the site. In addition to this required buffer yard, the proposal also includes an additional 15-foot residential building setback and a 40-foot commercial building setback beyond the required 35-foot buffer yard abutting single family residential.

3. If residential uses are proposed, provides for a mixture of housing types to meet market demands and encourage diversification.

Criterion met. According to the applicant, the project is proposing two types of residential housing to attract a variety of residents including young working professionals in the 39 North district: families and downsizing older adults. The first would be apartment style multi-family housing within the Main Street development category above commercial uses on Lots 4, 6, and 7, and a standalone apartment use within an existing building in the Mixed-Use development category on Lot 14. There is also a townhouse style residential development proposed for Lot 16, the details of which will be determined at the Site Development Plan stage. To better understand the housing needs from a regional and local context, Staff have asked the City's planning consultants, PGAV, to conduct a market analysis for the housing types proposed and this report is attached for the Planning and Zoning Commission's review. PGAV will also be in attendance at the meeting to present their findings and answer questions from the Commission.

4. Allows for and makes efficient use of parking and storage areas including cooperative parking facilities.

Criterion met. The project proposal provides a variety of parking options for the development including on street parking, at grade parking lots and parking structures which are to be shared amongst the uses within the development.

5. Provides for the more efficient provision of public and private utilities and facilities throughout the development area.

Criterion met. The applicant intends to establish all new utilities to serve this development. Currently, all public utilities are privately "fed" from the Bayer East campus via a tunnel under Lindbergh Boulevard, except wastewater which is discharged directly to existing MSD sewers. The applicant is working with Ameren, Spire, and Missouri American Water to establish all new electrical, gas and water service connections for this development. MSD approval will be required for future sanitary and storm sewer systems.

6. Provides adequate public facilities including streets, bicycle and pedestrian facilities, fire protection, water, storm water control, sanitary sewer and parks and recreation facilities.

Criterion met, subject to final approval by the appropriate jurisdictional agencies. The application provides adequate public facilities as is shown throughout the Site Concept Plan including providing public parking facilities, providing new and updated on and off-street pedestrian facilities throughout the development, providing a new park, burying overhead lines and providing new stormwater detention ponds to handle the runoff for the site. It should be noted that MSD and Creve Coeur Fire Protection District approval will be required in accordance with any future construction based upon detailed construction-level drawings.

7. Incorporates pocket parks, small plazas and places for public art where appropriate.

Criterion met. The project includes the development of a 0.7 acre park to anchor the Main Street development and serve as a gathering area for any events held there. The applicant has also indicated that public art is part of the proposal with final locations and designs to be determined in conjunction with a

Site Development Plan. At the appropriate time, the Arts Committee will review and provide a recommendation regarding the public art component.

8. Locates buildings in appropriate relation to sidewalks or public parks and plazas.

Criterion met. The centerpiece of the proposed development is the Main Street area which creates a dense “downtown” feel with buildings right up to the sidewalks along a wide pedestrian oriented thoroughfare with a park at one end. The buildings are located close to the streets along Twisted Branch, Vine Street, Main Street and Pavilion Drive which make up the dense mixed-use commercial and residential area. Sheet C-108 of the Site Concept Plan shows the location of the sidewalks as part of the pedestrian plan.

9. Provides for vehicular mobility in a manner that does not compromise pedestrian safety and mobility.

Criterion met, subject to further refinements. Sheet C-107 shows the Street Plan for the development and Sheet C-108 is the Pedestrian Plan of the overall Site Concept Plan. These two sheets show the location of all proposed streets and sidewalks and trails throughout the development. The layout of streets throughout the development includes sidewalks along one or both sides of the street with adequate crosswalks connecting the pedestrian access throughout. The Main Street area of the development pays particular attention to the pedestrian experience providing more frequent, staggered crosswalks which help to aid in the visibility of pedestrians in the roadway to oncoming vehicles. Staff suggests these crosswalks can be even more improved for pedestrian safety through the use of differentiated materials, colors and textures per the Design Guidelines recommendations. The plan also proposes a low-impact nature trail within sensitive areas of the development near protected stream areas and adjacent to existing single family uses. Finally, the applicant is working with staff on final alignments for a paved, 8-foot shared use path. The details for the shared use path will be presented at a future meeting.

10. Utilizes high-quality architectural design and materials, placement, relationship and orientation of structures throughout the planned development.

Criterion met. Sheet A-104 of the Site Concept Plan provides conceptual elevations for the project and Sheet A-105 provides an overview of the materials proposed throughout the development which includes fiber cement panels, metal panels, stone, a variety of brick types, and other decorative architectural panel materials. Attachment B, the document which serves as the development guidelines for the project and still in draft form, states that the development will have a consistent design theme throughout including a color palette of white, off-white, light grey, wood grain or light beige with dark grey, black or dark bronze accent materials and banning red, orange or yellow brick or other bold finish materials. The individual materials and architectural design of each building will be provided at a more detailed level with each Site Development Plan application. The placement, relationship and orientation of the structures throughout the development create a dense, urban design that encourages pedestrian activity while also creating a desirable residential environment for the apartment units. The attached single-family residential development is placed further away from the development surrounded by the existing wooded areas and proposed detention basins giving it a sense of privacy.

11. Places all utilities serving new projects underground, to the extent feasible, except where specific allowances and design considerations are provided elsewhere in this Section.

Criterion met. Sheet C-106 of the Site Concept Plan shows new utilities will be underground to the extent feasible for the site given the various environment and topographical concerns present.

12. Provides for appropriate spacing and/or greenspace in or around the separate developments within the PMD.

Criterion met. The Site Concept Plan provides for appropriate spacing and greenspace within each of the components within this development. The Main Street component is appropriately dense and is placed

on the northern portion of the site with less greenspace and buildings placed closer together with emphasis on the sidewalk and smaller plaza spaces. The traditional “big box” commercial on the northern and western end of the site and the office developments found in the Mixed-Use and General Office land use categories transition well from the Main Street area by offering larger greenspaces and landscaped areas appropriate for this type of development. The greenspaces are very pronounced around the Residential component on the southern portion of the site as well as around the perimeters of the site, most notably on the southwest, southern and eastern areas.

13. Functionally and aesthetically integrates all proposed storm water collection basins with the surrounding development through undergrounding or innovative design of above ground facilities that is visually commensurate with surrounding development.

Criterion met. Sheet C-106 of the Site Concept Plan details the utility and drainage plan for the development. The plan shows the proposed underground storm drainage system as well as the three proposed wet detention areas integrated into the south and western portions of the proposal. Some of these detention areas help to serve as an additional buffer between the single-family residential neighborhoods and serve as amenity spaces for the proposed development.

Review Criteria

An application for rezoning to the Planned Zoning District must satisfy specific Review Criteria as determined by the City Council upon recommendation by the Planning and Zoning Commission. The following is staff’s analysis of the Planned Mixed-Use Development (PMD) Design Criteria, Section 405.390(F), and the extent to which those items are present with this proposal:

1. The proposed development is in harmony with the general purpose and intent of this Chapter and is generally compatible with and implements the planning goals and objectives of the City including the Comprehensive Plan.

Criterion met. The proposed development is in harmony with the intent of Section 405.390 and the Zoning Ordinance as a whole. The planning goals and objectives outlined in the Comprehensive Plan seek to attract plant science and technology innovation type users integral to the 39 North district while providing more meaningful amenities such as housing, retail, hotel, commercial uses and services in a dense pedestrian friendly environment that is sensitive to the surrounding residential uses that will also attract other office tenants as well.

2. Streets or other means of access to the proposed development are suitable and adequate to carry anticipated traffic and will not overload the adjacent streets.

As part of the application submittal, the applicant’s traffic engineer studied the proposed development and uses to conclude that the streets and means of access to the development are adequate for the development with internal circulation that encourages safe pedestrian and vehicle circulation. The applicant has shared this review with MoDOT for comment as well as the City’s traffic engineering consultant who has also reviewed the traffic study and provided comments. As part of this requirement, any recommendations made by MoDOT or the City’s traffic consultant based on the Traffic Impact Study should be implemented.

3. The internal circulation system of the proposed development encourages safe movement for vehicles and pedestrians.

The proposed roads, sidewalks and multiple crosswalks provided in the Site Concept Plan appear to encourage safe movement for vehicles and pedestrians. Staff requests that the crosswalk material, color and texture be differentiated for better vehicle awareness of such pedestrian crossings. In addition, final alignment of the shared use path needs to be completed and submitted for review by the Planning and Zoning Commission at a future meeting.

4. Existing or proposed utility services are adequate for the proposed development.

The new underground utilities provided for the development have been reviewed by the Public Works Department with no concerns at this stage of the development review. Each utility will require a separate review and approval prior to construction.

5. Appropriate buffering is provided to protect adjacent land uses from light, noise and visual impacts.

The required 35-foot buffer when abutting residential uses is shown on Sheet C-103 of the Site Concept Plan along with additional building setbacks beyond the 35-foot buffer. Sheet LD-100 of the Site Concept Plan shows that some of the existing tree massing will be left untouched between the residential areas and the project development area for additional buffering to help reduce light noise and visual impacts. In addition, the proposed grades for the development result in several areas of the site will be lower than adjacent residential neighborhoods. Staff recommends that the Commission thoroughly review this aspect of the development with the applicant to understand any impacts to the existing residential neighborhoods and to determine if adjustments need to be made.

6. Architecture and building materials are consistent with the character of the proposed development and compatible with areas of the City proximate thereto.

The proposed materials are of a high quality that is indicative of the caliber of the proposed project. The applicant proposes to keep a consistent design character in material, color palate and architectural detail throughout the site that will be compatible with the surrounding areas of the City. Additional details of each building will be reviewed more specifically with a Site Development Plan application.

7. Landscaping is appropriate for the scale of development and consistent with any applicable City codes, ordinances and standards.

Sheet L-140 of the Site Concept Plan details the overall concept planting plan showing new street trees along the proposed roads in the development and along Olive Boulevard as well as ornamental landscaping along the main entrance to the site on Pavilion Drive and in the Main Street area. At a Site Concept level, the landscaping appears to be adequate. Additional details for each building and phase will be required as part of the landscaping plan for each Site Development plan application.

8. The proposed development preserves any significant architectural and environmental features of the property, to the extent reasonably possible.

All previously occupied existing buildings on the site are proposed to be reused and incorporated into the development. The significant environmental features of the site including the stream and topography on the southern end will be kept intact with the applicant proposing to develop around these features. The area is heavily wooded in many areas and as part of the proposal, roughly 61% of trees on the entire site will be removed to accommodate the development. Because the subdivision of the existing property into multiple lots is a component of this project, it is subject to Section 410.320 *Tree Conservation* which limits the tree removal to no more than 50% on site. Any further tree removal after approval is required to be replaced on a 1 to 1 basis or a 2 to 1 basis if the trees are over 20 inches DBH. The Planning and Zoning Commission should review the proposed tree removals with the applicant and determine if adjustments should be made, to bring the removals closer to the 50 percent limit. Please refer to the Preliminary Plat section in this staff report for further information.

9. Operating and delivery hours are compatible with the land uses adjacent to the planned zoning district.

The applicant has made a conscientious effort to concentrate more intense uses to the portion of the property adjacent to Olive Boulevard and Lindbergh Boulevard with less intense uses planned for the portions of the property that abut residential areas to the west and south. This site will have activity 24 hours a day due to the residential components. The commercial operating and delivery hours are not known at this time and will be reviewed as a component of the Site Development Plan review. General restrictions could be placed on the project as part of the planned development ordinance, if desired, such as limiting delivery hours for the components of the project that are adjacent to existing residential uses.

10. The proposed uses are compatible with the area surrounding the proposed development and will not have a material net cumulative adverse impact on the surrounding area or the City as a whole.

The proposed uses are compatible with the surrounding area as the properties opposite the subject property across Olive Boulevard are zoned for commercial uses in the “CB” Core Business and “GC” General Commercial zoning districts as well as the majority of the Olive Boulevard corridor. The proposed development replicates the existing development pattern to the west of the subject property along Olive Boulevard and south along Lindbergh Boulevard with commercial uses along the frontage of the main arterial roadways and residential uses behind. The applicant understands the sensitivity of this site as it abuts residential uses to the west and south of the property. With this in mind, the Site Concept Plan utilizes buffering in the form of existing trees, new trees, and proposed grading for the new development. In addition, more intense uses are placed to the interior of the development. Vehicular access to the site will be from Olive and Lindbergh, the two existing primary on-interstate roadways serving the City. No new access is proposed to directly serve the existing residential neighborhoods.

11. The proposed development complies with all other applicable codes and ordinances.

Staff is working with the applicant on additional details in some areas including the pedestrian path, street dedications, pedestrian access across Olive Boulevard, however, the application, as a whole, generally appears to be compliant with other required applicable codes and ordinances as submitted.

12. The layout of structures and spaces adequately takes into account the potential for future subdivision of the development.

The submitted Subdivision Preliminary Plat proposes to split the development into smaller areas for sale. Additional subdivision of land within the development beyond this is not anticipated at this time.

13. There is a demonstrated level of the public benefit to the City derived from the proposed development, per Section 405.390(E).

There are several aspects of the proposal that provide public benefit to the City including the pedestrian walking paths within the site and connections to the surrounding existing or planned facilities, public art, urban park, additional housing and retail amenities to support the 39 North District and a dense, walkable commercial Main Street development that fulfills the goals of the Comprehensive plan for the area. Please see the Public Benefit section of this report for additional information.

14. Any proposed direct impacts on public services, including public improvements proposed for dedication to the public, do not impose an unacceptable burden on the City, taking into account new City revenues projected to be realized from the development.

Site Concept Plan

The Site Concept Plan is a significant component of the Planned Zoning District rezoning process. The Site Concept Plan provides the general layout for the entire development and provides critical information but at a relatively high-level view. Information that is required to be provided on the Site Concept Plan includes: general land uses, building placement, building heights, setbacks and buffers, circulation and access, parking, site coverage, proposed preliminary grading and stormwater facilities, conceptual landscaping and greenspace. Additional information to be submitted as part of the Site Concept Plan includes a narrative of the project by the applicant, phasing plan, general architectural information, and a traffic impact study. Furthermore, the Site Concept Plan provides the basis for future Site Development Plan review by the Planning and Zoning Commission and City Council for each of the phases of the development. A key finding of any future Site Development Plan review is that the plan must be consistent with the approved Site Concept Plan. If they are not, the Site Concept Plan must be amended and submitted to the City for approval.

The applicant has supplied this required information in the form of a multi-sheet Site Concept Plan set. The narratives are provided with the rezoning application and a separate traffic impact study prepared by the applicant's project engineer and reviewed by City staff and the City's consulting traffic engineer has also been submitted. Finally, the applicant has submitted their proposed development standards, including specific allowable uses, as an attachment to the rezoning application (titled Attachment B). These development standards remain under review by staff, the City's planning consultant and the applicant and will be presented at a future meeting.

Site Overview—Four Components of the Development

There are four categories in the development: Category A-Main Street Development which includes Lots 2, 4-7, 11 and 12, Category B-Mixed-Use Development which includes Lots 1, 3, 8, 9, and 13-15, Category C-Genual Office Development which includes Lots 10 and 17, and Category D-Residential Development which includes Lot 16. Each category has its own set of guiding standards outlined in Attachment B, the rezoning ordinance. The general uses and building bulk information are provided in a table on Sheet C-101 of the Site Concept Plan and is available below:

ANTICIPATED STRUCTURE SUMMARY INFORMATION TABLE										
LOT				STRUCTURE INFORMATION			GROSS FLOOR AREA *			
LOT NUMBER	LOT AREA (ACRE)	GENERAL USE DESCRIPTION **	NUMBER OF STRUCTURES	FOOTPRINT AREA (SF)	NUMBER OF STORIES	BUILDING HEIGHT *** (FT)	CATEGORY A (SF)	CATEGORY B (SF)	CATEGORY C (SF)	CATEGORY D (SF)
#1	7.54	PARKING / RETAIL	3 PROPOSED	137,800	1 - 4	40' - 50'		214,000 - 268,000		
#2	1.61	PARKING / RESTAURANT	1 PROPOSED	42,600	1 - 3	30' - 40'		86,000 - 108,000		
#3	1.20	RETAIL	1 PROPOSED	14,000	1	30'		14,000 - 18,000		
#4	5.02	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	130,600	8	96'	869,000 - 1,087,000			
#5	1.27	RETAIL / WITH OFFICE ABOVE	1 PROPOSED	22,000	3	55'	49,000 - 62,000			
#6	2.60	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	60,000	6 - 8	72' - 96'	364,000 - 455,000			
#7	3.11	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	83,800	5	70'	401,000 - 502,000			
#8	3.66	RETAIL	1 EXISTING	35,000	2	40'		55,000 - 69,000		
#9	2.09	OFFICE / RESEARCH	1 EXISTING	17,630	EXISTING	EXISTING		35,000 - 44,000		
#10	6.69	OFFICE / RESEARCH	1 PROPOSED	56,500	3	50'			145,000 - 182,000	
#11	2.46	PARKING / HOTEL	1 PROPOSED	50,600	1 - 5	25' - 70'	218,000 - 273,000			
#12	1.01	HOTEL	1 PROPOSED	12,000	6	85'	67,000 - 84,000			
#13	5.82	OFFICE	1 PROPOSED	32,500	2	40'		65,000 - 82,000		
#14	3.85	RESIDENTIAL	1 EXISTING	65,528	EXISTING	EXISTING		307,000 - 384,000		
#15	3.48	PARKING / OFFICE	1 EXISTING 1 PROPOSED	64,600	4 - 5	60'		289,000 - 362,000		
#16	11.14	TOWNHOME	65 PROPOSED	100,500	2	30'				207,000 - 259,000
#17	2.11	OFFICE / RESEARCH	2 PROPOSED	21,250	1	30'			21,000 - 27,000	

Phases

As shown on the Phasing Plan (Site Concept Plan Sheet C-104), the applicant proposes that the development will be constructed in five phases over a period of five years. Phase 1 will consist of site clearing, mass grading, site utilities and roadway constraint. Phase 1 is proposed to take place from October 2023 to July 2025. The Site Development Plan for Phase 1 has been submitted for review and approval as a component of this review.

Phase 2 consists of building construction on Lots 1-6,8,9, 14 and 15, including the common areas which will take place tentatively from January 2023 to July 2026.

Phase 3 includes building construction on Lots 7, 10 and 11 from January 2025 to December 2026.

Phase 4 would be building construction for Lots 12, 13 and 17 from January 2026 to December 2027 and the final phase, Phase 5, would consist of building construction for lot 16 from January 2025 to December 2028. Each phase or individual building will require a Site Development Plan which will be reviewed against the Site Concept Plan for compliance by the Planning and Zoning Commission, and if applicable, the City Council. The Site Development Plans will include more detailed information about each building and lot.

Streets, Circulation and Pedestrian Access

The development proposes to add to the existing pedestrian trails on the site and expand the length of the trail along the western and southern portions of the property. The trail will link up to the sidewalk system within the development on Lot 17.

There are some areas in the southern portion of the lot where the existing aggregate trail will have to remain in order to not disturb the two federally jurisdictional wetlands, two isolated wetlands and two federally regulated streams in that area. Sheet C-108 of the Site Concept Plan shows that the trail will be a natural aggregate trail.

Staff are still working with the applicant on the details for a separate, 8-foot-wide paved shared use path to connect the various components of the development and to allow future connections to other areas within the 39 North District. The applicant is currently revising the location of the path and looking into providing additional connections upon the City's request. Additional information will be provided at a future meeting.

The project includes just under 4 miles of roadway throughout the development, the majority of which will be dedicated to the City for continued maintenance as shown on Sheet C-107. Final details of the dedications are still being worked out with the applicant, but the City anticipates taking on a loop of roads within the development including Harvest Drive, Arbor Lane, Olive Cove, a portion of Olive Drive before it turns private to serve the planned residential development on Lot 16, part of Main Street, part of Twisted Branch, Vine Street and part of Pavilion Drive. The remainder of Main Street, Twisted Branch and Pavilion Drive will be privately maintained. The proposed streets meet the City's standards for new streets. An extensive network of new concrete sidewalks, totaling 12,800 feet, are also proposed within the development as shown on Sheet C-108. The sidewalk system is proposed to link to the pedestrian trail giving access to the development from the trail between Lot 17 and the detention pond. Topography changes make it difficult to connect the pedestrian trail to the sidewalk system in other areas.

Setback and Buffers

The setback and buffer plan is shown on Sheet C-103 of the Site Concept Plan. It provides that the development will include a 35-foot Residential Buffer Yard along the western and southern portions of the property that abut residential as well as two additional setbacks beyond the 35-foot buffer yard of 15 feet for residential buildings setbacks and 40 feet for commercial building setbacks. The setback and building line requirements within the development are outlined below:

CATEGORY A – " MAIN STREET" SUB-DISTRICT:

1. MINIMUM FRONT YARD - ZERO (0) FEET
2. MINIMUM SIDE YARD - ZERO (0) FEET
3. MINIMUM REAR YARD - ZERO (0) FEET
4. BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY B – MIXED USE SUB-DISTRICT:

1. MINIMUM FRONT YARD - ZERO (0) FEET
2. MINIMUM SIDE YARD - ZERO (0) FEET
3. MINIMUM REAR YARD - ZERO (0) FEET
4. BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY C – GENERAL OFFICE SUB-DISTRICT:

1. MINIMUM FRONT YARD - ZERO (0) FEET
2. MINIMUM SIDE YARD - ZERO (0) FEET
3. MINIMUM REAR YARD - ZERO (0) FEET
4. MINIMUM DISTANCE BETWEEN BUILDINGS OR UNIT CLUSTERS - ZERO (0) FEET
5. BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY D – RESIDENTIAL SUB-DISTRICT:

1. MINIMUM FRONT YARD - FIVE (5) FEET
2. MINIMUM SIDE YARD - NONE OR SEVEN AND A HALF (7.5) FEET
3. MINIMUM REAR YARD - FIVE (5) FEET
4. MINIMUM DISTANCE BETWEEN BUILDINGS OR UNIT CLUSTERS - FIFTEEN (15) FEET
5. BUFFER YARD - NOT APPLICABLE INTERNALLY

Utilities, Grading and Drainage

Sheet C-105 and Sheet C-106 contain the grading and utilities and drainage plans for the site. Due to the extreme grade changes in parts of the site some significant grading will have to take place to prepare the site for the development including the installation of a retaining wall along the northwestern part of the site where the grade slopes down towards the subject property and away from the higher residential areas to the west. Sheet C-106 shows the placement of existing and proposed sanitary and storm sewers on the site along with proposed building footprints, lot lines and rights of way. Below are the preliminary buildout stormwater calculations:

PRELIMINARY BUILDOUT STORMWATER CALCULATIONS

PRE-DEVELOPED RUNOFF

TOTAL AREA	= 227.90 ac
WEIGHTED "CN" VALUE	= 81.59
AVERAGE "TC" VALUE	= 19.86 min
TOTAL FLOW	= 1,260± cfs

POST-DEVELOPED RUNOFF

TOTAL AREA	= 227.90 ac
WEIGHTED "CN" VALUE	= 86.54
AVERAGE "TC" VALUE	= 16.34 min
TOTAL FLOW	= 1,478± cfs

DIFFERENTIAL RUNOFF

PRE-DEVELOPED	= 1,260± cfs
POST-DEVELOPED	= 1,478± cfs
DIFFERENTIAL FLOW	= +218± cfs

100-YEAR, 24-HOUR PEAK FLOW RATE COMPARISON

PRE-DEVELOPED	= 404± cfs
POST-DEVELOPED	= 1,142± cfs
DIFFERENTIAL FLOW	= -738± cfs

THIS PROJECT HAS BEEN SUBMITTED TO MSD FOR CONCEPTUAL REVIEW (23CNCBPB-00003).

ALL STORM SEWER AND DETENTION FACILITY CALCULATIONS AND REPORTS WILL BE SUBMITTED TO MSD AND CITY OF CREVE COEUR FOR FINAL APPROVAL PRIOR TO CONSTRUCTION.

Architectural, Exterior Materials, and Lighting

The proposed lighting for the site, as shown on Sheet A-103.1, includes three different types of pole lighting ranging in height from 11 feet to 23 feet tall which will be liberally distributed through the site along the roads and Main Street development area. Sheets A-105 and A-104 detail the proposed exterior materials and elevations for the project. The high-quality materials proposed include four types/color of brick, fiber cement, metal, composite metal and wood phenolic panels in a neutral color scheme. The elevations provided show a nicely designed set of buildings that are interesting, modern and cohesively designed to interrelate to each other and fit in with the surrounding developments.

Concept Landscape Plan and Tree Preservation

Sheets LD-100, L-140 and L-141 include the Tree Preservation Plan for the property and the proposed landscaping for the site. The Tree Preservation Plan shows which trees and tree masses of 6-inch DBH or larger will be removed and which will stay in order to make way for the proposed development. The submitted plan shows 61% of existing trees and tree masses to be removed leaving 31%. This does not comply with the requirements of Section 410.320 which requires no more than 50% of existing trees at 6-inch DBH be removed from a subdivided site. Staff have discussed this with the applicant and the applicant is currently exploring options to address this. The tree masses that are remaining help to form a buffer around the perimeter of the development between it and the existing residential uses to the west and south. The Planning and Zoning Commission should review this document and consider the potential impacts this tree removal will have on the surrounding residents.

Sheets L-140 and L-141 detail the overall landscaping plan for the site. New trees and street trees will be planted throughout the site, in the park, and along Olive Boulevard. The landscaping plans also show the installation of ornamental landscape plantings of a combination of shrubs, perennials, and ground cover including native plant materials. The plans state that the 39 North Great Streets Plan plant palette will also be consulted in order to bring that element in to connect the site with the greater 39 North District. Staff have discussed the installation of additional landscaping elements along Olive Boulevard to provide a better experience for motorists and pedestrians traveling Olive Boulevard and entering the site via Pavilion Drive. The street frontage along Olive Boulevard is an important feature of the development that will help to screen the rear side of the buildings and give a sense of place when entering the site. Additional details will be provided for the landscaping for each site as part of the Site Development Plan application for each lot or phase.

Traffic Impact Study

A Traffic Impact Study (TIS) has been prepared by the applicant's project engineer, CMT, to assess the traffic impacts that could occur upon full completion of the project and beyond the year 2048. An initial meeting was held in late November 2022 at MoDOT's offices to identify the scope of the study based on the preliminary site concept plan, site access and potential land uses. The study area, study timeframe, data collection and analysis, and a review of other developments within the vicinity were identified.

The first draft of the TIS was submitted in April 2023 for review by MoDOT, the City and the City's consulting traffic engineer, Kyle Evans, PE, PTOE (formerly with Lochmueller, now with Trekk Design Group). Comments were provided to the developer by all entities. A revised TIS was submitted in May 2023 which addressed most of the comments from the first draft. A second revised draft was submitted to the City and MoDOT on June 20, 2023 to address additional comments.

The table on the following page provides the analysis results for the future build out scenarios with respect to intersection delays and Levels of Service for the Construction Year 2028 and Design Year 2048:

Table 14 – Build Intersection Operational Analysis

Intersection	App.	2028				2048			
		Delay, s (LOS)		95th% Queue, ft		Delay, s (LOS)		95th% Queue, ft	
		AM	PM	AM	PM	AM	PM	AM	PM
Olive & Spoede	EB	11.6 (B)	27.8 (C)	482	666	14.5 (B)	33.4 (C)	588	802
	WB	3.3 (A)	8.8 (A)	134	166	4.5 (A)	14.9 (B)	143	167
	NB	52.9 (D)	28.7 (C)	134	135	52.6 (D)	29.9 (C)	146	147
	SB	50.4 (D)	36.0 (D)	35	32	50.2 (D)	36.0 (D)	38	33
	ALL	10.7 (B)	18.7 (B)			12.5 (B)	24.2 (C)		
Olive & Old Olive W	EB	11.3 (B)	14.6 (B)	227	318	12.5 (B)	18.7 (B)	280	320
	WB	15.4 (B)	26.9 (C)	377	551	17.7 (B)	53.5 (D)	548	893
	NB	43.5 (D)	47.9 (D)	85	121	43.0 (D)	49.0 (D)	85	130
	SB	31.2 (C)	38.0 (D)	207	340	34.3 (C)	54.2 (D)	243	439
	ALL	16.5 (B)	24.5 (C)			18.2 (B)	39.8 (D)		
Olive & Pavilion	EB	14.8 (B)	14.7 (B)	257	393	19.3 (B)	19.0 (B)	596	524
	WB	19.7 (B)	14.2 (B)	465	377	19.8 (B)	16.3 (B)	468	380
	NB	40.8 (D)	30.1 (C)	204	170	40.8 (D)	29.5 (C)	204	170
	SB	53.7 (D)	40.6 (D)	84	136	53.5 (D)	41.6 (D)	89	151
	ALL	21.1 (C)	17.5 (B)			23.0 (C)	20.0 (B)		
Olive & SB Lindbergh	EB	6.8 (A)	12.2 (B)	148	303	7.1 (A)	14.2 (B)	151	368
	WB	10.9 (B)	16.1 (B)	216	406	11.5 (B)	16.5 (B)	225	436
	NB	43.7 (D)	39.6 (D)	154	154	46.0 (D)	42.6 (D)	163	155
	ALL	12.5 (B)	16.2 (B)			13.0 (B)	17.4 (B)		
Olive & NB Lindbergh	EB	4.1 (A)	5.2 (A)	175	151	5.2 (A)	5.7 (A)	197	164
	WB	6.6 (A)	10.7 (B)	283	531	8.1 (A)	13.3 (B)	394	613
	NB	47.3 (D)	42.9 (D)	155	165	49.8 (D)	46.1 (D)	174	177
	ALL	11.0 (B)	12.7 (B)			12.4 (B)	14.5 (B)		
Olive & Old Olive E	EB	3.5 (A)	6.7 (A)	251	456	5.0 (A)	8.8 (A)	120	556
	WB	6.0 (A)	9.8 (A)	277	520	6.5 (A)	11.5 (B)	321	627
	SB	41.8 (D)	48.2 (D)	72	163	41.9 (D)	53.1 (D)	77	179
	ALL	5.6 (A)	11.8 (B)			6.7 (A)	14.0 (B)		
Lindbergh & Old Olive	EB	36.6 (D)	21.1 (C)	100	83	40.4 (D)	23.1 (C)	118	98
	WB	36.3 (D)	58.1 (E)	121	487	46.3 (D)	67.6 (E)	156	593
	NB	8.5 (A)	16.4 (B)	353	486	9.9 (A)	19.1 (B)	417	570
	SB	10.0 (A)	20.8 (C)	681	735	13.5 (B)	28.2 (C)	909	930
	ALL	11.3 (B)	23.8 (C)			14.4 (B)	28.5 (C)		
Lindbergh / Monsanto Interchange (1)*	WB	9.1 (A)	9.0 (A)	3	3	9.1 (A)	9.0 (A)	3	3
Lindbergh / Monsanto Interchange (2.1)*	WB	9.8 (A)	9.1 (A)	38	30	9.9 (A)	9.1 (A)	40	30
	NB	9.6 (A)	9.0 (A)	30	23	9.6 (A)	9.0 (A)	30	23
	SB	9.9 (A)	9.5 (A)	23	20	9.9 (A)	9.5 (A)	23	20
Lindbergh / Monsanto Interchange (2.2)*	EB	10.6 (B)	10.1 (B)	48	40	10.8 (B)	10.1 (B)	48	40
	NB	13.7 (B)	11.7 (B)	88	60	13.8 (B)	11.7 (B)	90	60
Lindbergh / Monsanto Interchange (3)*	EB	8.7 (A)	8.7 (A)	28	25	8.7 (A)	8.8 (A)	28	28
	WB	8.0 (A)	8.2 (A)	3	3	8.1 (A)	8.2 (A)	3	3
	NB	9.9 (A)	10.7 (B)	35	48	10.0 (B)	10.8 (B)	35	48
Lindbergh / Monsanto Interchange (4)*	EB	7.3 (A)	7.4 (A)	5	3	7.3 (A)	7.4 (A)	5	3
	NB	7.2 (A)	7.1 (A)	4	1	7.2 (A)	7.1 (A)	5	1

* Unsignalized intersection, HCM6 delay/LOS/queue reported for stopped approach only.

The key findings of the Traffic Impact Study are as follows:

- According to the traffic study, the results of this analysis indicate that the existing roadway network generally operates efficiently with all intersections at Level of Service (LOS) C or better and all approaches at LOS D or better, and the Lindbergh and Old Olive intersection, due to future improvements by the City, will be improved with the new signalization. The only intersection that does not operate at this level of service is the intersection of Olive and Old Olive (West) which will operate a LOS of D during the 2048 PM peak hour due to projected background growth unrelated to this development.
- The entrance to the development at Olive Boulevard will require modifications. These modifications include the addition of a westbound left turn lane proposed at 500-feet in length to accommodate the proposed left turn queue within the existing median. The second modification involves reconfiguring the southbound approach at Pavilion Drive. The southbound approach is

- **Lindbergh/Monsanto Drive Interchange:** The existing interchange has ample capacity to accommodate the traffic demands with no additional improvements necessary.
- **Olive Boulevard and Old Olive Street (West):** There are no additional lanes required at this intersection, except in the future an additional southbound right turn lane at Old Olive and Lindbergh would improve operations beyond the 2028 build scenario.

Preliminary Subdivision Plat

The preliminary subdivision plat should provide sufficient information regarding a proposed subdivision of land to allow the Commission to evaluate the site development concept as it relates to the City's goals and objectives. The applicant is planning to sell portions of the development after completion of the project to other owners. In anticipation of this, the applicant has submitted an application for a preliminary plat to subdivide the subject property. The majority of the requirements of Section 410.110 Preliminary Subdivision Plat, have been met on the document provided while a few details are still needed. Staff continues to work with the applicant on the details of this requirement.

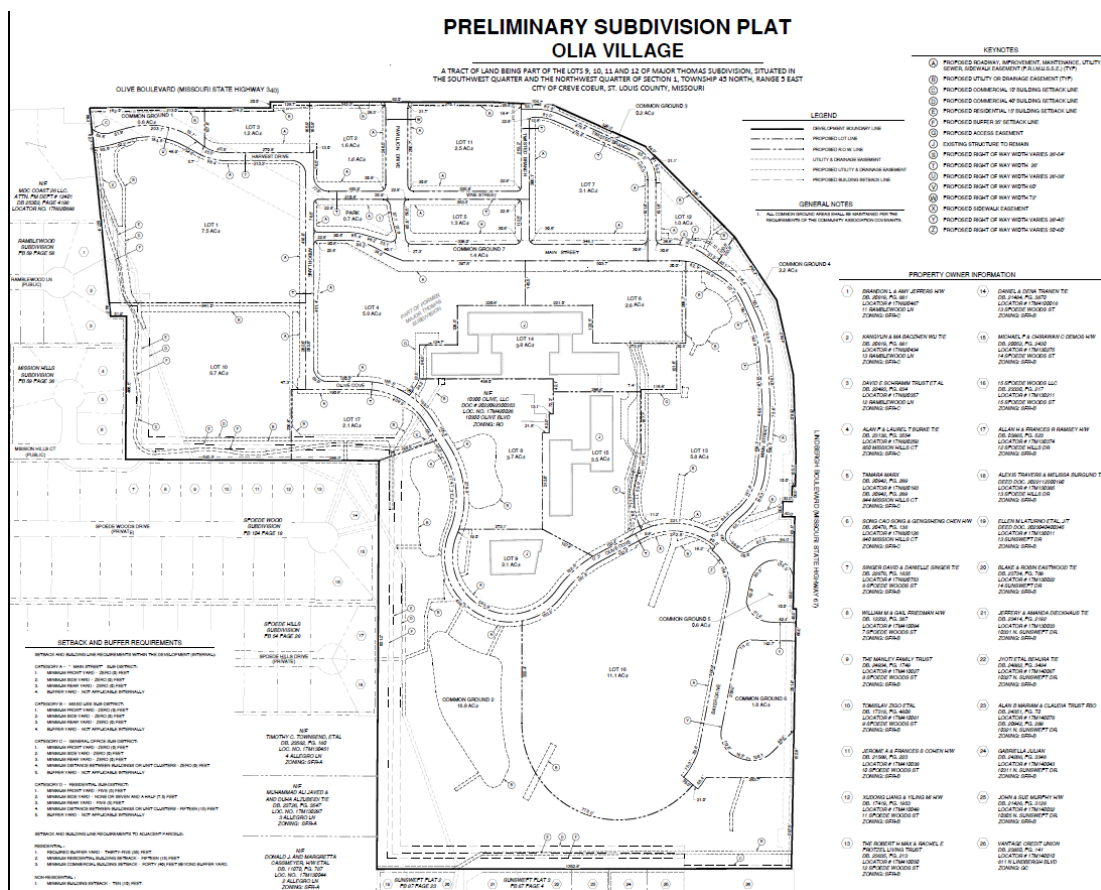


Figure 6: Preliminary Plat.

Tree Conservation Plan

A Tree Conservation Plan shall accompany every preliminary plat. The Tree Conservation plan provided, Sheet LD-100, shows that 61% of the existing trees or tree mass will be removed, leaving 39% on the lot. Section 410.320 requires that no more than 50% of the existing trees on the lot of 6-inch DBH be removed. This proposal is not compliant with the provisions of Section 410.320. Staff encourages the Planning and Zoning Commission to discuss this requirement with the applicant and consider what alternatives can be explored. The Commission can determine to what extent the requirements of Section 410.320 apply to projects in the new Planned Mixed-Use Development zoning district.



Figure 7: Tree Conservation Plan.

Site Development Plan Phase 1

The applicant would like to move forward with the construction phases of the project as soon as possible and the first step, the Phase 1 Site Development Plan, includes all of the improvements outlined in the Site Concept Plan as Phase 1, generally the clearing, grading, utilities and streets for the site. The plan appears to include all of the required elements of a Site Development Plan and an in-depth review of this proposal will be provided in the staff report for the upcoming meeting when this application returns to the Planning and Zoning Commission.

Rezoning Ordinance-Attachment B

This document serves as the new zoning code for this development and the “PMD” Planned Mixed-Use Development zoning district. It includes sections addressing permitted uses, standards, dimensional regulations, bulk regulations, parking and loading requirements, landscape and tree requirements, signage requirements, lighting requirements, architectural requirements, access, public/private road improvements, pedestrian circulation, traffic impact study and miscellaneous. This document is still under review by both Planning Staff and the City’s planning consultant, PGAV. It will be addressed in greater detail at an upcoming meeting when this application returns to the Planning and Zoning Commission.

SUMMARY AND RECOMMENDATION

The proposal represents a substantial change for this site and the City of Creve Couer. As reviewed above, there are many facets to consider since a completely new zoning district is created that is unique to this project. The majority of the requirements have been effectively addressed in the development. Some areas are still being worked out between Staff and the applicant at this time including aspects of the pedestrian path, finalizing street dedications to the City within the development, tree removals and access across Olive Boulevard. Staff recommends that the Commission hear from residents at the public hearing, and provide direction identifying areas for further staff analysis or for applicant adjustments to the proposal. Areas of discussion that Staff would like the Commission to give the applicant direction on include the removal of trees within the existing wooded buffer between residential and the subject property, the proposed buffer yard and setbacks in relation to residential and the pedestrian connection throughout and off the site.

No decision is requested at this time. Therefore, Staff request that following presentations and discussion, the Planning and Zoning Commission vote to continue the matter to the next regularly scheduled Planning and Zoning Commission meeting.

SUGGESTED ACTION

If the Planning and Zoning Commission agrees that a recommendation should be held until a subsequent meeting, the following is an example motion for a continuance:

“I move to continue the public hearing on applications #23-027 and #23-028, the rezoning, site concept plan, site development plan and preliminary plat for the Olia Village Planned Mixed-Use Development to September 18, 2023, to allow for Staff and the applicant to address any concerns or comments brought forth by the Planning and Zoning Commission.”

APPENDIX 1: COMPREHENSIVE PLAN

Included and attached by reference. See body of report for specific excerpts.

APPENDIX 2: ZONING CODE

Included and attached by reference. See body of report for specific excerpts.

APPENDIX 3: AERIAL MAP





city
of

CREVE COEUR

PLANNING DIVISION

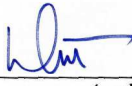
300 North New Ballas Road Creve Coeur, Missouri 63141

Tel. (314) 872-2501 • Fax (314) 872-2505

PLANNING AND ZONING COMMISSION

CHANGE OF ZONING APPLICATION

This application should be prepared and submitted in consultation with Planning Division staff. Rezoning applicants must appear before the Planning and Zoning Commission and the City Council at a regular meeting.

Owner:	Applicant's Representative:
	<i>Relationship to Applicant</i> Legal Counsel
Matt Pfund	Robert Klahr and Jaimie Mansfield
<i>Name</i>	<i>Name</i>
10300 Olive, LLC	Armstrong Teasdale LLP
<i>Company</i>	<i>Company</i>
90 Edwardsville Prof Park	7700 Forsyth Boulevard, Suite 1800
<i>Address</i>	<i>Address</i>
Edwardsville, IL 62025	St. Louis, Missouri 63105
<i>City State Zip</i>	<i>City State Zip</i>
618-692-9502	314.621.5070 314.621.5065
<i>Telephone</i> <i>Fax</i>	<i>Telephone</i> <i>Fax</i>
matt@jackmatthewsdevelopment.com	rklahr@atllp.com and jmansfield@atllp.com
<i>Email</i>	<i>Email</i>
	
<i>Applicant's Signature</i>	<i>Representative's Signature</i>

Property Information	
<i>Property Address:</i> 10300 Olive Boulevard, Creve Coeur, Missouri 63141	
<i>Existing Use:</i> Vacant office park/campus	
<i>Zoning District:</i> RO	
Zoning of Area Properties	Land Use of Area Properties
<i>North:</i> GC, CB, LI <i>East:</i> RO	Core Business & Research <i>North:</i> Gen. Commercial <i>East:</i> Office
<i>South:</i> B & GC <i>West:</i> A, B, C & GC	Single Family <i>South:</i> Residential and <i>West:</i> Single Family Gen. Commercial Residential

REQUEST

The applicant hereby requests a change of zoning district for the above described property from zoning district RO to zoning district PMD.

If the applicant proposes an entirely new zoning district be incorporated into the Zoning Code, please describe in detail, the **nature** and **regulations** and **rationale** of the proposed new zoning district:

Please see attached Statement of Rationale and supporting documents.

The undersigned hereby requests to be placed on the Agenda for the Planning and Zoning Commission meeting at 7:00 P.M. on Monday, July 17, 2023.

Signature



Title President

Date June 9, 2023

SUBMITTAL CHECKLIST

- ☐ *Electronic copy of ALL documents/materials*
- ☐ *Fees paid*
- ☐ *Plan/Survey of existing conditions on site*
- ☐ *Site Plan of proposed conditions if different*
- ☐ *Elevations of proposed buildings*
- ☐ *Elevations of proposed Signs*
- ☐ *Legal description of all properties involved*

Jason Jaggi, AICP, Director of Community Development
Whitney Kelly, AICP, City Planner
Jessica Stutte, Administrative Assistant (314-872-2501)

June 9, 2023

City of Creve Coeur, Missouri
Attn: Planning & Zoning Commission
300 N. New Ballas Road
Creve Coeur, Missouri 63141



RE: Applicant 10300 Olive, LLC's (the "Applicant") statement of rationale in support of its Planning and Zoning Commission (the "Commission") Change of Zoning Application regarding the real property located at 10300 Olive Boulevard, Creve Coeur, Missouri 63141, consisting of approximately 95 acres, inclusive of certain office and parking improvements (the "Property").

Dear Chairperson LaBonte, Vice-Chairperson Wang and Planning and Zoning Commission Members,

On behalf of the Applicant, please allow this letter to serve as its statement rationale in support of the request to rezone the Property from Research and Office Park District ("RO") to Planned Mixed-Use Development ("PMD") pursuant to Creve Coeur City (the "City") Zoning Code (the "Code") Section 405.1060.B.2 (the "Request").

I. Introduction

The Property, currently zoned RO, was part of the former headquarters of Bayer's North America crop science division and now sits vacant. Bayer acquired the Property in 2018 as part of the purchase of Monsanto and envisioned adding more jobs to the City while maintaining the 4,400 employees that worked for Monsanto at that time. In March of 2020, the unthinkable happened - the COVID-19 global pandemic – and it forever changed the way the world went to work. Like all companies, Bayer's workforce demanded a more flexible work environment, which meant less physical time in the office. In response to the shift, Bayer needed to pivot away from a fulltime in-office model and sought to sell the Property. Applicant seized on the opportunity, realizing the vast potential of the Property with existing access to two major arterial roads – Olive Boulevard and Lindbergh Boulevard – and over 95 acres of land to create the ultimate destination to work, live and play in the City. On September 22, 2022, Applicant purchased the Property and quickly started to plan a mixed-use development, including a combination of multifamily, townhouses, hotels, retail and office space, which would include repurposing of the existing buildings on the site.

The purpose of the RO district is to provide for the development of large-scale office parks which include extensive laboratories and other similar scientific research facilities. The RO zoning district precisely fit Bayer's business plan for the Property. However, in the wake of COVID-19, the demand for large-scale office parks has drastically declined. Applicant seeks to rezone the Property to PMD, a new planned zoned district that has recently been created via a text amendment to the City's zoning code as approved by the City's Commission on June 5, 2023, which is set on the City Council's agenda for June 26, 2023.. A PMD allows for innovative, high-quality development that implements the goals of the City's Comprehensive Plan, as amended, and other land use objectives in exchange for flexibility from the strict requirements of a specific zoning district. Through the rezone of the Property, Applicant seeks to develop the Property in a manner that is respectful of its single-family residential neighbors to the west and south, attractive to the bustling commercial corridor of Olive Boulevard to the north, and will pay homage to its predecessor and 39°N in the revitalization of the existing office buildings central to the Property. Succinctly, the proposed development is as unique as the Property itself, and a PMD is the only vehicle in which this vision can be actualized.

II. Nature, Regulations and Rationale of Proposed PMD District
a. Nature and purpose of PMD in relation to the proposed development

Applicant makes this Request in conjunction with the City Commission's recent text amendment to Section 405.390 of its Code to allow for a new planned zoning district – the PMD. While the City's Code provided two Planned Zoning Districts to developers – the Planned Residential District ("PRD") and the Planned Commercial District ("PCD") – the need to determine whether the overall development was predominately residential versus commercial proved challenging to Applicant for this specific Property. Based upon Applicant's proposed development of the Property, and considering the Property is a prominent site within the City and one of the largest single tracts of land within the City limits, the City identified the need to create a new Planned Zoning District that would serve as a hybrid between the two existing Planned Zoning Districts. The purpose of a PMD is to "provide sites for the development of a mixture of commercial and residential uses in a manner which is attractive for such uses and compatible with the surrounding neighborhoods." Section 405.390.F.6. PMD also encourages the "efficient use of land and resources, offer a mix of amenities for the populace of the area and promote a greater efficient in public and utility services." *Id.* In other words, the PMD is a perfect combination of a PRD and a PCD.

As set forth below and as depicted and described in the enclosed Site Concept Plan and in the Site Specific Planned District Ordinance ("Proposed District Ordinance"), Applicant's Request fulfills the PMD's purpose as it includes a robust mixture of commercial and residential uses in an innovative and thoughtful layout to create a space that feels more like a community, where not only the current residents of the City will work and gather, but where potential residents get to experience the best of *all* of what the City has to offer, with options to dine at new restaurants and shop at new boutiques or national, big box retailers, while living in upscale single-family residences in harmony with the adjacent neighborhoods or in a more dense multifamily living environment near the main street attractions.

b. Regulations and objectives of the PMD in relation with the proposed development

Applicant understands that through the flexibility of any Planned Zoning District, the City seeks to achieve certain objectives, specifically enumerated in Section 405.390.B. Rezoning the Property to PMD will meet the City's objectives as follows:

1. The development fulfills the goals and objectives of the Comprehensive Plan

Running concurrently with the City's application for a text amendment to Section 405.390 of the City's Code to create a new Planned Zoning District – the PMD – the City also amended the 39°N Master Plan provisions of the City's main Comprehensive Plan. In doing so, the City demonstrated its understanding that the Property remains an important site within the 39°N District and comprises nearly 17% of the 575-acre district and recognized that the existing Comprehensive Plan did not contemplate the sale and redevelopment of the Property. The 39°N Master Plan was created to centrally emphasize plant science and technologically innovative districts and allow for supportive mix of uses surrounding the site. Instead, given the size of the Property, the City seeks to amend the 39°N Master Plan to provide for a quality development that is sympathetic to the of the size and location of the Property. A PMD serves this objective and provides a higher density pedestrian friendly development that utilizes the existing topography of the site and maintains appropriate buffers to the adjacent single family residential uses. Applicant's proposed development does just that. Applicant will redevelop the Property seeking to attract plant science and technology innovative users, while being able to provide more meaningful amenities, such as housing, retail, hotel, commercial uses, and commercial services, which will attract other office tenants, as well. As depicted in the Site Concept Plan and supporting Proposed District Ordinance, Applicant provides for

pedestrian safety and accessibility, greenways and trails, public plazas and streetscapes, higher density, stormwater improvements, parking, landscaping, placemaking and more.

2. The development creates a more desirable environment than would be possible through application of conventional City land use regulations

The proposed development cannot be accomplished through any other land use regulation or Planned District. The City's ordinances limit development in terms of uses, lot sizes, parking ratios, setbacks between districts as opposed to setbacks between uses within the development, density and more.

3. The development promotes a creative approach to the use of land and related physical facilities that result in a better design and development that includes aesthetic amenities and allows for a mutually desired elimination of obsolete and deteriorated structures or incompatible uses through redevelopment

Applicant understands the City's desire to require that any development of the Property be compatible with the single-family residential uses located to the west and south of the Property. However, Applicant also understands, and the City appreciates through its thoughtful text amendments to the Planned Zoning District ordinances and its Comprehensive Plan, that the Property will deteriorate and/or be rendered obsolete if it were to remain office-use only. Applicant's proposed development provides a creative solution to that issue, by developing the portions of the Property adjacent to the single-family residential areas to the south and west with new office space, reinvigorating the current office buildings with a combination of office space and multifamily housing, and developing new single family residential units. On the northern portion of the of the Property along Olive Boulevard and Lindbergh Boulevard, Applicant seeks to develop a wide array of attractions and amenities to the residents of the development and the City, including a grocery store, national retailers, storefront boutiques, and other commercial and service providers. Applicant also appreciates the need to provide adequate parking, but desires to reduce the use of antiquated surface parking lots. Instead, the development will make parking vertical with above retail bays and provide for cross-access parking arrangements between users.

4. The development allows for the combination and coordination of architectural styles, building forms and building relationships, preserves and enhances desirable site characteristics such as natural topography, vegetation and geologic features, preferable by means of natural erosion control and stormwater control and allow for the use of design, landscape and architectural features consistent with the City's design guidelines

The Property has its unique challenges. The City of St. Louis has considerably large water transmissions lines within restrictive easements that run across the northern portion of the Property. The primary ingress/egress from Olive Boulevard into the Property must align with Pavillion Drive, and the existing ingress/egress from Lindbergh Boulevard into the Property will be the existing cloverleaf. Applicant also intends to reuse the four existing office buildings but needed to replace the entire private utility infrastructure provided from Bayer's existing campus to the east. The majority of the Property is surrounded by residential uses and the topography of the site changes in elevation to nearly 100 feet running north to south. The Property also contains two federally (2) jurisdictional wetlands, two (2) isolated wetlands, and two (2) federally regulated streams, each with a USACE regulated restoration corridor which will need to remain undisturbed throughout the development of the Property. As set forth in the Site Concept Plan and the proposed Plan District Ordinance, Applicant seeks to develop lots in a manner that is compatible with the surrounding land uses, in size, scale and style, while utilizing the existing topography

of the overall site. Applicant will provide for all new underground utilities to serve the Property and create new stormwater detention ponds to the south of the Property.

c. Eligibility

Applicant's development proposal and Request to rezone the Property is eligible for consideration under Section 405.390.C., as:

1. The Property is located on a lot totaling 95 acres;
2. The development cannot be approved under the provisions of another Zoning District, as it provides for multiple, integrated and dense commercial, residential, office and other uses;
3. The Property is currently zoned RO, and as such is one of the eligible districts set forth in Section 405.390.F; and
4. As more fully set forth herein, the proposed development plan substantially complies with Section 405.390 and the applicable provisions of the City's Comprehensive Plan.

d. Public Benefit

Applicant's PMD proposed development will provide public benefits. As depicted in its Site Concept Plan, the proposed development will:

1. Provide for public parking facilities;
2. Provide, maintain and enhance on-street and off-street pedestrian facilities linking surrounding businesses, office and residential uses;
3. Eliminate overhead utility wires;
4. Include landscaped gardens, plazas and public parks;
5. Include extensive pedestrian travel ways and public trails;
6. Provide for future alternative pedestrian connections and additional rights-of-way in collaboration with other members of 39°N;
7. Installation of public art displays;
8. Protection of natural buffers to the west and south of the development;
9. Enhance existing buildings and construct new buildings with architectural distinction and significance that would make the development overall noteworthy; and
10. Use high-quality building materials that would add to the assessed valuation of structures.

III. Site Concept Plan, PMD Design Criteria and Review Criteria

Applicant submits herewith its Site Concept Plan and its Proposed District Ordinance in conformity with the criteria set forth in Sections 405.390.F.6 and 405.390.G. Further, as set forth above and depicted within the attached Site Concept Plan and Proposed District Ordinance, the proposed development meets the City's Review Criteria set forth in Sections 405.390 G and I, as follows:

1. The proposed development is in harmony with the general purpose and intent of Chapter 405 and the amended 39°N Master Plan to allow for a forward-thinking and harmonious development of the Property with a mix of uses that, in the wake of COVID-19, will allow people new and more meaningful ways to come together

than the traditional research park/office space that previously existed on the Property.

2. Applicant's traffic engineer studied the proposed development and uses and concluded the streets and means of access to the development are suitable and adequate and that the internal circulation system of the development encourages safe pedestrian and vehicle movement. For purposes of an economic analysis of any proposed direct impacts on public costs, Applicant will seek to dedicate [Street names to be provided], consisting of approximately 3.61 lane miles of roadway, to the City. Applicant anticipates the annual cost to the City for maintaining said roads to be \$23,844. Notwithstanding the aforementioned, as set forth herein, there are several features of the development that will be open to the general public to enjoy, such as a public park, various common elements and gathering spaces and a nature trail, which will be privately maintained.
3. The proposed development will provide for new, underground utilities.
4. Not only will the proposed development have appropriate buffers to protect adjacent land uses from light, noise and other visual impacts, Applicant's Site Concept Plan proposes to lower impact uses (single family residential and office) the portions of the Property that are adjacent to existing single family residential to the west and south, while preserving and enhancing the natural landscape buffer that currently exists between the Property and the adjacent single family residential.
5. The proposed development will use architectural and building materials and landscaping consistent with the character of the development and compatible with nearby areas of the City, subject to input from the City's architectural review board at each phase of the development.
6. Operating and delivery hours for each use within the development will be compatible with surrounding land uses, as more intense uses are planned for the portions of the Property adjacent to Olive Boulevard and Lindbergh Boulevard and the less intense uses are planned for the portions of the Property adjacent to the single-family residential areas to the south and west.
7. The uses proposed are compatible with the surrounding area, as most of the Olive Boulevard corridor is comprised of hotel, multifamily, commercial and office uses. The proposed development essentially replicates that what already exists to the west of the Property along Olive Boulevard and to the south of the property along Lindbergh Boulevard – that is, commercial uses along the frontage of the main arterial roadways with residential uses to the south and west.
8. The proposed development will comply with all other applicable codes and ordinances, specifically with those that are required once final site development plans are submitted.
9. In compliance with the proposed Planned District Ordinance, the layout of the structures and spaces takes into account the potential of future subdivision of the development.
10. As set forth above, and depicted in the Site Concept Plan, Applicant is committed to providing a public benefit to the City and its residents.
11. Applicant envisions an integrated development on the Property that will, over time, have multiple owners and a myriad of different uses. To ensure that that development achieves this vision, Applicant anticipates that it will enter into one

or more covenants, conditions and restrictions that will (a) establish certain uniform development guidelines and design standards, (b) provide for the assessment of property owners to provide for maintenance of common areas within the Property, (c) provide for reciprocal easements between and among properties within the development as needed for pedestrian and vehicular ingress/egress and shared parking, stormwater management, common area signage, lighting, telecommunications and other infrastructure improvements that are intended for the mutual benefit of multiple properties, and (d) establishes one or more property owner associations to provide for on-going review and enforcement of such covenants, conditions and restrictions and, included within such associations, various boards and committees to oversee architectural review, design standards, use of acceptable exterior building materials, etc. It is anticipated that a master property owners association will have responsibility over those covenants, conditions and restrictions that apply to the Property as a whole, and that one or more other property owner associations may have responsibility over those covenants, conditions and restrictions that may apply only to individual sub-districts or other, more limited portions of the Property (e.g. Main Street vs. Mixed Use vs. Office vs. Residential).

12. The project timeline anticipates site development, earthwork, utilities, and roadways to begin in September of 2023. This includes a full disconnect of the current utilities provided by the Bayer East campus and new temporary feeds until the permanent infrastructure is installed. The first phase of building construction will include structures on parcels 1, 2, 3, 4, 5, and 6 as depicted in the Site Concept Plan. During this first phase, Applicant anticipates the decommission and repurpose of existing buildings will take place. This work along with the common areas and park will establish the substantial elements of the development with the first businesses openings occurring in mid to late 2025.

Applicant looks forward to working with the City to realize the Property's immense potential through its compassionate and considerate redevelopment.

Sincerely,



Matthew J. Pfund
President

cc: VIA EMAIL:

Jason Jaggi, City of Creve Coeur, Director of Community Development
Carl Lumley, City of Creve Coeur, City Counselor
Kristie, Bailey, Fireside Financial, Partner
Michael Bailey, Fireside Financial, Partner
Robert Klahr, Armstrong Teasdale LLP
Jaimie Mansfield, Armstrong Teasdale LLP
Chris Stritzel, PE, Crawford, Murphy & Tilly, Vice-President
Todd Ehlen, PE, Crawford, Murphy & Tilly, Civil Site Services Group Manager
Toby Heddinghaus, AIA, LEED AP BD+C, Gray Design Group, Principal

ATTACHMENT B

All provisions of the City of Creve Coeur, MO City Code shall apply to this Planned Mixed-Use Development (PMD) District except as specifically modified herein.

I SPECIFIC CRITERIA

A. PERMITTED USES

Permitted Uses within the PMD shall be as shown on Table A at the end of this Attachment B. The permitted uses are further broken down by the following sub-district categories which have been identified on the approved Site Concept Plan and further defined below in this Attachment B.

1. Sub-District Category A – Main Street Development
2. Sub-District Category B – Mixed-Used Development
3. Sub-District Category C – General Office Development
4. Sub-District Category D – Residential Development

B. SUB-DISTRICT CATEGORY STANDARDS

Within the PMD, four (4) sub-districts categories have been identified to provide varying levels of regulations. The location of each sub-district shall be as shown on the approved Site Concept Plan and have each been further defined below.

1. CATEGORY A – “Main Street” Development Pattern Building placement:
 - Building volume: Buildings may be constructed not to exceed (8) stories or (100) feet measured from the primary sidewalk entrance level. Additional lower levels accessed from the side or rear are permitted.
 - Building floor heights: Sidewalk commercial level shall be 12-30 feet, upper-level office or residential shall be 9-30 feet.
 - Projecting façade elements: Awnings, canopies, balconies, colonnades are permitted.
 - Bay windows permitted on upper stories.
 - Parking: Structured, public surface, or on-street parking permitted. Private off-street surface parking prohibited.
2. CATEGORY B – Mixed Use Development Pattern Building placement:
 - Building volume: Buildings may be constructed not to exceed (5) stories or (60) feet measured from the primary sidewalk entrance level. Additional lower levels accessed from the side or rear are permitted.
 - Building floor heights: First floor level shall be 12-30 feet; upper levels shall be 9-30 feet.
 - Projecting façade elements: Awnings, canopies, balconies, colonnades, porte-cocheres are permitted.
 - Bay windows permitted on upper stories.
 - Parking: Structured, public surface, on street parking, private off-street parking permitted.

3. CATEGORY C – General Office Development Pattern Building Placement:

- Building Volume: Buildings may be constructed not to exceed (4) stories or (70) feet measured from the primary building entrance. Additional lower levels accessed from the side or rear are permitted.
- Building Floor Heights: All floor levels shall be 12-30 feet.
- Projecting Façade Elements: Awnings, canopies, balconies, colonnades, porte-cocheres are permitted.
- Outdoor Space: Outdoor amenity space such as patios or plazas serving building occupants are permitted.
- Parking: Structured, public surface, on street parking, private off-street parking permitted.

4. CATEGORY D – Residential Development Pattern Building placement:

- None

B. DIMENSIONAL REGULATIONS

1. Maximum Site Coverage.

- a. Maximum site coverage shall be determined globally for the entire PMD District and shall not be calculated on an individual site/lot or sub-district basis. The total acreage used to define this calculation shall be the total PMD area less any land that has been dedicated for use as public ROW.
- b. The amount of gross site area covered by buildings and structures, surface parking, pavement for automobile circulation or permitted exterior business services, storage, merchandise display, repair or processing shall not exceed 70% of the site.

2. Maximum Floor Area Ratio (FAR).

- a. Floor Area Ratio shall be defined as the gross leasable floor area of all commercial buildings and all multifamily dwellings, and the dwelling unit floor area of all other residential buildings on any lot divided by the land area of such lots. Parking garages shall not be included in the Floor Area Ratio calculation.
- b. Maximum floor area ratio shall be determined globally for the entire PMD District and shall not be calculated on an individual site/lot or sub-district basis. The total acreage used to define this calculation shall be the total PMD area less any land that has been dedicated for use as public ROW.
 - i. The Maximum Floor Area Ratio for the entire PMD District shall not exceed 0.70.

3. Lot Size Requirements:

- a. Minimum Lot Area. The permitted use of any given site or lot shall be determined by the size of the site or lot under single ownership or other common legal control as prescribed in Section 405.370(B).

- b. CATEGORY A – “Main Street” Sub-district:
 - 1. Minimum Lot Area. One-half (1/2) acre.
 - 2. Minimum Lot Width. One Hundred (100) feet.
 - 3. Minimum Lot Depth. One Hundred (100) feet.
- c. CATEGORY B – Mixed Use Sub-district:
 - 1. Minimum Lot Area. One-half (1/2) acre.
 - 2. Minimum Lot Width. Seventy-Five (75) feet.
 - 3. Minimum Lot Depth. One Hundred Fifty (150) feet.
- d. CATEGORY C – General Office Sub-district:
 - 1. Minimum Lot Size. One-half (1/2) acre.
 - 2. Minimum Lot Width. Seventy-Five (75) feet.
 - 3. Minimum Lot Depth. One Hundred Fifty (150) feet.
- e. CATEGORY D – Residential Sub-district:
 - 1. Minimum Lot Size. Eight hundred (800) square feet per unit.
 - 2. Minimum Lot Width. Fifteen (15) feet.
 - 3. Minimum Lot Depth. Forty (40) feet.

C. BULK REGULATIONS

- 1. Setback and Building Line Requirements within the Development (Internal):
 - a. CATEGORY A – “Main Street” Sub-district:
 - 1. Minimum Front Yard. Zero (0) feet.
 - 2. Minimum Side Yard. Zero (0) feet.
 - 3. Minimum Rear Yard. Zero (0) feet.
 - 4. Buffer Yard. Not applicable internally.
 - b. CATEGORY B – Mixed Use Sub-district:
 - 1. Minimum Front Yard. Zero (0) feet.
 - 2. Minimum Side Yard. Zero (0) feet.
 - 3. Minimum Rear Yard. Zero (0) feet.
 - 4. Buffer Yard. Not applicable internally.
 - c. CATEGORY C – General Office Sub-district:
 - 1. Minimum Front Yard. Zero (0) feet.
 - 2. Minimum Side Yard. Zero (0) feet.
 - 3. Minimum Rear Yard. Zero (0) feet.
 - 4. Minimum Distance Between Buildings or Unit Clusters. Zero (0) feet.
 - 5. Buffer Yard. Not applicable internally.
 - d. CATEGORY D – Residential Sub-district:
 - 1. Minimum Front Yard. Five (5) feet.
 - 2. Minimum Side Yard. None or seven and a Half (7.5) feet.
 - 3. Minimum Rear Yard. Five (5) feet.
 - 4. Minimum Distance Between Buildings or Unit Clusters. Fifteen (15) feet.

5. Buffer Yard. Not applicable internally.
2. Setback and Building Line Requirements to Adjacent Zoning Parcels (External to the PMD District):
 - a. Any tract of land site abutting or adjoining a commercial development shall not require a buffer yard. Any tract of land site abutting or adjoining a residential development shall only be required to meet the setbacks requirements below.
 - ii. No new residential building may be located closer than fifteen (15) feet to any property line or any required buffer yard.
 - iii. No new commercial building may be located closer than forty (40) feet to any required buffer yard.
 - b. Setback and Building Line Requirements along Right-of-Ways:
 - i. In every instance, the first ten (10) feet of the front yard setback measured from the right-of-way shall be provided with and maintained with sidewalks and/or landscaping including, but not limited to, deciduous street trees at regular intervals as shown on the concept plan.
 - ii. No building or structure shall be closer than ten (10) feet when abutting a non-residential zoned property.
 - iii. No maximum building line setback shall be enforced.
 - c. Other CATEGORY D Regulations:
 1. Maximum number of units per acre. Twenty (20).
 2. Minimum dwelling unit floor area. Seven hundred fifty (750) square feet/unit.
 3. Garages. No district restrictions will be required on garage facing, recessing, architectural details, or street facing frontage.

D. PARKING AND LOADING REQUIREMENTS

1. Parking Requirements:
 - a. Required parking for this entire PMD District shall be determined globally for the entire District and shall not be calculated on an individual site/lot or sub-district basis; and shall be calculated as follows:
 - i. Required parking shall be calculated cumulatively based upon the sum of the square footage of individual land uses at the rate required by the City of Creve Coeur Code, less a fifteen percent (15%) reduction in the total number of parking spaces required.
 - ii. Required parking locations shall be allowed on surface parking lots, parking garages, and on-street locations.

- iii. No off-street surface parking locations will be allowed in any buffer yard or within the 10' yard setback along Right-of-Ways. Off-street surface parking locations shall be allowed in all other yards or setbacks within the development.
- iv. Joint Parking Facilities. In the case of mixed-use buildings, the parking spaces required shall be computed separately for each use except as provided in Sections 405.800(G)(3-4) and 405.820(H)(6)(b).
- v. On-street parking shall be allowed as approved by the City's Traffic Engineer and said parking shall count towards the required PMD parking noted in (i) above.
- vi. No individual lot Site Development Plan shall be approved which will result in parking provided at less than the amount set forth in prior paragraphs.

2. Loading Requirements:

a. Purpose And Intent:

- i. It is the developers' intent to provide sufficient off-street loading areas and to ensure that such areas are located in a convenient location to the extent feasible. Loading areas shall be provided for trash collection as well as general deliveries.
- ii. The developer also acknowledges that the complexity of the proposed development will require flexibility in providing loading spaces and zones. The developer shall work with the City to find a balance of meeting the needs of the tenants and lot owners while respecting the safety and aesthetics of the traveling public. This may include actions such as restricting on-street parking during off-peak hours to allow for loading zones within on-street parking spaces to occur during early morning or late evening hours. The developer shall work with the City to provide loading spaces and zones to meet the needs of the development.
- iii. Loading areas utilized for the location of trash collection or compaction areas may coincide with the required building loading space.

b. Dimensions of Spaces:

- i. Loading spaces, where designated, shall have a minimum dimension of twelve (12) feet width by thirty-five (35) feet length with a vertical clearance of at least fourteen (14) feet as shown on the approved individual lot Site Development Plan. In addition, some uses may require loading zones of larger dimension to accommodate larger tractor-trailers. These zones shall be at least sixty (60) feet in length, as shown on the approved individual lot Site Development Plan.

c. Schedule of Off-Street Loading Spaces:

- i. Loading spaces and zones shall take a shared approach within Category A – Main Street, Category B – Mixed-Use, and Category C – General Commercial sub-districts.

The required spaces and zones for each individual use will be determined based upon the sections below with the quantity to be provided for each lot based upon the minimum required for the highest individual use (not cumulative).

1. A combination of dedicated loading spaces and shared loading spaces / zones may be used by restricting on street parking during off peak hours to allow for loading spaces or zones within the on-street parking space areas to occur during early morning or late evening hours.
2. The required loading spaces shall be calculated based upon the maximum required uses as follows:

a. CATEGORIES A, B & C:

- i. Residential & Transient Residential (Hotels, etc.) Uses. Any building containing more than fifty (50) apartment dwelling / room units shall provide one (1) loading space for each two hundred (200) units or fraction thereof.
- ii. Office Uses. One (1) loading space shall be provided for each such use having greater than 6,000 square feet of gross floor space.
- iii. Non-Residential or Non-Office Uses. The required loading spaces and/or zones shall be calculated upon the following table:

Floor Area (square foot)	Number of Spaces	Number of Zones
0 – 3,000	0	0
3,000 – 24,999	1	0
25,000 – 49,999	0	1
50,000 – 150,000	1	1
Each additional 150,000	1 additional	1 additional

- b. CATEGORY D – Residential Sub-district: No loading spaces or zones shall be required within this sub-district.
3. The loading spaces required for Lots 8, 14 & 15 shall be shared. The existing underground tunnel network between the existing buildings to remain will provide access from each building to the existing loading docks on Lot 14. Additional loading spaces & zones may be provided to meet the requirements above on any of the 3 lots and will be shared and accessible from the existing tunnel system.
4. The loading spaces and zones shall be provided based upon the approved Site Development Plan for each individual lot.

F. LANDSCAPE AND TREE REQUIREMENTS

1. The developer shall adhere to the Resource Protection Standards (Article V) of the City of Creve Coeur Code with the following exceptions:
 - a. Landscaping along Main Street within the City of St. Louis water main easement shall require City of St. Louis Water Department Approval.
 - b. All parking and/or loading spaces adjoining interior public right-of-way shall not be required to be screened.
 - c. In addition to any landscaped front, back or side yard areas required by this or any other Section of the City of Creve Coeur code, a minimum of ten (10) square feet of interior landscaped area shall be provided within the parking lot for each five hundred (500) square feet of paved area within any surface parking lot including parking spaces and driving aisles. The landscaping shall be in one (1) or more areas so as to minimize and reduce the apparent size of parking areas. On-street parking provided within the development shall be exempt from this requirement. Existing surface parking lots to be repurposed as part of this development shall also be exempt from this requirement, even if maintenance is to be considered for said existing lots to remain.
 - d. The Tree Conservation ordinance (Section 410.320) shall not apply to this development. The developer shall work with the City to find a balance between minimizing mass tree removal and incorporating new trees into the development.
 - e. Landscape plans for each parcel shall be coordinated and consistent with a Landscape Concept Plan for the applicable Category of this ordinance. These plans should enhance the pedestrian experience, complement architectural features, provide shade, and screen utility areas.
 - f. All medians greater than 4' in width (3' of plant-able space) within the development are required to be landscaped and will be maintained by the developer.
 - g. All existing surface parking lots to remain shall not be required to meet Article V of the City of Creve Coeur Code.
 - h. In order to present a healthy, neat and orderly appearance, all landscaped areas within the Main Street sub-district category, as well as Lots 1 -3 of the Mixed-Use sub-district category and the "Park" as identified on the Site Concept Plan (with the exception of back of house and service areas) shall be provided with an installed, operated and maintained underground irrigation system. All other landscaped areas outside of these areas shall be landscaped with plant materials adapted to the region and not requiring irrigation to thrive unless proposed plant selections deem irrigation necessary.
 - i. All landscaped areas in parking areas or adjacent to parking areas or loading areas, or that can be encroached upon by a motor vehicle, shall be provided with adequate, vehicular deterrent (such as curb, bollard, wheel stop, or other design alternative to be approved

by the Director of Public Works) to restrict the destruction of the landscape areas by vehicles.

G. SIGN REQUIREMENTS

1. Individual sign packages shall meet City of Creve Coeur signage ordinances regarding size and location. Style of signage is specifically governed by this performance standard and shall be:
 - Internally illuminated signs prohibited.
 - Logos and lettering shall be on stand offs in a black, white or dark bronze finish.
 - Signage color shall contrast to the surface behind.
 - Lighting shall be back-lit LED with Warm white (4000K color temperature).
2. Ornamental Entrance Monument construction, if proposed, shall be reviewed by the City of Creve Coeur for sight distance considerations prior to installation or construction.

H. LIGHT REQUIREMENTS

1. Provide a lighting plan in accordance with the City of Creve Coeur Code.
2. Individual Lighting Plans, including fixture types, shall be consistent with a Lighting Fixture Plan for the applicable category in this ordinance. The proposed Lighting Fixture Plan must provide for consistent and complementary fixture designs and styles throughout the PMD District.

I. ARCHITECTURAL REQUIREMENTS

1. For individual lot developments only, the developer shall submit a design package including, but not limited to, architectural elevations, colored renderings and building materials. The proposed package shall give consideration to creating a visually appealing development pattern consistent with the intent and purpose of this PMD District. Architectural information is to be reviewed and approved by the Planning Commission.
2. Building facades should be articulated by using color, arrangement or change in materials to emphasize the façade elements. The planes of the exterior walls may be varied in height, depth or direction. Extremely long facades shall be designed with sufficient building articulation and landscaping to avoid a monotonous or overpowering appearance.
3. Building finish material types shall not be limited in Olia Village but shall be generally specified as any combination of white, off-white, light grey, wood grain, or light beige. Accents are acceptable as dark grey, black, or dark bronze. Red, orange, or yellow brick or other bold color finish materials are prohibited.
4. Trash enclosures: The location, material, and elevation of any trash enclosure will be as approved on the Site Development Plan. Trash receptacles shall be located indoors or be enclosed with an eight (8) foot high sight-proof enclosure with materials that match the adjacent structures and complemented by adequate landscaping as approved on the individual lot-specific landscape plans.

5. Mechanical equipment shall be adequately screened with six (6) foot high sight proof enclosures or to a height equal to the height of the equipment (whichever is greater).
6. Rooftop mechanical equipment shall be screened on roofs with architecturally designed, fully enclosed screening materials that complement the building design at a height equal to or greater than the height of the equipment.
7. Flat roof surfaces below 5 stories shall incorporate ballast, green roof, artificial turf, or medium tone colored membrane to reduce daytime glare for upper-level tenants in adjacent buildings.

J. ACCESS/ACCESS MANAGEMENT

1. Street and drives related to this development shall be designed and located as directed by the Department of Community Development.
2. The location of public streets within the PMD District shall be determined by the Site Concept Plan.
3. The location of lot access points shall be determined by individual lot-specific Site Development Plans within the PMD District.
4. Access to the development from external roadways shall be as shown on the Site Concept Plan and as directed by the City of Creve Coeur, the Missouri Department of Transportation, and St. Louis County Department of Transportation, as applicable.
5. Adequate sight distance shall be provided. If adequate sight distance cannot be provided at the access location(s), acquisition of right-of-way, reconstruction of pavement and other off-site improvements may be required to provide the required sight distance as required by the City of Creve Coeur and the agency in control of the right of way off which the access is proposed.
6. Driveway access to internal streets shall comply with City Code.
7. No construction-related parking shall be permitted within right-of-way or on an existing roadway. All construction related parking shall be confined to the development's boundary.
8. Any improvements within the Missouri Department of Transportation (MoDOT) right-of-way will require a permit from MoDOT. The entrance geometries and drainage design shall be in accordance with MoDOT standards.
9. Any request to install a gate in this development must be approved by the City of Creve Coeur and the agency in control of the right-of-way off of which the entrance is constructed. No gate installation will be permitted on public right-of-way.

- a. If a gate is installed on a street in the development, the street(s) within the development or that portion of the development that is gated shall be private and remain private forever.

K. PUBLIC/PRIVATE ROAD IMPROVEMENTS, INCLUDING PEDESTRIAN CIRCULATION

1. Obtained approvals from the City of Creve Coeur Department of Public Works and/or the Missouri Department of Transportation as applicable.
2. The National Association of City Transportation Officials (NACTO) has an Urban Street Design Guide. All intersections of Olia Village shall conform to the principles of the NACTO Urban Street Design Guide.
3. Internal streets and sidewalks shall be private unless an agreement is reached and executed between the City of Creve Coeur and Olia Village whereby the City of Creve Coeur accepts the internal streets and/or sidewalks as public. All public streets shall be designed to meet the City of Creve Coeur's Code for the Development of Streets (Section 410.240), unless otherwise described herein.
4. Provide sidewalks, conforming to Americans with Disabilities Act (ADA) standards, along all frontages of the site and along internal roadways as shown on the Site Concept Plan. The sidewalk shall provide for future connectivity to adjacent developments and/or roadway projects. The sidewalk may be located within right-of-way controlled by another agency, if permitted by that agency, or on private property within a sidewalk, maintenance, and utility easement dedicated to the City Creve Coeur for public use.
5. Pedestrian crossings for Olive Boulevard shall be provided as required by MoDOT.
6. Mid-block crossings internal to the PMD District shall be provided as shown on the approved Site Concept Plan, or as otherwise approved by the City's Traffic Engineer.
7. Obtain approvals from the City of Creve Coeur and Missouri Department of Transportation, as necessary, for locations of proposed curb cuts and access points, areas of new dedication, and roadway improvements.
8. Additional right-of-way and road improvements shall be provided, as required by the City of Creve Coeur and/or the Missouri Department of Transportation.
9. Provide a minimum 6-foot-wide shared use path for public use which connects to the existing sidewalk in right-of-way along the south side of Olive Boulevard.
 - a. The location of the shared use path within the PMD District shall be as shown in the approved Site Concept Plan.
10. Pedestrian circulation to be as shown on the approved Site Concept Plan.

11. Public Street Design Standards:

- | | |
|--|--|
| a. Minimum Right-Of-Way | 26' |
| b. Maximum Grade at Centerline | 10% |
| c. Minimum Grade at Centerline | 1.0% Asphalt / 0.5% Concrete |
| d. Minimum Pavement Width
(Back-to-Back of Curb) | 26' |
| e. Minimum Site Distance at
Crest of Curve | 150' |
| f. Minimum Horizontal Radius
of Centerline | 150' |
| g. Minimum Horizontal Tangent
Distance Between Reverse Curves | None |
| h. Sidewalks | As shown on approved Site Concept Plan |
| i. Curb & Gutter | Vertical Or Lip (Rolled) |

12. Public Street Pavement Standards:

- a. Concrete = minimum 7 inches on 4" granular base
- b. Asphalt = minimum 9 inches on 4" granular base

13. Private Street Design Standards:

- | | |
|--|--|
| a. Minimum Right-Of-Way | N/A |
| b. Maximum Grade at Centerline | 10% |
| c. Minimum Grade at Centerline | 1.0% Asphalt / 0.5% Concrete |
| d. Minimum Pavement Width
(Back-to-Back of Curb) | 24' |
| e. Minimum Site Distance at
Crest of Curve | 150' |
| f. Minimum Horizontal Radius
of Centerline | 150' |
| g. Minimum Horizontal Tangent
Distance Between Reverse Curves | None |
| h. Sidewalks | As shown on approved Site Concept Plan |
| i. Curb & Gutter | Vertical Or Lip (Rolled) |

14. Private Street Pavement Standards:

- a. Asphalt or Concrete. Pavement section to be determined based upon recommendations from Geotechnical Report prepared for this development.

L. TRAFFIC IMPACT STUDY

1. External Roadway Network:

- a. The developer shall provide a traffic impact study as directed by the City of Creve Coeur & the Missouri Department of Transportation for impacts to the existing adjacent public

roadway network. The scope of the study shall include external circulation and may be limited to specific impacts, such as the need for additional lanes, entrance configuration, geometries, sight distance, traffic signal modifications or other improvements required, as long as the density of the proposed development remains consistent with the Site Concept Plan. The proposed trip generations included as part of this study shall be used as a baseline for the overall development of the PMD District and shall not be reviewed or required to be adhered to for each individual lot development. Should the proposed trip generations for the entire PMD District increase by more than 10% from the density assumed in the traffic impact study approved by MoDOT within five (5) years of the initial approved Site Concept Plan, an updated traffic study may be required by the City of Creve Coeur.

2. Internal Roadway Network:

- a. Both the City and the developer acknowledge that this development will include a built environment that is meant to encourage pedestrian activity and improve pedestrian mobility. This approach will include intentional roadway & sidewalk design geometries to be established to promote pedestrian access over vehicular where possible, while respecting the safety of both pedestrians and vehicles as well as emergency personnel. This will include a design which considers how people interact with the space to increase access for all community members, including ADA compliancy. As such, a comprehensive traffic impact study including traffic counts, trip generations, signal warrants, accessory warrants, etc. for the internal roadway network will not be required. Approval will be required by the City's Traffic Engineer, which may include more detailed analysis of isolated locations.

M. MISCELLANEOUS

1. Kiosks are allowed in the PMD District provided they do not impede pedestrian traffic on the sidewalk and meet ADA accessibility requirements. Kiosks can be an arrangement of mobile units, fixed units, or a mixture of both joined together to form a structure not to exceed 100 sq. feet. Uses within the kiosk will be the approved uses in this Attachment A. Locations and numbers of kiosks shall be as approved on the Site Concept Plan for the PMD District.
2. Loading docks, overhead doors and service entries will be permitted only on the side or rear of a tenant space. Deliveries shall be made on the side or rear of a tenant space with the exception of designated street delivery and loading areas as approved on the Site Concept Plan.
3. Retaining walls required for the development shall not be limited in height.
4. Stream Buffer Protection Ordinance Requirements:
 - a. Stream bank shall be defined as the "ordinary high-water mark" as defined by the US Army Corps of Engineers.
 - b. Existing impervious encroachments into existing Stream Buffer Protection setbacks from any existing stream shall not be required to meet the Stream Buffer Protection

Regulations in Chapter 430 of the City of Creve Coeur code regardless of whether improvements are proposed to be made to said existing impervious areas. No further impervious encroachment into existing Stream Buffer setbacks will be allowed.

**OLIA VILLAGE PLANNED MIXED-USE DEVELOPMENT
TABLE A - PERMITTED USES**

P = Permitted Use					
Use Code	2012 NAICS Title	Zoning District - Olia PMD			
		A Main Street	B Mixed	C Office	D Residential
CC111419	Medical Marijuana Cultivation Facility, inside a building or greenhouse as defined under Section 405.120			P	
311351	Chocolate and Confectionery Manufacturing from Cacao Beans	P	P		
311352	Confectionery Manufacturing from Purchased Chocolate	P	P		
311340	Non-Chocolate Confectionary Manufacturing	P	P		
311811	Retail Bakeries	P	P		
311812	Commercial Bakeries	P	P		
311813	Frozen Cakes, Pies, and Other Pastries Manufacturing	P	P		
311821	Cookie and Cracker Manufacturing	P	P		
311920	Coffee and Tea Manufacturing	P	P		
312120	Breweries	P	P		
312140	Distilleries	P	P		
325220	Artificial and Synthetic Fibers and Filaments			P	
325411	Medicinal and Botanical Manufacturing			P	
325414	Biological Product (except Diagnostic) Manufacturing			P	
CC325415	Medical Marijuana Manufacturing Facility, entirely within an enclosed building as defined under Section 405.120			P	
325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing			P	
339116	Dental Laboratories			P	
441110	New Car Dealers	P	P		
441120	Used Car Dealers	P	P		
441228	Motorcycle, ATV, and All Other Motor Vehicle Dealers	P	P		
441310	Automotive Parts and Accessories Stores	P	P		
CC442100	All Drive-in and Drive Through Services (excluding Food Services)		P		
442110	Furniture Stores	P	P		
442210	Floor Covering Stores	P	P		
442291	Window Treatment Stores	P	P		
442299	All Other Home Furnishings Stores	P	P		
443141	Household Appliance Stores	P	P		
443142	Electronics Stores	P	P		
444120	Paint and Wallpaper Stores	P	P		
445110	Supermarkets and Other Grocery (except Convenience) Stores		P		
445120	Convenience Stores	P	P		
445210	Meat Markets	P	P		
445220	Fish and Seafood Markets	P	P		
445230	Fruit and Vegetable Markets	P	P		
445291	Baked Goods Stores	P	P		
445292	Confectionery and Nut Stores	P	P		
445299	All Other Specialty Food Stores	P	P		
445310	Beer, Wine, and Liquor Stores	P	P		
446110	Pharmacies and Drug Stores	P	P		
446120	Cosmetics, Beauty Supplies and Perfume Stores	P	P		
446130	Optical Goods Stores	P	P		
446191	Food (Health) Supplement Stores	P	P		
446199	All Other Health and Personal Care Stores	P	P		
448110	Men's Clothing Stores	P	P		
448120	Women's Clothing Stores	P	P		
448130	Children's and Infants' Clothing Stores	P	P		
448140	Family Clothing Stores	P	P		
448150	Clothing Accessories Stores	P	P		
448190	Other Clothing Stores	P	P		
448210	Shoe Stores	P	P		
448310	Jewelry Stores	P	P		
448320	Luggage and Leather Goods Stores	P	P		
451110	Sporting Goods Stores (except those exclusively engaged in the sale of firearms and ammunition)	P	P		
451120	Hobby, Toy, and Game Stores	P	P		
451130	Sewing, Needlework, and Piece Goods Stores	P	P		
451140	Musical Instrument and Supplies Stores	P	P		
451211	Book Stores	P	P		
451212	News Dealers and Newsstands	P	P		
452111	Department Stores (except Discount Department Stores)	P	P		
452112	Discount Department Stores	P	P		
452910	Warehouse Clubs and Supercenters	P	P		
452990	All Other General Merchandise Stores	P	P		

**OLIA VILLAGE PLANNED MIXED-USE DEVELOPMENT
TABLE A - PERMITTED USES**

P = Permitted Use					
Use Code	2012 NAICS Title	Zoning District - Olia PMD			
		A Main	B Mixed	C Office	D Residential
453110	Florists	P	P		
453210	Office Supplies and Stationary Stores	P	P		
453220	Gift, Novelty, and Souvenir Stores	P	P		
453310	Used Merchandise Stores (No building materials, outside sales, exchange or drop-off of used goods)	P	P		
453910	Pet and Pet Supplies Stores	P	P		
453920	Art Dealers	P	P		
453991	Tobacco Stores	P	P		
453998	All Other Miscellaneous Store Retailers (except auction houses, pool and hot tub sales/supplies and cemetery memorial dealers)	P	P		
492210	Local Messengers and Local Delivery	P	P		
493110	General Warehousing and Storage	P	P		
493120	Refrigerated Warehousing and Storage	P	P		
512240	Sound Recording Industries	P	P	P	
512290	Other Sound Recording Industries	P	P	P	
515111	Radio Networks	P	P	P	
518210	Data Processing, Hosting, and Related Services	P	P	P	
519110	News Syndicates	P	P	P	
519120	Libraries and Archives	P	P	P	
519130	Internet Publishing and Broadcasting and Web Search Portals	P	P	P	
519190	All Other Information Services	P	P	P	
521110	Monetary Authorities-Central Bank	P	P	P	
522110	Commercial Banking	P	P	P	
522120	Savings Institutions	P	P	P	
522130	Credit Unions	P	P	P	
522190	Other Depository Credit Intermediation	P	P	P	
522210	Credit Card Issuing	P	P	P	
522220	Sales Financing	P	P	P	
522291	Consumer Lending	P	P	P	
522292	Real Estate Credit	P	P	P	
522293	International Trade Financing	P	P	P	
522294	Secondary Market Financing	P	P	P	
522298	All Other Non-Depository Credit Intermediation (Incl. Pawnshops)	P	P	P	
522310	Mortgage and Non-Mortgage Loan Brokers	P	P	P	
522320	Financial Transactions Processing, Reserve and Clearinghouse Activities	P	P	P	
523110	Investment Banking and Securities Dealing	P	P	P	
523120	Securities Brokerage	P	P	P	
523130	Commodity Contracts Dealing	P	P	P	
523140	Commodity Contracts Brokerage	P	P	P	
523210	Securities and Commodity Exchanges	P	P	P	
523910	Miscellaneous Intermediation	P	P	P	
523920	Portfolio Management	P	P	P	
523930	Investment Advice	P	P	P	
523991	Trust, Fiduciary, and Custody Activities	P	P	P	
523999	Miscellaneous Financial Investment Activities	P	P	P	
524113	Direct Life Insurance Carriers	P	P	P	
524114	Direct Health and Medical Insurance Carriers	P	P	P	
524126	Direct Property and Casualty Insurance Carriers	P	P	P	
524127	Direct Title Insurance Carriers	P	P	P	
524128	Other Direct Insurance (except Life, Health, and Medical) Carriers	P	P	P	
524130	Reinsurance Carriers	P	P	P	
524210	Insurance Agencies and Brokerages	P	P	P	
524291	Claims Adjusting	P	P	P	
524292	Third Party Administration of Insurance and Pension Funds	P	P	P	
524298	All Other Insurance Related Activities	P	P	P	
525110	Pension Funds	P	P	P	
525120	Health and Welfare Funds	P	P	P	
525190	Other Insurance Funds	P	P	P	
525910	Open-End Investment Funds	P	P	P	
525920	Trusts, Estates, and Agency Accounts	P	P	P	
525990	Other Financial Vehicles	P	P	P	
531110	Lessors of Non-Residential Buildings and Dwellings	P	P	P	
531120	Lessors of Non-Residential Buildings (except Miniwarehouses)	P	P	P	
531190	Lessors of Other Real Estate Property	P	P	P	
531210	Offices of Real Estate Agents and Brokers	P	P	P	

**OLIA VILLAGE PLANNED MIXED-USE DEVELOPMENT
TABLE A - PERMITTED USES**

P = Permitted Use					
Use Code	2012 NAICS Title	Zoning District - Olia PMD			
		A Main	B Mixed	C Office	D Residential
531311	Residential Property Managers	P	P	P	
531312	Non-Residential Property Managers	P	P	P	
531320	Offices of Real Estate Appraisers	P	P	P	
531390	Other Activities Related to Real Estate	P	P	P	
532111	Passenger Car Rental	P	P	P	
532112	Passenger Car Leasing	P	P	P	
532120	Truck, Utility Trailer, and RV (Recreational Vehicle) Rental and Leasing	P	P	P	
532210	Consumer Electronics and Appliances Rental	P	P	P	
532220	Formal Wear and Costume Rental	P	P	P	
532230	Video Tape and Disc Rental	P	P	P	
532291	Home Health Equipment Rental	P	P	P	
541110	Offices of Lawyers	P	P	P	
541120	Office of Notaries	P	P	P	
541191	Title Abstract and Settlement Offices	P	P	P	
541199	All Other Legal Services	P	P	P	
541211	Offices of Certified Public Accountants	P	P	P	
541213	Tax Preparation Services	P	P	P	
541214	Payroll Services	P	P	P	
541219	Other Accounting Services	P	P	P	
541310	Architectural Services	P	P	P	
541320	Landscape Architectural Services	P	P	P	
541330	Engineering Services	P	P	P	
541340	Drafting Services	P	P	P	
541350	Building Inspection Services	P	P	P	
541360	Geophysical Surveying and Mapping Services	P	P	P	
541370	Surveying and Mapping (except Geophysical) Services	P	P	P	
541380	Testing Laboratories	P	P	P	
CC541381	Medical Marijuana Testing Facility, as defined under Section 405.120	P	P	P	
541410	Interior Design Services	P	P	P	
541420	Industrial Design Services	P	P	P	
541430	Graphic Design Services	P	P	P	
541490	Other Specialized Design Services	P	P	P	
541511	Custom Computer Programming Services	P	P	P	
541512	Computer Systems Design Services	P	P	P	
541513	Computer Facilities Management Services	P	P	P	
541519	Other Computer Related Services	P	P	P	
541611	Administrative Management and General Management Consulting Services	P	P	P	
541612	Human Resources Consulting Services	P	P	P	
541613	Marketing Consulting Services	P	P	P	
541614	Process, Physical Distribution, and Logistics Consulting Services	P	P	P	
541618	Other Management Consulting Services	P	P	P	
541620	Environmental Consulting Services	P	P	P	
541690	Other Scientific and Technical Consulting Services	P	P	P	
541711	Research and Development in Biotechnology	P	P	P	
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	P	P	P	
541720	Research and Development in the Social Sciences and Humanities	P	P	P	
541810	Advertising Agencies	P	P	P	
541820	Public Relations Agencies	P	P	P	
541830	Media Buying Agencies	P	P	P	
541840	Media Representatives	P	P	P	
541850	Outdoor Advertising	P	P	P	
541860	Direct Mail Advertising	P	P	P	
541870	Advertising Material Distribution Services	P	P	P	
541890	Other Services Related to Advertising	P	P	P	
541910	Marketing Research and Public Opinion Polling	P	P	P	
541921	Photography Studios, Portrait	P	P	P	
541922	Commercial Photography	P	P	P	
541930	Translation and Interpretation Services	P	P	P	
541940	Veterinary Services	P	P	P	
541990	All Other Professional, Scientific, and Technical Services	P	P	P	
551111	Offices of Bank Holding Companies	P	P	P	
551112	Offices of Other Holding Companies	P	P	P	
551114	Corporate, Subsidiary, and Regional Managing Offices	P	P	P	
CC561100	Business Enterprise Center (as defined in Chapter 405.120, Definition of Terms)	P	P	P	

**OLIA VILLAGE PLANNED MIXED-USE DEVELOPMENT
TABLE A - PERMITTED USES**

P = Permitted Use					
Use Code	2012 NAICS Title	Zoning District - Olia PMD			
		A Main	B Mixed	C Office	D Residential
561110	Office Administrative Services	P	P	P	
561210	Facilities Support Services	P	P	P	
561311	Employment Placement Agencies	P	P	P	
561312	Executive Search Services	P	P	P	
561320	Temporary Help Services	P	P	P	
561330	Professional Employer Organizations	P	P	P	
561410	Document Preparation Services	P	P	P	
561421	Telephone Answering Service	P	P	P	
561422	Telemarketing Bureaus and Other Contact Centers	P	P	P	
561431	Private Mail Centers	P	P	P	
561439	Other Business Service Centers (including Copy Shops)	P	P	P	
561440	Collection Agencies	P	P	P	
561450	Credit Bureaus	P	P	P	
561491	Repossession Services	P	P	P	
561492	Court Reporting and Stenotype Services	P	P	P	
561499	All Other Business Support Services	P	P	P	
561510	Travel Agencies	P	P	P	
561520	Tour Operators	P	P	P	
561591	Convention and Visitors Bureaus	P	P	P	
561599	All Other Travel Arrangement and Reservation Services	P	P	P	
621111	Offices of Physicians (except Mental Health Specialists)	P	P	P	
621112	Offices of Physicians, Mental Health Specialists	P	P	P	
621210	Offices of Dentists	P	P	P	
621310	Offices of Chiropractors	P	P	P	
621320	Offices of Optometrists	P	P	P	
621330	Offices of Mental Health Practitioners (except Physicians)	P	P	P	
621340	Offices of Physical, Occupational and Speech Therapists, and Audiologists	P	P	P	
621391	Office of Podiatrists	P	P	P	
621399	Offices of All Other Miscellaneous Health Practitioners	P	P	P	
621410	Family Planning Centers			P	
621420	Outpatient Mental Health and Substance Abuse Centers			P	
621491	HMO Medical Centers			P	
621492	Kidney Dialysis Centers			P	
621493	Freestanding Ambulatory Surgical and Emergency Centers			P	
621498	All Other Outpatient Care Centers			P	
621511	Medical Laboratories			P	
621512	Diagnostic Imaging Centers			P	
621610	Home Health Care Services			P	
713910	Golf Course and Country Clubs		P	P	
713940	Fitness and Recreational Sports Centers	P	P	P	
713950	Bowling Centers		P	P	
713990	All Other Amusement and Recreation Industries (except gun and shooting clubs)		P	P	
721110	Hotels (except Casino Hotels) and Motels	P	P	P	
722410	Drinking Places (Alcoholic Beverages)	P	P	P	
722511	Full-Service Restaurants	P	P	P	
722513	Limited-Service Restaurants	P	P	P	
722514	Cafeterias, Grill Buffets, and Buffets	P	P	P	
722515	Snack and Non-Alcoholic Beverage Bars	P	P	P	
811111	General Automotive Repair	P	P	P	
811112	Automotive Exhaust System Repair	P	P	P	
811113	Automotive Transmission Repair	P	P	P	
811118	Other Automotive Mechanical and Electrical Repair and Maintenance	P	P	P	
811121	Automotive Body, Paint, and Interior Repair and Maintenance	P	P	P	
811122	Automotive Glass Replacement Shops	P	P	P	
811191	Automotive Oil Change and Lubrication Shops	P	P	P	
811430	Footwear and Leather Goods Repair	P	P		
811490	Other Personal and Household Goods Repair and Maintenance	P	P		
812111	Barber Shops	P	P		
812112	Beauty Salons	P	P		
812113	Nail Salons	P	P		
812191	Diet and Weight Reducing Centers	P	P		
812199	Other Personal Care Services (except escort services, massage parlors, steam baths, tattoo parlors, permanent makeup salons and Turkish baths)	P	P		
812922	One-Hour Photofinishing	P	P		

**OLIA VILLAGE PLANNED MIXED-USE DEVELOPMENT
TABLE A - PERMITTED USES**

P = Permitted Use					
Use Code	2012 NAICS Title	Zoning District - Olia PMD			
		A Main	B Mixed	C Office	D Residential
812930	Parking Lots and Garages	P	P	P	
813319	Other Social Advocacy Organizations	P	P	P	
813410	Civic and Social Organizations	P	P	P	
813910	Business Associations	P	P	P	
813920	Professional Organizations	P	P	P	
813930	Labor Unions and Similar Labor Organizations	P	P	P	
813940	Political Organizations	P	P	P	
813990	Other Similar Organizations (except Business, Professional, Labor, and Political Organizations)	P	P	P	
814110	Private Households, Single-Family Residential				P
CC814111	Attached Single-Family Residential (townhouses or duplexes)				P
CC814120	Low-Density Multifamily Residential (up to 6 single family units per acre)				P
CC814130	Medium-Density Multifamily Residential (up to 20 single family units per acre)				P
CC814140	High-Density Multifamily Residential (more than 20 single family units per acre)	P	P		
921110	Executive Offices	P	P	P	
921120	Legislative Bodies	P	P	P	
921130	Public Finance Activities	P	P	P	
921140	Executive and Legislative Offices, Combined	P	P	P	
921190	Other General Government Support	P	P	P	
922110	Courts	P	P	P	
922120	Police Protection	P	P	P	
922130	Legal Counsel and Prosecution	P	P	P	
922160	Fire Protection	P	P	P	
922190	Other Justice, Public Order, and Safety Activities	P	P	P	
923110	Administration of Education Programs	P	P	P	

Path: M:\JackMatthews\Draw\23005201-00_BayerSiteDesign\Draw\Exhibit01-SITE-CONCEPT\1-SITE-CONCEPT-PLAN.dwg
Date: Friday, August 11, 2023 10:03 AM

SITE CONCEPT PLAN

OLIA VILLAGE

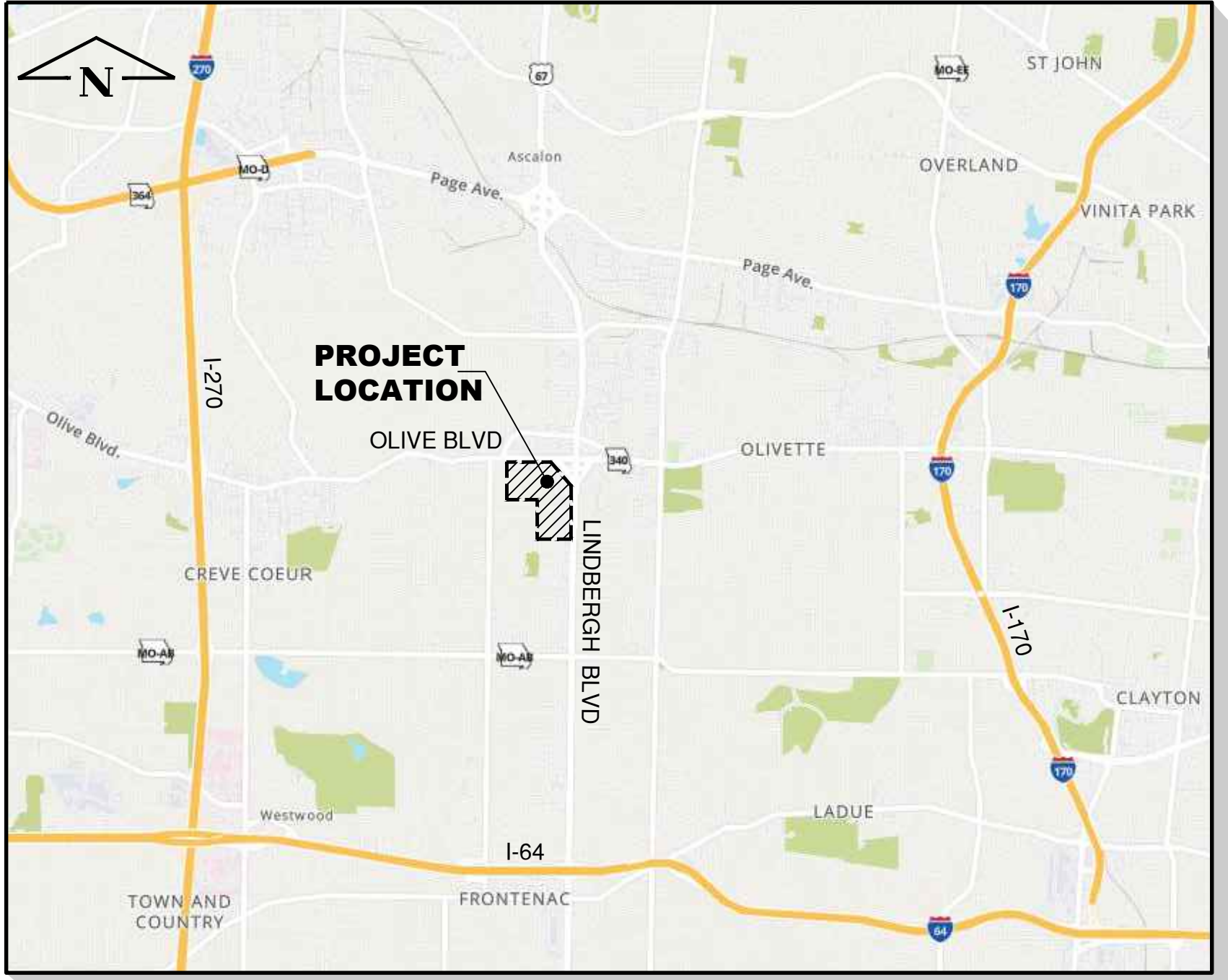
CREVE COEUR, MO

A TRACT OF LAND BEING PART OF LOTS 9, 10, 11 AND 12 OF MAJOR THOMAS SUBDIVISION
SITUATED IN THE SOUTHWEST QUARTER AND THE NORTHWEST QUARTER OF SECTION 1
TOWNSHIP 45 NORTH, RANGE 5 EAST, CITY OF CREVE COEUR, ST. LOUIS COUNTY, MISSOURI

AUGUST 11, 2023

SITE INFORMATION	
SITE ACREAGE	= 95.8 AC ±
SITE ADDRESS	= 10300 OLIVE BOULEVARD, CREVE COEUR, MO 63141
OWNER	= 10300 OLIVE, LLC
LOCATOR NUMBER	= 17M420026
EXISTING ZONING	= R0 - RESEARCH & PARK DISTRICT
PROPOSED ZONING	= PMD - PLANNED MIXED-USE DEVELOPMENT
CITY	= CREVE COEUR, MO
ZIP CODE	= 63141
FEMA FLOOD MAP	= 29189C0191K (REVISED 2/4/2015) (ZONE X) 29189C0192K (REVISED 2/4/2015) (ZONE X)
WUNNENBERG MAP	= PAGE 24, SECTIONS 17T & 18T
SCHOOL DISTRICT	= LADUE SCHOOL DISTRICT
FIRE DISTRICT	= CREVE COEUR FIRE DISTRICT
WATER SHED	= RIVER DES PERES WATERSHED, DEER CREEK SUB-SHED
SEWER DISTRICT	= METROPOLITAN ST. LOUIS SEWER DISTRICT
CABLE SERVICE	= CHARTER COMMUNICATIONS
ELECTRIC SERVICE	= AMEREN MISSOURI
GAS SERVICE	= SPIRE ENERGY
PHONE SERVICE	= AT&T
WATER SERVICE	= MISSOURI AMERICAN WATER COMPANY
WATER SERVICE	= CITY OF ST. LOUIS WATER DEPARTMENT (TRANSMISSION MAINS)
BUILDING TYPE	= N/A (NO BUILDINGS PROPOSED)
BLDG. CONST. TYPE	= N/A (NO BUILDINGS PROPOSED)

OWNER / DEVELOPER :
10300 OLIVE, LLC
1034 S. BRENTWOOD, SUITE 2300 PH-1D
ST. LOUIS, MO 63117
MATT PFUND
(618) 692-9502



VICINITY MAP
(NOT TO SCALE)

SHEET INDEX	
C-100	TITLE SHEET
C-101	SITE CONCEPT PLAN OVERVIEW
C-102	PARCEL PLAN
C-103	SETBACK & BUFFER PLAN
C-104	PHASING PLAN
C-105	GRADING PLAN
C-106	UTILITY & DRAINAGE PLAN
C-107	STREET PLAN
C-108	PEDESTRIAN PLAN
C-109	SITE SECTIONS
A-101	ARCHITECTURAL SITE PLAN
A-102	BIRD'S EYE VIEW
A-103.1 TO A103.4	SITE LIGHTING
A-104	ELEVATIONS
A-105	MATERIALS
A-106	RENDERED VIEW
LD-100	TREE PRESERVATION PLAN
L-100	OVERALL CONCEPT PLANTING PLAN
L-141	MAIN STREET CONCEPT PLANTING PLAN

FULL BUILD-OUT SITE CALCULATION NOTES

- ULTIMATE GROSS FLOOR AREA RATIO (FAR) = 0.59
- IMPERVIOUS LAND COVERAGE SUMMARY:

IMPERVIOUS	= 51.3 AC (53.6%)
PERVIOUS	= 44.5 AC (46.4%)
TOTAL SITE	= 95.8 AC (100%)
- LAND SUMMARY :

DEVELOPABLE LOTS	= 64.7 AC
COMMON GROUND	= 22.9 AC
PRIVATE ROADWAY	= 1.4 AC
PUBLIC ROADWAY	= 8.2 AC
TOTAL SITE	= 95.8 AC

UTILITY NOTE :

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS, RECORDS AND INFORMATION, AND, THEREFORE DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NON-EXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE FACILITIES, STRUCTURES AND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS. THE UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319 RSMo.

DISCLAIMER :

CRAWFORD, MURPHY & TILLY, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR SERVICES PROVIDED BY OTHERS TO IMPLEMENT THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. CRAWFORD, MURPHY & TILLY, INC. HAS NO RESPONSIBILITY TO VERIFY FINAL IMPROVEMENTS AS SHOWN ON THIS PLAN UNLESS SPECIFICALLY ENGAGED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

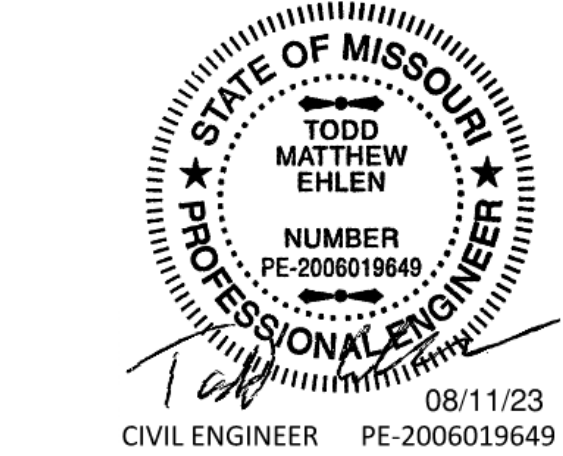
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OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

MARK DATE DESCRIPTION

PROJECT NO.: 23005201-00
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SHEET TITLE

TITLE SHEET

C-100

SHEET 1 OF 4

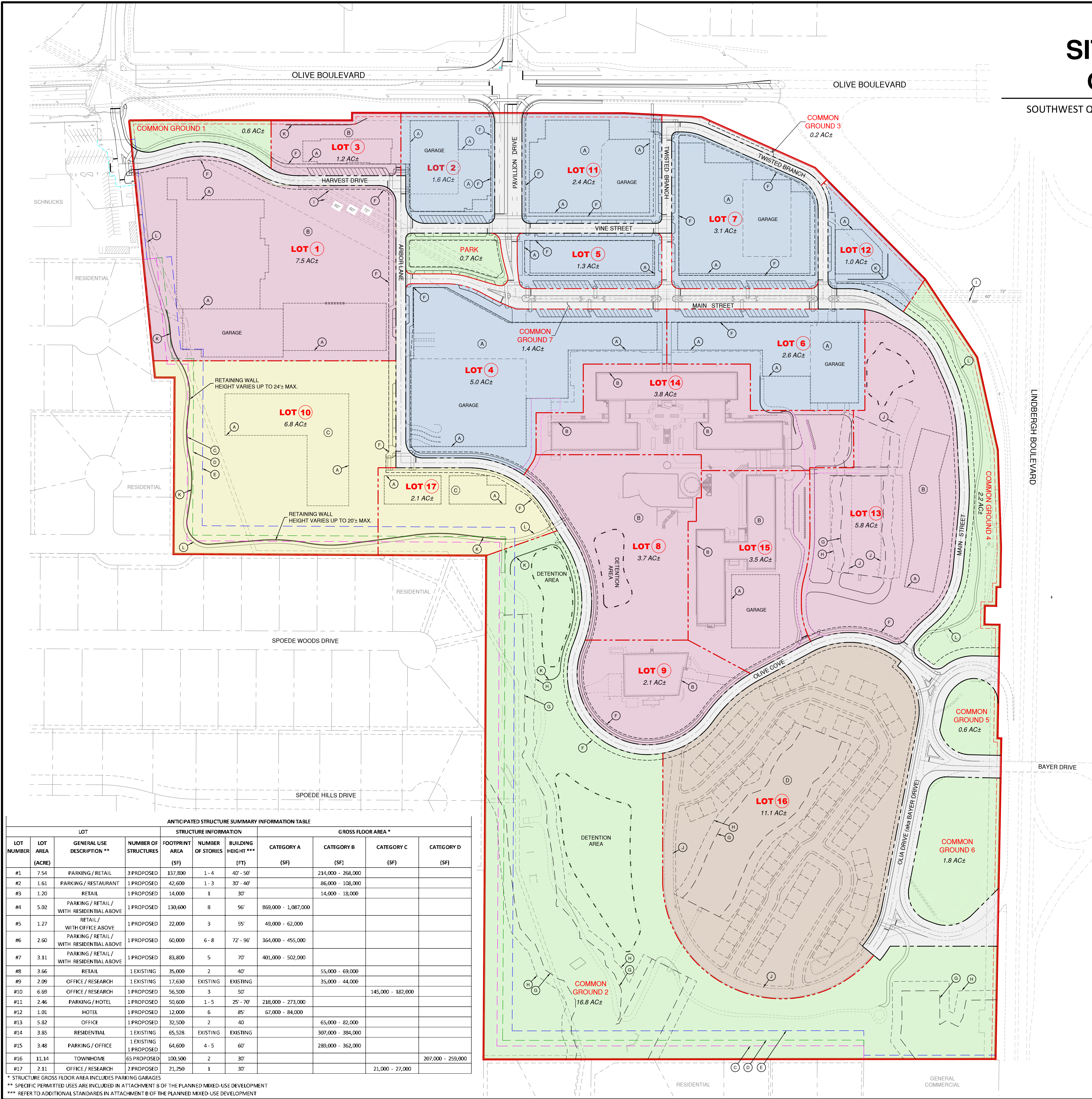
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ANTICIPATED STRUCTURE SUMMARY INFORMATION TABLE										
LOT			STRUCTURE INFORMATION			GROSS FLOOR AREA *				
LOT NUMBER	LOT AREA (ACRE)	GENERAL USE DESCRIPTION **	NUMBER OF STRUCTURES	FOOTPRINT AREA (SF)	NUMBER OF STORIES	BUILDING HEIGHT *** (FT)	CATEGORY A (SF)	CATEGORY B (SF)	CATEGORY C (SF)	CATEGORY D (SF)
#1	7.54	PARKING / RETAIL	3 PROPOSED	137,800	1 - 4	40' - 50'		214,000 - 268,000		
#2	1.61	PARKING / RESTAURANT	1 PROPOSED	42,600	1 - 3	30' - 40'		86,000 - 108,000		
#3	1.20	RETAIL	1 PROPOSED	14,000	1	30'		14,000 - 18,000		
#4	5.02	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	130,600	8	96'	869,000 - 1,087,000			
#5	1.27	WITH OFFICE ABOVE	1 PROPOSED	22,000	3	55'	49,000 - 62,000			
#6	2.60	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	60,000	6 - 8	72' - 96'	364,000 - 455,000			
#7	3.11	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	83,800	5	70'	401,000 - 502,000			
#8	3.66	RETAIL	1 EXISTING	35,000	2	40'		55,000 - 69,000		
#9	2.09	OFFICE / RESEARCH	1 EXISTING	17,630	EXISTING	EXISTING		35,000 - 44,000		
#10	6.69	OFFICE / RESEARCH	1 PROPOSED	56,500	3	50'			145,000 - 182,000	
#11	2.46	PARKING / HOTEL	1 PROPOSED	50,600	1 - 5	25' - 70'	218,000 - 273,000			
#12	1.01	HOTEL	1 PROPOSED	12,000	6	85'	67,000 - 84,000			
#13	5.82	OFFICE	1 PROPOSED	32,500	2	40'		65,000 - 82,000		
#14	3.85	RESIDENTIAL	1 EXISTING	65,528	EXISTING	EXISTING		307,000 - 384,000		
#15	3.48	PARKING / OFFICE	1 EXISTING 1 PROPOSED	64,600	4 - 5	60'		289,000 - 362,000		
#16	11.14	TOWNHOME	65 PROPOSED	100,500	2	30'				207,000 - 259,000
#17	2.11	OFFICE / RESEARCH	2 PROPOSED	21,250	1	30'			21,000 - 27,000	

* STRUCTURE GROSS FLOOR AREA INCLUDES PARKING GARAGES

** SPECIFIC PERMITTED USES ARE INCLUDED IN ATTACHMENT B OF THE PLANNED MIXED-USE DEVELOPMENT

*** REFER TO ADDITIONAL STANDARDS IN ATTACHMENT B OF THE PLANNED MIXED-USE DEVELOPMENT



SITE OVERVIEW

OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- CONCEPTUAL BLDG FOOTPRINT
- PROPOSED EASEMENT
- CATEGORY A - MAIN STREET DEVELOPMENT
- CATEGORY B - MIXED USE DEVELOPMENT
- CATEGORY C - GENERAL OFFICE DEVELOPMENT
- CATEGORY D - RESIDENTIAL DEVELOPMENT

KEYNOTES

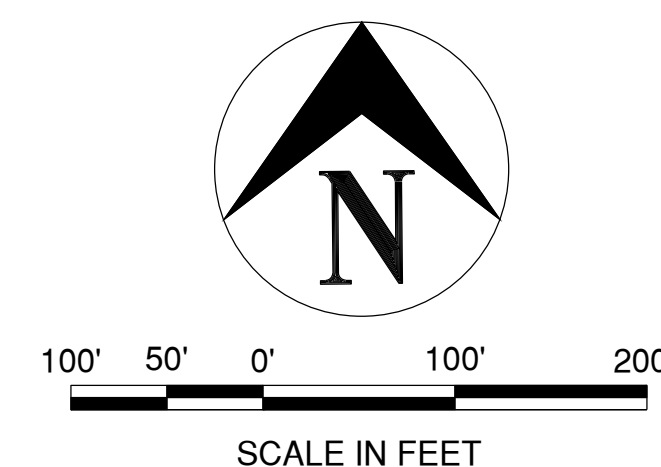
- (A) CONCEPTUAL BUILDING FOOTPRINT (TYP)
- (B) EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
- (C) 35' RESIDENTIAL BUFFER YARD (TYP)
- (D) 15' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
- (E) 40' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
- (F) 10' MINIMUM PROPOSED ROADWAY IMPROVEMENT MAINTENANCE UTILITY SEWER SIDEWALK EASEMENT (PRIMUMSSE)
- (G) 50' NATURAL VEGETATION BUFFER
- (H) 25' NO-IMPERVIOUS BUFFER
- (I) EXISTING STL WATER CO. WATERMAIN CONDUITS
- (J) EXISTING PARKING LOT / DRIVE TO REMAIN
- (K) PROPOSED SITE RETAINING WALL (TYP)
MECHANICALLY STABILIZED EARTH OR SEGMENTAL BLOCK WALL
(TO BE DETERMINED UPON FINAL DESIGN)
- (L) PROPOSED WALKING TRAIL OR SIDEWALK (TYP)
SEE PEDESTRIAN MOBILITY PLAN



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OLIA VILLAGE DEVELOPMENT

LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

CREVE COEUR, MO

MARK DATE DESCRIPTION

PROJECT NO.: 23005201-00

CAD DWG FILE: SITE-CONCEPT-PLAN.DWG

DESIGNED BY: TME/JFM

DRAWN BY: JFM

CHECKED BY: CJS

APPROVED BY: ---

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C-101

SHEET - OF 4

PARCEL PLAN
OLIA VILLAGE

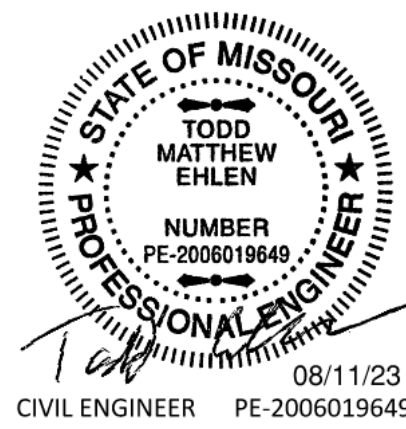
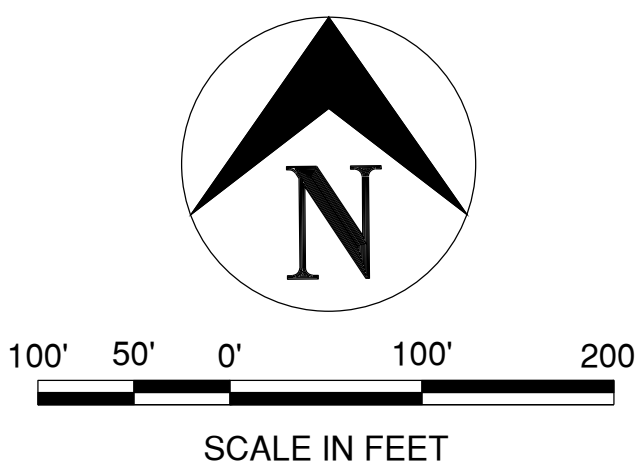
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LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN



LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- CONCEPTUAL BLDG FOOTPRINT
- PROPOSED EASEMENT
- CATEGORY A - MAIN STREET DEVELOPMENT
- CATEGORY B - MIXED USE DEVELOPMENT
- CATEGORY C - GENERAL OFFICE DEVELOPMENT
- CATEGORY D - RESIDENTIAL DEVELOPMENT

KEYNOTES

- CONCEPTUAL BUILDING FOOTPRINT (TYP)
- EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
- 35' RESIDENTIAL BUFFER YARD (TYP)
- 15' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
- 40' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
- 10' SETBACK (TYP)
- 50' NATURAL VEGETATION BUFFER
- 25' NO-IMPERVIOUS BUFFER

PARKING NOTES

- TYPICAL PERPENDICULAR PARKING STALLS ARE 9' WIDE x 19' LONG.
TYPICAL ANGLED PARKING (60°) STALLS ARE 9' WIDE x 21' LONG TO FACE OF CURB (LENGTH MEASURED PERPENDICULAR TO FACE OF CURB).
- TYPICAL PARALLEL PARKING STALLS ARE 9' WIDE x 23' LONG.
- EXACT NUMBER AND LOCATION OF ADA STALLS TO BE DETERMINED PER THE FINAL LOT LAYOUT AND WILL MEET THE REQUIREMENTS OF CREVE COEUR AND FEDERAL ACCESSIBILITY DESIGN STANDARDS.

ANTICIPATED PARKING SUMMARY																			
LOT	GENERAL USE DESCRIPTION	ANTICIPATED GENERAL RETAIL FLOOR AREA	ANTICIPATED GENERAL OFFICE FLOOR AREA	INTERIOR STORAGE	ANTICIPATED RESTAURANT FLOOR AREA				HOTELS AND ACCOMMODATIONS		ANTICIPATED NUMBER OF MULTI-FAMILY RESIDENTIAL UNITS		ANTICIPATED NUMBER OF SINGLE-FAMILY RESIDENTIAL UNITS		TOTAL REQUIRED PARKING **	TOTAL PROVIDED PARKING ***	PROVIDED OFF-STREET PARKING	PROVIDED ON-STREET PARKING	PROVIDED STRUCTURED PARKING
		(SF)	(SF)		(SF)	(SF)	(SEATS)	(SF)	(SEATS)	(SF)	(UNITS)	(SF)	(UNITS)	(SF)	(UNITS)	(STALLS)	(STALLS)	(STALLS)	(STALLS)
CATEGORY A, B, & C																			
#1	RETAIL	120,000													408	551	270	3	278
#2	RESTAURANT / RETAIL / OFFICE	6,700	6,700		11,300	380 ±	750	50 ±							207	212		16	196
#3	RESTAURANT / RETAIL	11,500			2,500	85 ±	300	20 ±							77	20		20	
#4	RETAIL / RESIDENTIAL / MULTI-FAMILY		66,000		8,000	270 ±	450	30 ±			334,000	290 ±			700	1,916		35	1,881
#5	RETAIL / RESTAURANT / OFFICE	6,800	28,000		14,300	480 ±	450	30 ±							297	41		41	
#6	RETAIL / RESTAURANT / MULTI-FAMILY	45,000			2,200	75 ±	450	30 ±			175,000	170 ±			439	425		30	395
#7	RETAIL / RESTAURANT / MULTI-FAMILY	25,000			5,000	170 ±	450	30 ±			242,000	220 ±			472	432		42	390
#8	RETAIL	55,600													190	0			
#9	OFFICE / RESEARCH		35,500												100	0			
#10	OFFICE / RESEARCH		145,500												409	391	384	7	
#11	HOTEL & ACCOMMODATIONS				7,600	255 ±	750	50 ±	81,500	130 ±					257	411		21	390
#12	HOTEL & ACCOMMODATIONS								67,000	130 ±					144	5		5	
#13	OFFICE	65,000													183	222	162		60
#14	STORAGE / MULTI-FAMILY			90,900							216,800	190 ±			306	0			
#15	OFFICE		160,000												449	390			390
#17	OFFICE / RESEARCH	21,250													60	42	42		
PARK	PARK															16		16	
TOTAL CATEGORY A, B, & C:															4,697	5,074	858	236	3,980
SHARED-USE PARKING EXCESS ****:															377				
CATEGORY D																			
#16	SINGLE FAMILY TOWNHOME												207,000	130	260	260	130	130	
TOTAL CATEGORY D:															260	260			

* THE ANTICIPATED NON-PARKING STRUCTURE GROSS FLOOR AREA IS BASED UPON THE LESSER AREA SHOWN ON THE ANTICIPATED STRUCTURE SUMMARY INFORMATION TABLE AND IS SUBJECT TO CHANGE.
** THE PROPOSED DEVELOPMENT ORDINANCE ALLOWS FOR A 15% REDUCTION IN OVERALL REQUIRED PARKING DUE TO SHARED-USED PARKING IN CATEGORY A, B, & C.
*** TOTAL PROVIDED PARKING COUNT DOES NOT ACCOUNT FOR REQUIRED ADA PARKING, TRASH ENCLOSURES OR LOADING SPACES.
EXACT PARKING COUNTS AND LOCATION TO BE DETERMINED BASED UPON SITE DEVELOPMENT PLAN FOR THE SPECIFIC LOT.
**** SHARED PARKING AGREEMENTS WILL OCCUR BETWEEN PARCELS.

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

CREVE COEUR, MO

PARCEL PLAN

C-102

SHEET - OF 4

SETBACK & BUFFER PLAN
OLIA VILLAGE

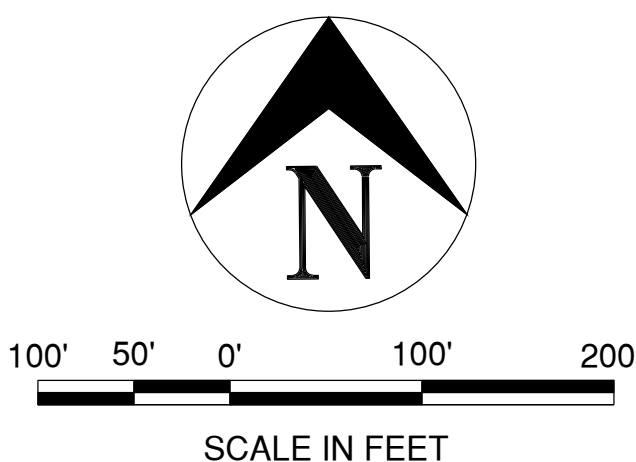
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CONSULTANTS:

SITE CONCEPT PLAN



LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- CONCEPTUAL BLDG FOOTPRINT
- PROPOSED EASEMENT
- PROPOSED BUILDING SETBACK

KEYNOTES

- (A) CONCEPTUAL BUILDING FOOTPRINT (TYP)
- (B) EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
- (C) 35' RESIDENTIAL BUFFER YARD (TYP)
- (D) 15' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
- (E) 40' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
- (F) 10' MINIMUM PROPOSED ROADWAY IMPROVEMENT MAINTENANCE UTILITY SEWER SIDEWALK EASEMENT (PRIMUSSE)
- (G) 50' NATURAL VEGETATION BUFFER
- (H) 25' NO-IMPERVIOUS BUFFER
- (I) EXISTING STREAM TO REMAIN

BUFFER NOTES

- EXISTING TRAILS AND PAVEMENTS WITHIN NATURAL OR IMPERVIOUS BUFFER LIMITS ARE ALLOWED TO REMAIN.
- ANY NEW OR IMPROVED PAVEMENTS SHALL NOT ENCR OACH INTO NATURAL OR IMPERVIOUS BUFFER LIMITS FURTHER THAN EXISTING PAVEMENT LIMITS.

SETBACK AND BUFFER REQUIREMENTS

SETBACK AND BUILDING LINE REQUIREMENTS WITHIN THE DEVELOPMENT (INTERNAL):

CATEGORY A - " MAIN STREET" SUB-DISTRICT:

- MINIMUM FRONT YARD - ZERO (0) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY B - MIXED USE SUB-DISTRICT:

- MINIMUM FRONT YARD - ZERO (0) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY C - GENERAL OFFICE SUB-DISTRICT:

- MINIMUM FRONT YARD - ZERO (0) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- MINIMUM DISTANCE BETWEEN BUILDINGS OR UNIT CLUSTERS - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

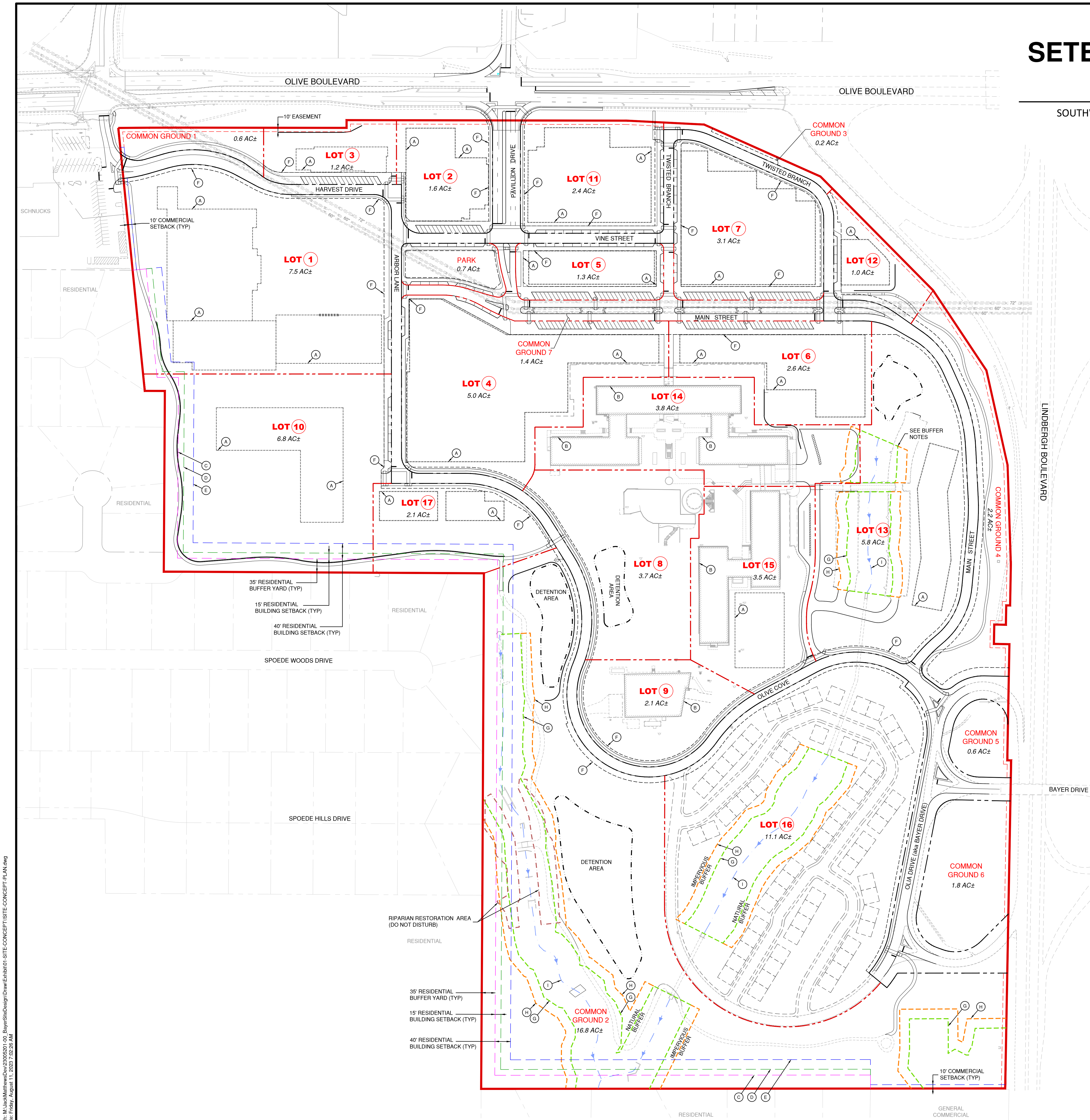
CATEGORY D - RESIDENTIAL SUB-DISTRICT:

- MINIMUM FRONT YARD - FIVE (5) FEET
- MINIMUM SIDE YARD - NONE OR SEVEN AND A HALF (7.5) FEET
- MINIMUM REAR YARD - FIVE (5) FEET
- MINIMUM DISTANCE BETWEEN BUILDINGS OR UNIT CLUSTERS - FIFTEEN (15) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

SETBACK AND BUILDING LINE REQUIREMENTS TO ADJACENT PARCELS:

- RESIDENTIAL :
- REQUIRED BUFFER YARD - THIRTY-FIVE (35) FEET.
 - MINIMUM RESIDENTIAL BUILDING SETBACK - FIFTEEN (15) FEET
 - MINIMUM COMMERCIAL BUILDING SETBACK - FORTY (40) FEET BEYOND BUFFER YARD.

- NON-RESIDENTIAL :
- MINIMUM BUILDING SETBACK - TEN (10) FEET.



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AUGUST 11, 2023

OLIA VILLAGE
DEVELOPMENT
LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

MARK DATE DESCRIPTION

PROJECT NO: 23005201-00

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DRAWN BY: JFM

CHECKED BY: CJS

APPROVED BY: ---

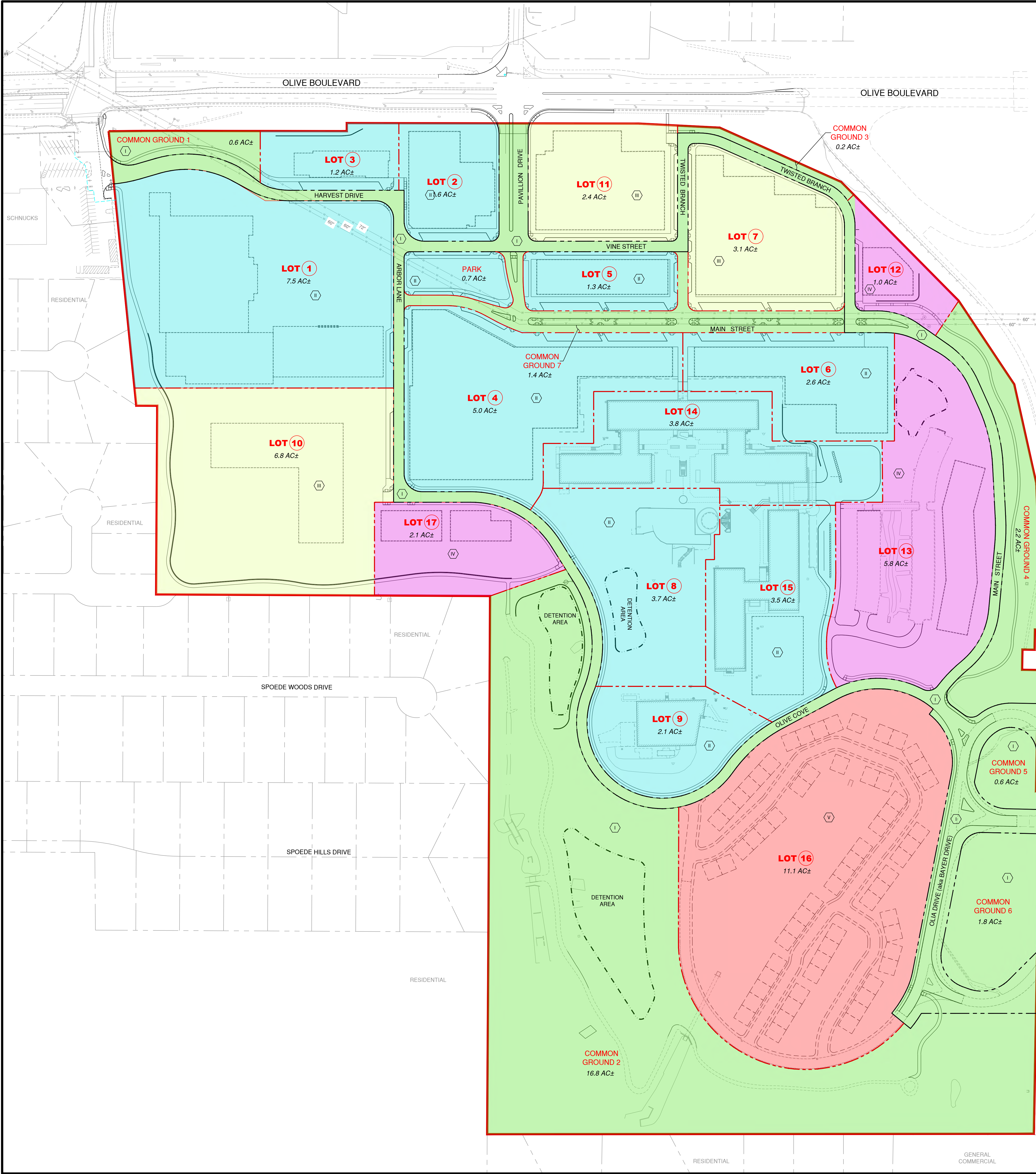
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SHEET TITLE

SETBACK & BUFFER
PLAN

C-103

SHEET - OF 4



PHASING PLAN

OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- CONCEPTUAL BLDG FOOTPRINT
- PROPOSED DEVELOPMENT PHASE I
- PROPOSED DEVELOPMENT PHASE II
- PROPOSED DEVELOPMENT PHASE III
- PROPOSED DEVELOPMENT PHASE IV
- PROPOSED DEVELOPMENT PHASE V

DEVELOPMENT PHASING	
PHASE I:	SITE CLEARING, MASS GRADING, SITE UTILITIES, ROADWAY CONSTRUCTION (OCTOBER 2023 - JULY 2025)
PHASE II:	BUILDING CONSTRUCTION ON LOTS 1, 2, 3, 4, 5, 6, 8, 9, 14 & 15 COMMON AREA DEVELOPMENTS (JANUARY 2024 - JULY 2026)
PHASE III:	BUILDING CONSTRUCTION ON LOTS 7, 11 & 10 (JANUARY 2025 - DECEMBER 2026)
PHASE IV:	BUILDING CONSTRUCTION ON LOTS 12, 13 & 17 (JANUARY 2026 - DECEMBER 2027)
PHASE V:	BUILDING CONSTRUCTION ON LOT 16 (JANUARY 2025 - DECEMBER 2028)

PREPARED BY:

CMT
Crawford, Murphy & Tilly

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ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN

100' 50' 0' 100' 200'

SCALE IN FEET

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AUGUST 11, 2023

**OLIA VILLAGE
DEVELOPMENT**

LINDBERGH & OLIVE BLVD

OLIA VILLAGE

THE HEART OF CREVE COEUR

CREVE COEUR, MO

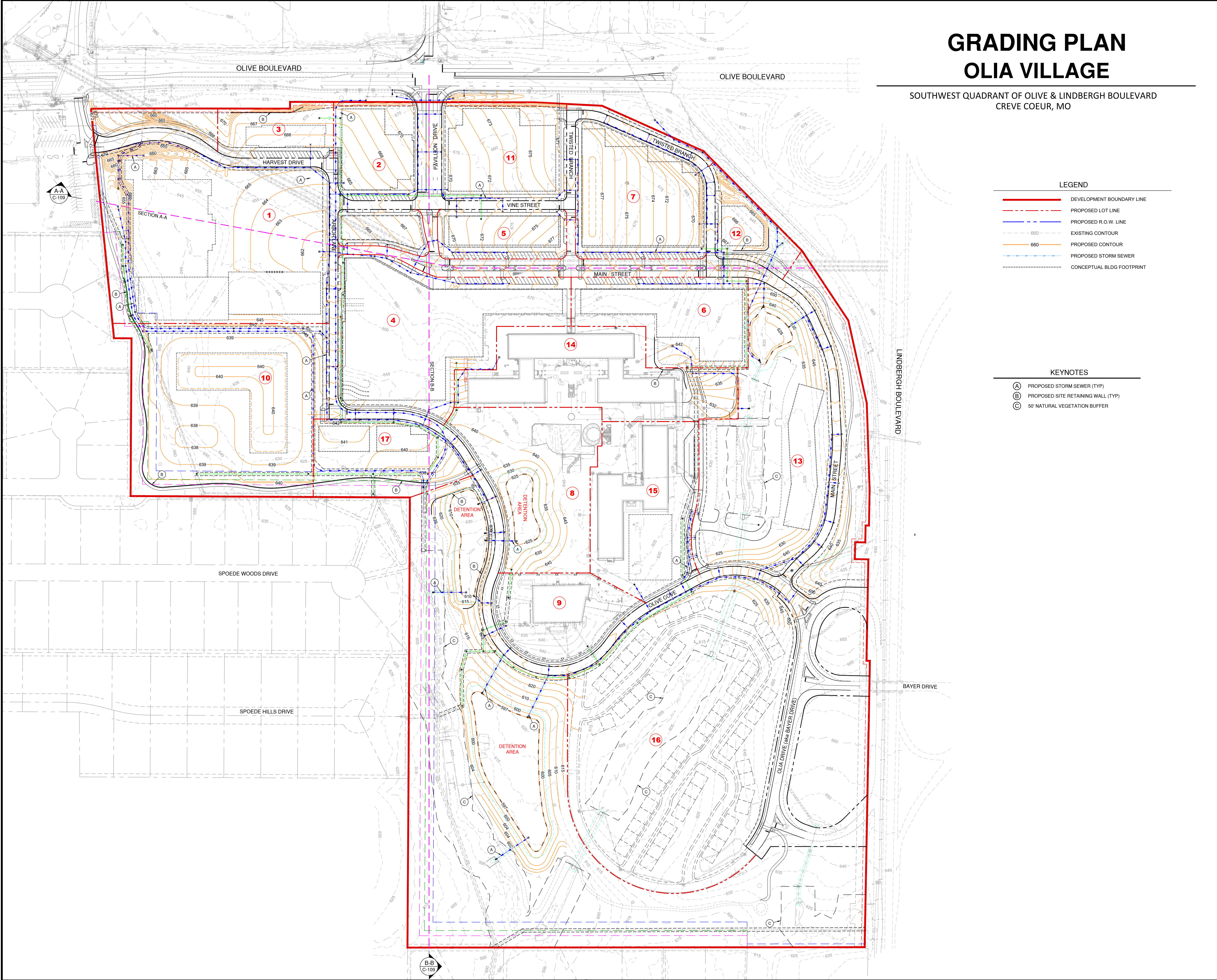
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PHASING PLAN

C-104

SHEET - OF 4



GRADING PLAN

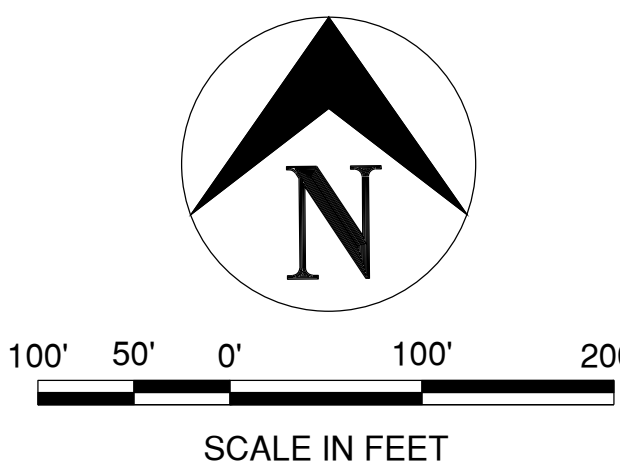
OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- LEGEND**
- DEVELOPMENT BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED R.O.W. LINE
 - EXISTING CONTOUR
 - PROPOSED CONTOUR
 - PROPOSED STORM SEWER
 - CONCEPTUAL BLDG FOOTPRINT

- KEYNOTES**
- (A) PROPOSED STORM SEWER (TYP)
 - (B) PROPOSED SITE RETAINING WALL (TYP)
 - (C) 50' NATURAL VEGETATION BUFFER

SITE CONCEPT PLAN



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AUGUST 11, 2023

OLIA VILLAGE DEVELOPMENT

LINDBERGH & OLIVE BLVD



MARK	DATE	DESCRIPTION
PROJECT NO.	23005201-00	
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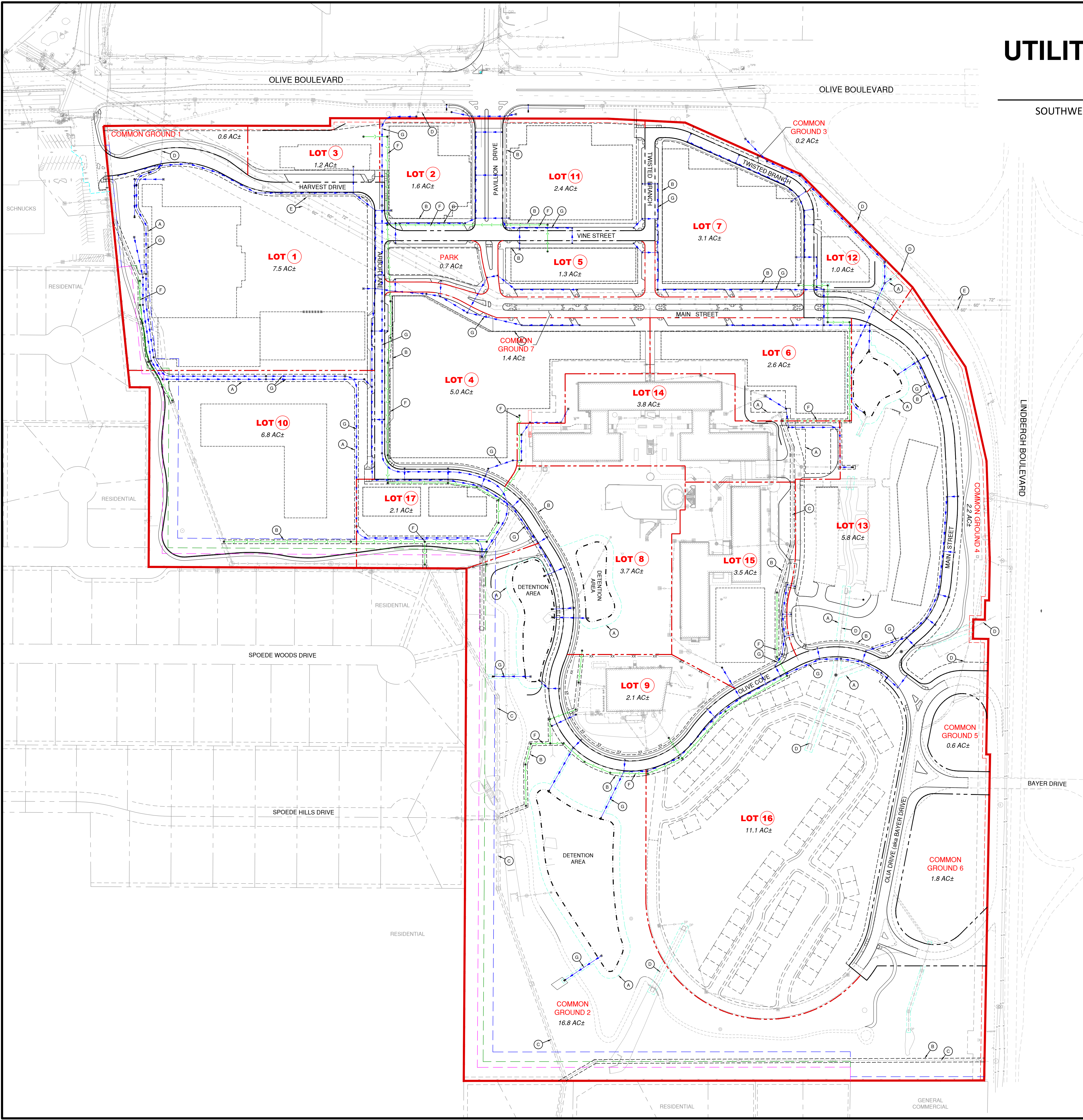
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GRADING PLAN

C-105

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UTILITY & DRAINAGE PLAN

OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- LEGEND**
- DEVELOPMENT BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED R.O.W. LINE
 - EXISTING SANITARY SEWER
 - EXISTING STORM SEWER
 - EXISTING WATER MAIN
 - PROPOSED SANITARY SEWER
 - PROPOSED STORM SEWER
 - CONCEPTUAL BLDG FOOTPRINT
 - PROPOSED EASEMENT

- KEYNOTES**
- (A) DRAINAGE EASEMENT (TYP)
 - (B) UTILITY EASEMENT (TYP)
 - (C) EXISTING SANITARY SEWER
 - (D) EXISTING STORM DRAINAGE SYSTEM
 - (E) EXISTING STL WATER CO. WATERMAIN CONDUITS
 - (F) PROPOSED SANITARY SEWER (TYP)
 - (G) PROPOSED STORM DRAINAGE SYSTEM (TYP)

PRELIMINARY BUILDOUT STORMWATER CALCULATIONS

PRE-DEVELOPED RUNOFF

TOTAL AREA	= 227.90 ac
WEIGHTED "CN" VALUE	= 81.59
AVERAGE "TC" VALUE	= 19.86 min
TOTAL FLOW	= 1,260± cfs

POST-DEVELOPED RUNOFF

TOTAL AREA	= 227.90 ac
WEIGHTED "CN" VALUE	= 86.54
AVERAGE "TC" VALUE	= 16.34 min
TOTAL FLOW	= 1,478± cfs

DIFFERENTIAL RUNOFF

PRE-DEVELOPED	= 1,260± cfs
POST-DEVELOPED	= 1,478± cfs
DIFFERENTIAL FLOW	= +218± cfs

100-YEAR, 24-HOUR PEAK FLOW RATE COMPARISON

PRE-DEVELOPED	= 404± cfs
POST-DEVELOPED	= 1,142± cfs
DIFFERENTIAL FLOW	= -738± cfs

THIS PROJECT HAS BEEN SUBMITTED TO MSD FOR CONCEPTUAL REVIEW (23CNCPB-00003).
ALL STORM SEWER AND DETENTION FACILITY CALCULATIONS AND REPORTS WILL BE SUBMITTED TO MSD AND CITY OF CREVE COEUR FOR FINAL APPROVAL PRIOR TO CONSTRUCTION.

PREPARED BY:

CMT
Crawford, Murphy & Tilly

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OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN

SCALE IN FEET

PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

**OLIA VILLAGE
DEVELOPMENT**

LINDBERGH & OLIVE BLVD

OLIA VILLAGE

THE HEART OF CREVE COEUR

CREVE COEUR, MO

MARK	DATE	DESCRIPTION
PROJECT NO: 23005201-00		
CAD DWG FILE: ISITE-CONCEPT-PLAN.DWG		
DESIGNED BY: TME/JFM		
DRAWN BY: JFM		
CHECKED BY: CJS		
APPROVED BY: ---		
COPYRIGHT: CRAWFORD, MURPHY & TILLY, INC. 2023		

SHEET TITLE

UTILITY & DRAINAGE PLAN

C-106

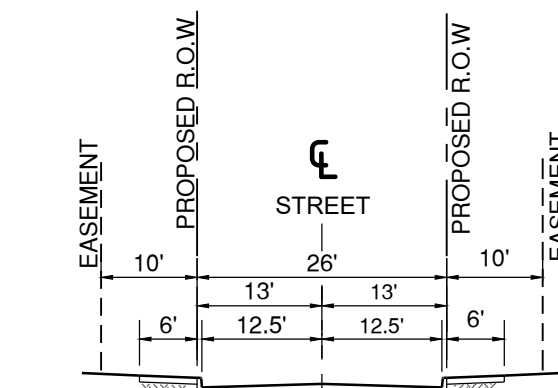
SHEET - OF 4

STREET PLAN
OLIA VILLAGE

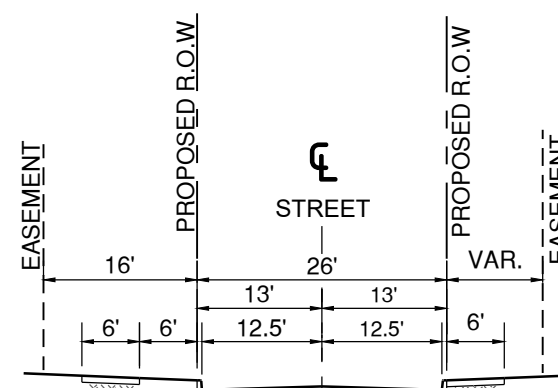
SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- LEGEND
- DEVELOPMENT BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED R.O.W. LINE
 - CONCEPTUAL BLDG FOOTPRINT
 - PROPOSED R.I.M.U.S.S. EASEMENT
 - PROPOSED ROADWAY (WITHIN RIGHT-OF-WAY)
 - PROPOSED ON-STREET PARKING (WITHIN EASEMENT)
 - PROPOSED PRIVATE ROADWAY

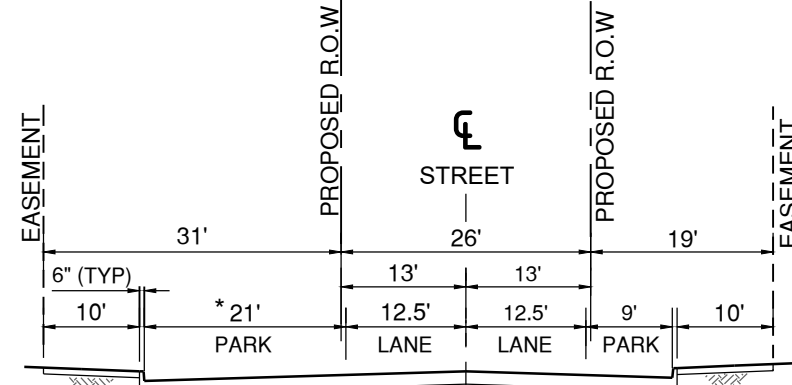
- KEYNOTES
- PROPOSED RIGHT-OF-WAY
 - PROPOSED ROADWAY IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, SIDEWALK (R.I.M.U.S.S.) EASEMENT
 - CONCEPTUAL FUTURE ENTRANCE
 - EXISTING STL WATER MAIN CONDUITS
 - EXISTING STL WATER MAIN EASEMENT



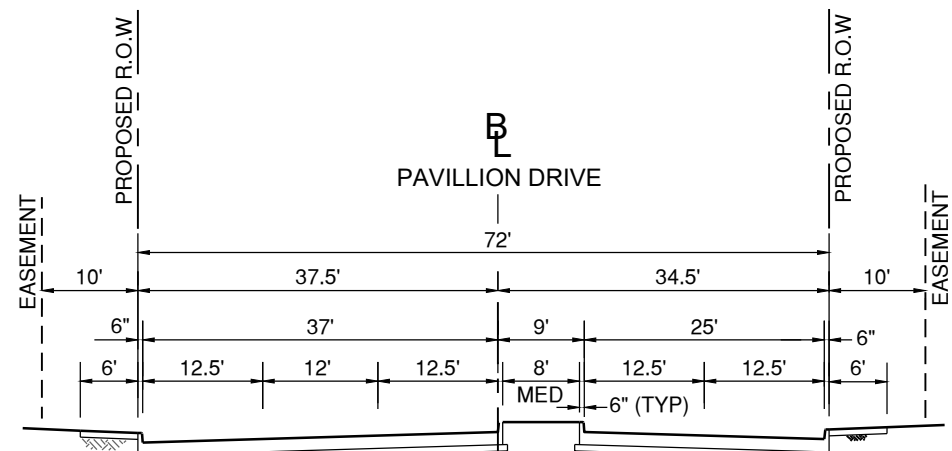
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STANDARD STREET SECTION



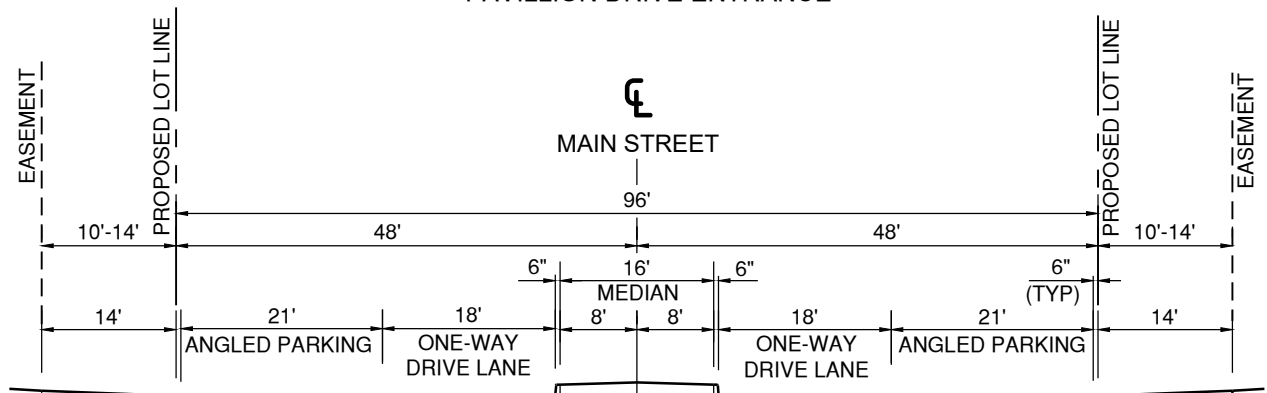
TYPICAL SECTION #2
OLIVE COVE



TYPICAL SECTION #3
STANDARD STREET SECTION
WITH ADJACENT PARKING



TYPICAL SECTION #4
PAVILLION DRIVE ENTRANCE



TYPICAL SECTION #5
MAIN STREET (MEDIAN SECTION)

ROADWAY INFORMATION		
STREET NAME	CENTERLINE LENGTH (FT)	LANE MILES
PUBLIC ROADWAYS		
PAVILLION DRIVE	380	0.360
MAIN STREET	1,210	0.458
HARVEST DRIVE	770	0.292
ARBOR LANE	750	0.284
OLIVE COVE	2,120	0.803
TWISTED BRANCH	1,000	0.379
VINE STREET	700	0.265
BAYER DRIVE	720	0.273
ON-RAMP FROM BAYER DRIVE	180	0.034
OFF-RAMP TO BAYER DRIVE	320	0.061
BAYER DRIVE (E/W)	220	0.083
SUB-TOTAL :	8,370	3.292
PRIVATE ROADWAYS		
PAVILLION DRIVE	180	0.068
MAIN STREET	1,120	0.424
TWISTED BRANCH	190	0.072
SUB-TOTAL :	1,490	0.564
TOTAL :	9,860	3.856

GENERAL NOTES

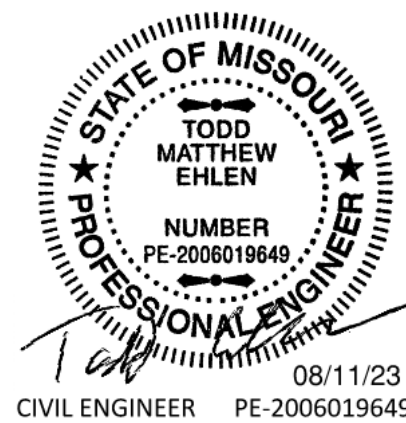
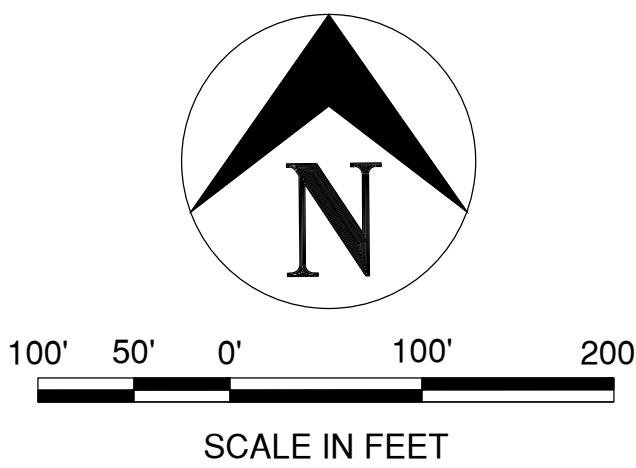
- EXISTING EASEMENTS NOT SHOWN FOR CLARITY.
- EXISTING UTILITIES NOT SHOWN FOR CLARITY.
- PROPOSED UTILITY EASEMENTS NOT SHOWN FOR CLARITY.
- PROPOSED UTILITIES NOT SHOWN FOR CLARITY.



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

MARK DATE DESCRIPTION
PROJECT NO.: 23005201-00
CAD DWG FILE: SITE-CONCEPT-PLAN.DWG
DESIGNED BY: TME/JFM
DRAWN BY: JFM
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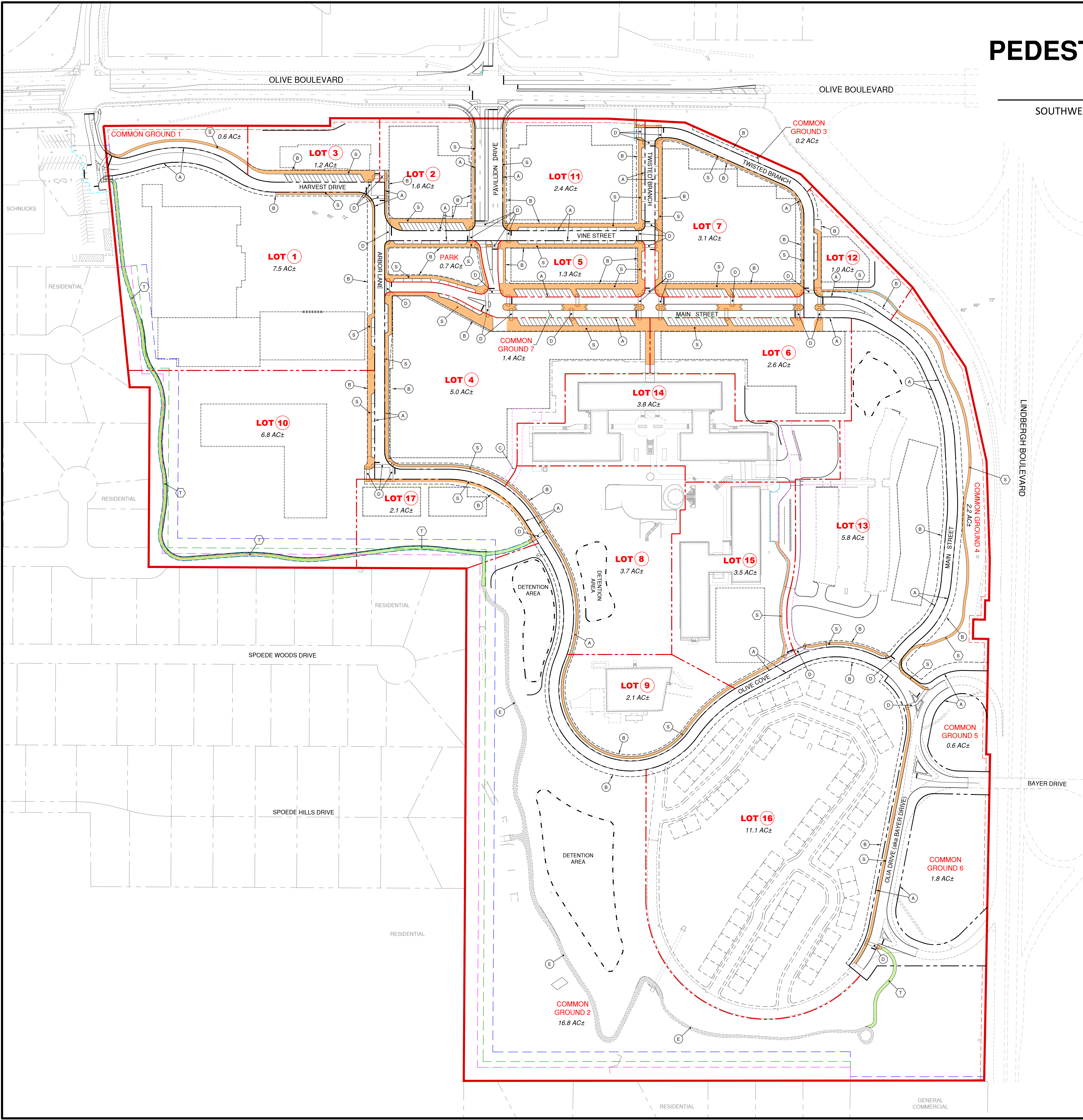
STREET PLAN

C-107

SHEET - OF 4

PEDESTRIAN MOBILITY PLAN
OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO



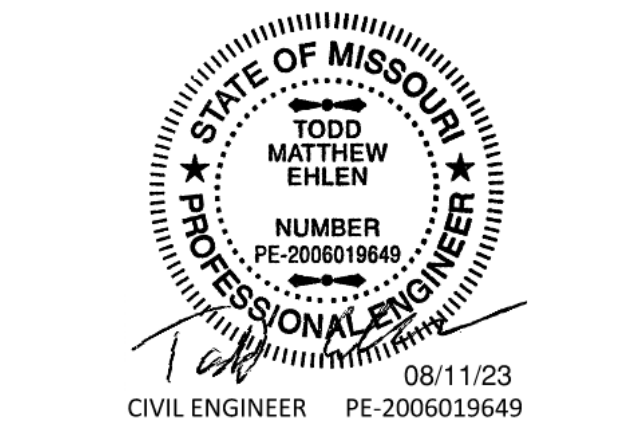
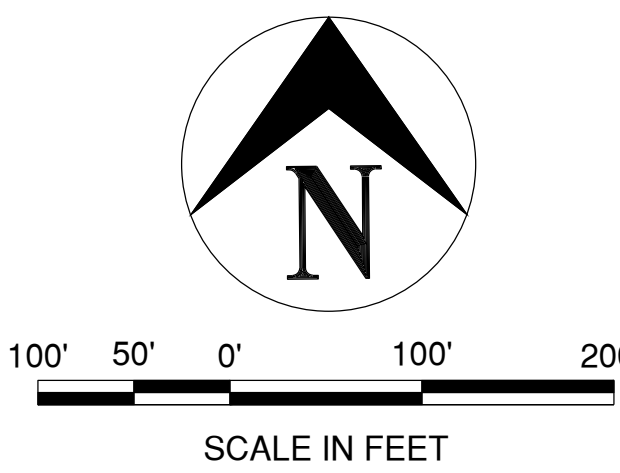
LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- CONCEPTUAL BLDG FOOTPRINT
- PROPOSED EASEMENT
- ROADWAY STRIPING - STOP BAR
- ROADWAY STRIPING - CROSSWALK
- PROPOSED CONCRETE SIDEWALK (WITHIN EASEMENT)
- PROPOSED 8' WIDE NATURAL AGGREGATE TRAIL (WITHIN EASEMENT ON NON-COMMON AREAS)

- KEYNOTES**
- (A) PROPOSED RIGHT-OF-WAY
 - (B) PROPOSED ROADWAY IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, SIDEWALK (R.I.M.U.S.S.) EASEMENT
 - (C) PROPOSED SIDEWALK EASEMENT
 - (D) PROPOSED CROSSWALK
 - (E) EXISTING AGGREGATE TRAIL TO REMAIN (WIDTH VARIES APPROXIMATELY 8' TO 12')

PEDESTRIAN MOBILITY INFORMATION		
LOCATION	SIDEWALK LENGTH (FT)	TRAIL LENGTH (FT)
PAVILLION DRIVE	840	
MAIN STREET	2,160	
MAIN STREET (EAST LEG)	1,250	
HARVEST DRIVE	1,040	
ARBOR LANE	1,400	
OLIVE COVE	2,520	
TWISTED BRANCH	1,710	
VINE STREET	1,190	
OLIA DRIVE (AKA BAYER DRIVE)	690	
WEST / SOUTH TRAIL (PROPOSED)		2,280
WEST / SOUTH TRAIL (EXISTING)		2,210
SUB-TOTAL :	12,800	4,490
TOTAL SIDEWALK / TRAIL (FT) :	17,290	
TOTAL SIDEWALK / TRAIL (MI) :	3.3	

SITE CONCEPT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
DEVELOPMENT
LINDBERGH & OLIVE BLVD



MARK	DATE	DESCRIPTION
PROJECT NO.:	23005201-00	
CAD DWG FILE:	ISITE-CONCEPT-PLAN.DWG	
DESIGNED BY:	TME/JFM	
DRAWN BY:	JFM	
CHECKED BY:	CJS	
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PEDESTRIAN PLAN

C-108
SHEET - OF 4

CONSULTANTS:



SHEET OF

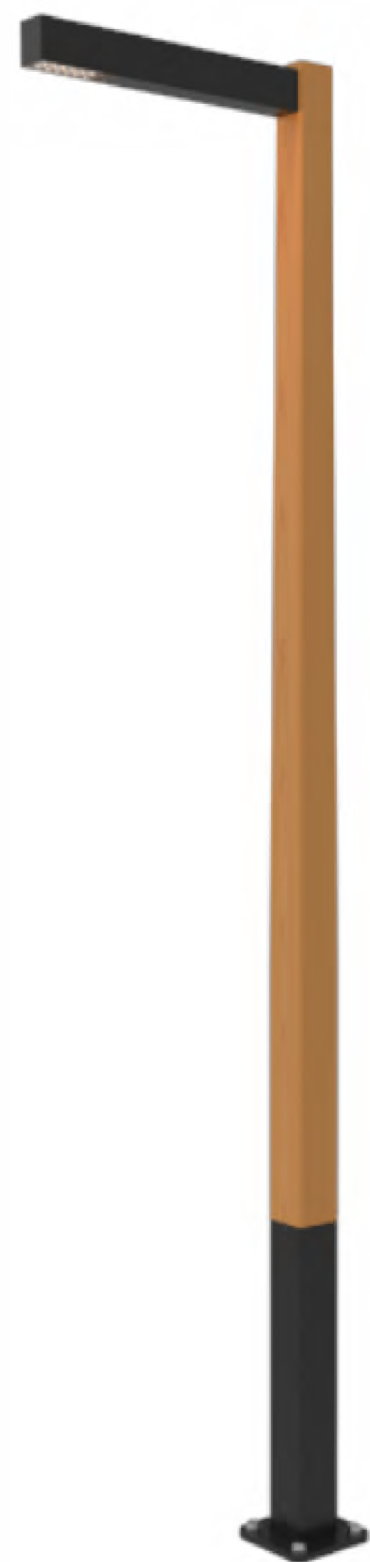


ARCHITECTURAL SITE PLAN

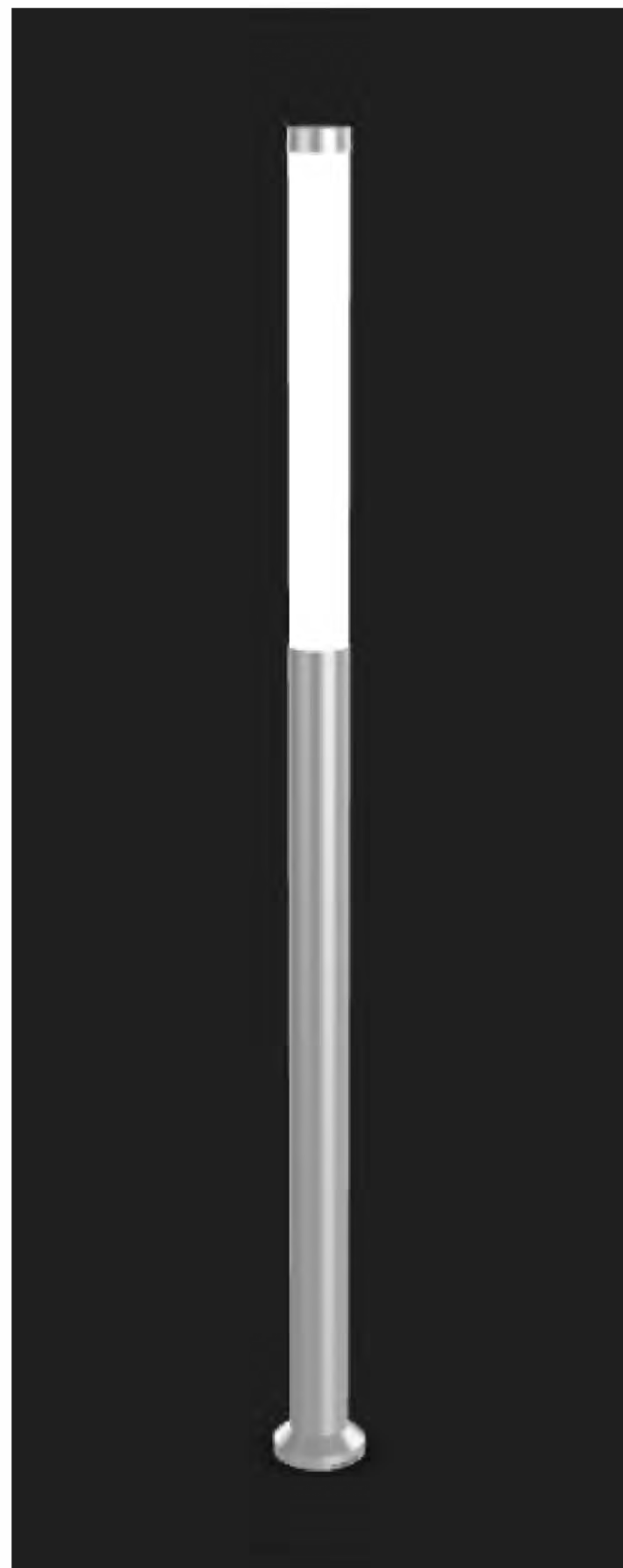
TYPE A1/A2



TYPE B1/B2



TYPE C1/C2



OLIA VILLAGE

NOTES:

CALCULATION POINTS ON GROUND
TYPE A1/A2 - 20' MOUNTING HEIGHT PLUS 3' BASE
TYPE B1/B2 - 20' MOUNTING HEIGHT
TYPE C1/C2 - 11' TALL

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	35	A1	Single	N.A.	0.912	GALN-SA3C-740-U-T3
	4	A2	Single	N.A.	0.912	GALN-SA4C-740-U-SL3
	10	B1	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-3
	31	B2	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-4
	5	C1-ALT	Single	N.A.	0.900	MTRCL-X-4-4B30-30-XX-UNV
	12	C2-ALT	Single	N.A.	0.900	MTRCL-X-4-1B30-30-XX-UNV

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PARK	Illuminance	Fc	0.62	1.4	0.2	3.1	7.0
SITE	Illuminance	Fc	1.95	6.8	0.2	9.8	34.0

PREPARED BY:

gray

8 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 22478.00
CAD DWG FILE: GRAY RENDERINGS A.DWG
DESIGNED BY: TDH/BKP
DRAWN BY: TDH
CHECKED BY:
APPROVED BY:
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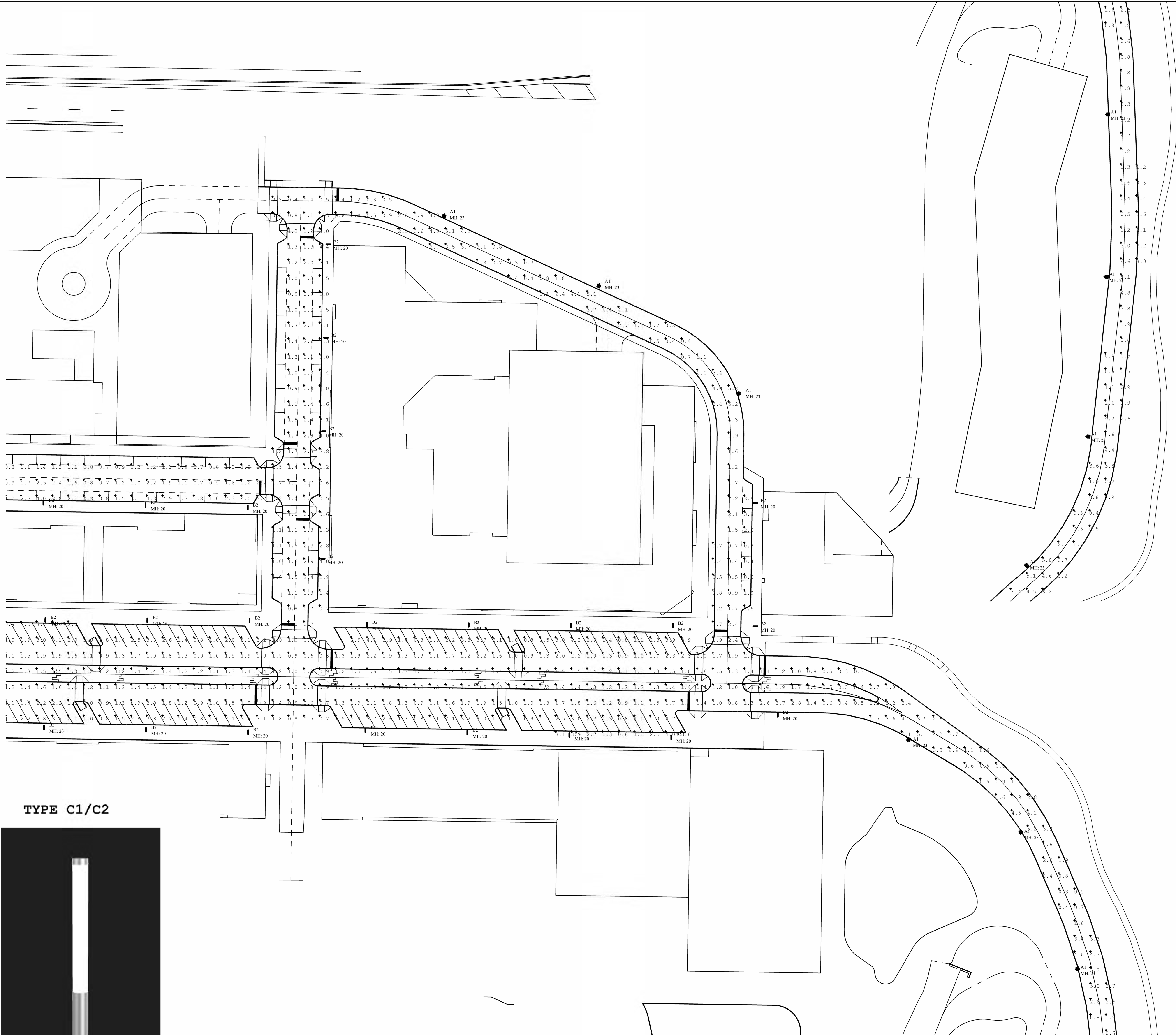
SHEET TITLE

SITE LIGHTING

A-103.1

SHEET

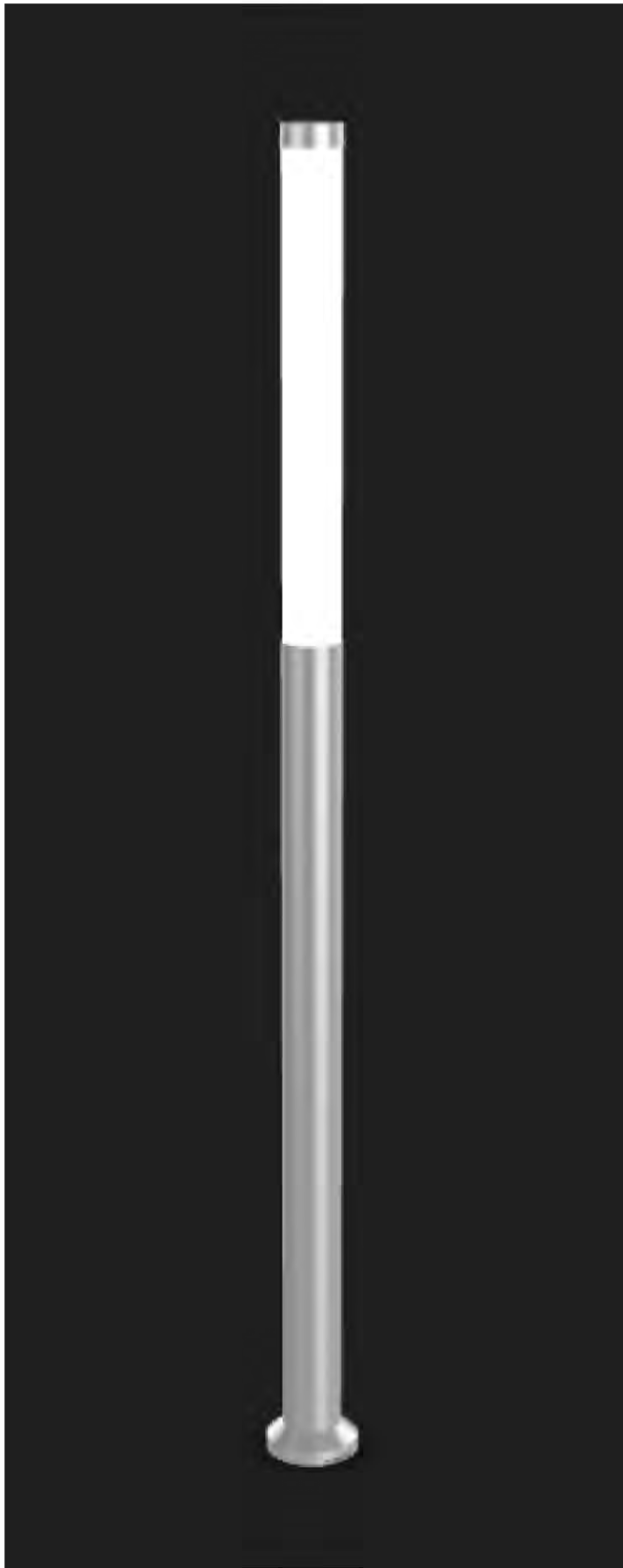
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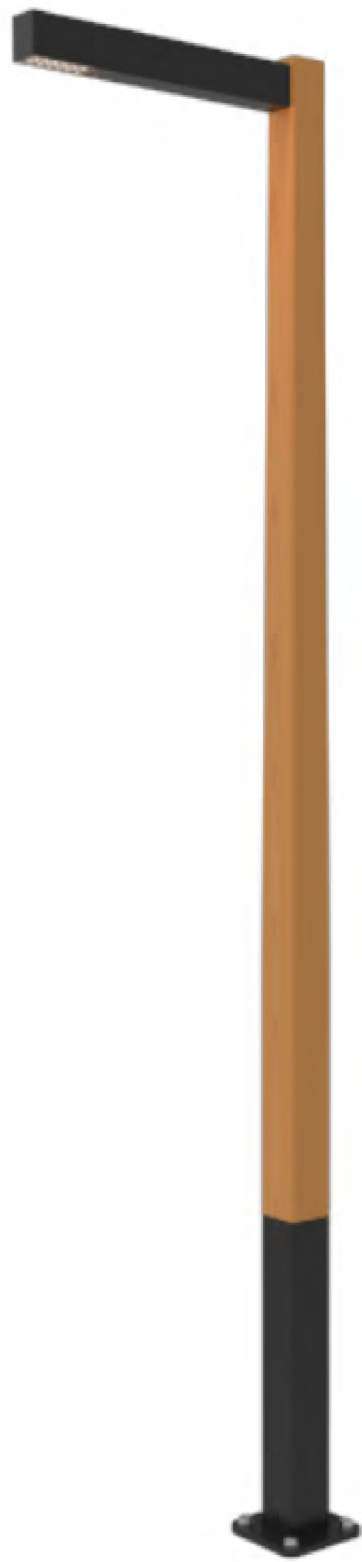
TYPE A1/A2



TYPE C1/C2



TYPE B1/B2



OLIA VILLAGE

NOTES:

CALCULATION POINTS ON GROUND
TYPE A1/A2 - 20' MOUNTING HEIGHT PLUS 3' BASE
TYPE B1/B2 - 20' MOUNTING HEIGHT
TYPE C1/C2 - 11' TALL

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	35	A1	Single	N.A.	0.912	GALN-SA3C-740-U-T3
	4	A2	Single	N.A.	0.912	GALN-SA4C-740-U-SI-3
	10	B1	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-3
	31	B2	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-4
	5	C1-ALT	Single	N.A.	0.900	MTRCL-X-4-4B30-30-XX-UNV
	12	C2-ALT	Single	N.A.	0.900	MTRCL-X-4-1B30-30-XX-UNV

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PARK	Illuminance	Fc	0.62	1.4	0.2	3.1	7.0
SITE	Illuminance	Fc	1.95	6.8	0.2	9.8	34.0

PREPARED BY:

gray

8 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 22478.00
CAD DWG FILE: GRAY RENDERINGS A.DWG
DESIGNED BY: TDH/BKP
DRAWN BY: TDH
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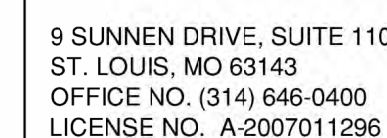
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SITE LIGHTING

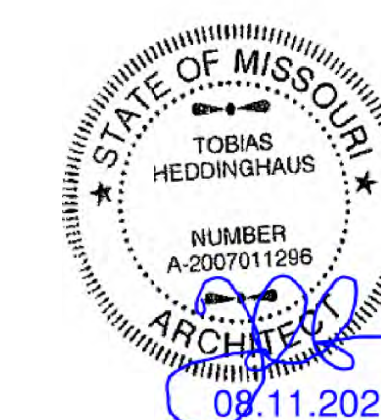
A-103.2

SHEET

OF



CONSULTANTS



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTIC
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PROJECT NO:	22478.00
CAD DWG FILE:	GRAY RENDERINGS A.DWG
DESIGNED BY:	TDH/BKP
DRAWN BY:	TDH

CHECKED BY:

APPROVED BY:

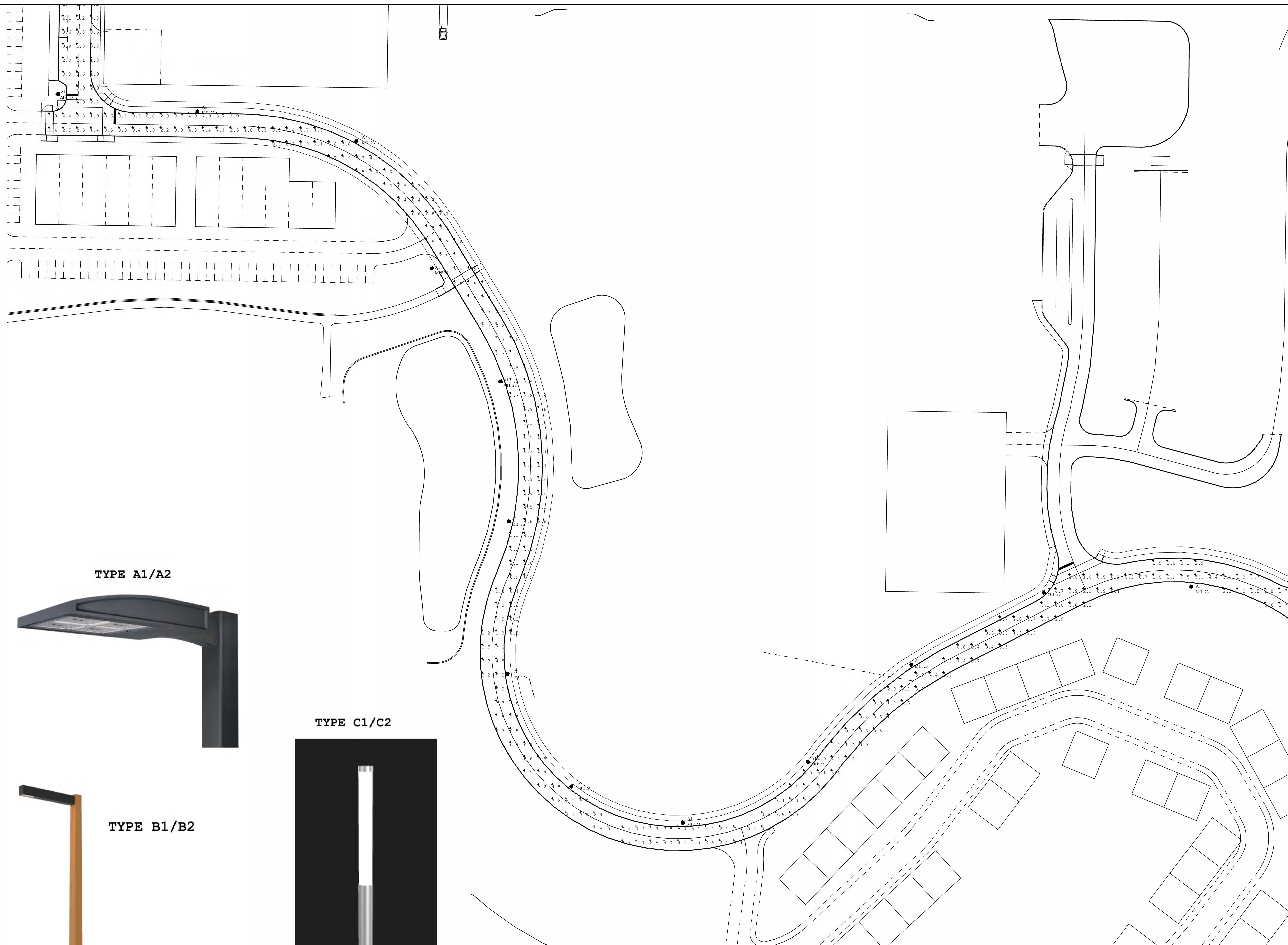
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SHEET TITLE

SITE LIGHTING

A-103.3

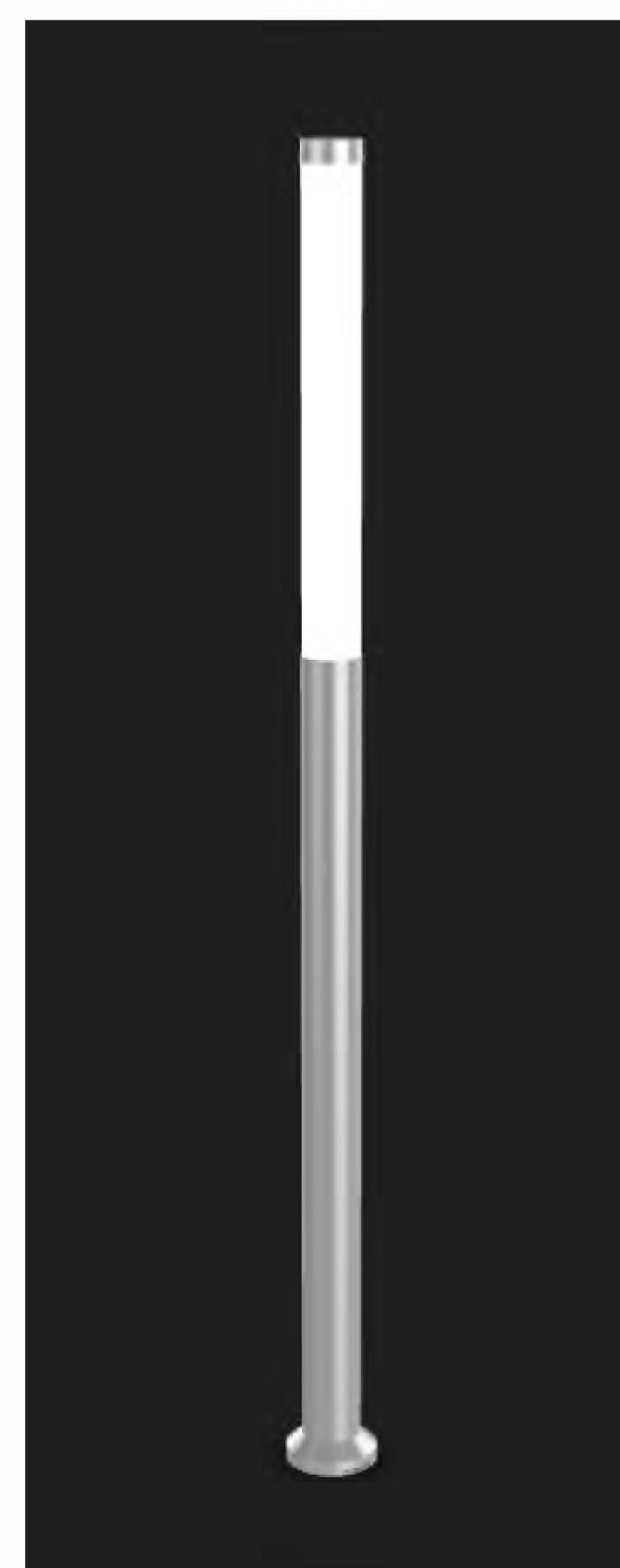
SHEET OF



TYPE A1/A2



TYPE C1/C2



TYPE B1/B2



OLIA VILLAGE

NOTES:

CALCULATION POINTS ON GROUND
TYPE A1/A2 - 20' MOUNTING HEIGHT PLUS 3' BASE
TYPE B1/B2 - 20' MOUNTING HEIGHT
TYPE C1/C2 - 11' TALL

Luminaire Schedule							
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description	
	35	A1	Single	N.A.	0.912	GALN-SA3C-740-U-T3	
	4	A2	Single	N.A.	0.912	GALN-SA4C-740-U-SL3	
	10	B1	Single	N.A.	0.900	BLDM-SD-120 277-CSL-L160-40K-CRI 70-3	
	31	B2	Single	N.A.	0.900	BLDM-SD-120 277-CSL-L160-40K-CRI 70-4	
	5	C1-ALT	Single	N.A.	0.900	MTRCL-X-4 4B3C-30-XX-UNV	
	12	C2-ALT	Single	N.A.	0.900	MTRCL-X-4 1B3C-30-XX-UNV	

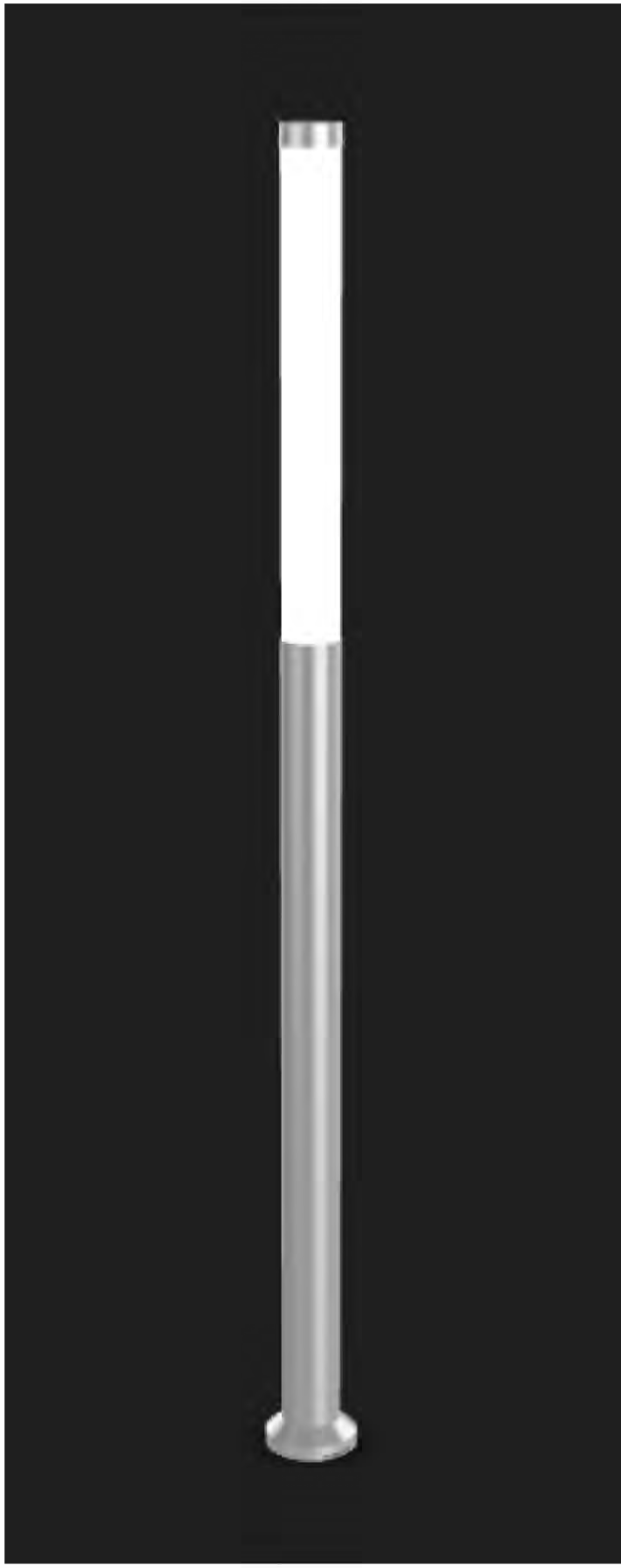
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SITE	Illuminance	Fc	1.95	6.8	0.2	9.8



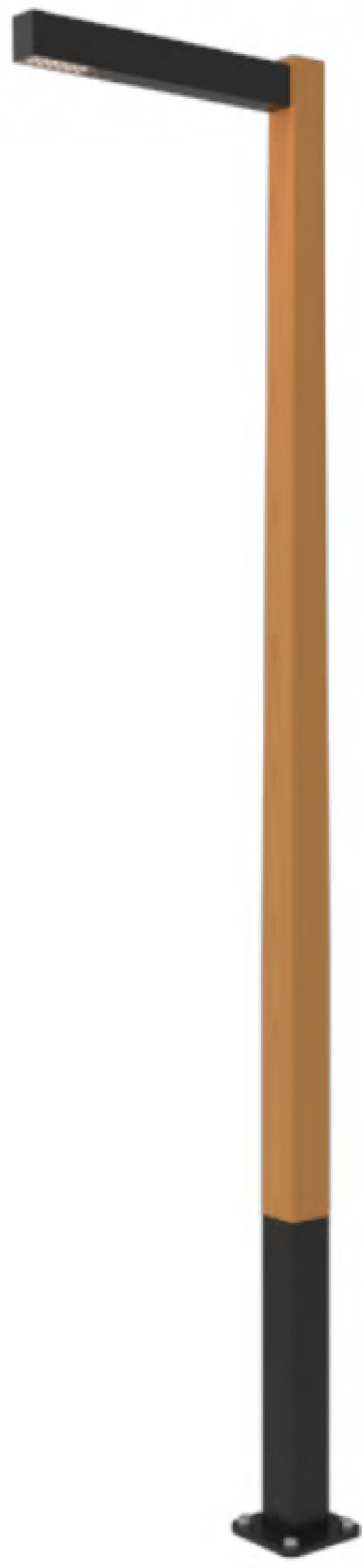
TYPE A1/A2



TYPE C1/C2



TYPE B1/B2



OLIA VILLAGE

NOTES:

CALCULATION POINTS ON GROUND
TYPE A1/A2 - 20' MOUNTING HEIGHT PLUS 3' BASE
TYPE B1/B2 - 20' MOUNTING HEIGHT
TYPE C1/C2 - 11' TALL

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	35	A1	Single	N.A.	0.912	GALN-SA3C-740-U-T3
	4	A2	Single	N.A.	0.912	GALN-SA4C-740-U-SL3
	10	B1	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-3
	31	B2	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-4
	5	C1-ALT	Single	N.A.	0.900	MTRCL-X-4-4B30-30-XX-UNV
	12	C2-ALT	Single	N.A.	0.900	MTRCL-X-4-1B30-30-XX-UNV

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PARK	Illuminance	Fc	0.62	1.4	0.2	3.1	7.0
SITE	Illuminance	Fc	1.95	6.8	0.2	9.8	34.0

PREPARED BY:

gray

8 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR
10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 22478.00
CAD DWG FILE: GRAY RENDERINGS A.DWG
DESIGNED BY: TDH/BKP
DRAWN BY: TDH
CHECKED BY:
APPROVED BY:
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SHEET TITLE

SITE LIGHTING

A-103.4

SHEET

OF



SOUTH ELEVATION OF LOT 5



EAST ELEVATION OF LOT 5



NORTH ELEVATION OF LOT 6



NORTH ELEVATION OF LOT 4

Note:

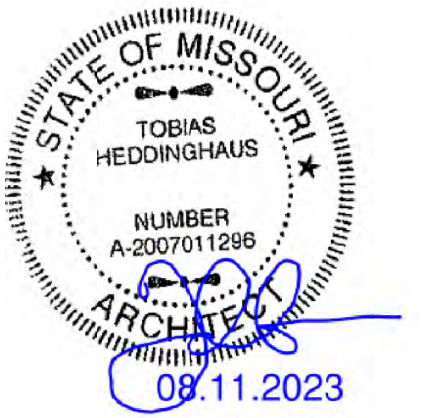
Conceptual Elevations are for illustrative purposes only and final elevations will be submitted as part of the Site Development Plan application for each phase.

PREPARED BY:

gray®

9 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



OLIA VILLAGE

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

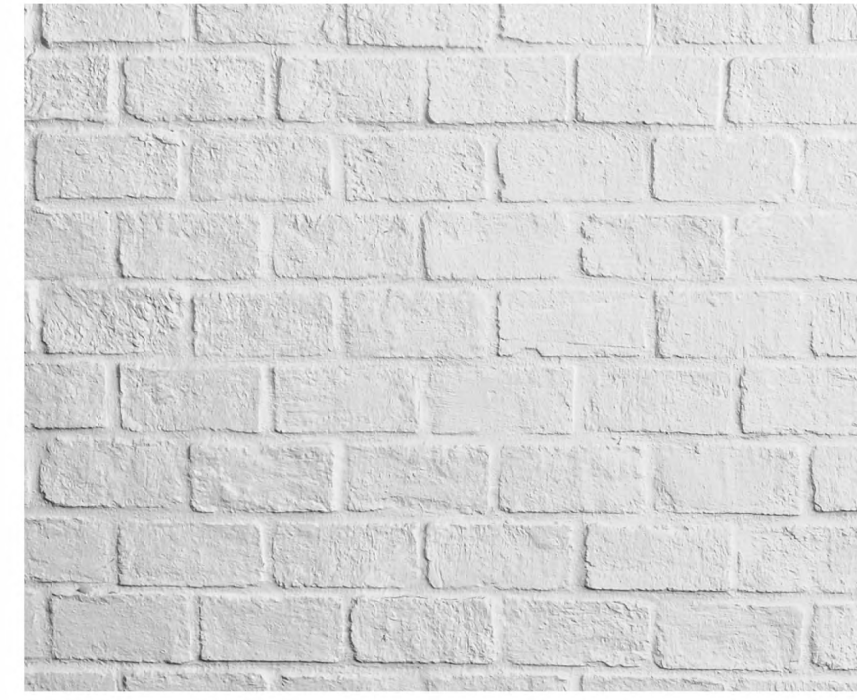
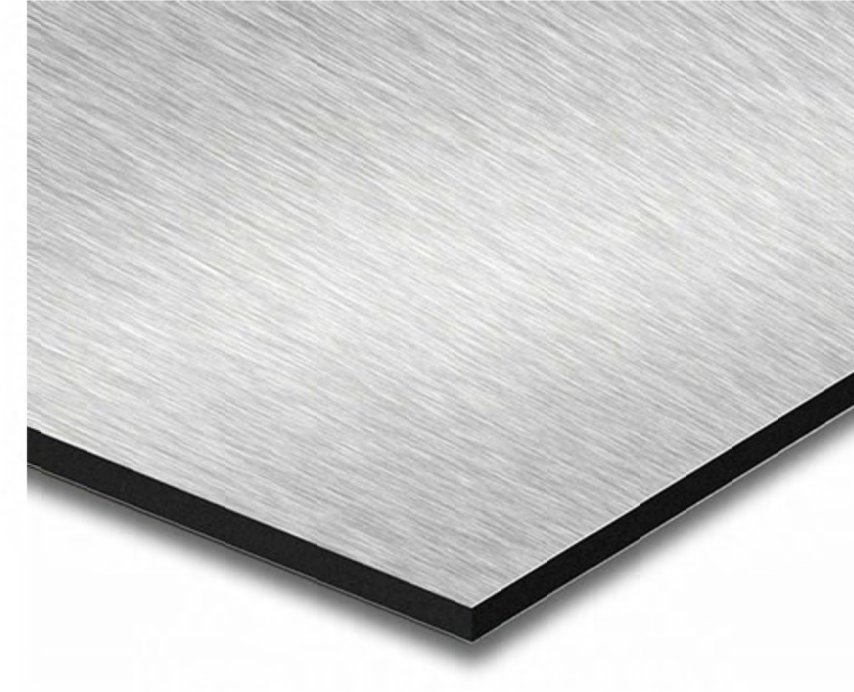
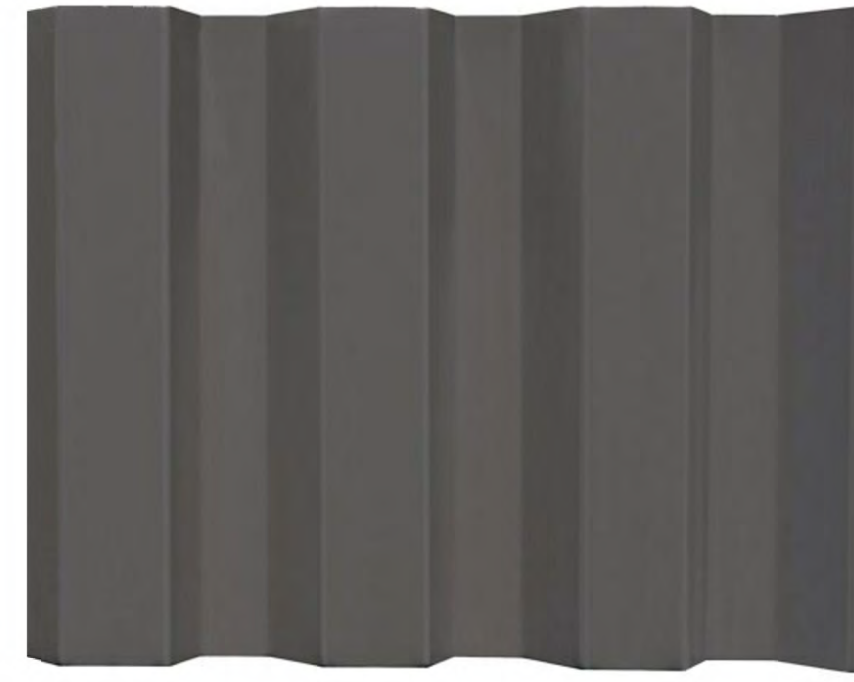
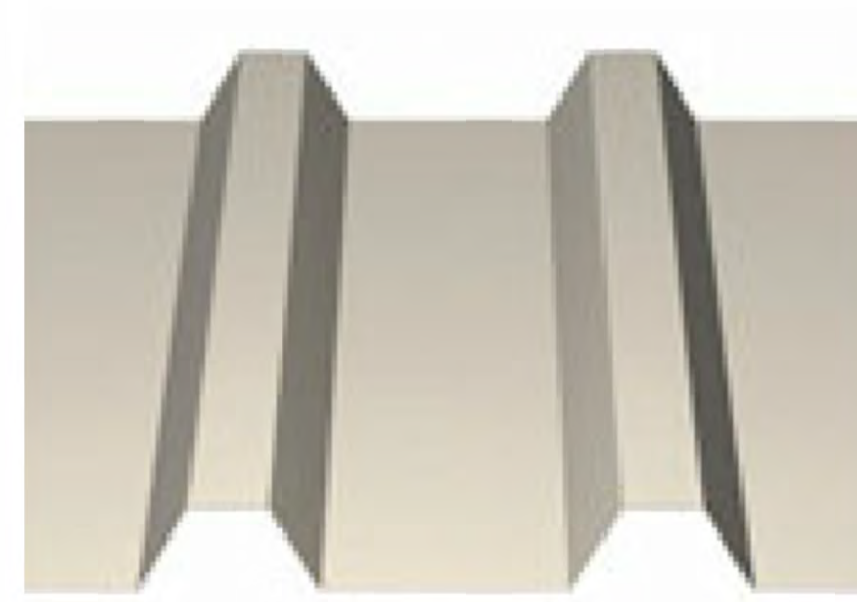
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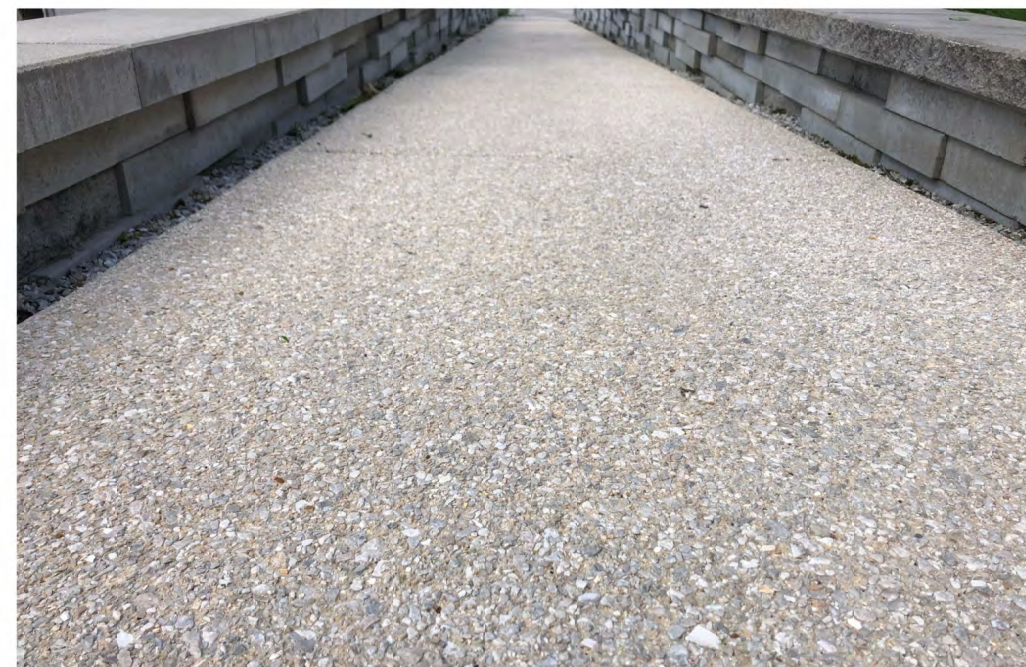
ELEVATIONS

A-104

SHEET 4 OF 6



ARCHITECTURAL MATERIALS



SITE FURNISHINGS AND MATERIALS

PREPARED BY:

gray®

9 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
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PROJECT NO:	22478.00
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CAD DWG FILE: GRAY RENDERINGS A.DWG

DESIGNED BY: TDH/BKP

DRAWN BY: TDH

CHECKED BY: _____

APPROVED BY:

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SHEET TITLE

MATERIALS

A-105

SHEET 5 OF 6



VIEW LOOKING WEST DOWN MAIN STREET

P:\10300\103001125712 - Bayview West Masterplanning\5-SD\ACAD\Zoning Documents\Gray Renderings A.dwg
Date: Wednesday, August 9, 2023 10:52:52 AM

Note:
Conceptual Elevations are for illustrative purposes only and final elevations will be submitted as part of the Site Development Plan application for each phase.

PREPARED BY:

gray

8 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:

STATE OF MISSOURI
TODAS
HERDINGHAUS
NUMBER
A-2007011296
ARCHITECT
09.11.2023

PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD

OLIA VILLAGE

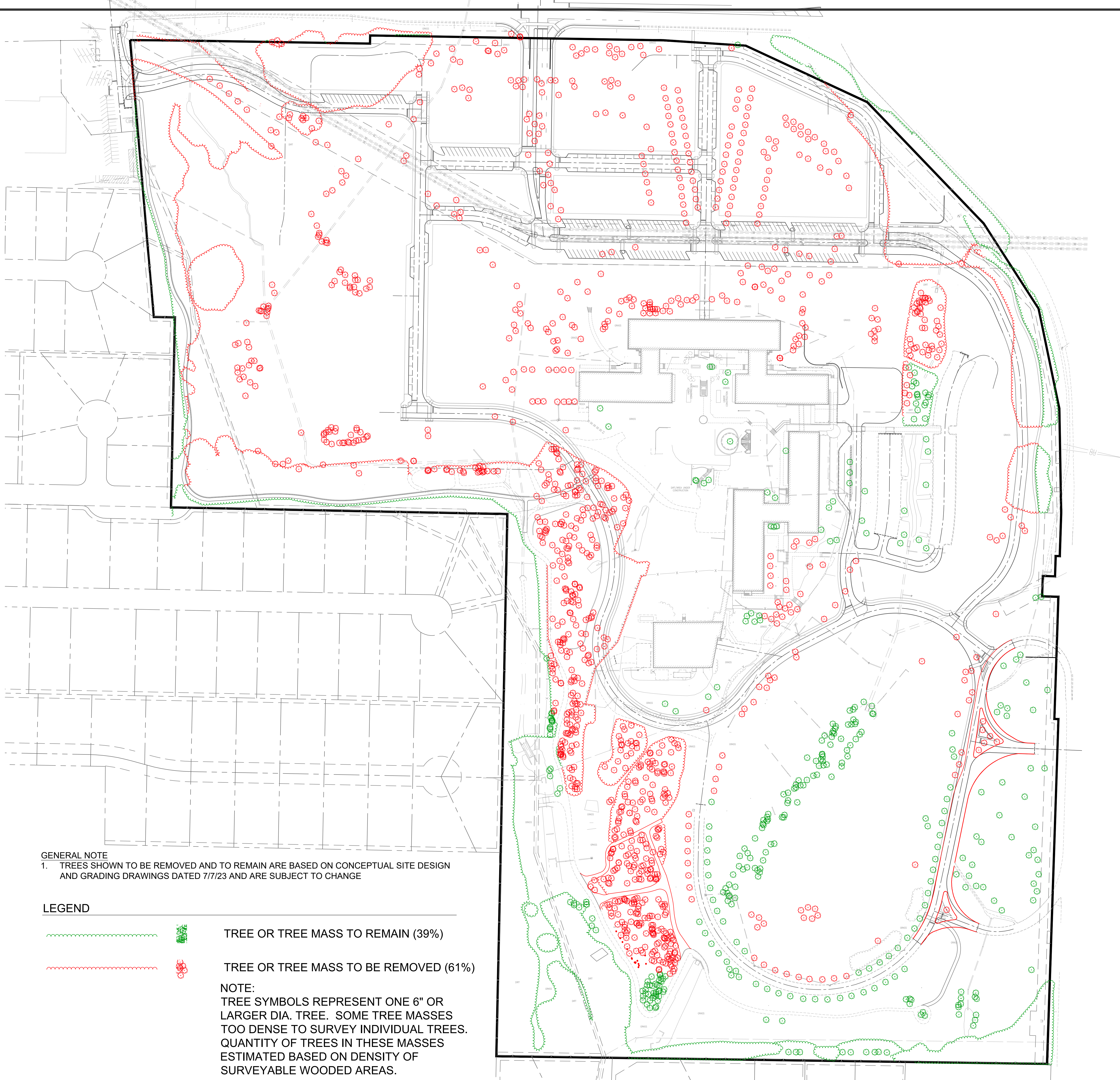
THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
PROJECT NO:	22478.00	
CAD DWG FILE:	GRAY RENDERINGS A.DWG	
DESIGNED BY:	TDH/BKP	
DRAWN BY:	TDH	
CHECKED BY:		
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SHEET TITLE		
RENDERED VIEW		
A-106		
SHEET	6	OF 6

P. 10300 IS PRESENT ON THIS SHEET. IT HAS BEEN ELECTRONICALLY TRACED AND LATER.

Page 96 of 641



GENERAL NOTE
1. TREES SHOWN TO BE REMOVED AND TO REMAIN ARE BASED ON CONCEPTUAL SITE DESIGN AND GRADING DRAWINGS DATED 7/7/23 AND ARE SUBJECT TO CHANGE

LEGEND

		TREE OR TREE MASS TO REMAIN (39%)
		TREE OR TREE MASS TO BE REMOVED (61%)

NOTE:
TREE SYMBOLS REPRESENT ONE 6" OR LARGER DIA. TREE. SOME TREE MASSES TOO DENSE TO SURVEY INDIVIDUAL TREES. QUANTITY OF TREES IN THESE MASSES ESTIMATED BASED ON DENSITY OF SURVEYABLE WOODED AREAS.

A TREE PRESERVATION PLAN
SCALE: 1"=100'

Call Before you DIG
TOLL FREE
1-800-344-7483
MISSOURI ONE-CALL SYSTEM INC.
MODOT (314) 340-4100

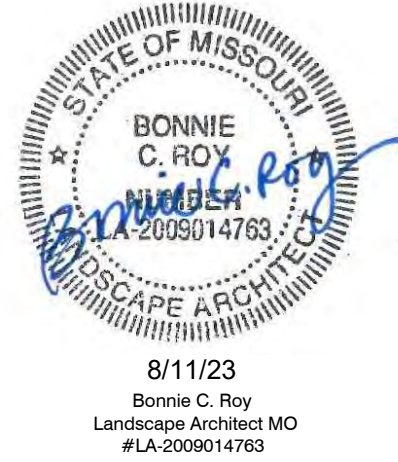


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LICENSE NO. 184-000631

CONSULTANTS:



7722 Big Bend Blvd.
St. Louis, MO 63119
T. 314.644.5700



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
DEVELOPMENT
LINDBERGH & OLIVE BLVD



MARK	DATE	DESCRIPTION
2	8/11/23	LANDSCAPE CONCEPT PLANS
1	7/21/23	LANDSCAPE CONCEPT PLANS

PROJECT NO.: 2309201-00
CAD DWG FILE: 21585.01_SHEETS_GENERAL.DWG
DESIGNED BY: WH
DRAWN BY: MB/ZTS
CHECKED BY: BR
APPROVED BY: BR
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SHEET TITLE
TREE PRESERVATION PLAN

LD-100

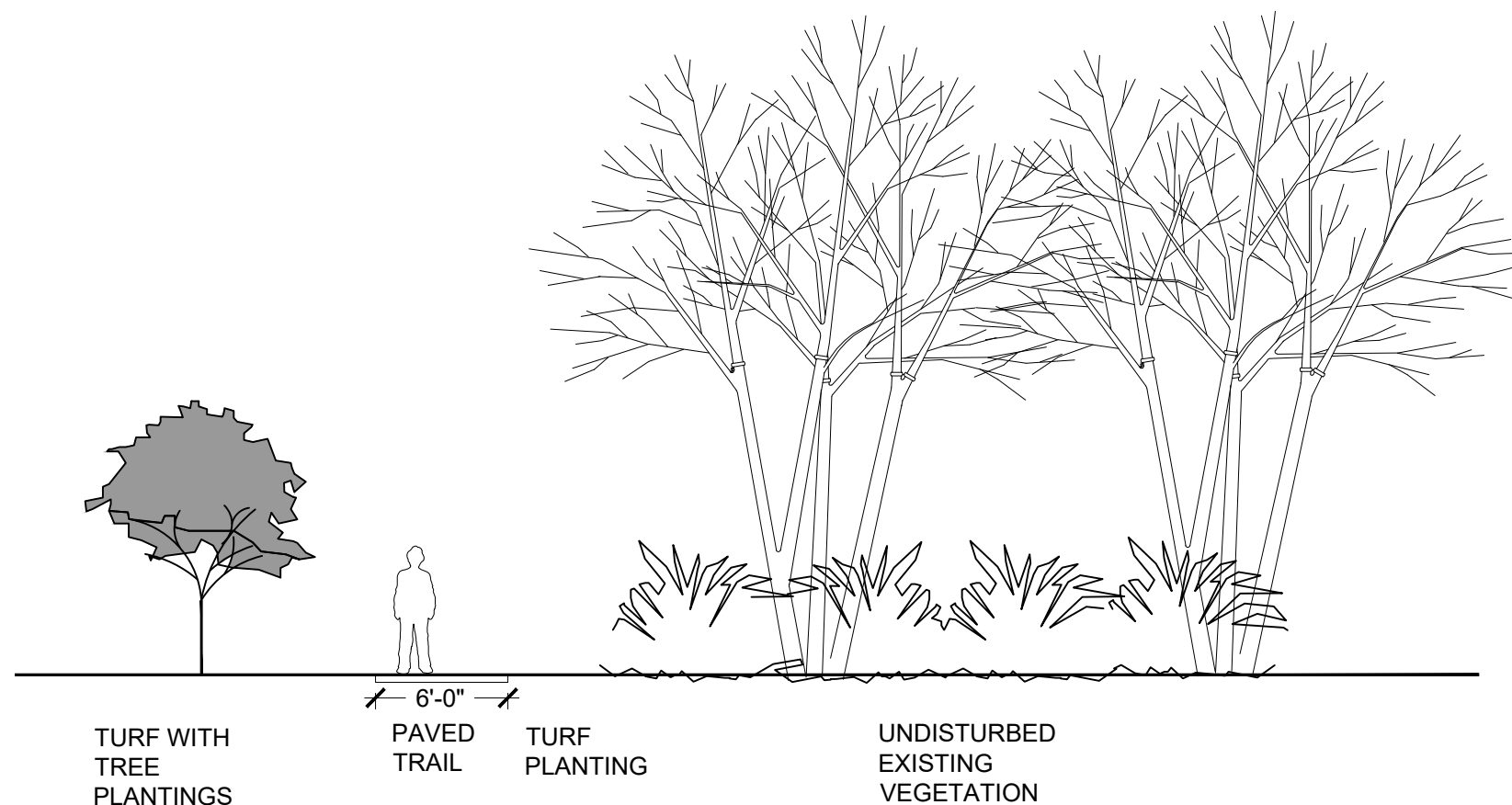
SHEET 1 OF 3

NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY IN EVENTS OF DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS IN THE DRAWINGS OR SPECIFICATIONS. THE CONTRACTOR IS NOT AUTHORIZED TO SCALE THE DRAWINGS. ALL QUESTIONS IN REFERENCE TO CONTRACT DOCUMENTS SHALL BE IMMEDIATELY DIRECTED TO THE LANDSCAPE ARCHITECT.

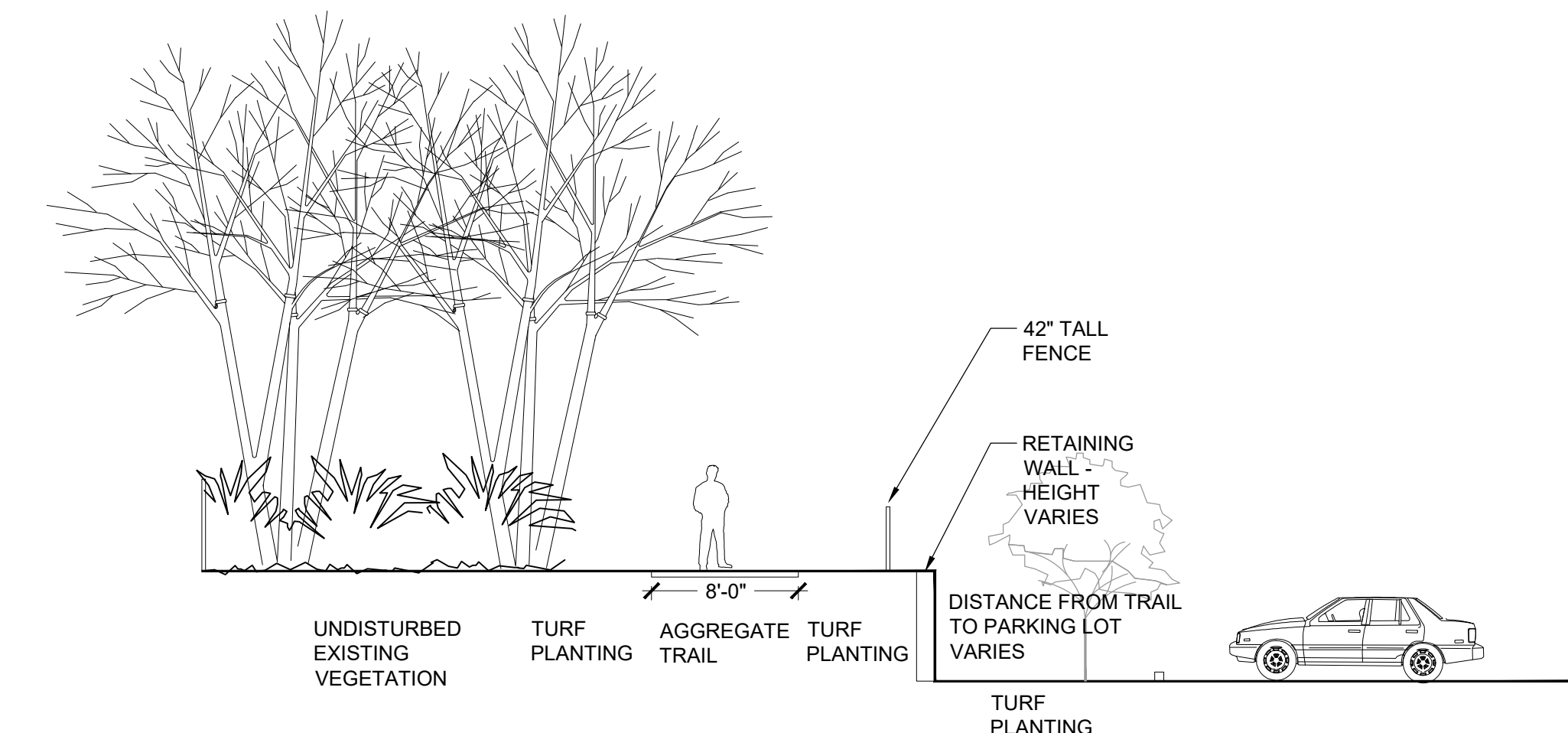
LEGEND

- UNDISTURBED EXISTING VEGETATION
- TURF GRASS SPECIES TO BE DETERMINED BASED ON LOCAL SOIL AND SITE CONDITIONS
- ORNAMENTAL LANDSCAPE PLANTINGS COMBINATION OF SHRUB, PERENNIAL, AND GROUNDCOVER SPECIES ADAPTED TO REGIONAL CLIMATE AND SITE CONDITIONS. NATIVE PLANT MATERIAL TO BE UTILIZED WHERE APPROPRIATE. 39N0TH GREAT STREETS PLAN PLANT PALETTE WILL BE USED AS A REFERENCE WHEN DETERMINING FINAL PLANT MATERIAL
- EXISTING TREE MASSING EXISTING TREES AND UNDERSTORY VEGETATION TO REMAIN
- PROPOSED ORNAMENTAL AND CANOPY TREES
- EXISTING TREES TO REMAIN

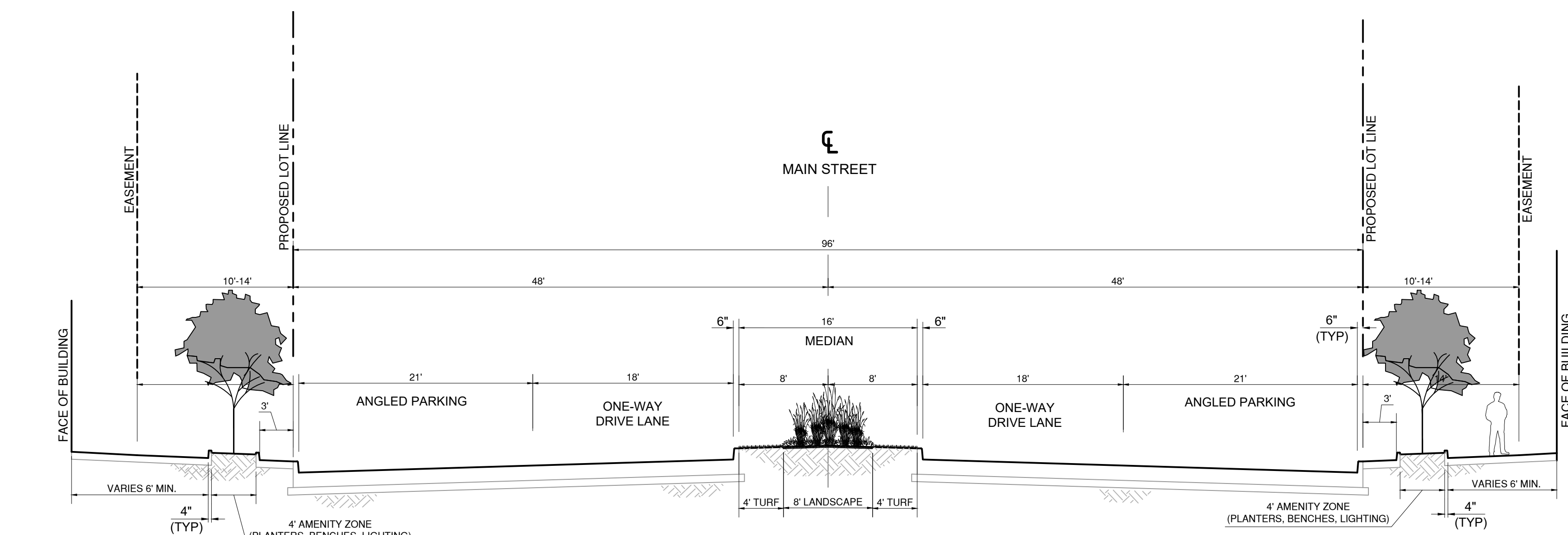
- NOTES
- TREES AND LIGHTING WITHIN CITY OF ST. LOUIS EASEMENT REQUIRES CITY APPROVAL
 - ACTUAL PLANTING AND LIGHTING DESIGN MAY VARY FROM THESE CONCEPT PLANS
 - STREET TREES SHOWN ALONG PAVILION DRIVE, TWISTED BRANCH DRIVE, AN VINE STREET MAY REQUIRE ADA ACCESSIBLE TREE GRATES OR TREE PLANTING WELLS, DEPENDING ON AVAILABLE SIDEWALK WIDTH FROM BACK OF CURB TO BUILDING FACADE IN ORDER TO MAINTAIN ACCESSIBLE WALKING PATHS FREE OF OBSTRUCTIONS.
 - IRRIGATION WILL BE PROVIDED TO NEW LANDSCAPE BEDS AND TO STREET TREES INSTALLED WITHIN MAIN STREET AREA AND PARK. A WATER LINE WILL BE INSTALLED TO THE MEDIAN IN OLIVE WEST OF PAVILION.
 - ALL DISTURBED AREAS NOT OTHERWISE IMPROVED SHALL RECEIVE SEEDED TURF GRASS.
 - ALL LANDSCAPE SHALL COMPLY WITH THE REQUIREMENTS DETAILED IN ATTACHMENT B.



D TYPICAL TRAIL SECTION
SCALE: 1"=8'



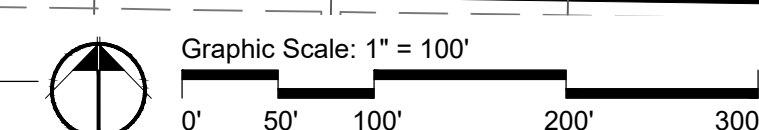
C TYPICAL TRAIL SECTION
SCALE: 1"=8'



B TYPICAL SECTION - MAIN STREET (MEDIAN SECTION)
SCALE: 1"=8' HORIZONTAL, 1"=4' VERTICAL



A OVERALL PLANTING PLAN
SCALE: 1"=100'



NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY IN EVENTS OF DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS IN THE DRAWINGS OR SPECIFICATIONS. THE CONTRACTOR IS NOT AUTHORIZED TO SCALE THE DRAWINGS. ALL QUESTIONS IN REFERENCE TO CONTRACT DOCUMENTS SHALL BE IMMEDIATELY DIRECTED TO THE LANDSCAPE ARCHITECT.

PREPARED BY:

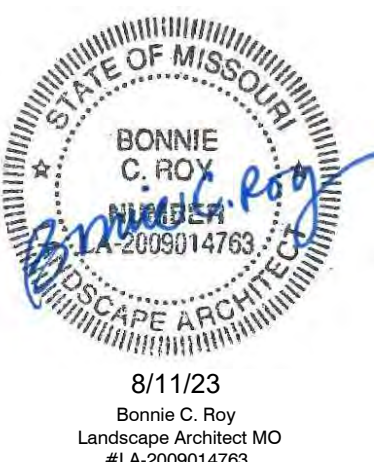


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PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
2	8/11/23	LANDSCAPE CONCEPT PLANS
1	7/21/23	LANDSCAPE CONCEPT PLANS

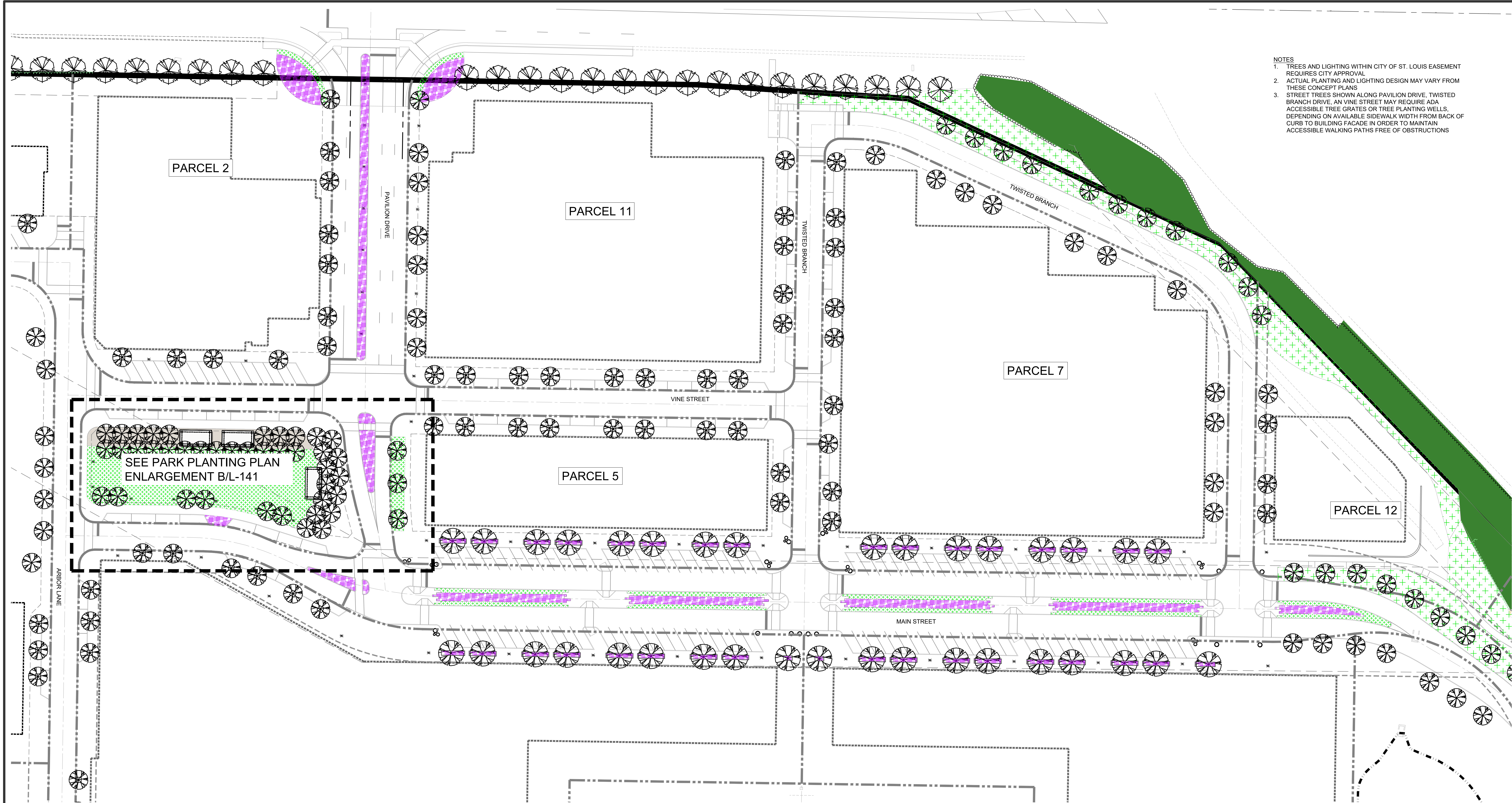
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CAD DWG FILE: 21585.01_SHEETS_PLANTING.DWG
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SHEET TITLE

OVERALL CONCEPT
PLANTING PLAN

L-140

SHEET 2 OF 3



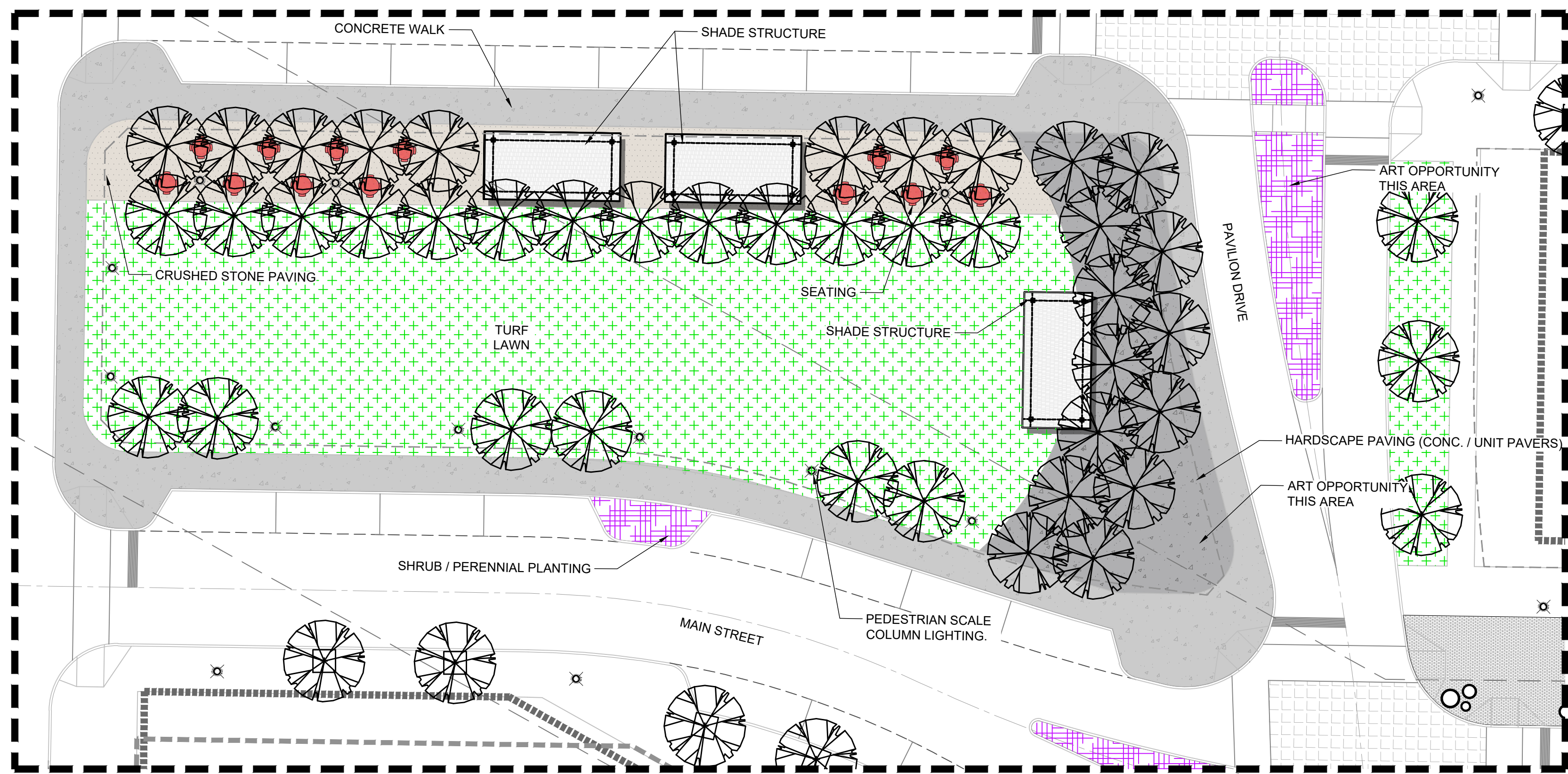
A MAIN STREET PLANTING PLAN
SCALE: 1"=40'

LEGEND

- UNDISTURBED EXISTING VEGETATION
- TURF GRASS
SPECIES TO BE DETERMINED BASED ON
LOCAL SOIL AND SITE CONDITIONS
- ORNAMENTAL LANDSCAPE PLANTINGS
COMBINATION OF SHRUB, PERENNIAL, AND GROUNDCOVER
SPECIES ADAPTED TO REGIONAL CLIMATE AND SITE CONDITIONS.
NATIVE PLANT MATERIAL TO BE UTILIZED WHERE APPROPRIATE.
39N0TH GREAT STREETS PLANT PALETTE WILL BE USED AS
A REFERENCE WHEN DETERMINING FINAL PLANT MATERIAL
- EXISTING TREE MASSING
EXISTING TREES AND UNDERSTORY
VEGETATION TO REMAIN

- PROPOSED ORNAMENTAL AND CANOPY TREES
- EXISTING TREES TO REMAIN

- NOTES
- TREES AND LIGHTING WITHIN CITY OF ST. LOUIS EASEMENT REQUIRES CITY APPROVAL
 - ACTUAL PLANTING AND LIGHTING DESIGN MAY VARY FROM THESE CONCEPT PLANS
 - STREET TREES SHOWN ALONG PAVILION DRIVE, TWISTED BRANCH DRIVE, AN VINE STREET MAY REQUIRE ADA ACCESSIBLE TREE GRATES OR TREE PLANTING WELLS, DEPENDING ON AVAILABLE SIDEWALK WIDTH FROM BACK OF CURB TO BUILDING FACADE IN ORDER TO MAINTAIN ACCESSIBLE WALKING PATHS FREE OF OBSTRUCTIONS
 - IRRIGATION WILL BE PROVIDED TO NEW LANDSCAPE BEDS AND TO STREET TREES INSTALLED WITHIN MAIN STREET AREA AND PARK



B PARK PLANTING PLAN
SCALE: 1"=20'

- NOTES
- TREES AND LIGHTING WITHIN CITY OF ST. LOUIS EASEMENT REQUIRES CITY APPROVAL
 - ACTUAL PLANTING AND LIGHTING DESIGN MAY VARY FROM THESE CONCEPT PLANS
 - STREET TREES SHOWN ALONG PAVILION DRIVE, TWISTED BRANCH DRIVE, AN VINE STREET MAY REQUIRE ADA ACCESSIBLE TREE GRATES OR TREE PLANTING WELLS, DEPENDING ON AVAILABLE SIDEWALK WIDTH FROM BACK OF CURB TO BUILDING FACADE IN ORDER TO MAINTAIN ACCESSIBLE WALKING PATHS FREE OF OBSTRUCTIONS

Graphic Scale: 1" = 40'

Graphic Scale: 1" = 20'

NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY IN EVENTS OF DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS IN THE DRAWINGS OR SPECIFICATIONS. THE CONTRACTOR IS NOT AUTHORIZED TO SCALE THE DRAWINGS. ALL QUESTIONS IN REFERENCE TO CONTRACT DOCUMENTS SHALL BE IMMEDIATELY DIRECTED TO THE LANDSCAPE ARCHITECT.

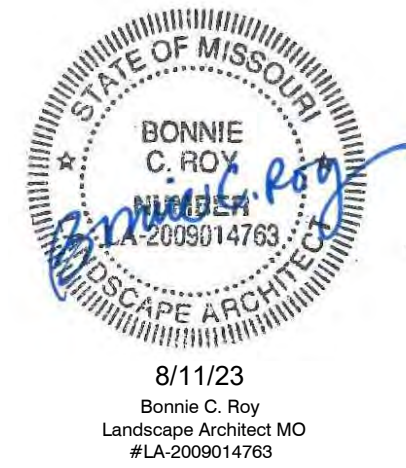


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PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
DEVELOPMENT
LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR
10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
2	8/11/23	LANDSCAPE CONCEPT PLANS
1	7/21/23	LANDSCAPE CONCEPT PLANS
PROJECT NO: 2309201-00		
CAD DWG FILE: 21585_01_SHEETS_PLANTING.DWG		
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SHEET TITLE

ENLARGEMENT
PLANTING PLANS

L-141

SHEET 3 OF 3

SITE DEVELOPMENT PLAN
OLIA VILLAGE - PHASE 1 DEVELOPMENT

CREVE COEUR, MO

A TRACT OF LAND BEING PART OF LOTS 9, 10, 11 AND 12 OF MAJOR THOMAS SUBDIVISION
SITUATED IN THE SOUTHWEST QUARTER AND THE NORTHWEST QUARTER OF SECTION 1
TOWNSHIP 45 NORTH, RANGE 5 EAST, CITY OF CREVE COEUR, ST. LOUIS COUNTY, MISSOURI

AUGUST 11, 2023

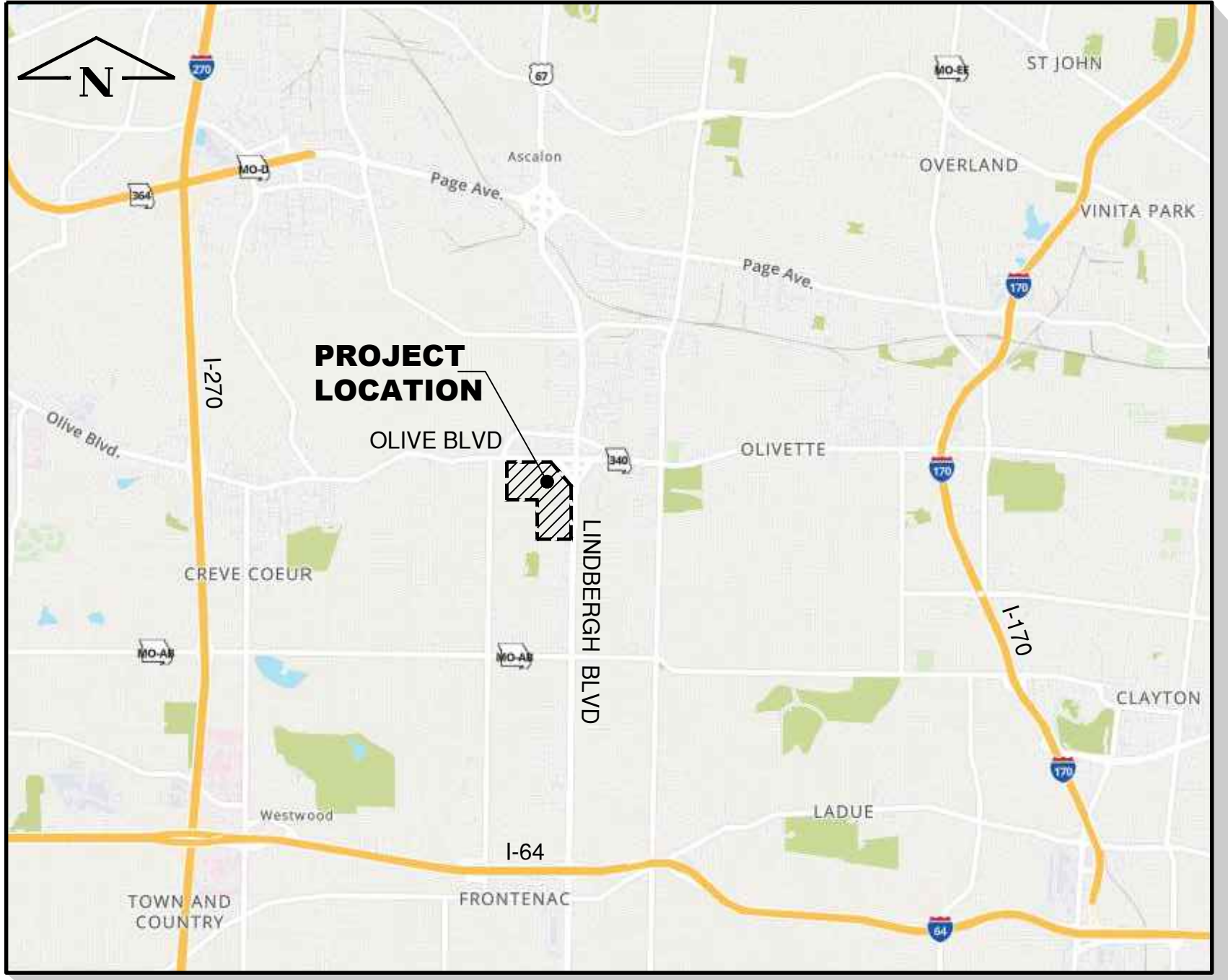
Table with 2 columns: SITE INFORMATION and details. Includes site acreage (95.8 AC), address (10300 OLIVE BLVD), owner (10300 OLIVE, LLC), zoning (PMD - PLANNED MIXED-USE DEVELOPMENT), and various utility services.

OWNER / DEVELOPER :
10300 OLIVE, LLC
1034 S. BRENTWOOD, SUITE 2300 PH-1D
ST. LOUIS, MO 63117
MATT PFUND
(618) 692-9502

Table with 2 columns: SITE BENCHMARK and details. Includes benchmark 13294 NAVD88 (SLC2011a) ELEV = 674.60 F.I.U.S. and site location details.

UTILITY NOTE :
UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS, RECORDS AND INFORMATION, AND, THEREFORE DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NON-EXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE FACILITIES, STRUCTURES AND UTILITIES.

DISCLAIMER :
CRAWFORD, MURPHY & TILLY, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR SERVICES PROVIDED BY OTHERS TO IMPLEMENT THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS.



VICINITY MAP
(NOT TO SCALE)

Table with 2 columns: SHEET INDEX and sheet details. Lists sheets C-100 through C-106, including Title Sheet, Overview, Setback and Buffer Plan, Grading Plan, Utility & Drainage Plan, Pedestrian Plan, and Site Sections.

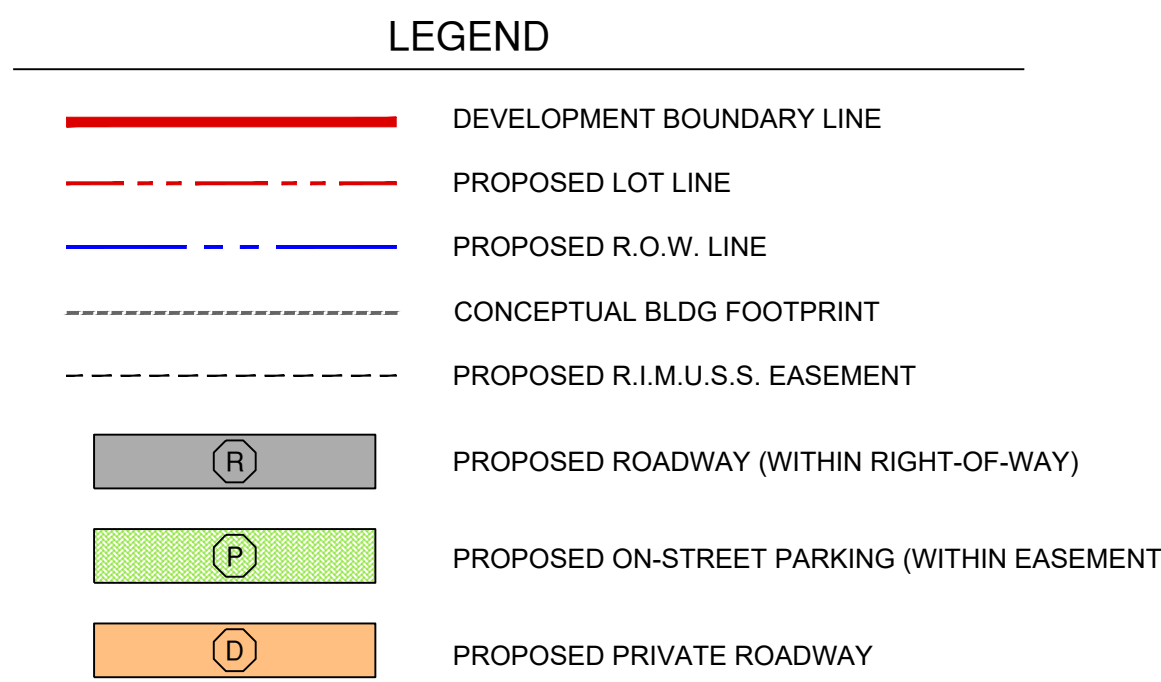
Table with 2 columns: SITE DEVELOPMENT CALCULATION NOTES and calculations. Includes Gross Floor Area Ratio (FAR) = N/A, Impervious Land Coverage Summary (Total Site = 95.8 AC), and Land Summary (Total Site = 95.8 AC).

Prepared by: CMT Crawford, Murphy & Tilly
Site Development Plan
Professional Engineer Seal: Todd Matthew Ehlen, PE-2006019649, 08/11/23
Preliminary Not for Construction August 11, 2023
Olia Village Lindbergh & Olive Blvd
The Heart of Creve Coeur
10300 Olive Blvd, Creve Coeur, MO 63141
Title Sheet C-100

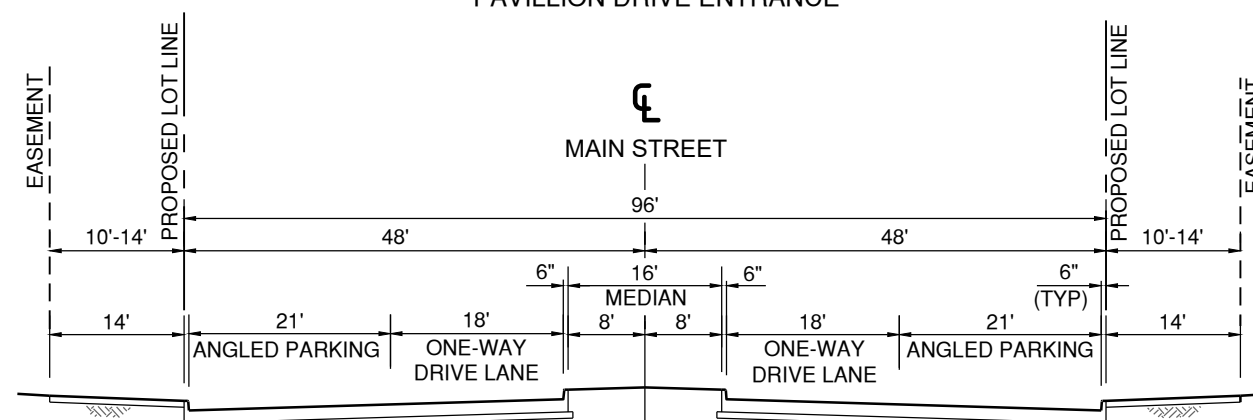
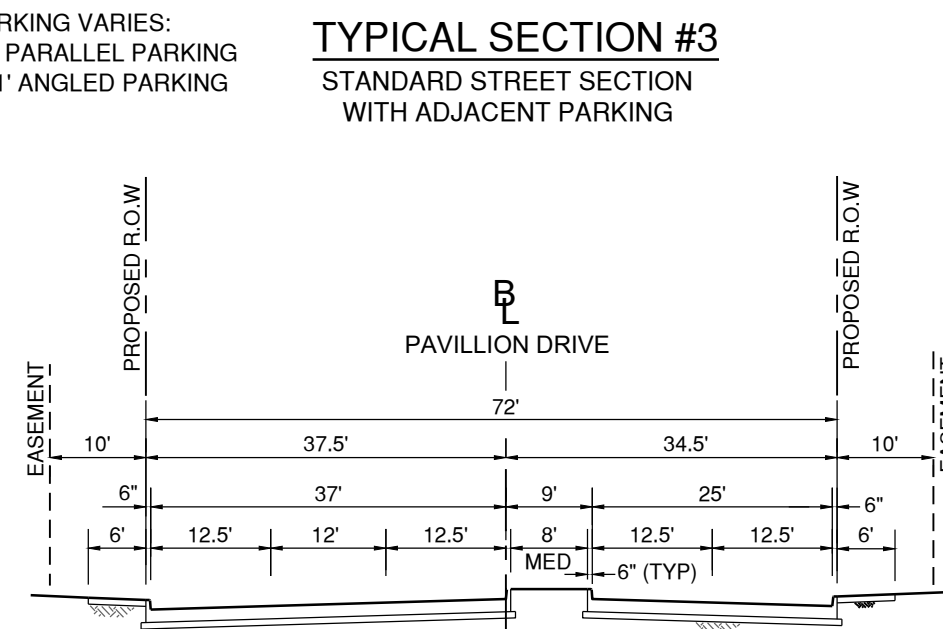
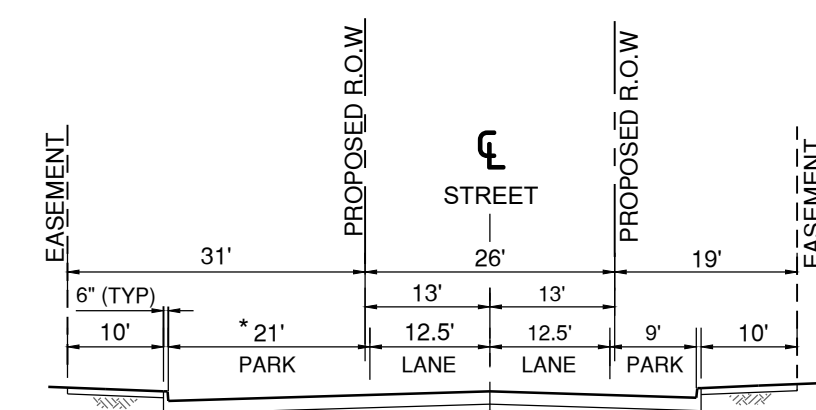
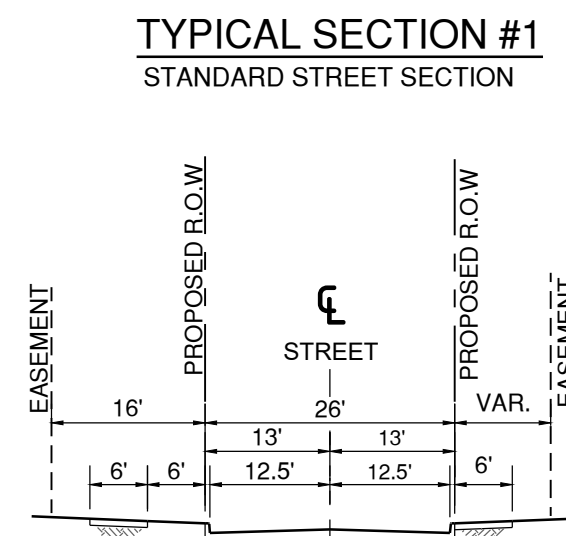
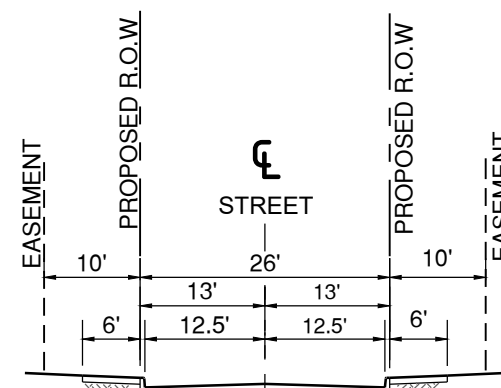
SITE DEVELOPMENT PLAN

SITE OVERVIEW - OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO



- KEYNOTES**
- (A) PROPOSED RIGHT-OF-WAY
 - (B) PROPOSED ROADWAY IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, SIDEWALK (R.I.M.U.S.S.) EASEMENT
 - (C) FUTURE ENTRANCE
 - (D) EXISTING STL WATER MAIN CONDUITS
 - (E) EXISTING STL WATER MAIN EASEMENT
 - (F) EXISTING PRIVATE DRIVE TO REMAIN
 - (G) PROPOSED SITE RETAINING WALL (TYP) MECHANICALLY STABILIZED EARTH OR SEGMENTAL BLOCK WALL (TO BE DETERMINED UPON FINAL DESIGN)
 - (H) PROPOSED WALKING TRAIL OR SIDEWALK (TYP) SEE PEDESTRIAN MOBILITY PLAN
 - (I) EXISTING PARKING LOT / DRIVE TO REMAIN



PUBLIC STREET INFORMATION		
STREET NAME	CENTERLINE LENGTH (FT)	LANE MILES (MI)
PAVILLION DRIVE	490	0.357
MAIN STREET	2,340	0.886
HARVEST DRIVE	770	0.292
ARBOR LANE	750	0.284
OLIVE COVE	2,120	0.803
TWISTED BRANCH	1,160	0.439
VINE STREET	730	0.277
BAYER DRIVE	720	0.273
ON-RAMP FROM BAYER DRIVE	180	0.034
OFF-RAMP TO BAYER DRIVE	320	0.061
BAYER DRIVE (E/W)	160	0.061
TOTAL :	9,740	3.767

GENERAL NOTES

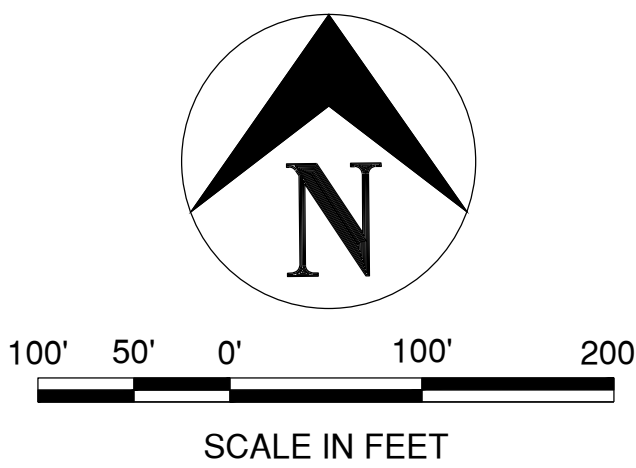
- EXISTING EASEMENTS NOT SHOWN FOR CLARITY.
- EXISTING UTILITIES NOT SHOWN FOR CLARITY.
- PROPOSED UTILITIES NOT SHOWN FOR CLARITY.



ONE MEMORIAL DRIVE, SUITE 500
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SITE DEVELOPMENT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO.: 23005201-00
CAD DWG FILE: SITE-DEVELOPMENT-PLAN.DWG
DESIGNED BY: TME/JFM
DRAWN BY: JFM
CHECKED BY: CJS
APPROVED BY: ---
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SHEET TITLE

SITE OVERVIEW

C-101

SHEET - OF --

SETBACK & BUFFER PLAN
OLIA VILLAGE

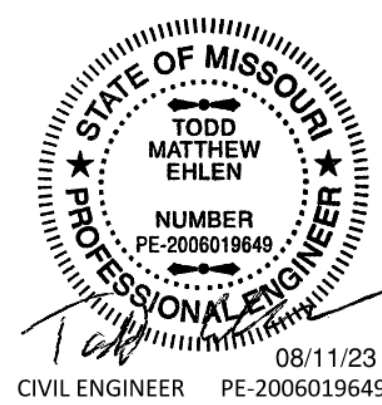
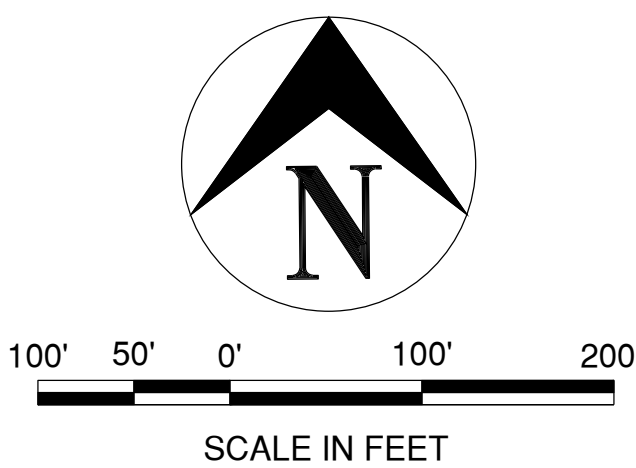
SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE DEVELOPMENT PLAN



LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- CONCEPTUAL BLDG FOOTPRINT
- PROPOSED EASEMENT
- PROPOSED BUILDING SETBACK

KEYNOTES

- OFF-SITE ROADWAY IMPROVEMENTS ON OLIVE BOULEVARD (TYP)
- EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
- 35' RESIDENTIAL BUFFER YARD (TYP)
- 15' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
- 40' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
- 10' MINIMUM PROPOSED ROADWAY IMPROVEMENT MAINTENANCE UTILITY SEWER SIDEWALK EASEMENT (PRIMUSSE)
- 50' NATURAL VEGETATION BUFFER
- 25' NO-IMPERVIOUS BUFFER
- EXISTING STREAM TO REMAIN

BUFFER NOTES

- EXISTING TRAILS AND PAVEMENTS WITHIN NATURAL OR IMPERVIOUS BUFFER LIMITS ARE ALLOWED TO REMAIN.
- ANY NEW OR IMPROVED PAVEMENTS SHALL NOT ENCR OACH INTO NATURAL OR IMPERVIOUS BUFFER LIMITS FURTHER THAN EXISTING PAVEMENT LIMITS.

SETBACK AND BUFFER REQUIREMENTS

SETBACK AND BUILDING LINE REQUIREMENTS WITHIN THE DEVELOPMENT (INTERNAL):

CATEGORY A - " MAIN STREET" SUB-DISTRICT:

- MINIMUM FRONT YARD - ZERO (0) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY B - MIXED USE SUB-DISTRICT:

- MINIMUM FRONT YARD - ZERO (0) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY C - GENERAL OFFICE SUB-DISTRICT:

- MINIMUM FRONT YARD - ZERO (0) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- MINIMUM DISTANCE BETWEEN BUILDINGS OR UNIT CLUSTERS - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

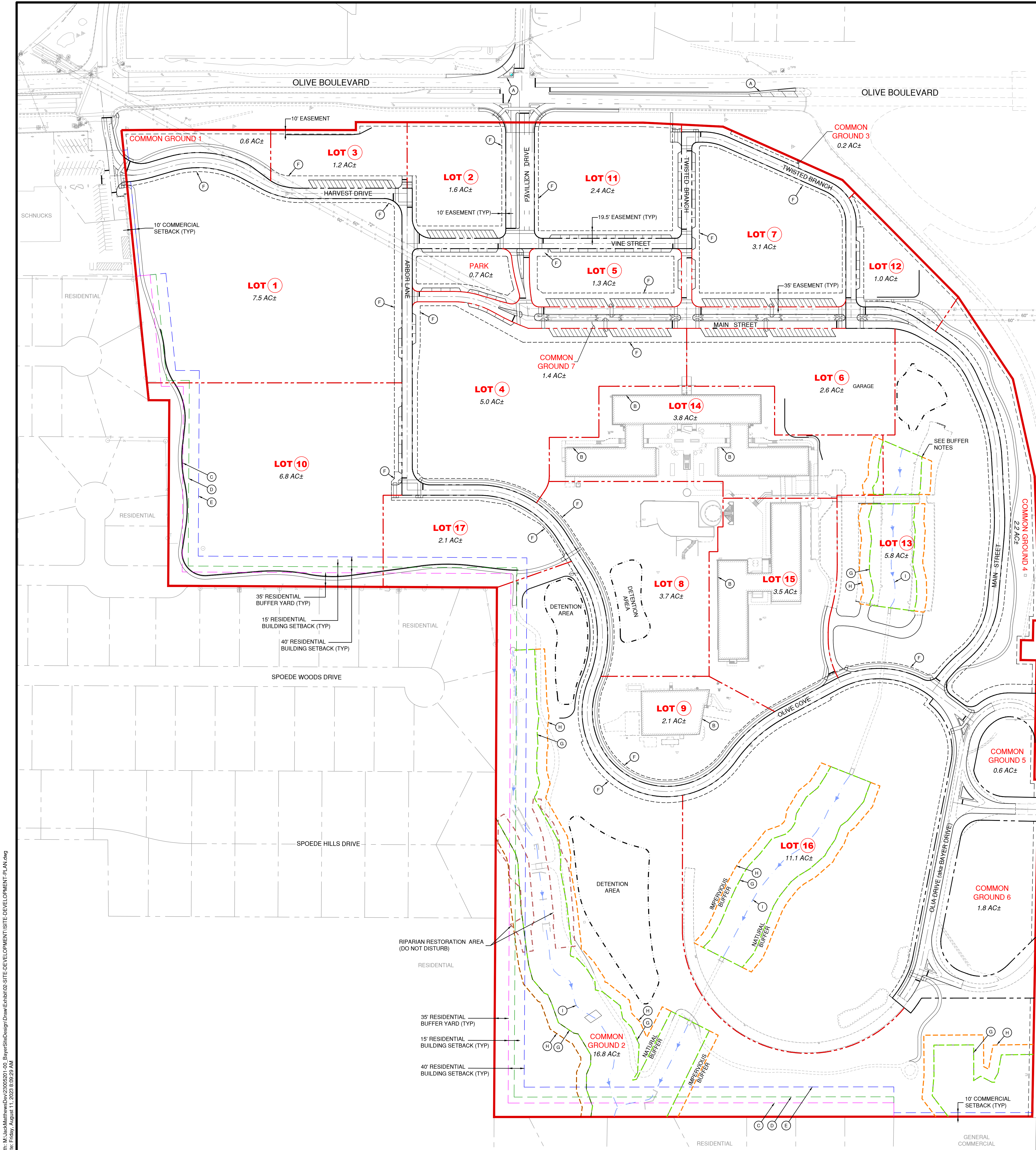
CATEGORY D - RESIDENTIAL SUB-DISTRICT:

- MINIMUM FRONT YARD - FIVE (5) FEET
- MINIMUM SIDE YARD - NONE OR SEVEN AND A HALF (7.5) FEET
- MINIMUM REAR YARD - FIVE (5) FEET
- MINIMUM DISTANCE BETWEEN BUILDINGS OR UNIT CLUSTERS - FIFTEEN (15) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

SETBACK AND BUILDING LINE REQUIREMENTS TO ADJACENT PARCELS:

- RESIDENTIAL :
- REQUIRED BUFFER YARD - THIRTY-FIVE (35) FEET.
 - MINIMUM RESIDENTIAL BUILDING SETBACK - FIFTEEN (15) FEET
 - MINIMUM COMMERCIAL BUILDING SETBACK - FORTY (40) FEET BEYOND BUFFER YARD.

- NON-RESIDENTIAL :
- MINIMUM BUILDING SETBACK - TEN (10) FEET.



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 23005201-00
CAD DWG FILE: ISITE-DEVELOPMENT-PLAN.DWG
DESIGNED BY: TME/JFM
DRAWN BY: JFM
CHECKED BY: CJS
APPROVED BY: ---
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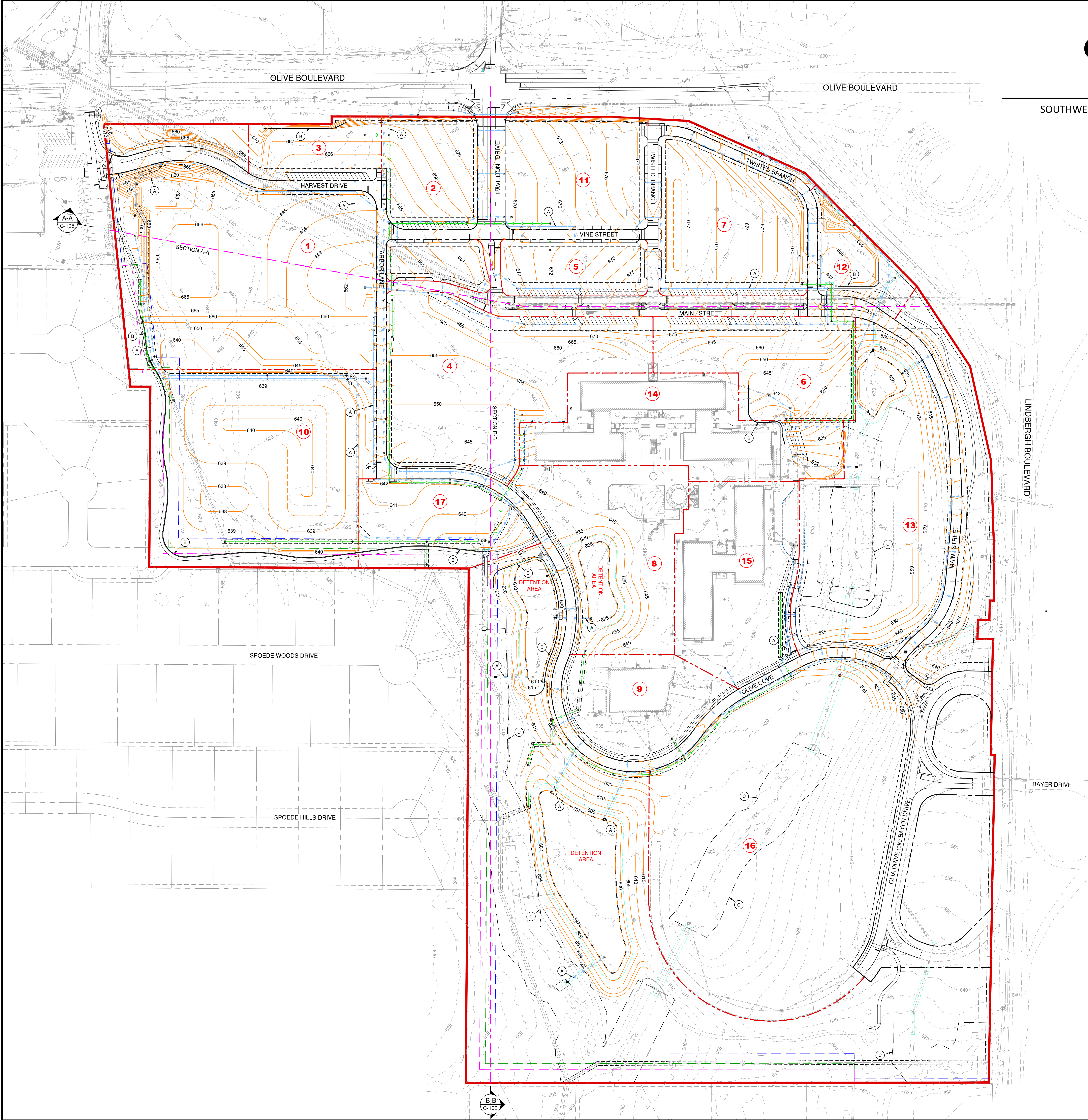
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SETBACK & BUFFER
PLAN

C-102

SHEET - OF --

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Date: Friday, August 11, 2023 2:28:23 AM



GRADING PLAN

OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- LEGEND**
- DEVELOPMENT BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED R.O.W. LINE
 - EXISTING CONTOUR
 - PROPOSED CONTOUR
 - PROPOSED STORM SEWER
 - CONCEPTUAL BLDG FOOTPRINT

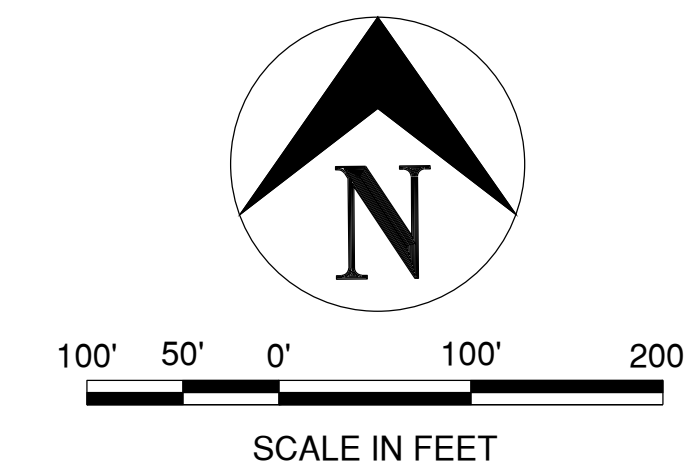
- KEYNOTES**
- (A) PROPOSED STORM SEWER (TYP)
 - (B) PROPOSED SITE RETAINING WALL (TYP)
MECHANICALLY STABILIZED EARTH OR SEGMENTAL BLOCK WALL
(TO BE DETERMINED UPON FINAL DESIGN)
 - (C) 50' NATURAL VEGETATION BUFFER



ONE MEMORIAL DRIVE, SUITE 500
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LICENSE NO. 184-000631

CONSULTANTS:

SITE DEVELOPMENT PLAN



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NOT FOR CONSTRUCTION
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OLIA VILLAGE
LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD
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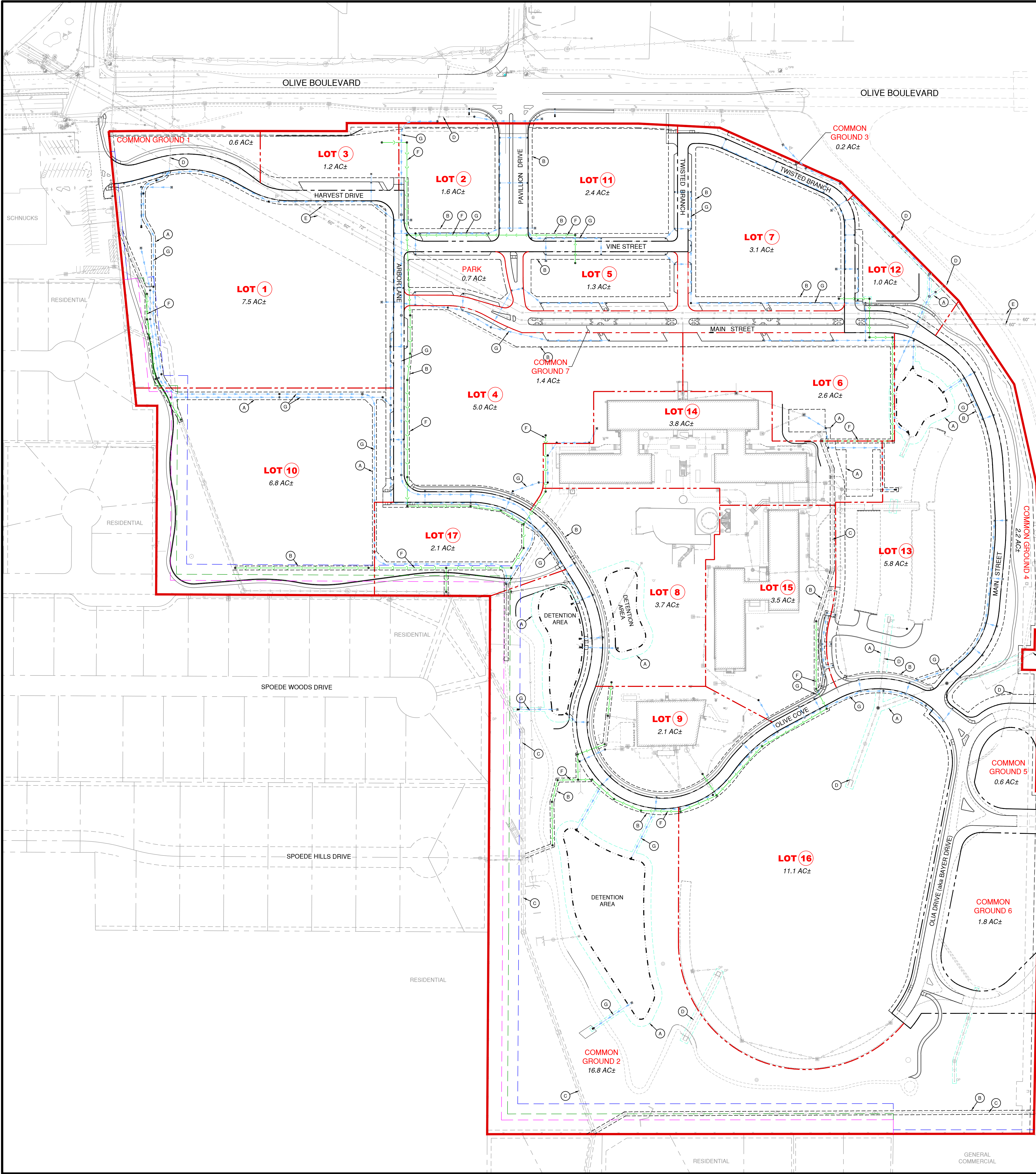
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DRAWN BY:	JFM	
CHECKED BY:	CJS	
APPROVED BY:	---	
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SHEET TITLE

GRADING PLAN

C-103

SHEET - OF --



UTILITY & DRAINAGE PLAN

OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- LEGEND**
- DEVELOPMENT BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED R.O.W. LINE
 - EXISTING SANITARY SEWER
 - EXISTING STORM SEWER
 - EXISTING WATER MAIN
 - PROPOSED SANITARY SEWER
 - PROPOSED STORM SEWER
 - PROPOSED EASEMENT

- KEYNOTES**
- (A) DRAINAGE EASEMENT (TYP)
 - (B) UTILITY EASEMENT (TYP)
 - (C) EXISTING SANITARY SEWER
 - (D) EXISTING STORM DRAINAGE SYSTEM
 - (E) EXISTING STL WATER CO. WATERMAIN CONDUITS
 - (F) PROPOSED SANITARY SEWER (TYP)
 - (G) PROPOSED STORM DRAINAGE SYSTEM (TYP)

PREPARED BY:

CMT
Crawford, Murphy & Tilly

ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE DEVELOPMENT PLAN

SCALE IN FEET

PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD

OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
PROJECT NO:	23005201-00	
CAD DWG FILE:	ISITE-DEVELOPMENT-PLAN.DWG	
DESIGNED BY:	TME/JFM	
DRAWN BY:	JFM	
CHECKED BY:	CJS	
APPROVED BY:	---	
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SHEET TITLE

UTILITY & DRAINAGE PLAN

C-104

SHEET - OF --

PEDESTRIAN MOBILITY PLAN
OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- CONCEPTUAL BLDG FOOTPRINT
- PROPOSED EASEMENT
- ROADWAY STRIPING - STOP BAR
- ROADWAY STRIPING - CROSSWALK
- PROPOSED CONCRETE SIDEWALK (WITHIN EASEMENT)
- PROPOSED 8' WIDE NATURAL AGGREGATE TRAIL (WITHIN EASEMENT ON NON-COMMON AREAS)

KEYNOTES

- PROPOSED RIGHT-OF-WAY
- PROPOSED ROADWAY IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, SIDEWALK (R.I.M.U.S.S.) EASEMENT
- PROPOSED SIDEWALK EASEMENT
- PROPOSED CROSSWALK
- EXISTING AGGREGATE TRAIL TO REMAIN (WIDTH VARIES APPROXIMATELY 8' TO 12')

PEDESTRIAN MOBILITY INFORMATION		
LOCATION	SIDEWALK LENGTH (FT)	TRAIL LENGTH (FT)
PAVILLION DRIVE		
MAIN STREET		
MAIN STREET (EAST LEG)	1,250	
HARVEST DRIVE	390	
ARBOR LANE		
OLIVE COVE	2,520	
TWISTED BRANCH		
VINE STREET		
OLIA DRIVE (AKA BAYER DRIVE)	690	
WEST / SOUTH TRAIL (PROPOSED)		2,280
WEST / SOUTH TRAIL (EXISTING)		2,210
SUB-TOTAL :	4,850	4,490
TOTAL SIDEWALK / TRAIL (FT) :	9,340	
TOTAL SIDEWALK / TRAIL (MI) :	1.8	

PREPARED BY:
CMT
Crawford, Murphy & Tilly
ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE DEVELOPMENT PLAN

N

100' 50' 0' 100' 200'

SCALE IN FEET

STATE OF MISSOURI

TODD MATTHEW EHLEN

NUMBER FE-2006019549

PROFESSIONAL ENGINEER

08/11/23

CIVIL ENGINEER FE-2006019549

PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
LINDBERGH & OLIVE BLVD

OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
PROJECT NO.:	23005201-00	
CAD DWG FILE:	ISITE-DEVELOPMENT-PLAN.DWG	
DESIGNED BY:	TME/JFM	
DRAWN BY:	JFM	
CHECKED BY:	CJS	
APPROVED BY:	---	
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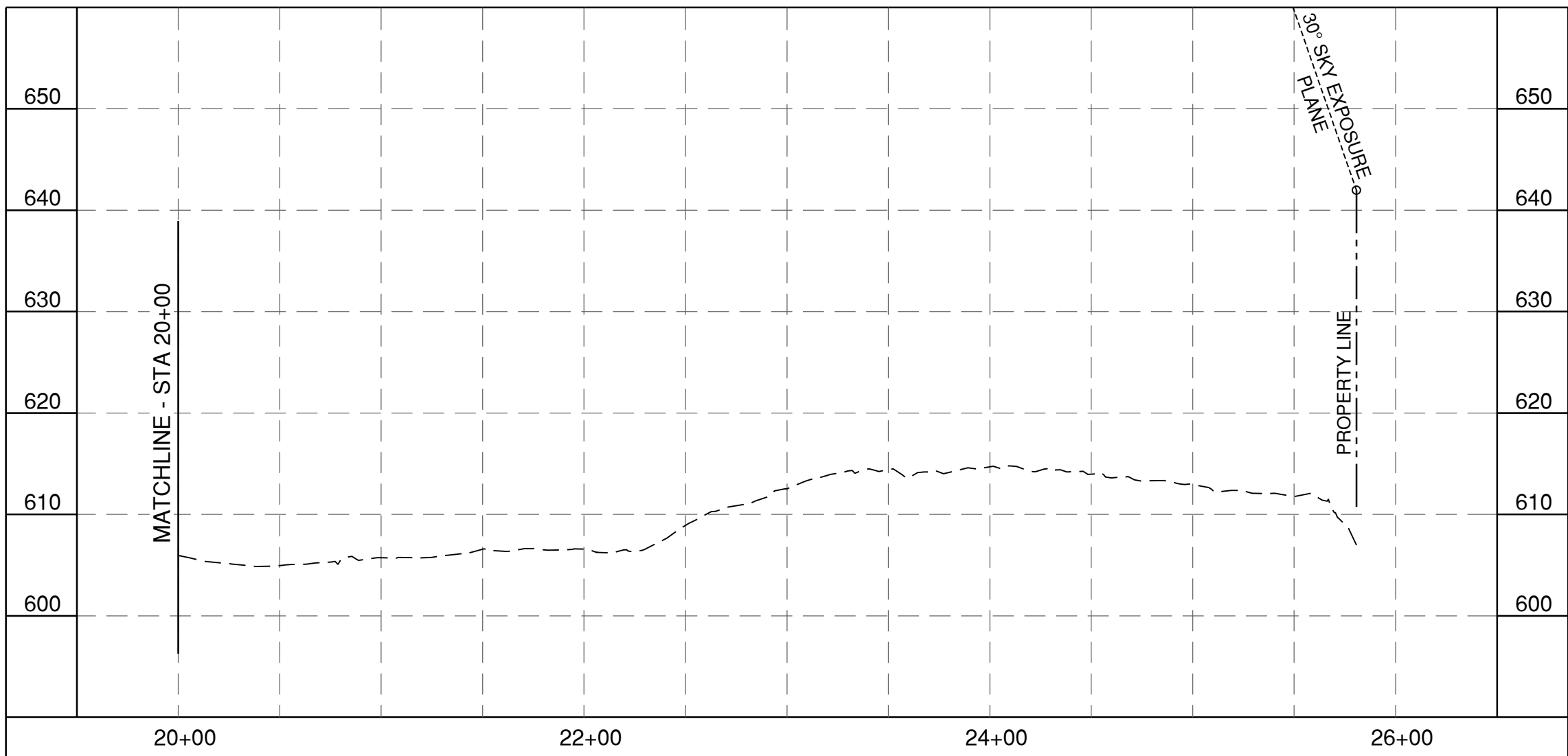
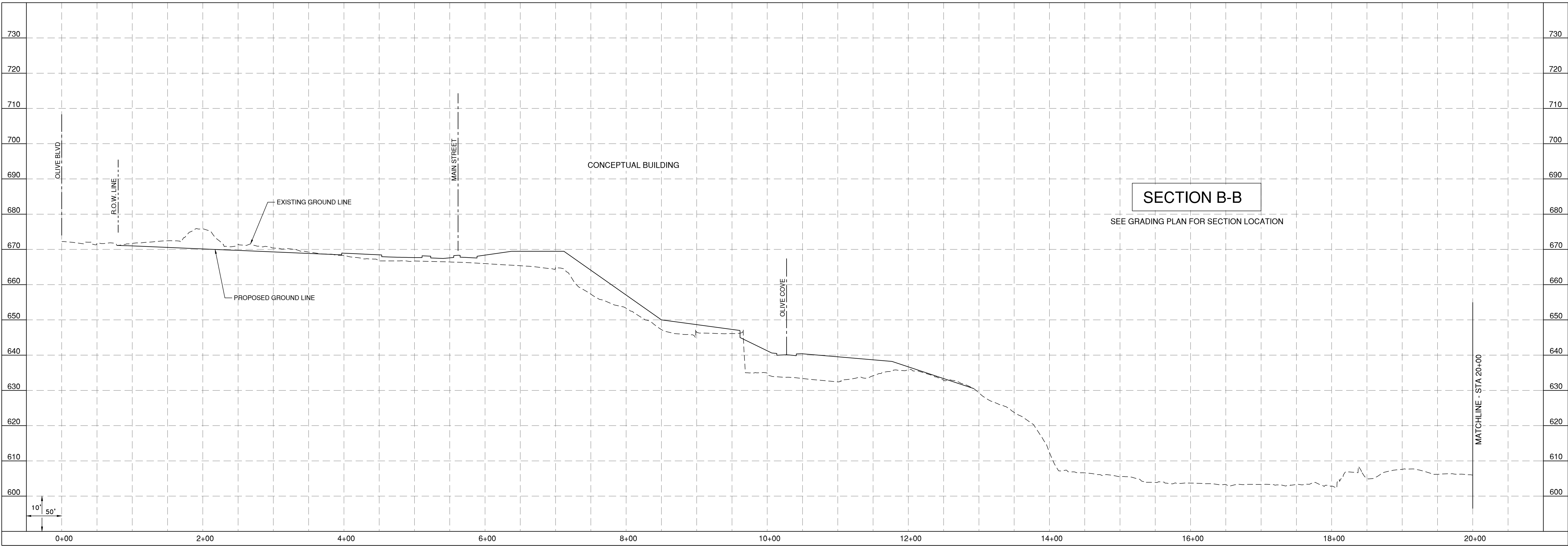
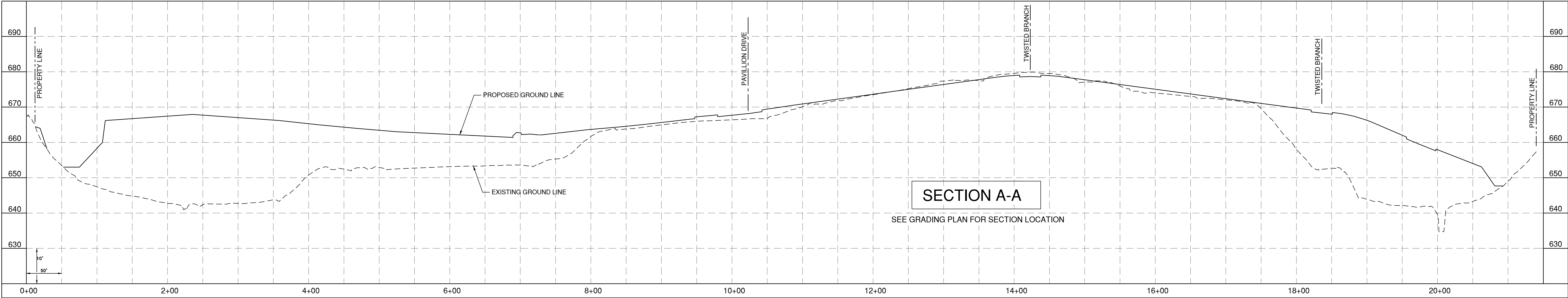
SHEET TITLE

PEDESTRIAN PLAN

C-105

SHEET - OF --

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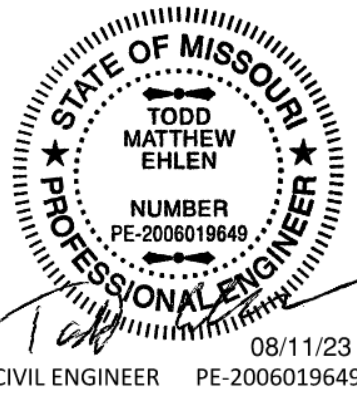
PREPARED BY:



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE DEVELOPMENT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
------	------	-------------

PROJECT NO:	23005201-00
CAD DWG FILE:	ISITE-DEVELOPMENT-PLAN.DWG
DESIGNED BY:	TME/JFM
DRAWN BY:	JFM
CHECKED BY:	CJS
APPROVED BY:	---
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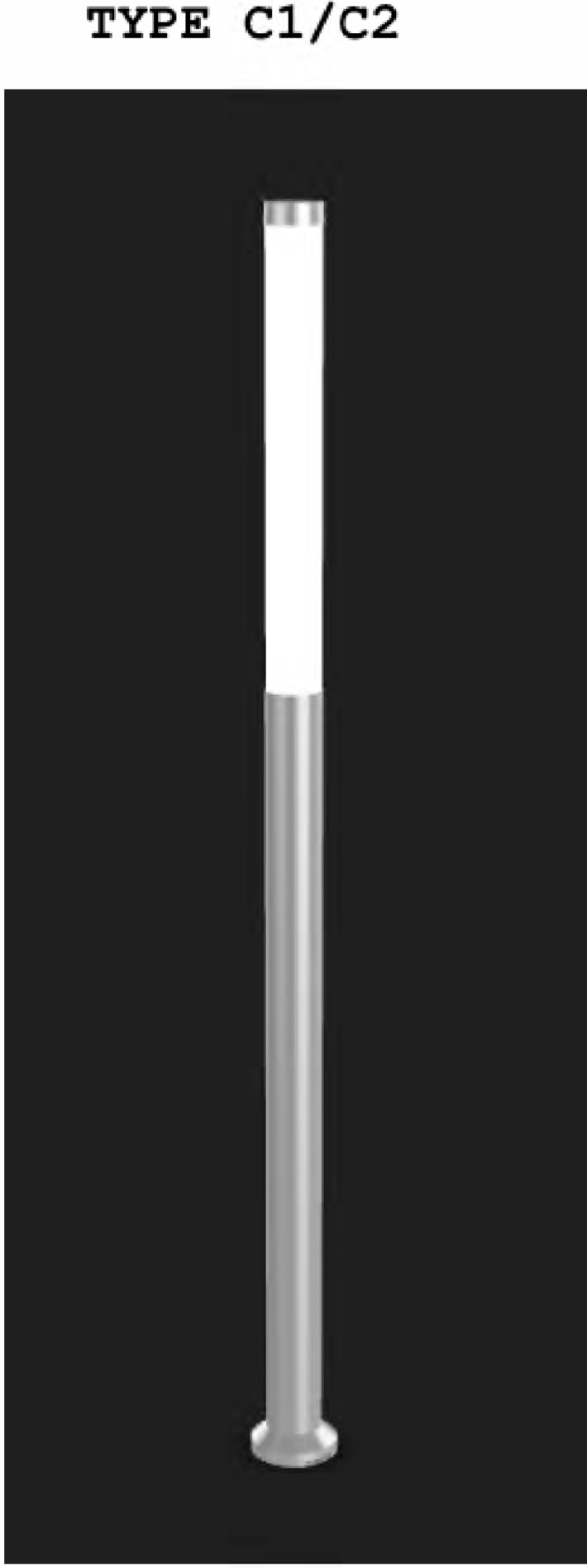
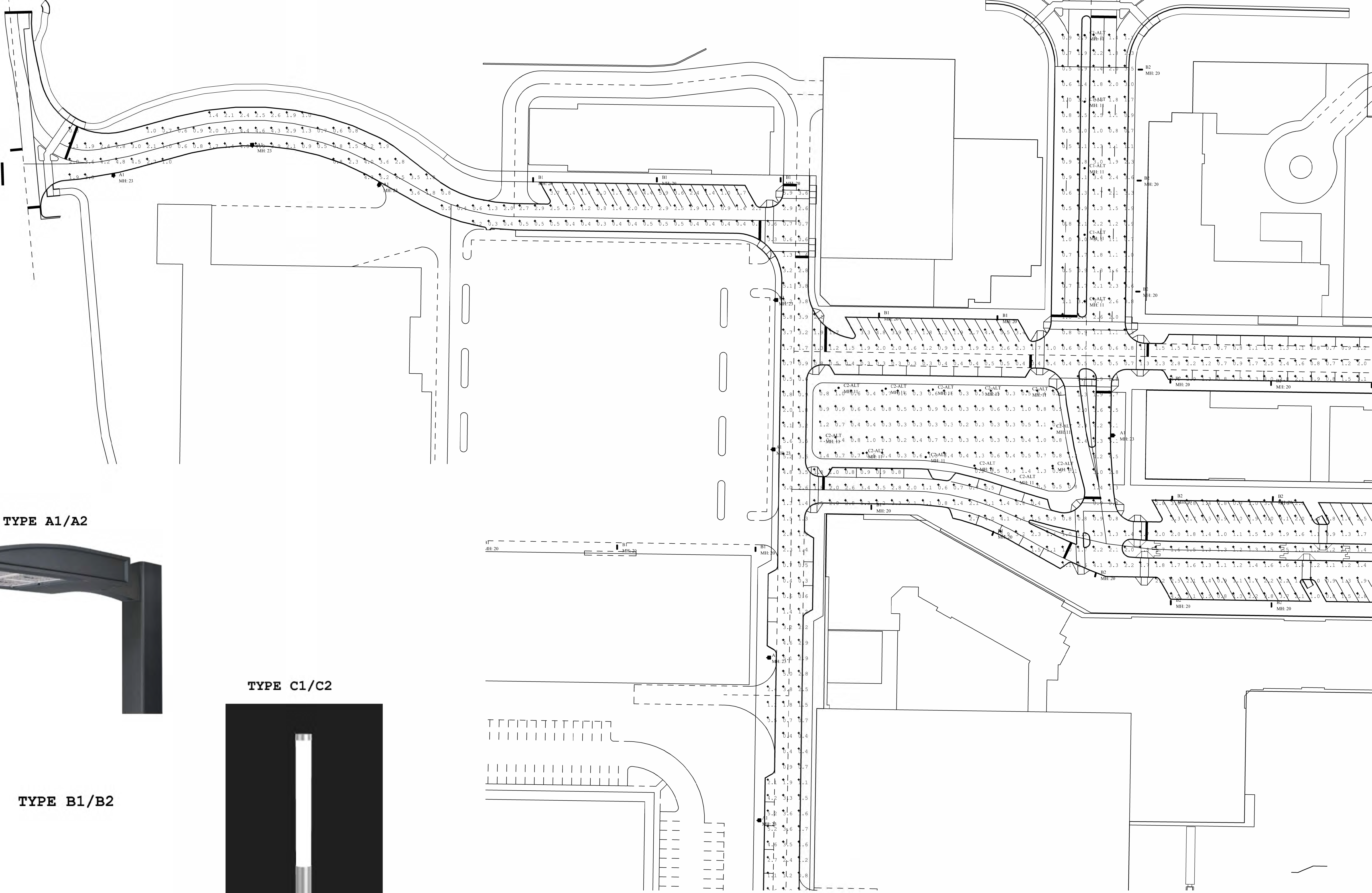
SHEET TITLE

SITE SECTIONS

C-106

SHEET - OF --

NOTE: CONCEPTUAL OVERALL BACKGROUND SHOWN FOR INFORMATION ONLY. ACTUAL PHASING OF STREET LIGHTING INSTALLATION WILL COINCIDE WITH THE PHASING OF EACH ADJACENT STREET SECTION AND CORRESPONDING APPURTENANCES.



OLIA VILLAGE

NOTES:

CALCULATION POINTS ON GROUND
TYPE A1/A2 - 20' MOUNTING HEIGHT PLUS 3' BASE
TYPE B1/B2 - 20' MOUNTING HEIGHT
TYPE C1/C2 - 11' TALL

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	35	A1	Single	N.A.	0.912	GALN-SA3C-740-U-T3
	4	A2	Single	N.A.	0.912	GALN-SA4C-740-U-SL3
	10	B1	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-3
	31	B2	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-4
	5	C1-ALT	Single	N.A.	0.900	MTRCL-X-4-4B30-30-XX-UNV
	12	C2-ALT	Single	N.A.	0.900	MTRCL-X-4-1B30-30-XX-UNV

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PARK	Illuminance	Fc	0.62	1.4	0.2	3.1	7.0
SITE	Illuminance	Fc	1.95	6.8	0.2	9.8	34.0

PREPARED BY:

gray

8 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 22478.00
CAD DWG FILE: GRAY RENDERINGS A.DWG
DESIGNED BY: TDH/BKP
DRAWN BY: TDH
CHECKED BY:
APPROVED BY:
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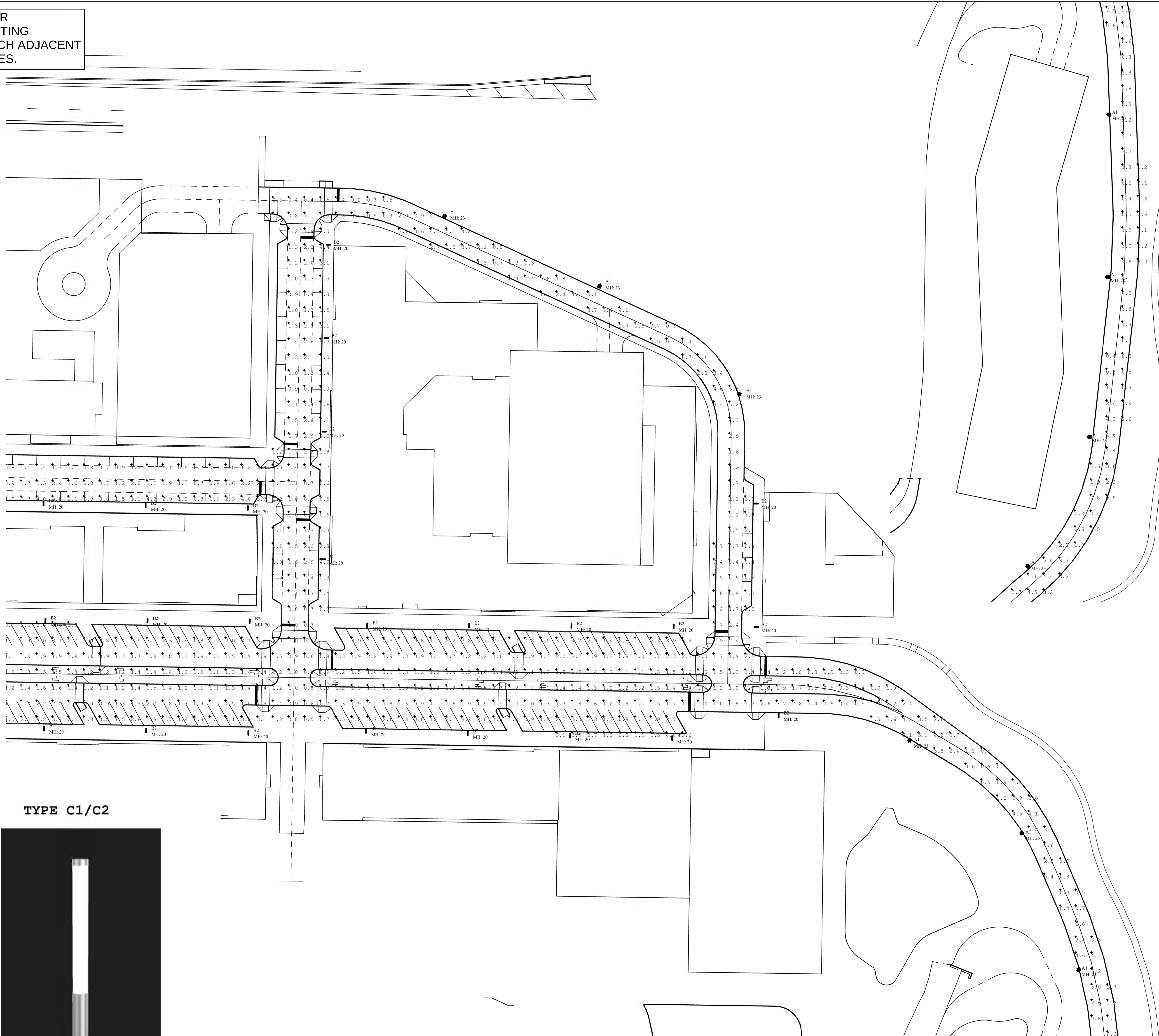
SHEET TITLE

SITE LIGHTING

A-103.1

SHEET OF

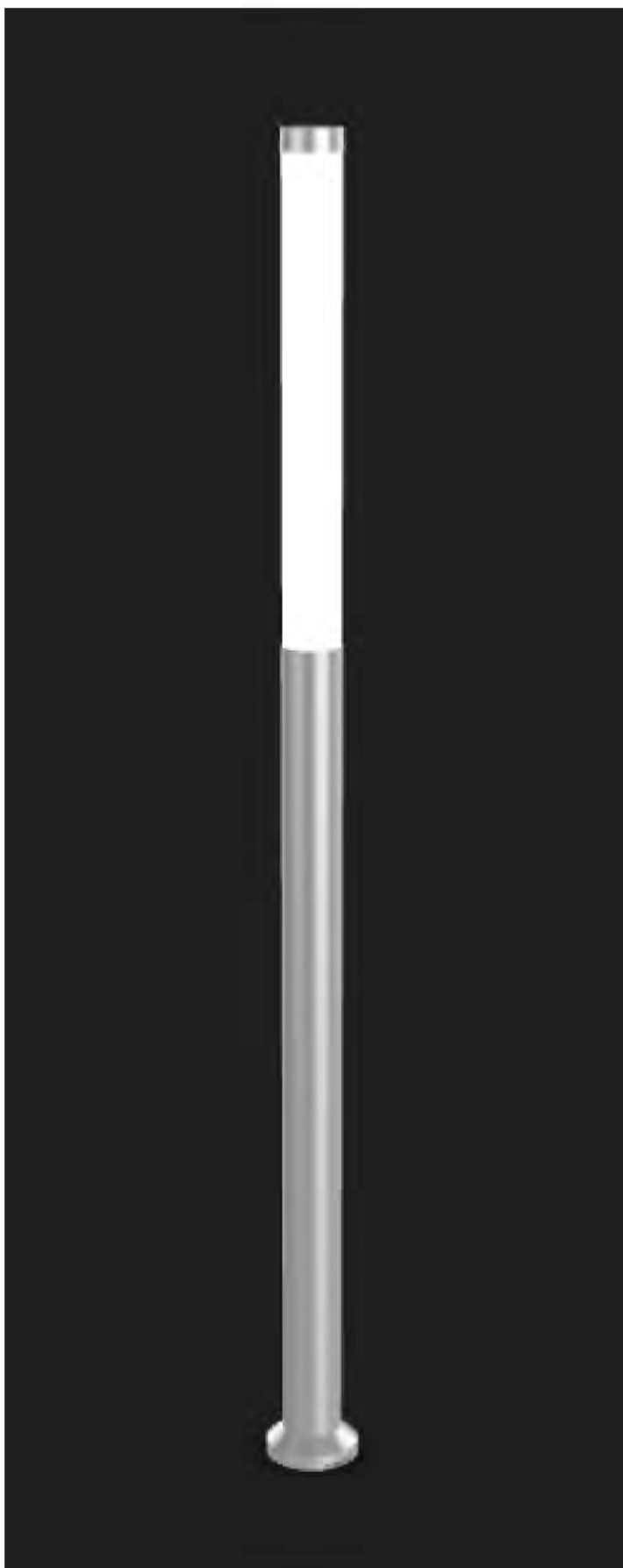
NOTE: CONCEPTUAL OVERALL BACKGROUND SHOWN FOR INFORMATION ONLY. ACTUAL PHASING OF STREET LIGHTING INSTALLATION WILL COINCIDE WITH THE PHASING OF EACH ADJACENT STREET SECTION AND CORRESPONDING APPURTENANCES.



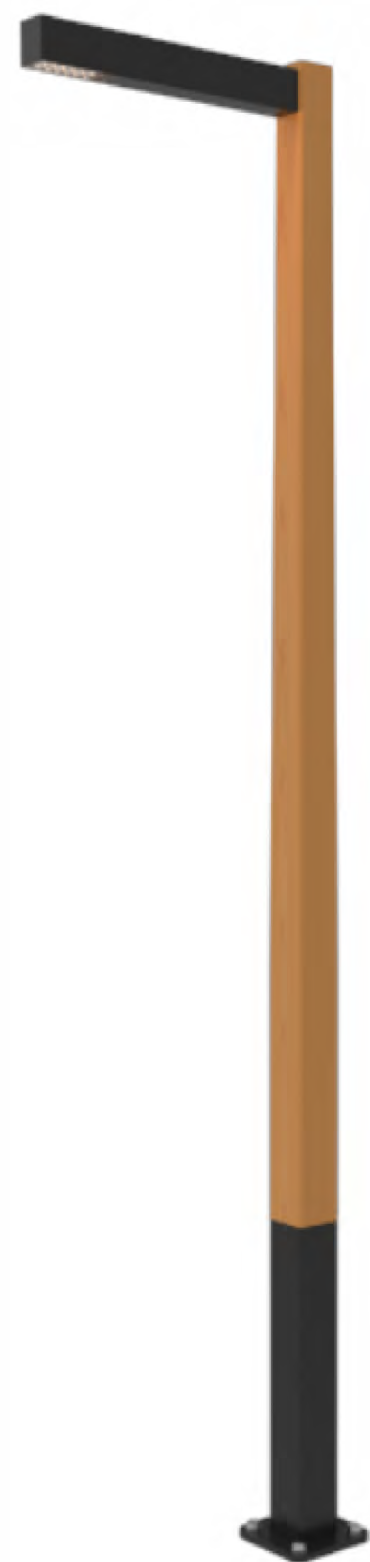
TYPE A1/A2



TYPE C1/C2



TYPE B1/B2



OLIA VILLAGE

NOTES:

CALCULATION POINTS ON GROUND
TYPE A1/A2 - 20' MOUNTING HEIGHT PLUS 3' BASE
TYPE B1/B2 - 20' MOUNTING HEIGHT
TYPE C1/C2 - 11' TALL

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	35	A1	Single	N.A.	0.912	GALN-SA3C-740-U-T3
	4	A2	Single	N.A.	0.912	GALN-SA4C-740-U-SI-3
	10	B1	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-3
	31	B2	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-4
	5	C1-ALT	Single	N.A.	0.900	MTRCL-X-4-4B30-30-XX-UNV
	12	C2-ALT	Single	N.A.	0.900	MTRCL-X-4-1B30-30-XX-UNV

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PARK	Illuminance	Fc	0.62	1.4	0.2	3.1	7.0
SITE	Illuminance	Fc	1.95	6.8	0.2	9.8	34.0

PREPARED BY:

gray

8 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 22478.00
CAD DWG FILE: GRAY RENDERINGS A.DWG
DESIGNED BY: TDH/BKP
DRAWN BY: TDH
CHECKED BY:
APPROVED BY:
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SHEET TITLE

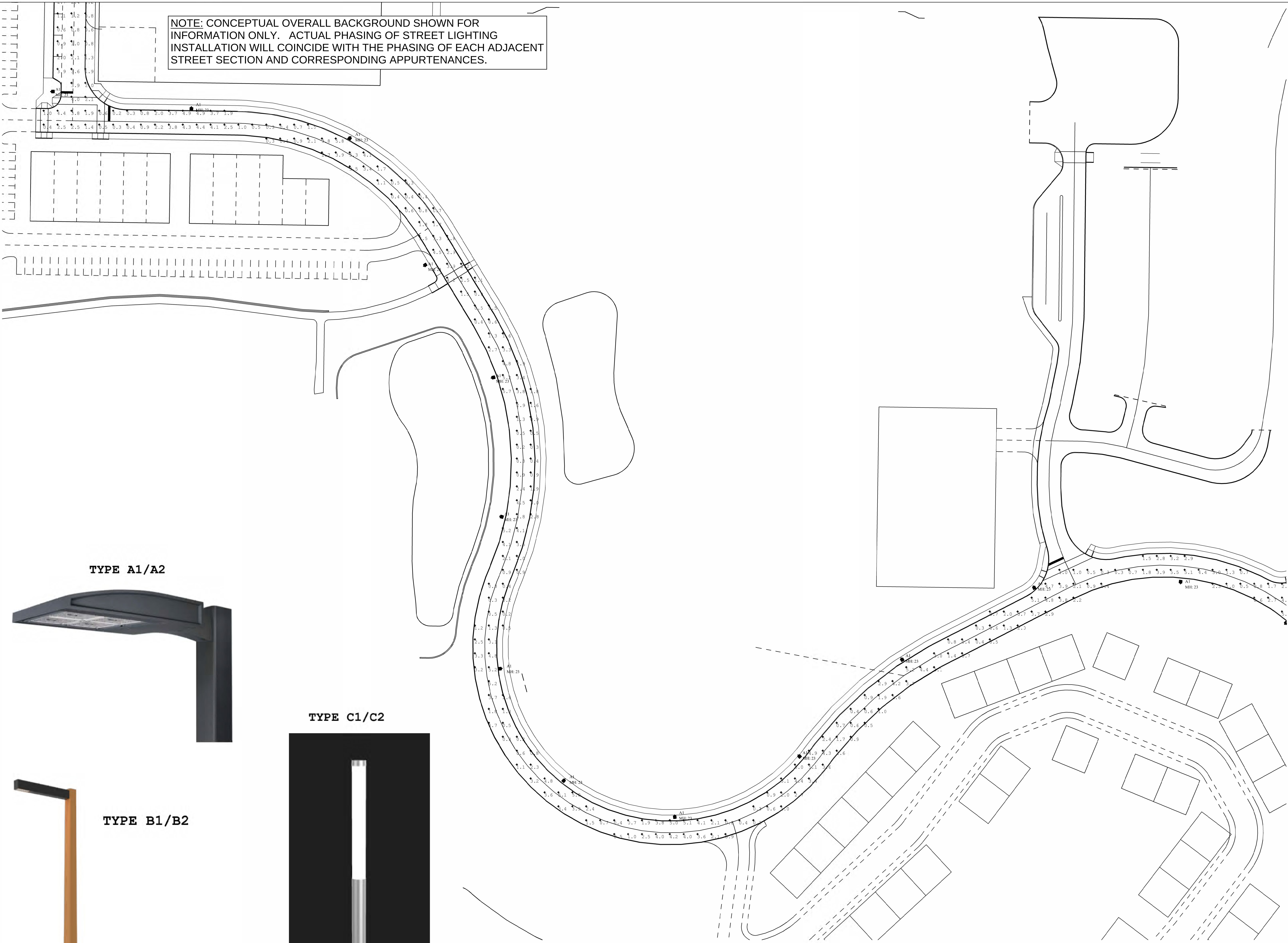
SITE LIGHTING

A-103.2

SHEET

OF

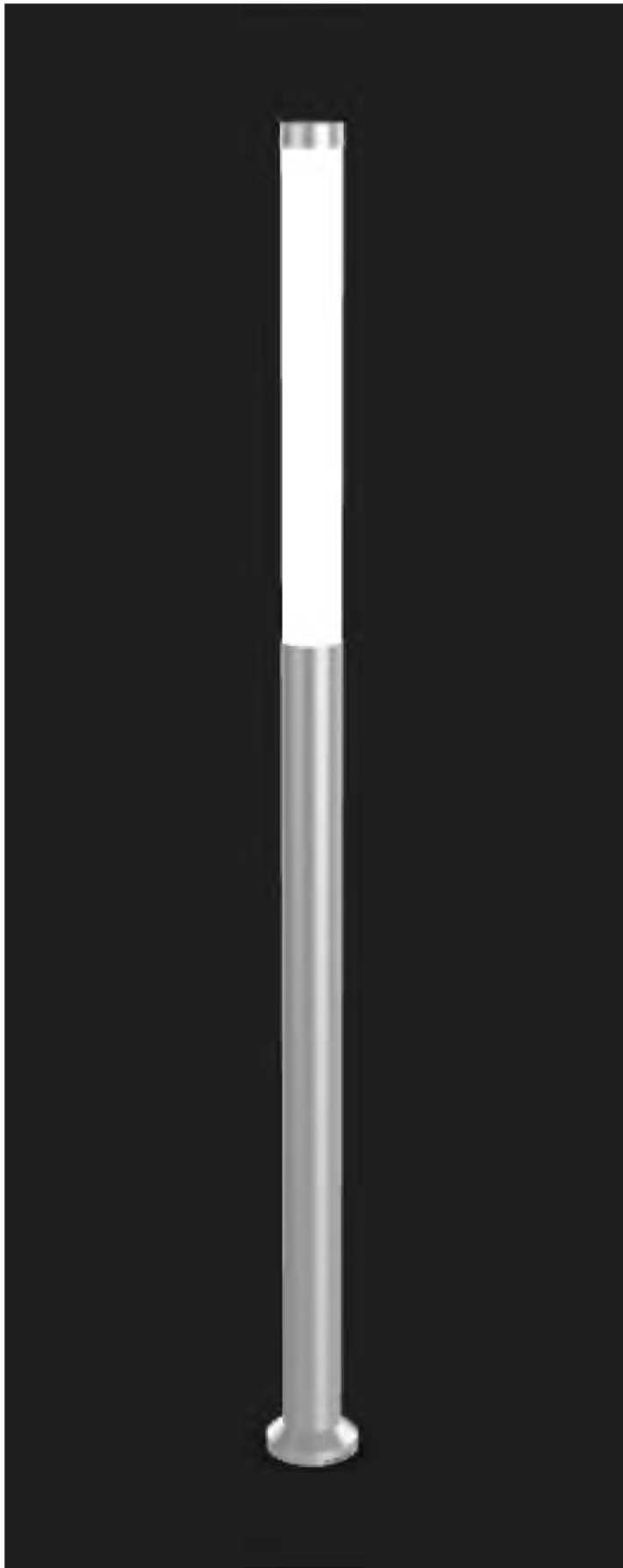
NOTE: CONCEPTUAL OVERALL BACKGROUND SHOWN FOR INFORMATION ONLY. ACTUAL PHASING OF STREET LIGHTING INSTALLATION WILL COINCIDE WITH THE PHASING OF EACH ADJACENT STREET SECTION AND CORRESPONDING APPURTENANCES.



TYPE A1/A2



TYPE C1/C2



TYPE B1/B2



OLIA VILLAGE

NOTES:

CALCULATION POINTS ON GROUND
TYPE A1/A2 - 20' MOUNTING HEIGHT PLUS 3' BASE
TYPE B1/B2 - 20' MOUNTING HEIGHT
TYPE C1/C2 - 11' TALL

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	35	A1	Single	N.A.	0.912	GALN-SA3C-740-U-T3
	4	A2	Single	N.A.	0.912	GALN-SA4C-740-U-SL3
	10	B1	Single	N.A.	0.900	BLDM-SD-120 277-CSL-L160-40K-CRI 70-3
	31	B2	Single	N.A.	0.900	BLDM-SD-120 277-CSL-L160-40K-CRI 70-4
	5	C1-ALT	Single	N.A.	0.900	MTRCL-X-4-4B30-30-XX-UNV
	12	C2-ALT	Single	N.A.	0.900	MTRCL-X-4-1B30-30-XX-UNV

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PARK	Illuminance	Fc	0.62	1.4	0.2	3.1	7.0
SITE	Illuminance	Fc	1.95	6.8	0.2	9.8	34.0

PREPARED BY:

gray

8 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 22478.00
CAD DWG FILE: GRAY RENDERINGS A.DWG
DESIGNED BY: TDH/BKP
DRAWN BY: TDH
CHECKED BY:
APPROVED BY:
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SHEET TITLE

SITE LIGHTING

A-103.3

SHEET

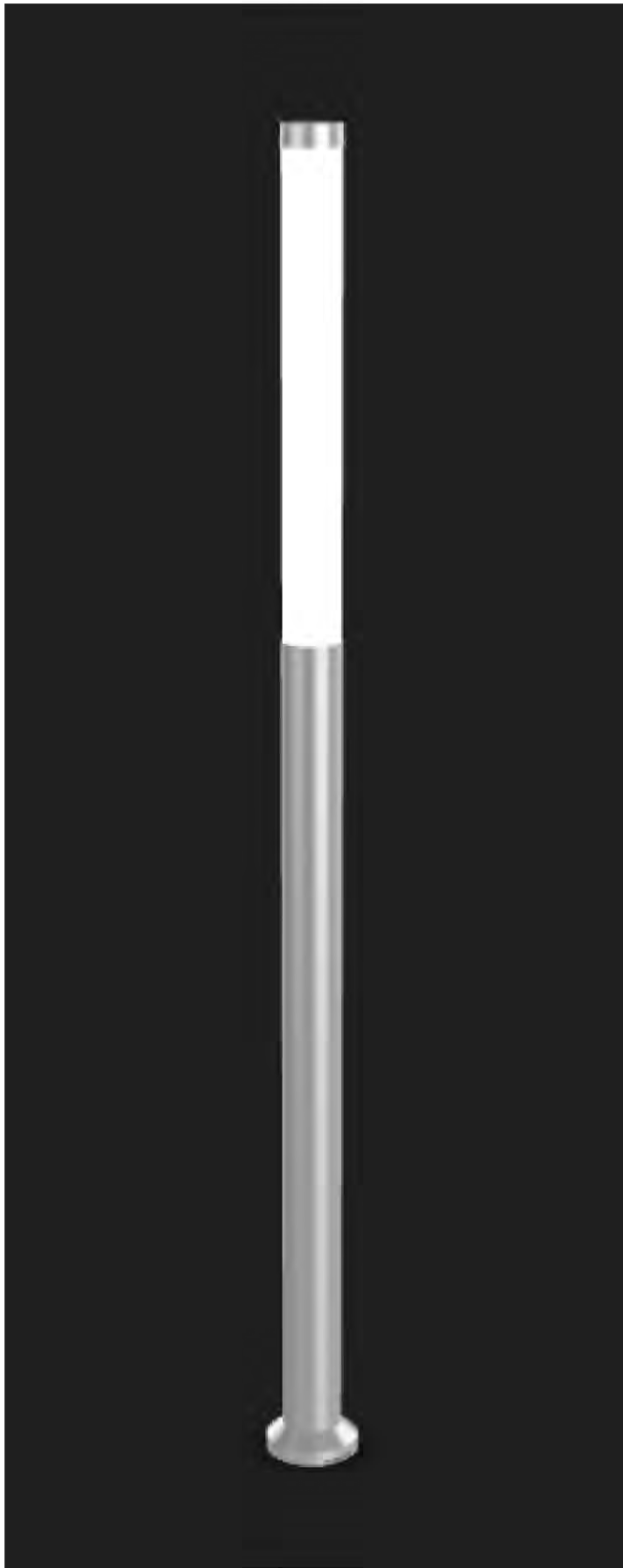
OF

NOTE: CONCEPTUAL OVERALL BACKGROUND SHOWN FOR INFORMATION ONLY. ACTUAL PHASING OF STREET LIGHTING INSTALLATION WILL COINCIDE WITH THE PHASING OF EACH ADJACENT STREET SECTION AND CORRESPONDING APPURTENANCES.

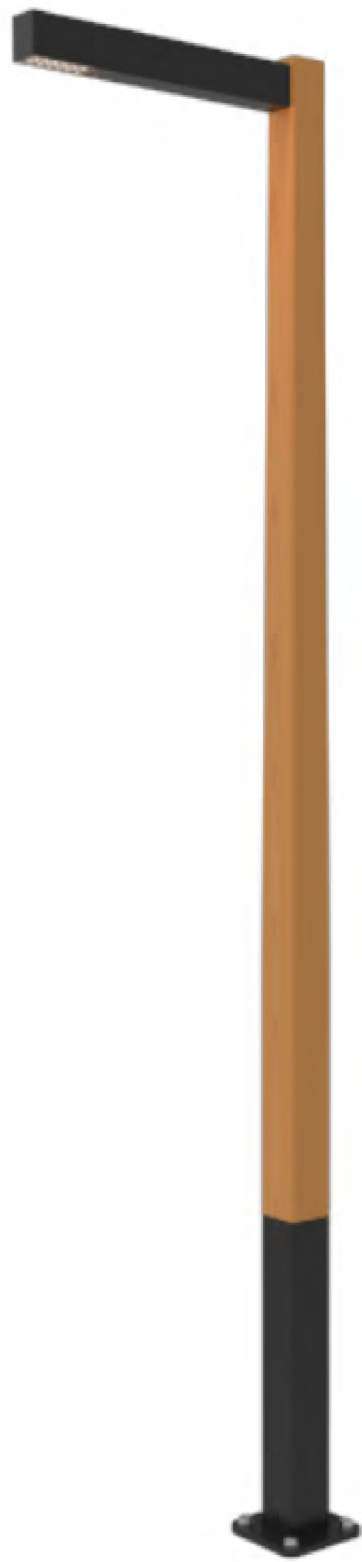
TYPE A1/A2



TYPE C1/C2



TYPE B1/B2



OLIA VILLAGE

NOTES:

CALCULATION POINTS ON GROUND
TYPE A1/A2 - 20' MOUNTING HEIGHT PLUS 3' BASE
TYPE B1/B2 - 20' MOUNTING HEIGHT
TYPE C1/C2 - 11' TALL

Luminaire Schedule						
Symbol	Qty	Label	Arrangement	Total Lamp Lumens	LLF	Description
	35	A1	Single	N.A.	0.912	GALN-SA3C-740-U-T3
	4	A2	Single	N.A.	0.912	GALN-SA4C-740-U-SL3
	10	B1	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-3
	31	B2	Single	N.A.	0.900	BLDM-SD-120-277-CSL-L160-40K-CRI 70-4
	5	C1-ALT	Single	N.A.	0.900	MTRCL-X-4-4B30-30-XX-UNV
	12	C2-ALT	Single	N.A.	0.900	MTRCL-X-4-1B30-30-XX-UNV

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
PARK	Illuminance	Fc	0.62	1.4	0.2	3.1	7.0
SITE	Illuminance	Fc	1.95	6.8	0.2	9.8	34.0

PREPARED BY:

gray

8 SUNNEN DRIVE, SUITE 110
ST. LOUIS, MO 63143
OFFICE NO. (314) 646-0400
LICENSE NO. A-2007011296

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 22478.00
CAD DWG FILE: GRAY RENDERINGS A.DWG
DESIGNED BY: TDH/BKP
DRAWN BY: TDH
CHECKED BY:
APPROVED BY:
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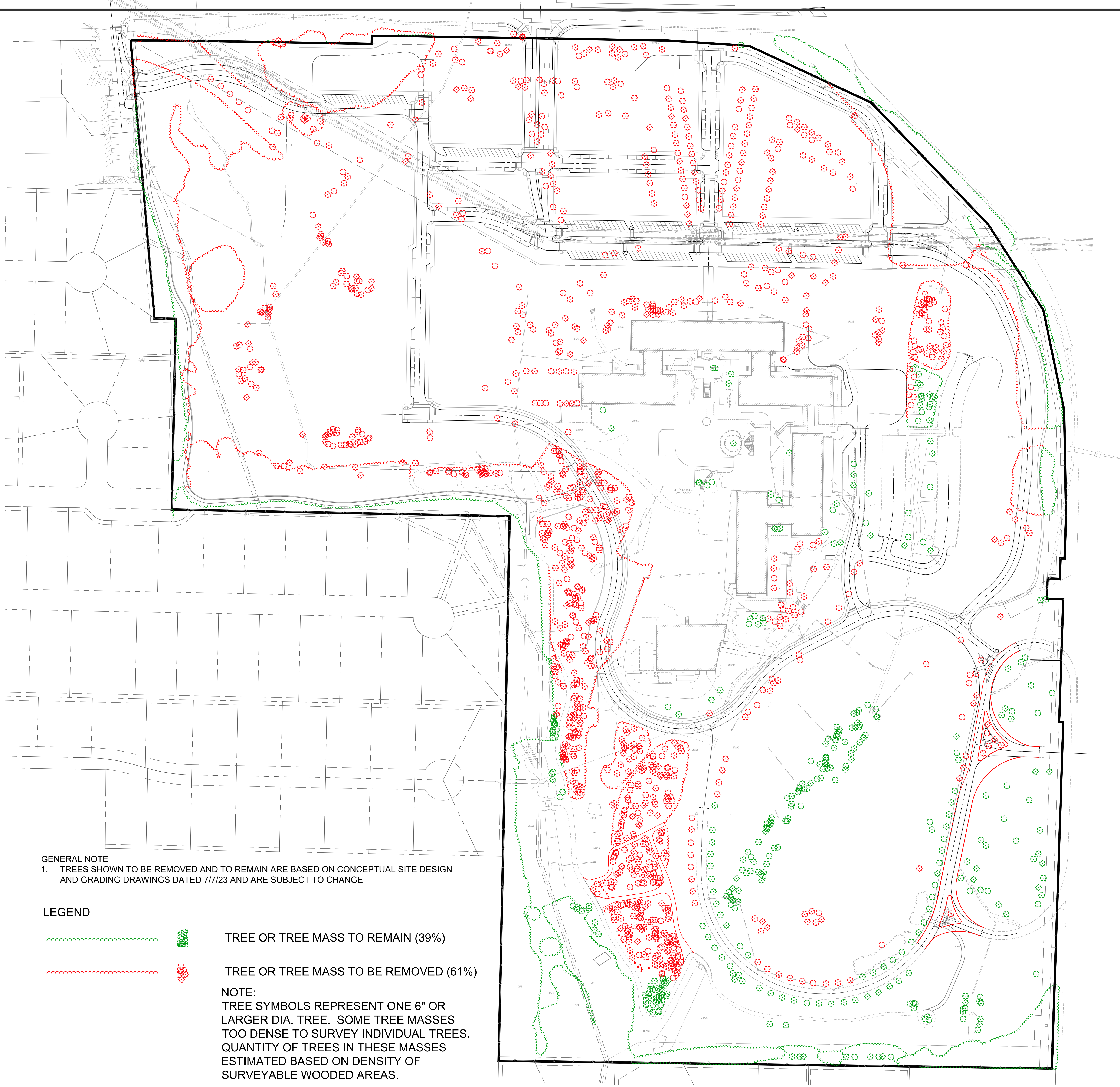
SHEET TITLE

SITE LIGHTING

A-103.4

SHEET

OF



GENERAL NOTE
1. TREES SHOWN TO BE REMOVED AND TO REMAIN ARE BASED ON CONCEPTUAL SITE DESIGN AND GRADING DRAWINGS DATED 7/7/23 AND ARE SUBJECT TO CHANGE

LEGEND

		TREE OR TREE MASS TO REMAIN (39%)
		TREE OR TREE MASS TO BE REMOVED (61%)

NOTE:
TREE SYMBOLS REPRESENT ONE 6" OR LARGER DIA. TREE. SOME TREE MASSES TOO DENSE TO SURVEY INDIVIDUAL TREES. QUANTITY OF TREES IN THESE MASSES ESTIMATED BASED ON DENSITY OF SURVEYABLE WOODED AREAS.

A TREE PRESERVATION PLAN
SCALE: 1"=100'

Call Before you DIG
TOLL FREE
1-800-344-7483
MISSOURI ONE-CALL SYSTEM INC.
MODOT (314) 340-4100

PREPARED BY:

CMT
Crawford, Murphy & Tilly

ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SWT DESIGN

7722 Big Bend Blvd.
St. Louis, MO 63119
T. 314.644.5700

8/11/23
Bonnie C. Roy
Landscape Architect MO
#LA-202014783

PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

**OLIA VILLAGE
DEVELOPMENT**

LINDBERGH & OLIVE BLVD

OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
2	8/11/23	LANDSCAPE CONCEPT PLANS
1	7/21/23	LANDSCAPE CONCEPT PLANS

PROJECT NO.: 2309201-00
CAD DWG FILE: 21585.01_SHEETS_GENERAL.DWG
DESIGNED BY: WH
DRAWN BY: MB/ZTS
CHECKED BY: BR
APPROVED BY: BR
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TREE PRESERVATION PLAN

LD-100

SHEET 1 OF 3

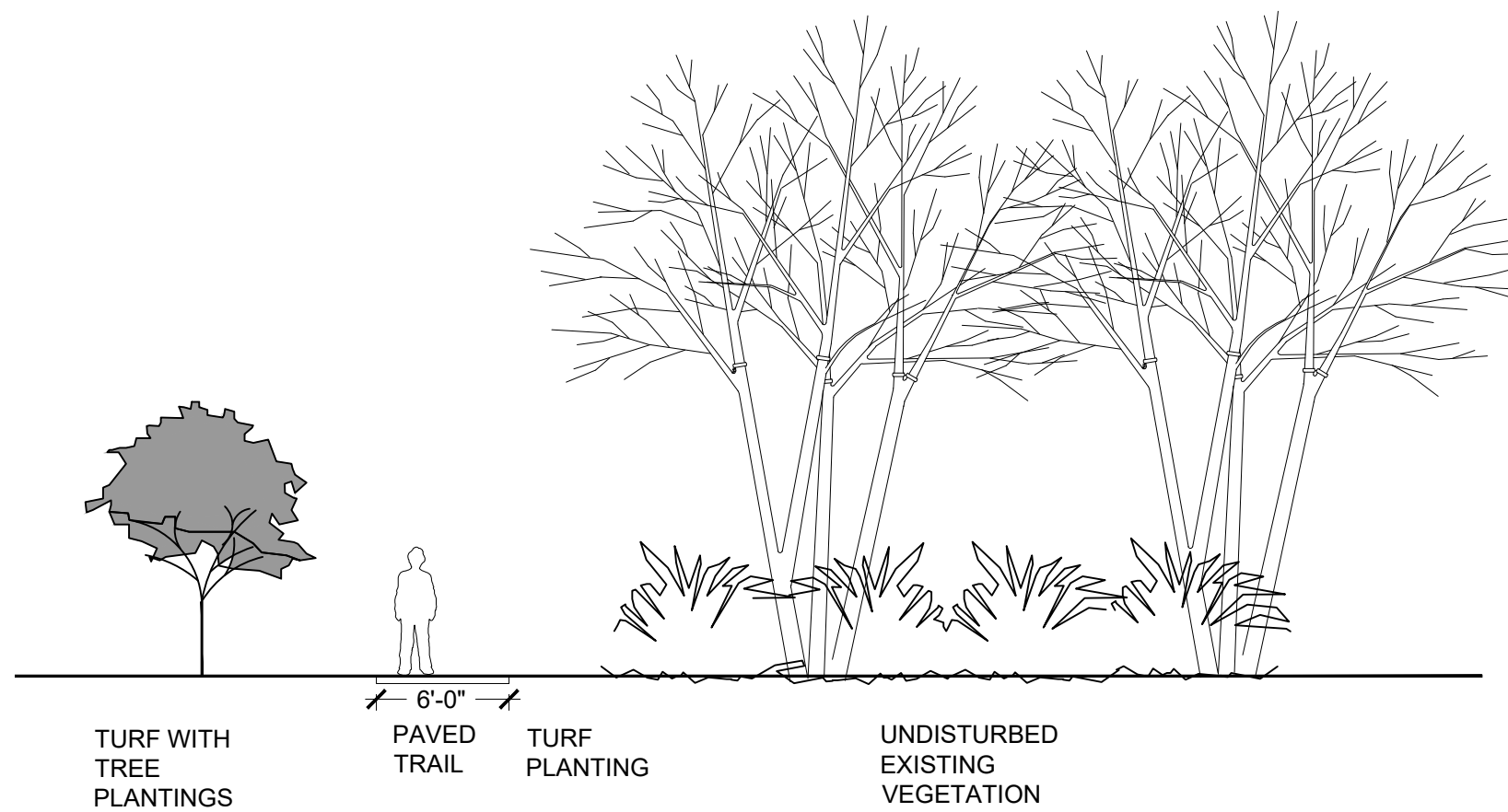
NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY IN EVENTS OF DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS IN THE DRAWINGS OR SPECIFICATIONS. THE CONTRACTOR IS NOT AUTHORIZED TO SCALE THE DRAWINGS. ALL QUESTIONS IN REFERENCE TO CONTRACT DOCUMENTS SHALL BE IMMEDIATELY DIRECTED TO THE LANDSCAPE ARCHITECT.

Path: H:\04_Projects\21585_Olia Village\01_Sheets\01_Olia Village Schematic Design\02_Production\04_AutoCAD\21585.01_Sheets_General.dwg
Date: Thursday, August 10, 2023 3:27:15 PM

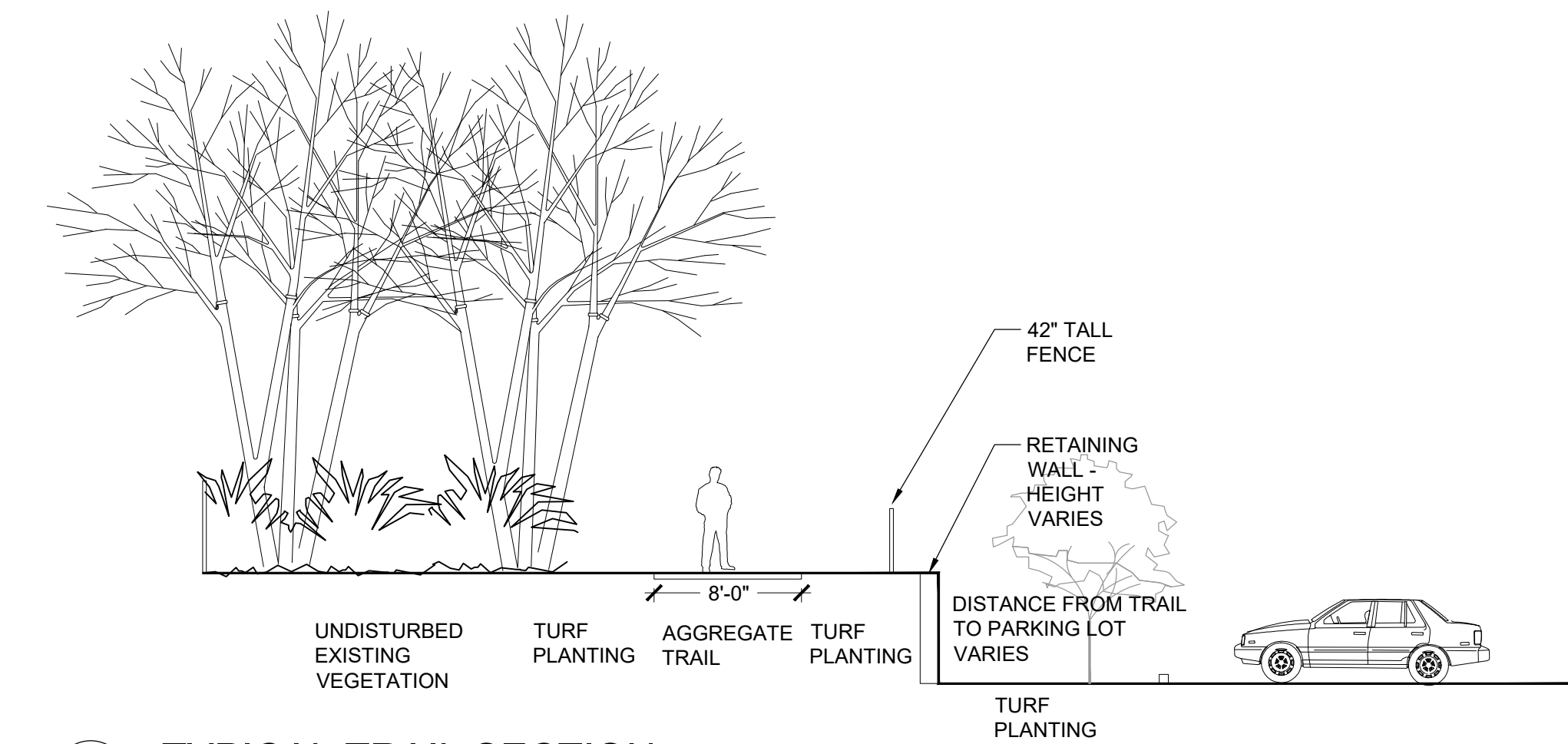


NOTES

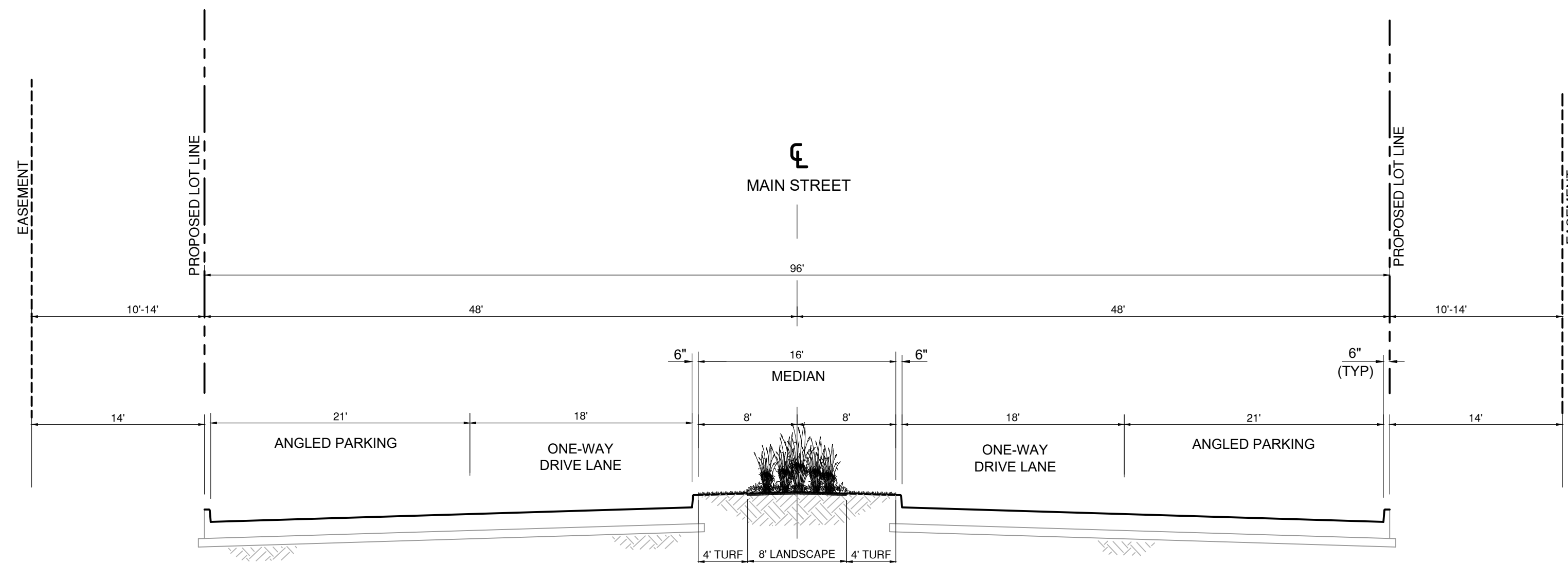
1. TREES AND LIGHTING WITHIN CITY OF ST. LOUIS EASEMENT REQUIRES CITY APPROVAL.
2. IRRIGATION WILL BE PROVIDED TO NEW LANDSCAPE BEDS. A WATER LINE WILL BE INSTALLED TO THE MEDIAN IN OLIVE WEST OF PAVILION.
3. ALL DISTURBED AREAS NOT OTHERWISE IMPROVED SHALL RECEIVE SEEDED TURF GRASS.
4. ALL LANDSCAPE SHALL COMPLY WITH THE REQUIREMENTS DETAILED IN ATTACHMENT B.



(D)



(



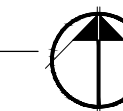
(

1-800-344-7483

MISSOURI ONE-CALL SYSTEM
MODOT (314) 340-4100



SCALE: 1"=100



Graphic Scale: 1" = 100'

NOTIFY LANDSCAPE ARCHITECT IMMEDIATELY IN EVENTS OF DISCREPANCIES, OMISSIONS, AND/OR CONFLICTS IN THE DRAWINGS OR SPECIFICATIONS. THE CONTRACTOR IS NOT AUTHORIZED TO SCALE THE DRAWINGS. ALL QUESTIONS IN REFERENCE TO CONTRACT DOCUMENTS SHALL BE IMMEDIATELY DIRECTED TO THE LANDSCAPE ARCHITECT.

PREPARED BY:



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:



7722 Big Bend Blvd.
St. Louis, MO 63119
t. 314.644-5700



8/11/23
Bonnie C. Roy
Landscape Architect MO
#1 A-2009014763

OLIA VILLAGE
DEVELOPMENT



OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

1	8/11/23	PHASE 1 LANDSCAPE DEVELOPMENT PLANS
MARK	DATE	DESCRIPTION

PROJECT NO: 23005201-00

CAD DWG FILE: 21585.01_SHEETS_PLANTING_PHASE

DESIGNED BY: J DWG
WH

DRAWN BY: MB/ZTS

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SHEET TITLE

PHASE 1 CONCEPT PLANTING PLAN

L-140

SHEET 2 OF 3

PRELIMINARY SUBDIVISION PLAT

OLIA VILLAGE

CREVE COEUR, MO

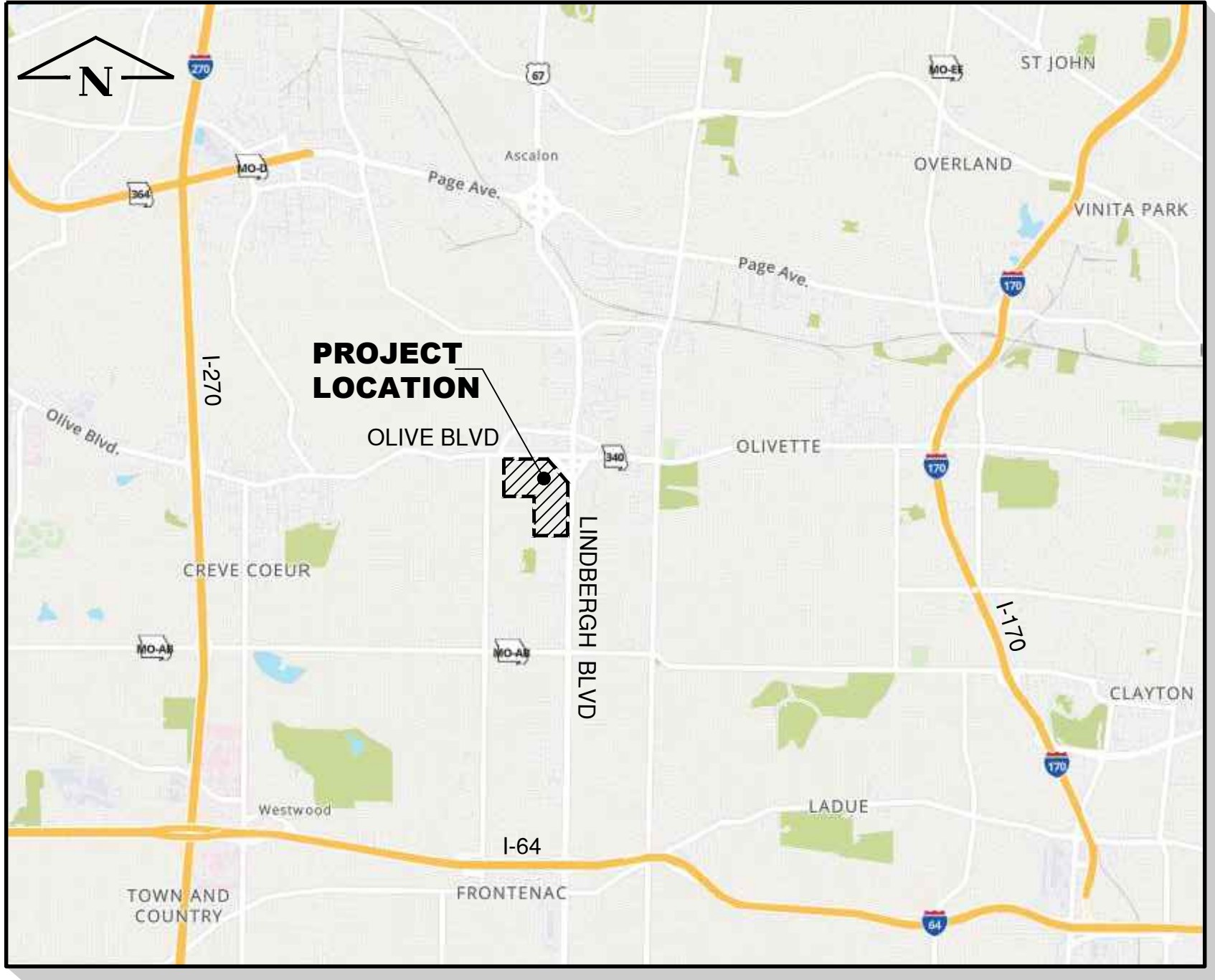
A TRACT OF LAND BEING PART OF LOTS 9, 10, 11 AND 12 OF MAJOR THOMAS SUBDIVISION
SITUATED IN THE SOUTHWEST QUARTER AND THE NORTHWEST QUARTER OF SECTION 1
TOWNSHIP 45 NORTH, RANGE 5 EAST, CITY OF CREVE COEUR, ST. LOUIS COUNTY, MISSOURI

AUGUST 11, 2023

SITE INFORMATION	
SITE ACREAGE	= 95.8 AC ±
SITE ADDRESS	= 10300 OLIVE BOULEVARD, CREVE COEUR, MO 63141
OWNER	= 10300 OLIVE, LLC
LOCATOR NUMBER	= 17M420026
EXISTING ZONING	= R-O - RESEARCH & PARK DISTRICT
PROPOSED ZONING	= PMD - PLANNED MIXED-USE DEVELOPMENT
CITY	= CREVE COEUR, MO
ZIP CODE	= 63141
FEMA FLOOD MAP	= 29189C0191K (REVISED 2/4/2015) (ZONE X) 29189C0192K (REVISED 2/4/2015) (ZONE X)
WUNNENBERG MAP	= PAGE 24, SECTIONS 17T & 18T
SCHOOL DISTRICT	= LADUE SCHOOL DISTRICT
FIRE DISTRICT	= CREVE COEUR FIRE DISTRICT
WATER SHED	= RIVER DES PERES WATERSHED, DEER CREEK SUB-SHED
SEWER DISTRICT	= METROPOLITAN ST. LOUIS SEWER DISTRICT
CABLE SERVICE	= CHARTER COMMUNICATIONS
ELECTRIC SERVICE	= AMEREN MISSOURI
GAS SERVICE	= SPIRE ENERGY
PHONE SERVICE	= AT&T
WATER SERVICE	= MISSOURI AMERICAN WATER COMPANY
WATER SERVICE	= CITY OF ST. LOUIS WATER DEPARTMENT (TRANSMISSION MAINS)
BUILDING TYPE	= N/A (NO BUILDINGS PROPOSED)
BLDG. CONST. TYPE	= N/A (NO BUILDINGS PROPOSED)

OWNER / DEVELOPER :

10300 OLIVE, LLC
1034 S. BRENTWOOD, SUITE 2300 PH-1D
ST. LOUIS, MO 63117
MATT PFUND
(618) 692-9502



VICINITY MAP
(NOT TO SCALE)

SHEET INDEX	
V-100	TITLE SHEET
V-101	PRELIMINARY SUBDIVISION PLAT
C-101	SITE CONCEPT PLAN OVERVIEW
C-105	GRADING PLAN
C-106	UTILITY & DRAINAGE PLAN
C-107	STREET PLAN

LEGAL DESCRIPTION

A TRACT OF LAND BEING PART OF LOTS 9, 10, 11 AND 12 OF MAJOR THOMAS SUBDIVISION, SITUATED IN THE SOUTHWEST QUARTER AND NORTHWEST QUARTER OF SECTION 1, TOWNSHIP 45 NORTH, RANGE 5 EAST, ST. LOUIS COUNTY, MISSOURI, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE WEST RIGHT OF WAY LINE OF STATE HIGHWAY 67, LINDBERGH (VARIABLE WIDTH-PUBLIC RIGHT OF WAY) BOULEVARD WITH THE NORTH LINE OF LAND NOW OR FORMERLY OF VANTAGE CREDIT UNION, AS RECORDED BY DEED IN BOOK 23850, PAGE 141 OF THE ST. LOUIS COUNTY, MISSOURI RECORDER'S OFFICE;

THENCE ALONG SAID NORTH LINE AND THE NORTH LINE OF SUNSWEPT PLAT 3, A SUBDIVISION AS RECORDED IN PLAT BOOK 87 PAGE 4 AND SUNSWEPT PLAT 2, A SUBDIVISION AS RECORDED IN PLAT BOOK 87 PAGE 23, ALL OF SAID RECORDER'S OFFICE, NORTH 89 DEGREES 11 MINUTES 17 SECONDS WEST, A DISTANCE OF 1352.62 FEET TO THE EAST LINE OF LAND NOW OR FORMERLY OF DONALD J AND MARGRETTA CASSMEYER, ETAL, AS RECORDED BY DEED IN BOOK 11070, PAGE 767 OF SAID RECORDER'S OFFICE;

THENCE ALONG SAID EAST LINE AND THE EAST LINE OF LAND NOW OR FORMERLY OF JAVED MUHAMMAD ALI AND ALZUBEIDI DUHA, AS RECORDED BY DEED IN BOOK 23726, PAGE 3547; TIMOTHY C TOWNSEND, ETAL, AS RECORDED BY DEED IN BOOK 23562, PAGE 160, ALL OF SAID RECORDER'S OFFICE, NORTH 01 DEGREES 12 MINUTES 14 SECONDS EAST, A DISTANCE OF 500.19 FEET TO THE EAST LINE OF SPOEDE HILLS, A SUBDIVISION AS RECORDED IN PLAT BOOK 54, PAGE 26 OF SAID RECORDER'S OFFICE;

THENCE ALONG SAID EAST LINE AND THE EAST LINE OF SPOEDE WOODS, A SUBDIVISION FORMERLY KNOWN AS GAS LIGHT SQUARE, AS RECORDED IN PLAT BOOK 104, PAGE 18 OF SAID RECORDER'S OFFICE, NORTH 01 DEGREES 08 MINUTES 11 SECONDS EAST, A DISTANCE OF 831.21 FEET TO THE NORTH LINE OF SAID SPOEDE WOODS;

THENCE ALONG SAID NORTH LINE, NORTH 88 DEGREES 51 MINUTES 14 SECONDS WEST, A DISTANCE OF 826.36 FEET TO THE EAST LINE OF MISSION HILLS, A SUBDIVISION AS RECORDED IN PLAT BOOK 59, PAGE 36 OF SAID RECORDER'S OFFICE;

THENCE ALONG SAID EAST LINE AND THE EAST LINE OF RAMBLEWOOD, A SUBDIVISION AS RECORDED IN PLAT BOOK 59, PAGE 58 AND THE EAST LINE OF LAND NOW OR FORMERLY OF MDC COAST 22 LLC, AS RECORDED BY DEED IN BOOK 25302, PAGE 4186, ALL OF SAID RECORDER'S OFFICE;

THENCE ALONG SAID EAST LINE, THE FOLLOWING COURSES AND DISTANCES: NORTH 01 DEGREES 12 MINUTES 15 SECONDS EAST, A DISTANCE OF 466.53 FEET; NORTH 88 DEGREES 57 MINUTES 33 SECONDS WEST, A DISTANCE OF 51.85 FEET AND NORTH 04 DEGREES 53 MINUTES 33 SECONDS WEST, A DISTANCE OF 682.38 FEET TO THE SOUTH RIGHT OF WAY LINE OF MISSOURI STATE HIGHWAY 340, A.K.A. OLIVE (VARIABLE WIDTH - PUBLIC RIGHT OF WAY) BOULEVARD;

THENCE ALONG SAID SOUTH RIGHT OF WAY LINE, THE FOLLOWING COURSES AND DISTANCES: ALONG A NON- TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 11,358.19 FEET, WITH A CENTRAL ANGLE OF 00 DEGREES 49 MINUTES 02 SECONDS, WHICH CHORD BEARS SOUTH 89 DEGREES 27 MINUTES 38 SECONDS EAST, A CHORD DISTANCE OF 162.03 FEET, THROUGH AN ARC LENGTH OF 162.03 FEET; SOUTH 89 DEGREES 03 MINUTES 07 SECONDS EAST, A DISTANCE OF 427.12 FEET; NORTH 01 DEGREES 00 MINUTES 53 SECONDS EAST, A DISTANCE OF 20.00 FEET; SOUTH 89 DEGREES 03 MINUTES 07 SECONDS EAST, A DISTANCE OF 723.00 FEET AND SOUTH 86 DEGREES 13 MINUTES 52 SECONDS EAST, A DISTANCE OF 200.26 FEET TO THE SOUTHWEST RIGHT OF WAY TRANSITION BETWEEN STATE HIGHWAY 340 AND STATE HIGHWAY 67, A.K.A. LINDBERGH (VARIABLE WIDTH - PUBLIC RIGHT OF WAY) BOULEVARD;

THENCE ALONG SAID SOUTHWEST RIGHT OF WAY LINE, THE FOLLOWING COURSES AND DISTANCES: SOUTH 65 DEGREES 03 MINUTES 50 SECONDS EAST, A DISTANCE OF 328.98 FEET; SOUTH 43 DEGREES 48 MINUTES 52 SECONDS EAST, A DISTANCE OF 413.64 FEET; SOUTH 32 DEGREES 46 MINUTES 12 SECONDS EAST, A DISTANCE OF 248.25 FEET AND SOUTH 11 DEGREES 42 MINUTES 30 SECONDS EAST, A DISTANCE OF 250.82 FEET TO THE WEST RIGHT OF WAY LINE OF THE AFOREMENTIONED LINDBERGH BOULEVARD;

THENCE ALONG SAID WEST RIGHT OF WAY LINE, THE FOLLOWING COURSES AND DISTANCES: SOUTH 01 DEGREES 00 MINUTES 47 SECONDS EAST, A DISTANCE OF 256.89 FEET; SOUTH 01 DEGREES 53 MINUTES 43 SECONDS WEST, A DISTANCE OF 105.09 FEET; NORTH 88 DEGREES 06 MINUTES 17 SECONDS WEST, A DISTANCE OF 10.00 FEET; SOUTH 01 DEGREES 53 MINUTES 43 SECONDS WEST, A DISTANCE OF 50.00 FEET; NORTH 88 DEGREES 06 MINUTES 17 SECONDS WEST, A DISTANCE OF 30.00 FEET; SOUTH 01 DEGREES 53 MINUTES 43 SECONDS WEST, A DISTANCE OF 50.00 FEET; SOUTH 88 DEGREES 06 MINUTES 17 SECONDS EAST, A DISTANCE OF 40.00 FEET; SOUTH 01 DEGREES 53 MINUTES 43 SECONDS WEST, A DISTANCE OF 300.00 FEET; SOUTH 88 DEGREES 06 MINUTES 17 SECONDS EAST, A DISTANCE OF 10.00 FEET AND SOUTH 01 DEGREES 53 MINUTES 43 SECONDS WEST, A DISTANCE OF 847.31 FEET TO THE POINT OF BEGINNING.

THE ABOVE DESCRIBED TRACT OF LAND CONTAINING 4,171,444 SQUARE FEET OR 95.763 ACRES IS BASED UPON AN ACTUAL URBAN CLASS BOUNDARY SURVEY DONE IN ACCORDANCE WITH THE CURRENT MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS, SUBJECT TO ALL EASEMENTS, RESTRICTIONS, RESERVATIONS, CONDITIONS OF RECORD AND NOT OF RECORD, IF ANY.

UTILITY NOTE :

UNDERGROUND FACILITIES, STRUCTURES AND UTILITIES HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS, RECORDS AND INFORMATION, AND, THEREFORE DO NOT NECESSARILY REFLECT THE ACTUAL EXISTENCE, NON-EXISTENCE, SIZE, TYPE, NUMBER, OR LOCATION OF THESE FACILITIES, STRUCTURES AND UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE ACTUAL LOCATION OF ALL UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES, EITHER SHOWN OR NOT SHOWN ON THESE PLANS. THE UNDERGROUND FACILITIES, STRUCTURES, AND UTILITIES SHALL BE LOCATED IN THE FIELD PRIOR TO ANY GRADING, EXCAVATION OR CONSTRUCTION OF IMPROVEMENTS. THESE PROVISIONS SHALL IN NO WAY ABSOLVE ANY PARTY FROM COMPLYING WITH THE UNDERGROUND FACILITY SAFETY AND DAMAGE PREVENTION ACT, CHAPTER 319 RSMo.

DISCLAIMER :

CRAWFORD, MURPHY & TILLY, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR SERVICES PROVIDED BY OTHERS TO IMPLEMENT THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE OWNER AND CONTRACTOR. CRAWFORD, MURPHY & TILLY, INC. HAS NO RESPONSIBILITY TO VERIFY FINAL IMPROVEMENTS AS SHOWN ON THIS PLAN UNLESS SPECIFICALLY ENGAGED AND AUTHORIZED TO DO SO BY THE OWNER OR CONTRACTOR.

PREPARED BY:



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
------	------	-------------

PROJECT NO.:	23005201-00
CAD DWG FILE:	IPRELIMINARY-PLAT.DWG
DESIGNED BY:	TME/JFM
DRAWN BY:	JFM
CHECKED BY:	CJS
APPROVED BY:	---
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SHEET TITLE

TITLE SHEET

V-100

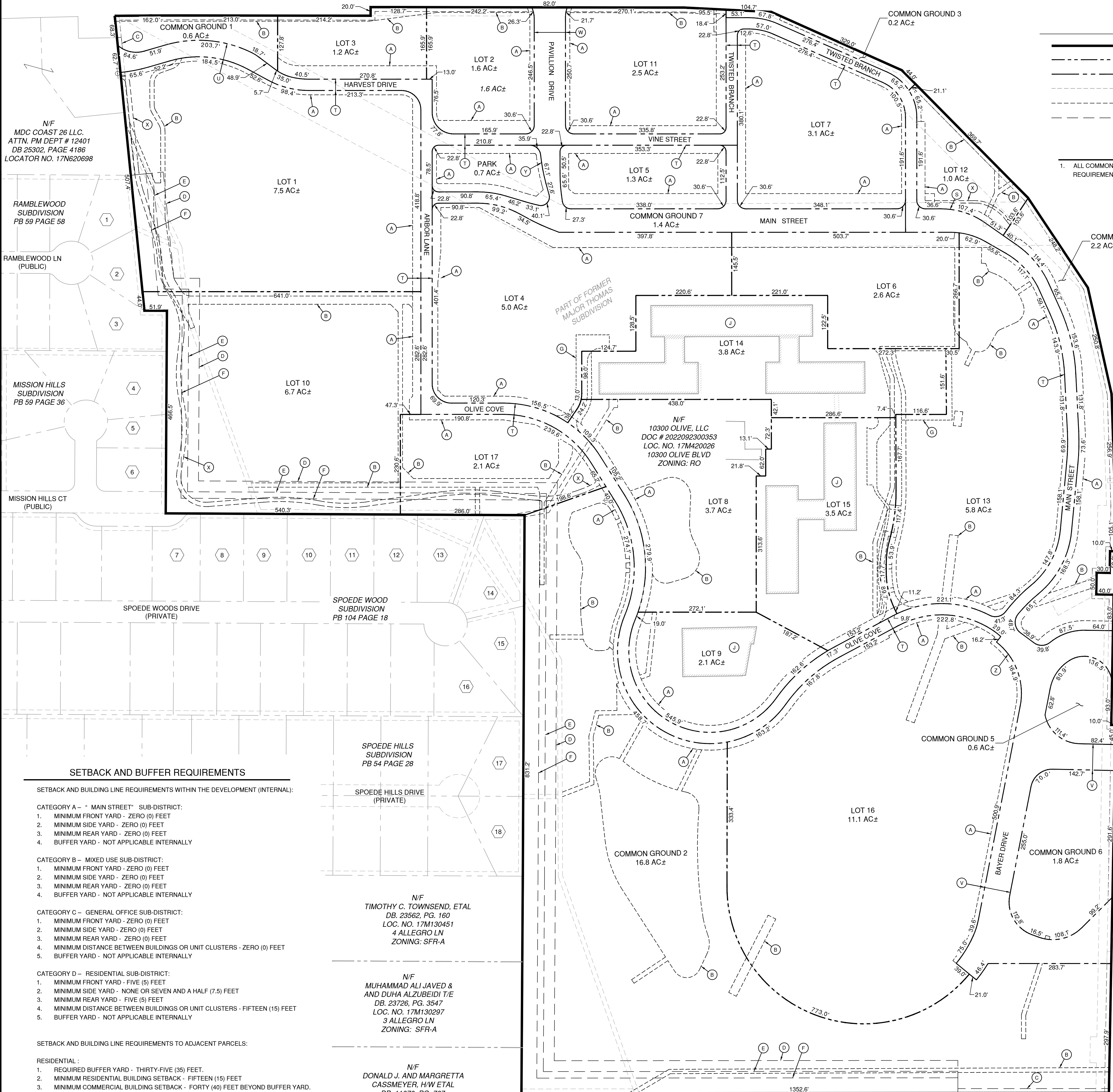
SHEET OF --

PRELIMINARY SUBDIVISION PLAT

OLIA VILLAGE

A TRACT OF LAND BEING PART OF THE LOTS 9, 10, 11 AND 12 OF MAJOR THOMAS SUBDIVISION, SITUATED IN THE SOUTHWEST QUARTER AND THE NORTHWEST QUARTER OF SECTION 1, TOWNSHIP 45 NORTH, RANGE 5 EAST CITY OF CREVE COEUR, ST. LOUIS COUNTY, MISSOURI

OLIVE BOULEVARD (MISSOURI STATE HIGHWAY 340)



LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- UTILITY & DRAINAGE EASEMENT
- PROPOSED UTILITY & DRAINAGE EASEMENT
- PROPOSED BUILDING SETBACK LINE

GENERAL NOTES

- ALL COMMON GROUND AREAS SHALL BE MAINTAINED PER THE REQUIREMENTS OF THE COMMUNITY ASSOCIATION COVENANTS.

KEYNOTES

- (A) PROPOSED ROADWAY, IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, SIDEWALK EASEMENT (P.R.I.M.U.S.S.E.) (TYP)
- (B) PROPOSED UTILITY OR DRAINAGE EASEMENT (TYP)
- (C) PROPOSED COMMERCIAL 10' BUILDING SETBACK LINE
- (D) PROPOSED COMMERCIAL 40' BUILDING SETBACK LINE
- (E) PROPOSED RESIDENTIAL 15' BUILDING SETBACK LINE
- (F) PROPOSED BUFFER 35' SETBACK LINE
- (G) PROPOSED ACCESS EASEMENT
- (J) EXISTING STRUCTURE TO REMAIN
- (S) PROPOSED RIGHT OF WAY WIDTH VARIES 26'-54'
- (T) PROPOSED RIGHT OF WAY WIDTH 26'
- (U) PROPOSED RIGHT OF WAY WIDTH VARIES 26'-38'
- (V) PROPOSED RIGHT OF WAY WIDTH 60'
- (W) PROPOSED RIGHT OF WAY WIDTH 72'
- (X) PROPOSED SIDEWALK EASEMENT
- (Y) PROPOSED RIGHT OF WAY WIDTH VARIES 28'-45'
- (Z) PROPOSED RIGHT OF WAY WIDTH VARIES 50'-60'

PROPERTY OWNER INFORMATION

1	BRANDON L & AMY JEFFERS H/W DB. 20819, PG. 681 LOCATOR # 17N620467 11 RAMBLEWOOD LN ZONING: SFR-C	14	DANIEL & DENA TRANEN T/E DB. 21484, PG. 3870 LOCATOR # 17M4100016 13 SPOEDE WOODS ST ZONING: SFR-B
2	KANGYUN & MA BAOZHEN WU T/E DB. 20819, PG. 681 LOCATOR # 17N620434 13 RAMBLEWOOD LN ZONING: SFR-C	15	MICHAEL P & CHIRAWAN C DEMOS H/W DB. 20052, PG. 2430 LOCATOR # 17M130275 14 SPOEDE WOODS ST ZONING: SFR-B
3	DAVID E SCHRAMM TRUST ET AL DB. 22493, PG. 634 LOCATOR # 17N620357 12 RAMBLEWOOD LN ZONING: SFR-C	16	15 SPOEDE WOODS LLC DB. 23330, PG. 217 LOCATOR # 17M130211 15 SPOEDE WOODS ST ZONING: SFR-B
4	ALAN P & LAUREL T BURKE T/E DB. 23138, PG. 3554 LOCATOR # 17N620258 850 MISSION HILLS CT ZONING: SFR-C	17	ALLAN H & FRANCES R RAMSEY H/W DB. 03865, PG. 523 LOCATOR # 17M130374 12 SPOEDE HILLS DR ZONING: SFR-B
5	TAMARA MARX DB. 20942, PG. 289 LOCATOR # 17N620193 DB. 20942, PG. 289 844 MISSION HILLS CT ZONING: SFR-C	18	ALEXIS TRAVERS & MELISSA BURGUND T/E DEED DOC. 2022112300190 LOCATOR # 17M130385 13 SPOEDE HILLS DR ZONING: SFR-B
6	SONG CAO SONG & GENGSHENG CHEN H/W DB. 20476, PG. 136 LOCATOR # 17N620126 840 MISSION HILLS CT ZONING: SFR-C	19	ELLEN M LATURNO ETAL, J/T DEED DOC. 2023040400345 LOCATOR # 17M130011 13 SUNSWEPT DR ZONING: SFR-B
7	SINGER DAVID & DANIELLE SINGER T/E DB. 22676, PG. 1635 LOCATOR # 17N620753 6 SPOEDE WOODS ST ZONING: SFR-B	20	BLAKE & ROBIN EASTWOOD T/E DB. 23734, PG. 769 LOCATOR # 17M130022 14 SUNSWEPT DR ZONING: SFR-B
8	WILLIAM M & GAIL FRIEDMAN H/W DB. 12232, PG. 387 LOCATOR # 17M410094 7 SPOEDE WOODS ST ZONING: SFR-B	21	JEFFERY & AMANDA DIECKHAUS T/E DB. 23414, PG. 2192 LOCATOR # 17M130033 10331 N. SUNSWEPT DR. ZONING: SFR-B
9	THE MANLEY FAMILY TRUST DB. 24934, PG. 1749 LOCATOR # 17M410027 8 SPOEDE WOODS ST ZONING: SFR-B	22	JYOTI ETAL BEHURA T/E DB. 24882, PG. 3484 LOCATOR # 17M140087 10327 N. SUNSWEPT DR. ZONING: SFR-B
10	TOMISLAV ZIGO ETAL DB. 17318, PG. 4808 LOCATOR # 17M410061 9 SPOEDE WOODS ST ZONING: SFR-B	23	ALAN B MARIAM & CLAUDIA TRUST FBO DB. 24351, PG. 70 LOCATOR # 17M140076 DB. 20942, PG. 289 10321 N. SUNSWEPT DR. ZONING: SFR-B
11	JEROME A & FRANCES S COHEN H/W DB. 21569, PG. 223 LOCATOR # 17M410038 10 SPOEDE WOODS ST ZONING: SFR-B	24	GABRIELLA JULIAN DB. 24286, PG. 3346 LOCATOR # 17M140043 10311 N. SUNSWEPT DR. ZONING: SFR-B
12	XUDONG LIANG & YILING MI H/W DB. 17419, PG. 1953 LOCATOR # 17M410049 11 SPOEDE WOODS ST ZONING: SFR-B	25	JOHN & SUE MURPHY H/W DB. 21426, PG. 3126 LOCATOR # 17M140032 10305 N. SUNSWEPT DR. ZONING: SFR-B
13	THE ROBERT H MAX & RACHEL E PROTZEL LIVING TRUST DB. 23635, PG. 213 LOCATOR # 17M410050 12 SPOEDE WOODS ST ZONING: SFR-B	26	VANTAGE CREDIT UNION DB. 23850, PG. 141 LOCATOR # 17M140010 611 N LINDBERGH BLVD ZONING: GC

SETBACK AND BUFFER REQUIREMENTS

SETBACK AND BUILDING LINE REQUIREMENTS WITHIN THE DEVELOPMENT (INTERNAL):

CATEGORY A - " MAIN STREET" SUB-DISTRICT:

- MINIMUM FRONT YARD - ZERO (0) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY B - MIXED USE SUB-DISTRICT:

- MINIMUM FRONT YARD - FIVE (5) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY C - GENERAL OFFICE SUB-DISTRICT:

- MINIMUM FRONT YARD - ZERO (0) FEET
- MINIMUM SIDE YARD - ZERO (0) FEET
- MINIMUM REAR YARD - ZERO (0) FEET
- MINIMUM DISTANCE BETWEEN BUILDINGS OR UNIT CLUSTERS - ZERO (0) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

CATEGORY D - RESIDENTIAL SUB-DISTRICT:

- MINIMUM FRONT YARD - FIVE (5) FEET
- MINIMUM SIDE YARD - NONE OR SEVEN AND A HALF (7.5) FEET
- MINIMUM REAR YARD - FIVE (5) FEET
- MINIMUM DISTANCE BETWEEN BUILDINGS OR UNIT CLUSTERS - FIFTEEN (15) FEET
- BUFFER YARD - NOT APPLICABLE INTERNALLY

SETBACK AND BUILDING LINE REQUIREMENTS TO ADJACENT PARCELS:

RESIDENTIAL:

- REQUIRED BUFFER YARD - THIRTY-FIVE (35) FEET.
- MINIMUM RESIDENTIAL BUILDING SETBACK - FIFTEEN (15) FEET
- MINIMUM COMMERCIAL BUILDING SETBACK - FORTY (40) FEET BEYOND BUFFER YARD.

NON-RESIDENTIAL:

- MINIMUM BUILDING SETBACK - TEN (10) FEET.

N/F
TIMOTHY C. TOWNSEND, ETAL
DB. 23562, PG. 160
LOC. NO. 17M130451
4 ALLEGRO LN
ZONING: SFR-A

N/F
MUHAMMAD ALI JAVED &
AND DUHA ALZUBEIDI T/E
DB. 23726, PG. 3547
LOC. NO. 17M130297
3 ALLEGRO LN
ZONING: SFR-A

N/F
DONALD J. AND MARGARETTA
CASSMEYER, H/W ETAL
DB. 11070, PG. 767
LOC. NO. 17M130044
2 ALLEGRO LN
ZONING: SFR-A

PREPARED BY:



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:



SCALE IN FEET

OWNER / SUBDIVIDER

10300 OLIVE, LLC
1034 S. BRENTWOOD, SUITE 2300 PH-1D
ST. LOUIS, MO 63117
MATT PFUND
(618) 692-9502

ENGINEER

CRAWFORD MURPHY & TILLY, INC.
1 MEMORIAL DRIVE #500
ST. LOUIS, MO 63102
PH (314) 5436-5500
ENGINEER: TODD EHLEN

SURVEYOR

CRAWFORD MURPHY & TILLY, INC.
2750 WEST WASHINGTON STREET
SPRINGFIELD, IL 62702
PH (217) 787-8050
SURVEYOR: MICHAEL E MIZEUR

AUGUST 11, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

PROJECT NO: 23005201-00

CAD DWG FILE: IPRELIMINARY-PLAT.DWG

DESIGNED BY: TME/JFM

DRAWN BY: JFM

CHECKED BY: CJS

APPROVED BY: ---

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SHEET TITLE

PRELIMINARY
SUBDIVISION PLAT

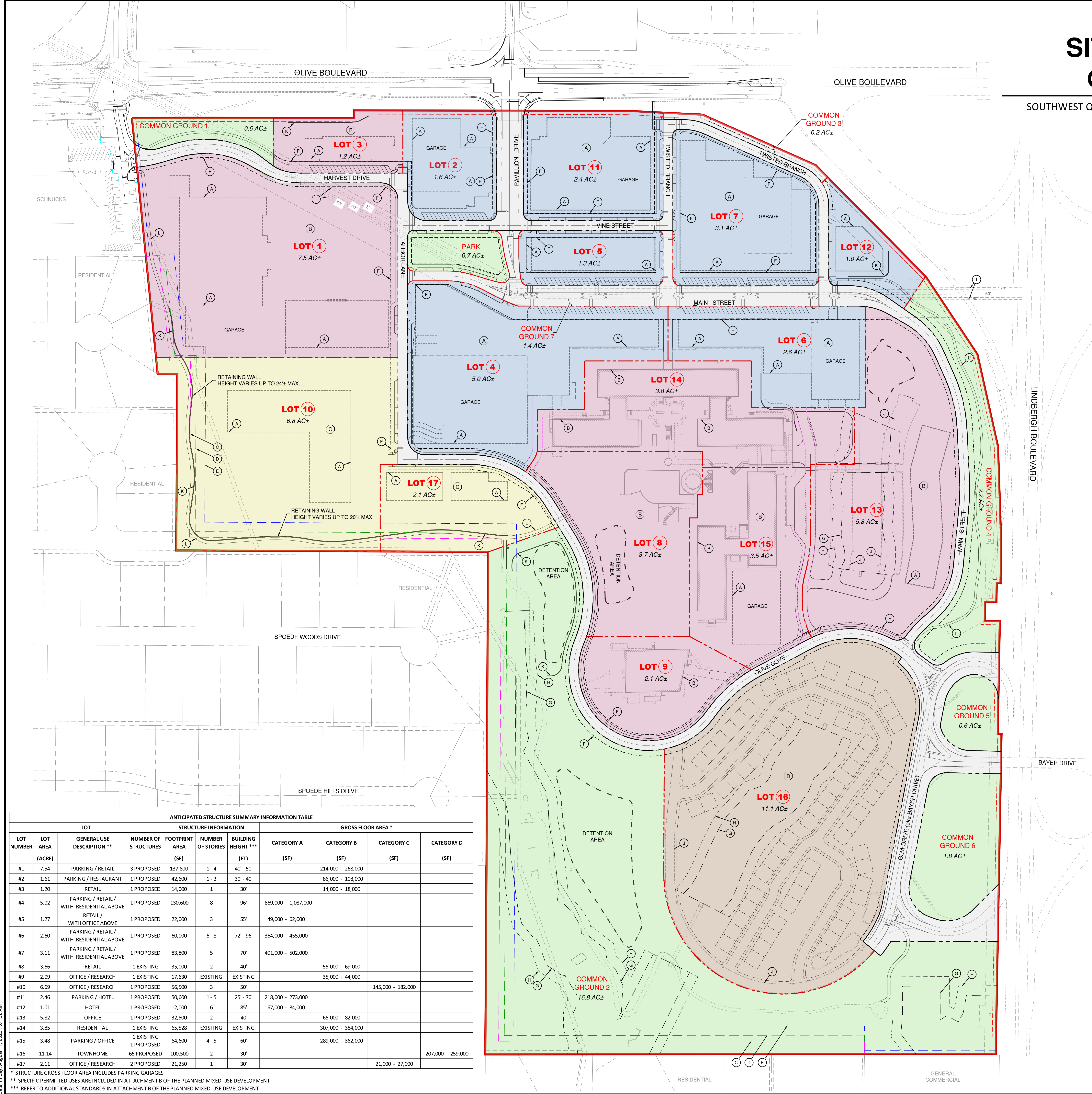
V-101

SHEET OF --

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Date: Friday, August 11, 2023 2:01:52 AM

ANTICIPATED STRUCTURE SUMMARY INFORMATION TABLE										
LOT			STRUCTURE INFORMATION			GROSS FLOOR AREA *				
LOT NUMBER	LOT AREA (ACRE)	GENERAL USE DESCRIPTION **	NUMBER OF STRUCTURES	FOOTPRINT AREA (SF)	NUMBER OF STORIES	BUILDING HEIGHT *** (FT)	CATEGORY A (SF)	CATEGORY B (SF)	CATEGORY C (SF)	CATEGORY D (SF)
#1	7.54	PARKING / RETAIL	3 PROPOSED	137,800	1 - 4	40' - 50'		214,000 - 268,000		
#2	1.61	PARKING / RESTAURANT	1 PROPOSED	42,600	1 - 3	30' - 40'		86,000 - 108,000		
#3	1.20	RETAIL	1 PROPOSED	14,000	1	30'		14,000 - 18,000		
#4	5.02	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	130,600	8	96'	869,000 - 1,087,000			
#5	1.27	RETAIL / WITH OFFICE ABOVE	1 PROPOSED	22,000	3	55'	49,000 - 62,000			
#6	2.60	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	60,000	6 - 8	72' - 96'	364,000 - 455,000			
#7	3.11	PARKING / RETAIL / WITH RESIDENTIAL ABOVE	1 PROPOSED	83,800	5	70'	401,000 - 502,000			
#8	3.66	RETAIL	1 EXISTING	35,000	2	40'		55,000 - 69,000		
#9	2.09	OFFICE / RESEARCH	1 EXISTING	17,630	EXISTING	EXISTING		35,000 - 44,000		
#10	6.69	OFFICE / RESEARCH	1 PROPOSED	56,500	3	50'			145,000 - 182,000	
#11	2.46	PARKING / HOTEL	1 PROPOSED	50,600	1 - 5	25' - 70'	218,000 - 273,000			
#12	1.01	HOTEL	1 PROPOSED	12,000	6	85'	67,000 - 84,000			
#13	5.82	OFFICE	1 PROPOSED	32,500	2	40'		65,000 - 82,000		
#14	3.85	RESIDENTIAL	1 EXISTING	65,528	EXISTING	EXISTING		307,000 - 384,000		
#15	3.48	PARKING / OFFICE	1 EXISTING 1 PROPOSED	64,600	4 - 5	60'		289,000 - 362,000		
#16	11.14	TOWNHOME	65 PROPOSED	100,500	2	30'				207,000 - 259,000
#17	2.11	OFFICE / RESEARCH	2 PROPOSED	21,250	1	30'			21,000 - 27,000	

* STRUCTURE GROSS FLOOR AREA INCLUDES PARKING GARAGES
** SPECIFIC PERMITTED USES ARE INCLUDED IN ATTACHMENT B OF THE PLANNED MIXED-USE DEVELOPMENT
*** REFER TO ADDITIONAL STANDARDS IN ATTACHMENT B OF THE PLANNED MIXED-USE DEVELOPMENT



SITE OVERVIEW

OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

LEGEND

- DEVELOPMENT BOUNDARY LINE
- PROPOSED LOT LINE
- PROPOSED R.O.W. LINE
- CONCEPTUAL BLDG FOOTPRINT
- PROPOSED EASEMENT
- CATEGORY A - MAIN STREET DEVELOPMENT
- CATEGORY B - MIXED USE DEVELOPMENT
- CATEGORY C - GENERAL OFFICE DEVELOPMENT
- CATEGORY D - RESIDENTIAL DEVELOPMENT

KEYNOTES

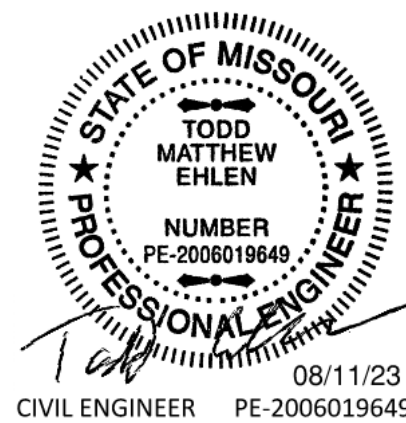
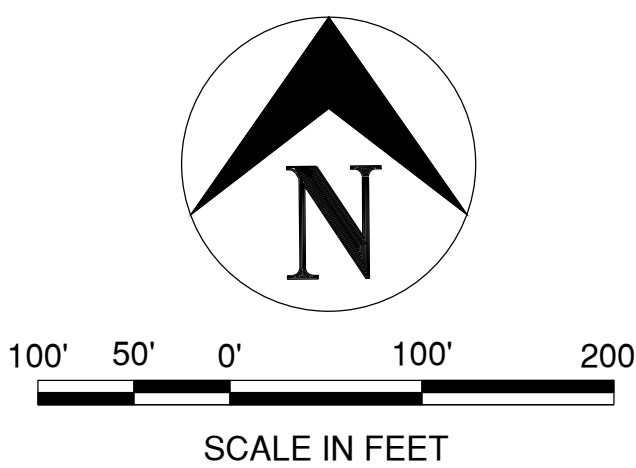
- (A) CONCEPTUAL BUILDING FOOTPRINT (TYP)
- (B) EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
- (C) 35' RESIDENTIAL BUFFER YARD (TYP)
- (D) 15' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
- (E) 40' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
- (F) 10' MINIMUM PROPOSED ROADWAY IMPROVEMENT MAINTENANCE UTILITY SEWER SIDEWALK EASEMENT (PRIMUMSSE)
- (G) 50' NATURAL VEGETATION BUFFER
- (H) 25' NO-IMPERVIOUS BUFFER
- (I) EXISTING STL WATER CO. WATERMAIN CONDUITS
- (J) EXISTING PARKING LOT / DRIVE TO REMAIN
- (K) PROPOSED SITE RETAINING WALL (TYP)
MECHANICALLY STABILIZED EARTH OR SEGMENTAL BLOCK WALL
(TO BE DETERMINED UPON FINAL DESIGN)
- (L) PROPOSED WALKING TRAIL OR SIDEWALK (TYP)
SEE PEDESTRIAN MOBILITY PLAN



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

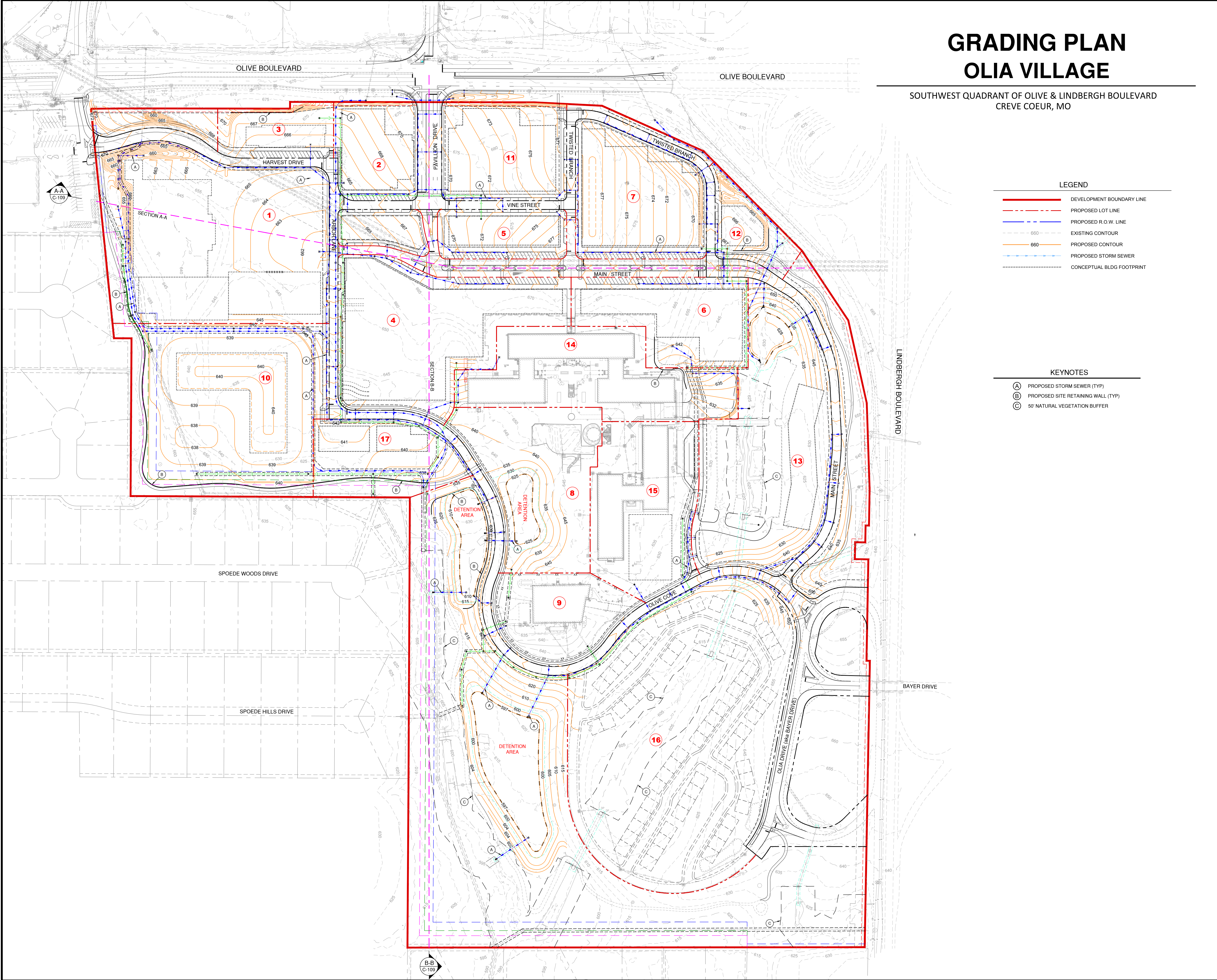
MARK	DATE	DESCRIPTION
PROJECT NO.	23005201-00	
CAD DWG FILE:	ISITE-CONCEPT-PLAN.DWG	
DESIGNED BY:	TME/JFM	
DRAWN BY:	JFM	
CHECKED BY:	CJS	
APPROVED BY:	---	
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SHEET TITLE

SITE OVERVIEW

C-101

SHEET - OF 4



GRADING PLAN

OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- LEGEND
- DEVELOPMENT BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED R.O.W. LINE
 - EXISTING CONTOUR
 - 660 PROPOSED CONTOUR
 - PROPOSED STORM SEWER
 - CONCEPTUAL BLDG FOOTPRINT

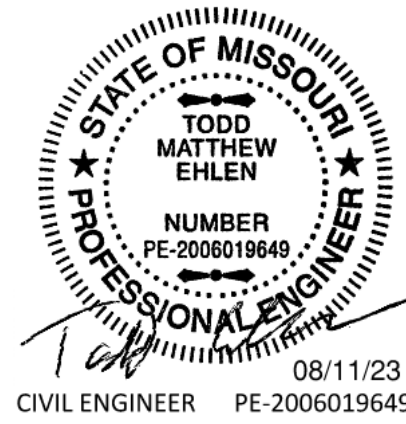
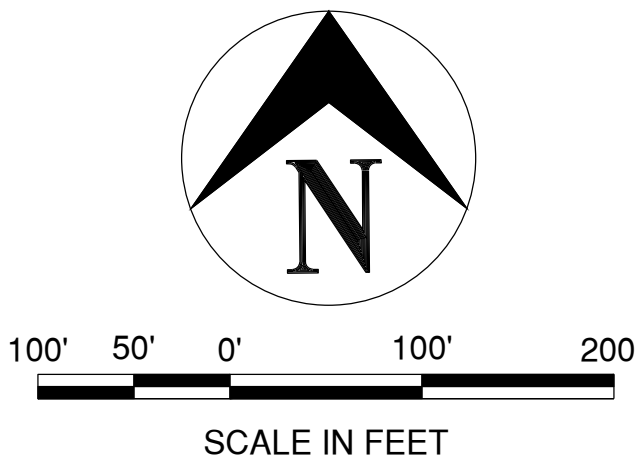
- KEYNOTES
- (A) PROPOSED STORM SEWER (TYP)
 - (B) PROPOSED SITE RETAINING WALL (TYP)
 - (C) 50' NATURAL VEGETATION BUFFER



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE DEVELOPMENT

LINDBERGH & OLIVE BLVD



THE HEART OF CREVE COEUR

CREVE COEUR, MO

MARK	DATE	DESCRIPTION
PROJECT NO.	23005201-00	
CAD DWG FILE:	ISITE-CONCEPT-PLAN.DWG	
DESIGNED BY:	TME/JFM	
DRAWN BY:	JFM	
CHECKED BY:	CJS	
APPROVED BY:	---	
COPYRIGHT:	CRAWFORD, MURPHY & TILLY, INC. 2023	

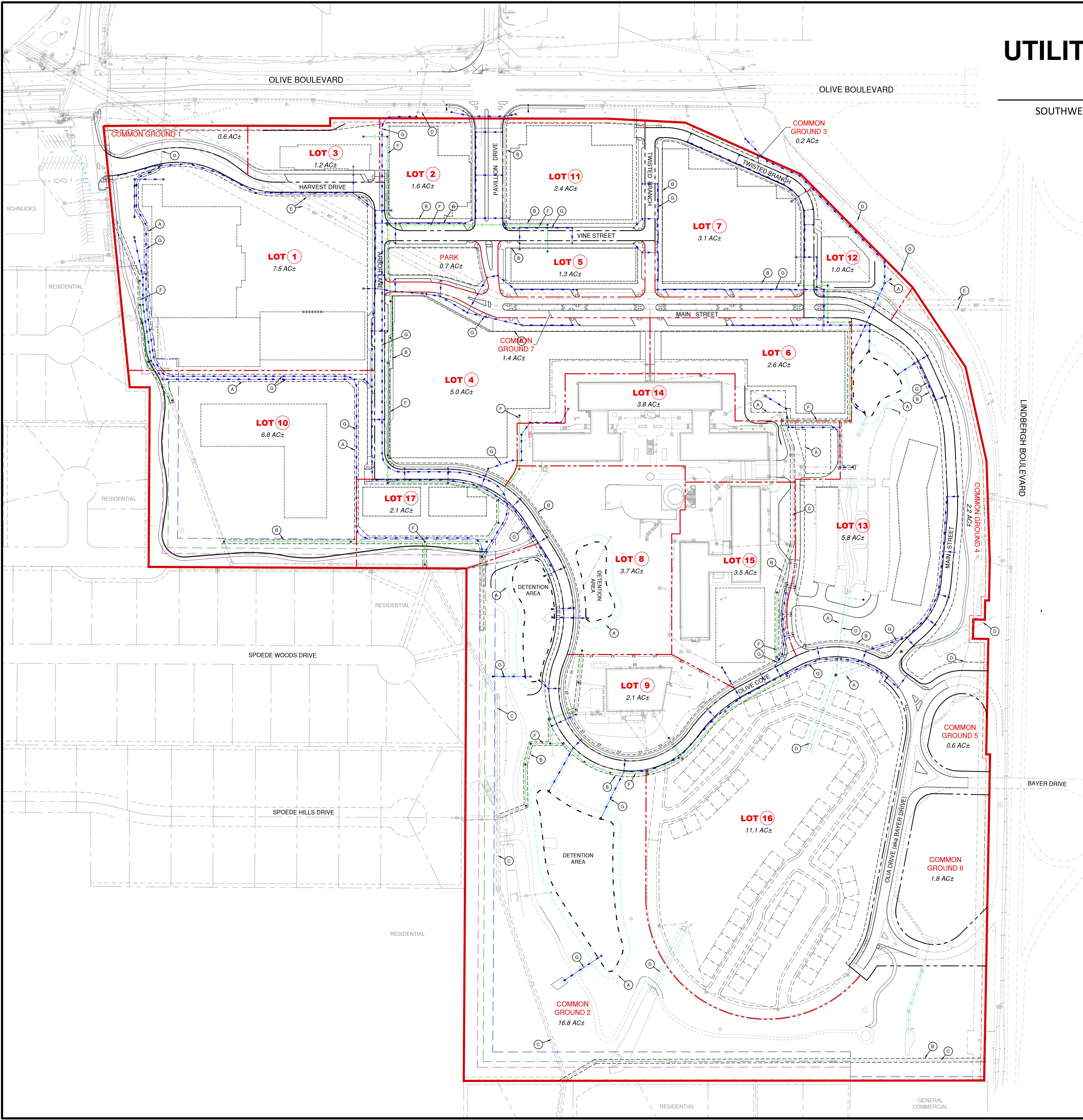
SHEET TITLE

GRADING PLAN

C-105

SHEET - OF 4

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Date: Friday, August 11, 2023 2:02:22 AM



UTILITY & DRAINAGE PLAN

OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- LEGEND**
- DEVELOPMENT BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED R.O.W. LINE
 - EXISTING SANITARY SEWER
 - EXISTING STORM SEWER
 - EXISTING WATER MAIN
 - PROPOSED SANITARY SEWER
 - PROPOSED STORM SEWER
 - CONCEPTUAL BLDG FOOTPRINT
 - PROPOSED EASEMENT

- KEYNOTES**
- (A) DRAINAGE EASEMENT (TYP)
 - (B) UTILITY EASEMENT (TYP)
 - (C) EXISTING SANITARY SEWER
 - (D) EXISTING STORM DRAINAGE SYSTEM
 - (E) EXISTING STL WATER CO. WATERMAIN CONDUITS
 - (F) PROPOSED SANITARY SEWER (TYP)
 - (G) PROPOSED STORM DRAINAGE SYSTEM (TYP)

PRELIMINARY BUILDOUT STORMWATER CALCULATIONS

PRE-DEVELOPED RUNOFF

TOTAL AREA	= 227.90 ac
WEIGHTED "CN" VALUE	= 81.59
AVERAGE "TC" VALUE	= 19.86 min
TOTAL FLOW	= 1,260± cfs

POST-DEVELOPED RUNOFF

TOTAL AREA	= 227.90 ac
WEIGHTED "CN" VALUE	= 86.54
AVERAGE "TC" VALUE	= 16.34 min
TOTAL FLOW	= 1,478± cfs

DIFFERENTIAL RUNOFF

PRE-DEVELOPED	= 1,260± cfs
POST-DEVELOPED	= 1,478± cfs
DIFFERENTIAL FLOW	= +218± cfs

100-YEAR, 24-HOUR PEAK FLOW RATE COMPARISON

PRE-DEVELOPED	= 404± cfs
POST-DEVELOPED	= 1,142± cfs
DIFFERENTIAL FLOW	= -55± cfs

THIS PROJECT HAS BEEN SUBMITTED TO MSD FOR CONCEPTUAL REVIEW (23CNCPB-00003).
ALL STORM SEWER AND DETENTION FACILITY CALCULATIONS AND REPORTS WILL BE SUBMITTED TO MSD AND CITY OF CREVE COEUR FOR FINAL APPROVAL PRIOR TO CONSTRUCTION.

PREPARED BY:

CMT
Crawford, Murphy & Tilly

ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN

SCALE IN FEET

PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

**OLIA VILLAGE
DEVELOPMENT**

LINDBERGH & OLIVE BLVD

CREVE COEUR, MO

MARK	DATE	DESCRIPTION
PROJECT NO: 23005201-00		
CAD DWG FILE: ISITE-CONCEPT-PLAN.DWG		
DESIGNED BY: TME/JFM		
DRAWN BY: JFM		
CHECKED BY: CJS		
APPROVED BY: ---		
COPYRIGHT: CRAWFORD, MURPHY & TILLY, INC. 2023		

SHEET TITLE

UTILITY & DRAINAGE PLAN

C-106

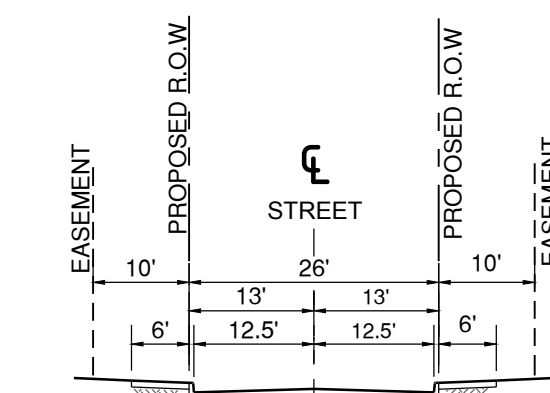
SHEET - OF 4

STREET PLAN
OLIA VILLAGE

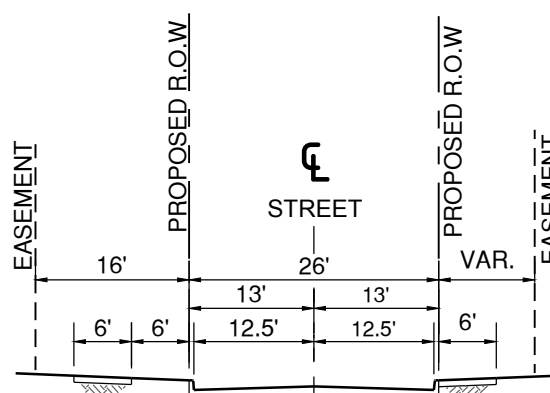
SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- LEGEND
- DEVELOPMENT BOUNDARY LINE
 - PROPOSED LOT LINE
 - PROPOSED R.O.W. LINE
 - CONCEPTUAL BLDG FOOTPRINT
 - PROPOSED R.I.M.U.S.S. EASEMENT
 - PROPOSED ROADWAY (WITHIN RIGHT-OF-WAY)
 - PROPOSED ON-STREET PARKING (WITHIN EASEMENT)
 - PROPOSED PRIVATE ROADWAY

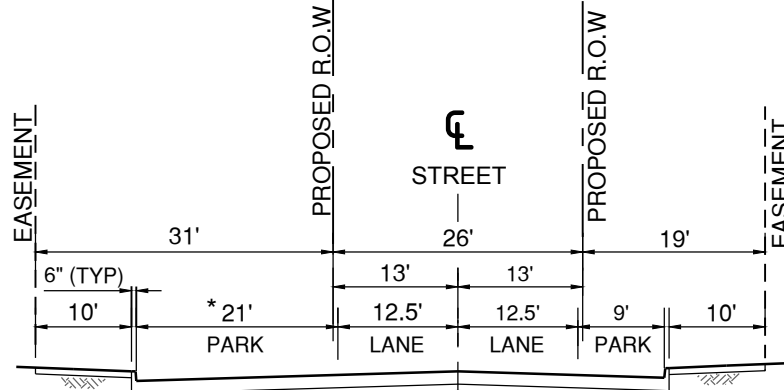
- KEYNOTES
- PROPOSED RIGHT-OF-WAY
 - PROPOSED ROADWAY IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, SIDEWALK (R.I.M.U.S.S.) EASEMENT
 - CONCEPTUAL FUTURE ENTRANCE
 - EXISTING STL WATER MAIN CONDUITS
 - EXISTING STL WATER MAIN EASEMENT



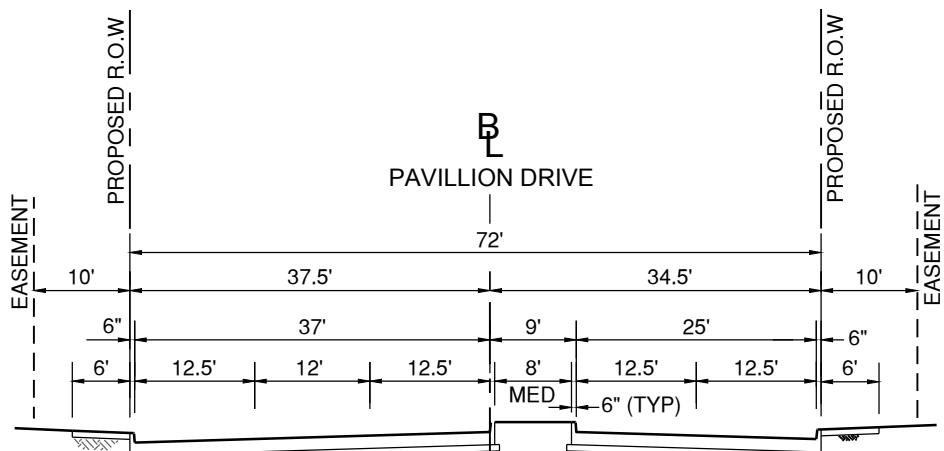
TYPICAL SECTION #1
STANDARD STREET SECTION



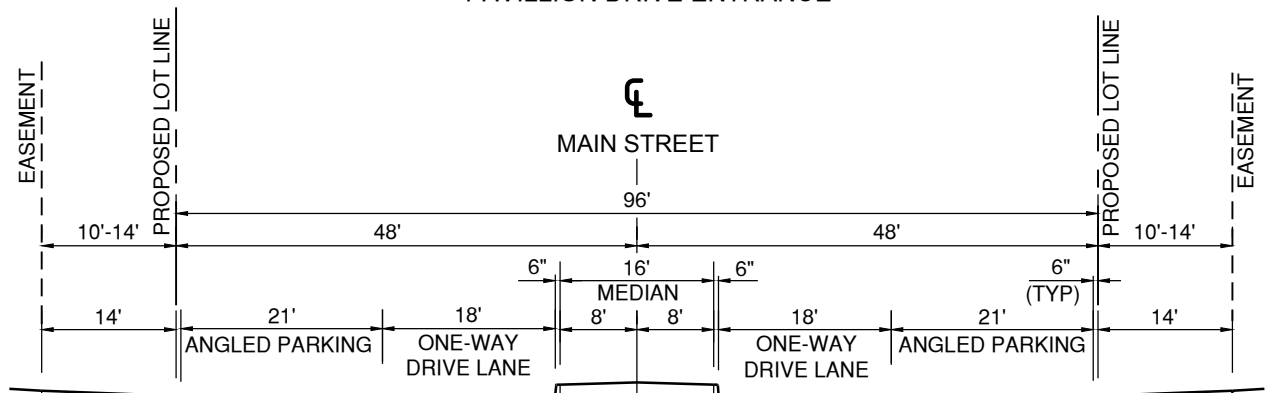
TYPICAL SECTION #2
OLIVE COVE



TYPICAL SECTION #3
STANDARD STREET SECTION
WITH ADJACENT PARKING



TYPICAL SECTION #4
PAVILLION DRIVE ENTRANCE



TYPICAL SECTION #5
MAIN STREET (MEDIAN SECTION)

ROADWAY INFORMATION		
STREET NAME	CENTERLINE LENGTH (FT)	LANE MILES (MI)
PUBLIC ROADWAYS		
PAVILLION DRIVE	380	0.360
MAIN STREET	1,210	0.458
HARVEST DRIVE	770	0.292
ARBOR LANE	750	0.284
OLIVE COVE	2,120	0.803
TWISTED BRANCH	1,000	0.379
VINE STREET	700	0.265
BAYER DRIVE	720	0.273
ON-RAMP FROM BAYER DRIVE	180	0.034
OFF-RAMP TO BAYER DRIVE	320	0.061
BAYER DRIVE (E/W)	220	0.083
SUB-TOTAL :	8,370	3.292
PRIVATE ROADWAYS		
PAVILLION DRIVE	180	0.068
MAIN STREET	1,120	0.424
TWISTED BRANCH	190	0.072
SUB-TOTAL :	1,490	0.564
TOTAL :	9,860	3.856

GENERAL NOTES

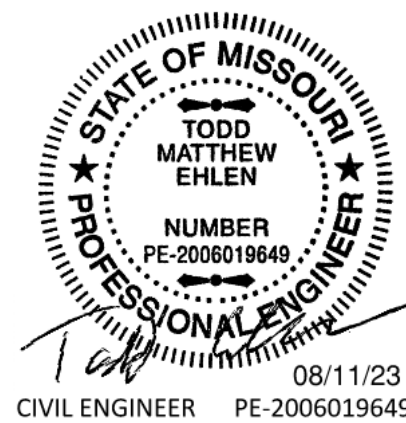
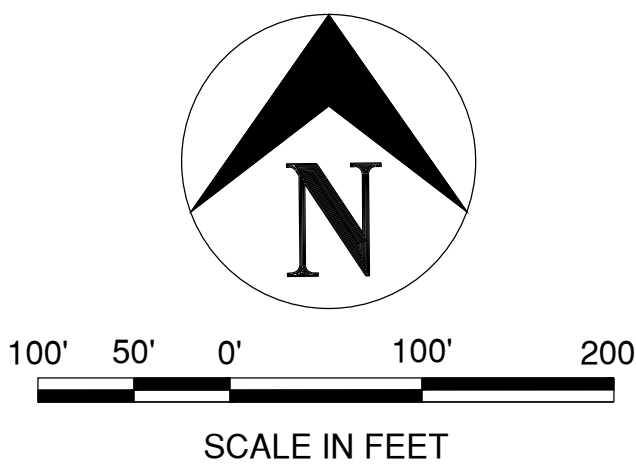
- EXISTING EASEMENTS NOT SHOWN FOR CLARITY.
- EXISTING UTILITIES NOT SHOWN FOR CLARITY.
- PROPOSED UTILITY EASEMENTS NOT SHOWN FOR CLARITY.
- PROPOSED UTILITIES NOT SHOWN FOR CLARITY.



ONE MEMORIAL DRIVE, SUITE 500
ST. LOUIS, MO 63102
OFFICE NO. (314) 436-5500
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CONSULTANTS:

SITE CONCEPT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
AUGUST 11, 2023

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

MARK DATE DESCRIPTION
PROJECT NO.: 23005201-00
CAD DWG FILE: ISITE-CONCEPT-PLAN.DWG
DESIGNED BY: TME/JFM
DRAWN BY: JFM
CHECKED BY: CJS
APPROVED BY: ---
COPYRIGHT: CRAWFORD, MURPHY & TILLY, INC. 2023

STREET PLAN

C-107

SHEET - OF 4



city of CREVE COEUR

300 North New Ballas Road • Creve Coeur, Missouri 63141
(314) 432-6000 • Fax (314) 872-2539 • Relay MO 1-800-735-2966
www.creve-coeur.org

July 28, 2023

Matt Pfund
10300 Olive, LLC
90 Edwardsville Professional Park
Edwardsville, IL 62025

SENT VIA E-MAIL

Re: Applications #23-027 and #23-028: Olia Village Mixed-Use Planned Zoning District—Incomplete Application

Dear Mr. Pfund:

The City of Creve Coeur staff has received and reviewed your submittal for the above application. Below are our initial comments based upon a review of the City's comprehensive plan and ordinances including Section 405.390 Planned Zoning Districts and Section 410.110 Preliminary Subdivision Plat.

General Comments:

1. Several plan sheets are incorrectly located within the Site Development Plan submitted. See comments below for additional information on the organization of the plan sheets.
2. The site concept plans are difficult to read and don't communicate the information clearly. For example, the buffer yards and building setbacks would be better to have dimensioned on the drawing rather than utilizing key notes. Another example is that the distinction between building footprints and parking structures is not clear. Staff would like to discuss options to make the plans easier to read.
3. All drawings should be stamped and sealed. Please provide with the re-submitted plans.
4. Staff and the City's planning consultant are still reviewing "Attachment B" that was submitted to provide the development standards for the Planned District. Comments are expected to be ready by mid-August and will be sent under separate cover.
5. Please provide a written acknowledgement from the City of St. Louis Water Division providing their approval of these conceptual plans as they involve disturbance within their 100-foot easement.
6. Please be advised, signage for the development will require approval of a Master Sign Plan to be submitted at a later date.

Site Concept Plan:

1. Staff has concerns about location of the garage shown on Lot 2 at the entrance into the development. A garage facing this main entrance and its proximity to Olive Boulevard is not ideal. Please consider revising the layout to eliminate this condition.
2. Staff would like to discuss Lot 2 being changed from Category B-Mixed-Use Development to Category A-Main Street Development for consistency at the main entrance.
3. Public art is mentioned in the narrative as a public benefit. Please provide additional details concerning possible locations/type on plans or in response letter.

4. Pedestrian connection across Olive Boulevard at the main entrance to Pavilion Drive is not shown on the plans. Please provide an update on the status of this future crossing and, if appropriate, and show on the plans. This is a recommendation of the comprehensive plan amendment.
5. Please include the number of existing buildings and number of proposed buildings for the site in a table on the plans for clarity.
6. General uses of all buildings are not clearly provided on the plans (hotel, office, commercial, apartments, townhouses, mixed-use commercial, etc.). Please revise to include this information. Provide total number of residential units by building/lot and by type (apartment, attached single family, etc.) and max number of hotel units on the plans.
7. Please label the parking garages on the plans. These structures are not clearly depicted.
8. Staff suggests creating a separate Buffering and Setback Plan sheet and label dimensions on the plan for clarity. Label proposed buffer yard setbacks and building setbacks. Provide dimensions on plan sheets in lieu of keyed notes.
9. Add a note on plans that specific allowable uses will be included in the PD ordinance. Staff comments on proposed allowable uses, as shown on Attachment B, are under review and will be sent under separate cover.
10. Sheet C-101: Maximum Height of all buildings. Add note on plans to refer to additional standards in "Attachment B".
11. Sheet C-102: Parking Summary Table: How is required parking determined? For example, the City's parking requirements are based on number of seats for restaurants and number of hotel rooms which are not available at this stage. How is this being determined at the site concept level?
12. Sheet C-105: Will stormwater basins be designed as "wet" detention to serve as an amenity to the development as depicted on the Architectural Site Plan (Sheet A-101)?
13. Sheet C-105: Are there pre-development and post-development runoff calculations and detention volume information available at this stage to support concept stormwater plan? Have plans been submitted to MSD for preliminary review?
14. Move renderings, elevations and birds eye views from the Site Development Plan set to the Site Concept Plan set. Provide additional Perspective View drawings from outside the development, as viewed along Olive and Lindbergh to aid in Planning and Zoning Commission and City Council review.
15. Please provide additional details about the pedestrian path including lighting, benches, way finding signs etc.
16. Staff would like to discuss additional streetscape details for the Main Street area to review at the site concept level such as street section drawings, pedestrian zones, street trees/planters etc.

Site Development Plan-Phase 1:Site Improvements:

1. Site Development Plan should be limited to only improvements related to Phase 1 as shown on the Site Concept Plan, Sheet C-103: Site clearing, Site utilities, Roadway construction.
2. All other sheets should be moved to the Site Concept Plan set. With that said, the following comments have been generated based on the specific plan sheet within the Site Development Plan set.
3. On Sheet A-101 the pedestrian trail location and the detention areas do not match other plan sheets. Please revise so all plan sheets match. Please relocate this illustrative plan sheet to the Site Concept Plan set.

4. On Sheets A-104 and A-106 please revise to indicate conceptual elevations for illustrative purposes only. Final elevations will be submitted as part of the Site Development Plan application for each phase.
5. On Sheet C-106 Street Plan:
 - a. The City would like to discuss some of the streets that are shown to be dedicated as public R-O-W. Please see attached mark-up for the locations representing the City's preference for further discussion. The streets shown in red highlight would be the City's preference for dedication. This leaves mostly the Main Street area as private.
 - b. The City requests the use of standard Street Sections that include the sidewalks within the 50 foot R-O-W. Please revise all appropriate plan sheets and Section details accordingly.
 - c. The street connection to Olive Blvd. at the northwest corner of the site, within the existing Schnucks property should be placed within a R-O-W dedicated to the City of Creve Coeur. Please revise plans accordingly.
6. On Sheet C-107 Pedestrian Plan:
 - a. Will the shared use path and trails be privately maintained and open to the public by easement?
 - b. The City requests the shared use path be a solid surface, minimum 8-feet width and that the shared use path be continued in lieu of the assumed gravel surface trail along the south and southeast sections of the site. Add a section detail providing width of shared use path and surface material. Will this be a component of the site development plan for Phase 1?
 - c. The southernmost portion of the trail should tie in with the remainder of the site and to Lindbergh Boulevard. The plans show the trail terminating in a circular loop.
 - d. Please consider providing more direct connections from the shared use path on the western end to the Main Street District to increase pedestrian mobility.
 - e. All sidewalks are shown to be placed back of curb. Please consider utilizing a separated sidewalk such as on Olia Drive, Olive Cove, Arbor Lane and Harvest Drive.
 - f. Will there be dedicated public parking to access the trail system for outside users?
 - g. The City would like to request that pedestrian connections from the site to adjacent neighborhoods be explored. For example, it appears possible to provide a connection to the trail on the south side of the property to the Sunswept neighborhood on the Vantage Credit Union property.
7. On Sheet C-108 there is no plan view sheet provided to that reference the cross-section details. Please provide.
8. Please make the stream clearer on the plans and verify that Section 430.050 is being properly addressed showing both sets of buffers, the 50-foot undisturbed natural vegetative buffer and the additional 25-foot buffer, for both banks of the stream.
9. Please provide additional details about the proposed retaining wall on the western boundary of the site including material, height and elevations. Will this be a component of the site development plan for Phase 1?
10. Please provide details pertaining to which phase the street lighting will be installed.

Landscaping Concept Plan:

1. The concept landscaping along the Olive Boulevard frontages do not appear on plan. For example, will the frontages incorporate berms, street trees at regular intervals, plantings, etc.? Please include general design concepts that will be detailed in the landscape plan submitted with

- each phase as part of the Site Development Plan. Please provide information on when the landscaping improvements along exterior road frontages will be provided? During what phase?
2. Do the future landscape plans intend to incorporate native landscaping as recommended by the comprehensive plan, where appropriate? If so, please add a note to the concept landscape plan.
 3. Please refer to the landscape palette provided in the [39 North Great Streets Plan](#), (p. 56-68) In order to strengthen the district identity, can these materials be incorporated into future landscape plans as recommended by the comprehensive plan? Based on staff's review, the materials for the development, particularly along Main Street, appear to be consistent with the materials palette as shown the 39N Great Streets Plan. Staff would like to discuss opportunities to incorporate additional elements along the Olive frontage to further increase 39 North district identity as recommended in the comprehensive plan.
 4. Please provide the appropriate amount of Street Trees along Olive Boulevard and the interior streets of the development to comply with Section 405.540.F.1.
 5. Please provide an estimate of the percentage of trees proposed for removal on site.
 6. Please include a note stating that an irrigation system will be provided on site for the landscaping and will be shown on the site development plans. The City requests that irrigation be extended to the medians in Olive Boulevard at the entrance to the site.

Traffic Study:

1. The City will provide additional comments from our consulting traffic engineer on the Traffic Impact Study next week.
2. Please submit preliminary approval letter from MoDOT concurring with the findings and recommendations of the Traffic Impact Study.

Preliminary Plat:

1. The owner is shown as Bayer Cropscience LP. Please update with the current owner.
2. Cover Sheet, Site Information, update to show Ladue School District.
3. Adjust proposed R-O-W widths and lots pursuant to staff comments provided under Sheet C-106.
4. Provide setback information on preliminary plat arranged by subdistrict.
5. Please include metes and bounds legal description on plan sheet.
6. Please add note regarding maintenance of all common ground areas (community association as described in covenants to be drafted and approved by the City).
7. Please explain the purpose of the "Olivia Village Preliminary Boundary Plan" prepared by Cole.
8. Submit tree conservation plan as required under Section 410.320. In addition to individual or groups of trees within the development, the tree conservation plan should correspond to the proposed buffer yards along the perimeter of the site.

Please contact us to set up a review meeting to further discuss these comments and to discuss public hearing and meeting dates. After the review meeting, please include a response letter addressing each of the items listed in this letter along with the revised plans. Feel free to contact me at (314) 872-2504 or by email at jjaggi@crevecoeurmo.gov to schedule the meeting.

Sincerely,

Jason Jaggi
Director of Community Development

CC: Bethany L. Moore, City Planner
Mark Perkins, City Administrator

STREET PLAN OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO



ONE MINERAL DRIVE, SUITE 100
ST. LOUIS, MO 63103
OFFICE NO. 314-438-8800
LICENSING NO. 184-00001

CONSULTANTS:



100' 50' 0' 100' 200'
SCALE IN FEET



LEGEND

- DEVELOPMENT BOUNDARY LINE
- - - PROPOSED LOT LINE
- - - PROPOSED R.O.W. LINE
- - - CONCEPTUAL BLDG FOOTPRINT
- - - PROPOSED R.I.M.U.S.S. SUBMITT
- (A) PROPOSED ROADWAY (WITHIN RIGHT-OF-WAY)
- (B) PROPOSED ON-STREET PARKING (WITHIN SUBMITT)
- (C) PROPOSED PRIVATE ROADWAY

KEYNOTES

- (A) PROPOSED RIGHT-OF-WAY
- (B) PROPOSED ROADWAY IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, (SIGNAL) (R.I.M.U.S.S.) SUBMITT
- (C) CONCEPTUAL FUTURE ENTRANCE
- (D) EXISTING ST. WATER MAIN CONDUIT
- (E) EXISTING ST. WATER MAIN SUBMITT



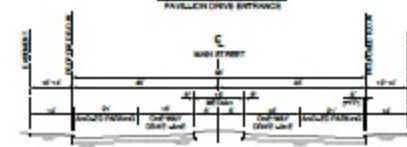
TYPICAL SECTION #1
STANDARD STREET SECTION



TYPICAL SECTION #2
STANDARD STREET SECTION WITH ADJACENT PARKING



TYPICAL SECTION #3
PAVILLION DRIVE ENTRANCE



TYPICAL SECTION #4
MAIN STREET (MEDIAN SECTION)

PUBLIC STREET INFORMATION		
STREET NAME	CENTERLINE LENGTH (FT)	LANE MILES (MI)
PAVILLION DRIVE	490	0.352
MAIN STREET	2,540	0.858
HARVEST DRIVE	770	0.252
ARBOR LANE	750	0.254
OLIVE COVE	2,120	0.803
TWISTED BRANCH	1,180	0.439
VINE STREET	730	0.277
BAVER DRIVE	720	0.273
ON-RAMP FROM BAVER DRIVE	180	0.034
OFF-RAMP TO BAVER DRIVE	320	0.062
BAVER DRIVE (2/26)	180	0.062
TOTAL:	9,780	3.767

GENERAL NOTES

- EXISTING SUBMITT NOT SHOWN FOR CLARITY.
- EXISTING UTILITIES NOT SHOWN FOR CLARITY.
- PROPOSED UTILITIES NOT SHOWN FOR CLARITY.

JULY 7, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



THE HEART OF CREEK CREEK

10300 OLIVE BLVD
CREVE COEUR, MO 63141

NO.	DATE	DESCRIPTION
1	07/07/23	ISSUED FOR PERMIT
2	07/07/23	ISSUED FOR PERMIT
3	07/07/23	ISSUED FOR PERMIT
4	07/07/23	ISSUED FOR PERMIT
5	07/07/23	ISSUED FOR PERMIT
6	07/07/23	ISSUED FOR PERMIT
7	07/07/23	ISSUED FOR PERMIT
8	07/07/23	ISSUED FOR PERMIT
9	07/07/23	ISSUED FOR PERMIT
10	07/07/23	ISSUED FOR PERMIT

STREET PLAN



Jason Jaggi <jjaggi@crevecoeurmo.gov>

FW: Olia Village - STL Watermain Concept Approval

1 message

Todd Ehlen <tehlen@cmtengr.com>

Mon, Jul 31, 2023 at 3:55 PM

To: Jason Jaggi <jjaggi@crevecoeurmo.gov>

Cc: Matt Pfund <matt@jackmatthewsdevelopment.com>, Chris Stritzel <cstritzel@cmtengr.com>, Joe Miller <jmiller@cmtengr.com>

Jason, please find the email below from the City's water department stating that they have no objections to the conceptual plans.

Thanks

Todd

TODD EHLEN PE | Crawford, Murphy & Tilly | w 314.571.9105 | m 314.456.4418
Civil Site Services Group Manager

From: Nankivil, Mark <mnankivil@stlwater.com>
Sent: Monday, July 31, 2023 3:50 PM**To:** Todd Ehlen <tehlen@cmtengr.com>**Cc:** Chris Stritzel <cstritzel@cmtengr.com>; Joe Miller <jmiller@cmtengr.com>; Matt Pfund <matt@jackmatthewsdevelopment.com>; Ron Leible <rleible@cmtengr.com>**Subject:** Re: Olia Village - STL Watermain Concept Approval

***External Message:** This email was sent from someone outside of CMT. Please use caution with links and attachments from unknown senders or receiving unexpected emails.*

Good Day Todd -

Conceptually, the Water Division has no objections to the overall layout as shown on the attached drawings and in particular, the area that encompasses our existing easements.

As noted, we await the details going forward as to how the development will impact our existing facilities and how those items will be addressed.

Regards -

Mark Nankivil

Water Distribution Executive

Service Delivery Group

|



8/11/2023

Mr. Jason Jaggi
Director of Community Development
300 North New Ballas Road
City of Creve Coeur, MO 63141

Re: Applications #23-027 & #23-028
Olia Village Mixed-Use Development
CMT Project No. 23005201.00

Mr. Jaggi,

The following responses are in reference to the City of Creve Coeur's staff review letter sent by email on 07/28/23 as well as correspondence during the review call on 08/01/23.

GENERAL COMMENTS:

1. Several plan sheets are incorrectly located within the Site Development Plan submitted. See comments below for additional information on the organization of the plan sheets.
Olia Team Response: The revised sheets included with this submittal for both the Site Concept Plan (SCP) & Site Development Plan (SDP) submittals have been reorganized to better align with the City's intent for this stage of the project development. The revised Site Development Plan has been submitted to include only items that are proposed to be constructed in Phase 1.
2. The site concept plans are difficult to read and don't communicate the information clearly. For example, the buffer yards and building setbacks would be better to have dimensioned on the drawing rather than utilizing key notes. Another example is that the distinction between building footprints and parking structures is not clear. Staff would like to discuss options to make the plans easier to read.
Olia Team Response: The revised sheets included with this submittal have been reorganized to provide additional clarity. This includes the addition of a standalone buffer/setback sheet (C-103), added labeling of buildings and structures, and removal of unnecessary linework for certain sheets.
3. All drawings should be stamped and sealed. Please provide with the re-submitted plans.
Olia Team Response: The revised sheets included with this submittal have been stamped & sealed and "Preliminary Not for Construction" notes have been added where appropriate.
4. Staff and the City's planning consultant are still reviewing "Attachment B" that was submitted to provide the development standards for the Planned District. Comments are expected to be ready by mid-August and will be sent under separate cover.
Olia Team Response: No response required at this time.
5. Please provide a written acknowledgement from the City of St. Louis Water Division providing their approval of these conceptual plans as they involve disturbance within their 100-foot easement.
Olia Team Response: Attached to this cover letter is an email from Mr. Mark Nankivil from the City of St. Louis Water Department acknowledging conceptual approval of the overall layout.

6. Please be advised, signage for the development will require approval of a Master Sign Plan to be submitted at a later date.

Olia Team Response: Comment noted. Olia intends on submitting a standalone overall development signage package outside of the Phase 1 infrastructure package at a later date for approval through the standard city process.

SITE CONCEPT PLAN COMMENTS:

1. Staff has concerns about location of the garage shown on Lot 2 at the entrance into the development. A garage facing this main entrance and its proximity to Olive Boulevard is not ideal. Please consider revising the layout to eliminate this condition.

Olia Team Response: The building and parking garage on Lot 2 have been “mirrored” to move the face of garage approximately 80’ further to the west. This change accomplishes placing a building (rather than garage) along the entrance drive, providing an outdoor dining experience near the first intersection in the development, and allowing for a new generous open space at the intersection of Olive for a future development monument signage and landscape feature to reinforce the Olia Village brand and arrival experience. The development team has provided updated renderings from Olive Boulevard to indicate intent of outside public facing facades as well as added detail to the landscape plans to help soften that approach.

2. Staff would like to discuss Lot 2 being changed from Category B-Mixed-Use Development to Category A-Main Street Development for consistency at the main entrance.

Olia Team Response: Lot 2 has been changed to Category A-Main Street with the resubmittal.

3. Public art is mentioned in the narrative as a public benefit. Please provide additional details concerning possible locations/type on plans or in response letter.

Olia Team Response: Two (2) possible locations of public art have been identified on Sheet L-141 near the park. The exact details of which have yet to be defined but will remain an amenity to be provided within this development. Similar to the development signage, Olia intends on submitting a standalone art package outside of the Phase 1 infrastructure package to be reviewed and approved by the City’s Arts Committee and Planning & Zoning Commission at a later date.

4. Pedestrian connection across Olive Boulevard at the main entrance to Pavilion Drive is not shown on the plans. Please provide an update on the status of this future crossing and, if appropriate, and show on the plans. This is a recommendation of the comprehensive plan amendment.

Olia Team Response: There are currently no accommodations on the north side of Olive Boulevard at Pavilion Drive for pedestrian movements. The developer intends to design the proposed MoDOT improvements required for Olive to accommodate the future addition of crosswalks across Olive to the north by others. Design considerations are anticipated to include modifying stop bar placement, island configuration, and signal mast arm placement as well as providing conduit rough ins for future pedestrian signal heads and pushbuttons. The proposed plan will also include replacing the existing crosswalk on the south side of Olive at Pavilion as shown in the plans as well as extending the sidewalk along the west end of Harvest Drive to connect to the existing crosswalks at Olive & Old Olive. Additionally, a connection has been added to the existing sidewalk along the south side of Olive Boulevard at the end of Twisted Branch with this resubmittal. A more prominent pedestrian crossing feature near Pavilion Drive across Olive Boulevard will require cooperation and approval from several different entities and the inclusion of said infrastructure in the Olia Village development plans is not expected at this time.

5. Please include the number of existing buildings and number of proposed buildings for the site in a table on the plans for clarity.

Olia Team Response: The SCP have been updated to include these numbers on Sheet C-101.

6. General uses of all buildings are not clearly provided on the plans (hotel, office, commercial, apartments, townhouses, mixed-use commercial, etc.). Please revise to include this information. Provide total number of residential units by building/lot and by type (apartment, attached single family, etc.) and max number of hotel units on the plans.

Olia Team Response: The table on Sheet C-101 of the SCP has been updated to provide the general uses of all buildings. Additionally, the anticipated number of residential units and hotel units by type have been included in the revised parking table on Sheet C-102.

7. Please label the parking garages on the plans. These structures are not clearly depicted.

Olia Team Response: Labels have been added to the SCP on Sheet C-101 to define the locations of the parking garages.

8. Staff suggests creating a separate Buffering and Setback Plan sheet and label dimensions on the plan for clarity. Label proposed buffer yard setbacks and building setbacks. Provide dimensions on plan sheets in lieu of keyed notes.

Olia Team Response: A standalone buffer/setback sheet (C-103) has been provided within the revised set.

9. Add a note on plans that specific allowable uses will be included in the PD ordinance. Staff comments on proposed allowable uses, as shown on Attachment B, are under review and will be sent under separate cover.

Olia Team Response: A note has been added to the bottom on the table on Sheet C-101.

10. Sheet C-101: Maximum Height of all buildings. Add note on plans to refer to additional standards in "Attachment B".

Olia Team Response: A note has been added to the bottom of the table on Sheet C-101.

11. Sheet C-102: Parking Summary Table: How is required parking determined? For example, the City's parking requirements are based on number of seats for restaurants and number of hotel rooms which are not available at this stage. How is this being determined at the site concept level?

Olia Team Response: Additional detail has been added to the table on Sheet C-102 to better define the assumptions provided in the SCP.

12. Sheet C-105: Will stormwater basins be designed as "wet" detention to serve as an amenity to the development as depicted on the Architectural Site Plan (Sheet A-101)?

Olia Team Response: The two (2) main stormwater basins on the west / south side of Olive Cove will be designed as wet detention ponds to also serve as an amenity for the development. It has yet to be determined if the other detention areas shown on the plans will be wet or dry basins.

13. Sheet C-105: Are there pre-development and post-development runoff calculations and detention volume information available at this stage to support concept stormwater plan? Have plans been submitted to MSD for preliminary review?

Olia Team Response: Pre-development and post-development runoff calculations and detention volume information were previously provided in the Preliminary Stormwater Management Report. A summary table/notes have been added to Sheet C-106 for reference as part of the resubmittal package.

14. Move renderings, elevations and birds eye views from the Site Development Plan set to the Site Concept Plan set. Provide additional Perspective View drawings from outside the development, as viewed along Olive and Lindbergh to aid in Planning and Zoning Commission and City Council review.

Olia Team Response: The revised sheets included with this submittal for both the Site Concept Plan (SCP) & Site Development Plan (SDP) submittals have been reorganized to better align with the City's intent for this stage of the project development. A revised perspective drawing along Olive Boulevard has been provided on Sheet A-102.

15. Please provide additional details about the pedestrian path including lighting, benches, way finding signs etc.

Olia Team Response: Additional notes and details have been added to the SCP & SDP regarding the proposed pedestrian nature trail which includes anticipated widths and surface material for each section within the development. It is the developer's intent to keep this trail as natural as possible, specifically on the west / south side of the development against the existing residential neighborhoods (no lighting or benches will be provided). As the trail transitions to the east and north sides of the development, the surface material and amenities will be more consistent with an urban pedestrian path (paved, lighted, etc. as appropriate).

16. Staff would like to discuss additional streetscape details for the Main Street area to review at the site concept level such as street section drawings, pedestrian zones, street trees/planters etc.

Olia Team Response: An enhanced main street typical section has been added to Sheet L-140 in the SCP.

SITE DEVELOPMENT PLAN – PHASE 1 COMMENTS:

1. Site Development Plan should be limited to only improvements related to Phase 1 as shown on the Site Concept Plan, Sheet C-103: Site clearing, Site utilities, Roadway construction.

Olia Team Response: The revised sheets included with this submittal for the Site Development Plan (SDP) have been reorganized to better align with the City's intent for this stage of the project development.

2. All other sheets should be moved to the Site Concept Plan set. With that said, the following comments have been generated based on the specific plan sheet within the Site Development Plan set.

Olia Team Response: Comment noted. No further response required.

3. On Sheet A-101 the pedestrian trail location and the detention areas do not match other plan sheets. Please revise so all plan sheets match. Please relocate this illustrative plan sheet to the Site Concept Plan set.

Olia Team Response: Both architectural and landscape plan sheets have been updated to match civil plans.

4. On Sheets A-104 and A-106 please revise to indicate conceptual elevations for illustrative purposes only. Final elevations will be submitted as part of the Site Development Plan application for each phase.

Olia Team Response: Notes have been added to these sheets accordingly.

5. On Sheet C-106 Street Plan:

- a. The City would like to discuss some of the streets that are shown to be dedicated as public R-O-W. Please see attached mark-up for the locations representing the City's preference for further discussion. The streets shown in red highlight would be the City's preference for dedication. This leaves mostly the Main Street area as private.

Olia Team Response: Public streets have been updated based upon the City feedback. Main Street has been changed to a private street. All other streets remain public as shown in the original submittal.

- b. The City requests the use of standard Street Sections that include the sidewalks within the 50 foot R-O-W. Please revise all appropriate plan sheets and Section details accordingly.

Olia Team Response: Both the City and the developer acknowledge that this development will include a built environment that is meant to encourage pedestrian activity and improve pedestrian mobility. This approach will include intentional roadway & sidewalk design geometries to be established to promote pedestrian access over vehicular where possible, while respecting the safety of both pedestrians and vehicles as well as emergency personnel. This will include a design which considers how people interact with the space to increase access for all community members, including ADA compliancy. As such, the developer desires to provide typical street sections as presented in Attachment B and as further shown on the SCP & SDP. Additionally, due to the downtown urban core nature of the development, the developer intends to dedicate ROW for the public streets from back of curb to back of curb and dedicate a proposed roadway, improvement, maintenance, utility, sewer, and sidewalk easement (PRIMUSSE) to the City and various public utilities for the proposed on-street parking and public sidewalks to allow for utility to be run within these corridors.

- c. The street connection to Olive Blvd. at the northwest corner of the site, within the existing Schnucks property should be placed within a R-O-W dedicated to the City of Creve Coeur. Please revise plans accordingly.

Olia Team Response: Sheet C-107 has been updated to show "Future ROW" on the existing Schnuck's parcel to the west. Please note that the property in question is privately owned. The Olia Village development team is committed to working with the existing Schnuck's property landlord, when the time is right, to not only secure their approval of the changes, but also negotiate the additional ROW required between the current MoDOT ROW for Olive Boulevard and the proposed Olia Village ROW for Harvest Drive.

6. On Sheet C-107 Pedestrian Plan:

- a. Will the shared use path and trails be privately maintained and open to the public by easement?

Olia Team Response: The shared use paths will be privately maintained and open to the public. An easement has been added to the Preliminary Plat accordingly.

- b. The City requests the shared use path be a solid surface, minimum 8-feet width and that the shared use path be continued in lieu of the assumed gravel surface trail along the south and southeast sections of the site. Add a section detail providing width of shared use path and surface material. Will this be a component of the site development plan for Phase 1?

Olia Team Response: Additional notes and details have been added to the SCP & SDP regarding the proposed pedestrian nature trail which includes anticipated widths and surface material for each section within the development. The portion of the trail / path which is to be constructed as part of Phase 1 is now shown on Sheet C-105 within the revised SDP set.

- c. The southernmost portion of the trail should tie in with the remainder of the site and to Lindbergh Boulevard. The plans show the trail terminating in a circular loop.

Olia Team Response: The nature trail has been extended at the southeast corner of the site to tie back into the proposed sidewalk on Olia Drive at the cloverleaf. A connection to Lindbergh Boulevard will not be provided due to the lack of facilities that currently exist on the west side of Lindbergh.

- d. Please consider providing more direct connections from the shared use path on the western end to the Main Street District to increase pedestrian mobility.

Olia Team Response: There are obstacles along this section of the trail that may prohibit direct connections to Main Street, including grade challenges. The developer commits to exploring additional connections as the lots between develop and more clarity is known regarding their access opportunities.

- e. All sidewalks are shown to be placed back of curb. Please consider utilizing a separated sidewalk such as on Olia Drive, Olive Cove, Arbor Lane and Harvest Drive.

Olia Team Response: The sidewalk along both Olive Cove and Harvest Drive has been separated from the back of curb where the proposed geometry allows. Due to grade challenges along Olia Drive and development barriers along Arbor Drive, the sidewalk will remain adjacent to the back of curb for these two (2) sections.

- f. Will there be dedicated public parking to access the trail system for outside users?

Olia Team Response: There are complications along sections of the trail that may prohibit direct connections to it, including grade challenges. The developer commits to exploring dedicated public parking to access the trail system as the adjacent lots develop.

- g. The City would like to request that pedestrian connections from the site to adjacent neighborhoods be explored. For example, it appears possible to provide a connection to the trail on the south side of the property to the Sunswept neighborhood on the Vantage Credit Union property.

Olia Team Response: No direct connections between the nature trail and the adjacent properties will be provided in Phase 1.

7. On Sheet C-108 there is no plan view sheet provided to that reference the cross-section details. Please provide.

Olia Team Response: The plan view section locations are shown in bold dashed magenta line styles on the Grading Plan Sheet C-105. A note has been added to the sections referring to the Grading Plan.

8. Please make the stream clearer on the plans and verify that Section 430.050 is being properly addressed showing both sets of buffers, the 50-foot undisturbed natural vegetative buffer and the additional 25-foot buffer, for both banks of the stream.

Olia Team Response: More clarity has been provided on the new buffer / setback plan Sheet C-103, including more direct callouts to the 50-ft undisturbed natural vegetation buffer and the additional 25-foot no impervious buffer. As noted during the coordination call with the City on 08/01/23, disturbance to portions of the existing streams under the US Army Corps Of Engineers (USACOE) jurisdiction will be mitigated through the nationwide permit process. Streams to remain under USACOE jurisdiction will comply with the required buffers within the City Ordinance. The exception to this requirement will be any existing encroachment prior to redevelopment will remain and no new development or redevelopment adjacent to said streams will encroach any farther than the existing documented encroachments.

9. Please provide additional details about the proposed retaining wall on the western boundary of the site including material, height and elevations. Will this be a component of the site development plan for Phase 1?

Olia Team Response: Additional notes have been added to Sheet C-101 for the proposed retaining walls (Keynote K). The construction of the Phase 1 walls are shown on the updated SDP.

10. Please provide details pertaining to which phase the street lighting will be installed.

Olia Team Response: Updated street lighting sheets including photometrics have been provided in both the SCP & SDP packages. The phasing of the construction of the proposed street lighting will coincide with the phasing for each adjacent street section.

LANDSCAPING CONCEPT PLAN COMMENTS:

1. The concept landscaping along the Olive Boulevard frontages do not appear on plan. For example, will the frontages incorporate berms, street trees at regular intervals, plantings, etc.? Please include general design concepts that will be detailed in the landscape plan submitted with each phase as part of the Site Development Plan. Please provide information on when the landscaping improvements along exterior road frontages will be provided? During what phase?

Olia Team Response: Additional detail for the Olive Boulevard frontage has been added to the landscape plans. An overall landscape concept plan has been included with the revised SCP set and a Phase 1 specific landscape plan has been included in the revised SDP set. All landscaping shown in the SDP set will be constructed as part of the Phase 1 improvements.

2. Do the future landscape plans intend to incorporate native landscaping as recommended by the comprehensive plan, where appropriate? If so, please add a note to the concept landscape plan.

Olia Team Response: The intent is for the future landscape plans to incorporate native or near-native landscaping where appropriate. Notes have been added to Sheet L-140 accordingly within the legend.

3. Please refer to the landscape palette provided in the [39 North Great Streets Plan](#), (p. 56-68) In order to strengthen the district identity, can these materials be incorporated into future landscape plans as recommended by the comprehensive plan? Based on staff's review, the materials for the development, particularly along Main Street, appear to be consistent with the materials palette as shown the 39N Great Streets Plan. Staff would like to discuss opportunities to incorporate additional elements along the Olive frontage to further increase 39 North district identity as recommended in the comprehensive plan.

Olia Team Response: The intent is for the future landscape plans to use the 39 North Great Streets Plan as a reference for plant material selections, along with additional plant and material character guidelines for Oli Village.

4. Please provide the appropriate amount of Street Trees along Olive Boulevard and the interior streets of the development to comply with Section 405.540.F.1.

Olia Team Response: The landscape plans have been updated and a note has been added to Sheet L-140 to acknowledge compliance with Attachment B (Note #6).

5. Please provide an estimate of the percentage of trees proposed for removal on site.

Olia Team Response: The estimated percentage of trees proposed for removal on site has been added to Sheet LD-100.

6. Please include a note stating that an irrigation system will be provided on site for the landscaping and will be shown on the site development plans. The City requests that irrigation be extended to the medians in Olive Boulevard at the entrance to the site.

Olia Team Response: Notes have been added to Sheet L-140 indicating areas of proposed irrigation as well as a proposed irrigation line to be installed to the median in Olive west of Pavilion (Note #4).

TRAFFIC STUDY COMMENTS:

1. The City will provide additional comments from our consulting traffic engineer on the Traffic Impact Study next week.
Olia Team Response: Comment noted. CMT has provided formal response to those comments in a separate letter that has been included in this resubmittal packet.
2. Please submit preliminary approval letter from MoDOT concurring with the findings and recommendations of the Traffic Impact Study.
Olia Team Response: MoDOT approval is pending the City's response to the email from MoDOT dated 06/09/23.

PRELIMINARY PLAT (PP) COMMENTS:

1. The owner is shown as Bayer Cropscience LP. Please update with the current owner.
Olia Team Response: The Plat has been updated to provide the current owner information.
2. Cover Sheet, Site Information, update to show Ladue School District.
Olia Team Response: The Plat has been updated to provide the Ladue School District.
3. Adjust proposed R-O-W widths and lots pursuant to staff comments provided under Sheet C-106.
Olia Team Response: Please see our team's response to Item #5b above.
4. Provide setback information on preliminary plat arranged by subdistrict.
Olia Team Response: Setback and buffer information has been added to the Plat as appropriate. A summary of all proposed setbacks and buffers have been added to the bottom left hand of Sheet V-101.
5. Please include metes and bounds legal description on plan sheet.
Olia Team Response: The metes and bounds legal description has been added to the Cover Sheet V-100.
6. Please add note regarding maintenance of all common ground areas (community association as described in covenants to be drafted and approved by the City).
Olia Team Response: A note has been added regarding maintenance of all common ground areas on Sheet V-101.
7. Please explain the purpose of the "Olia Village Preliminary Boundary Plan" prepared by Cole.
Olia Team Response: This sheet has been removed from the Preliminary Plat packet.
8. Submit tree conservation plan as required under Section 410.320. In addition to individual or groups of trees within the development, the tree conservation plan should correspond to the proposed buffer yards along the perimeter of the site.
Olia Team Response: The estimated percentage of trees proposed for removal on site has been added to Sheet LD-100 in the SCP & SDP packet. This information has not been provided on the Preliminary Plat. As noted in proposed Attachment B, "The Tree Conservation ordinance (Section 410.320) shall not apply to this development. The developer shall work with the City to find a balance between minimizing mass tree removal and incorporating new trees into the development."

If you have any questions regarding these responses, please feel free to reach out and discuss.

Thank you,

Matthew J. Pfund

Owner – Olia Village

Christopher J. Stritzel, P.E.

Project Manager - CMT

CC: Kristie Bailey, Fireside Financial
Michael Bailey, Fireside Financial
Toby Heddinghaus, Gray Design Group
Wes Haid, SWT Design
Jamie Mansfield, Armstrong Teasdale



city of CREVE COEUR

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August 23, 2023

Matt Pfund
10300 Olive, LLC
90 Edwardsville Professional Park
Edwardsville, IL 62025

SENT VIA E-MAIL

Re: Applications #23-027 and #23-028: Olia Village Mixed-Use Planned Zoning District—Second Review

Dear Mr. Pfund:

The City of Creve Coeur staff has received and reviewed your re-submittal for the above application, received August 14, 2023. Below are our comments:

1. Site Concept Plan. Street Plan, Sheet C-107. In the response letter regarding the pedestrian crossing at the entrance to Olive Blvd. and across from Pavilion Drive, the developer seems agreeable to designing the improvements that would be constructed by others at a future date. We understand that a full crossing may not be feasible at this time due to lack of pedestrian facilities across Olive. However, this crossing has been identified as a priority in the comprehensive plan amendment and would also contribute to the Public Benefit requirements of the Planned Zoning District ordinance. City staff would request that all improvements be designed and constructed to the extent allowable by MoDOT in association with this development. City staff will be reaching out to MoDOT to discuss options regarding this crossing and will report back on this matter.
2. Site Concept Plan. Street Plan, Sheet C-107. City staff is agreeable to this revised plan to dedicate the streets to the City with the following comments:
 - Lindbergh ramps ROW dedication limits. Please explain the limits of the Lindbergh ramps that are to be dedicated to the City. Staff would prefer that only future Olia Drive be public and dedicated to the City (not to include any portion of the ramps).
 - The future ROW for all streets dedicated to the City should be from 1-foot back of curb on each side for future maintenance purposes.
 - The City requests that Harvest Drive also be shown as future ROW in conjunction with the future ROW dedication on the Schnucks site at Olive/Old Olive intersection.
3. Dual Lefts, Westbound Olive at entrance. The City has received your response to the City's request for further study on this option. Staff will ask our consulting traffic engineer to provide an opinion and response, which we will share with the development team. City staff also will discuss whether or not this configuration is necessary with MoDOT.
4. Site Concept Plan. Pedestrian Plan, Sheet C-108.
 - The revised plans seem to have eliminated the Shared Use Path design. Staff prefers a paved 8-foot wide Shared Use Path that would provide a continuous route throughout the development, connect the various components within the

development, and provide direct access to Olive and Lindbergh that could tie into planned trail/multi-use networks. The above recommendations are provided in the Comprehensive Plan amendment. The nature trail would be appropriate on the southern end of the site due to environmental/regulatory limitations. Staff would like to discuss these options in greater detail.

- The City staff requests that all shared use paths and nature trails should be a minimum of 8-feet wide; detached sidewalks, minimum of 5-feet wide; and, sidewalks placed at back of curb, 6-feet wide throughout the development.
5. Pedestrian Connection to Lindbergh.
 - The response letter and the plans do not show any connections to Lindbergh. These connections are recommended in the Comprehensive Plan amendment. The City believes MoDOT has plans to provide sidewalks on Lindbergh Blvd. City staff will reach out to MoDOT to confirm and obtain these plans and the timing for these improvements and will advise the development team.
 - The connection to surrounding neighborhoods is recommended in the plan and would also contribute to the Public Benefit requirements of the Planned Zoning District ordinance. Staff has suggested that the Vantage Credit Union site could provide a connection to the neighborhood to the south,
 6. Site Concept Plan. Parking requirements. The additional information is helpful; however, the City would request that parking information needs to also be provided at the site development plan stage for each phase to evaluate against the generalizations provided at this stage (Site Concept Plan). In addition, the City will require a review of the specific end users to determine compliance with City standards and/or those approved as part of Attachment B (Regulatory Standards). The City's planning consultant, PGAV, is also looking into how best to manage the required parking given the unknown parking demands for this development at this conceptual stage. Please note the City recently removed the requirement for additional off-street parking for seasonal outside dining areas associated with restaurants.
 7. Phase 1 Site Development Plan. Site Lighting (Street Lighting). Sheets A-103.1-4. Street light standards appear to be shown on private property within an easement. Will the street lights be privately owned and maintained?
 8. Phase 1 Site Development Plan. General. Staff would like to confirm that all improvements shown on the Site Development Plan set will be constructed as Part of Phase 1. These include lighting, landscaping, pedestrian paths/trails/sidewalks, detention basins, and tree removals?
 9. Concept Landscape Plan. Sheet L-140-141. Landscaping along the Olive frontage should provide additional plantings beyond the street trees. A detailed landscape plan can be submitted in accordance with the Site Development Plan for Phase 2. Staff would like to clearly understand what landscaping will be provided as part of Phase 1 (site work) and what landscaping would be installed at a later date along the Olive frontage.
 10. Final Plat Submittal. Staff would like to discuss the timing for final plat submittal and approval by P&Z and City Council. Please refer to Section 405.390.H of the Planned Zoning District ordinance.

We would also like to discuss the status of your review of PGAV's comments that were distributed to you and coordinate with you for the first public hearing on September 5th. Attached are staff's notes on the

feedback received by the P&Z Commission from this week's work session in which we discussed managing the meeting review process for this project.

We look forward to discussing these comments tomorrow at virtual meeting, scheduled for 1:30 p.m. Feel free to contact me at (314) 872-2504 or by email at jjaggi@crevecoeurmo.gov with any questions prior to our review meeting.

Sincerely,

Jason Jaggi
Director of Community Development

CC: Bethany L. Moore, City Planner
Mark Perkins, City Administrator



08/30/2023

Mr. Jason Jaggi
Director of Community Development
300 North New Ballas Road
City of Creve Coeur, MO 63141

Re: Applications #23-027 & #23-028
Olia Village Mixed-Use Development
CMT Project No. 23005201.00

Mr. Jaggi,

The following responses are in reference to the City of Creve Coeur's 2nd staff review letter sent by email on 08/23/23 as well as correspondence during the review call on 08/24/23.

1. Site Concept Plan. Street Plan, Sheet C-107. In the response letter regarding the pedestrian crossing at the entrance to Olive Blvd. and across from Pavilion Drive, the developer seems agreeable to designing the improvements that would be constructed by others at a future date. We understand that a full crossing may not be feasible at this time due to lack of pedestrian facilities across Olive. However, this crossing has been identified as a priority in the comprehensive plan amendment and would also contribute to the Public Benefit requirements of the Planned Zoning District ordinance. City staff would request that all improvements be designed and constructed to the extent allowable by MoDOT in association with this development. City staff will be reaching out to MoDOT to discuss options regarding this crossing and will report back on this matter.

Olia Team Response: Currently, the developer plans to design the proposed MoDOT improvements required for Olive to accommodate the future addition of crosswalks across Olive to the north by others which will include design considerations for modifying stop bar placement, island configuration containing knock-out panels, signal mast arm placement to avoid future conflicts, as well as providing conduit rough ins for future pedestrian signal heads and pushbuttons.

2. Site Concept Plan. Street Plan, Sheet C-107. City staff is agreeable to this revised plan to dedicate the streets to the City with the following comments:

- Lindbergh ramps ROW dedication limits. Please explain the limits of the Lindbergh ramps that are to be dedicated to the City. Staff would prefer that only future Olia Drive be public and dedicated to the City (not to include any portion of the ramps).

Olia Team Response: Upon further discussion with City staff, our team proposes to leave the Bayer overpass as existing private ownership & maintenance while indicating the entire exit and entrance ramps on the west side of Lindbergh Boulevard as public ROW to eliminate a potential gap in public ROW between Main Street & Lindbergh Boulevard.

- The future ROW for all streets dedicated to the City should be from 1-foot back of curb on each side for future maintenance purposes.

Olia Team Response: Upon further discussion with City staff, the proposed ROW for all streets to be dedicated to the City will remain at the back of curb and a Permanent Roadway Improvement, Maintenance, Utility, Sewer & Sidewalk Easement (PRIMUSSE) will be dedicated to the City behind the curb to allow for future maintenance considerations. A copy of St. Louis County's standard PRIMUSSE language has been attached to this letter for review and consideration by City staff. The PRIMUSSE will be added to the Preliminary Plat upon resubmittal.

Crawford, Murphy & Tilly

Centered in Value

- The City requests that Harvest Drive also be shown as future ROW in conjunction with the future ROW dedication on the Schnucks site at Olive/Old Olive intersection.

Olia Team Response: Harvest Drive will be shown as future ROW upon resubmittal. It is the developer's intent to secure the necessary ROW from the adjacent parcel to the west and dedicate both to the City as part of the Final Plat.

3. Dual Lefts, Westbound Olive at entrance. The City has received your response to the City's request for further study on this option. Staff will ask our consulting traffic engineer to provide an opinion and response, which we will share with the development team. City staff also will discuss whether or not this configuration is necessary with MoDOT.

Olia Team Response: Comment noted. No further response required at this time.

4. Site Concept Plan. Pedestrian Plan, Sheet C-108.

- The revised plans seem to have eliminated the Shared Use Path design. Staff prefers a paved 8-foot wide Shared Use Path that would provide a continuous route throughout the development, connect the various components within the development, and provide direct access to Olive and Lindbergh that could tie into planned trail/multi-use networks. The above recommendations are provided in the Comprehensive Plan amendment. The nature trail would be appropriate on the southern end of the site due to environmental/regulatory limitations. Staff would like to discuss these options in greater detail.

Olia Team Response: The development team is considering an alternate location within the development for a paved 8-foot shared use path connection between Olive & Lindbergh. The developer desires to maintain a natural walking trail against the adjacent neighborhoods to the west and south.

- The City staff requests that all shared use paths and nature trails should be a minimum of 8-feet wide; detached sidewalks, minimum of 5-feet wide; and, sidewalks placed at back of curb, 6-feet wide throughout the development.

Olia Team Response: Comment noted. No further response required.

5. Pedestrian Connection to Lindbergh.

- The response letter and the plans do not show any connections to Lindbergh. These connections are recommended in the Comprehensive Plan amendment. The City believes MoDOT has plans to provide sidewalks on Lindbergh Blvd. City staff will reach out to MoDOT to confirm and obtain these plans and the timing for these improvements and will advise the development team.

Olia Team Response: Comment noted. No further response required.

- The connection to surrounding neighborhoods is recommended in the plan and would also contribute to the Public Benefit requirements of the Planned Zoning District ordinance. Staff has suggested that the Vantage Credit Union site could provide a connection to the neighborhood to the south.

Olia Team Response: The developer will consider providing a nature trail connection to the northwest corner of the Vantage Credit Union property, should the City desire. Obtaining an easement or ROW from the Vantage Credit Union and extending the trail to Sunswept Drive will be the responsibility of others.

6. Site Concept Plan. Parking requirements. The additional information is helpful; however, the City would request that parking information needs to also be provided at the site development plan stage for each phase to evaluate against the generalizations provided at this stage (Site Concept Plan). In addition, the City will require a review of the specific end users to determine compliance with City standards and/or those approved as part of Attachment B (Regulatory Standards). The City's planning consultant, PGAV, is also looking into how best to manage the required parking given the unknown parking demands for this development at this conceptual stage. Please note the City recently removed the requirement for additional off-street parking for seasonal outside dining areas associated with restaurants.

Olia Team Response: Comment noted. The parking calculations shown on the Site Concept Plan were derived from the standard formulas within the existing City ordinance. The total parking counts include all off-street and on-

street parking within the development. Olia is further requesting a 15% reduction for shared parking considerations as noted in Attachment B. In addition, parking has been evaluated as a part of the phasing plan to ensure required parking minimums are met through development.

7. Phase 1 Site Development Plan. Site Lighting (Street Lighting). Sheets A-103.1-4. Street light standards appear to be shown on private property within an easement. Will the streetlights be privately owned and maintained?

Olia Team Response: The streetlights will be constructed within the proposed PRIMUSSE easement. Olia will retain ownership and maintenance responsibilities for all streetlights.

8. Phase 1 Site Development Plan. General. Staff would like to confirm that all improvements shown on the Site Development Plan set will be constructed as Part of Phase 1. These include lighting, landscaping, pedestrian paths/trails/sidewalks, detention basins, and tree removals?

Olia Team Response: All improvements shown on the Site Development Plan set will be constructed as part of Phase 1. Furthermore, Phase 1 is intended to be broken down into three (3) permit packages, generally as follows:

- Phase 1 – Permit Package #1: Site demo, mass grading, tree removal, detention ponds & outlets, portions of utilities, retaining walls, City of St. Louis water main protection, and interim fire protection requirements. It is anticipated that the construction documents for this package will be submitted to the City no later than 10/01/23 with the goal of starting construction in late 2023 assuming all other necessary entitlements are also in place.
- Phase 1 – Permit Package #2: All remaining onsite work including streets, sidewalks, lights, trails, utilities, and landscaping. It is anticipated that the construction documents for this package will be submitted to the City late 2023 with construction starting early 2024.
- Phase 1 – Permit Package #3: All off-site public improvements required by the MoDOT traffic study. It is anticipated that the construction documents for this package will be submitted to the City / MoDOT in early 2024 with the goal of starting construction in spring / summer 2024.

9. Concept Landscape Plan. Sheet L-140-141. Landscaping along the Olive frontage should provide additional plantings beyond the street trees. A detailed landscape plan can be submitted in accordance with the Site Development Plan for Phase 2. Staff would like to clearly understand what landscaping will be provided as part of Phase 1 (site work) and what landscaping would be installed at a later date along the Olive frontage.

Olia Team Response: All landscaping shown on the Site Development Plan – Phase 1 will be constructed as part of the Phase 1 (site work) within Permit Package 2. Additional foundation plantings along Olive Boulevard will be provided with the development of individual Lots 3, 2, 11 & 7.

10. Final Plat Submittal. Staff would like to discuss the timing for final plat submittal and approval by P&Z and City Council. Please refer to Section 405.390.H of the Planned Zoning District ordinance.

Olia Team Response: The development team understands that construction of permanent City infrastructure won't be permitted until the Final Plat has been approved by City Council. It is anticipated that the Final Plat submittal will follow closely behind the Phase 1 SCP/SDP package once the public infrastructure components have been finalized and approved by City staff. That being said, it is also our understanding that the Phase 1 – Permit Package #1 (as noted above) may be approved for construction prior to approval of the Final Plat.

If you have any questions regarding these responses, please feel free to reach out and discuss.

Thank you,

Matthew J. Pfund

President – Jack Matthews Development

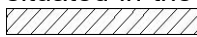
Christopher J. Stritzel, P.E.

Project Manager - CMT

CC: Kristie Bailey, Fireside Financial
Michael Bailey, Fireside Financial
Toby Heddinghaus, Gray Design Group
Wes Haid, SWT Design
Jamie Mansfield, Armstrong Teasdale

PERMANENT ROADWAY IMPROVEMENT,
MAINTENANCE, UTILITY, SEWER AND SIDEWALK EASEMENT
(Form 7.2.4)

THIS INDENTURE made and entered into this _____ day of _____, 20____, between _____ of the County of St. Louis, State of Missouri, Grantor(s) and ST. LOUIS COUNTY, MISSOURI, 41 South Central Avenue, Clayton, Missouri 63105, Grantee.

WITNESSETH, that the Grantor(s), for and in consideration of the sum of One Dollar and No/100 (\$1.00) and other valuable considerations paid by the Grantee, the receipt of which is hereby acknowledged, do_____ by these presents, grant unto the Grantee a permanent easement to improve, construct, repair and maintain roadway improvements, utilities, stormwater and sanitary sewers and sidewalks in and upon the following described premises situated in the County of St. Louis and State of Missouri, to wit, all the real estate indicated by  on the attached Exhibit "A", hereby made a part of this Indenture.

TO HAVE AND TO HOLD said easement unto ST. LOUIS COUNTY, MISSOURI, and to its assigns and successors forever.

The Grantor(s) do_____ hereby covenant to ST. LOUIS COUNTY, MISSOURI, that _____ lawfully seized and possessed of the real estate above described that _____ a good and lawful right to convey it, or any part thereof, that it is free from all encumbrances, and that _____ shall forever warrant and defend the title thereto against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the said Grantor(s) ha_____ executed these presents the day and year first above written.

(Corporation Name)

Attest: _____
Secretary

(SEAL)



ANDY STRUCKHOFF

President, AICP, DFCEP

PGAV Planners' approach to urban planning is to produce plans that reflect the community's vision and that are actionable and achievable. These plans are based on community input, market knowledge, and sound planning principles. Andy Struckhoff applies this philosophy as President and leader of PGAV Planners' staff.

Andy consults regularly with municipal clients, elected officials, staff, and private developers to develop creative planning, policy, and finance solutions. He has helped more than 100 communities across the country find planning, policy, and development solutions and has helped facilitate more than \$2 billion in development activity in the past decade.

Andy has more than a decade of experience helping clients understand the market, their financial impacts, and the role they play in the economy. Whether advising developers on the best market-supported solution, or working with community leaders to define a path towards implementing major projects, Andy is able to understand complex data and interpret it for his clients.

He has developed a strong reputation as an economic development consultant and serves as the on-call financial consultant for several districts, cities, and developers around the Country.

EDUCATIONAL EXPERIENCE

Saint Louis University, St. Louis, MO

MA Urban Planning & Real Estate Development

Saint Louis University, St. Louis, MO

BA English & Communication

American Institute of Certified Planners (AICP)

#024045

Development Finance Certified Professional (DFCEP) Council of Development Finance

Tourism Management & Investment Plan, Asheville NC

Data Collection & Analysis, Bond Financing

Master Plan & Real Estate Planning, Columbia SC

Data Collection, Financial Analysis, Development Planning, Pre-Development Solicitation

Development Planning, Wharton TX

Market Analysis (Housing, Industrial, Retail, Office), Development Feasibility Analysis, Land Use Planning

Revenue Study, Aurora CO

Revenue Analysis, Financial Projections

Field Station Revenue Study, Derby KS

Revenue Analysis, Financial Projections

Cortex Innovation Community, Saint Louis MO

Market Analysis (Office, Hotel, Retail), Revenue Analysis, Financial Projections, On-Call Economic Development Consultation

Olympic Park Revenue Study, Goddard KS

Revenue Analysis, Financial Projections

Ballpark Village, Saint Louis MO

Market Analysis (Office, Hotel, Retail, Multi-Family), Revenue Analysis, Financial Projections, On-Call Economic Development Consultation

Market Study, Broomfield CO

Economic Analysis, Revenue Analysis, Market Research, Financial Projections

Feasibility Study & Strategic Plan - United Keetoowah Band of Cherokee Indians, Tahlequah OK

Real Estate Analysis, Financial Review

Downtown Market Study, Kirkwood MO

Plan Recommendations, Economic Analysis, City Council Review



CATHERINE HAMACHER

Associate Director, AICP

Catherine Hamacher, Associate Director at PGAV, brings her background in urban planning and community engagement to each project. She has organized large town halls, orchestrated social media strategies, and led strategic planning efforts for a variety of planning and organizational development projects. Her favorite projects bring together community members and traditional leaders to come to consensus about what works for everyone.

Catherine loves to think about how to strategically get communities where they want to go. Whether its policy interventions, public space design, better systems for working together, or simply a marketing approach, Catherine enjoys helping communities implement ideas that will further a strong sense of place.

EDUCATIONAL EXPERIENCE

Saint Louis University, St. Louis, MO

MS in Urban Planning & Development

Trinity University, San Antonio, TX

B.A., Urban Studies & Political Science, Urban Issues and Policy

Coro Fellowship in Public Affairs (2013-2014)

CERTIFICATIONS / TRAINING

American Institute of Certified Planners (AICP) #363711

Anti-Bias/Anti-Racism Training, Crossroads (2019)

Community Development Practitioner Training, Springboard for the Arts (2020)

Comprehensive Plan, Richmond Heights MO

Data Collection, Stakeholder Engagement, Scenario Planning

Downtown Zoning Rewrite, St. Louis MO

Data Collection, Zoning Legislation, Stakeholder Engagement

South Campus Master Plan - University of Missouri St. Louis, St. Louis County MO

Stakeholder Engagement, Market Analysis, Feasibility, Master Planning

National Museum of Indian Removal Feasibility Study, St. James MO

Stakeholder Engagement, Site Selection, Visitor Analysis

Tourism Management & Investment Plan, Asheville NC

Market Analysis, Community Engagement, Public Space Design, Policy Analysis

Rock City Master Plan, Chattanooga TN

Stakeholder Engagement, Market Analysis, Master Planning

24:1 Land Use & Economic Development Plan, St. Louis County MO

Data Collection, Market Analysis, Mapping

Redevelopment Plan, Wellston MO

Data Collection, Scenario Planning, Community Engagement

Sedalia Comprehensive Plan, Sedalia MO

Data Collection, Market Analysis, Community Engagement

O'Fallon Comprehensive Plan, O'Fallon MO

Data Collection, Market Analysis, Community Engagement

St. Louis Innovation District Continued Planning St. Louis, MO

Market Analysis

Downtown Plan, Kirkwood MO

Market Analysis, Scenario Planning, Community Engagement

Swansea Streetscape Master Plan, Swansea IL

Community Engagement, Land Use Planning

LINDSEY EVANS

Senior Project Manager, LEED AP



Throughout her life and professional career, Lindsey has developed a passion for continued investigation of how transformation succeeds at various scales and the role each of us, as individuals and qualified advisers, can play. Architecture is a field with an incredibly broad spectrum of specified interests. Development spans an even broader range by more wholly integrating the financial and operational considerations. With a background in both these fields, Lindsey has found herself experiencing constant crossover between a variety of professions including planning, housing development, design, and community engagement.

She is continually intrigued by analysis and progress that respects historic context, integrates comprehensive diversity, and provides equitable improvements. Over the past 15 years, she has been involved in various challenges including developing and constructing a catalyst for redevelopment after a natural disaster wiped an entire town off the map, sustainable restoration of public sector buildings as well as sustainable policy review in New York City, neighborhood transformation through single-family homeownership, and leading the development of over 750 units of mixed-income rental housing across numerous multi-million dollar mixed-use real estate developments in various states. These experiences have helped her develop a variety of skills including project management and leadership, written and verbal communication, and creative and critical thinking.

EDUCATIONAL EXPERIENCE

University of Kansas, Lawrence, KS

Master of Architecture

NDC Rental Housing Development Finance Training (2019)

Rise Young Professionals Board (2018-2019)

Previous Work Experience:

McCormack Baron Salazar, St. Louis, MO

An affordable housing real estate development company which transforms places into communities where all people can thrive. MBS is an industry leader with experience underwriting some of the most complicated affordable housing development deals. As an Assistant Vice President, her responsibilities included community engagement, project scheduling, financing applications, acquisition and entitlements, design and construction coordination, economic development outreach, stakeholder relationship management, underwriting and due diligence coordination, funding disbursement, equity installments, and transition to operations.

Urban Improvement Construction, St. Louis, MO

A design/build construction firm which strives to find development and design-build solutions to contemporary homebuilding. UIC is a multifaceted practice where her responsibilities included homebuilding team leadership, contract negotiations, permit and bidding documents, land acquisition coordination, budget analysis, community and client outreach, and integrated construction administration.

Goshow Architects, New York, NY

A mid-size architecture firm which excels in sustainable design solutions for the public sector. Individual responsibilities included internal project team coordination, construction documents and administration, RFQ and RFP prep, NYC Public Design Commission management, LEED certification development, NYC SCA Green Schools Guide documentation, and project manager support.



CRISTEN HARDIN

Senior Project Manager

Cristen has a strong background in urban and regional planning. Her professional experience ranges from time in both municipal government and private sector consulting. She has successfully managed short and long-range planning projects including major federal grant applications, municipal policy review, and community engagement.

Cristen is also an experienced and certified community liaison and enjoys presenting information to the public and elected officials. This often requires translating complex planning and economic development concepts for public understanding.

In her previous role as City Planner, she administered the TIF and Business District incentive programs, organized and wrote staff reports for City leadership, and prepared annual TIF reports.

EDUCATIONAL EXPERIENCE

Illinois Basic Economic Development Course

University of Missouri-St. Louis

Chancellor's Certificate in Fundamentals of Economic Development

University of Illinois at Champaign-Illinois (UIUC)

M.A., Urban Planning

Southern Illinois University Edwardsville (SIUE)

B.S., Business Administration, Finance and Management

Comprehensive Plan Perryville MO

Data Collection, Analysis, Community Engagement

Tabernacle CDC Neighborhood Plan St. Louis MO

Data Collection, Analysis, Community Engagement

24:1 Land Use & Economic Development Plan, St. Louis County, MO

Data Collection, Market Analysis, Mapping

South Memphis TIF Redevelopment Plan Memphis TN

Data Analysis, Market Analysis, Mapping, Redevelopment

Economic Development Consulting Services

Bloomington, IL (TIF); Cahokia Heights, IL (TIF);

Marshall, IL (TIF); Springfield, IL (TIF);

Quincy, IL (Enterprise Zone); Urbana, IL (TIF)

Immersive Experience Art Museum Feasibility Study Manhattan KS

Market Analysis, Visitation Potential, Revenue Projections

Redevelopment Finance Consulting & Market Analysis

Aurora, CO; Cameron County, TX; Republic, MO;

Wheat Ridge, CO

Previous Experience:

Project Manager, STPD Community Center Plan - Pro Bono Service Program, APA-IL (2020)

Managed a 9-person, multi-disciplinary project team including planners, architects, and development professionals to kick-start an early planning project to redevelop the site of an old skating rink into a community center through a participatory planning process. The project team delivered the Park District a summary report which detailed the planning process; community vision; recommended program and conceptual design; funding, partnership, and other resource opportunities; and next steps for the Park District to continue the project.

MEMORANDUM

Re: Olia Village (Creve Coeur)
Project Review

Date: August 15, 2023

To: Jason Jaggi, Director of Community
Development

Bethany Moore, City Planner

From: Andy Struckhoff, President
Catherine Hamacher, Associate Director
Lindsey Evans, Senior Project Manager

CC: Mark Perkins, City Administrator

Project Overview

The City of Creve Coeur, Missouri (the “City”) was provided with a series of documents outlining a development proposal (the “Project”) for approximately 95 acres at the corner of Olive and Lindbergh within the City. The property is part of the former Bayer headquarters campus and is now vacant. The applicant purchased the property in 2022 and has planned for a mixed-use development on the site, utilizing some of the existing buildings and proposing a mix of new buildings to house commercial and residential components. The Project is located within the 39 North District, a bioscience focused planned innovation district centered at the intersection of Lindbergh and Olive that includes a variety of uses. The Donald Danforth Plant Science Center and the remaining Bayer campus are located to the northeast and constitute the heart of the district, with other adjacent businesses and complementary land uses. Single-family residential development surrounds the Project to the west and south.

Relevant Plans

The **39 North District Master Plan** was adopted in 2017 by the City’s Planning and Zoning Commission and is included as an addendum to the City’s Comprehensive Plan. The plan seeks to guide development in the area in order to grow the region’s plant science and agtech sector. This place-based strategy specifically calls for:

- Defining a place where people want to be.
- Leveraging a mix of building types including new construction, existing, and adaptive reuse.
- Providing a mix of uses including residential, retail, office, and research.
- Connecting municipal, institutional, and commercial anchors.
- Creating high quality public space with a variety of amenities and design encouraging interaction.
- Enhancing mobility to the site and connectivity to regional assets.

An analysis was conducted of how the Project aligns with the goals of the 39 North District Master Plan. This analysis determined that while the Project calls for a mix of uses which is in alignment with the plan, there are several areas for further development, including:

- The Project includes a pedestrian path within the site but does not include any connections to nearby areas, across Olive, or to adjacent innovation district assets.
- The Project documents lack specificity on the design of the public spaces to be included within the site.

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Comprehensive Plan Creve Coeur 2030 is the guiding planning document for the City. Adopted in March of 2017, the plan provides a series of objectives and strategies for the community for the next decade. These include:

- Placemaking & Community Identity
- Residential Development & Preservation
- Economic Growth & Community Services
- Community Amenities & Facilities
- Parks, Open Space & Environment
- Transportation, Connectivity & Mobility
- Community Sustainability & Resilience

Each of the seven objectives includes a variety of strategies for implementation. An analysis of how the Project aligns with these objectives and strategies finds the following:

Alignment:

- The Project includes a mix of uses within a walkable district, specifically recommended by the Comprehensive Plan.
- The Project includes public realm enhancements including a new public roadway network, on-street parking, lighting, streetscape components on Main Street, and a small park. This is consistent with the Comprehensive Plan's vision for mixed-use districts.

Areas for Improvement:

- The Comprehensive Plan specifically calls for providing a greater range of housing options to attract young professionals and families and ensure residents are able to age in place in Creve Coeur. There is a lack of specificity about the residential components included in the Project to understand if these markets are the target. The more dense, mixed-use components at the northern end of the site are likely targeting the young professional, but the residential use shown on the southern end of the site requires additional detail to understand the potential audience and ensure it is the right fit for Creve Coeur.
- The Project includes a walking trail but does not connect that trail to the adjacent residential areas to the south or west, nor across Olive. Strategy 2.3 of the Comprehensive Plan states the intention to improve neighborhood walkability and connectivity. As a result, the Project should seek to connect the walking trail to adjacent areas.
- Strategy 3.3 calls for transforming the Olive Blvd. corridor with a Central Business District and supporting mixed-use districts. The Project represents an opportunity to create one of these supporting mixed-use districts but requires a clearer entrance off Olive Blvd. The site plan currently calls for an entrance off Olive Blvd at Pavilion Drive. Lot 2 and Lot 11 line these entrances. Currently, Lot 2 is depicted as a Phase 2 development project, with Lot 11 identified as Phase 3. In order to ensure this entrance creates a gateway (identified in Strategy 1.4), these two lots should be developed in Phase 2, and both include active components rather than parking as the primary use.

MEMORANDUM

- Strategy 5.1 recommends that the City “Actively pursue the integration of trails and bikeways and create a comprehensive community wide network.” The trail included on the western side of the Project does not connect to any existing trail systems, nor does it recommend connections to internal site components. This should be rectified by creating a safe pedestrian crossing across Olive at Pavilion Drive, creating a connection to the north between Lot 10 and Lot 17 to provide access to Arbor Lane, north to the park and Main Street, and ensuring the southern end is connected to Lindbergh, the adjacent neighborhoods, or both.
- Additional clarity is needed regarding the park to be included in the Project to determine if it could represent the City’s desire to develop a public park space that could serve as a central gathering space for the community (Strategy 5.4 and 5.5).

The **39 North Master Plan Comprehensive Plan Amendment** updates the Comprehensive Plan to reflect the closing and sale of Bayer’s campus where the Project is to be located. Adopted in June 2023, this document recommends future land use, transportation, open space, and site development components to ensure the future development on this site, while different than imagined in the original Comprehensive Plan, is still consistent with the City’s vision for the area. A review of this document found several places where the Project is not aligned with the City’s stated objectives:

- “Of particular importance is providing a pedestrian crossing from the site across Olive Boulevard to connect this site with the other areas of the 39 North District.” The Project does not include a crossing at Olive and Pavilion Drive and should be amended to include such a crossing.
- The Project includes an internal trail from the north to the south of the site but lacks any further connectivity. The trail should be altered to, at minimum, provide pedestrian access to the Main Street area of the Project as well as a walkable connection to the public park.
- Additional detail should be provided regarding the building materials used within the site in order to ensure they are “quality exterior materials such as masonry and glass” as identified in the Comprehensive Plan Amendment.

The **39 North Greenway Plan** was adopted in January 2020 as a component of the Comprehensive Plan. The plan does not specifically address the Project site, but rather identifies improvements north of Olive to create better regional connectivity. Given the closure of Bayer’s campus, the Project site presents an opportunity to further this connectivity and should provide a safe pedestrian crossing over Olive Blvd. to eventually connect to Old Olive Street Road, which has had significant planning and investment in recent years.

Site Plan Recommendations:

A review of the Site Development Plan, Site Concept Plan, and Preliminary Plat was conducted. Recommended additions, edits, or improvements are listed below:

- Identify residential components on the southern end of the site
- Pedestrian path should be:
 - A solid surface, 8-foot minimum path

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- Should be shown as part of Phase 1
- Should have a northern connection between Lots 10 and 17
- Should connect at the southeast to Lindbergh Drive – recommendation to consider a connection via the Vantage Credit Union Property to keep pedestrian traffic off Lindbergh
- Identify public parking to be used by trail visitors
- Identify amenities to be located on the trail (benches, etc.)
- Provide a street diagram of Main Street showing:
 - Street widths
 - Parking areas
 - Pedestrian zones

Development Standard Recommendations:

A draft of the Planned Mixed-Use Development District (Attachment B) was conducted. The following changes are recommended:

- A – Permitted Uses. The following changes are recommended to the Use Table as included in Attachment B.
 - Remove the following manufacturing uses from the table (should not be permitted in any Olia PMD District). These uses require loading and transportation and are distinct from those that prepare items for immediate consumption.
 - 311352 – Confectionary Manufacturing from Purchased Chocolate
 - 311340 – Non-Chocolate Confectionary Manufacturing
 - 311821 – Cookie and Cracker Manufacturing
 - 311920 – Coffee and Tea Manufacturing
 - Remove the following warehousing uses from the table (should not be permitted in any Olia PMD District). These uses require significant square footage and have traffic and loading requirements not suitable for the site.
 - 493110 – General Warehousing and Storage
 - 493120 – Refrigerated Warehousing and Storage
 - Remove the following automobile-related businesses from the use table (should not be permitted in any Olia PMD District) due to incompatibility with walkable site plan.
 - 441110 – New Car Dealers
 - 441120 – Used Car Dealers
 - 441228 – Motorcycle, ATV, and All other Motor Vehicle Dealers
 - 441310 – Automobile Parts and Accessories Stores
 - 532111 – Passenger Car Rental
 - 532112 – Passenger Car Leasing
 - 532120 – Truck, Utility Trailers, and RV Rental and Leasing
 - 811111 – General Automotive Repair
 - 811112 – Automotive Exhaust System Repair
 - 811113 – Automotive Transmission Repair

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- 811118 – Other Automotive Mechanical and Electrical Repair and Maintenance
- 811121 – Automotive Body, Paint, and Interior Repair and Maintenance
- 811122 – Automotive Glass Replacement Shops
- 811191 – Automotive Oil Change and Lubrication Shops
- Remove 453998 – Tobacco Stores from the use table as they are not compatible with adjacent or adjoining residential uses
- The following uses should be permitted only in the Office District as they are office users and would not be suitable as active, ground floor users:
 - 518210 – Data Processing, Hosting, and Related Services
 - 519110 – News Syndicates
 - 519130 – Internet Publishing and Broadcasting and Web Search Portals
 - 519190 – All other Information Services
 - 522310 – Financial Transactions Processing, Reserve and Clearinghouse Activities
 - 523110 – Investment Banking and Securities Dealing
 - 523120 – Securities Brokerage
 - 523130 – Commodity Contracts Dealing
 - 523140 – Commodity Contracts Brokerage
 - 523210 – Securities and Commodity Exchanges
 - 523910 – Miscellaneous Intermediation
 - 524130 – Reinsurance Carriers
 - 524291 – Claims Adjusting
 - 524292 – Third Party Administration of Insurance and Pension Funds
 - 525110 – Pension Funds
 - 525120 – Health and Welfare Funds
 - 525190 – Other Insurance Funds
 - 525910 – Open-End Investment Funds
 - 525920 – Trusts, Estates, and Agency Accounts
 - 525990 – Other Financial Vehicles
 - 541214 – Payroll Services
 - 541219 – Other Accounting Services
 - 541380 – Testing Laboratories
 - CC541381 – Medical Marijuana Testing Facility
 - 541711 – Research and Development in Biotechnology
 - 541712 – Research and Development in the Physical, Engineering, and Life Sciences
 - 541720 – Research and Development in the Social Sciences and Humanities
 - 551111 – Offices of Bank Holding Companies
 - 551112 – Offices of Other Holding Companies
 - 551114 – Corporate, Subsidiary, and Regional Managing Offices
 - 561410 – Document Preparation Services

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- 561421 – Telephone Answering Service
 - 561422 – Telemarketing Bureaus and Other Contact Centers
 - 561440 – Collection Agencies
 - 561450 – Credit Bureaus
 - 561491 – Repossession Services
 - 561492 – Court Reporting and Stenotype Services
- Remove 522298 – All Other Non-Depository Credit Intermediation (Incl. Pawnshops) from use table (should not be a permitted use within the Olia PMD District)
- Remove 713910 – Golf Course and Country Clubs from use table (should not be a permitted use within the Olia PMD District)
- Allow the following in the Main District (currently also shown as allowed in Mixed and Office)
 - 731950 – Bowling Centers
 - 713990 – All Other Amusement and Recreation Industries
- Remove 812930 – Parking Lots and Garages as Permitted use in Main District (allow them in Mixed and Office)
- B. Sub-District Category Standards
 - 1. Category A – Main Street Development Pattern Building Placement
 - Additional detail is required in this section. This typology should have more specific standards including:
 - Zero-lot line set-backs
 - Parking should not be permitted as a primary use
 - Street frontage should be active
 - 4. Category D – Residential Development Pattern Building Placement
 - Additional details are required here. Right now, this allows too much leeway on the type, scale, and appearance of residential in this District.
- D. Bulk Requirements (listed incorrectly as C in the attachment)
 - Category A – Main Street
 - Maximum front, side, and rear yard set-backs should be identified to ensure buildings in this area are built to the street, encouraging the dense, walkable environment depicted on the concept plan.
 - Other Category D Regulations
 - 2. Garages – Remove this note as garages should be complying with relevant regulations.
- E. Parking and Loading Requirements (listed incorrectly as D in the attachment)
 - Remove sub-bullet i – “Required parking shall be calculated...” – 15% reduction is arbitrary.
 - Required parking shall be calculated cumulatively per phase of development (as designated on the approved Phasing Plan) based upon the sum of the square footage of individual land uses at the rate required by the City of Creve Coeur Code. If adequate

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shared parking arrangements are established, the City can approve up to a 15% reduction in the number of parking spaces required.

- G. Landscape and Tree Requirements (listed incorrectly as E in the attachment)
 - d. remove sub-bullet d as the Tree Conservation Ordinance should apply.
 - g. clarify sub-bullet g – “All existing surface parking...” to apply only to Lots 14, 8, 9, and 15.
- H. Sign Requirements (incorrectly listed as G in the attachment)
 - Remove all current sub-bullets. Section should read: “Individual sign packages shall meet City of Creve Coeur signage ordinances regarding size and location. Style of signage is specifically governed by this performance standard and shall be submitted to the City of Creve Coeur as a sign package.”
- J. Architectural Requirements (incorrectly listed as I)
 - Update building finish material guidelines to be consistent with 39 North Master Plan Comprehensive Plan Amendment:
 - “Masonry and glass are preferred. Metal, cementitious siding, and EIFS should not be used as the primary material on building.”
- Consider adding a section about public art to require approval of these components prior to installation. Could work similarly to the landscaping approvals currently needed by indicating agreement to participate in the City’s Public Art Program.

Summary / Next Steps

Our team is available to assist with next steps related to this project including the following tasks:

- Review revised Planned District Ordinance, Site Development Plan, and other related documents.
- Conduct a review of the Developer’s Market Study for consideration of the demand for certain uses. If the Developer has not completed a recent Market Study, PGAV will conduct a study to consider demand for proposed uses.
- Conduct a review of the development finance for the Project. Upon receipt of materials from the development team, review with City staff in light of:
 - The developer’s representations of financial need;
 - The City’s desire to achieve the planning and policy goals described above; and
 - The level of assistance necessary for both parties to achieve their goals.



8/30/2023

Mr. Jason Jaggi
Director of Community Development
300 North New Ballas Road
City of Creve Coeur, MO 63141

Re: PGAV Project Review
Olia Village Mixed-Use Development
CMT Project No. 23005201.00

Mr. Jaggi,

The following selective responses are in reference to the memorandum prepared by PGAV to the City of Creve Coeur dated 08/15/23 as well as correspondence during the review call on 08/24/23. Please note that a portion of the comments from PGAV have been addressed previously in other memos and/or previous submittals and, for simplicity, have not been included in this letter.

RELEVANT PLANS RECOMMENDATIONS:

1. The project documents lack specificity on the design of the public spaces to be included within the site.
Olia Team Response: Additional detail will be provided as part of the Planning & Zoning presentation as well as within the formal resubmittal of the Site Concept Plan package.
2. There is a lack of specificity about the residential components included in the project to understand if these markets are the target. The more dense, mixed-use components at the northern end of the site are likely targeting the young professional, but the residential use shown on the southern end of the site requires additional detail to understand the potential audience and ensure it is the right fit for Creve Coeur.
Olia Team Response: The target market for residential components of Olia Village are professionals of all ages. The entire development is walkable with a variety of amenities. The multifamily buildings include one- and two-bedroom units as well as townhome units, the villa style units on Lot 16 are anticipated to be larger with garages.
3. In order to ensure the Pavilion Drive entrance creates a gateway, Lot 2 and Lot 11 should be developed in Phase 2
Olia Team Response: There is a total of 32.32 acres and more than 2.2 million GFA to be developed in Phase 2 of this development within approximately 2 years. The development team feels that it is not feasible to consider adding Lot 11 to Phase 2 at this time.
4. Additional clarity is needed regarding the park to be included in the project to determine if it could represent the City's desire to develop a public park space that could serve as central gathering space for the community.
Olia Team Response: Additional detail will be provided as part of the Planning & Zoning presentation as well as within the formal resubmittal of the Site Concept Plan package.

DEVELOPMENT STANDARD RECOMMENDATIONS:

1. A – Permitted Uses. PGAV is recommending several changes to the Use Table in Attachment B.

Olia Team Response: The only changes the development team asks for the City to reconsider at this time are the following:

- Inclusion of 441110 – New Car Dealers to allow for certain style new car dealers within Main Street
- Partial permitting of Sectors 51, 52, 54, 55, & 56 within the Main Street & Mixed-Use Districts

The development team will work with City legal to propose alternative language within the revised Attachment B for these uses above. All other recommendations are accepted.

2. B. Sub-District Category Standards – 4. Category D – Residential Development Building Placement. Additional details are required here. Right now this allows too much leeway on the type, scale, and appearance of residential in this District.

Olia Team Response: The development team asks that the Residential Development standards for Category D be left undefined at this time and suggests an amendment to Attachment B be presented when more clarity is available for the development of this sub-district on Lot 16. Wording may be added to Attachment B if necessary to clarify this approach.

3. E. Parking & Loading Requirements. Required parking shall be calculated cumulatively per phase of the development (as designated on the approved Phasing Plan) based upon the sum of the square footage of individual land uses at the rate required by the City of Creve Coeur code. If adequate shared parking arrangements are established, the City can approve up to a 15% reduction in the number of parking spaces required.

Olia Team Response: Our team accepts this language as written.

4. G. Landscape & Tree Requirements – d. remove sub-bullet d as the Tree Conservation Ordinance should apply.

Olia Team Response: Our team understands the importance of this ordinance and will continue to work on refining our plans to best meet these requirements.

5. H. Sign Requirements. Remove all current sub-bullets. Section should read: “Individual sign packages shall meet City of Creve Coeur signage ordinances regarding size and location. Style of signage is specifically governed by this performance standard and shall be submitted to the City of Creve Coeur as a sign package.”

Olia Team Response: Our team accepts this language as written and plans to submit a standalone sign ordinance package at a later date.

6. J. Architectural Requirements. Update building finish material guidelines to be consistent with 39 North Master Plan Comprehensive Plan Amendment.

Olia Team Response: The primary façade materials presented for Olia Village are intended to compliment 39 North yet maintain its own unique character.

7. Consider adding a section about public art to require approval of these components prior to installation. Could work similarly to the landscaping approvals currently needed by indicating agreement to participate in the City’s Public Art Program.

Olia Team Response: A section will be added to address public art as noted.

If you have any questions regarding these responses, please feel free to reach out and discuss.

Thank you,

Matthew J. Pfund

President

Jack Matthews Development

Christopher J. Stritzel, P.E.

Project Manager

CMT

CC: Kristie Bailey, Fireside Financial
Michael Bailey, Fireside Financial
Toby Heddinghaus, Gray Design Group
Wes Haid, SWT Design
Jamie Mansfield, Armstrong Teasdale

OLIA VILLAGE PROJECT RESIDENTIAL MARKET STUDY

Creve Coeur, Missouri
August 30, 2023

PCAV PLANNERS
ST. LOUIS, MISSOURI

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SECTION I – OVERVIEW AND SUMMARY OF FINDINGS

Project Overview

The Olia Village Project is a mixed-use, multi-phase project proposed on the former Bayer West Campus property at the southwest corner of North Lindbergh Boulevard and Olive Boulevard (the “Project”). The Project is located within the City of Creve Coeur, Missouri (the “City”), which is located in St. Louis County (the “County”) in the State of Missouri (the “State”). Matt Pfund, of Jack Matthews Development, representing 10300 Olive, LLC (the “Developer”) submitted a zoning amendment application and a series of documents outlining a development proposal to the City. The Developer purchased the approximately 95-acre property in 2022 after Bayer decided to sell the property citing a reduced need for physical office space post-pandemic. The Developer has planned to utilize some of the now vacant, existing buildings and is proposing a mix of new buildings to house commercial and residential components with a town center feel.

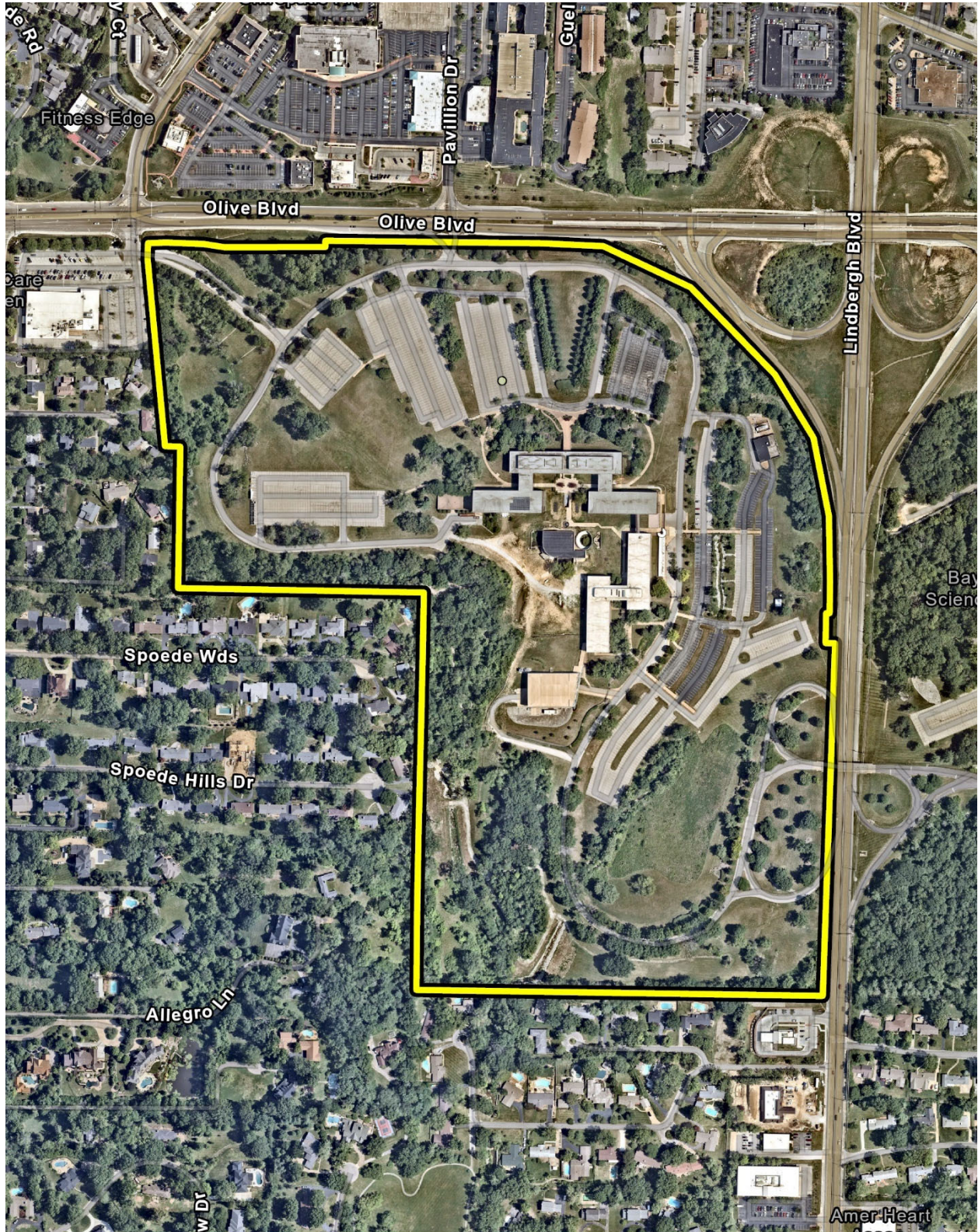
The Project is located within the 39 North District, a bioscience focused planned innovation district centered at the intersection of North Lindbergh Boulevard (“Lindbergh”) and Olive Boulevard (“Olive”) that includes a variety of uses. The Donald Danforth Plant Science Center and the remaining Bayer campus are located to the northeast and constitute the heart of the district, with other adjacent businesses and complementary land uses. Single-family residential development surrounds the Project to the west and south. A rendering of the Project is shown in Figure 1, and a site plan of the Project, with lot numbers for the components of the Project that include residential uses, is shown in Figure 2.

The Developer is seeking the required approvals from the City for a development that will feature a variety of building uses including commercial, restaurant, mixed-use with ground floor retail/commercial and multifamily above, hotels, apartments, parking, office, research, and attached townhomes. The City engaged PGAV Planners, LLC (“PGAV”) to review portions of the Developer submitted materials and develop this Residential Market Study (the “Study”) as an independent analysis of the current and projected demand for the housing types proposed by the Developer, mixed-use multifamily apartment buildings and townhomes in a district setting.

The Project is currently expected to include approximately 1,000 residential units. Figure 3 shows a breakdown of the residential project components. The Developer is proposing 130 of these units as single family townhomes with the remaining 870 units as multifamily residential. The Developer is proposing 17 total lots in the Project, as well as a park area, and the residential units are located on five of these lots. The multifamily residential units on lots 4, 6, and 7 are located in new construction, mixed-use buildings with commercial space on the lower levels (retail, office, and restaurants uses) and multifamily residential above. The Developer is proposing to renovate the existing building on lot 14 into multifamily residential units. The multifamily residential units are spread across four lots with 170 to 290 units in each building and an average square footage per unit of approximately 1,100 square feet. The 130 single family townhomes are located on lot 16 and have an average square footage of approximately 1,600 square feet per unit.

Figure 1 - Project Site Rendering





AERIAL IMAGE & SITE BOUNDARY

Olia Village
Creve Coeur, Missouri

0 125 250 500 Feet

PCAV PLANNERS



Figure 2 - Project Site Plan

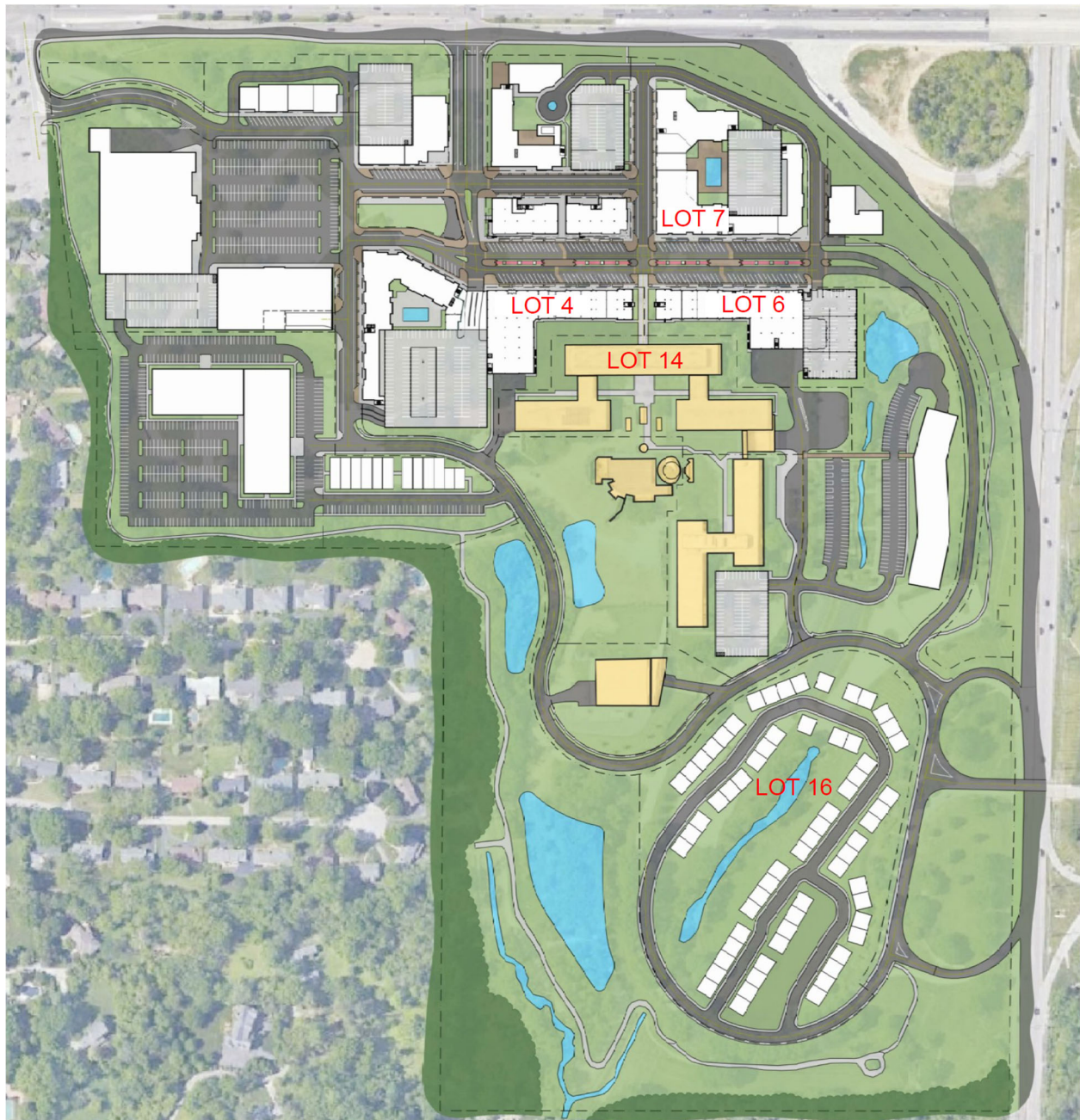


Figure 3 – Residential Project Components

Residential Project Components															
Lot #	Use Type	Proposed Zoning Category	Phase	# of Buildings	Bldg Footprint (SF)	# of Stories	Gross Bldg Floor Area (SF)	Retail Floor Area (SF)	Office Floor Area (SF)	Restaurant Floor Area (SF)	Storage Floor Area (SF)	Multifamily Residential Units (SF)	Single Family Residential Units (SF)	Approximate # of Units	Average SF Per Unit
4	Parking, Retail, Residential Above	A - Main Street Development	1	1 - Proposed	130,600	8	869,000 to 1,087,000		66,000	8,000		334,000		290	1,152
6	Parking, Retail, Residential Above	A - Main Street Development	2	1 - Proposed	60,000	6-8	364,000 to 455,000	45,000		2,200		175,000		170	1,029
7	Parking, Retail, Residential Above	A - Main Street Development	3	1 - Proposed	83,800	5	401,000 to 502,000	25,000		5,000		242,000		220	1,100
14	Storage, Residential	B - Mixed Use Development	2	1 - Existing	65,528	4-5	307,000 to 384,000				90,900	216,800		190	1,141
16	Townhome	D - Residential Development	4	65 - Proposed	100,500	2	207,000 to 259,000						207,000	130	1,592

Summary of Findings

- This site presents a rare opportunity to create a new mixed-use district in a fully built-out community. This site is well-located for a higher density, mixed-use district development and has the potential to build on adjacent catalytic development and provide a new product in the region.
- The St. Louis region is not projected to add significant new population in the next five years. That being said, if the Project ensures new residential units are engrained in a mixed-use setting of retail, hotel, office, and restaurant uses, providing an environment that activated throughout the day and throughout the week as opposed to during limited portions of time, these residential units are likely to be more attractive than the current inventory and be absorbed by existing demand.
- The current phasing plan predicts more than 850 residential units becoming available across three years. With approximately 676 units projected to be delivered each year for the next two years in the Mid County submarket, these 290 units proposed annually for the Project are a considerable portion of the market. To maintain economic viability and a positive absorption trend, it is recommended that the Developer weigh the cost of more incremental phasing against the cost of potentially slower absorption or reduced asking rates if a high number of similar units simultaneously enter the market.
- Employees currently coming to Creve Coeur for work, students at nearby educational institutions, and existing Creve Coeur residents that are looking for new housing typologies represent potential markets for the residential uses in this Project. If these units are marketed to these groups, it is anticipated that absorption can be successfully attained in a reasonable timeframe.
- The townhome/condominium component planned for the southern end of the Project is a popular, in-demand land use in the region. That being said, the projected rent levels provided by the Developer are at the high end of the market and additional details are needed to determine if this is a viable option.
- With the large number of units in this Project, most if not all of which will be at unrestricted market rate rents and sale prices, the net operating income and return on investment flowing to the Developer (or sub-developer) may allow for a percentage of these units to be restricted to rent levels and/or sale prices below market. This consideration expands the market for potential residents and could provide for an inclusive district that reflects the current employee and residential makeup of Creve Coeur.
- Appropriate oversight and flexibility, long-term partnerships, thoughtful phasing to not overburden the market, and continued analysis of how the markets perform in the near future are all imperative to the Project's success.

SECTION II – DEMOGRAPHIC AND ECONOMIC ANALYSIS

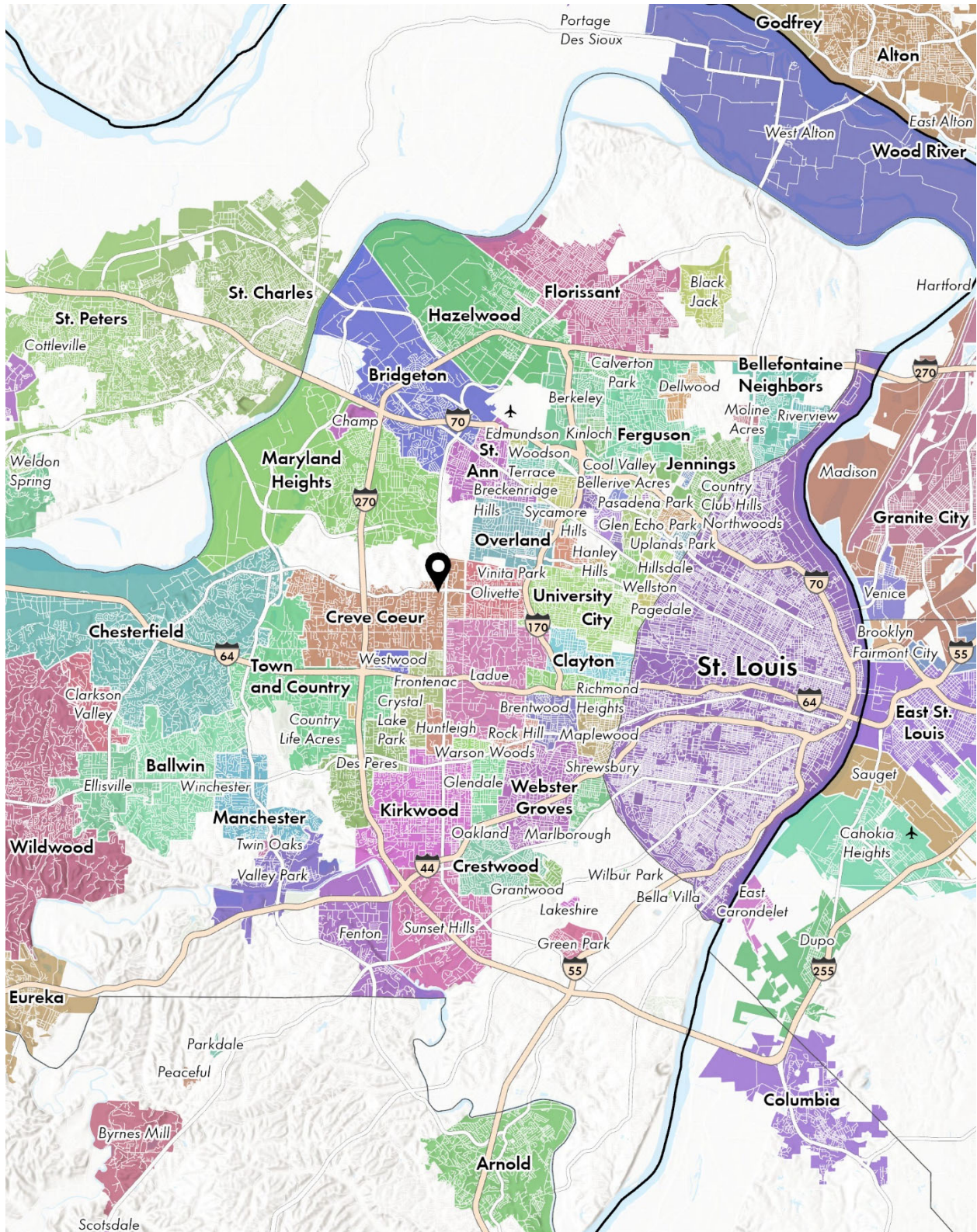
Project Location

The City is a premier community centrally located in St. Louis County. The City is well connected to the St. Louis region with close proximity to Interstate 270 and Interstate 64. The Project is located at the southwest corner of two heavily trafficked roads. Lindbergh is a major north-south connector with an annual average daily traffic count, in both directions, of over 23,000 vehicles.¹ MetroBus Route 49 connects South County Center with Lambert International Airport via Lindbergh, directly adjacent to the site. Olive is a major east-west connector with an annual average daily traffic count, in both directions, of over 22,000 vehicles.¹ MetroBus Route 91 connects Chesterfield Mall with the Delmar Loop, running adjacent to the Project on Olive.

Lambert International Airport is an approximately 15-minute drive from the Project. The University of Missouri-St. Louis and Washington University are an approximately 15-minute drive and have a high concentration of students that could be a potential market. Significant jobs centers include Barnes-Jewish West County Hospital and Mercy Hospital, both located in the City, and Missouri Baptist Medical Center, all within a 10-minute drive. The Plaza Frontenac retail node is a quick 6-minute drive south on Lindbergh, and the St. Louis Galleria retail node is also close, with a drive time of approximately 11 minutes. The City is an established community with access to parks and a variety of recreational opportunities as well as employment opportunities.

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¹ MoDOT, 2022.



REGIONAL LOCATION

Olia Village
Creve Coeur, Missouri

0 1 2 4 Miles

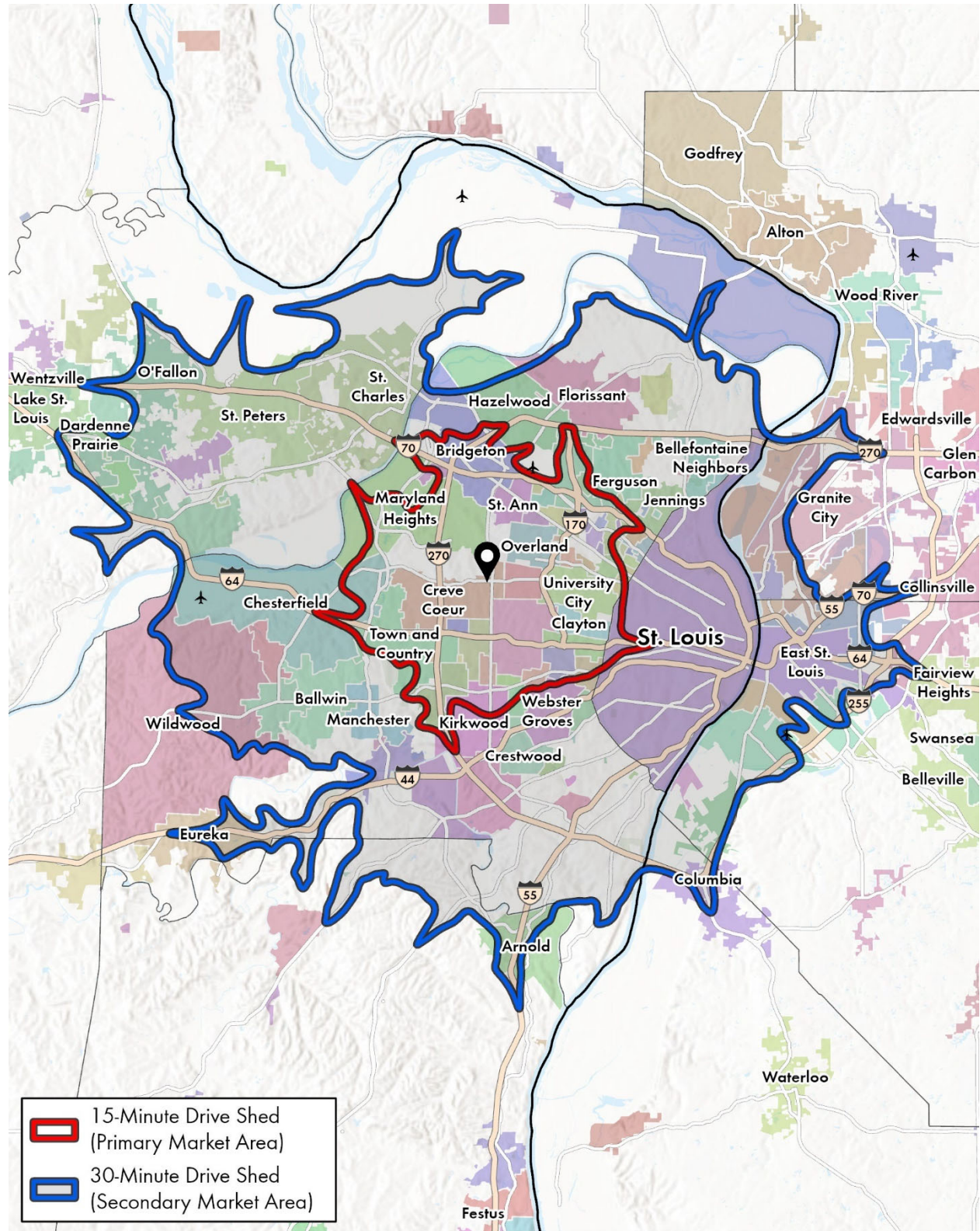
PG&V PLANNERS



Market Area Overview

Two market areas were defined using drive time data. The Primary Market Area (“PMA”) is the area within a 15-minute drive of the Project. This area includes Town and Country, Frontenac, Ladue, and Clayton along the Interstate 64 corridor. The area also extends south into portions of Kirkwood. On the north, the area includes Maryland Heights, St. Ann and Overland and extends north to Lambert International Airport. The Secondary Market Area (“SMA”) is defined as the area within a 30-minute drive of the Project. This area encompasses a large portion of the County. The area also extends into Illinois on the east, to Arnold on the south, Eureka on the southwest, and Chesterfield Valley on the west. Florissant, St. Charles, and St. Peters are included in the SMA on the north. Olive and Lindbergh facilitate transportation within the PMA, while the SMA is also served by Interstates 64, 270, and 70. These trade areas are shown on the map on the following page.

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15- AND 30-MINUTE DRIVE SHEDS

Olia Village
Creve Coeur, Missouri

0 1.5 3 6 Miles

PCAV PLANNERS



Population and Households

The MSA is home to approximately 2.8 million residents in 2023, ranking it the 21st MSA by population in the United States. The MSA has been only slightly growing by 0.1% annually since 2010. The State has experienced a population growth rate of 0.3% annually, and the County population change is flat. Within the PMA, the number of residents has grown by approximately 4,000 residents since 2010, which matches the MSA at 0.1%. In 2023, the PMA was home to approximately 261,000 residents, and the SMA was home to approximately 1,529,000 residents.

Population growth is expected to remain fairly flat in the upcoming years with the City and the County experiencing an estimated -0.2% population change and the MSA experiencing an estimated 0% population change. If the number of residents within the PMA and SMA decreases as estimated, -0.1%, then the PMA and SMA will have a surplus of housing units. That being said, older housing stock may need to be replaced or renovated to meet the estimated demand. Providing new housing units has the potential to pull residents from older housing units, who can afford new construction rents, while opening up older housing units for residents who need the lower rents that often come with older housing options. While older, these still need to be quality, well-maintained housing options for this result to be realized. Additionally, even without an increase in population, new construction units may still be absorbed into the market by pulling residents from other locations throughout the City and/or region. This indicates the need for analysis of the region as a whole and a comprehensive and regional approach to development and decision making. Table 1 shows the population totals and trends since 2010.

Table 1 - Population Trends

Population Trends						
	Primary Market Area 15-Minute Drive Time Area	Secondary Market Area 30-Minute Drive Time Area	City of Creve Coeur	St. Louis County	St. Louis, MO-IL MSA	Missouri
<i>Population Totals</i>						
2010 Total Population	257,233	1,548,121	18,018	998,917	2,787,701	5,988,927
2020 Total Population	262,686	1,536,141	18,834	1,004,125	2,820,253	6,154,913
2023 Total Population	261,461	1,528,852	18,687	998,778	2,823,156	6,208,310
2028 Total Population (Est.)	260,479	1,521,966	18,468	990,252	2,821,210	6,239,262
<i>Population Change</i>						
Annual Pop Growth Rate 2010 - 2023	0.1%	-0.1%	0.3%	0.0%	0.1%	0.3%
Annual Pop Growth Rate (Est.) 2023 - 2028	-0.1%	-0.1%	-0.2%	-0.2%	0.0%	0.1%
<i>Population Density</i>						
Area (Square Miles)	125	733	11	523	7,864	68,727
Residents per Square Mile	2,092	2,086	1,743	1,910	359	90
<i>Household Size</i>						
Average Household Size	2.26	2.29	2.17	2.38	2.39	2.40
<i>Housing Units Needed</i>						
Est. Additional Residents by 2028	(982)	(6,886)	(219)	(8,526)	(1,946)	30,952
Housing Units Needed	(435)	(3,007)	(101)	(3,582)	(814)	12,897

Source: U.S. Census, ESRI (2023)

The median age of all the geographies is similar and ranges from 39.8 median age in the State to the highest median age, 45.9, in the City. The largest percentage of population by age in each of the geographies is 25 to 64 years of age with 47.7% in the City and 52.1% in the MSA. The smallest percentage of population by age in each of the geographies is 18 to 24 years of age with 7.9% in the City and 8.9% in the State. The percentage of population at 0 through 18 years of age is comparable to the percentage of population 65 years of age and higher in all the geographies. The largest spread between these two age groups is in the City with 25.8% of the population 65 years and older and 18.6% of the population 0 to 18 years of age. The City's percentage of residents 65 years or older, 25.8%, is higher than the percentage for the same age cohort in the other geographies. With an aging population, the City has a higher percentage of existing residents that may be interested in lower maintenance housing options. Depending on the details of rental and ownership agreements that are determined for the housing options that will be included in this Project, these housing options may satisfy this need. Table 2 shows population by age.

Table 2 - Population by Age

Population by Age						
	Primary Market Area 15-Minute Drive Time Area	Secondary Market Area 30-Minute Drive Time Area	City of Creve Coeur	St. Louis County	St. Louis, MO-IL MSA	Missouri
Median Age	41.5	40.3	45.9	42.1	40.2	39.8
Population by Age Cohort						
Children (0 - 18 Years)	19.9%	20.5%	18.6%	20.6%	21.3%	21.4%
Young Adults (18 - 24 Years)	8.4%	8.8%	7.9%	8.1%	8.3%	8.9%
Adults (25 - 64 Years)	50.7%	51.7%	47.7%	50.6%	52.1%	50.9%
Seniors (65+ Years)	21.0%	19.0%	25.8%	20.7%	18.3%	18.8%

Source: U.S. Census, ESRI (2023)

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The 2023 median home value in the PMA is higher than the other geographies at \$294,594, with the exception of the City which is significantly higher at \$500,000. The City's median home value is a 70% increase above the PMA and a 113% increase above the MSA. Median home values are expected to increase annually at a rate of approximately 2% in the City over the next five years, 3% in the State, and 4% in the other geographies. Of the geographies, the City has the highest percentage of owner-occupied housing at 68%, with 59% owner-occupied housing in both the PMA and SMA. The renter-occupied housing percentages differ between the PMA and SMA due to a slight difference in the percentage of vacant housing units. Table 3 shows housing trends locally and regionally.

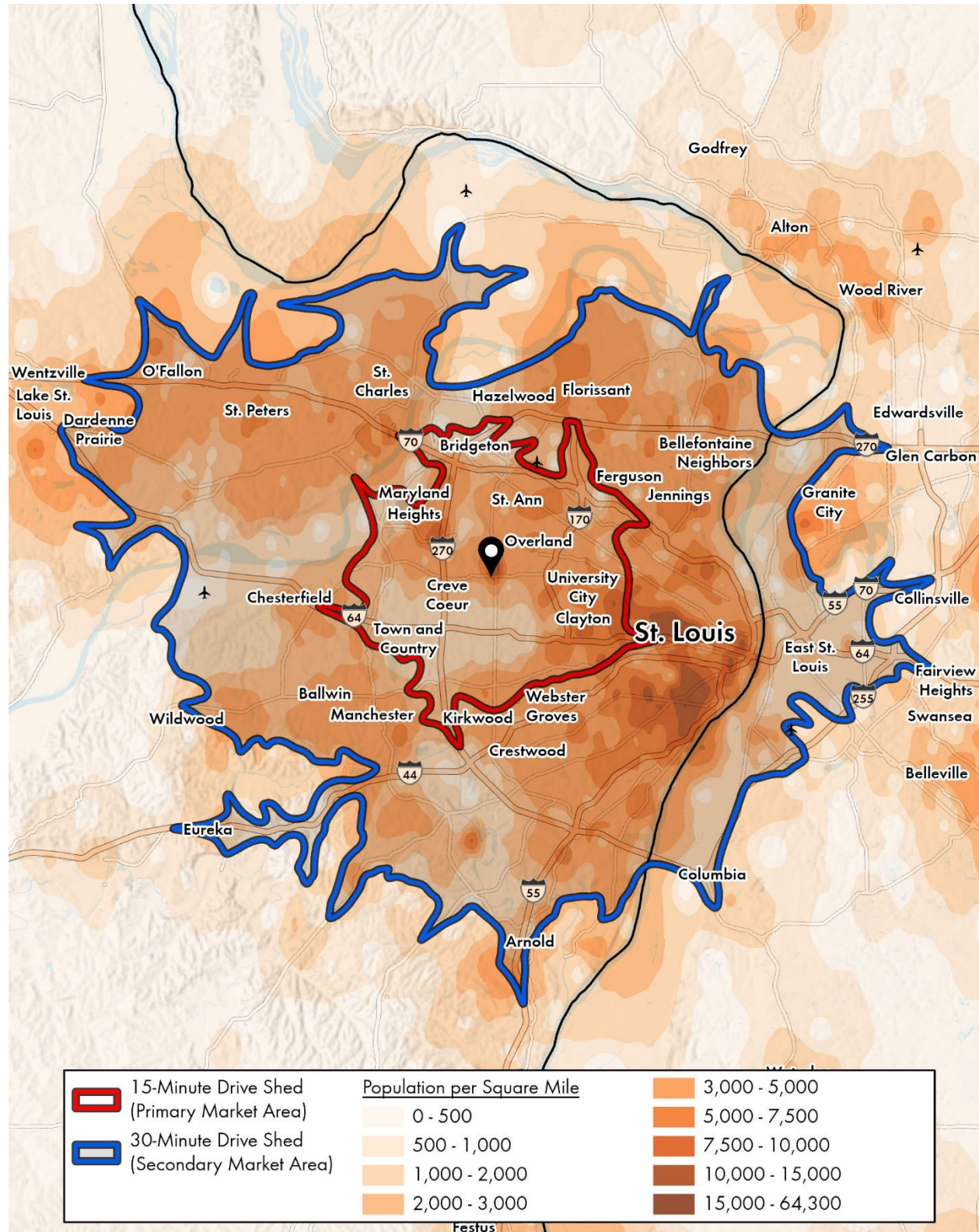
Table 3 – Housing Trends

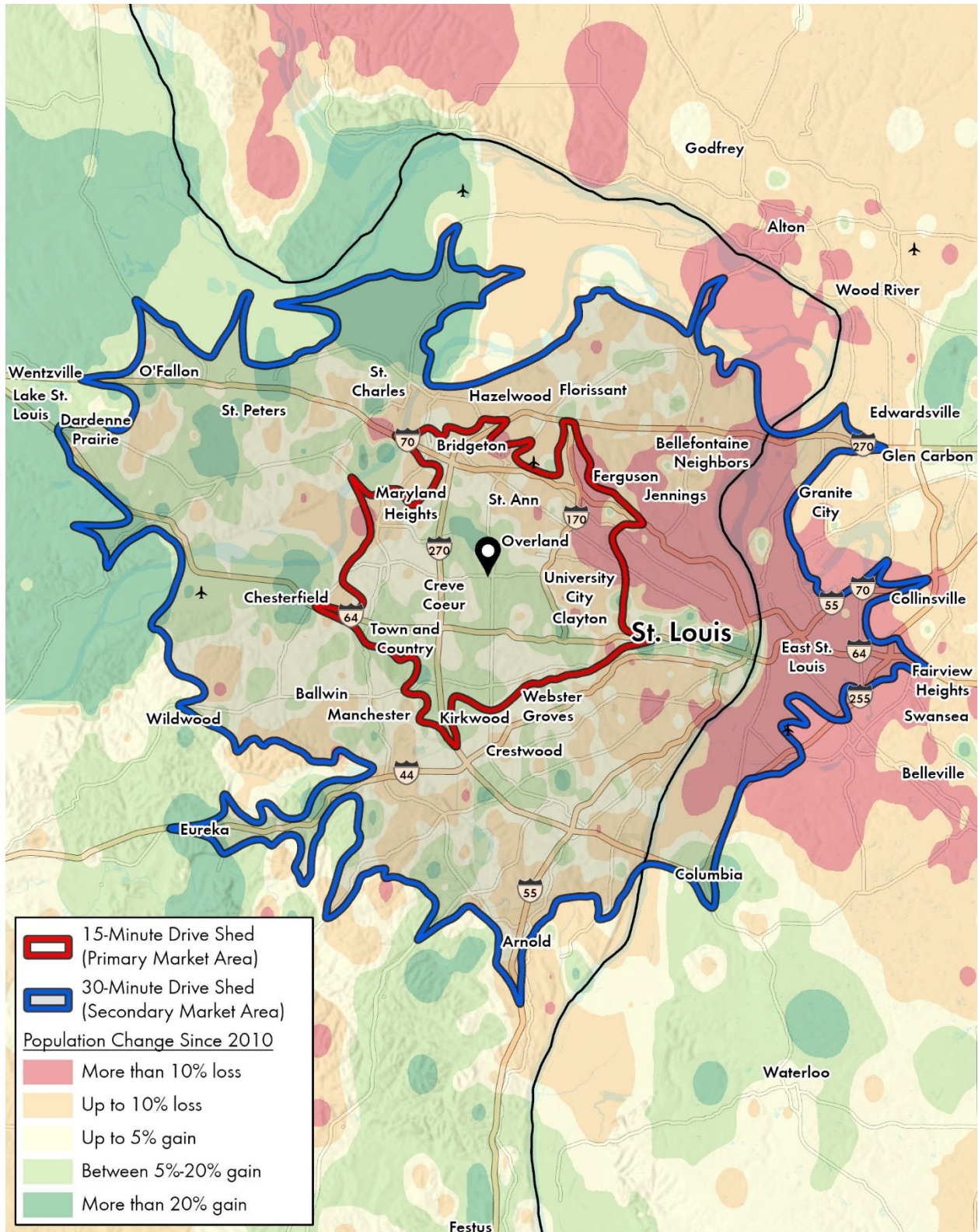
Housing Trends						
	Primary Market Area 15-Minute Drive Time Area	Secondary Market Area 30-Minute Drive Time Area	City of Creve Coeur	St. Louis County	St. Louis, MO-IL MSA	Missouri
Occupancy						
Owner-Occupied	59%	59%	68%	65%	65%	61%
Renter-Occupied	33%	31%	25%	28%	26%	28%
Housing Unit Vacancy						
Total Housing Units	123,234	723,242	8,998	446,675	1,272,975	2,832,246
Vacant Housing Units	10,475	71,601	657	34,841	114,568	317,212
Median Housing Value						
2023 Median Home Value	\$294,594	\$252,300	\$500,000	\$271,435	\$234,986	\$218,294
2028 Median Home Value	\$355,820	\$300,852	\$542,099	\$329,434	\$283,125	\$257,565
Annual Increase (Est.) 2023 - 2028	4%	4%	2%	4%	4%	3%
Housing Value by Range						
Less than \$100,000	12%	13%	0%	12%	15%	17%
\$100,000 to \$199,999	19%	23%	4%	22%	26%	28%
\$200,000 to \$299,999	20%	25%	13%	23%	26%	25%
\$300,000 to \$399,999	12%	16%	15%	16%	16%	15%
\$400,000 to \$499,999	10%	9%	18%	11%	8%	7%
\$500,000 to \$999,999	20%	11%	39%	14%	8%	7%
\$1,000,000 or Greater	7%	3%	11%	4%	2%	1%

Source: U.S. Census, ESRI (2023)

The maps on the following pages show population density in 2023 and change in population since 2010 in the PMA and SMA. The densest areas are located within the City of St. Louis near the confluence of Interstates 64, 44, and 55. Though the area south of the Project near the intersection of Interstate 64 and Interstate 270 have lower population densities than the Project area and the City of St. Louis, this same area has seen an increase in population since 2010. Some of the densest areas in the SMA have seen population decline since 2010, while areas immediately surrounding the Project have remained relatively steady or seen growth.

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CHANGE IN POPULATION FROM 2010 TO 2023

Olia Village
Creve Coeur, Missouri

0 1.5 3 6 Miles

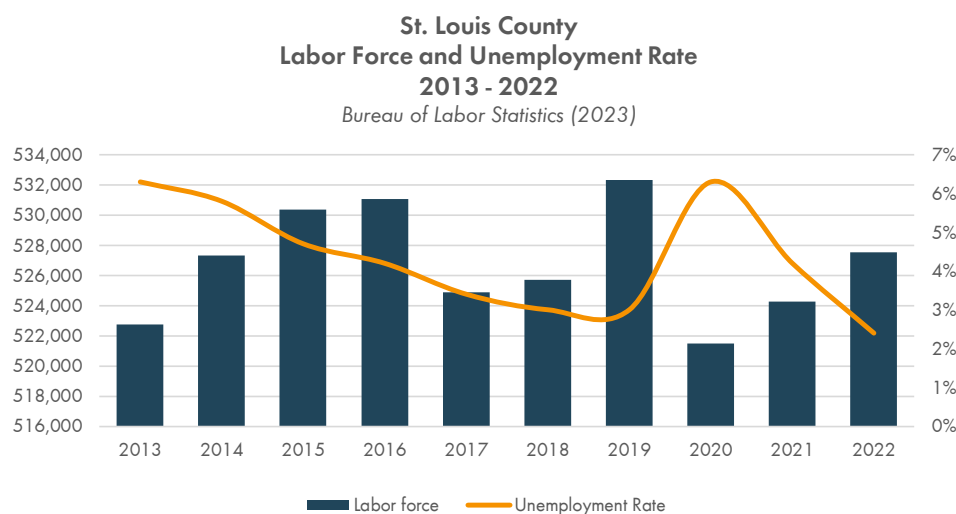
PCAV PLANNERS



Employment

The largest industries in the MSA by number of employees are (1) Trade, Transportation, and Utilities; (2) Education and Health Services; and (3) Professional and Business Services.² The Mid County multifamily submarket is home to some of the largest employers in St. Louis, including Centene, Enterprise, Commerce Bank, Washington University, World Wide Technology, and Edward Jones.⁴ Table 4 shows the total labor force and unemployment rate since 2013 for the County. The County's labor force increased by approximately 1% during this time while unemployment fell from 6.3% to 2.4%. The labor force year-over-year percentage change dropped in 2020 at the height of the COVID-19 pandemic but has since continued to grow. The unemployment rate rose by 3.3% in 2020 but dropped back down by 2.1% in 2021 and another 1.8% drop in 2022.

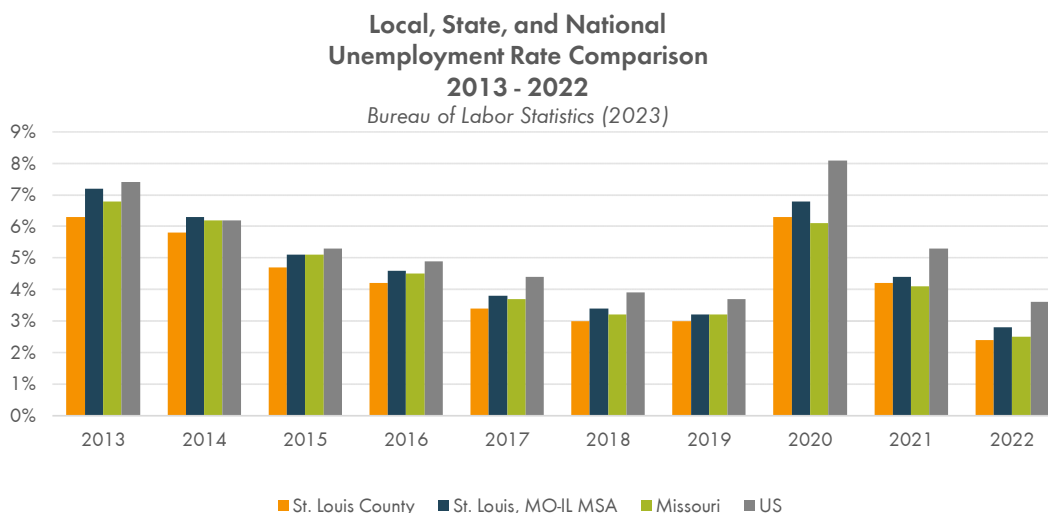
Table 4 – Labor Force and Unemployment



A comparison of local, state, and national trends, as shown in Table 5, found that between 2013 and 2022 unemployment in the County is on average 1% lower than the U.S., 0.2% lower than the State, and 0.4% lower than the MSA. The COVID-19 pandemic heightened the gap between the County's unemployment rate and the MSA, State, and U.S. in 2020, and each of the geographies dropped back below 2019 unemployment levels by 2022. Overall, except for the rise in unemployment during the COVID-19 pandemic, the local employment trends are positive.

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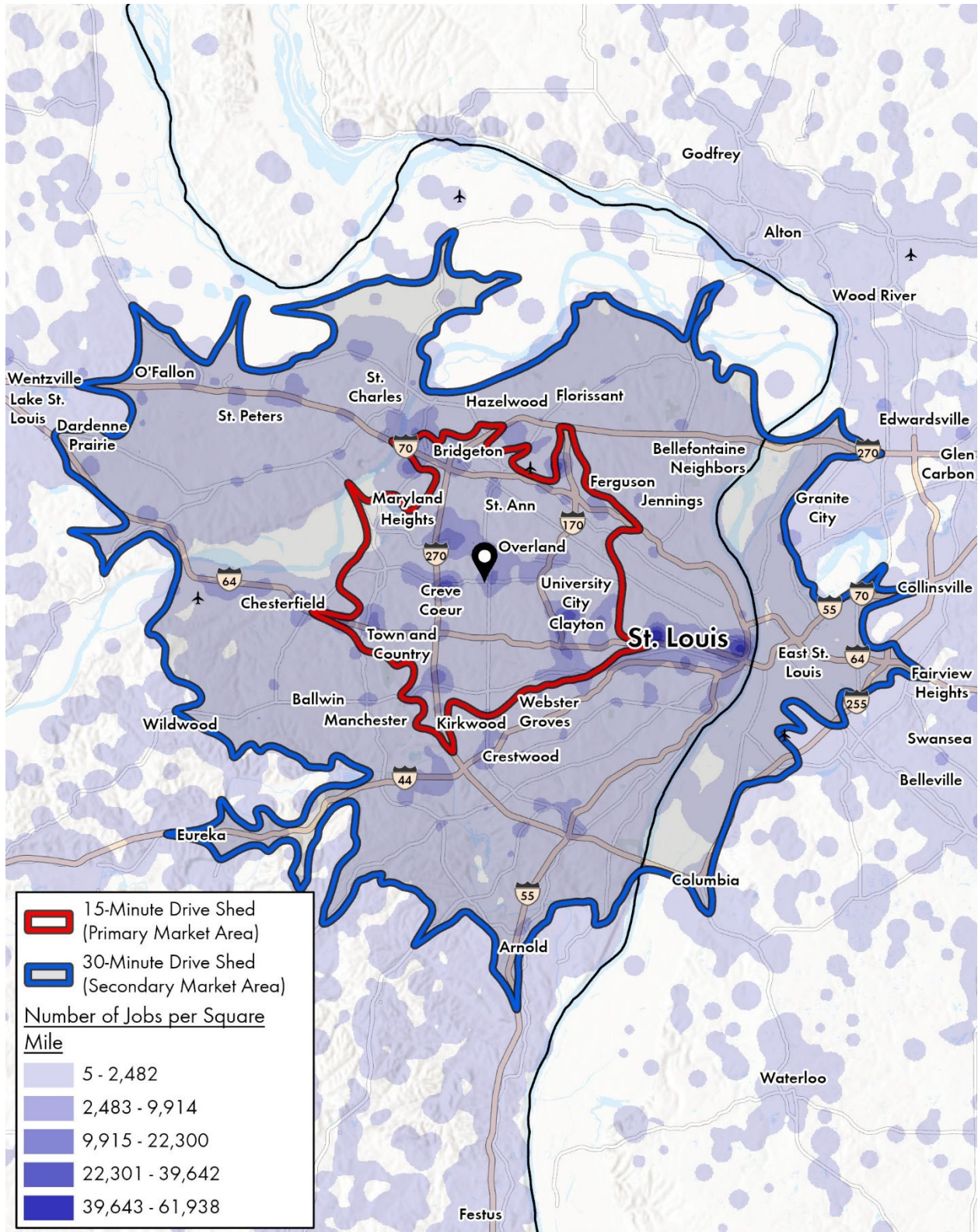
² U.S. Bureau of Labor Statistics, 2023.

Table 5 – Unemployment Rate Comparison

The 39 North AgTech District, an agri-food tech/plant science employment hub, is located within the City as well as numerous technology, life sciences, and health services businesses. Of the 45,866 employees in the City, only approximately 2% of these employees, 804, live and work in the City.³ This current data point, and the catalytic potential of 39 North and the Project, presents an opportunity for the City to attract employees currently commuting to the area with new rental or ownership housing options. Approximately 38% of these employees are earning \$3,333 per month or less, which equates to a maximum of \$1,000 for housing expenses per the industry standard recommendation for housing expenses as 30% of income. Approximately 54% of employees in the City have some college education or degree. Approximately 80% of employees in the City are white, and approximately 57% are between the ages of 30 and 54. The residents who live in the City and work elsewhere make up approximately 88% of City residents. The City is an approximately 25-minute drive from Downtown St. Louis and 15-minute drive from Downtown Clayton, both of which are St. Louis region employment hubs.

The map on the following page displays major employment concentrations in the St. Louis region. The area with the highest concentration of employment is along the Interstate 64 corridor between the Central West End and Downtown St. Louis. Employment concentration is also shown in Clayton and Creve Coeur at the intersection of Interstate 270 and Olive, both approximately equidistant from the Project. The Project's central location in the County and the MSA places any potential residents of the Project in close proximity to numerous employment opportunities.

³ U.S. Census On the Map, 2020.



REGIONAL EMPLOYMENT LOCATIONS

Olia Village
Creve Coeur, Missouri

0 1.5 3 6 Miles

PCAV PLANNERS



Income

The median household income in the PMA is lower than all other geographies at \$69,648, with the exception of the State at \$63,390. The City has the highest median household income at \$115,414, considerable higher than the other geographies. The City's median household income is a 66% increase above the SMA, and the City's per capita income is an 85% increase above the SMA. Median household incomes are expected to increase annually at a rate of approximately 3% in the City over the next five years and approximately 2.5% in the MSA during the same period. Table 6 shows median household income trends locally and regionally.

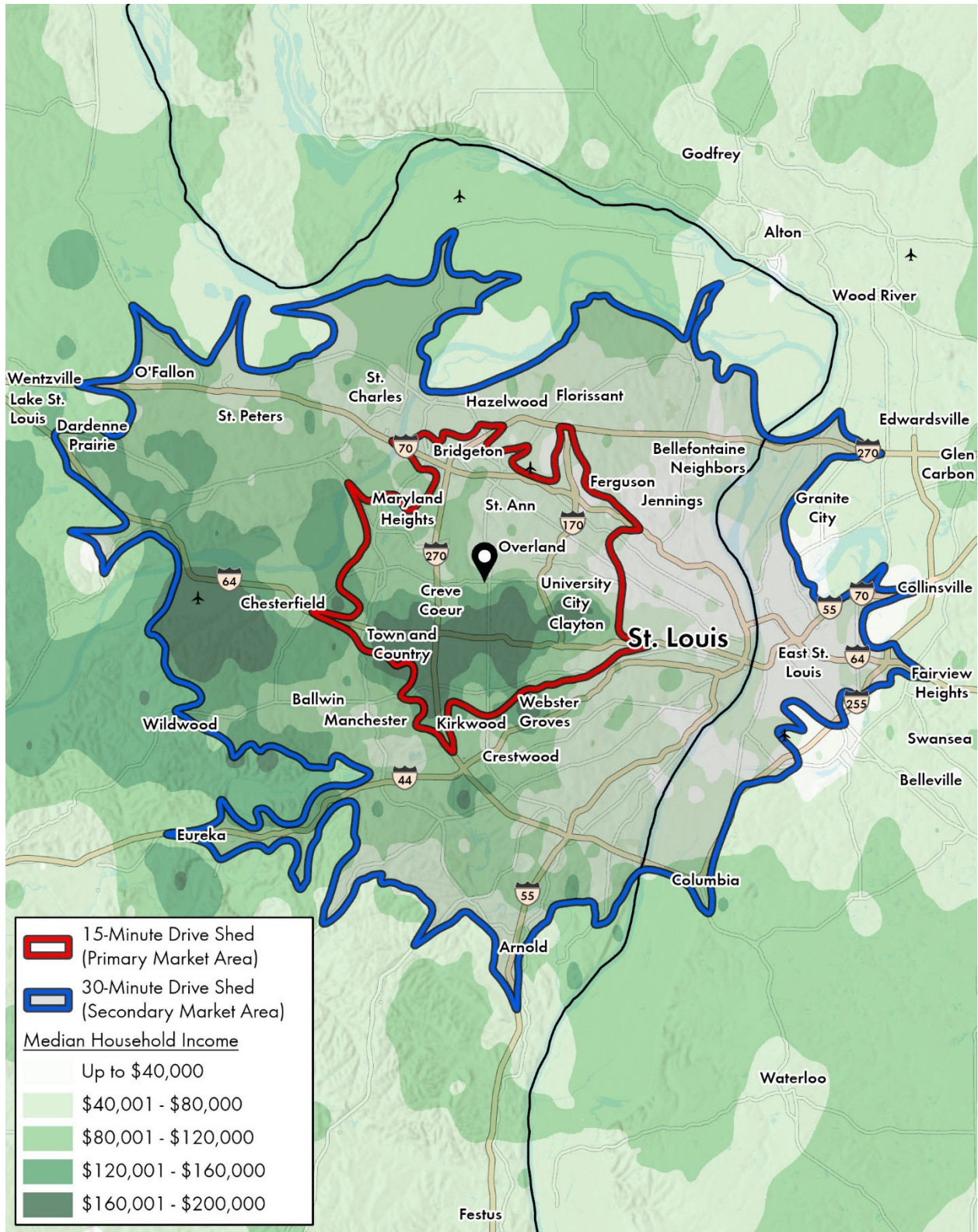
Table 6 – Household Income Trends

Household Income	Primary Market Area 15-Minute Drive Time Area	Secondary Market Area 30-Minute Drive Time Area	City of Creve Coeur	St. Louis County	St. Louis, MO-IL MSA	Missouri
<i>Income by Range</i>						
Less than \$25,000	14.6%	16.9%	9.0%	14.7%	15.1%	17.6%
\$25,000 to \$49,999	18.5%	19.3%	12.1%	18.6%	18.8%	21.1%
\$50,000 to \$74,999	15.8%	16.5%	12.6%	15.7%	17.0%	18.1%
\$75,000 to \$99,999	11.9%	12.6%	10.1%	12.9%	13.3%	13.5%
\$100,000 to \$149,999	14.8%	15.9%	15.8%	15.8%	17.4%	15.4%
\$150,000 or more	24.4%	18.9%	40.4%	22.3%	18.4%	14.3%
<i>Per Capita and Median Household Income</i>						
Per Capita Income	\$56,517	\$45,873	\$84,884	\$49,409	\$43,287	\$37,703
Median Household Income	\$76,889	\$69,648	\$115,414	\$76,495	\$73,017	\$63,390
<i>Household Income Trends</i>						
2028 Median Household Income (Est.)	\$89,339	\$80,613	\$133,813	\$87,797	\$82,735	\$73,286
Annual Increase (Est.) 2023 - 2028	3.0%	3.0%	3.0%	2.8%	2.5%	2.9%

Source: U.S. Census, ESRI (2023)

The map on the following page shows median household income within the PMA and SMA. The areas with the highest incomes in the PMA are located near the intersection of Interstate 270 and Interstate 64 near Creve Coeur and Town and Country, as well as the City of Clayton. In the SMA, the area with the highest incomes is west of Olive in Chesterfield.

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2023 MEDIAN HOUSEHOLD INCOME

Olia Village
Creve Coeur, Missouri

0 1.5 3 6 Miles

PCAV PLANNERS



SECTION III – DEVELOPMENT ANALYSIS

Residential Overview

The residential uses expected to be located throughout the Project include mixed-use, multifamily residential units for rent as well as single family townhomes for sale constructed in a planned district with a town center feel. The uses anticipated throughout the Project that are not residential include commercial, retail, restaurant, hotels, office, research, and parking. The Developer is anticipating one residential building will be the conversion of an existing office building to residential. The other three buildings that include multifamily residential units are new construction. The single family townhomes are new construction and clustered in the southern portion of the site. The Developer is proposing a high end, market rate development that will prioritize top-of-the-line quality construction and utilize premium materials. The Developer is anticipating the apartments will rent for \$2.50 to \$3.00 per square foot on average, and the townhomes will be for sale on the open market. While the townhomes are not planned to be developed by the Developer, it is estimated the townhomes will sell for \$275 to \$300 per square foot.

The multifamily components of the Project are proposed to be located in mixed-use buildings between four and eight stories tall. The renderings of “main street” show five to six story residential buildings and three story commercial buildings. The draft attachment B submitted by the Developer suggests a maximum height of eight stories for Category A Main Street (of which is the proposed zoning for the buildings fronting main street) and five stories for Category B Mixed-Use. With this proposed maximum height, there is potential for the buildings fronting main street to be taller than presented in the renderings. Additionally, the site has a significant grade change from north to south, so the height of the building on main street may not be the same as the height on the opposite side of the building. Because of these considerations, the ordinance will need to be fully negotiated; and as the project progresses, additional information will need to be submitted by the developer to the City to confirm acceptable building heights in each location across the site.

The Developer is planning to construct the Project in phases. This phasing has changed in the past few months and may not be final. The current phasing, as it relates to lots with residential land uses, is as follows. Phase I includes lot 4, approximately 290 units. The Developer is expecting Phase I to be complete with construction in 2026. Phase II includes lots 6 and 14, approximately 360 units. The Developer is expecting Phase II to be complete with construction in 2027. Phase III includes lot 7, approximately 220 units and is expected to be complete with construction in 2028. Phase IV includes lot 16, which is the 130 townhomes. The Developer expects these townhomes to be developed by a sub-developer with construction complete in 2029.

As the Project becomes more fully realized and makes its way through each of the necessary approvals, the timing of construction and lease up will be determined with a higher likelihood of accuracy. The timing, and additional analysis, if necessary, will allow the Developer to further define the Project and provide the details to the City in subsequent submissions for review. The Developer will need to

determine the appropriate districtwide management to ensure respectful interaction between and a positive experience for residents, employees, and visitors. The exact residential product (type, size, and amenities) and the differences, or similarities, between the new construction and renovation residential product will determine how the rent levels are spread across the multifamily units. The development approach and ownership structure of the townhome lot as well as the specific types of townhomes will need to be further understood by the Developer, and the Developer will need to continue to analyze construction costs, interest rates, and many other factors.

Defining these factors will assist the Developer in determining the appropriate phasing for the different uses throughout the Project and ensure the number of residential units entering the market at the same time, from this project and others, does not overburden the market. Currently, the Developer is anticipating approximately 870 multifamily units to enter the market between 2026 and 2028, approximately 290 units per year. For reference, with the exception of the current year, inventory increased in the entire Mid County submarket by the largest number of multifamily units per year in 2017 with 871 units.⁴ Of these 871 units entering the market, 576 units were 4 and 5 star properties. The vacancy rate for 4 and 5 star properties in 2017 rose to 23.9%. That being said, the cost of spreading out the construction of the residential units across additional phases, and potentially extending construction and financing periods, will need to be weighed by the Developer against the cost of potentially slower absorption or reduced asking rates if a high number of similar units enter the market at the same time.

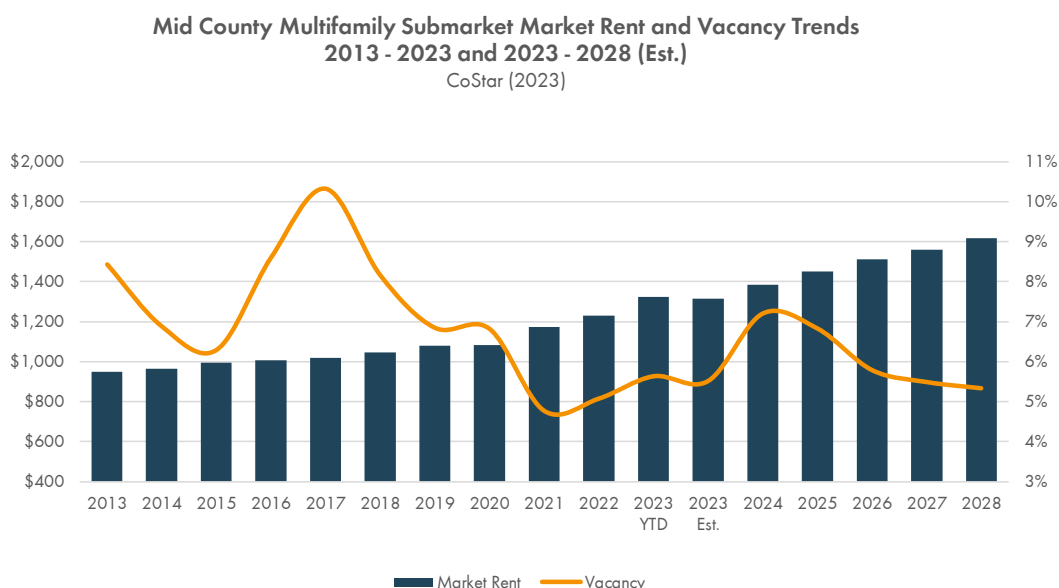
A massive housing shortage exists throughout the U.S., and there is a need for additional housing supply, of all types, to stabilize rent growth and reduce the percentage of income spent on housing costs. From a review of 800 cities and towns, based on data from 2017 through 2019, an index of housing shortages by area was developed by Up for Growth. The two areas with the largest shortage of housing are located in California and Texas with an 11% shortage. The St. Louis MSA falls 150th on the list with a -0.1% shortage, equaling 902 units. Therefore, as of 2019, the MSA as a whole did not have a major housing shortage problem. Since 2019, the economy has changed, the employment environment has changed, and the real estate market has changed. If the MSA can, as a region, continue creating new jobs, working to attract new residents, and retaining current residents, it will need additional quality housing options. The region also needs access to quality housing options for all to attract new jobs.

Multifamily Market

The St. Louis multifamily market is made up of numerous multifamily submarkets, and the Project is located in the Mid County submarket.⁴ Mid County is the largest multifamily submarket in St. Louis, however much of the inventory is older with over 80% of all units built prior to 2000. Demand in this submarket has slowed recently, and the vacancy rate has increased to 5.5% with the rent growth rate topping out in 2021 and cooling to 5.2%. That being said, the vacancy rate remains below the historical average of 8.9% and rent growth remains above the historical average of 2%. Table 7 shows market rents per unit and vacancy rates between 2013 and 2023 year-to-date and projected through 2028. Rental rates in Mid County are some of the highest in St. Louis, averaging \$1,310 per month and \$1.51

per square foot, putting it in the top five of all submarkets. The current average market rent for one bedroom apartments in the Mid County submarket is approximately \$1,150 per month. This \$1,150, is 115% of \$1,000, the maximum industry standard recommendation for housing expenses as 30% of income for 38% of employees that work in the City but live elsewhere. Among property types, demand for 4 and 5 star buildings has continued, leading the way with 100 units of absorption in the past year and an average asking rate of \$1,980 per month. Vacancies among 4 and 5 star properties are 5.9%, well below the region's 12.6% vacancy rate.

Table 7 - Rent and Vacancy Trends



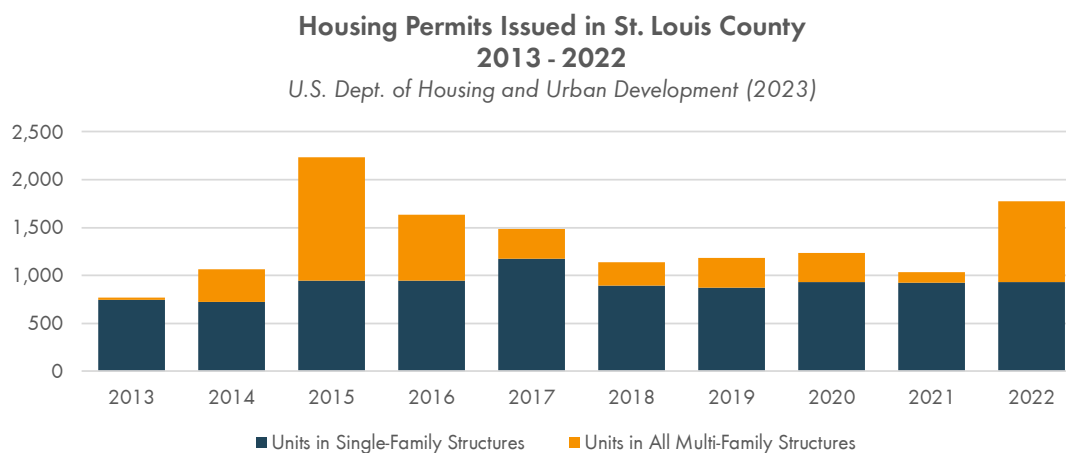
With a record number of units set to deliver in 2024, Mid County is projected to see its vacancy rate rise to just over 7% over the next 24 months but remain below the regional level. After the units currently under construction are completed over the next two years, the vacancy rate is projected to drop back down due to absorption exceeding net deliveries. The submarket rent growth is forecasted to return closer to its long-term average, 3.1%, from the second half of 2024 onwards. With 1,200 units under construction, representing 4.3% of inventory, the Mid County submarket has the largest construction pipeline in the region, just ahead of Downtown St. Louis. Construction starts in Mid County reached an all-time high recently, as developers focus on projects near Interstates 170 and 270. The most recent new construction to deliver in Mid County is the 151-unit Oliver in Olivette which opened in 2022, and the projects currently under construction include the 181-unit Clover in Olivette expected to be complete in 2023 and the 234-unit Bemiston Place in Downtown Clayton expected to be complete in 2024.

An analysis of Class A, mid-rise, market rate multifamily buildings within or near the PMA that are between 150 and 310 units and were built after 2015 showed an average market rent per unit of \$1,973 and an asking rent of \$2.39 per square foot.⁴ Asking rents leveled out in 2020 during the pandemic but

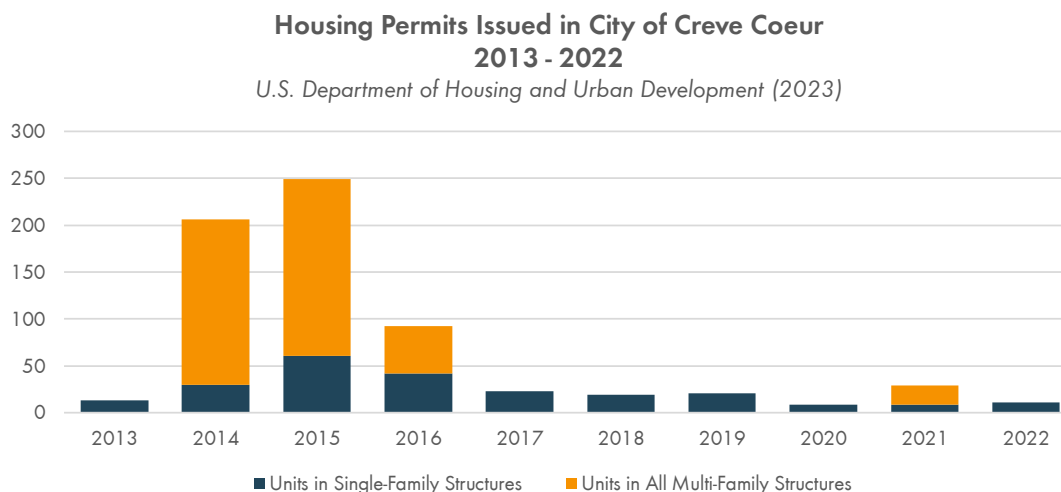
have risen considerably since the beginning of 2021. The 12 month absorption was 157 units, and the current vacancy rate is 7.9%. The vacancy rate jumped to 14.1% in quarter 2 of 2022 after seeing a 4.4% vacancy rate in quarter 4 of 2019 prior to the pandemic. The absorption of units dropped dramatically at the beginning of 2020 but has since remained positive when analyzed on an annual basis.

Table 8 and Table 9 show housing permits issued in the City and the County between 2013 and 2022. The number of multifamily permits issued in the County was a larger portion of all permits in 2015 and 2022 than in the other years. Multifamily permits have remained a very small portion of the City's market with the exception of a major uptick in 2014 through 2016. The multifamily construction pipeline boom occurring in the Mid County submarket and reflected in the County permits issued in 2022, as shown in Table 8, is not reflected in the City's multifamily permits issued in 2022, as shown in Table 9.

Table 8 – Housing Permits in the County



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Table 9 – Housing Permits in the City

With the multifamily buildings in the Project proposed to be mixed use, the retail market will also affect the vitality of this proposed development. The St. Louis retail market is made up of numerous retail submarkets, and the Project is located in the Mid County submarket.⁴ Mid County has strong demographics and a central location in the St. Louis region providing retailers with a large consumer base and a high buying potential. Among submarkets with more than 5 million square feet of inventory in St. Louis, Mid County has one of the lowest availability rates in the region at 2.8%, below the submarket's 10-year average of 4.4%. In the last year, grocery stores were active with new and backfilled locations, fitness centers grew with new leased locations, and restaurant local operators added new locations. Mid County's average asking rent is \$23.00 per square foot, second in the region, behind Chesterfield. This is also well above St. Louis' average asking rate of \$16.30 per square foot. Rent growth has been 4.2%, compared to the market's average of 3.7%. The scope of this Study does not encompass an analysis of the retail market. However, as it relates to the residential uses proposed for this Project, the current retail market, and the inclusion of retail in this Project, is a positive attribute and has the potential to enhance the viability of the residential uses.

Multifamily Comparable Properties

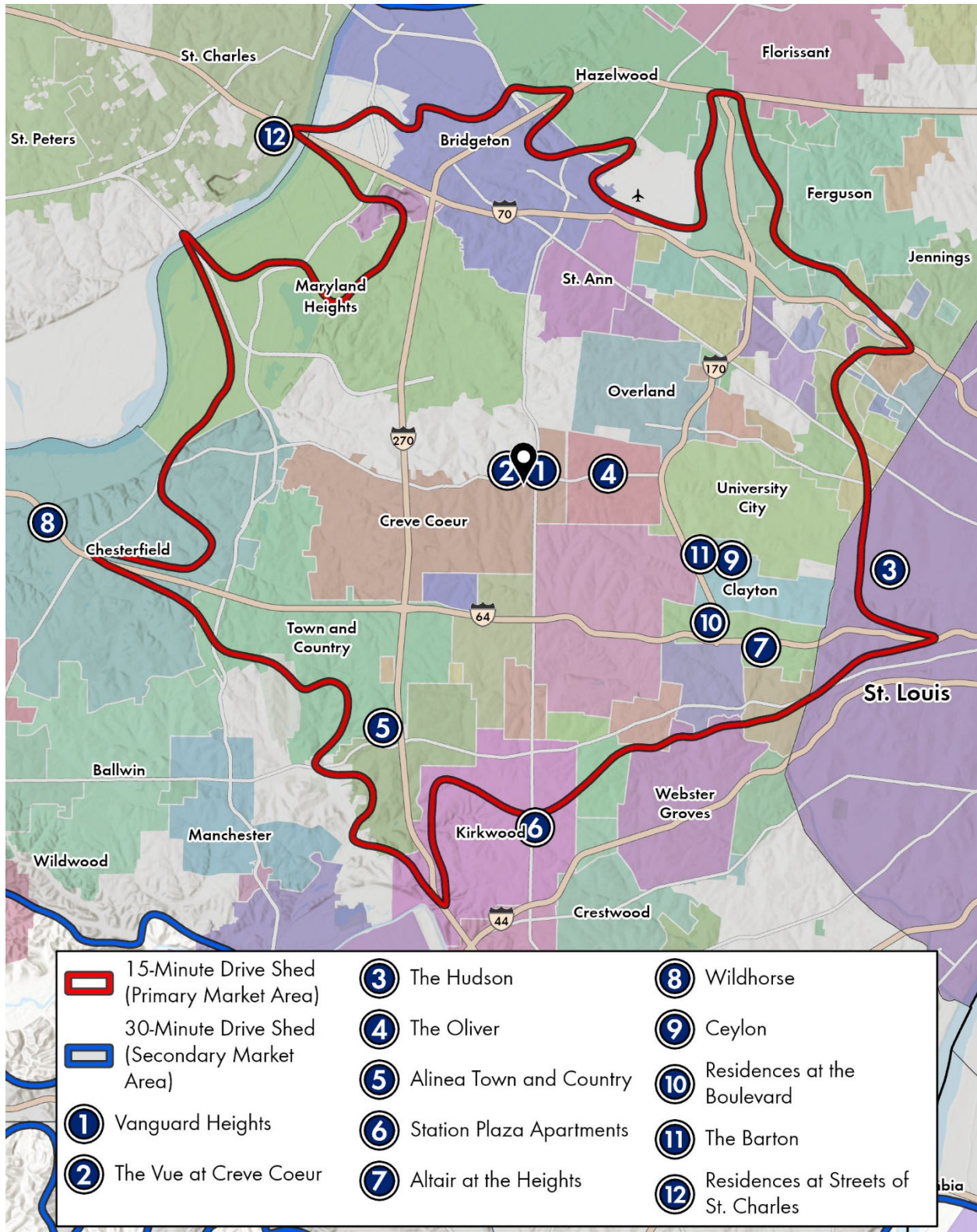
A review of comparable multifamily properties in the St. Louis area is shown in Table 10. These properties are of similar size, type, and character to what is planned for the Project. Similar to the Project, many of these properties have commercial space on the ground level and/or are located in a planned district. As the project moves further through predevelopment, the Developer will need to more fully define, and submit to the City for review, the unit mix of each individual multifamily building

⁴ CoStar, 2023.

(size, number of bedrooms/bathrooms, and amenities) in order to confirm the property's place in the market. The vacancy rates of the comparable properties in Table 10 vary from 2.4% to 7.9% with an average vacancy rate of 5%. The average unit size of these properties is 865 square feet, which is smaller than the conceptual average square footage of the units in the Project, 1,105 square feet. The properties vary from 74 to 309 units with an average asking rent per square foot of \$2.34. Escalating this asking rent per square foot from 2023 to 2026, when the multifamily units in the Project are anticipated to enter the market, at a growth rate of 3%, the long-term average for the Mid County multifamily market, results in an average asking rent per square foot of \$2.56. The Developer anticipates the apartments to rent at \$2.50 to \$3.00 per square foot. Therefore, at the current conceptual level of design, the Developer's projections are at the high end of the market. A map of these comparable properties is shown on the following page.

Table 10 – Multifamily Comparable Properties

Multifamily Comparable Properties								
Subject Development								
Property	Location	Type	Year of Completion	Total Units	Average Unit Size (SF)	Average Estimated Rent	Average Estimated Rent PSF	
Phase II - Lot 4 - New Construction	Creve Coeur / St. Louis County	Market Rate - 8 Stories	2026	290			\$2.50 to \$3.00	
Phase II - Lot 6 - New Construction	Creve Coeur / St. Louis County	Market Rate - 6 to 8 Stories	2026	170			\$2.50 to \$3.00	
Phase III - Lot 7 - New Construction	Creve Coeur / St. Louis County	Market Rate - 5 Stories	2026	220			\$2.50 to \$3.00	
Phase II - Lot 14 - Repurposing Existing	Creve Coeur / St. Louis County	Market Rate - 4 to 5 Stories	2026	190			\$2.50 to \$3.00	
Comparable Developments								
Property	Location	Location	Year of Completion	Total Units	Average Unit Size (SF)	Average Rent	Average Rent PSF	Vacancy
Vanguard Heights 10362 Old Olive Street Road	Creve Coeur / St. Louis County	4 Star - Class B - 4 Stories	2016	174	860	\$ 1,644	\$ 1.91	2.4%
The Vue at Creve Coeur 1001 Old Olive Way	Creve Coeur / St. Louis County	4 Star - Class A - 5 Stories	2017	182	898	\$ 2,008	\$ 2.24	3.2%
The Hudson 5655 Pershing Avenue	DeBaliviere Place / STL City County	4 Star - Class A - 6 Stories	2021	153	709	\$ 2,009	\$ 2.83	6.1%
The Oliver 9473 Olive Boulevard	Olivette / St. Louis County	4 Star - Class A - 4 Stories	2022	151	783	\$ 1,705	\$ 2.18	5.7%
Alinea Town and Country 12831 Daylight Drive	Des Peres / St. Louis County	5 Star - Class A - 4 Stories	2016	254	876	\$ 2,124	\$ 2.42	7.6%
Station Plaza Apartments 141 East Madison Avenue	Kirkwood / St. Louis County	4 Star - Class A - 4 Stories	2005	159	964	\$ 1,885	\$ 1.96	7.9%
Altair at the Heights 1325 Boland Place	Clayton / St. Louis County	4 Star - Class B - 5 Stories	2020	187	879	\$ 2,202	\$ 2.51	2.4%
Wildhorse 16511 Wild Horse Creek Road	Chesterfield / St. Louis County	4 Star - Class B - 4 Stories	2021	188	886	\$ 2,125	\$ 2.40	2.6%
Ceylon 25-45 North Central Avenue	Clayton / St. Louis County	4 Star - Class A - 6 Stories	2017	120	837	\$ 2,660	\$ 3.18	6.3%
Residences at the Boulevard 24 The Boulevard Saint Louis	Brentwood / St. Louis County	4 Star - Class A - 4 Stories	2005	74	961	\$ 1,656	\$ 1.72	3.2%
The Barton 8500 Maryland Avenue	Clayton / St. Louis County	4 Star - Class B - 5 Stories	2018	228	919	\$ 2,571	\$ 2.80	5.4%
Residences at Streets of St. Charles - 1650 Beale St	St. Charles / St. Charles County	4 Star - Class A - 5 Stories	2013	309	809	\$ 1,590	\$ 1.97	6.7%



SELECTED MULTIFAMILY PROPERTIES

Olia Village
Creve Coeur, Missouri

0 0.5 1 2 Miles

PCAV PLANNERS



Townhome Market

The townhome typology is a necessary balance in residential markets between single family housing on individual lots and multiple apartments in a single building. These properties are popular with renters and buyers who may want more indoor and outdoor space than an apartment, and single family housing type amenities like attached garages, but may want less responsibilities than those that come with single family homeownership. Townhomes are also popular near areas with higher density, a variety of uses, increased walkability, and extremely high homes prices. These are areas similar to the Project. With a number of highly rated schools in the PMA, the townhomes in this Project have the opportunity to be housing options for families that need more space than an apartment and a lower maintenance option and/or more attainable housing option than the high cost of single family homes in much of the City. Townhomes can be a flexible housing development option in that they can be for sale or for rent properties and oftentimes include a type of homeowners association to facilitate a well maintained property.

The housing market in the City is currently very competitive. Homes in Creve Coeur receive three offers on average, sell in around six days, and, on average, sell for approximately 103% of the list price.⁵ The median sale price per square foot in Creve Coeur is \$197, up 7.7% since last year. While townhomes are a different sector of the residential market than single family homes on individual lots, it is important to consider a variety of facets when analyzing the market. Increasing supply in a diverse manner can help calm a competitive market to better enable participation by potential residents in the market. Across St. Louis City and St. Louis County, there are currently 16.9% less townhomes and condos for sale than the same period in 2022.⁶ The median sales price of townhomes and condos is \$219,000, up 7.9% from 2022, and the average days on the market until sale is 27 days, versus 20 days in 2022.

Townhome Comparable Properties

A review of comparable townhome properties in the St. Louis area is shown in Table 11. The Developer is anticipating this component of the Project will be developed by a sub-developer after the other phases of the project are well into development, and this component of the Project is currently in a very conceptual stage of design with few determined details. Therefore, these properties were compiled with the intent of being a similar size as the subject property and a type and character typical of the region. As shown in the table, many of the properties sold relatively quickly. The comparable properties include a few new construction properties. The older properties that are listed are well maintained and/or renovated.

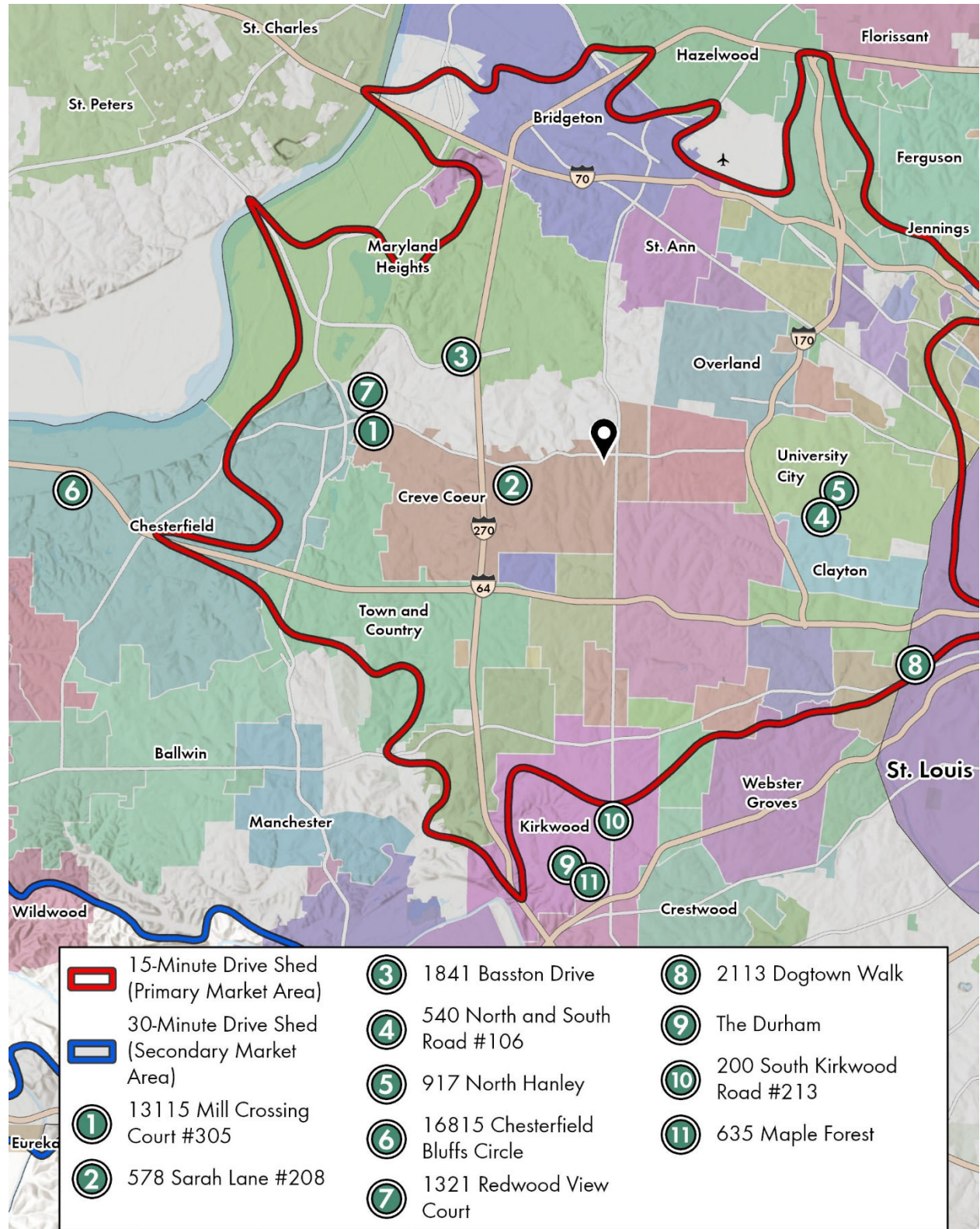
⁵ Redfin, 2023.

⁶ Mid America Regional Information Systems, 2023.

At a conceptual level, the Developer anticipates 130 townhomes at 207,000 total square feet. This is an average of 1,592 square feet per unit. The average unit size of these comparable properties is 1,654 square feet which includes 2 and 3 bedroom units. As the project moves further through predevelopment and a sub-developer is identified, the size and attributes of the units based on the targeted residents will need to be further determined in order to confirm the property's place in the market. The Developer anticipates the townhomes to sell at \$275 to \$300 per square foot. At 1,592 square feet, this results in a sale price for the townhomes of approximately \$438,000. With the median home value in 2028 estimated to be \$542,000 in the City, the anticipated sale price of the townhomes is 81% of the estimated median home value. The comparable properties listed below saw an average sale price per square foot of \$245. Escalating this sale price per square foot from 2023 to 2028, when the townhome units in the Project are anticipated to enter the market, at a growth rate of 2%, per the current estimated annual increase shown in Table 3, results in an average sale price per square foot of \$271. Therefore, at the current conceptual level of design, the Developer's projections are at the high end of the market. A map of these comparable properties is shown on the following page.

Table 11 – Townhome Comparable Properties

Townhome Comparable Properties								
Subject Development								
Property	Location	Type	Parking	Year Built	Unit Size (SF)	Estimated Sale Price	Average Estimated Sale Price PSF	
Phase IV - Lot 16 - New Construction	Creve Coeur / St. Louis County			2028			\$275 to \$300	
Comparable Developments								
Property	Location	Type	Parking	Year Built	Unit Size (SF)	Sale Price	Average Rent PSF	Days on Market
13115 Mill Crossing Court #305	Creve Coeur / St. Louis County	2 bed / 2 bath	1 car garage	2000	1,356	\$ 365,000	\$ 269.17	11
578 Sarah Lane #208	Creve Coeur / St. Louis County	3 bed / 2 bath	2 car garage	1980	2,047	\$ 355,000	\$ 173.42	30
1841 Basston Drive	Creve Coeur / St. Louis County	2 bed / 2.5 bath	1 car garage	2018	1,434	\$ 269,900	\$ 188.21	4
540 North and South Road #106	University City / St. Louis County	2 bed / 2 bath	2 car garage	2005	1,793	\$ 509,000	\$ 283.88	0
917 North Hanley	University City / St. Louis County	2 bed / 2.5 bath	2 car garage	1997	1,624	\$ 310,000	\$ 190.89	62
16815 Chesterfield Bluffs Circle	Chesterfield / St. Louis County	3 bed / 2 bath	2 car garage	1997	1,494	\$ 520,000	\$ 348.06	60
1321 Redwood View Court	Unincorporated / St. Louis County	2 bed / 2 bath	2 car garage	1998	1,584	\$ 400,000	\$ 252.53	45
2113 Dogtown Walk	Franz Park / St. Louis City County	3 bed / 2.5 bath	2 car garage	2005	1,800	\$ 400,000	\$ 222.22	12
1011 Geyer Grove - The Durham	Kirkwood / St. Louis County	3 bed / 2 bath	2 car garage	2023	1,600	\$ 446,638	\$ 279.15	75
200 South Kirkwood Road #213	Kirkwood / St. Louis County	2 bed / 2 bath	2 car garage	2005	1,796	\$ 407,000	\$ 226.61	30
635 Maple Forest	Kirkwood / St. Louis County	3 bed / 2 bath	2 car garage	2023	1,669	\$ 435,900	\$ 261.17	37



SELECTED TOWNHOME PROPERTIES

Olia Village
Creve Coeur, Missouri

0 0.5 1 2 Miles

PCAV PLANNERS



Additional Considerations

Another important consideration with mixed-use district development is how the Project will be successful for the residents, visitors, public services, and employees. This Project is located in a premier community with good schools and a multitude of employment opportunities. Additionally, the Project site is centrally located and close to major roadways and public transit making it well-located to attract employees currently commuting to the City, City residents commuting to work elsewhere, and students at nearby universities. A significant portion of employees in the City who live elsewhere are only able to afford a maximum of \$1,000 for housing expenses, and the average rent of a one-bedroom apartment in the Mid County submarket is approximately \$1,150 per month. The Developer's projected rents and sale prices of the project components are at the high-end of the market, and the Developer is anticipating a large number of residential units. For all these reasons, this Project is poised to leverage the private market and provide quality, attainable housing options for market rate renters and buyers as well as those who need housing options at costs below market rate.

In the St. Louis, MO-IL Metropolitan Statistical Area ("MSA"), 22% of renter households between 51% and 80% of Area Median Income ("AMI") are cost burdened, meaning the renter household is spending more than 30% of their income on housing costs and utilities, and there is a deficit of 21,548 affordable and available rental units at or below 50% AMI.⁷ The Housing Affordability Index ("HAI") for the City in 2023 is 89.⁸ An HAI less than 100 indicates areas where homes are less affordable and where median income is not high enough to purchase a median valued home.

Inclusionary housing policies have been employed in more than 800 cities since the 1970s, with significant evidence that they've impacted the creation and expansion of attainable housing.⁹ Under inclusionary zoning, developers are encouraged or required to set aside a share, oftentimes 10-30%, of the market rate housing they're creating to be sold or rented at below market rates.¹⁰ The below market rate rents can include workforce housing which is typically considered housing for residents at or below 80% AMI and is housing for essential occupations that are integral to the community such as teachers, police officers, and firefighters. Inclusionary zoning leverages the private market to create housing units that are affordable to households with lower incomes while allowing the development projects to

⁷ National Low Income Housing Coalition, 2019.

⁸ ESRI, 2023.

⁹ National League of Cities, 2022.

¹⁰ "Inclusionary Housing in the United States," Lincoln Institute of Land Policy, 2017.

still produce an acceptable return on investment.¹¹ For this reason, inclusionary zoning is more effective in affluent areas where more development is occurring, such as the City.

The Maplewood City Council recently passed an inclusionary housing ordinance in an effort to increase access to quality attainable housing and ensure that individuals and families across various income levels have the opportunity to live in a safe and vibrant community with a high-quality school district.¹² Maplewood is a St. Louis County municipality 15 minutes southeast of the City. The ordinance mandates that developers who receive tax incentives from the city on residential multifamily developments must set aside 20% of housing units as affordable housing units.

As described in this Study, the Developer's proposed rents are on the high end of a projected market rate rent in 2026 and 2028, when the units are expected to enter the market. From information provided by the Developer to date, the proposed rents do not seem to facilitate occupancy by residents with incomes that require rents below market rate. Housing options with rents or purchase prices lower than market rate are in much higher demand than market rate housing options, with households that make less than 30% of the area median income, such as childcare workers, having the largest unmet demand for affordable housing¹³.

With the large number of units in this Project, most if not all of which will be at unrestricted market rate rents and sale prices, the net operating income and return on investment flowing to the Developer (or sub-developer) may allow for a percentage of these units to be restricted to rent levels and/or sale prices below market. This consideration expands the market for potential residents and provides for an inclusive district that reflects the employee and residential community. Requirements related to inclusionary housing could be included in a development agreement for this Project specifically and would not necessarily need to be a requirement throughout the City. Affordable, quality, and safe housing is key to thriving communities, and the City should consider whether inclusionary housing requirements are a factor for this Project when negotiating a development agreement and/or incentives for the Project.

¹¹ Local Housing Solutions, 2023.

¹² City of Maplewood, 2023.

¹³ St. Louis Affordable Housing Report Card, 2021.

SECTION IV – CONCLUSION

Conditions and Assumptions

This Study is based on estimates, assumptions, and information provided by the Developer, the City, and various other sources current as of the date of this Study. Information provided by others is assumed to be reliable, but PGAV neither verified nor audited the information that was provided by others and assumes no responsibility for its accuracy or certainty. The analysis is based, in part, on assumptions and conditions provided by these various sources. PGAV believes that the assumptions used in this analysis constitute a reasonable basis for its preparation. A negative change in the conditions that form the basis of the assumptions could adversely affect the projected outcomes.

Conclusion

It is very rare that a consolidated parcel of this scale becomes available for a full revisioning without any displacement. The potential of this Project is the definition of one door closing and another opening. With that said, the scale of this project requires increased scrutiny to best ensure the viability of this development for decades to come. The real estate market is not the most stable of markets, and often as one use finds itself floundering another use finds itself thriving. We see this over the last couple years with the office market and the multifamily market. It is imperative that cities and think regionally and integrate a diversity of income streams when it comes to creating and/or maintaining a thriving community.

This Project includes a district approach to development in which the City will need to be an integral part of the process and develop an ongoing working partnership with the development team. Partnering with a developer will allow for public risk to be spread to the private sector and a balance of responsibilities to work toward a common goal. A district with a mix of complimentary uses, pleasant walkability and natural surroundings, and cohesive connections beyond its boundaries will create an environment where the variety of uses benefit each other during different times of day. With the appropriate amount of oversight and flexibility by both the City and the Developer, thoughtful phasing, and continued analysis of the markets as timing becomes clearer, the proposed residential typologies in the Project have the potential to be absorbed by the market and are needed in order to balance the real estate demand and maintain a vibrant community.



Jason Jaggi <jjaggi@crevecoeurmo.gov>

RE: FW: Olia Village Development - Creve Coeur - Route 340 & Route 671 message

Brian Eads <beads@cmtengr.com>
To: Jason Jaggi <jjaggi@crevecoeurmo.gov>
Cc: Chris Stritzel <cstritzel@cmtengr.com>

Wed, May 10, 2023 at 11:31 AM

Jason,

I wanted to let you know that we've received comments from MoDOT on this report and will be meeting with them on Monday to discuss those comments. In case these comments are helpful with the City's review I wanted to pass them along to you with our initial responses. I wanted to make sure the City was aware of the latest changes.

Thanks,

Brian

1. Synchro General: SB US 67 off-ramp to EB MO 340, dual rights are signalized not yield control

This existing dual right was incorrectly modeled. This change did not impact the delays for this movement.

2. Synchro General: shouldn't all roadways connect for SimTraffic to run properly?

SimTraffic was not used for the analysis. During the scoping meeting only Synchro was proposed for the analysis.

3. Synchro Build: MO 340 @ Old Olive St W, stop controlled intersection geometrics questionable. How will this conflict with Schnuck's traffic? Stop controlled intersection immediately after the signal is not going to work. The report does call this out recommending the stop-controlled intersection move as far south as possible but how far, and how far do they have to work with. Volumes throughout the different build scenarios are inconsistent.

The current site plan has been able to move this intersection about 100 feet further south to align with the drive aisle in front of Schnucks. This makes the intersection outside of the 95th percentile queue for the signal to the north. We are not clear on what volumes are "inconsistent". Based upon our review of the volumes we did not see any errors.

4. Synchro Build: all non-signalized intersections within the Synchro models will need to report HCM6 data.

We are currently reporting Synchro data for the unsignalized intersections. If needed we can revise to report the HCM6 results for all the stop control intersections. Based upon a review of the Synchro models there does not appear to be any operational issues with HCM6 or Synchro reported results.

5. Page 10, Section 4.2: Please verify where the ramp terminal signal timings were provided from.

Added clarification that these timings (since timings were not provided) were developed in Synchro by matching cycle lengths/turn types with other intersections and optimizing splits/offsets.

6. Page 12, Section 4.4: we need further validation of SIDRA modeling for the Lindbergh @ Monsanto interchange. This is vaguely covered under Recommendations and Conclusions.

SIDRA was only used to analyze the eastern most intersection at the Lindbergh & Monsanto interchange which is a 3-legged intersection with 2-way stop control. The current HCM and Synchro methodologies will not analyze this existing configuration. SIDRA can analyze this configuration, which is why this model was used for this intersection. Let us know if further information / validation is needed for the use of SIDRA in this case.

7. Page 24, Proposed Improvements: does not include content regarding to Lindbergh @ Old Olive

Improvements are only recommended at the development access points. The intersection of Lindbergh @ Old Olive is being modified through a separate project and no further changes are recommended as part of this study.

8. Page 25, Recommendations and Conclusions: At Pavilion Dr and MO 340, north leg improvements will also indicate drainage structure and pull box relocates, while east leg upgrades will require upgraded signal equipment. Entire intersection may need to be re-signalized with upgraded ITS/signal equipment due to both these recommendations

Correct, these modifications are expected and will be included in the design of the intersection. We have added additional narrative about needing drainage structure / pull box relocation for the north leg and upgrades to signals on the east leg.

9. All unsignalized intersections within the Synchro model will need to report HCM6 data?

Refer to comment 4

10. The dual rights at the Olive and MO 340 is shown as Yield control; shouldn't this be signalized? We do not have any unsignalized dual rights that look like this.

Refer to comment 1

11. Sheet 4 – Please add a list of the intersections within the study area.

Added a list of the study intersections following the figure.

12. Sheet 12 – What intersection was modeled in SIDRA? No SIDRA Models were provided

Eastmost intersection in the Monsanto interchange was done in Sidra as explained in Comment 6. Will provide model on next submittal.

13. Sheet 24 – When is the SB to WB right turn needed? Please add this to the report because I assume it will be needed before 2048.

Based upon the expected traffic projections we estimate that movements at this intersection will operate at LOS E around 2032. Further analysis will refine this year and additional discussion will be added to

the report.

14. Sheet 25 – Has sight distance been checked for FYA's to be considered?

Initial observations appear that sight distance will be sufficient for the proposed changes at the Olive Blvd & Pavilion Drive intersection. Survey data will be used to confirm that adequate sight distance is provided.

15. Sheet 25 (Olive Blvd and Old Olive Street) – What is the recommendation for the distance between the connection to the site and the intersection. The Synchro model shows the link to be 125'. I would like more information on this within the study.

A minimum separation distance recommendation will be added to the report. Since the report was submitted the design has been revised to align the intersection with the drive aisle in front of Schnucks, which provides adequate queue storage.

BRIAN EADS P.E., PTOE | Crawford, Murphy & Tilly | w 314.571.9065 | m 314.322.1043
Project Manager | Traffic Practice Lead

From: Jason Jaggi <jjaggi@crevecoeurmo.gov>
Sent: Monday, April 10, 2023 1:40 PM
To: Brian Eads <beads@cmtengr.com>
Cc: Chris Stritzel <cstritzel@cmtengr.com>
Subject: Re: FW: Olia Village Development - Creve Coeur - Route 340 & Route 67

External Message: This email was sent from someone outside of CMT. Please use caution with links and attachments from unknown senders or receiving unexpected emails.

Thanks, Brian. I will forward these documents to our consulting traffic engineer for his review and comments.

--Jason

On Mon, Apr 10, 2023 at 12:34 PM Brian Eads <beads@cmtengr.com> wrote:

Jason,

I wanted to share with you the Traffic Impact Study that was completed for Olia Village at Olive and Lindbergh. This was submitted to MoDOT on Friday. My apologies for not including you on the original email.

We look forward to any comments from the City of Creve Coeur in addition to comments from MoDOT.

Thank you,

Brian

BRIAN EADS P.E., PTOE | Crawford, Murphy & Tilly | w 314.571.9065 | m 314.322.1043
Project Manager | Traffic Practice Lead

From: Brian Eads
Sent: Friday, April 7, 2023 9:17 AM
To: JOHN "JAY JAY" BRADEN <John.Braden@modot.mo.gov>
Cc: Robert B. Meyer <Robert.Meyer@modot.mo.gov>; Chris Stritzel <cstritzel@cmtengr.com>; Richard Shang <rshang@cmtengr.com>
Subject: Olia Village Development - Creve Coeur - Route 340 & Route 67

Jay-Jay,

Please find attached the Traffic Impact Study for the Olia Village Development located at the SW quadrant of Route 340 & Route 67 in Creve Coeur. This report is based upon the Trip Generation that we agreed to last month.

We have also attached our Synchro files for your use/review.

Please let us know if you have any questions, require any additional information, or have comments on the report.

We look forward to your comments and eventual approval for this development.

Thank you,

Brian

BRIAN EADS P.E., PTOE | Project Manager | Traffic Practice Lead


Crawford, Murphy & Tilly | Engineers & Consultants
Gateway Tower | One Memorial Drive, Suite 500 | St. Louis, MO 63102
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 *Centered in Value*

--

Jason W. Jaggi, AICP

Director of Community Development

City of Creve Coeur, Missouri

[300 North New Ballas Rd](#)

[Creve Coeur, MO 63141](#)

314-872-2504

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MEMO

To: Jason Jaggi, AICP (City of Creve Coeur)
Bethany Moore, AICP (City of Creve Coeur)

From: Kyle Evans, PE, PTOE
Sarah Baty, PE, PTOE

Date: May 24, 2023

Subject: Olia Village TIS Review
Lochmueller Project: 522-0072-03T

As requested, Lochmueller staff have completed a review of the traffic impact study report submitted in association with the proposed Olia Village Development, located in Creve Coeur, Missouri in the southwest of the Lindbergh Boulevard (Route 67) and Olive Boulevard (Route 370) interchange. The study was prepared by Crawford, Murphy & Tilly and submitted in April 2023 with a revised document submitted in May of 2023.

Summary of TIS Review

1. Analysis was performed for the existing year 2022, construction year 2028, and design year 2048. A growth rate of 0.5% was used to forecast background growth within the study area per agreement with MoDOT during the project scoping meeting.
2. The internal capture trips included in **Table 6** are stated to be based on NCHRP 684 and the ITE Trip Generation Handbook. Please provide the calculations spreadsheet utilized to develop the 17% and 51% reduction rates for analysis.
3. Pass-by trips are summarized in **Table 7**. It is our opinion that these pass-by rates are valid.
4. The Lindbergh and Monsanto Drive interchange entrance and exit ramp operations were not evaluated. It is our opinion that this analysis should be completed and included in the study.
5. Currently there is no access for a westbound left turn movement from Olive Boulevard onto Pavilion Drive. The recommendation is to open the existing median and construct a 400-foot left turn lane. The eastbound and westbound left turns would have protected/permissive phasing. As shown in **Table 10**, the AM peak hour queue is 481 feet, which exceeds the recommended 400-foot turn lane. The forecasted left turn volumes anticipated during the AM and PM peak hours are 330 vehicles and 320 vehicles, respectively (**Exhibit 5**). Consider a westbound dual left turn lane with a protected phase or extend the storage area to accommodate the anticipated queue.
6. The revised site plan provided with the May 19th document revision shows an Office Building in the NW portion of the site which replaced what was previously Senior Adult Housing. In the central portion of the development, OB2 has replaced the previous Multi-Family (MF) 2 building. Table 5 on Page 18, Trip Generation Table 6 and Table 7 still refer to Senior Adult Housing. Please review and modify the trip generation and analysis information if those changes in the site plan are accurate. This will require revisions to Synchro if trip generation numbers change.
7. Synchro Analysis sheets provided in the appendices show Olive and Pavillion were analyzed with a 500' WB left turn lane, but AM Peak hour results suggest a 95th percentile queue that exceeds

capacity and the max queue could be longer. Analysis should be reviewed for impacts with a turn bay length set to 400' as proposed.

8. The recommendations portion should provide the potential layout/control features of study intersection number 7.2. As it serves as another potential entrance into the development.

TIS Review Documentation

It is our understanding that the proposed Olia Village development will replace a portion of the site previously occupied by Bayer southwest of the Olive Boulevard and Lindbergh Boulevard interchange. The site is currently unoccupied. Access to the site will be provided at existing access at Olive Boulevard and Old Olive Drive intersection, Olive Boulevard and Pavilion Drive intersection, and Lindbergh Boulevard and Monsanto Drive interchange. The proposed redevelopment includes a variety of residential, commercial and retail developments, as shown in **Exhibit 1** of the report.

The eight (8) study area intersections that are shown in Figure 2 of the study match what were requested during the kick-off meeting with MoDOT and the City.

For Section 4.4 *Level of Service*, there should be a statement with regards to what is considered acceptable for the City and MoDOT. Typically, in urban areas a LOS D is the goal for operational acceptance.

Section 5.1 details the proposed growth rate of 0.5% to be utilized for the study and we agree with that rate, as it has been used frequently over the last few years for the urban areas within the St. Louis Metro area.

With regards to Sections 5.2.1 and 5.2.2, the trip generation process appears to be in line with industry standards for following ITE Trip Generation Manual processes for developing the number of trips associated with the new development. For Section 5.2.2 *Adjustments to Trip Generation Rates*, the reduction in total trips for internal capture seems to be high for the PM peak hour at 51%. Review of NCHRP 684 shows a wide array of internal capture rates based on the various origins and destinations within the mixed-use development. Would suggest that additional information be provided showing how the 51% reduction rate was determined.

Lochmueller staff reviewed the calculations for the reductions in pass-by trips based on the information provided by the ITE Trip Generation Manual and agree with those calculations.

Review of the proposed traffic assignment in Section 5.2.4 seems logical based on the factors presented in the report.

The analysis and improvements documented within Section 6 of the report should provide additional documentation related to the operations of intersection 7.2. The revised site plan provided with the May 2023 revision to the report shows that this intersection in the build configuration has been revised to two separate intersections. Results for both intersections should be presented in the table. With regards to the main study intersection of Olive and Pavillion, the intersection analysis results for the 2028 and 2048 build analysis shows a queue for the westbound left turn lane that exceeds the recommended storage length based on the output in the appendix.

May 24, 2023

Page 3

It should also be noted that no analysis was provided for the operations of the back-to-back entrance ramps for southbound Lindbergh from Olive and the Monsanto interchange. HCS analysis of the merging operations should be provided to verify the operations.

Olia Village Development

Traffic Impact Study Report

June 2023

Prepared for:



Missouri Department of Transportation

105 W. Capitol Avenue

Jefferson City, MO 65102

Prepared by:



Crawford, Murphy & Tilly, Inc.

One Memorial Drive, Suite 500

St. Louis, MO 63102

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1 Executive Summary

The Olia Village development is a planned mixed-use development in Creve Coeur, Missouri, southwest of the Olive Boulevard (Route 340) and Lindbergh Boulevard (Route 67) interchange, on what was previously part of the Bayer headquarters campus. The development is expected to significantly impact traffic in the surrounding area, particularly at development access points. Access to the planned development will be on Olive Boulevard at Old Olive Street Road West and Pavillion Drive and on Lindbergh Boulevard at the Monsanto Drive interchange.

Using data provided by MoDOT, past data, and recently collected traffic data, operational analyses for peak hour delay, LOS, and queue length were performed for study intersections in the existing year (2022), construction year (2028), and design year (2048). An additional analysis was performed on Lindbergh Boulevard to verify ramp operations would not be significantly affected. For no-build scenarios, traffic forecasts were developed using a 0.5% annual growth rate. For build scenarios, traffic forecasts were found by adding background traffic to newly generated trips, estimated using the Institute of Transportation Engineers' Trip Generation Report.

Based on the intersection analyses, the Olia Village development will result in increases to delay on the existing roadway network, but the network still generally works efficiently with the newly generated and diverted traffic. Without the development traffic, except for Lindbergh and Old Olive Street which will be improved as part of the 39 North Development, all study intersections operate at LOS C or better, and all approaches at LOS D or better. With the development traffic, with signal timing improvements, most intersections remain at LOS C or better and approaches D or better. Olive Boulevard and Old Olive Street (West) is the exception, operating at LOS D during the 2048 PM peak hour, in part because of a heavy southbound right turn movement unrelated to the development. The addition of a southbound right turn lane greatly improves this delay.

Based on the freeway analysis for Lindbergh Boulevard, the ramp operations will not be significantly affected. Both with and without the development traffic, all ramp segments operate at LOS C or better. Most increases in density and reductions in speed are negligible.

To accommodate the growth in background traffic and the new traffic generated by the Olia Village development, in addition to signal timing improvements, improvements to the existing roadway network will be necessary. The most significant improvements will be at the Olive Boulevard and Pavillion Drive intersection, where the northbound leg should be modified into a three-lane approach with separate left/through/right lanes in accordance with the site plan, the southbound right turn lane should be modified into a shared through/right lane, and a left turn lane with approximately 500 feet of storage should be added to the westbound leg. The Olive Boulevard and Old Olive Street (West) intersection does not need major improvements, but site access should be about 100 feet further south to align with the front of the existing Schnucks to allow for proper operations of the intersection. In the future, a southbound right turn lane at this intersection may be necessary because of the heavy southbound right turn movement. Lastly, the Lindbergh Boulevard and Monsanto Drive interchange has ample capacity and will not need improvements following the proposed site plan, assuming all-way stop-control.

2 Introduction

The purpose of this Traffic Impact Study (TIS) is to determine the impacts of the proposed Olia Village development on various roadways in Creve Coeur, Missouri, as a result of the newly generated and diverted traffic to and from the development. The proposed development is located on part of the former Monsanto property southwest of the Olive Boulevard (Route 340) and Lindbergh Boulevard (Route 67) interchange, as shown in **Figure 1**. The previous land use for the site was primarily office land use, and the existing roadway network provided the necessary capacity for this large office development with two access points from Olive Boulevard and an interchange with Lindbergh Boulevard. This TIS will first determine the design hourly traffic volumes for the new land uses on Olive Boulevard from Spoele Road to Old Olive Street Road East and on Lindbergh Boulevard from Old Olive Street Road to the Monsanto Drive Interchange. Then, the TIS will estimate the traffic impacts of the proposed development on the existing roadway network.



Figure 1 - Site Location

In order to forecast traffic volumes within the study area, trip ends produced by the proposed development will be studied. Additional traffic growth in the area will be accounted for through projected background growth. The resulting design hourly traffic volumes will be used for

determining the recommended geometrics and traffic control at the study intersections along Olive Boulevard and Lindbergh Boulevard.

2.1 Study Objectives

The objectives for the analysis contained in this TIS consist of the following:

1. Forecast the number of trips that will be generated by the development in the study area during the morning and evening weekday peak hours.
2. Distribute the generated traffic onto the public roadway system based on historic traffic volumes, population distributions, and existing and forecasted traffic volumes.
3. Assign the traffic volumes to the entrances and roadways that will serve as access points to the development.
4. Provide an operational analysis for the design traffic.
5. Provide design recommendations based on the operational analysis.

3 Proposed Development

This section describes the proposed Olia Village development and the study area for the TIS.

3.1 Study Area

The influence area and area of significant impacts of the proposed development are located in Creve Coeur, Missouri, in the area surrounding the Olive Boulevard and Lindbergh interchange. Trips are expected to be generated from the surrounding residential and commercial areas and to primarily use Olive Boulevard and Lindbergh Road for access to the development. The intersections with significant impacts to traffic consist of the intersections on Olive Boulevard from Spoede Road to Old Olive Street Road East and on Lindbergh Boulevard from Old Olive Street Road to the Monsanto Drive Interchange. A map of the study area with study intersections and the approximate location of the development is provided in **Figure 2**. A list of each study intersection is given below. Further detail on each existing study intersection is provided in section 4.1.

1. Missouri Route 340 (Olive Blvd) and Spoede Road
2. Missouri Route 340 (Olive Blvd) and Old Olive Street Road (West)
3. Missouri Route 340 (Olive Blvd) and Pavillion Drive
4. Missouri Route 340 (Olive Blvd) and US Route 67 Southbound Ramps
5. Missouri Route 340 (Olive Blvd) and US Route 67 Northbound Ramps
6. Missouri Route 340 (Olive Blvd) and Old Olive Street Road (East)
7. US Route 67 (Lindbergh Blvd) and Monsanto Drive
8. US Route 67 (Lindbergh Blvd) and Old Olive Street Boulevard

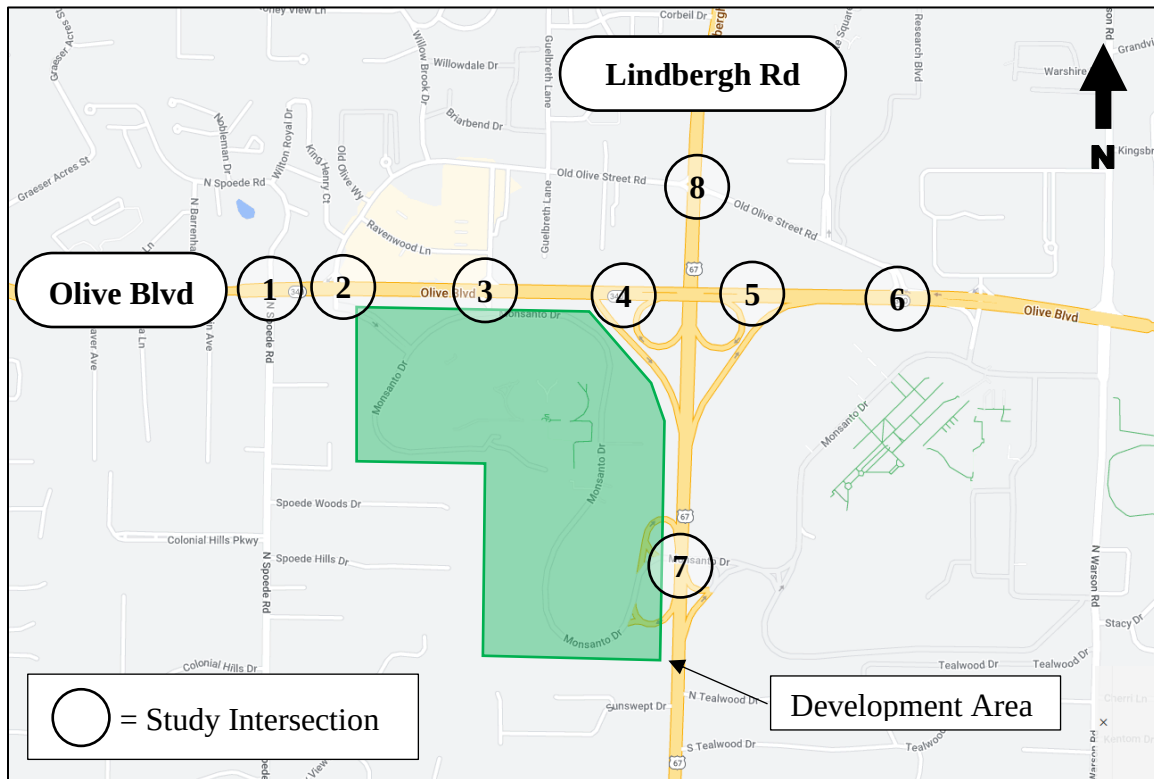


Figure 2 - Study Area

3.2 On-Site Development

The proposed Olia Village development is a mixed-use development consisting mostly of retail, commercial, office, and residential land uses. A small amount of industrial and recreational land use is also anticipated with a data center and amenity building. The development is to redevelop what was formerly Bayer's western campus into a large mixed-use town center for Creve Coeur. **Figure 3** shows the proposed site plan and anticipated land use of the development. Refer to **Exhibit 1** for the enlarged site plan shown in **Figure 3**. This updated site plan includes the relocation of the western access point near Old Olive further south to align with the front of the existing Schnucks, and the center-to-center distance between the two intersections is increased from roughly 120 feet to 220 feet.



Figure 3 – Anticipated Development Land Use (Site Plan)

3.3 Off-Site Land Uses

The existing land use within the development is currently vacant, and the existing land use surrounding the proposed development is composed of residential, retail, and office development. North and northeast of the proposed development, across Olive Boulevard, is a mix of retail and office developments including restaurants, car dealerships, a movie theater, and medical offices. East of the proposed development, across Lindbergh Boulevard, is Bayer's Crop Science Headquarters office campus. South, west, and further away from the development, the existing land use is almost entirely suburban residential. **Figure 4** shows a map of the study area with the primary land use of each area labeled.

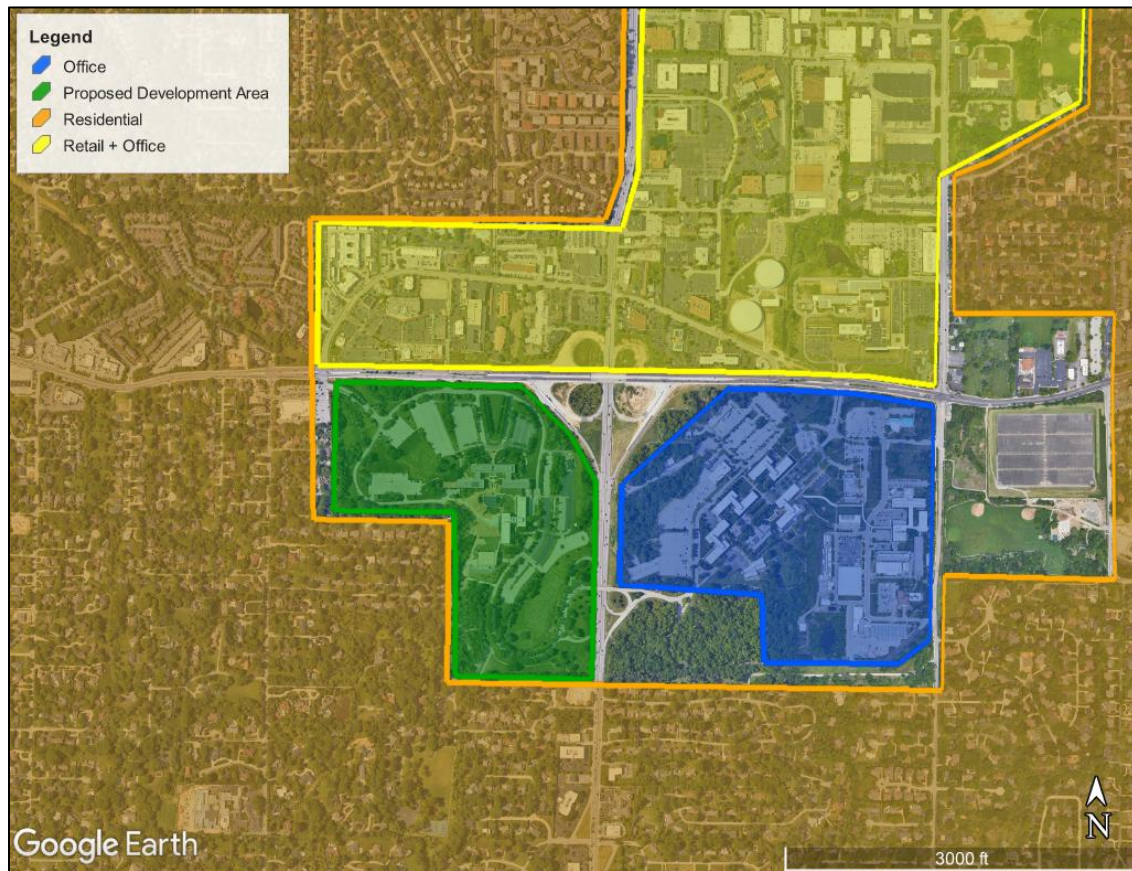


Figure 4 – Existing Off-Site Land Uses

3.4 Site Accessibility

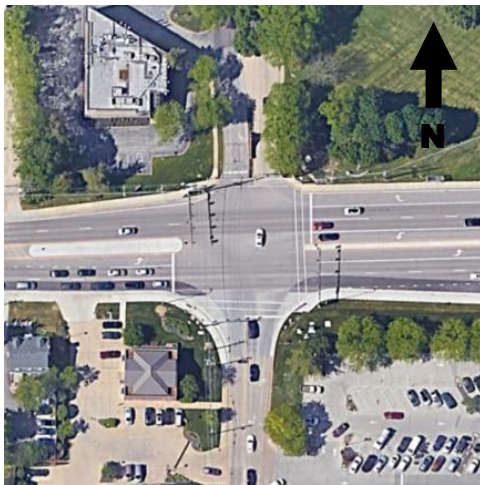
Access to the proposed development is located along Olive Boulevard at Old Olive Street Road West and Pavillion Drive and along Lindbergh Boulevard at the Monsanto Drive interchange. These access points are study intersections 2, 3, and 7, respectively, as labeled in **Figure 2**. The Olive Boulevard and Old Olive Street Road West intersection is a signalized intersection that currently also provides access to a Schnucks grocery store directly south of the intersection. The Olive Boulevard and Pavillion Drive intersection is also a signalized intersection, but this existing intersection only provides right-in and through/right-out movements for the proposed development; this will be modified to provide full access with the construction of the proposed development. The Lindbergh Road and Monsanto Drive interchange is an unsignalized interchange with stop-control. The new intersection at this intersection providing development access will be constructed according to the site plan. Further detail on each intersection within the study area is given in section 4.1.

4 Existing Conditions

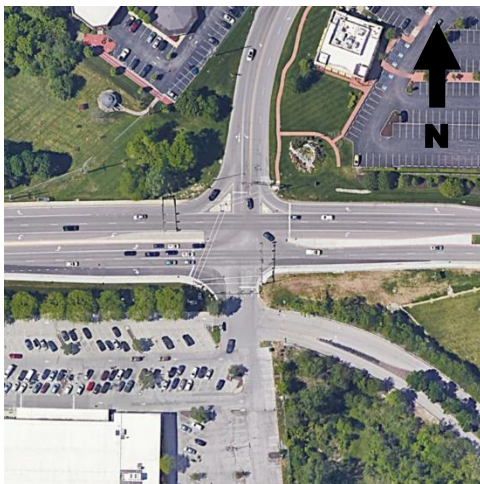
This section describes the existing conditions of the study area with an overview of study intersection configurations and existing traffic conditions.

4.1 Physical Characteristics

Existing conditions for the study area intersections are described below. Refer to Figure 1 in Section 3.1 for each intersection's location in the overall study area.



1. Missouri Route 340 (Olive Blvd) and Spoede Road – A four-legged signalized intersection. The northbound leg consists of a right turn lane and a shared through / left turn lane. The southbound leg consists of a left turn lane and a shared through / right turn lane. The eastbound leg consists of a left turn lane, a through lane, and a shared through / right turn lane. The westbound leg consists of a right turn lane, a left turn lane, and two through lanes.



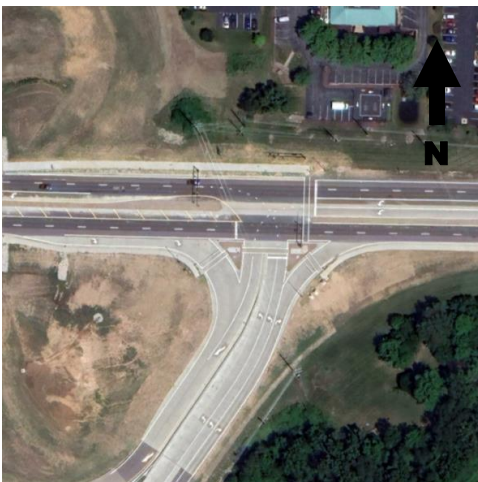
2. Missouri Route 340 (Olive Blvd) and Old Olive Street Road (West) – A four-legged signalized intersection. The northbound and southbound legs consist of a left turn lane and shared through / right turn lane. The eastbound and westbound approaches have a left turn lane, a right turn lane, and two through lanes. A second intersection providing access into the Schnucks parking lot and into the proposed development itself is located approximately 120 feet south of this intersection.



3. Missouri Route 340 (Olive Blvd) and Pavillion Drive –
A four-legged signalized intersection between MO 340 and Pavillion Drive, a private road. The northbound leg consists of a shared through / right turn lane. The southbound leg consists of a right turn lane and a left turn lane. The eastbound leg consists of a right turn lane, a left turn lane, and two through lanes. The westbound leg consists of a right turn lane and two through lanes.



4. Missouri Route 340 (Olive Blvd) and US Route 67 Southbound Ramps – This signalized, three-legged ramp terminal is approximately 800 feet east of MO 340 / Pavilion Drive intersection and 1100 feet west of the northbound ramp terminal. The northbound leg (the SB US 67 ramp) consists of two right turn lanes and a single left turn lane. The eastbound leg consists of two through lanes and a right turn lane. The westbound leg consists of two through lanes and two left turn lanes.



5. Missouri Route 340 (Olive Blvd) and US Route 67 Northbound Ramps – This signalized, three-legged ramp terminal is approximately 1100 feet east of the southbound ramp terminal. The northbound leg (the NB US 67 ramp) consists of a right turn lane and two left turn lanes. The eastbound leg consists of two through lanes and a right turn lane. The westbound leg consists of two through lanes and two left turn lanes.



6. Missouri Route 340 (Olive Blvd) and Old Olive Street Road (East) – A three-legged signalized intersection. The southbound leg consists of a left turn lane and a right turn lane. The eastbound approach consists of two through lanes and a left turn lane. The westbound approach consists of two through lanes and a right turn lane.



7. US Route 67 (Lindbergh Blvd) and Monsanto Drive – This interchange between US 67 and Monsanto Drive consists of an unconventional cloverleaf design. The design can be separated into four different intersections. These intersections are described as follows, according to the numbering in the image shown to the left.

7.1. This is a three-legged, stop-controlled intersection, in which only the westbound left turn movement is stop-controlled. The northbound and southbound legs consist of a single through lane. The westbound leg consists of a right turn lane and a left turn lane.

7.2. This is a three-legged, stop-controlled intersection, in which the northbound and southbound legs are stop-controlled. The northbound leg consists of a through lane and a right turn lane. The southbound leg consists of a single through lane. The westbound leg consists of a right turn lane and a left turn lane. As part of the proposed development, another three-leg intersection will be added approximately 100 feet further north of this intersection with an eastbound leg.

7.3. This is a three-legged, stop-controlled intersection with all approaches being stop-controlled. The northbound leg consists of a single left turn lane. The eastbound leg consists of a shared through / right turn lane. The westbound leg consists of a single through lane.

7.4. This is a three-legged, stop-controlled intersection with northbound and eastbound approaches being stop-controlled. The northbound leg consists of a single right turn lane. The eastbound leg consists of a single through lane. The westbound leg consists of a shared through / left turn lane.

8. US Route 67 (Lindbergh Blvd) and Old Olive Street Boulevard – This intersection will be improved as part of the 39 North project and the proposed configuration from the 39 North project will be utilized in this study.

4.2 Data Sources

Traffic data used in this study included both data obtained from MoDOT, past study data, and data collected within the past year specifically for this study. Historic Average Annual Daily Traffic (AADT) from 2013 to 2022 was obtained from MoDOT. Existing signal timings at all signalized intersections along Olive Boulevard were also obtained from Synchro files provided by MoDOT. Peak Hour turning movement counts were initially collected in December 2022; however, due to inaccuracies in the data collection, some study intersections were recounted in February 2023. The intersections recounted in February are listed below.

- Missouri Route 340 (Olive Blvd) and Old Olive Street Road (West)
- Missouri Route 340 (Olive Blvd) and Pavillion Drive
- Missouri Route 340 (Olive Blvd) and US Route 67 Northbound Ramps
- Missouri Route 340 (Olive Blvd) and Old Olive Street Road (East)

Traffic on mainline Lindbergh Avenue and associated ramps were developed using collected ramp traffic counts and past data from the 39 North project.

4.3 Traffic Volumes

AADT volumes as reported by MoDOT for 2013 through 2022 are shown in **Table 1**. **Figure 5** graphically displays these volumes. Traffic volumes along MO 340 and US 67 averaged a 1.5 percent annual decrease over the ten-year period. In the last five years, from 2018 to 2022, traffic volumes averaged a 4.2 percent annual decrease.

Table 1 – Creve Coeur Historic Average Annual Daily Traffic

Location	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
MO 340 e/o US 67	28800	27634	28629	28800	29232	25939	26017	23337	25391	23740
MO 340 w/o US 67	28760	29993	28588	28760	29192	30812	30905	27722	28201	22498
US 67 n/o MO 340	27892	27166	27726	27892	28311	28595	28680	25726	27990	23557
US 67 s/o MO 340	26393	25710	26236	26393	26789	27055	27136	24341	26483	22284
Old Olive Street Rd	7048	6878	6842	7048	7260	6673	6740	6403	6743	6743

The AADT volumes reported by MoDOT show a significant decrease in traffic in recent years. To demonstrate that future traffic projections can be reasonably assumed to be an increase from past years, 2022 AADT was estimated by multiplying collected peak hour volumes by 1/K, where:

$$\text{Design Hourly Volume} = K * \text{AADT}$$

PM peak hour volume counts were used as the DHV, and K was estimated using past peak hour volumes and AADTs reported by MoDOT. The resulting AADTs are shown in **Table 2** and in **Figure 5**, denoted by the “X” for each corresponding segment.

Table 2 – 2022 AADT Estimate

Location	1 / K	DHV	2022 AADT (CMT)
MO 340 e/o US 67	10	2951	29510
MO 340 w/o US 67	11	3039	33429
US 67 n/o MO 340	9	3335	30015
US 67 s/o MO 340	10	3235	32350
Old Olive Street Rd	10	614	6140

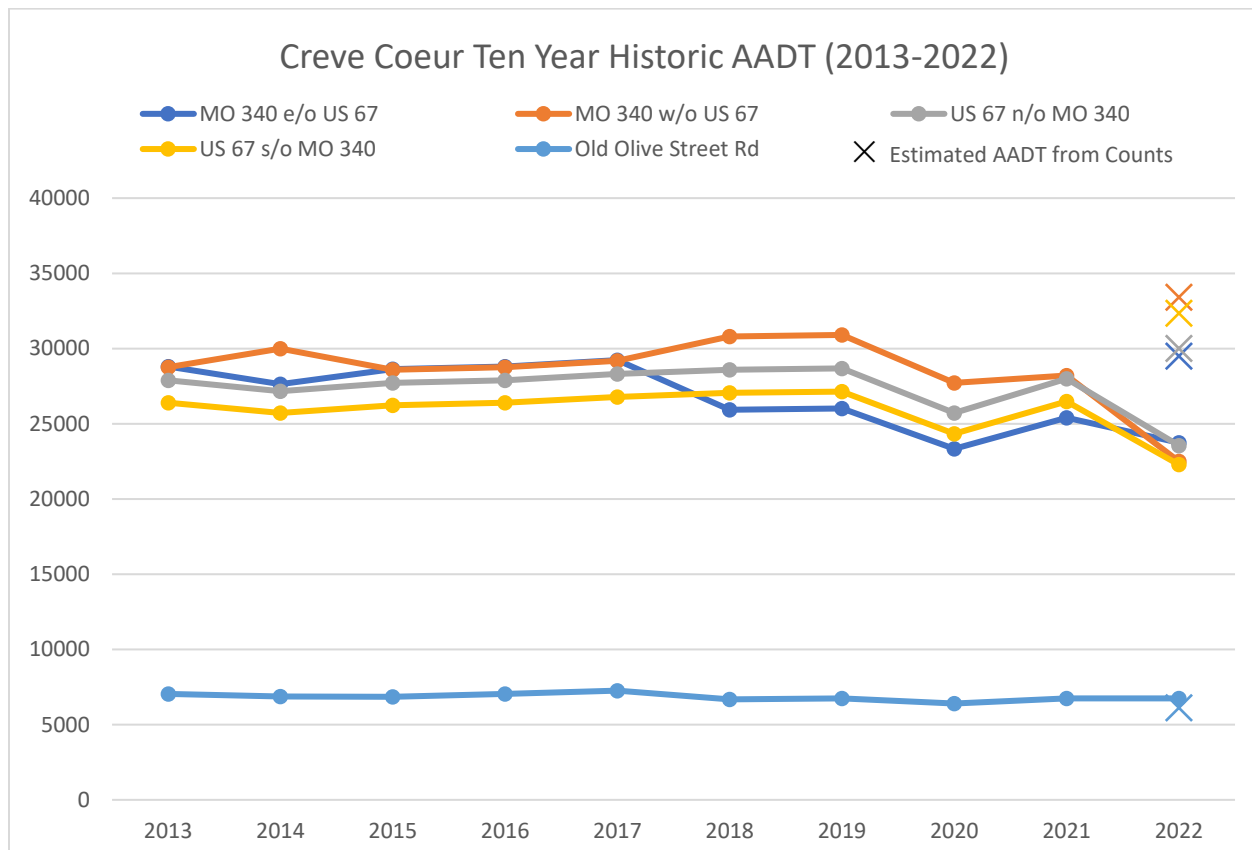


Figure 5 - Creve Coeur Historic Average Annual Daily Traffic

Based on the AADTs estimated using the peak hour volume counts conducted for this study, it is reasonable to assume that the existing peak hour volumes used are a conservative representation of traffic conditions and future traffic volumes will exhibit a positive trend. Further information

on the projected traffic is given in Section 5 of this TIS. Existing 2022 peak hour turning volumes are shown in **Exhibit 2**. Volumes were balanced across the study area prior to analysis.

4.4 Level of Service

The operational analysis for delay and LOS of the existing study intersections was performed using the macroscopic program Synchro. The primary performance measure used in the Synchro model to provide a LOS for signalized intersections is control delay, measured in seconds per vehicle. The LOS rating system describes the operational characteristics of an intersection and ranges from A (free flow, minimal delay) to F (extreme congestion, unacceptable delay). For this project, the target LOS for intersection operations is LOS D. The ranges of control delay used to define LOS are shown in **Table 3**.

Table 3 – Intersection LOS Criteria

LOS	Signalized Intersection Control Delay (sec)	Unsignalized Intersection Control Delay (sec)
A	0-10	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

Existing scenarios included AM and PM peak conditions using the volumes depicted in **Exhibit 2**. SIDRA intersection was used for the eastern-most unsignalized intersection in the Monsanto / Lindbergh interchange due to its unique configuration. For unsignalized intersections, HCM6 results produced by Synchro are given. **Table 4** shows the intersection analysis results for 2022 existing AM and PM peak hours.

Table 4 – 2022 Existing Intersection Operational Analysis

Intersection	App.	Delay, s (LOS)		95th% Queue, ft	
		AM	PM	AM	PM
Olive & Spoede	EB	19.7 (B)	30.1 (C)	462	628
	WB	3.3 (A)	3.8 (A)	112	114
	NB	32.3 (C)	34.8 (C)	102	148
	SB	44.8 (D)	45.0 (D)	34	36
	ALL	13.1 (B)	17.7 (B)		
Olive & Old Olive W	EB	6.9 (A)	16.4 (B)	219	225
	WB	0.7 (A)	7.9 (A)	6	543
	NB	27.5 (C)	32.7 (C)	30	85
	SB	29.3 (C)	37.6 (D)	138	205
	ALL	8.0 (A)	16.0 (B)		
Olive & Pavillion	EB	4.3 (A)	2.8 (A)	137	68
	WB	2.9 (A)	9.9 (B)	68	228
	NB	0.0 (A)	0.0 (A)	0	0
	SB	41.9 (D)	34.8 (C)	83	138
	ALL	4.7 (A)	8.6 (A)		
Olive & SB Lindbergh	EB	4.5 (A)	5.5 (A)	219	203
	WB	15.5 (B)	13.2 (B)	386	372
	NB	28.8 (C)	18.3 (B)	118	48
	ALL	11.6 (B)	10.4 (A)		
Olive & NB Lindbergh	EB	5.7 (A)	2.5 (A)	263	90
	WB	5.6 (A)	10.2 (B)	251	517
	NB	41.8 (D)	39.1 (D)	106	117
	ALL	9.9 (A)	10.4 (B)		
Olive & Old Olive E	EB	5.4 (A)	7.4 (A)	499	392
	WB	8.4 (A)	9.6 (A)	252	419
	SB	33.1 (C)	35.0 (C)	67	163
	ALL	7.5 (A)	11.0 (A)		
Lindbergh & Old Olive*	EB	31.1 (D)	21.9 (C)	55	38
	WB	20.5 (C)	86.3 (F)	53	343
Lindbergh / Monsanto Interchange (1)*	WB	0.0 (A)	8.4 (A)	0	0
Lindbergh / Monsanto Interchange (2)*	WB	6.7 (A)	6.5 (A)	3	3
	NB	6.8 (A)	6.7 (A)	3	3
Lindbergh / Monsanto Interchange (3)*	EB	7.2 (A)	7.1 (A)	3	3
	WB	0.0 (A)	7.1 (A)	0	0
	NB	7.4 (A)	7.4 (A)	5	3
Lindbergh / Monsanto Interchange (4)*	EB	7.2 (A)	7.3 (A)	2	1
	NB	7.0 (A)	7.0 (A)	4	1

* Unsignalized intersection, HCM6 delay/LOS/queue reported for stopped approach only.

In addition to the analysis of the study intersections, an additional analysis was performed on Lindbergh Boulevard ramps to determine if the development traffic would have a significant impact on the ramp operations. This analysis was performed using HCS2023 Freeways. Unlike in Synchro, LOS criteria given by HCS for freeway segments are based on density and driver perception of operating conditions. The LOS criteria for freeway segments are given below in **Table 5**. Individual segments have slightly different LOS criteria depending on segment type.

Table 5 – Freeway Facility LOS Criteria

LOS	Freeway Facility Density (pc/mi/ln)	
	Urban	Rural
A	≤11	≤6
B	>11-18	>6-14
C	>18-26	>14-22
D	>26-35	>22-29
E	>35-45	>29-39
F	>45 or any segment $v_d/c > 1$	>39 or any segment $v_d/c > 1$

Table 6 shows the ramp analysis results on Lindbergh Boulevard for 2022 existing AM and PM peak hours.

Table 6 – 2022 Existing Lindbergh Operational Analysis

		Segment		Type	LOS		Speed (mph)		Density (pc/mi/ln)	
		From	To		AM	PM	AM	PM	AM	PM
2022	NB	Monsanto Off		Diverge	B	B	43.5	43.5	20.7	18.6
		Monsanto On	Olive Off	Weaving	B	B	39.7	39.6	14.5	13.5
		Olive On		Merge	B	B	44.0	44.0	16.5	15.4
	SB	Olive Off		Diverge	B	B	43.0	43.1	24.6	20.8
		Olive On		Merge	B	B	44.0	44.0	23.6	22.6
		Monsanto On	Monsanto Off	Weaving	B	B	41.1	41.4	17.1	16.3

5 Projected Traffic

The following section details the projected background traffic and the estimated traffic produced by the proposed development.

5.1 Background (Future No-Build) Forecasting

Background traffic forecasts were made for the years 2028 and 2048 based on the historic traffic data presented in Section 4.3 and on population census data. **Table 7** shows census data for Creve Coeur and St. Louis County between 2000 and 2020. Despite the general decrease in traffic volumes in Creve Coeur as shown in Section 4.3, the population of Creve Coeur has steadily increased.

Table 7 – Creve Coeur and St. Louis County Growth

	2000 Population	2010 Population	2020 Population
Creve Coeur	16,500	17,833 (8% increase)	18,834 (6% increase)
St. Louis County	1,016,178	998,954 (2% decrease)	1,004,125 (1% increase)

For this study, a growth rate of 0.5% will be used to project background growth within the study area that is not included by explicitly studied developments. This 0.5% annual growth rate was discussed and agreed to at the initial scoping meeting with MoDOT for the project. Forecasted AM and PM no-build peak hour turning volumes for 2028 and 2048 are shown in **Exhibit 3** and **Exhibit 4**, respectively.

5.2 Existing Build Forecasting

Evaluation of the traffic on the transportation network assuming the proposed development is completed involves a process of trip generation, distribution, and assignment. These steps are outlined in the following subsections.

5.2.1 Trip Generation

The number of trips generated by the proposed developments is a function of land use and development size. The Institute of Transportation Engineers (ITE) publishes the Trip Generation Report, an established compilation of trip data for various land uses in studies performed across the United States¹. This enables the analyst to forecast traffic based on generation rates comparable to previously constructed sites with similar characteristics when local or established trip generation data is not available.

The current Bayer office campus is unused and is therefore unoccupied. This analysis assumes that additional trips will be produced by the new development reaching full occupancy. The current redevelopment plan includes a small data center, over 1300 living units of residential and lodging space, approximately 260,000 SF of office buildings, and over 220,000 SF of retail and commercial businesses. Based on the proposed site location characteristics, a Dense Multi-Use Urban setting/location was used when sufficient data was available.

Table 8 lists the ITE Land Use Codes (LUC) used for each site shown in the site plan. Refer to **Exhibit 1** for specific site locations. LUCs used for the sites listed as sidewalk commercial on the site plan were based on recommendations from the developer. Since information on the exact usage of some individual developments was not available, office, retail, and restaurant square footage that was not clearly defined was divided into plausible land uses as follows:

¹ Trip Generation, Institute of Transportation Engineers, 11th Edition, 2021.

- Office area (sites MU3, MOB, and OB1) was split 50/50 into LUC 715 Single Tenant Office Building and LUC 760 Research and Development Center.
- A portion of sidewalk commercial (sites MU2E, MU2F, MU2G, MU2H, and MU2J) was split 50/50 into LUC 876 Apparel Store and 930 Fast Casual Restaurant.
- Dining (sites R3B, R4, MU3A, and MU3B) was split evenly between LUC 930 Fast Casual Restaurant, 931 Fine Dining Restaurant, and 932 High-Turnover Restaurant without Drive-Through Window.

Table 8 – Olia Village Development Site ITE Land Use Codes

ITE Code	Land Use	Site(s)
151	Mini-Warehouse	CC1, CC2
160	Data Center	DC1
220	Multifamily Housing (Low-Rise)	TH
221	Multifamily Housing (Mid-Rise)	MU2, MU4, MU5, MF1, MF2
310	Hotel	H1, H2
492	Health/Fitness Club	A1
715	Single Tenant Office Building	50% of (MU3, MOB, OB-1)
760	Research and Development Center	50% of (MU3, MOB, OB-1)
814	Variety Store	MU2A
822	Strip Retail Plaza (<40k)	R3A, MU4C
850	Supermarket	R1
861	Sporting Goods Superstore	R2
876	Apparel Store	MU1B, MU2B, MU2D, MU4A, MU5A, MU5B + 50% of (MU2E, MU2F, MU2G, MU2H, MU2J)
879	Arts and Crafts Store	MU2C, MU5A
920	Copy, Print, and Express Ship Store	MU1C
930	Fast Casual Restaurant	33% of (R3B, R4, MU3A, MU3B) + 50% of (MU2E, MU2F, MU2G, MU2H, MU2J)
931	Fine Dining Restaurant	MU4B, MU5E + 33% of (R3B, R4, MU3A, MU3B)
932	High-Turnover (Sit-Down) Restaurant	33% of (R3B, R4, MU3A, MU3B)
933	Fast-Food Restaurant without Drive-Through	MU5D
936	Coffee/Donut Shop without Drive-Through	MU1D
937	Coffee/Donut Shop with Drive-Through	MU1A

Table 9 summarizes the amount of additional traffic that would be generated by full occupancy of Olia Village Development, estimated using data given by the ITE's Trip Generation Report. The complete set of trip generation reports and graphs created using the ITETripGen web app can be seen in **Appendix A**. ITE Code 151 Mini Warehouse sites were not included in the analysis as

they will only service the new apartments. The buildings labeled “GREENHOUSES” on the site plan are in support of the operations of business located elsewhere within the development and are not anticipated to generate any additional trips.

Table 9 – Olia Village Development Trip Generation

ITE Code	Land Use	Units	Value	AM Enter	AM Exit	PM Enter	PM Exit
160	Data Center	SF	36,476	2	2	1	2
220	Multifamily Housing (Low-Rise)	Dwellings	130	4	37	31	3
221	Multifamily Housing (Mid-Rise)	Dwellings	986	35	217	207	73
310	Hotel	Rooms	251	30	48	23	30
492	Health/Fitness Club	SF	55,549	37	36	96	73
715	Single Tenant Office Building	SF	129,613	211	26	35	196
760	Research and Development Center	SF	129,613	115	25	21	113
814	Variety Store	SF	3,351	3	2	5	5
822 (1)	Strip Retail Plaza (<40k)	SF	7,068	14	9	30	31
822 (2)	Strip Retail Plaza (<40k)	SF	34,928	39	27	95	94
850	Supermarket	SF	67,238	183	149	313	314
861	Sporting Goods Superstore	SF	50,000	14	2	33	35
876	Apparel Store	SF	55,892	13	8	26	37
879	Arts and Crafts Store	SF	6,741	12	10	19	23
920	Copy, Print, and Express Ship Store	SF	3,654	8	2	12	15
930	Fast Casual Restaurant	SF	33,656	24	24	324	265
931	Fine Dining Restaurant	SF	24,031	9	9	126	61
932	High-Turnover (Sit-Down) Restaurant	SF	13,445	71	58	83	49
933	Fast-Food Restaurant without Drive-Through	SF	3,032	76	55	22	21
936	Coffee/Donut Shop without Drive-Through	SF	3,600	171	164	58	58
937	Coffee/Donut Shop with Drive-Through	SF	2,435	219	180	108	95
Subtotal – All Trips				1290	1090	1668	1593
Internal Capture (20%/49%)				249	249	801	801
Total External Trip Generation				1041	841	867	792
<i>Pass-By Trips</i>				(293)	(243)	(495)	(426)

*Sites belonging to LUC 822 were analyzed separately because of a nonlinear fitted curve for trip generation.

5.2.2 Adjustments to Trip Generation Rates

Trip generation rates were adjusted for internal capture and pass-by trips as outlined below.

Internal Capture Trips

This development contains various development classifications and will have a significant amount of internal capture. Calculations for the internal capture rates reported in **Table 9** are based on the estimated internal capture rates reported by NCHRP 684 and the ITE Trip Generation Handbook².

Pass-By Trips

According to the ITE Trip Generation Handbook, pass-by trips are made as intermediate stops on the way from an origin to a primary trip destination without a route diversion. They are attracted from traffic passing the proposed site on an adjacent street that offers access to the development. As such, pass-by trips are not added to traffic directly generated by the site in question, as they would be on the road network if the site did not exist. Pass-by trips were diverted from Olive Boulevard and Lindbergh Boulevard through the Monsanto interchange and the Olive Boulevard intersections at Old Olive Street Road and Pavillion Drive. Calculations were based on estimated pass-by rates given by the Trip Generation Handbook. In cases where a pass-by rate was not available, the rate was estimated using similar land use cases. **Table 10** is a summary of the pass-by trips for the development.

² ITE Trip Generation Handbook, Institute of Transportation Engineers, Third Edition 2017.

Table 10 – Olivia Village Development Pass-by Trips

ITE Code	Land Use	AM Pass-By Rate %	PM Pass-By Rate %	AM Enter	AM Exit	PM Enter	PM Exit
160	Data Center	0%	0%	0	0	0	0
220	Multifamily Housing (Low-Rise)	0%	0%	0	0	0	0
221	Multifamily Housing (Mid-Rise)	0%	0%	0	0	0	0
310	Hotel	5%	5%	2	2	1	2
492	Health/Fitness Club	5%	5%	2	2	5	4
715	Single Tenant Office Building	0%	0%	0	0	0	0
760	Research and Development Center	0%	0%	0	0	0	0
814	Variety Store	22%	34%	1	0	2	2
822 (1)	Strip Retail Plaza (<40k)	25%	40%	4	2	12	12
822 (2)	Strip Retail Plaza (<40k)	25%	40%	10	7	38	38
850	Supermarket	18%	24%	33	27	75	75
861	Sporting Goods Superstore	25%	40%	4	1	13	14
876	Apparel Store	25%	40%	3	2	10	15
879	Arts and Crafts Store	25%	40%	3	3	8	9
920	Copy, Print, and Express Ship Store	25%	40%	2	1	5	6
930	Fast Casual Restaurant	22%	43%	5	5	139	114
931	Fine Dining Restaurant	20%	44%	2	2	55	27
932	High-Turnover (Sit-Down) Restaurant	22%	43%	16	13	36	21
933	Fast-Food Restaurant without Drive-Through	40%	45%	30	22	10	9
936	Coffee/Donut Shop without Drive-Through	40%	45%	68	66	26	26
937	Coffee/Donut Shop with Drive-Through	50%	55%	110	90	59	52
Total Pass-By Trips				293	243	495	426

5.2.3 Trip Distribution

Trip distribution involves taking the trips generated by the development in this study and determining which direction vehicles will arrive from and depart to in order to reach their final destinations. Trips generated by the proposed mixed-use development are estimated to primarily come from Olive Boulevard and Lindbergh Boulevard.

The trip distribution of traffic was estimated based upon existing developments and the existing traffic patterns on Olive Boulevard and Lindbergh Boulevard. A summary of the external traffic distribution (not including pass-by trips) from this estimation is as follows:

- To/From the north on Lindbergh Boulevard: 22%
- To/From the south on Lindbergh Boulevard: 22%
- To/From the west on Olive Boulevard: 22%
- To/From the east on Olive Boulevard: 22%
- To/From the east on Monsanto Drive: 4%
- To/From the north on Old Olive Street W: 4%
- To/From the north on Pavillion Drive: 4%

Pass-by trips are assumed to be generated primarily by Olive Boulevard and Lindbergh Boulevard and are estimated to have the following distribution:

- To/From the north on Lindbergh Boulevard: 25%
- To/From the south on Lindbergh Boulevard: 25%
- To/From the west on Olive Boulevard: 25%
- To/From the east on Olive Boulevard: 25%

These trip distribution assumptions were based upon ADT volumes and existing turning volumes for the study area.

5.2.4 Trip Assignment

Trip assignment involves assigning the distribution traffic to each individual intersection in the study area, both existing and proposed. This includes both entering and exiting trips in the morning and evening peak hours. The trip assignment assumptions were based on logic, assumed travel patterns, development layout and anticipated traffic delays. **Table 11** shows the resulting traffic assignment between the access points to the planned development. These assignments are based upon small differences in the delays between each intersection. Slight modifications to these assignments may occur if delays are lower at adjacent intersections as travelers attempt to minimize their delay entering or exiting the development.

Table 11 – Proposed Development Traffic Assignment

	External (Excludes Pass-By)			Pass-By		
	Old Olive W	Pavilion	Monsanto	Old Olive W	Pavilion	Monsanto
To/From north on US 67	0%	40%	60%	0%	40%	60%
To/From south on US 67	0%	30%	70%	0%	30%	70%
To/From west on MO 340	30%	60%	10%	30%	60%	10%
To/From east on MO 340	0%	85%	15%	0%	85%	15%
To/From east Monsanto	0%	0%	100%			
To/From north Olive W	90%	10%	0%			
To/From north Pavilion	0%	100%	0%			

Exhibit 5 shows the total change to traffic patterns in the study area from the trips generated by the site using the outlined trip generation, distribution, and assignment.

5.3 Future Build Forecasting

Using the estimated trip generation, assuming the proposed development has been constructed, traffic projections were produced by adding the development trips to the background volumes. Projections were made for the construction year (2028) and design year (2048). These volumes are shown in **Exhibit 6**, and **Exhibit 7**, respectively.

6 Analysis of Traffic and Improvements

The following section presents the results of the analysis of traffic for the proposed development, along with recommendations for alternative improvements.

6.1 Site Access Performance

As stated in Section 3.4, access to the proposed development is located along Olive Boulevard at Old Olive Street Road West and Pavillion Drive and along Lindbergh Boulevard at the Monsanto Drive interchange. Analysis results for the development access points are given below in Section 6.2 alongside results for the other study intersections.

6.2 Capacity and Level of Service Analysis

This subsection evaluates the delays and LOS of the study intersections with and without the forecasted traffic volumes of the proposed development.

6.2.1 Background (Future No-Build)

Future No-Build intersection analysis scenarios included AM and PM peak hours for 2028 and 2048. Forecasted volumes are shown in **Exhibit 3** and **Exhibit 4**. **Table 12** shows the intersection analysis results for the Future No-Build scenarios. **Table 13** shows the ramp analysis results for Lindbergh Boulevard. These results provide a baseline for comparison with the build scenarios.

Table 12 – No-Build Intersection Operational Analysis

Intersection	App.	2028				2048			
		Delay, s (LOS)		95th% Queue, ft		Delay, s (LOS)		95th% Queue, ft	
		AM	PM	AM	PM	AM	PM	AM	PM
Olive & Spoede	EB	20.2 (C)	31.4 (C)	485	662	22.4 (C)	38.4 (D)	576	810
	WB	3.4 (A)	3.9 (B)	115	119	4.4 (A)	5.0 (A)	127	132
	NB	33.8 (C)	35.5 (C)	105	151	37.2 (D)	37.5 (D)	126	165
	SB	44.8 (D)	45.3 (D)	34	36	45.3 (D)	45.4 (D)	37	37
	ALL	13.5 (B)	18.4 (B)			15.1 (B)	22.0 (C)		
Olive & Old Olive W	EB	8.9 (A)	18.1 (B)	240	237	11.3 (B)	20.9 (C)	314	252
	WB	0.7 (A)	8.9 (B)	6	591	1.3 (A)	15.4 (B)	17	871
	NB	27.0 (C)	32.1 (C)	31	87	26.3 (C)	32.4 (C)	33	97
	SB	29.2 (C)	39.6 (C)	142	223	32.1 (C)	46.1 (D)	152	333
	ALL	9.0 (A)	17.4 (B)			10.8 (B)	22.3 (C)		
Olive & Pavillion	EB	3.5 (A)	2.8 (A)	65	71	3.8 (A)	3.1 (A)	71	78
	WB	2.9 (A)	10.9 (B)	68	250	2.8 (A)	14.7 (B)	67	323
	NB	0.0 (A)	0.0 (A)	0	0	0.0 (A)	0.0 (A)	0	0
	SB	42.2 (D)	35.1 (D)	86	141	41.8 (D)	35.9 (D)	91	156
	ALL	4.3 (A)	9.1 (A)			4.4 (A)	11.3 (B)		
Olive & SB Lindbergh	EB	4.7 (A)	5.8 (A)	256	221	5.3 (A)	6.9 (A)	288	283
	WB	15.8 (B)	13.3 (B)	411	374	16.6 (B)	13.8 (B)	501	383
	NB	30.4 (C)	20.6 (C)	126	51	35.2 (D)	26.4 (C)	153	69
	ALL	11.9 (B)	10.6 (B)			13.0 (B)	11.7 (B)		
Olive & NB Lindbergh	EB	5.8 (A)	2.5 (A)	272	88	7.0 (A)	3.1 (A)	296	103
	WB	6.1 (A)	10.8 (B)	281	530	8.6 (A)	13.4 (B)	395	642
	NB	42.8 (D)	39.1 (D)	108	120	45.6 (D)	39.1 (D)	138	130
	ALL	10.3 (B)	10.7 (B)			12.2 (B)	12.2 (B)		
Olive & Old Olive E	EB	5.3 (A)	6.9 (A)	534	389	7.2 (A)	7.5 (A)	800	488
	WB	8.5 (A)	9.6 (A)	264	419	9.1 (A)	11.1 (B)	307	533
	SB	32.9 (C)	35.0 (C)	68	163	32.8 (C)	41.3 (D)	73	184
	ALL	7.5 (A)	10.8 (B)			8.8 (A)	12.4 (B)		
Lindbergh & Old Olive*	EB	34.0 (D)	23.2 (C)	63	40	50.5 (F)	29.3 (D)	95	58
	WB	21.7 (C)	107.9 (F)	58	393	27.6 (D)	206.4 (F)	83	593
Lindbergh / Monsanto Interchange (1)*	WB	0.0 (A)	0.0 (A)	0	0	0.0 (A)	0.0 (A)	0	0
Lindbergh / Monsanto Interchange (2)*	WB	6.7 (A)	6.5 (A)	5	3	6.7 (A)	6.5 (A)	5	3
	NB	6.8 (A)	6.7 (A)	3	3	6.8 (A)	6.7 (A)	3	3
Lindbergh / Monsanto Interchange (3)*	EB	7.2 (A)	7.1 (A)	3	3	7.2 (A)	7.1 (A)	3	3
	WB	0.0 (A)	7.1 (A)	0	0	0.0 (A)	7.1 (A)	0	0
	NB	7.5 (A)	7.4 (A)	5	3	7.5 (A)	7.4 (A)	5	3
Lindbergh / Monsanto Interchange (4)*	EB	7.2 (A)	7.3 (A)	2	1	7.2 (A)	7.3 (A)	3	2
	NB	7.0 (A)	7.0 (A)	4	1	7.1 (A)	7.0 (A)	5	1

* Unsignalized intersection, HCM6 delay/LOS/queue reported for stopped approach only.

Based upon the intersection analysis, the existing roadway network works efficiently with all intersections at LOS C or better and all approaches at LOS D or better, with the exception of the intersection of Lindbergh and Old Olive Street. The intersection of Lindbergh and Old Olive Street will be improved as part of the 39 North Development, which is included in the build analysis.

Table 13 – No-Build Lindbergh Operational Analysis

		Segment		Type	LOS		Speed (mph)		Density (pc/mi/ln)	
		From	To		AM	PM	AM	PM	AM	PM
2028	NB	Monsanto Off		Diverge	B	B	43.5	43.5	21.3	19.1
		Monsanto On	Olive Off	Weaving	B	B	39.5	39.4	15.0	14.0
		Olive On		Merge	B	B	44.0	44.0	17.0	15.9
	SB	Olive Off		Diverge	B	B	43.0	43.1	25.3	21.4
		Olive On		Merge	B	B	44.0	44.0	24.3	23.3
		Monsanto On	Monsanto Off	Weaving	B	B	41.0	41.3	17.7	16.8
2048	NB	Monsanto Off		Diverge	B	B	43.5	43.5	23.6	21.1
		Monsanto On	Olive Off	Weaving	B	B	38.9	38.9	16.8	15.7
		Olive On		Merge	B	B	44.0	44.0	18.8	17.5
	SB	Olive Off		Diverge	B	B	43.0	43.1	28.0	23.7
		Olive On		Merge	C	C	44.0	44.0	26.8	25.8
		Monsanto On	Monsanto Off	Weaving	B	B	40.6	41.0	19.8	18.7

Based on the ramp analysis, the existing ramps on Lindbergh Boulevard also work efficiently with all segments operating at LOS B or better, except for the southbound on-ramp from Olive Boulevard which falls to LOS C in 2048. This is due to a slight increase in traffic density of approximately 2.5 pc/mi/ln from 2028. The density increase has a negligible effect on travel speed.

6.2.2 Future Build

With the addition of the Olia Village Development the entrance located at Olive Boulevard and Pavillion Drive will require modifications to provide access. This includes the addition of a westbound left turn lane within the existing median and the modification of the southbound approach to a left turn lane and a shared through/right turn lane. The additional intersection on the west side of the Lindbergh-Monsanto interchange was also analyzed, assuming stop control for all approaches. The new intersection and existing intersection directly south are referred to as (2.2) and (2.1), as shown in the image below.



Future Build analysis scenarios included AM and PM peak hours for 2028 and 2048. Forecasted volumes are shown in **Exhibit 6** and **Exhibit 7**. **Table 14** shows the intersection analysis results for the Future Build scenarios. **Table 15** shows the ramp analysis results for Lindbergh Boulevard.

Table 14 – Build Intersection Operational Analysis

Intersection	App.	2028				2048			
		Delay, s (LOS)		95th% Queue, ft		Delay, s (LOS)		95th% Queue, ft	
		AM	PM	AM	PM	AM	PM	AM	PM
Olive & Spoede	EB	11.6 (B)	27.8 (C)	482	666	14.5 (B)	33.4 (C)	588	802
	WB	3.3 (A)	8.8 (A)	134	166	4.5 (A)	14.9 (B)	143	167
	NB	52.9 (D)	28.7 (C)	134	135	52.6 (D)	29.9 (C)	146	147
	SB	50.4 (D)	36.0 (D)	35	32	50.2 (D)	36.0 (D)	38	33
	ALL	10.7 (B)	18.7 (B)			12.5 (B)	24.2 (C)		
Olive & Old Olive W	EB	11.3 (B)	14.6 (B)	227	318	12.5 (B)	18.7 (B)	280	320
	WB	15.4 (B)	26.9 (C)	377	551	17.7 (B)	53.5 (D)	548	893
	NB	43.5 (D)	47.9 (D)	85	121	43.0 (D)	49.0 (D)	85	130
	SB	31.2 (C)	38.0 (D)	207	340	34.3 (C)	54.2 (D)	243	439
	ALL	16.5 (B)	24.5 (C)			18.2 (B)	39.8 (D)		
Olive & Pavillion	EB	14.8 (B)	14.7 (B)	257	393	19.3 (B)	19.0 (B)	596	524
	WB	19.7 (B)	14.2 (B)	465	377	19.8 (B)	16.3 (B)	468	380
	NB	40.8 (D)	30.1 (C)	204	170	40.8 (D)	29.5 (C)	204	170
	SB	53.7 (D)	40.6 (D)	84	136	53.5 (D)	41.6 (D)	89	151
	ALL	21.1 (C)	17.5 (B)			23.0 (C)	20.0 (B)		
Olive & SB Lindbergh	EB	6.8 (A)	12.2 (B)	148	303	7.1 (A)	14.2 (B)	151	368
	WB	10.9 (B)	16.1 (B)	216	406	11.5 (B)	16.5 (B)	225	436
	NB	43.7 (D)	39.6 (D)	154	154	46.0 (D)	42.6 (D)	163	155
	ALL	12.5 (B)	16.2 (B)			13.0 (B)	17.4 (B)		
Olive & NB Lindbergh	EB	4.1 (A)	5.2 (A)	175	151	5.2 (A)	5.7 (A)	197	164
	WB	6.6 (A)	10.7 (B)	283	531	8.1 (A)	13.3 (B)	394	613
	NB	47.3 (D)	42.9 (D)	155	165	49.8 (D)	46.1 (D)	174	177
	ALL	11.0 (B)	12.7 (B)			12.4 (B)	14.5 (B)		
Olive & Old Olive E	EB	3.5 (A)	6.7 (A)	251	456	5.0 (A)	8.8 (A)	120	556
	WB	6.0 (A)	9.8 (A)	277	520	6.5 (A)	11.5 (B)	321	627
	SB	41.8 (D)	48.2 (D)	72	163	41.9 (D)	53.1 (D)	77	179
	ALL	5.6 (A)	11.8 (B)			6.7 (A)	14.0 (B)		
Lindbergh & Old Olive	EB	36.6 (D)	21.1 (C)	100	83	40.4 (D)	23.1 (C)	118	98
	WB	36.3 (D)	58.1 (E)	121	487	46.3 (D)	67.6 (E)	156	593
	NB	8.5 (A)	16.4 (B)	353	486	9.9 (A)	19.1 (B)	417	570
	SB	10.0 (A)	20.8 (C)	681	735	13.5 (B)	28.2 (C)	909	930
	ALL	11.3 (B)	23.8 (C)			14.4 (B)	28.5 (C)		
Lindbergh / Monsanto Interchange (1)*	WB	9.1 (A)	9.0 (A)	3	3	9.1 (A)	9.0 (A)	3	3
Lindbergh / Monsanto Interchange (2.1)*	WB	9.8 (A)	9.1 (A)	38	30	9.9 (A)	9.1 (A)	40	30
	NB	9.6 (A)	9.0 (A)	30	23	9.6 (A)	9.0 (A)	30	23
	SB	9.9 (A)	9.5 (A)	23	20	9.9 (A)	9.5 (A)	23	20
Lindbergh / Monsanto Interchange (2.2)*	EB	10.6 (B)	10.1 (B)	48	40	10.8 (B)	10.1 (B)	48	40
	NB	13.7 (B)	11.7 (B)	88	60	13.8 (B)	11.7 (B)	90	60
Lindbergh / Monsanto Interchange (3)*	EB	8.7 (A)	8.7 (A)	28	25	8.7 (A)	8.8 (A)	28	28
	WB	8.0 (A)	8.2 (A)	3	3	8.1 (A)	8.2 (A)	3	3
	NB	9.9 (A)	10.7 (B)	35	48	10.0 (B)	10.8 (B)	35	48
Lindbergh / Monsanto Interchange (4)*	EB	7.3 (A)	7.4 (A)	5	3	7.3 (A)	7.4 (A)	5	3
	NB	7.2 (A)	7.1 (A)	4	1	7.2 (A)	7.1 (A)	5	1

* Unsignalized intersection, HCM6 delay/LOS/queue reported for stopped approach only.

Based upon the intersection analysis of the build scenario the existing roadway network generally works efficiently with most intersections at LOS C or better and all approaches at LOS D or better. The intersection Lindbergh and Old Olive Street works better with the proposed signalization, including significant reduction in delay for the eastbound and westbound approaches.

The only intersection that does not operate at a LOS C or better is the intersection of Olive Boulevard and Old Olive Street (West), which operates at LOS D during the 2048 PM peak hour. The delay at this intersection during the PM peak hour is driven in part by a heavy southbound right turn movement, driven by background growth and unrelated to the proposed development. A future improvement to address this intersection is reviewed in Section 6.3.

Table 15 – Build Lindbergh Operational Analysis

		Segment		Type	LOS		Speed (mph)		Density (pc/mi/ln)	
		From	To		AM	PM	AM	PM	AM	PM
2028	NB	Monsanto Off		Diverge	B	B	43.4	43.5	23.5	20.2
		Monsanto On	Olive Off	Weaving	B	B	37.6	37.7	17.3	15.6
		Olive On		Merge	B	B	44.0	44.0	18.5	16.7
	SB	Olive Off		Diverge	C	B	43.0	43.1	27.5	22.5
		Olive On		Merge	C	C	44.0	44.0	26.6	24.7
		Monsanto On	Monsanto Off	Weaving	B	B	37.7	38.4	22.4	20.4
2048	NB	Monsanto Off		Diverge	C	B	43.4	43.5	25.7	22.2
		Monsanto On	Olive Off	Weaving	B	B	37.0	37.3	19.3	17.3
		Olive On		Merge	B	B	44.0	44.0	20.3	18.3
	SB	Olive Off		Diverge	C	B	43.0	43.0	30.2	24.8
		Olive On		Merge	C	C	43.9	44.0	29.3	27.1
		Monsanto On	Monsanto Off	Weaving	C	B	37.3	38.1	24.7	22.4

Based on the ramp analysis of the build scenario, the Lindbergh Boulevard ramps continue to operate efficiently with all segments at LOS C or better. Compared to the no-build scenario, there are slight increases in density and reductions in travel speed, with the largest difference on the weaving segments. The largest increase in density, 4.9 pc/mi/ln, occurs on the southbound weaving segment. Speed decreases at most 3.3 mph, also on the southbound weaving segment. Changes in speed on the merge and diverge segments are negligible.

6.3 Proposed Improvements

With the existing heavy evening southbound to westbound right turn movement at the Old Olive Street intersection, the addition of a separate right turn lane, as shown below in **Figure 6**, was analyzed to determine if improved operations would result for the overall intersection.

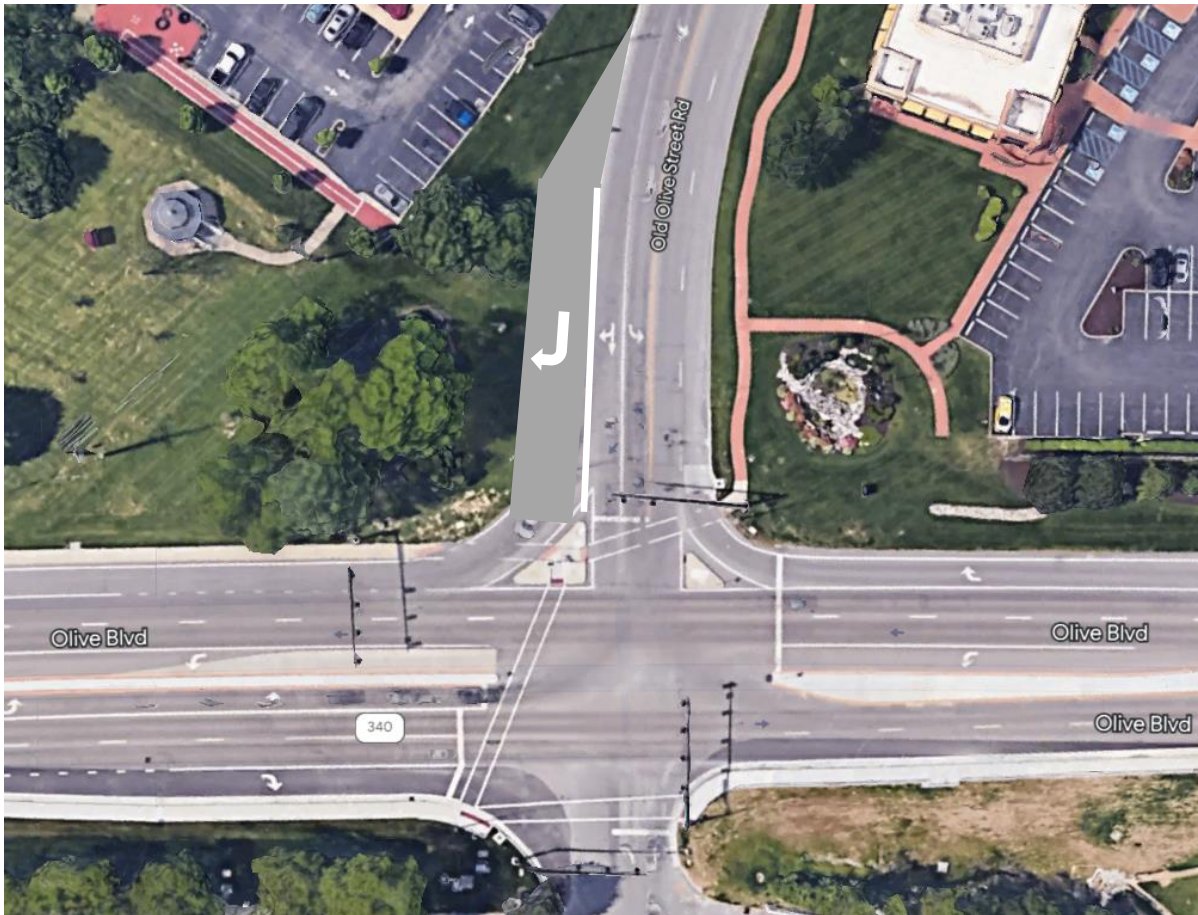


Figure 6 – Southbound Old Olive Street (West) Right Turn Lane

6.3.1 Future Build with Improvements

Table 16 shows the impact that the additional southbound right turn lane on Old Olive Street has on the overall intersection operations with Future Build scenario.

Table 16 – Build Operational Analysis with Old Olive Street Improvement

Intersection	App.	2028				2048			
		Delay, s (LOS)		95th% Queue, ft		Delay, s (LOS)		95th% Queue, ft	
		AM	PM	AM	PM	AM	PM	AM	PM
Olive & Old Olive W (with SB RT Lane)	EB	11.3 (B)	14.6 (B)	227	318	12.5 (B)	18.7 (B)	280	320
	WB	15.4 (B)	26.9 (C)	377	551	17.7 (B)	53.2 (D)	548	893
	NB	40.3 (D)	39.6 (D)	85	121	39.8 (D)	40.5 (D)	85	130
	SB	23.3 (C)	28.5 (C)	124	210	24.0 (C)	36.1 (D)	135	318
	ALL	15.4 (B)	22.8 (C)			16.7 (B)	36.8 (D)		

Without the additional southbound right turn lane, the southbound approach at the Olive & Old Olive intersection first experiences excessive delays on some movements (greater than 55 seconds,

or LOS E) at around the year 2048. While not initially necessary, this lane addition keeps delays within reasonable limits and, while LOS does not change, provides an improvement in the 2048 scenario of almost 20 seconds of delay on the southbound approach. The additional turn lane does not have a big impact on the 2028 scenario and is not required until later.

7 Recommendations and Conclusion

Based upon the analysis of the traffic impacts of the Olia Village Development, there are some improvements along the existing roadway network that will be required to adequately accommodate the anticipated traffic demands. The improvements to the Lindbergh and Old Olive Street intersection are not included in this section as they were taken from the 39 North project.

Olive Boulevard & Pavillion Drive

The future south leg of this intersection will provide one of the main entrances into the development. The proposed site plan includes a three lane northbound approach that includes separate left turn, through, and right turn lanes. Modifications to the westbound leg includes the addition of the left turn lane, through the removal of the existing median, and upgrades to signal equipment. This left turn lane is recommended to be 500 feet long to accommodate the anticipated left turn queue. The southbound approach is recommended to be modified through the conversion of the existing right turn lane to a shared through / right turn lane. This will require the removal of a portion of the existing channelizing island to allow for the through movement. Relocation of the drainage structure and pull box will also be necessary. With this intersection becoming a four-legged intersection, the north and south approaches are recommended to have protected/permissive left turn phasing, including flashing yellow arrows. Sight distances for the new permissive left turns are not expected to be a concern but should be reviewed during plan development for these improvements.

Olive Boulevard & Old Olive Street (West)

The Olive Boulevard & Old Olive Street (West) intersection will provide a secondary entrance into the development. There are no additional lanes initially required at this intersection. The connection to the site should be moved further south about 100 feet to align with the front of the Schnucks to allow for better operations of the intersection. Signal phasing modifications are recommended, consisting of implementing protected/permissive left turn phasing on the north and south approaches, including flashing yellow arrows. In the future, increased traffic volumes may necessitate the addition of a separate southbound right turn lane to accommodate this heavy evening peak hour movement, but this improvement is not required upon completion of the development.

Lindbergh Boulevard and Monsanto Drive Interchange

The existing Monsanto interchange with Lindbergh Boulevard has ample capacity to accommodate the traffic demands that are expected to utilize this access point to the development. Aside from

the additional intersection providing access to the development, no additional improvements are recommended here.



SITE TABULATIONS				
R1	1-STORY GROCERY	67,238 SF	289 SPACES	
R2	2-STORY RETAIL	50,000 SF	200 SPACES	
R3A	1-STORY RETAIL	7,068 SF	28 SPACES	
R3B	1-STORY DINING W/ PATIO	11,225 SF	111 SPACES	
R4	DINING WITH PATIO	7,542 SF	75 SPACES	
SUB:		143,073 SF	684 SPACES	
MU1A	SW COM W/ DRIVE-THRU	2,435 SF	10 SPACES	
MU1B	SIDEWALK COMMERCIAL	4,245 SF	17 SPACES	
MU1C	SIDEWALK COMMERCIAL	3,654 SF	15 SPACES	
MU1D	SIDEWALK COMMERCIAL	3,600 SF	14 SPACES	
SUB:		14,722 SF	59 SPACES	
MU2	4-STORY APARTMENTS	303,633 SF	452 SPACES	276 APT UNITS
MU2A	SIDEWALK COMMERCIAL	3,351 SF	14 SPACES	
MU2B	SIDEWALK COMMERCIAL	7,204 SF	29 SPACES	
MU2C	SIDEWALK COMMERCIAL	3,580 SF	15 SPACES	
MU2D	SIDEWALK COMMERCIAL	2,559 SF	11 SPACES	
MU2E	SIDEWALK COMMERCIAL	2,898 SF	12 SPACES	
MU2F	SIDEWALK COMMERCIAL	21,637 SF	87 SPACES	
MU2G	SIDEWALK COMMERCIAL	3,098 SF	13 SPACES	
MU2H	SIDEWALK COMMERCIAL	6,562 SF	27 SPACES	
MU2J	SIDEWALK COMMERCIAL	6,228 SF	25 SPACES	
SUB:		360,780 SF	685 SPACES	
MU3	2-STORY OFFICE	49,108 SF	162 SPACES	
MU3A	DINING WITH PATIO	10,226 SF	103 SPACES	
MU3B	DINING WITH PATIO	11,341 SF	113 SPACES	
SUB:		70,675 SF	378 SPACES	
MU4	4-STORY APARTMENTS	184,179 SF	288 SPACES	167 APT UNITS
MU4A	SIDEWALK COMMERCIAL	3,002 SF	12 SPACES	
MU4B	SIDEWALK COMMERCIAL	5,825 SF	24 SPACES	
MU4C	2-STORY RETAIL	34,928 SF	190 SPACES	(+ 100 CARS)
SUB:		227,934 SF	514 SPACES	
MU5	4-STORY APARTMENTS	241,416 SF	387 SPACES	219 APT UNITS
MU5A	SIDEWALK COMMERCIAL	3,161 SF	13 SPACES	
MU5B	SIDEWALK COMMERCIAL	3,544 SF	14 SPACES	
MU5C	SIDEWALK COMMERCIAL	15,096 SF	61 SPACES	
MU5D	SIDEWALK COMMERCIAL	3,032 SF	12 SPACES	
MU5E	SIDEWALK COMMERCIAL	4,761 SF	19 SPACES	
SUB:		270,010 SF	486 SPACES	
CC1	CLIMATE CONTROL STOR	90,849 SF	0 SPACES	
MF1	3.5-STORY APARTMENTS	216,761 SF	334 SPACES	197 APT UNITS
MF2	3.5-STORY APARTMENTS	139,618 SF	205 SPACES	127 APT UNITS
CC2	CLIMATE CONTROL STOR	23,431 SF	0 SPACES	
SUB:		470,659 SF	539 SPACES	
A1	AMENITY BUILDING	55,549 SF	222 SPACES	
DC1	2-STORY DATA CENTER	36,476 SF	21 SPACES	
OB1	OFFICE BUILDING	145,500 SF		
H1	5-STORY HOTEL	81,470 SF	123 SPACES	123 KEYS
H2	6-STORY HOTEL	66,510 SF	128 SPACES	128 KEYS
SUB:		148,250 SF	251 SPACES	251 KEYS
MOB	2-STORY OFFICE	64,618 SF	214 SPACES	
G1	4-STORY GARAGE	94,340 SF		278 SPACES
G2	5-STORY GARAGE	289,345 SF		870 SPACES
G3	5-STORY GARAGE	128,675 SF		390 SPACES
G4	5-STORY GARAGE	128,675 SF		390 SPACES
G5	4-STORY GARAGE	125,548 SF		400 SPACES
G6	5-STORY GARAGE	128,675 SF		390 SPACES
G7	3-STORY GARAGE	61,460 SF		196 SPACES
G8	2-STORY GARAGE	60,338 SF		140 SPACES
SUB:		1,017,076 SF		3,054 SPACES
TH	TOWNHOMES			130 UNITS
	GREENHOUSES	21,250 SF		

OLIA VILLAGE

THE HEART OF CREVE COEUR

OLIA VILLAGE

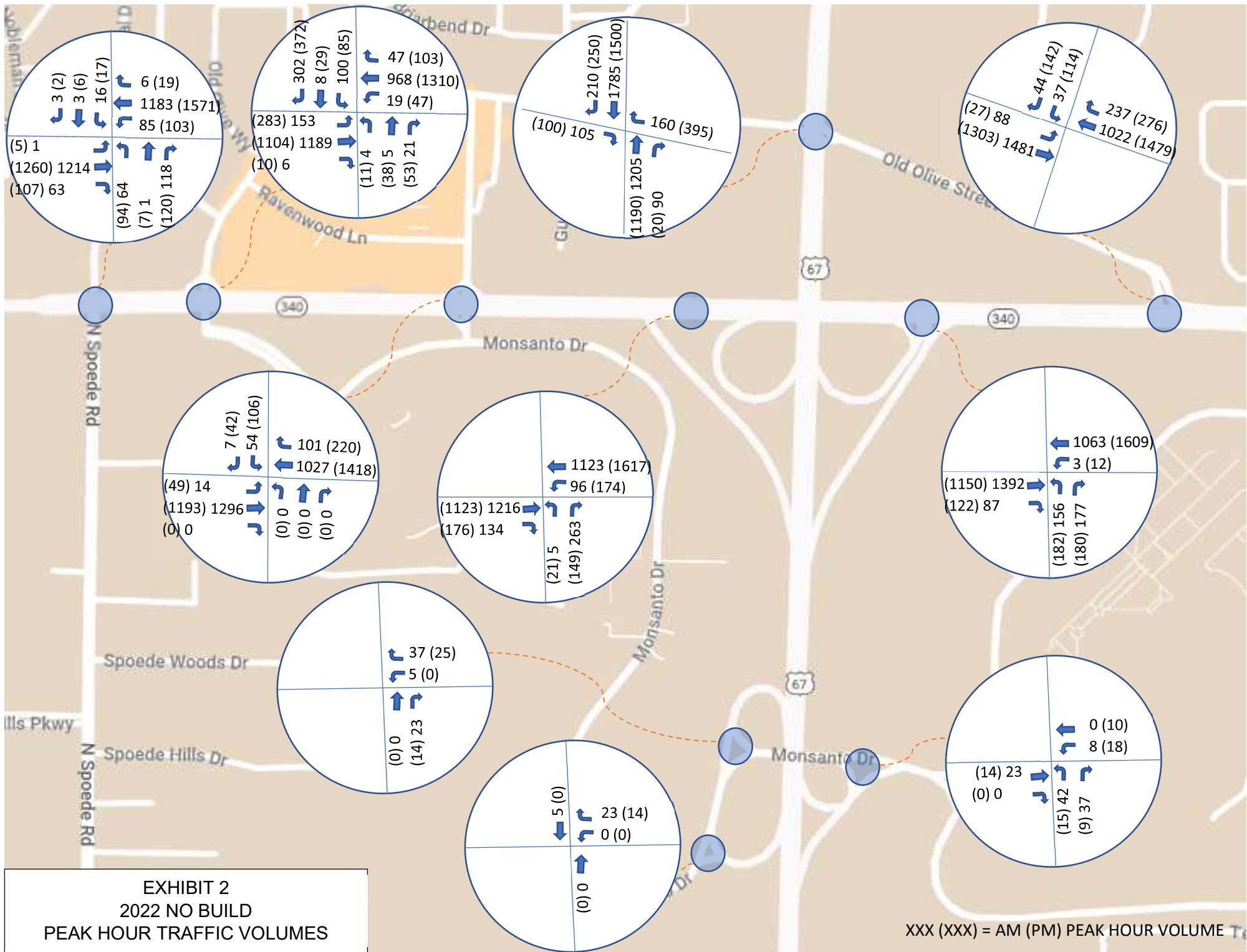
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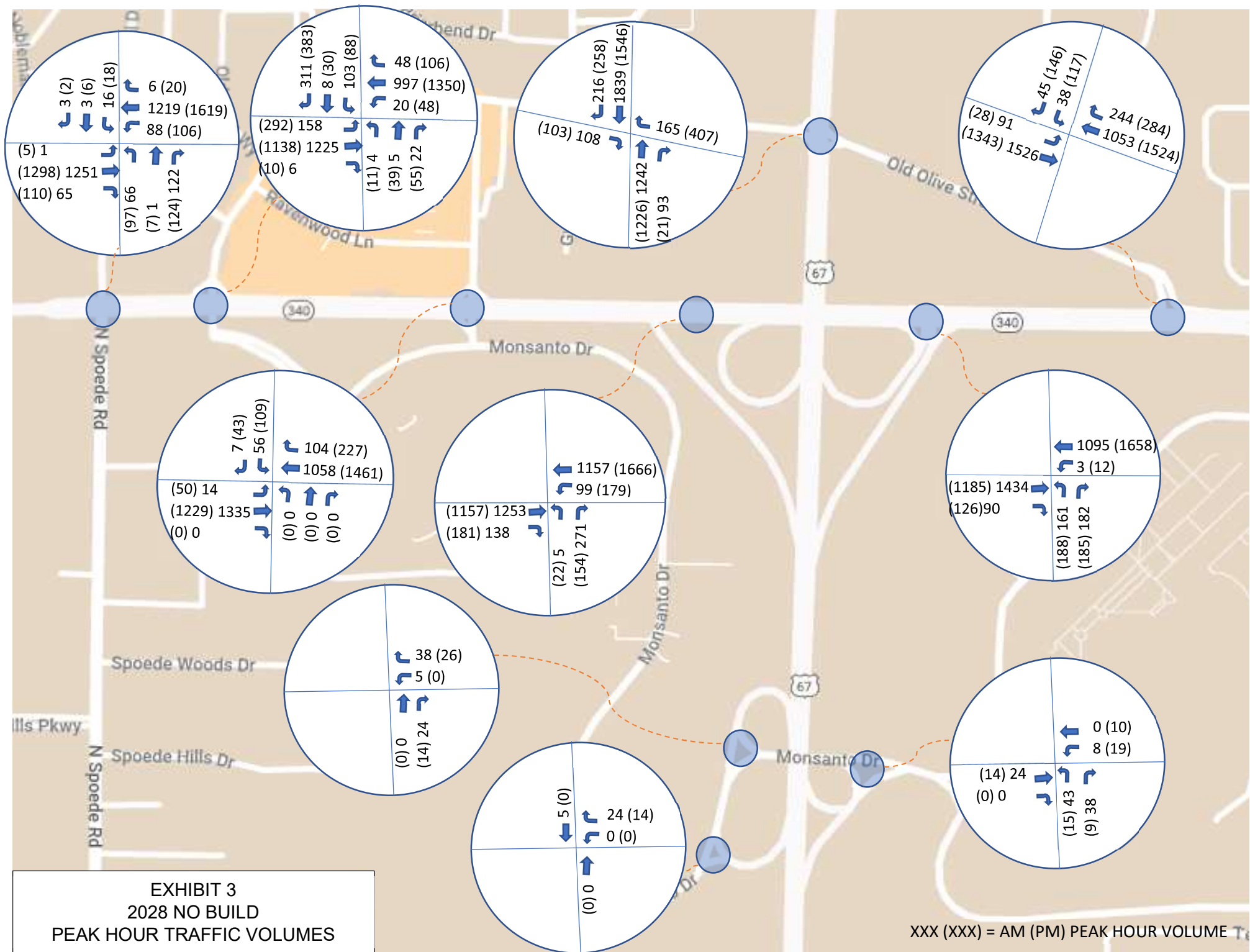
MASTER PLAN

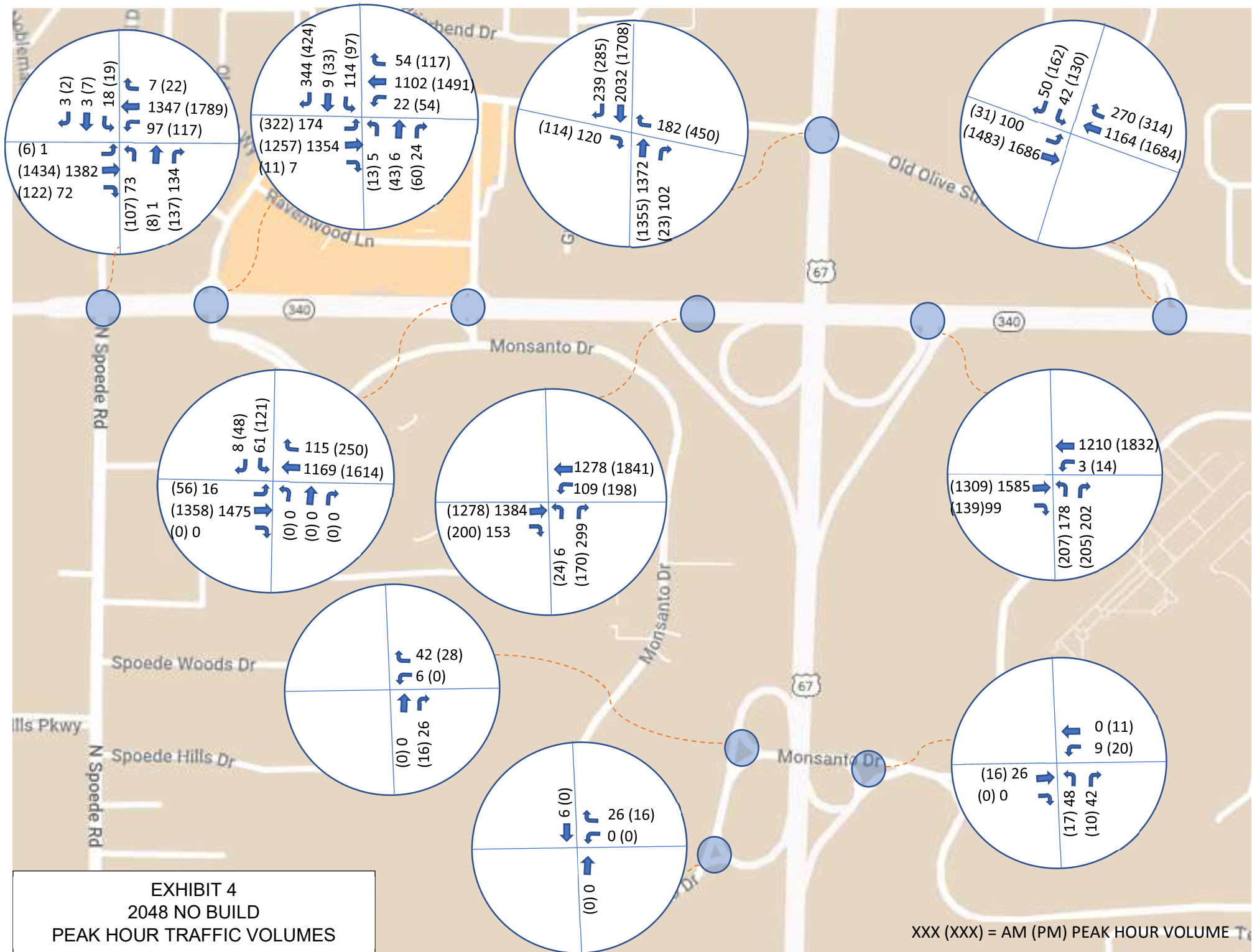
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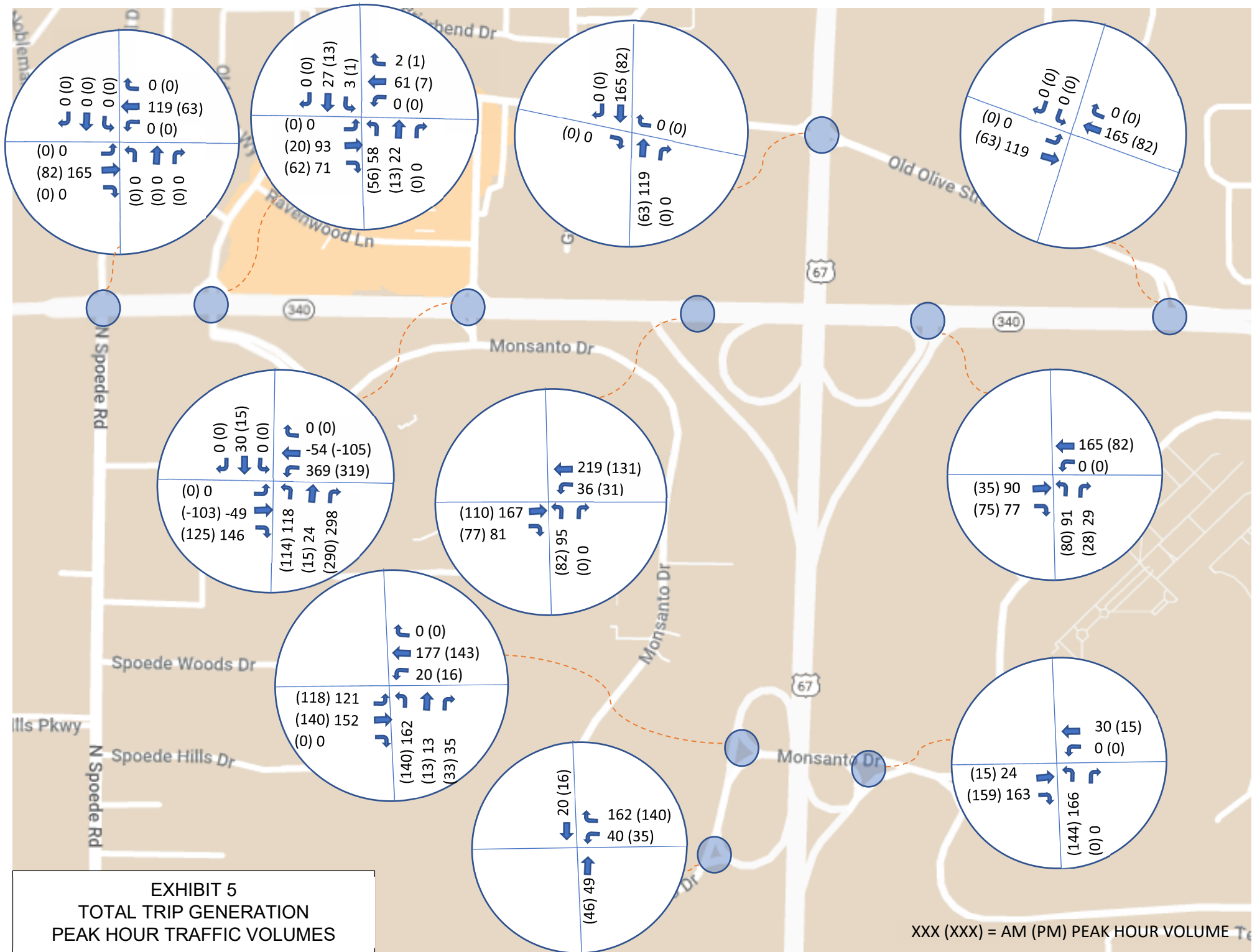
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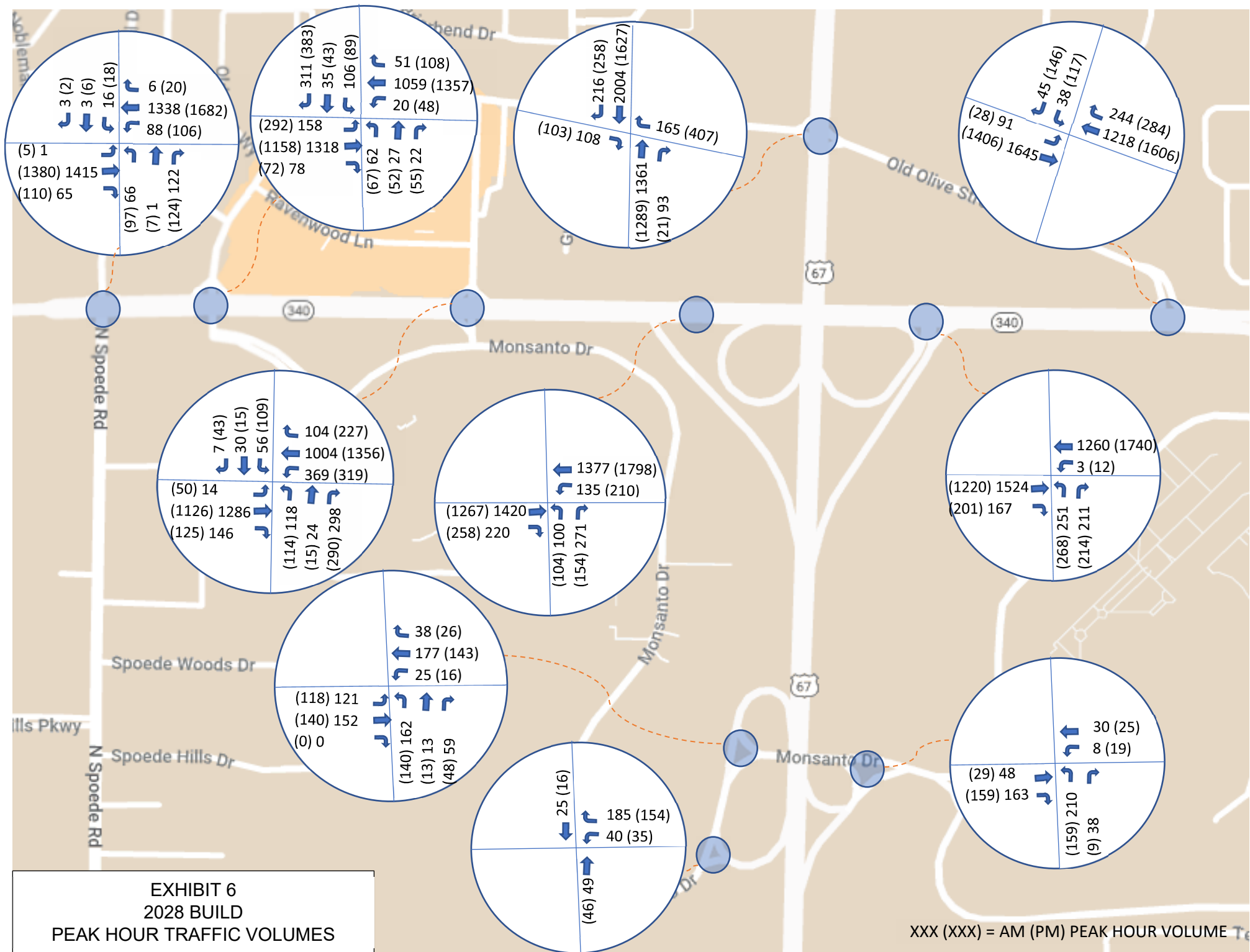


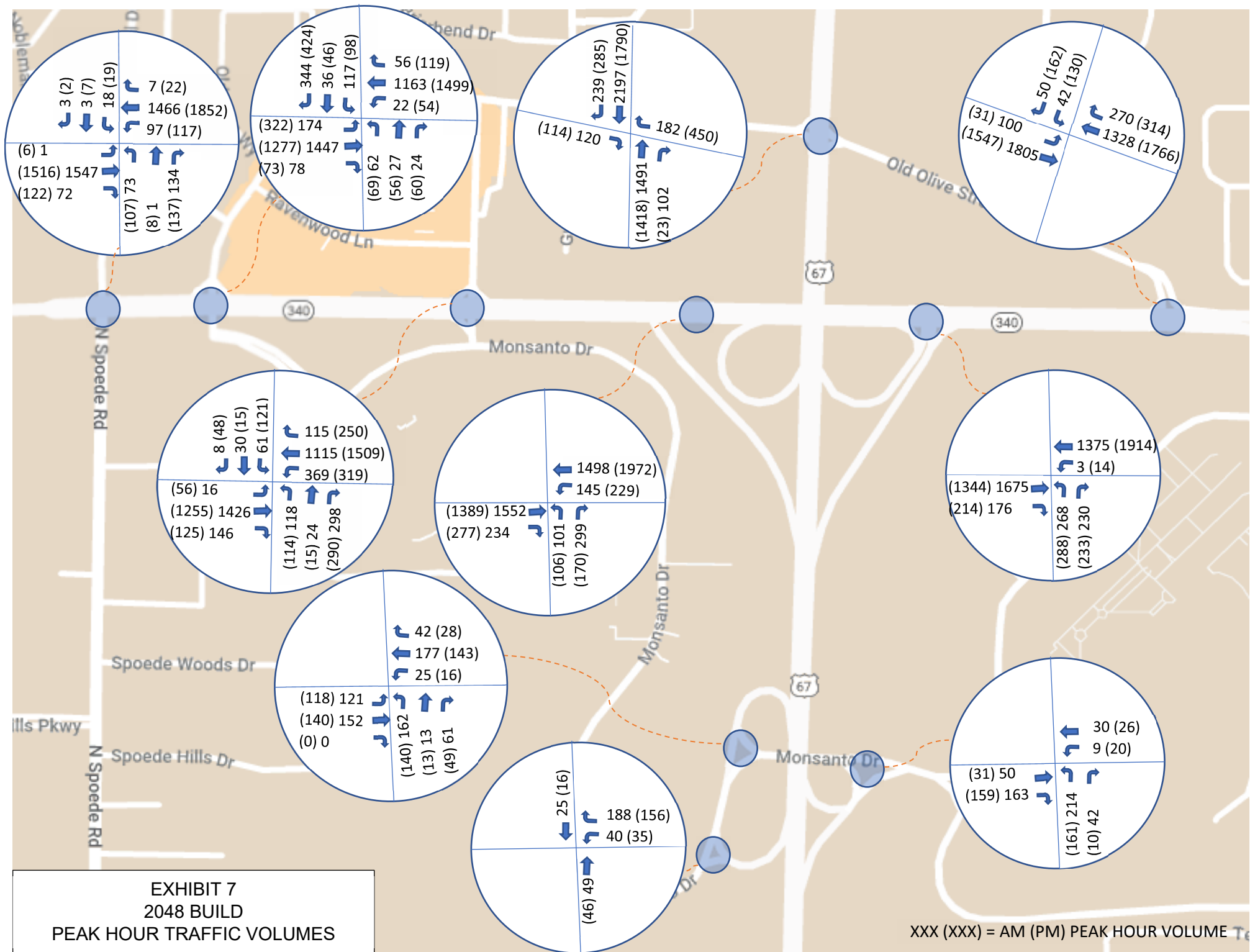












Appendix A

Trip Generation Reports and Graphs

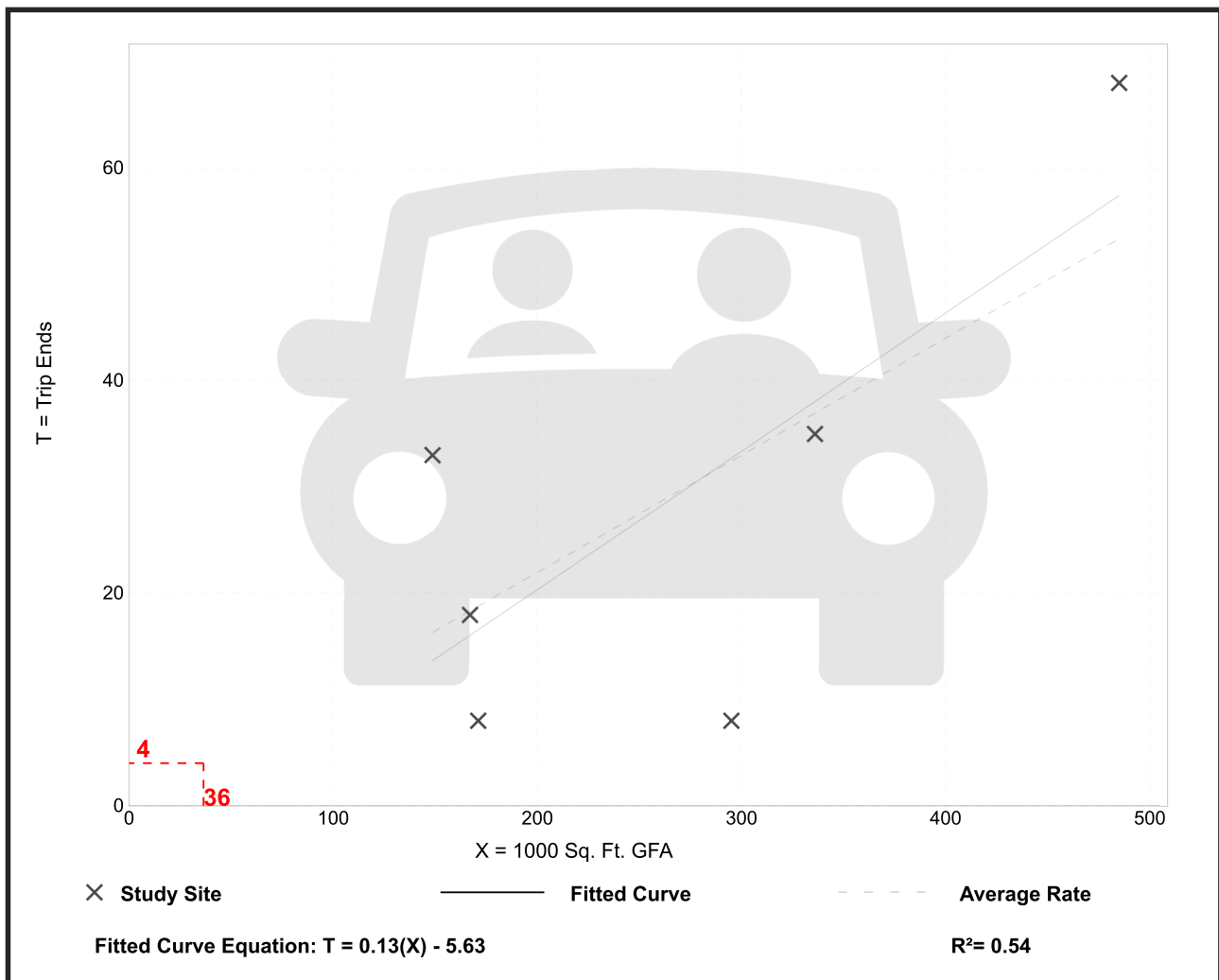
Data Center (160)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 6
 Avg. 1000 Sq. Ft. GFA: 267
 Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.11	0.03 - 0.22	0.06

Data Plot and Equation



Data Center (160)

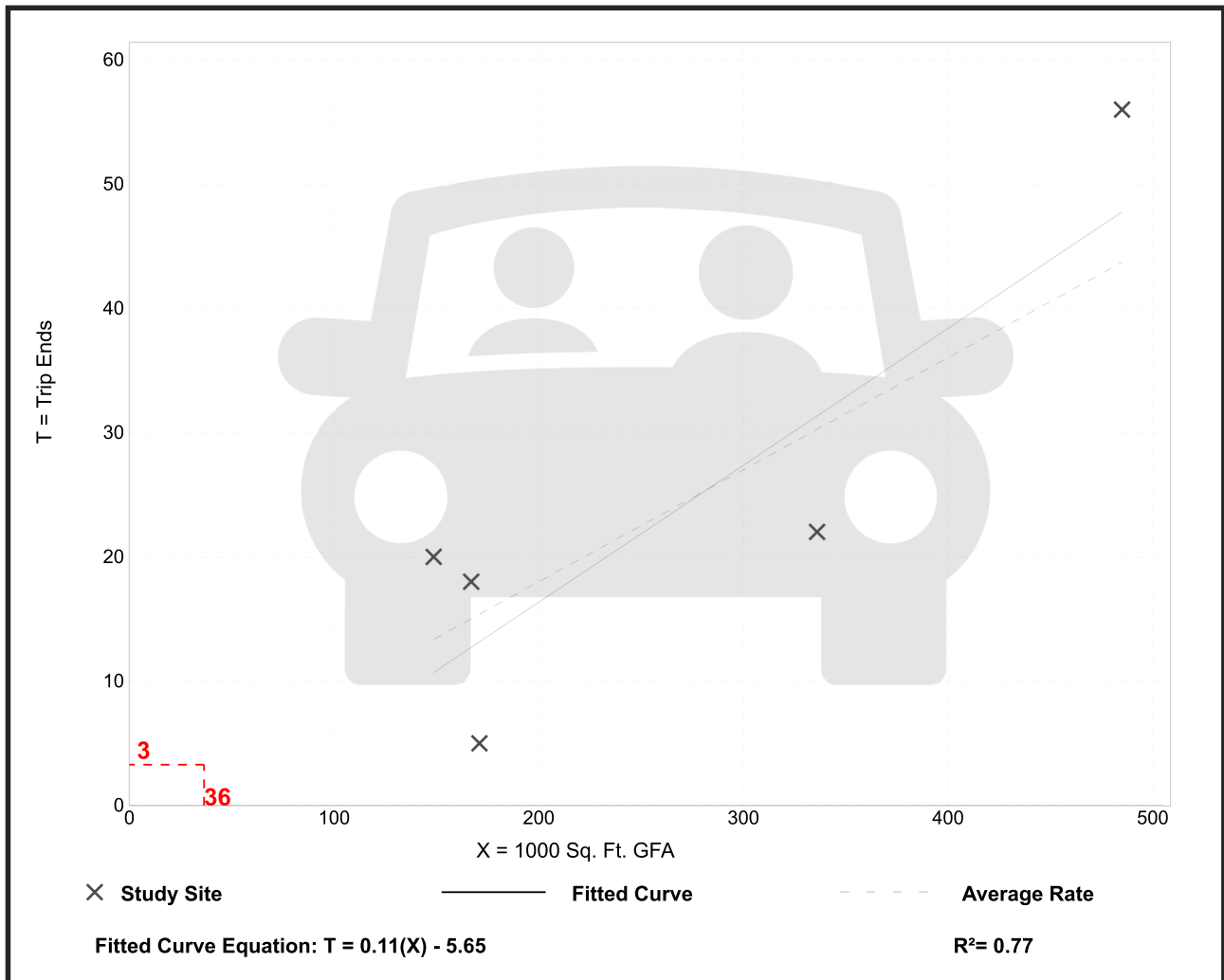
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GFA: 262
 Directional Distribution: 30% entering, 70% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.09	0.03 - 0.13	0.04

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: Dense Multi-Use Urban

Number of Studies: 7

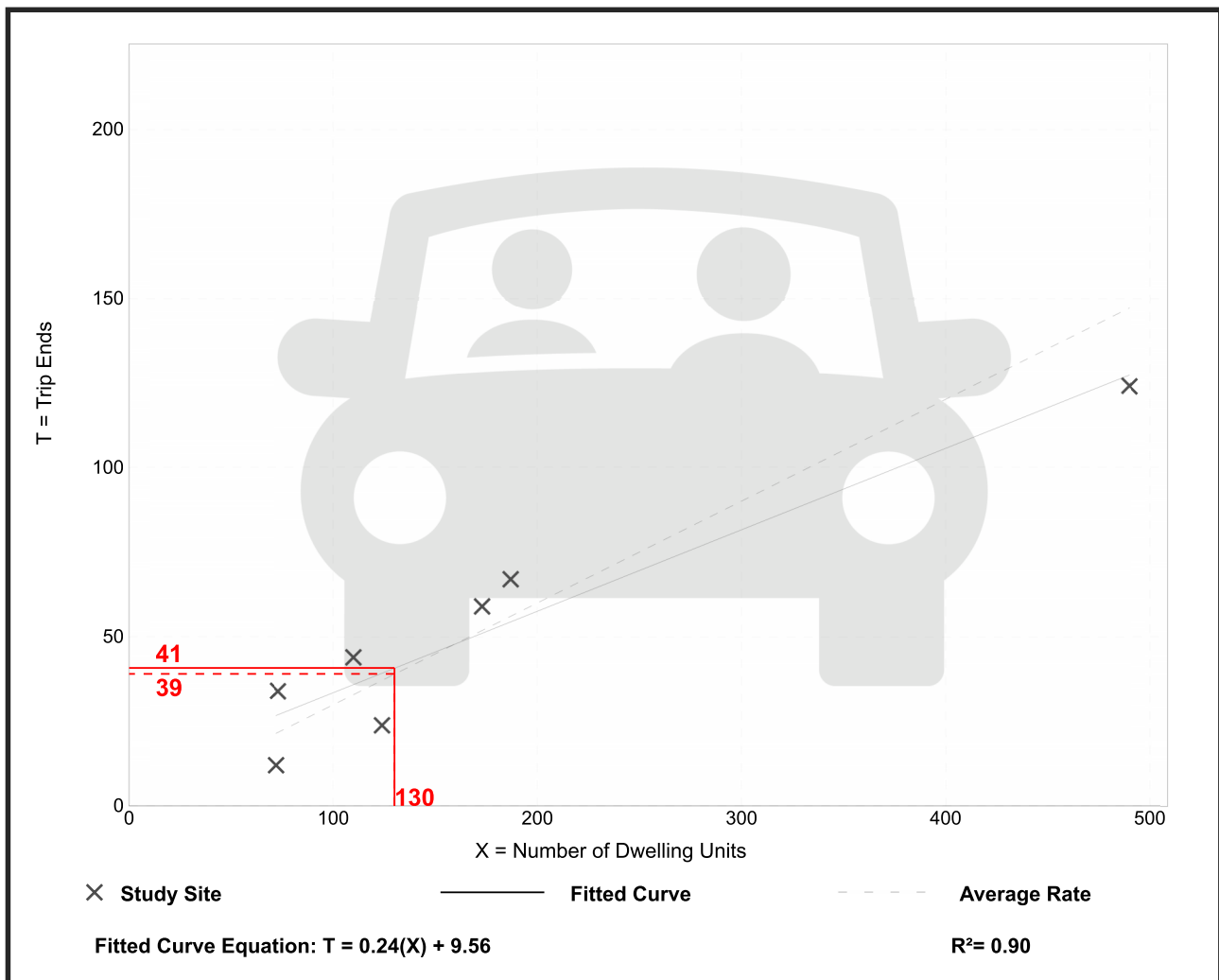
Avg. Num. of Dwelling Units: 176

Directional Distribution: 10% entering, 90% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.30	0.17 - 0.47	0.09

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: Dense Multi-Use Urban

Number of Studies: 7

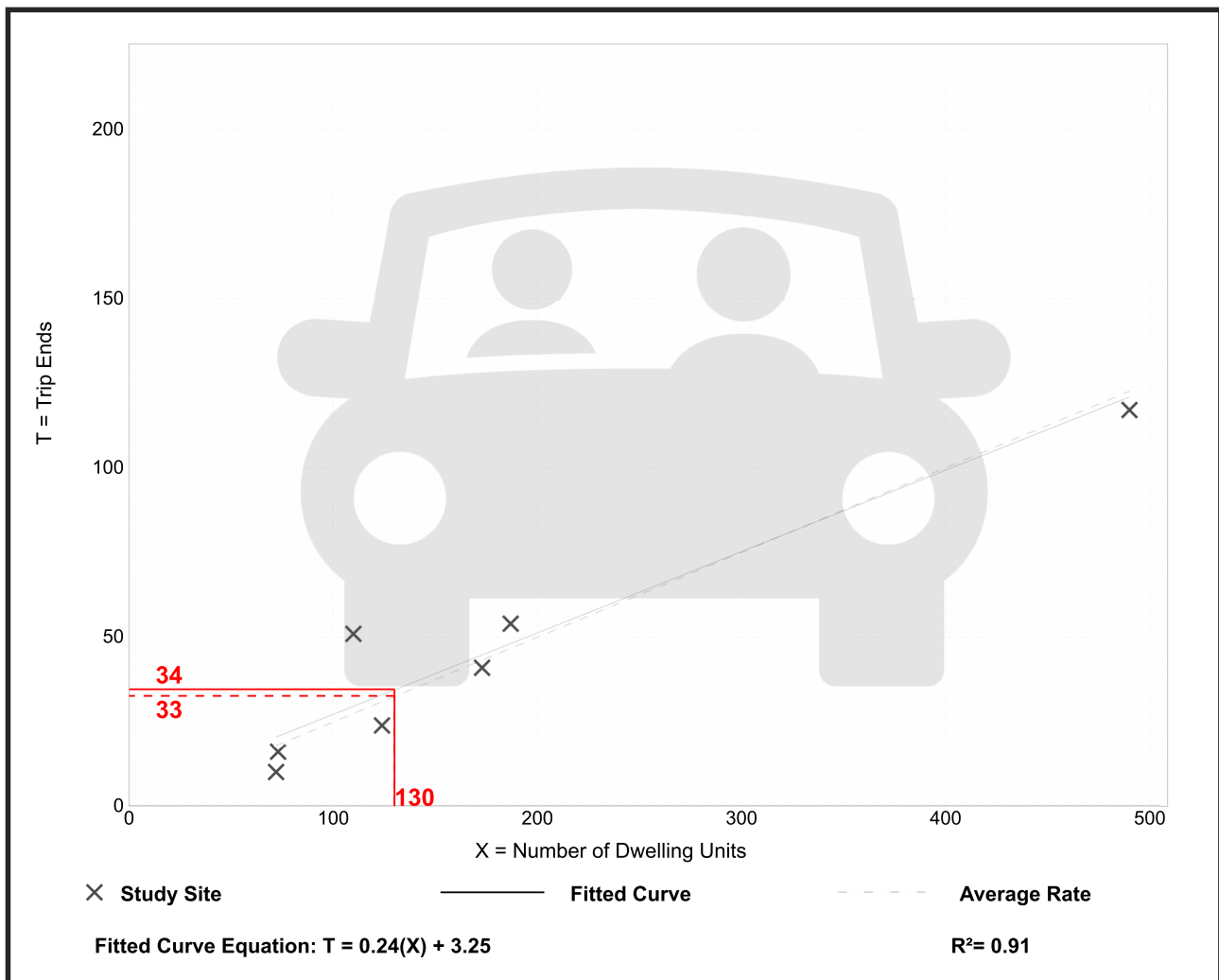
Avg. Num. of Dwelling Units: 176

Directional Distribution: 90% entering, 10% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.25	0.14 - 0.46	0.08

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Setting/Location: Dense Multi-Use Urban

Number of Studies: 15

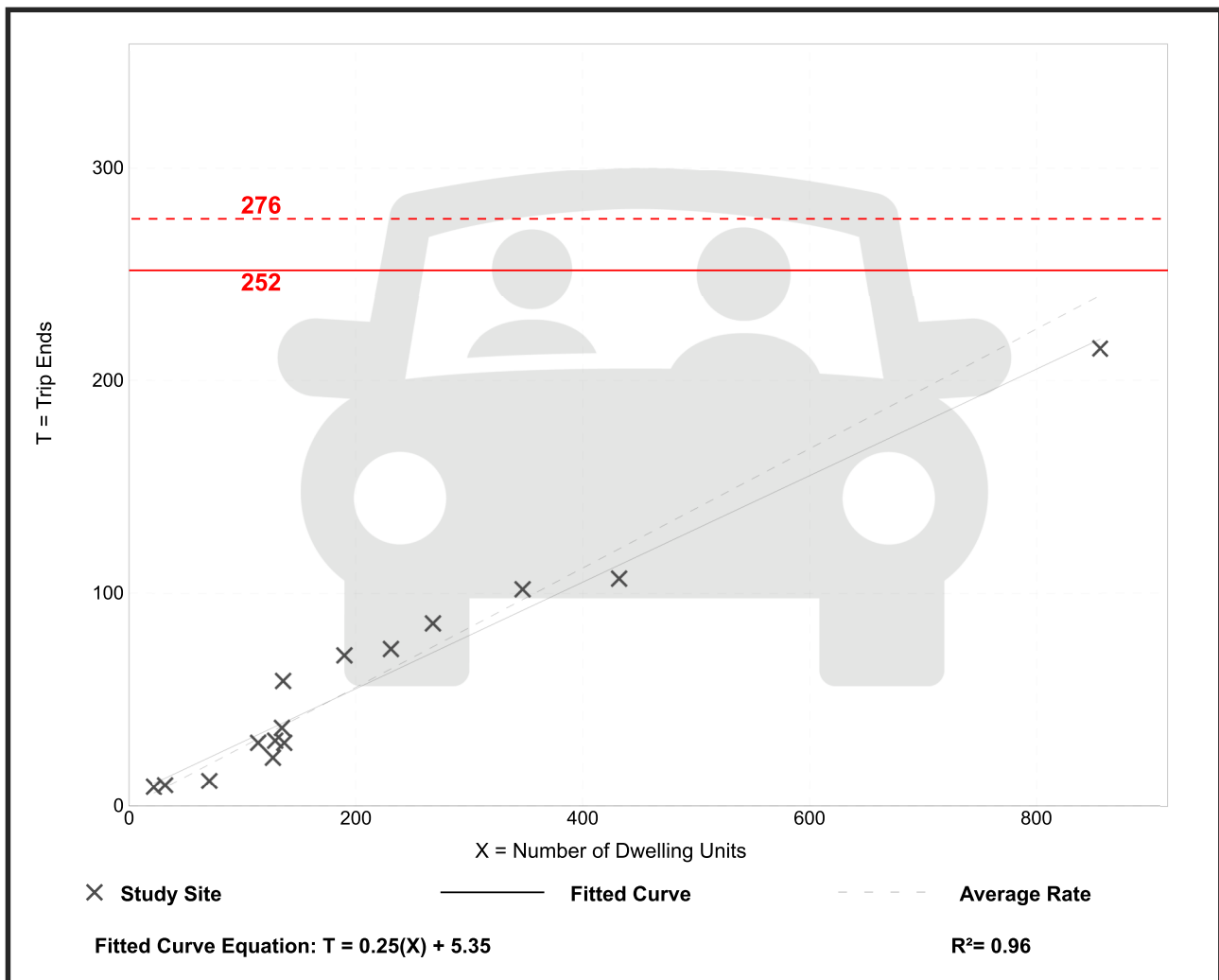
Avg. Num. of Dwelling Units: 215

Directional Distribution: 14% entering, 86% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.28	0.17 - 0.43	0.06

Data Plot and Equation



Multifamily Housing (Mid-Rise) Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Setting/Location: Dense Multi-Use Urban

Number of Studies: 13

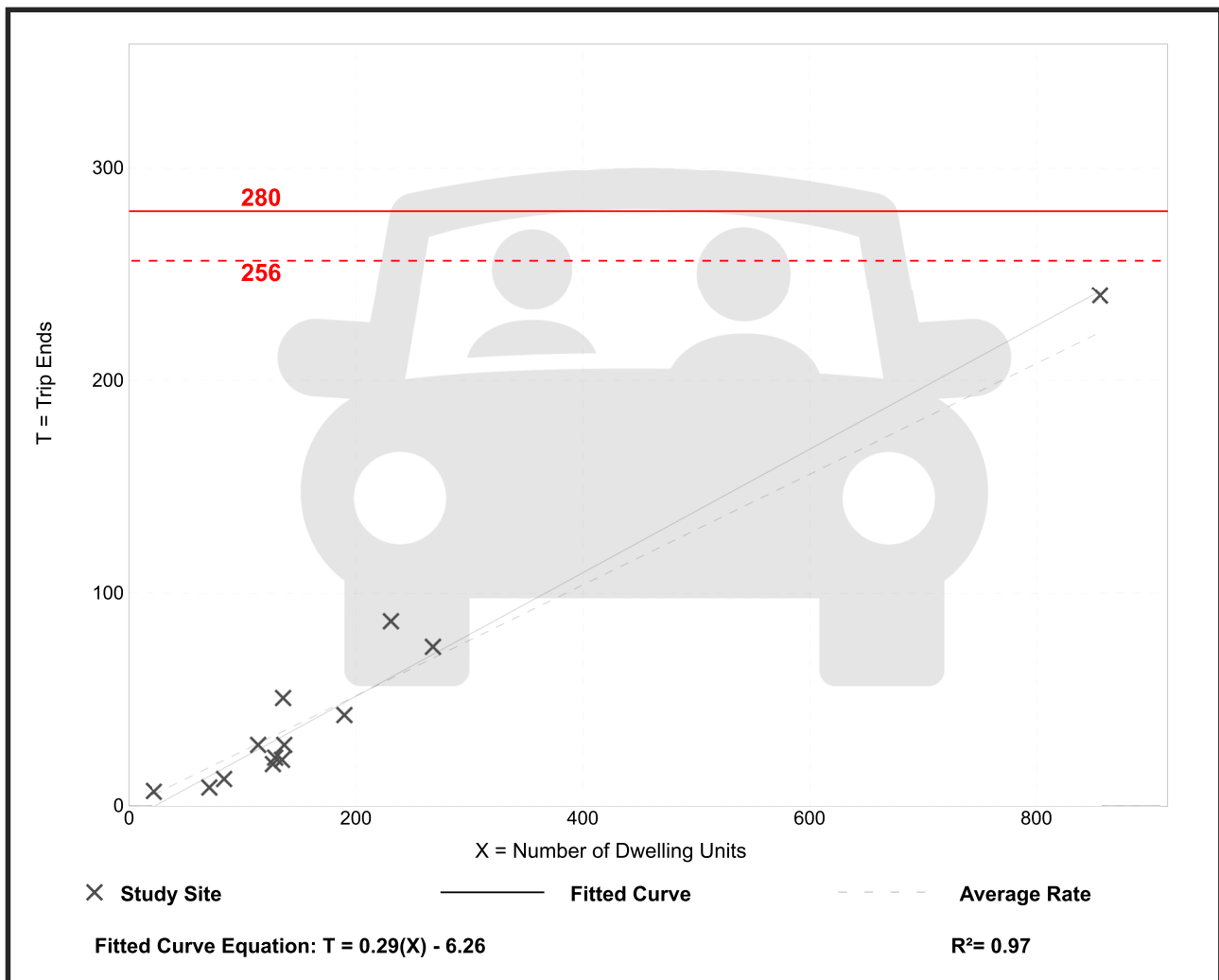
Avg. Num. of Dwelling Units: 192

Directional Distribution: 74% entering, 26% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.26	0.13 - 0.38	0.07

Data Plot and Equation



Hotel (310)

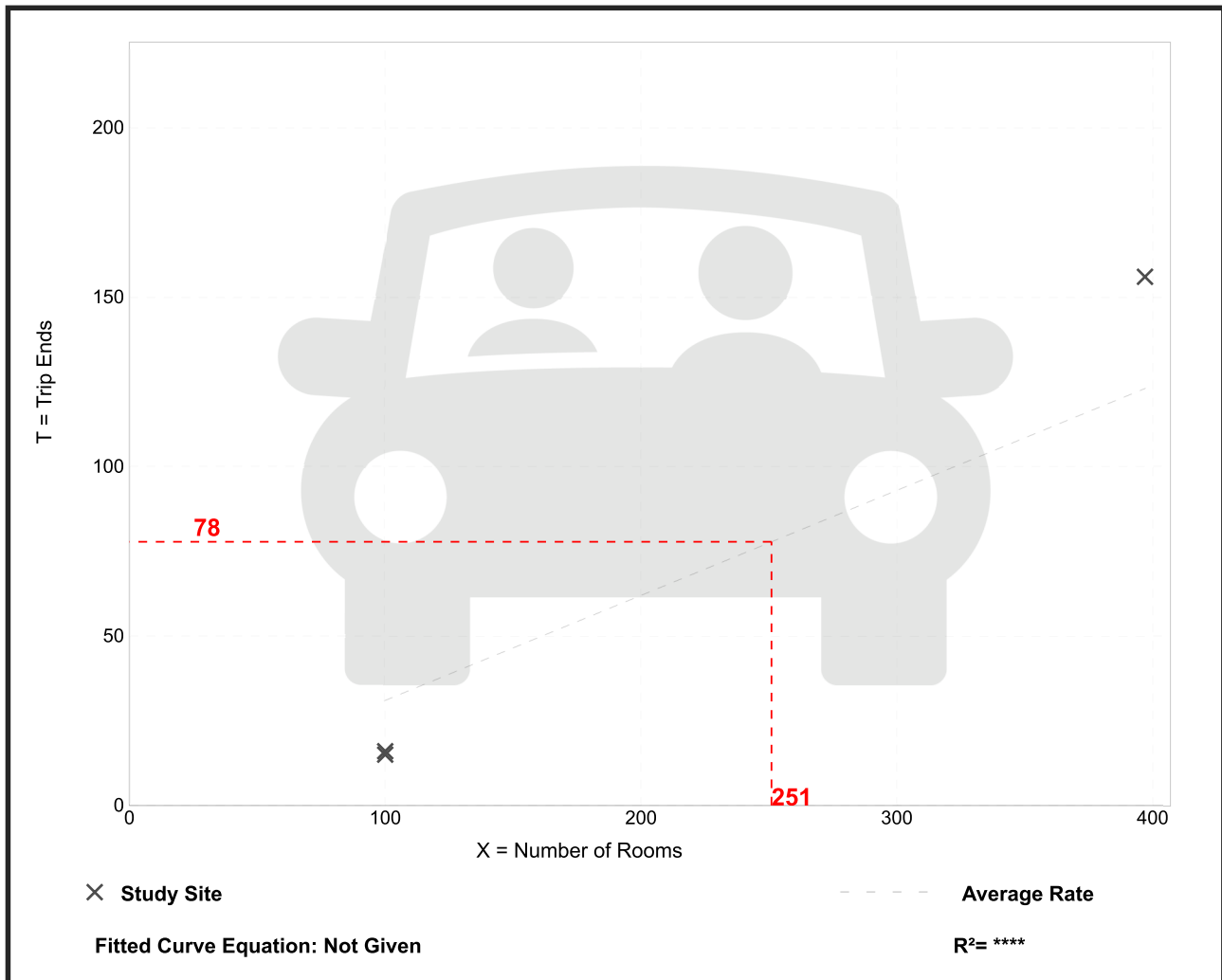
Vehicle Trip Ends vs: Rooms
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: Dense Multi-Use Urban
 Number of Studies: 3
 Avg. Num. of Rooms: 199
 Directional Distribution: 39% entering, 61% exiting

Vehicle Trip Generation per Room

Average Rate	Range of Rates	Standard Deviation
0.31	0.15 - 0.39	0.14

Data Plot and Equation

Caution – Small Sample Size



Hotel (310)

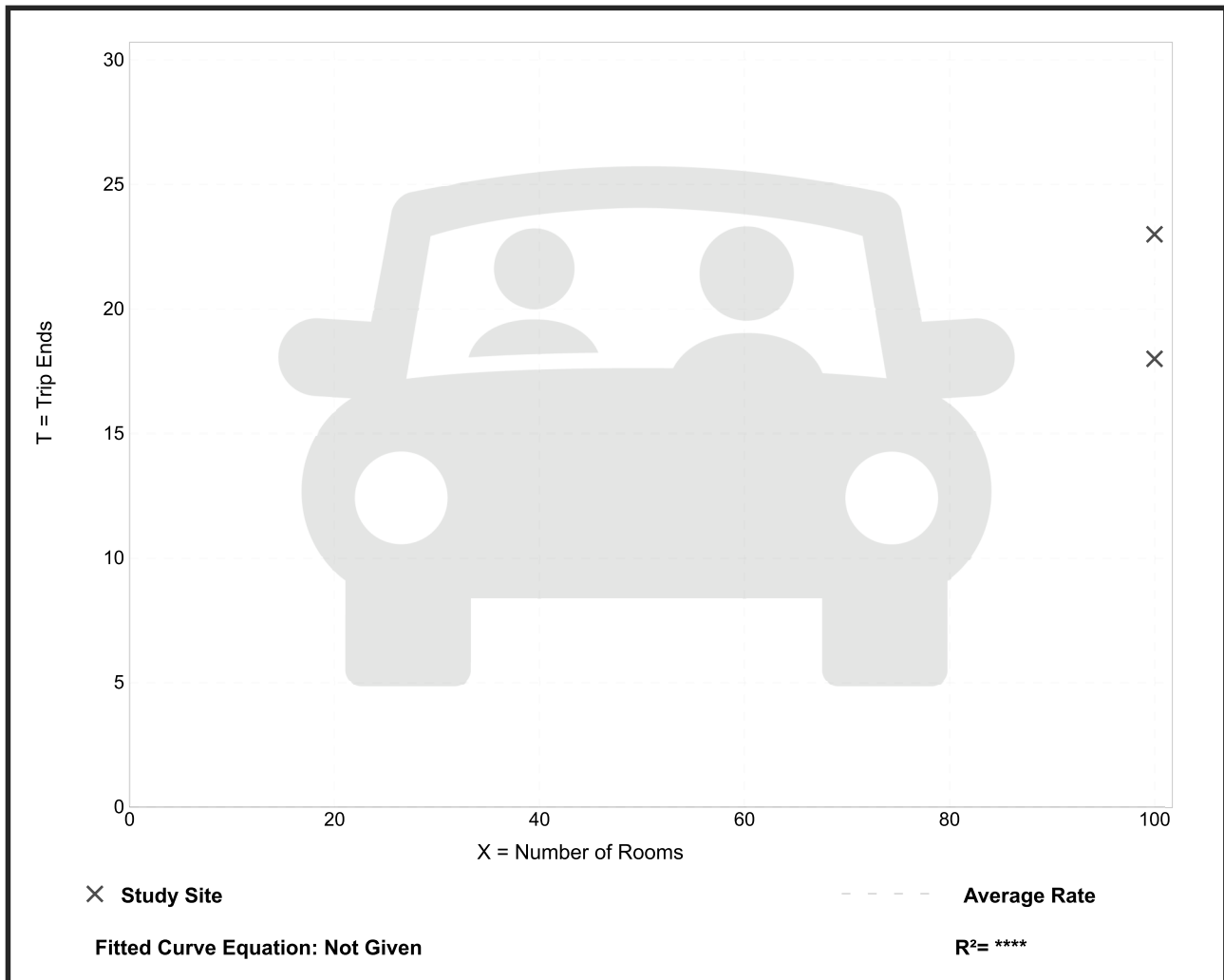
Vehicle Trip Ends vs: Rooms
On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. Num. of Rooms: 100
 Directional Distribution: 44% entering, 56% exiting

Vehicle Trip Generation per Room

Average Rate	Range of Rates	Standard Deviation
0.21	0.18 - 0.23	*

Data Plot and Equation

Caution – Small Sample Size



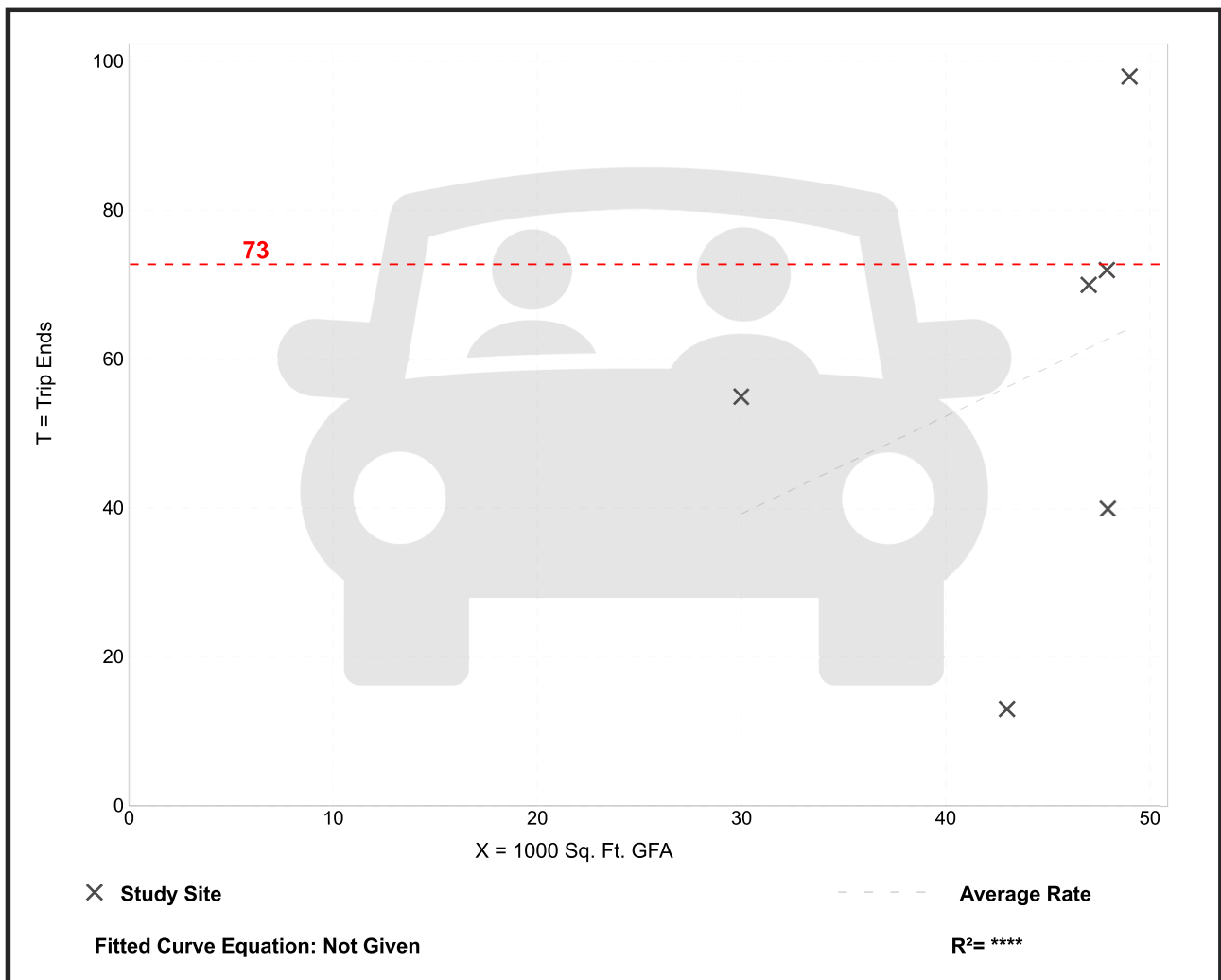
Health/Fitness Club (492)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 6
 Avg. 1000 Sq. Ft. GFA: 44
 Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.31	0.30 - 2.00	0.64

Data Plot and Equation



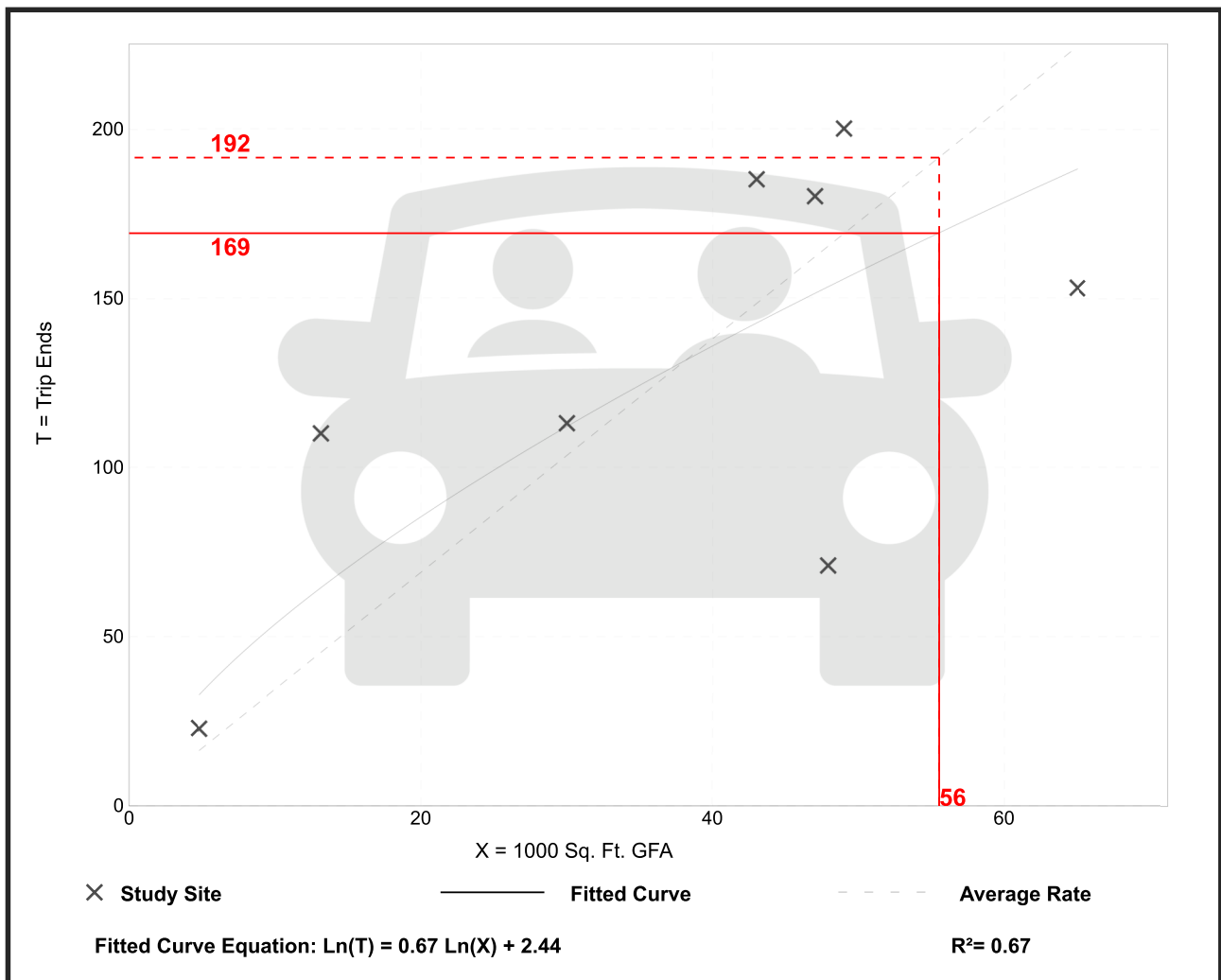
Health/Fitness Club (492)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 8
 Avg. 1000 Sq. Ft. GFA: 37
 Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.45	1.48 - 8.37	1.57

Data Plot and Equation



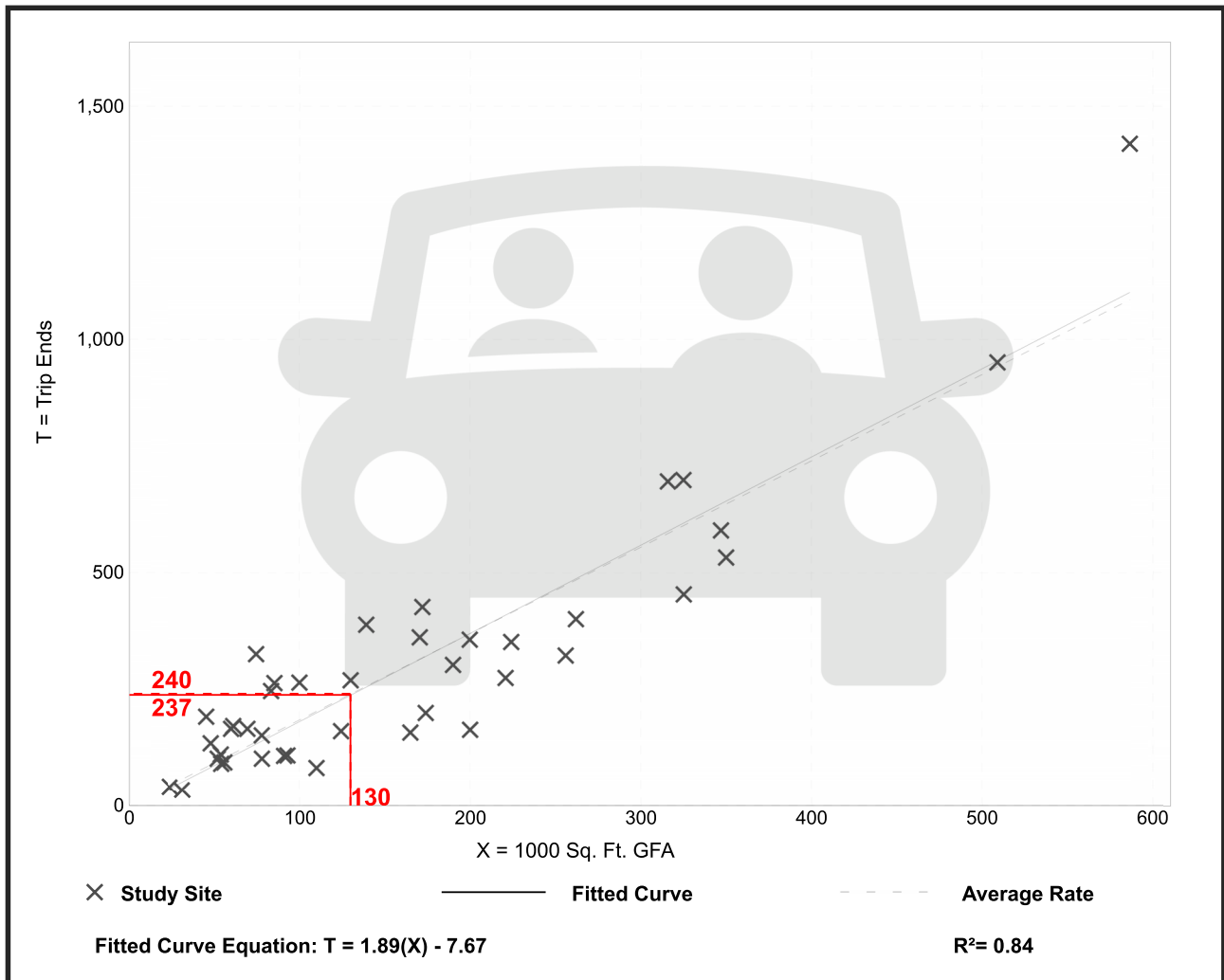
Single Tenant Office Building (715)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 41
 Avg. 1000 Sq. Ft. GFA: 164
 Directional Distribution: 89% entering, 11% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.85	0.75 - 4.37	0.65

Data Plot and Equation



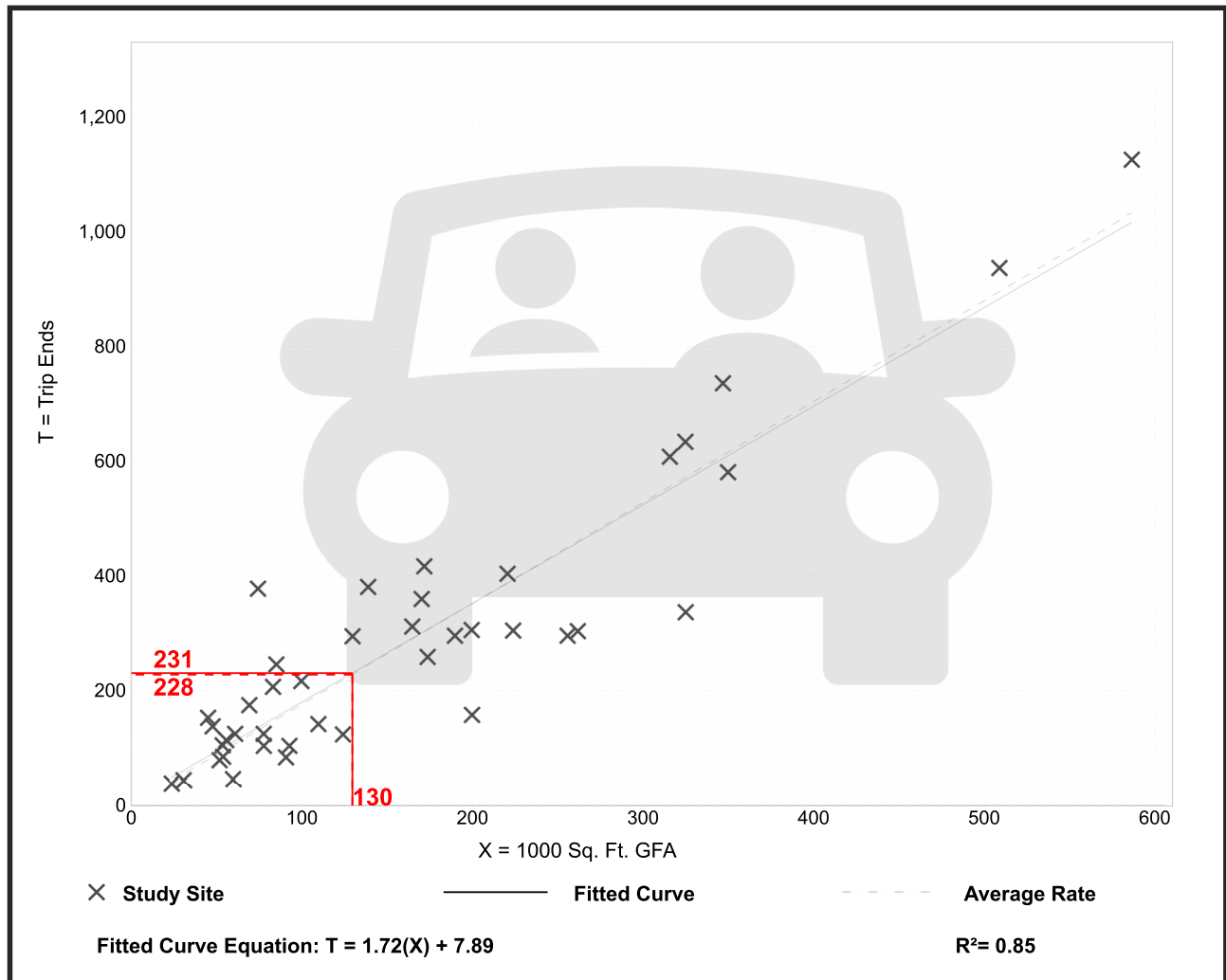
Single Tenant Office Building (715)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 41
 Avg. 1000 Sq. Ft. GFA: 164
 Directional Distribution: 15% entering, 85% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.76	0.77 - 5.07	0.61

Data Plot and Equation



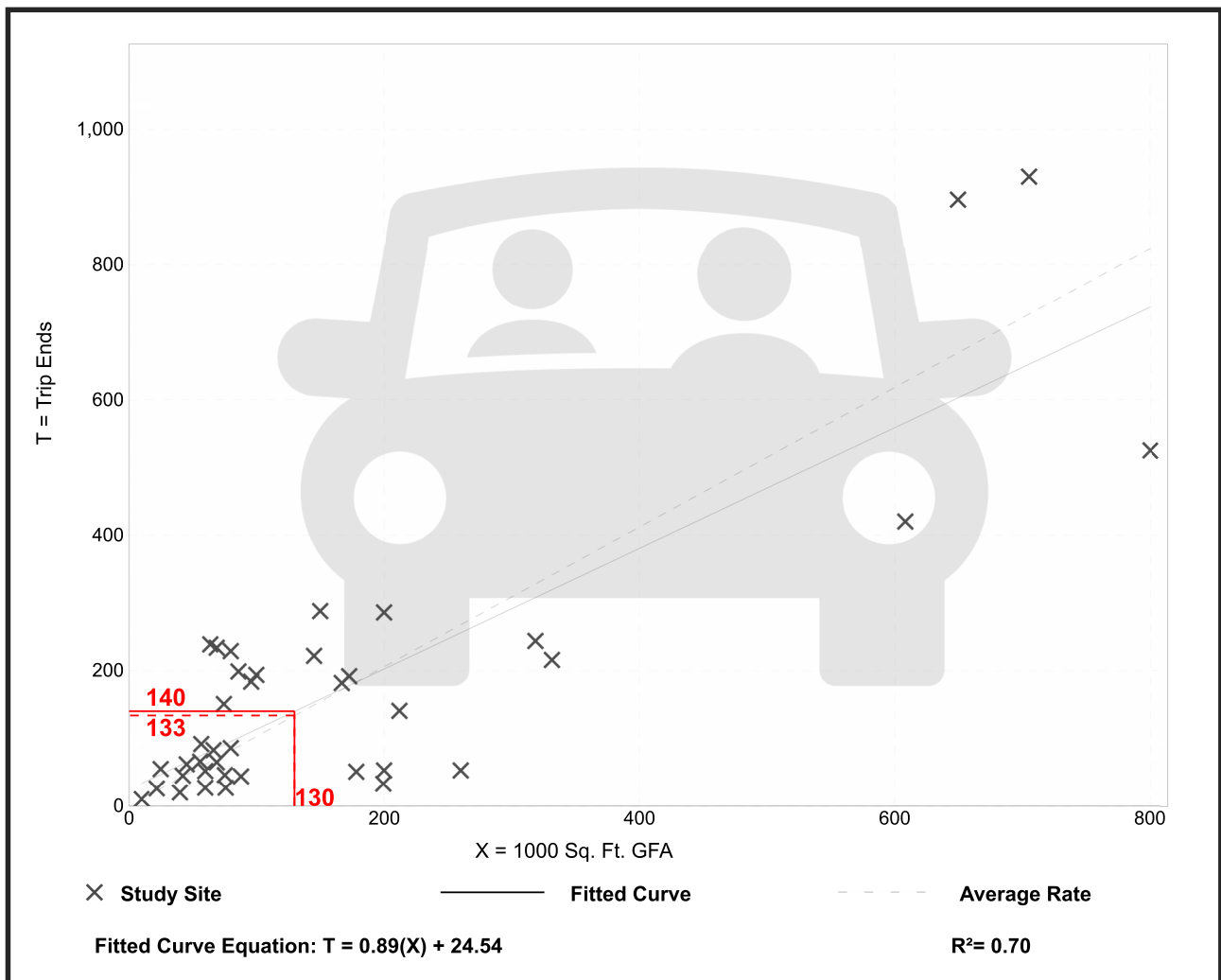
Research and Development Center (760)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 39
 Avg. 1000 Sq. Ft. GFA: 173
 Directional Distribution: 82% entering, 18% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.03	0.17 - 3.73	0.65

Data Plot and Equation



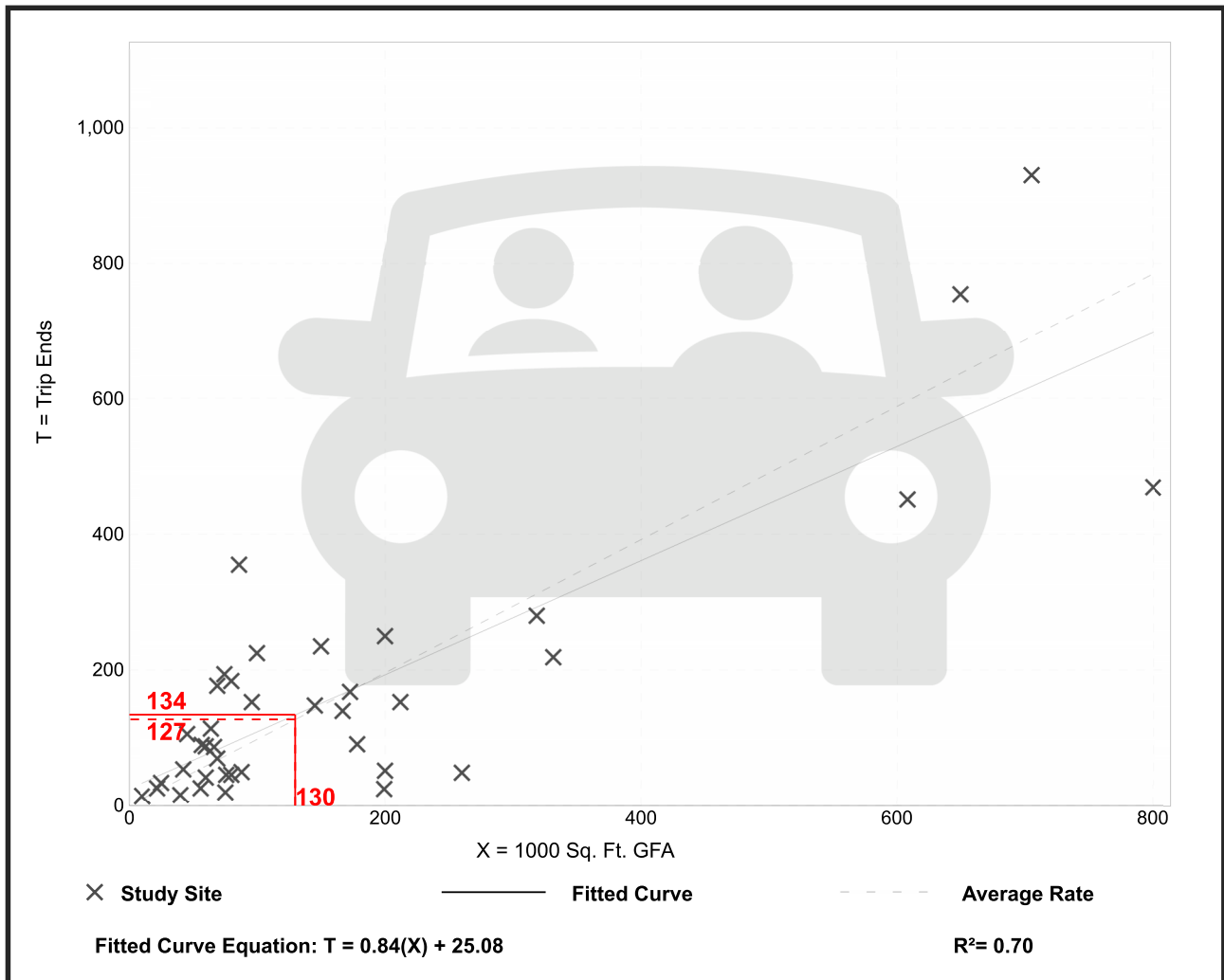
Research and Development Center (760)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 39
 Avg. 1000 Sq. Ft. GFA: 173
 Directional Distribution: 16% entering, 84% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.98	0.13 - 4.13	0.64

Data Plot and Equation



Variety Store (814)

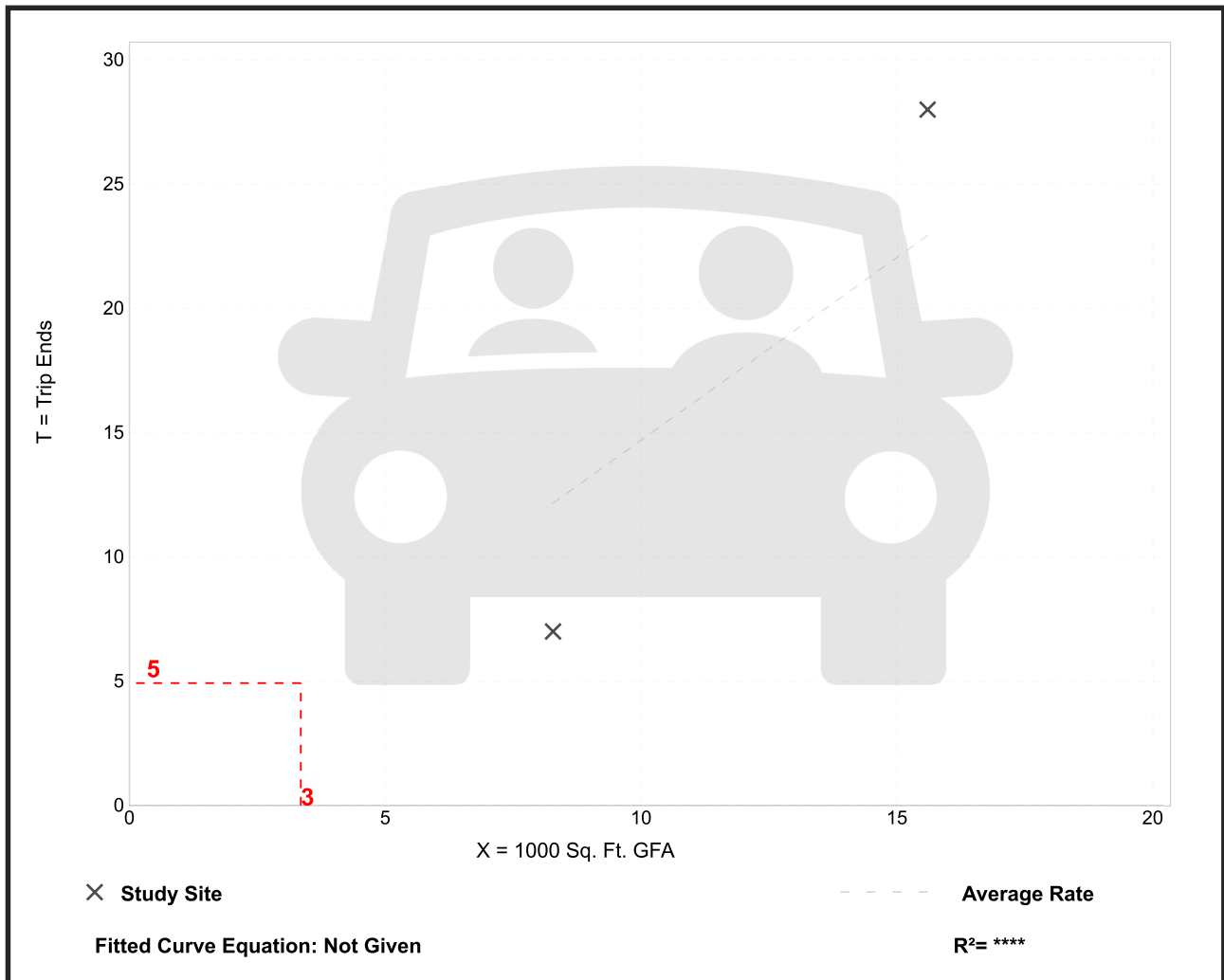
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 12
 Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.47	0.85 - 1.79	*

Data Plot and Equation

Caution – Small Sample Size



Variety Store (814)

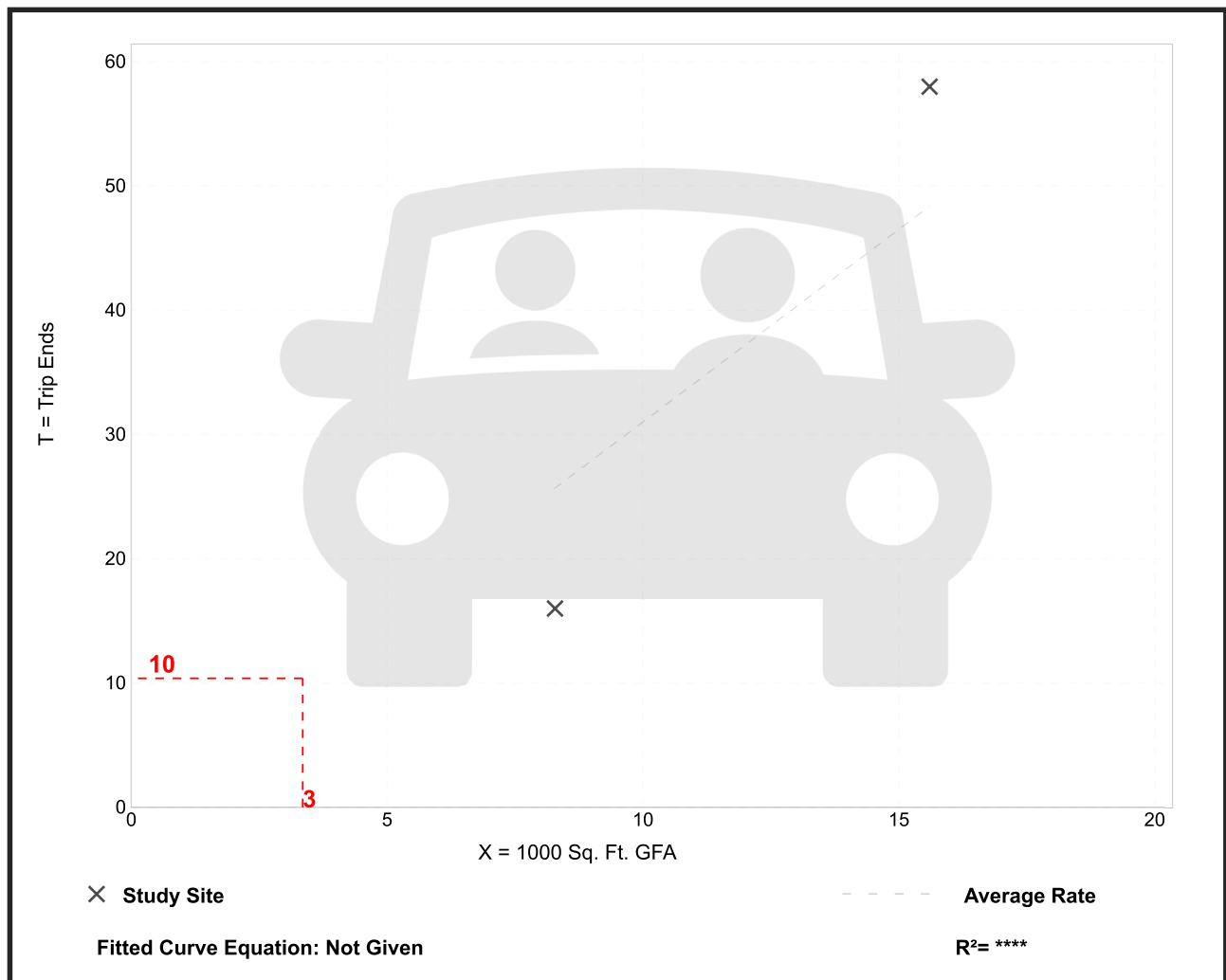
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 12
 Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.10	1.93 - 3.72	*

Data Plot and Equation

Caution – Small Sample Size



Strip Retail Plaza (<40k) (822)

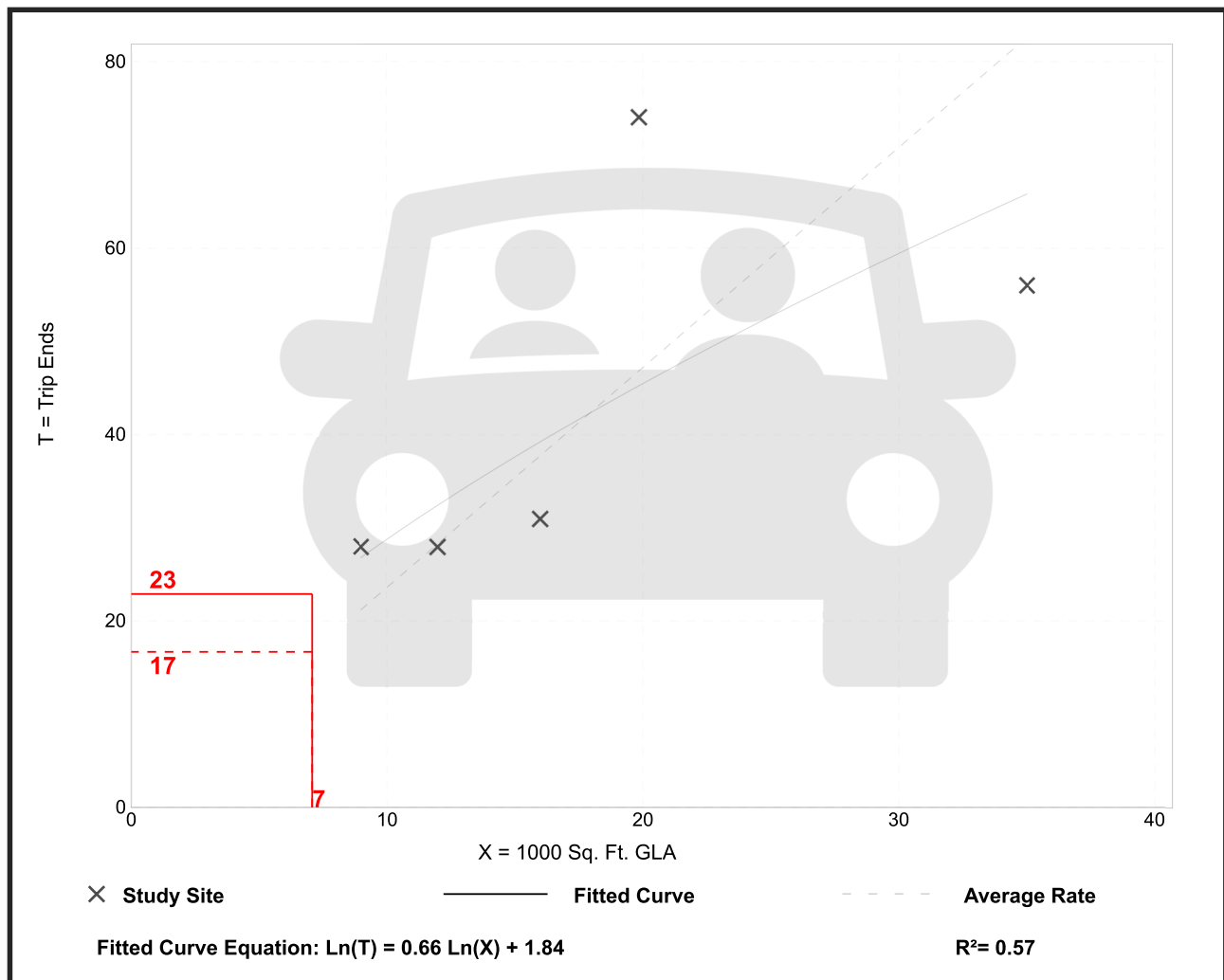
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GLA: 18
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation

Caution – Small Sample Size



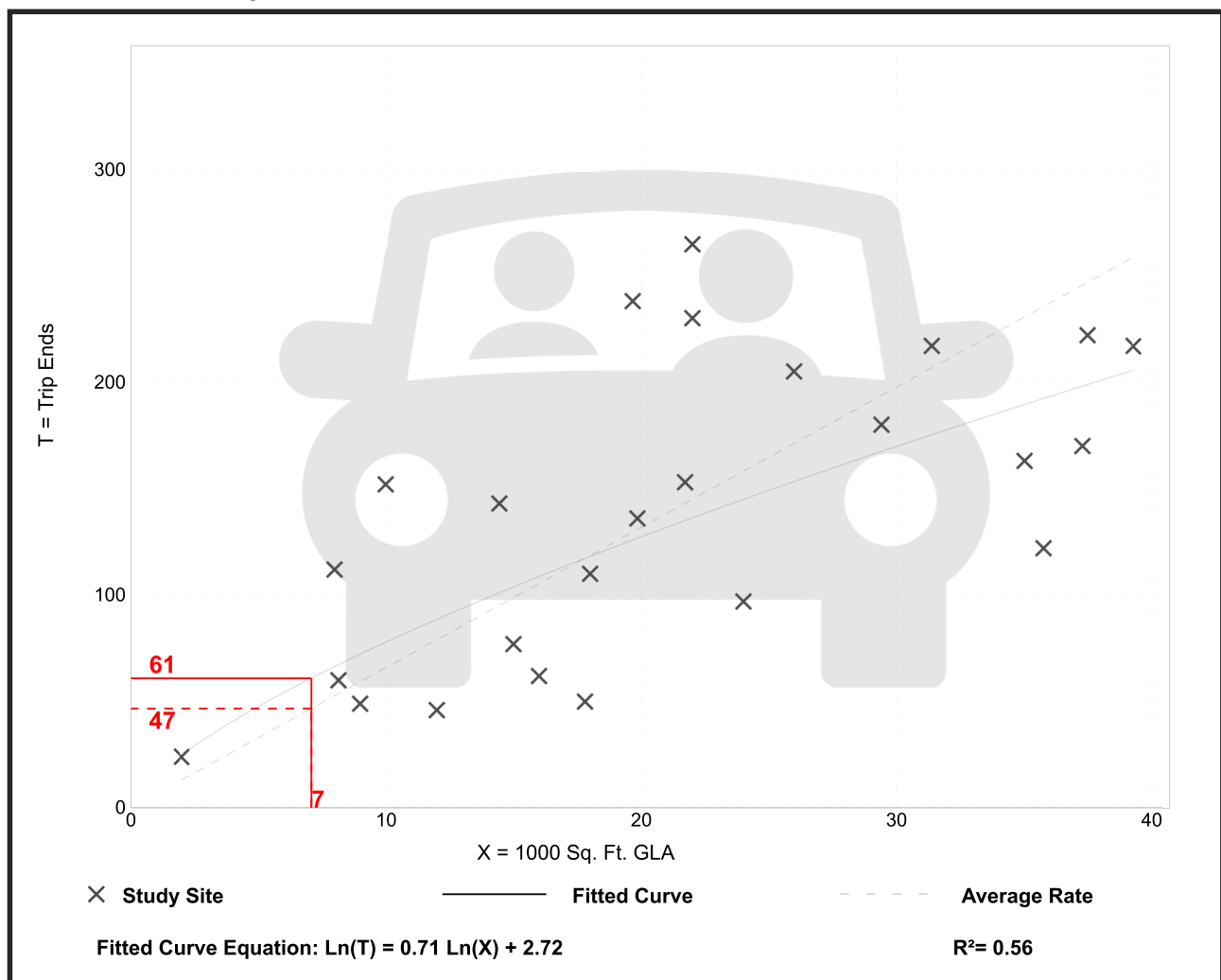
Strip Retail Plaza (<40k) (822)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 25
 Avg. 1000 Sq. Ft. GLA: 21
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation



Strip Retail Plaza (<40k) (822)

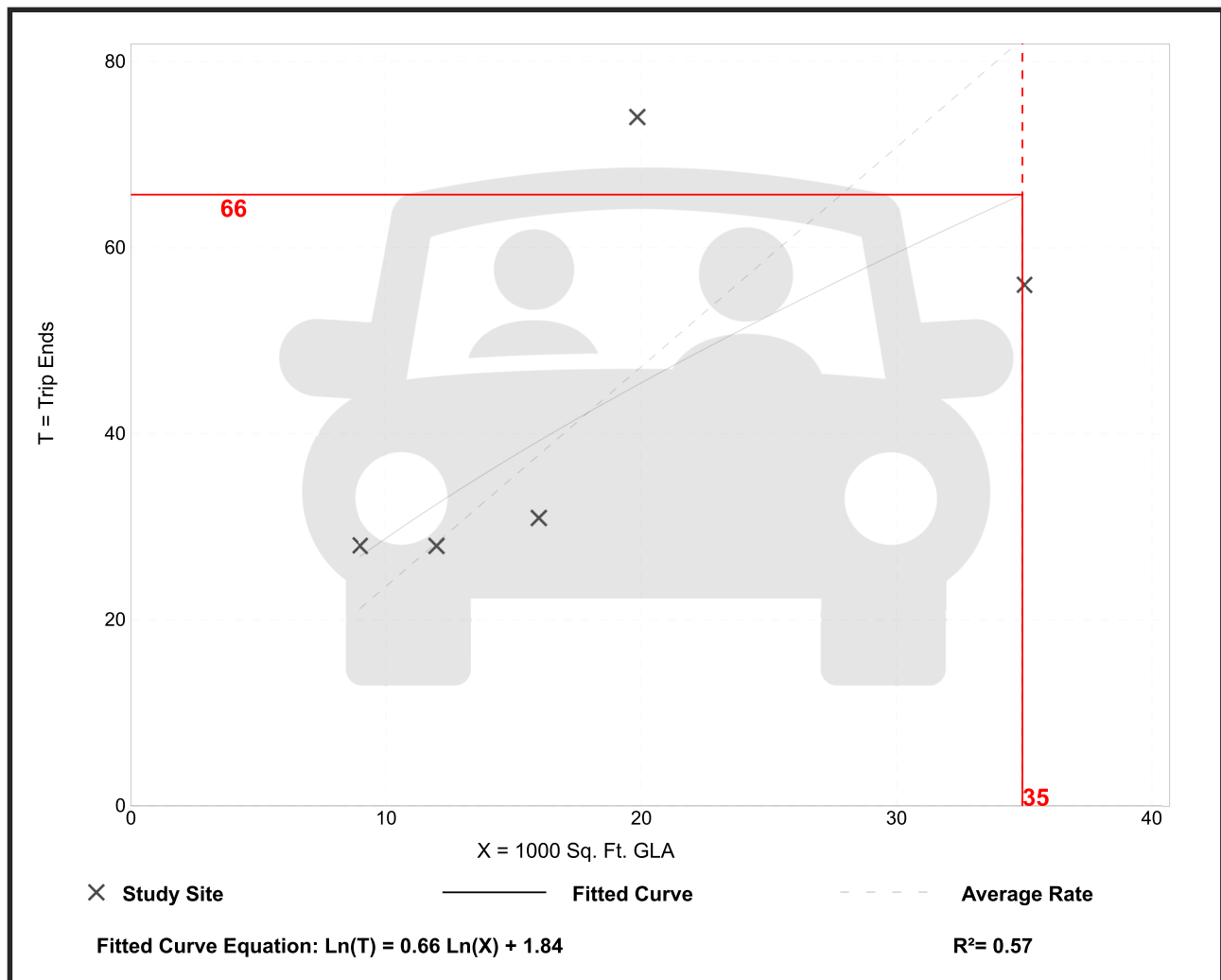
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GLA: 18
 Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.36	1.60 - 3.73	0.94

Data Plot and Equation

Caution – Small Sample Size



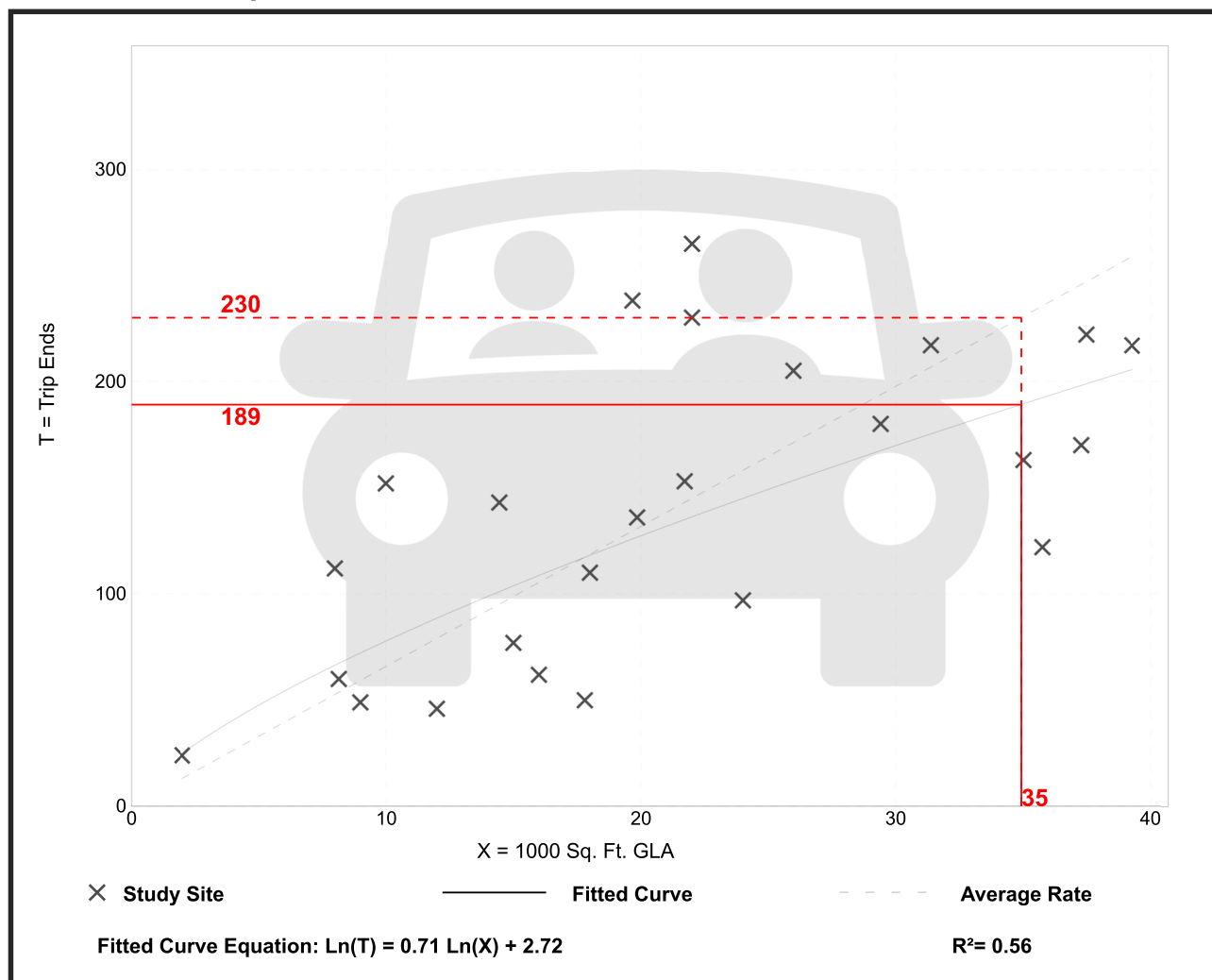
Strip Retail Plaza (<40k) (822)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 25
 Avg. 1000 Sq. Ft. GLA: 21
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
6.59	2.81 - 15.20	2.94

Data Plot and Equation



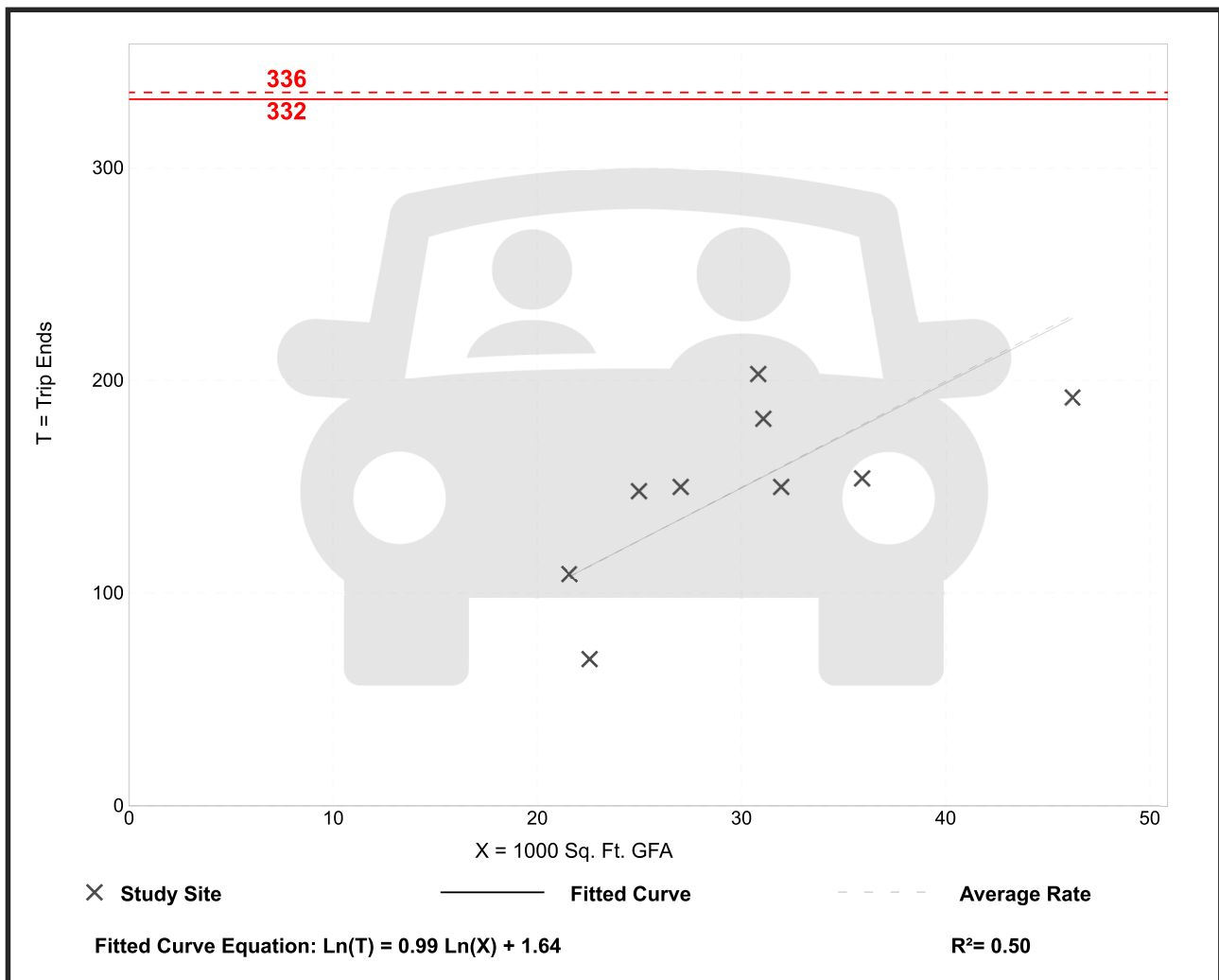
Supermarket (850)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 9
 Avg. 1000 Sq. Ft. GFA: 30
 Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.99	3.06 - 6.58	1.05

Data Plot and Equation



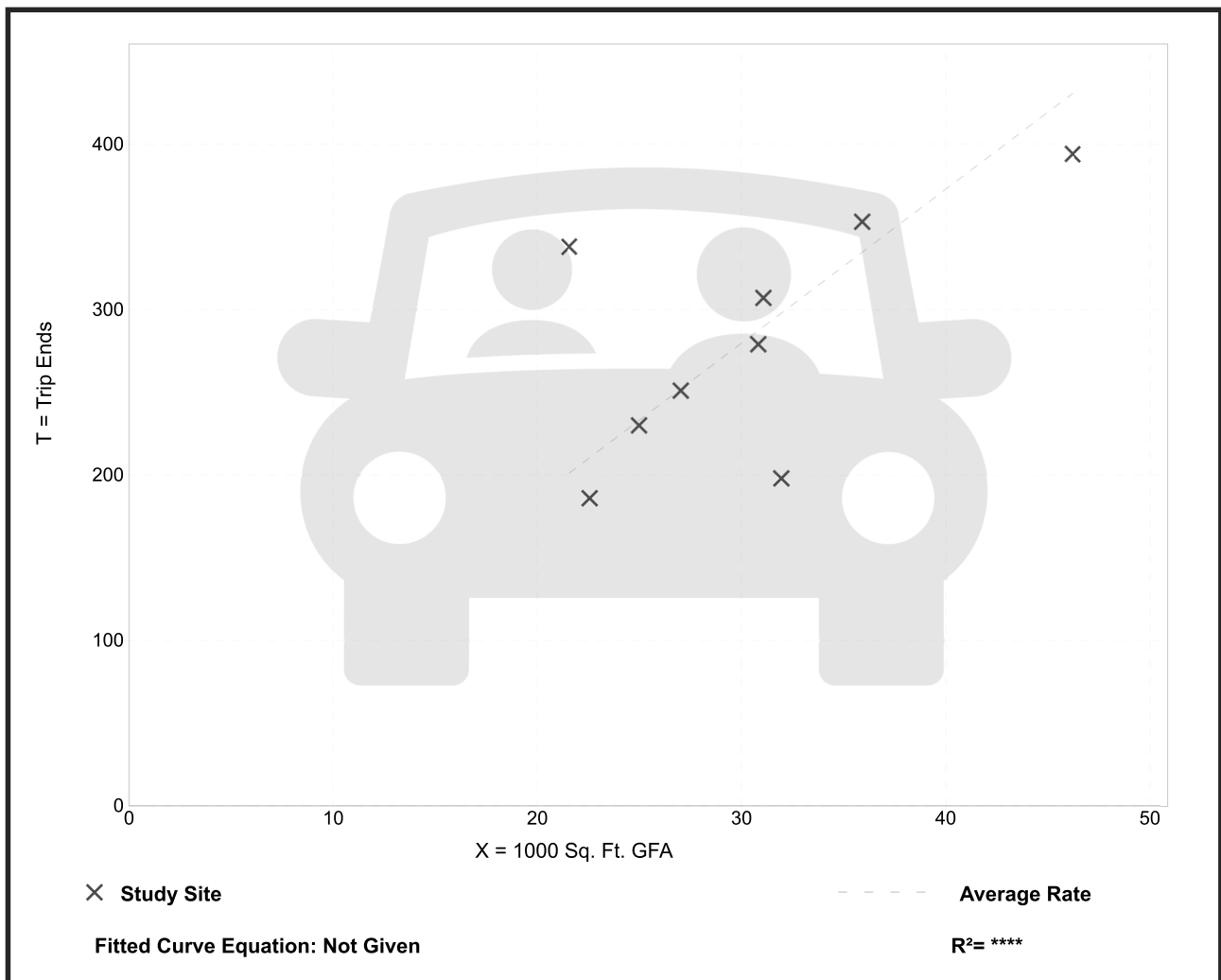
Supermarket (850)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 9
 Avg. 1000 Sq. Ft. GFA: 30
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.32	6.20 - 15.67	2.28

Data Plot and Equation



Sporting Goods Superstore (861)

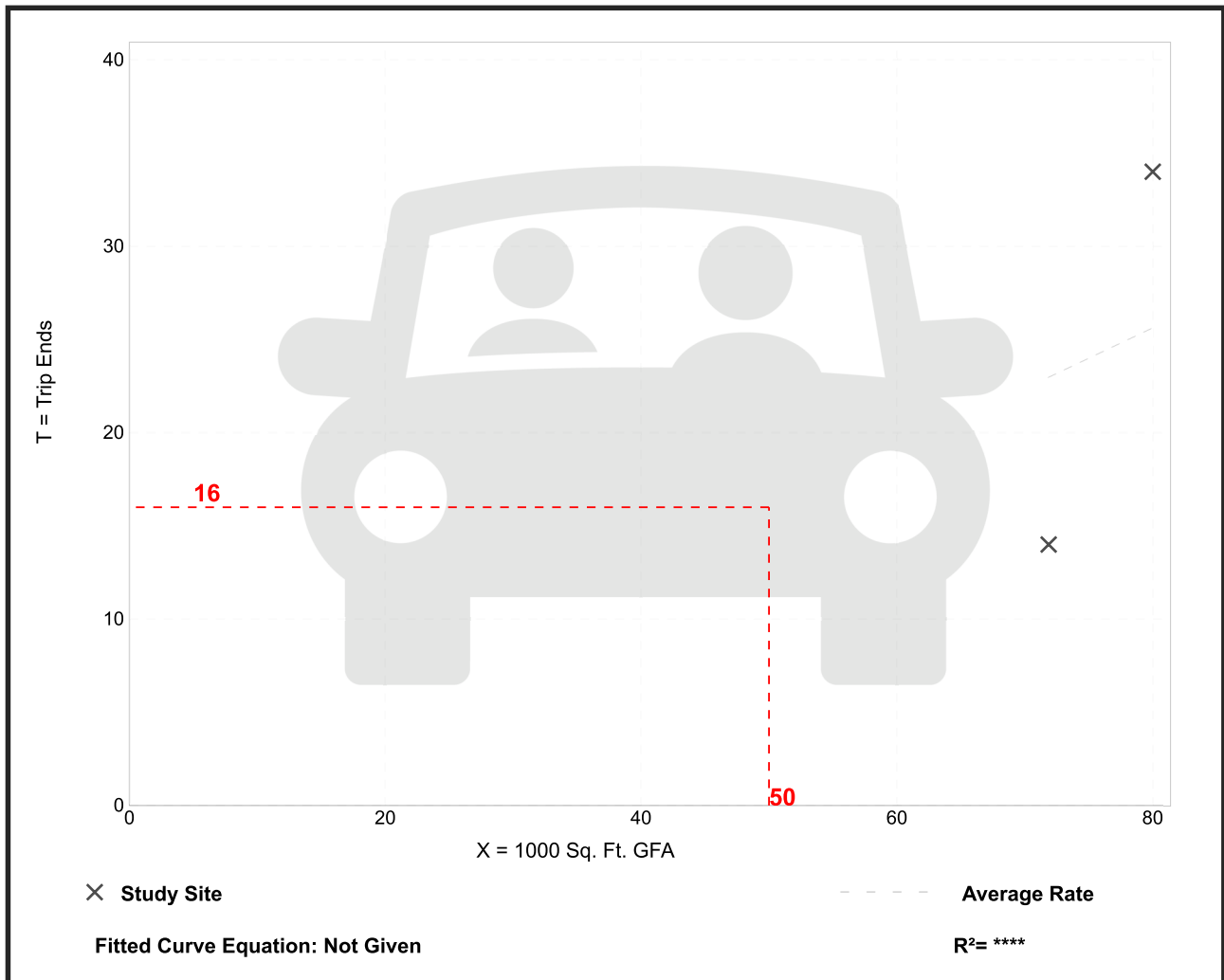
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 76
 Directional Distribution: 90% entering, 10% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.32	0.19 - 0.43	*

Data Plot and Equation

Caution – Small Sample Size



Sporting Goods Superstore (861)

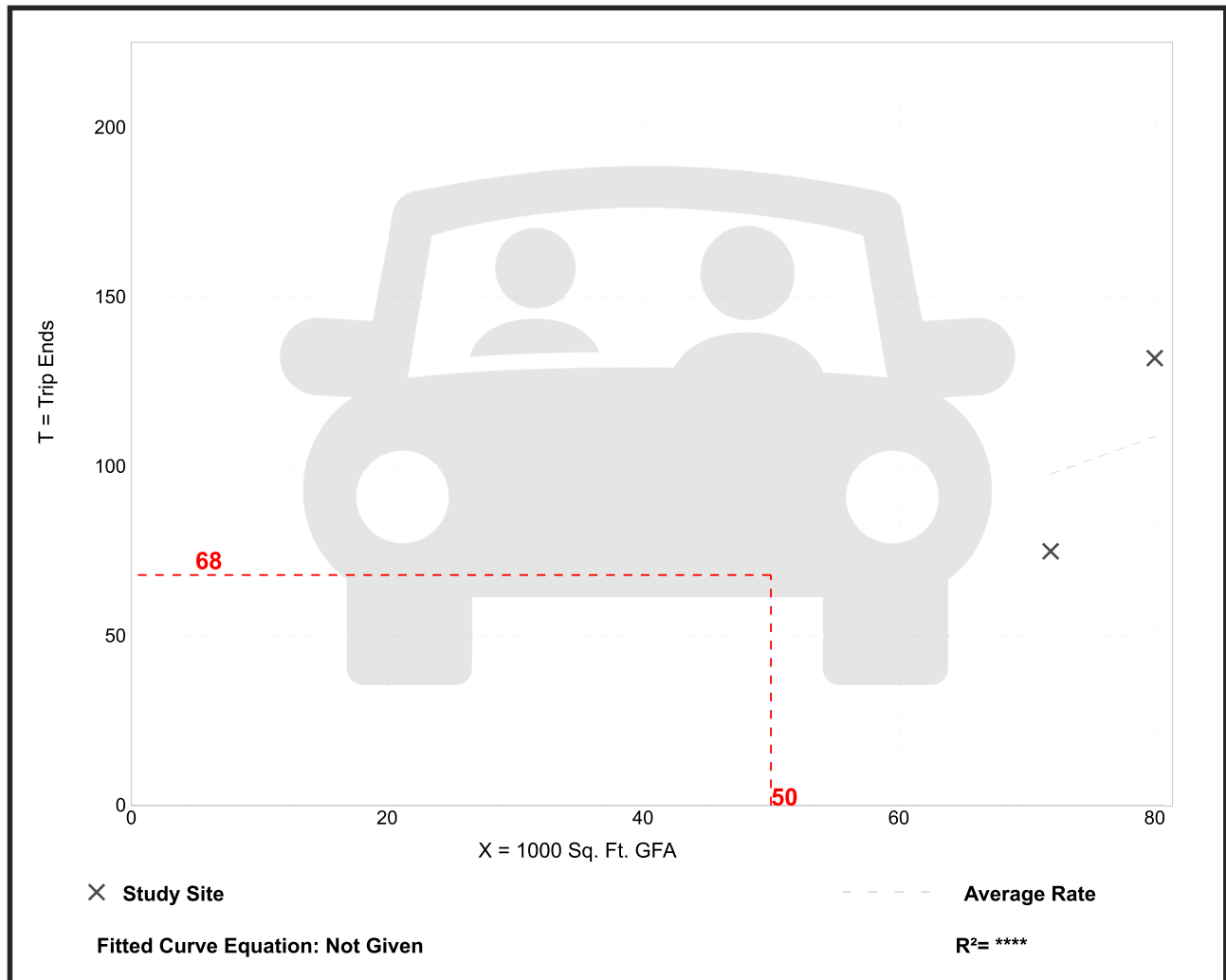
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 76
 Directional Distribution: 49% entering, 51% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.36	1.04 - 1.65	*

Data Plot and Equation

Caution – Small Sample Size



Apparel Store (876)

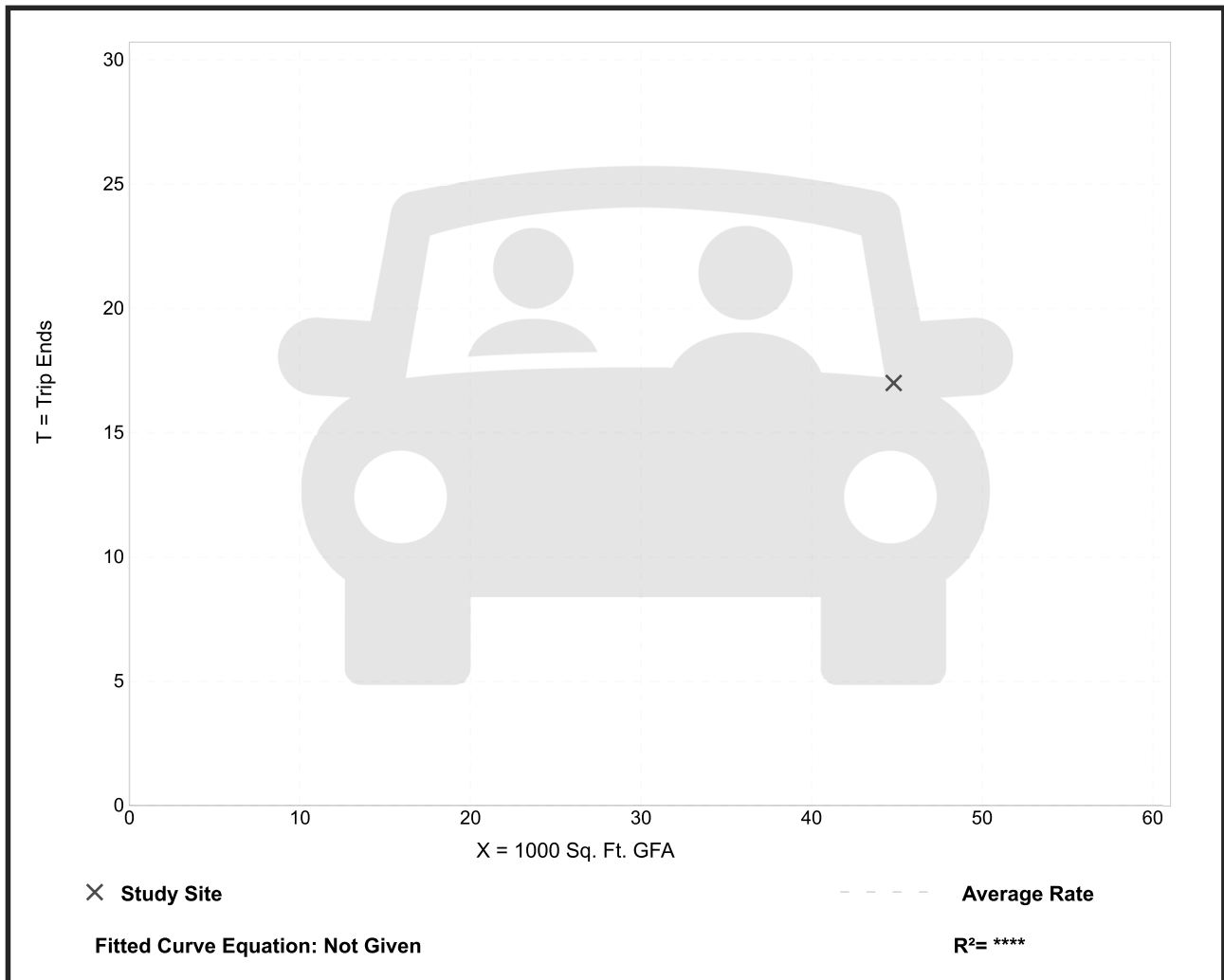
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 45
 Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.38	0.38 - 0.38	*

Data Plot and Equation

Caution – Small Sample Size



Apparel Store (876)

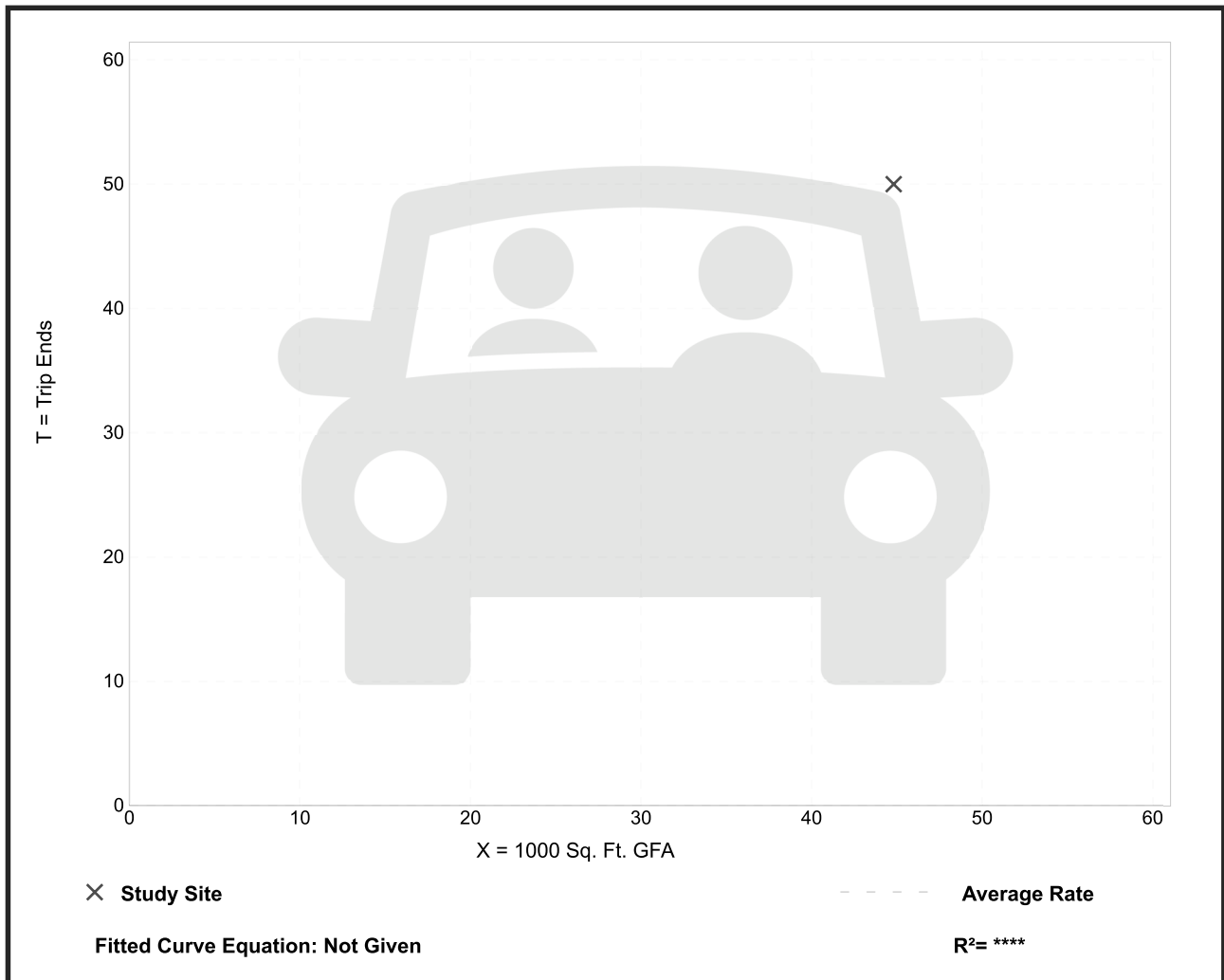
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 45
 Directional Distribution: 42% entering, 58% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.12	1.12 - 1.12	*

Data Plot and Equation

Caution – Small Sample Size



Arts and Crafts Store (879)

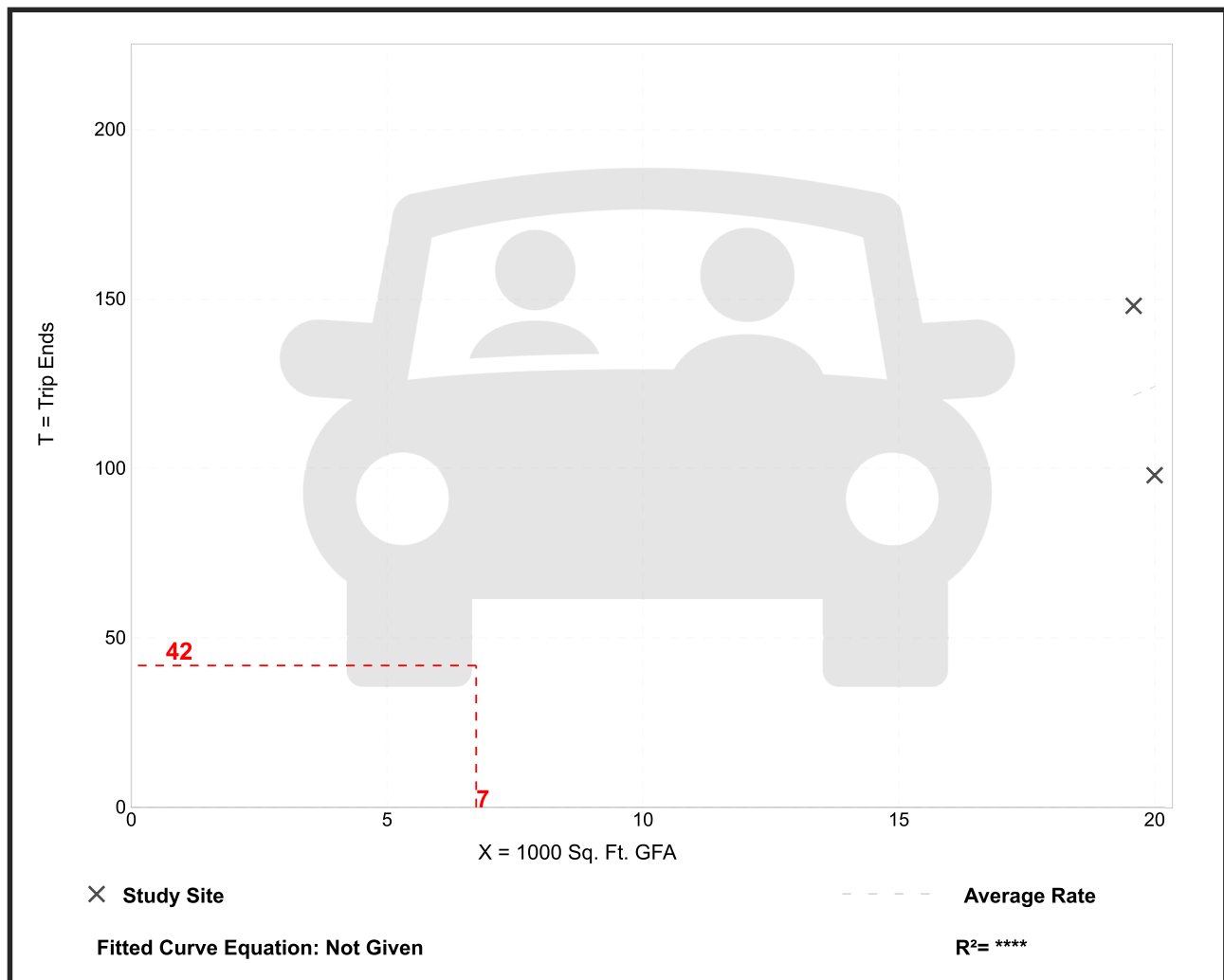
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 20
 Directional Distribution: 46% entering, 54% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
6.21	4.90 - 7.55	*

Data Plot and Equation

Caution – Small Sample Size



Copy, Print, and Express Ship Store (920)

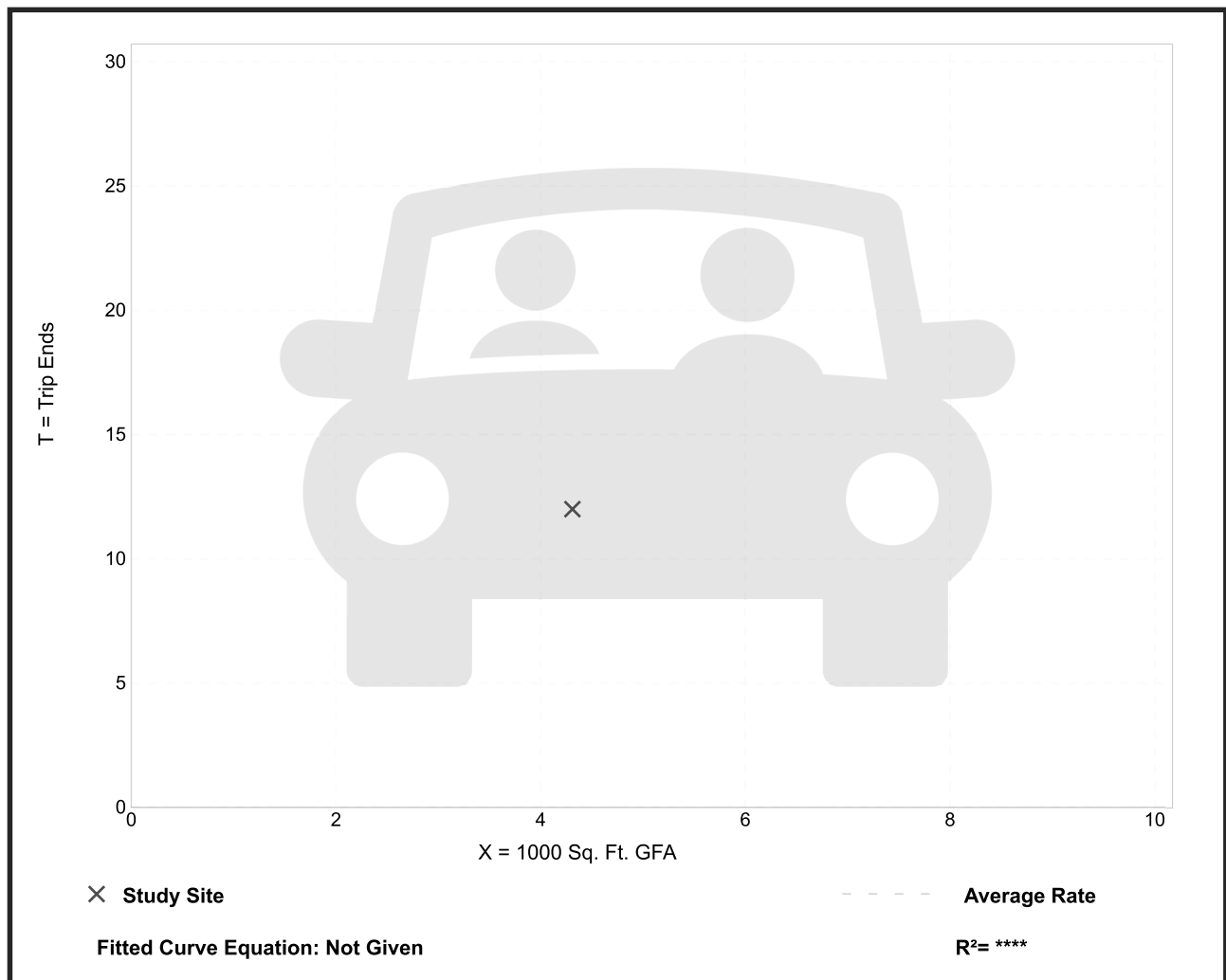
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 4
 Directional Distribution: 75% entering, 25% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.78	2.78 - 2.78	*

Data Plot and Equation

Caution – Small Sample Size



Copy, Print, and Express Ship Store (920)

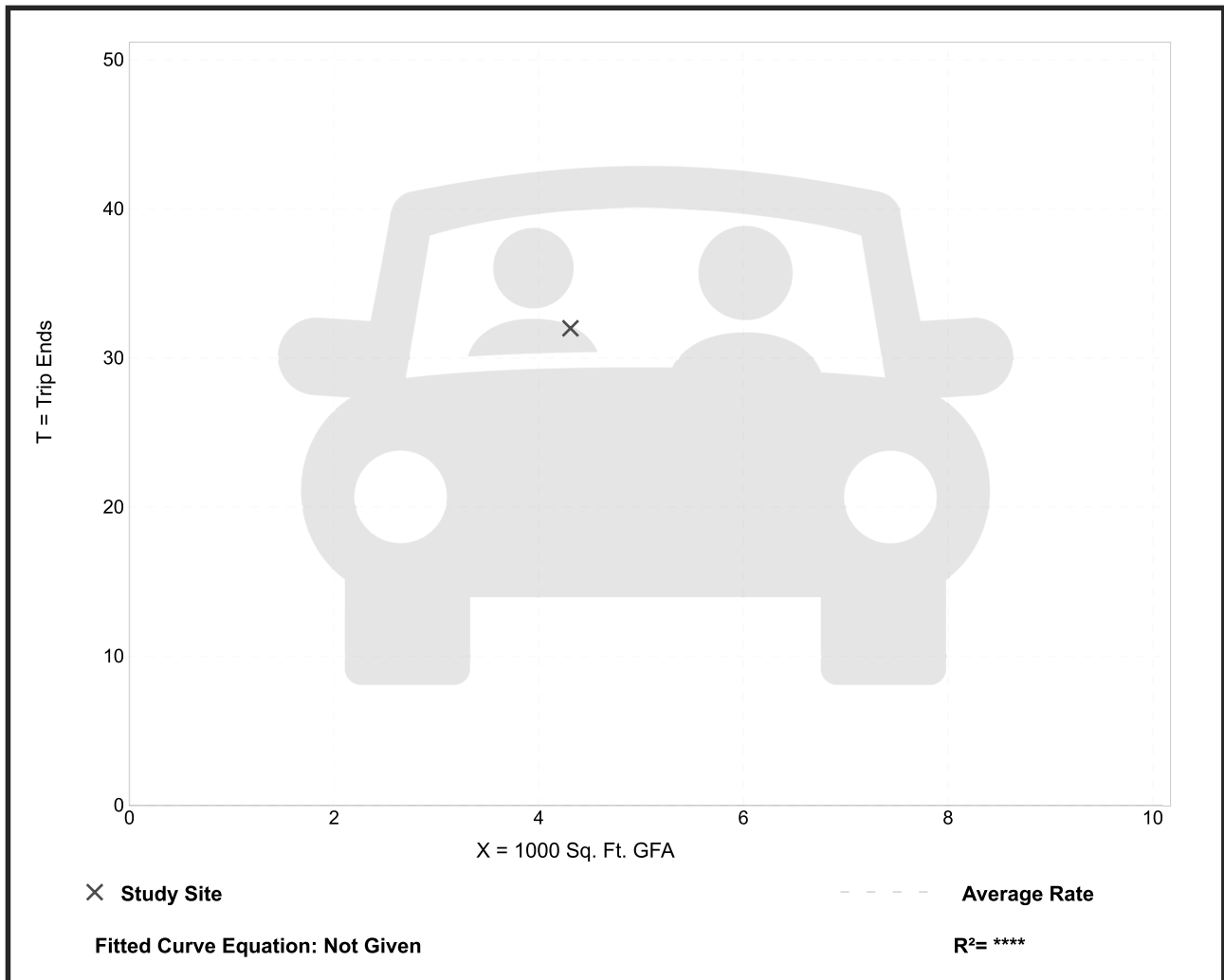
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 4
 Directional Distribution: 44% entering, 56% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
7.42	7.42 - 7.42	*

Data Plot and Equation

Caution – Small Sample Size



Fast Casual Restaurant (930)

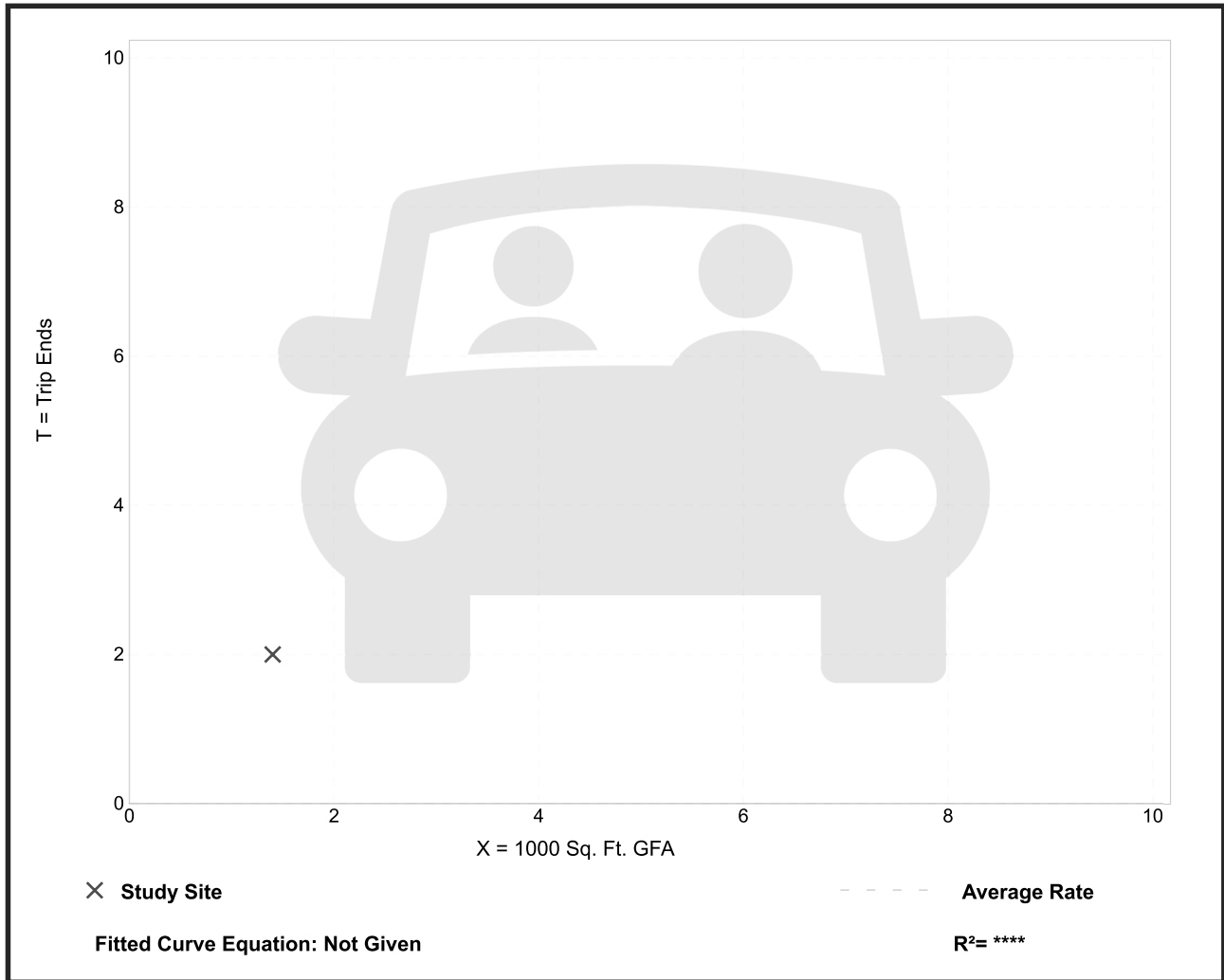
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 1
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.43	1.43 - 1.43	*

Data Plot and Equation

Caution – Small Sample Size



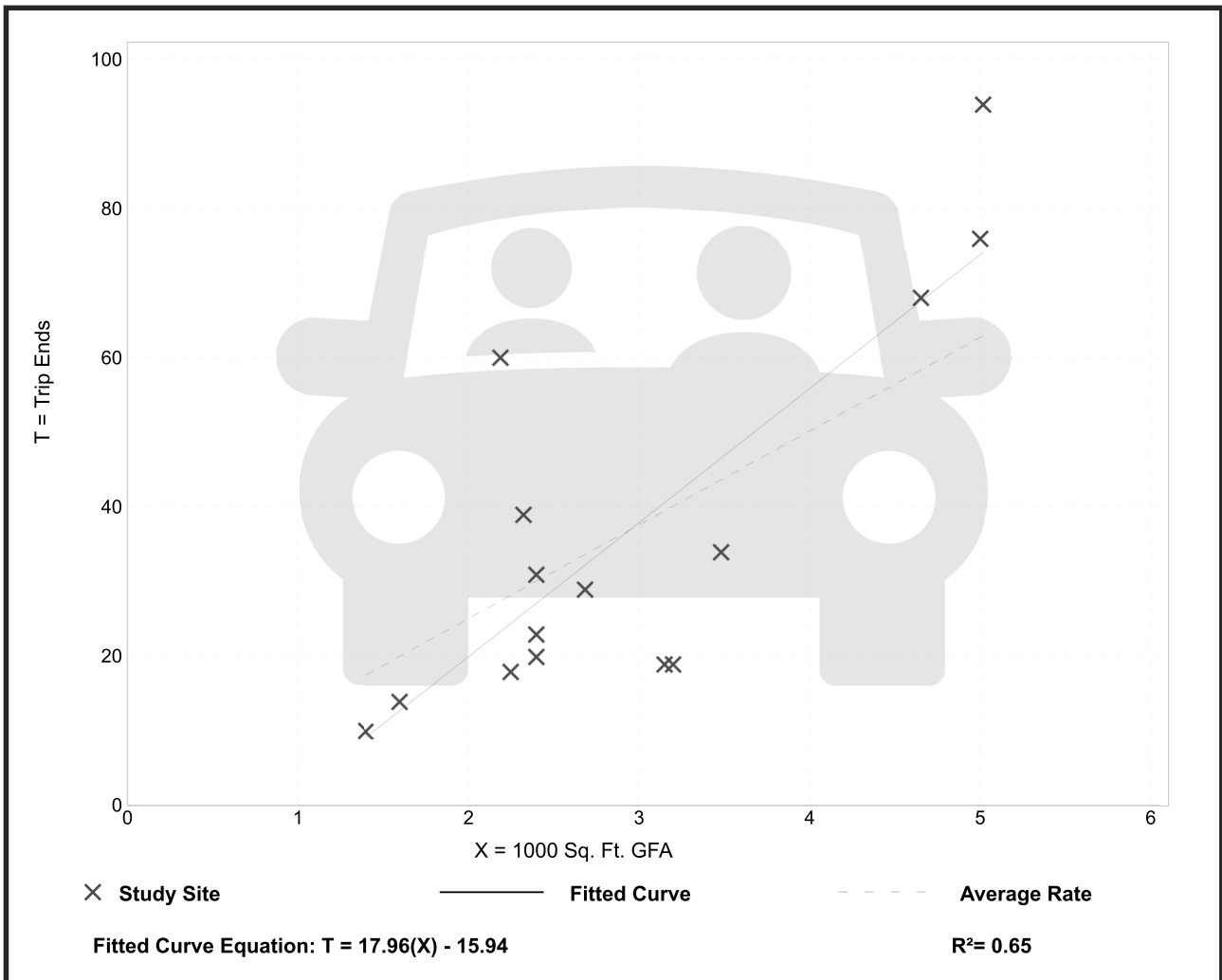
Fast Casual Restaurant (930)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 15
 Avg. 1000 Sq. Ft. GFA: 3
 Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
12.55	5.94 - 27.40	5.52

Data Plot and Equation



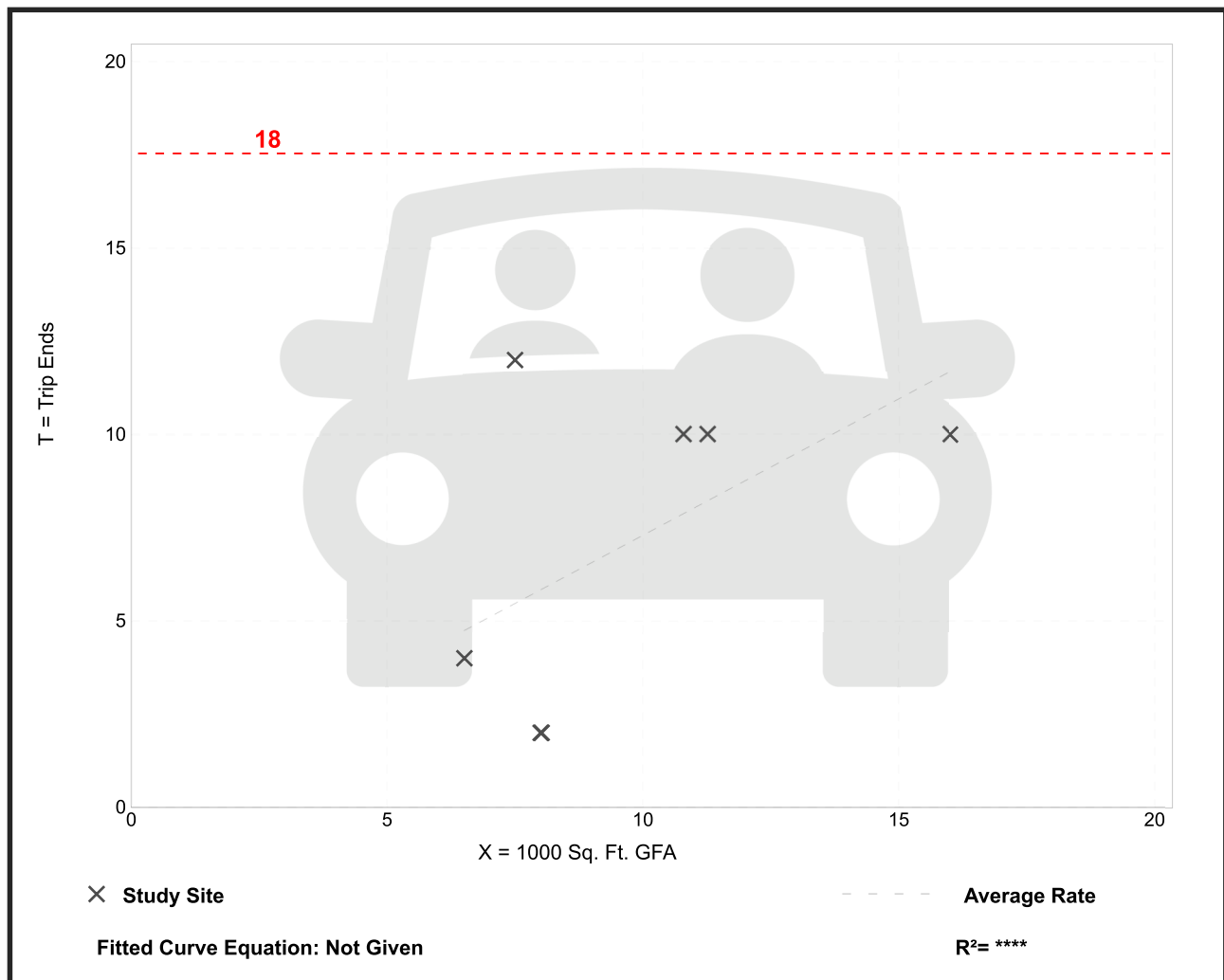
Fine Dining Restaurant (931)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 7
 Avg. 1000 Sq. Ft. GFA: 10
 Directional Distribution: Not Available

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
0.73	0.25 - 1.60	0.42

Data Plot and Equation



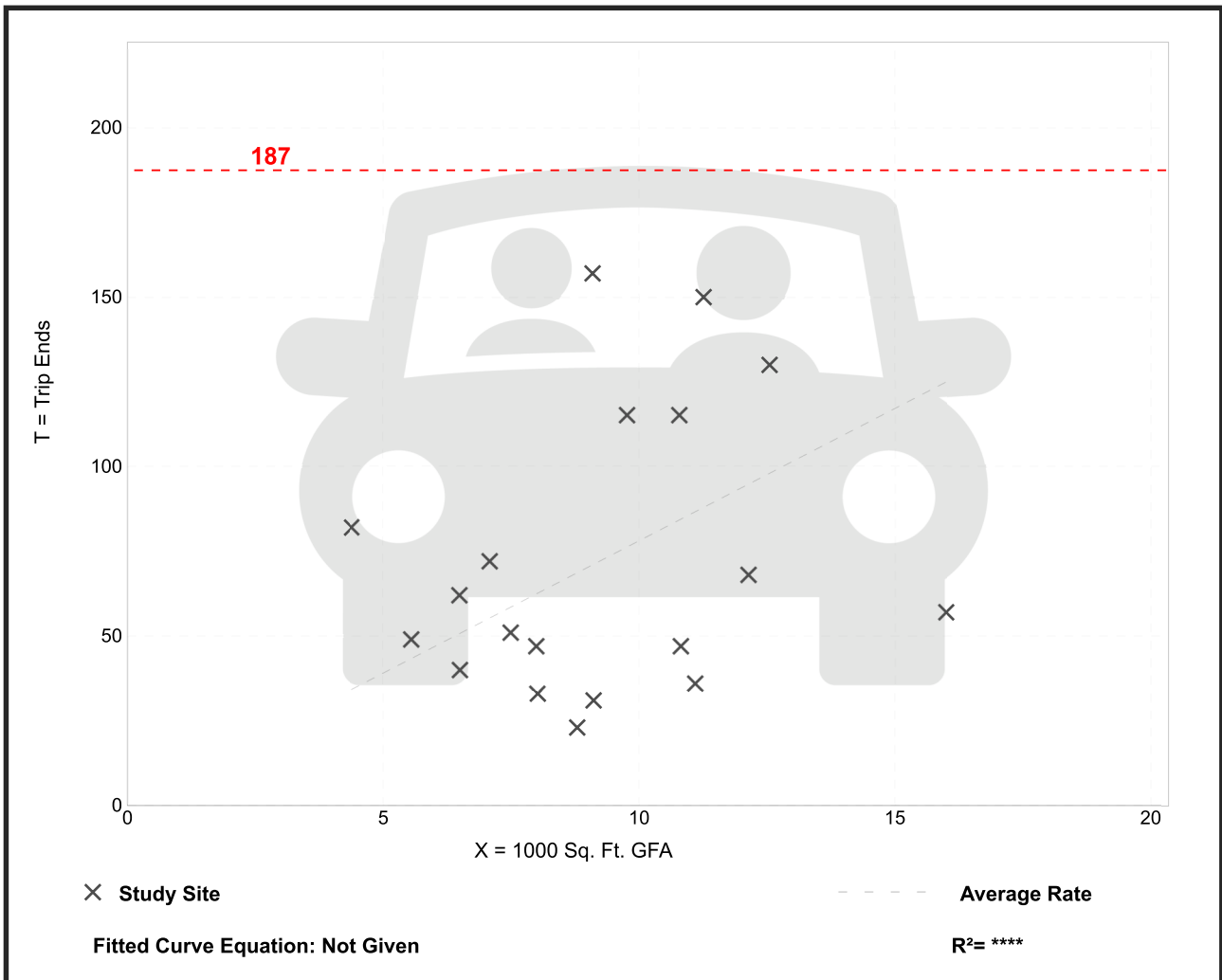
Fine Dining Restaurant (931)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 19
 Avg. 1000 Sq. Ft. GFA: 9
 Directional Distribution: 67% entering, 33% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
7.80	2.62 - 18.68	4.49

Data Plot and Equation



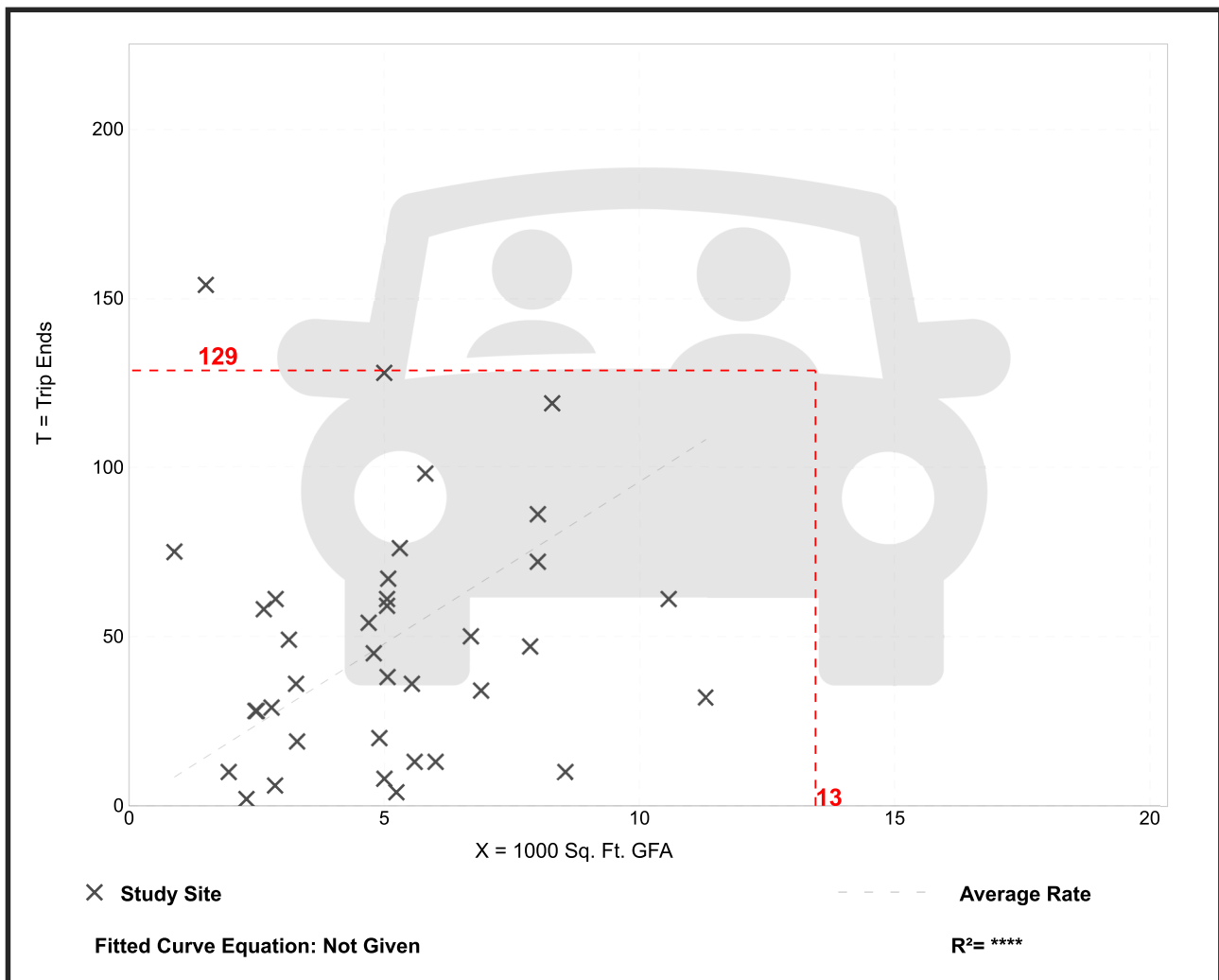
High-Turnover (Sit-Down) Restaurant (932)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 37
 Avg. 1000 Sq. Ft. GFA: 5
 Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.57	0.76 - 102.39	11.61

Data Plot and Equation



High-Turnover (Sit-Down) Restaurant (932)

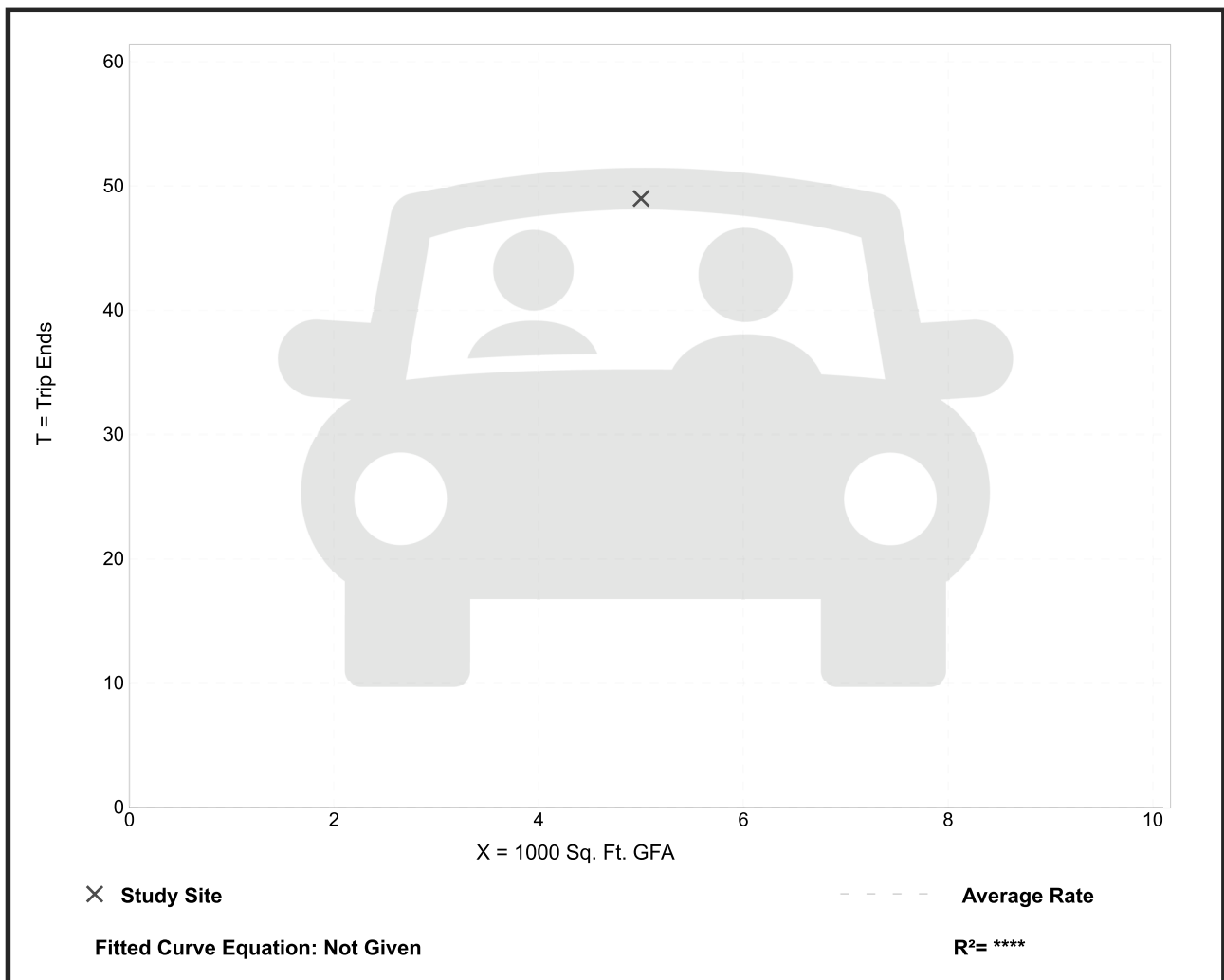
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 5
 Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
9.80	9.80 - 9.80	*

Data Plot and Equation

Caution – Small Sample Size



Fast-Food Restaurant without Drive-Through Window (933)

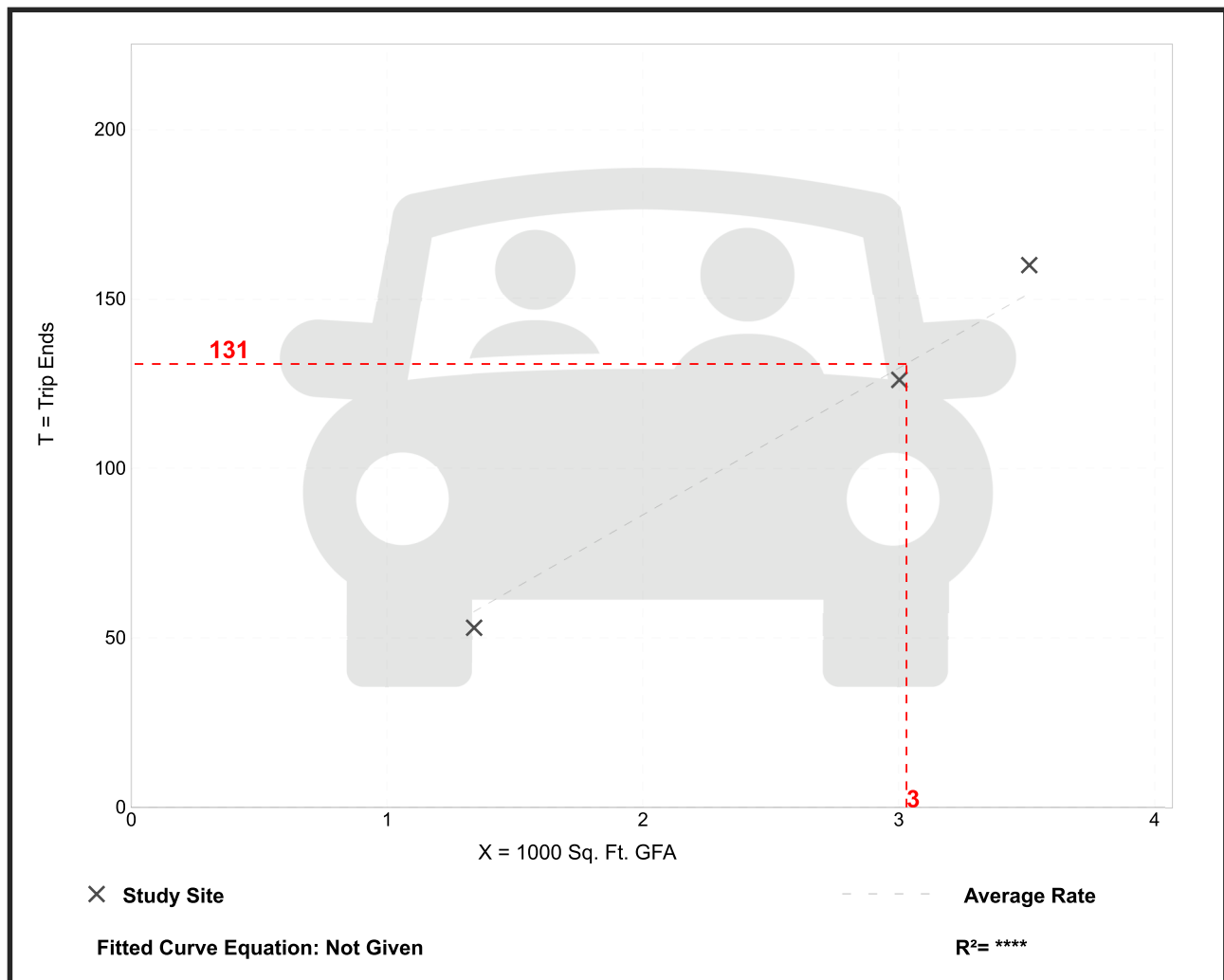
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 3
 Avg. 1000 Sq. Ft. GFA: 3
 Directional Distribution: 58% entering, 42% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
43.18	39.55 - 45.58	2.84

Data Plot and Equation

Caution – Small Sample Size



Fast-Food Restaurant without Drive-Through Window (933)

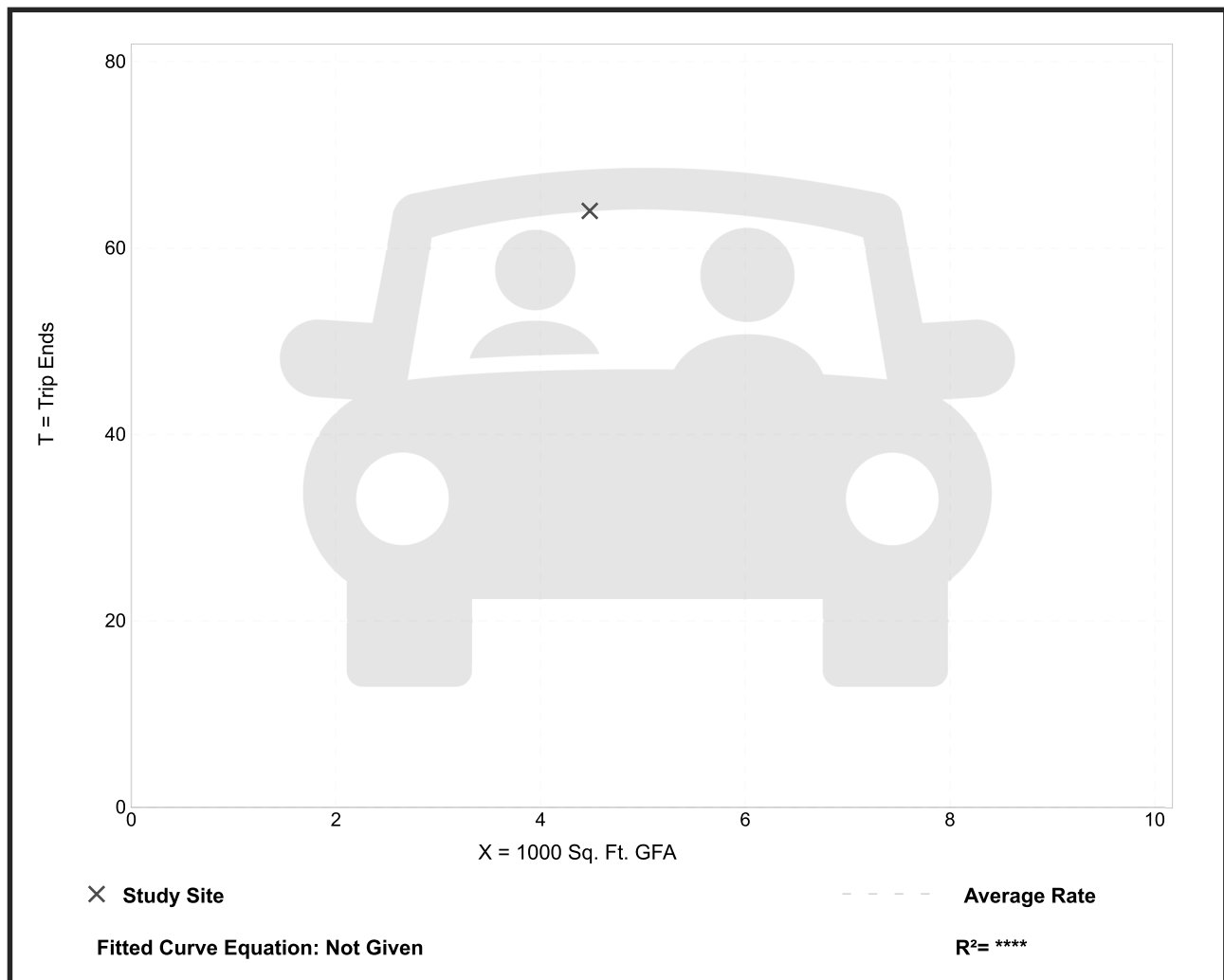
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 4
 Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
14.29	14.29 - 14.29	*

Data Plot and Equation

Caution – Small Sample Size



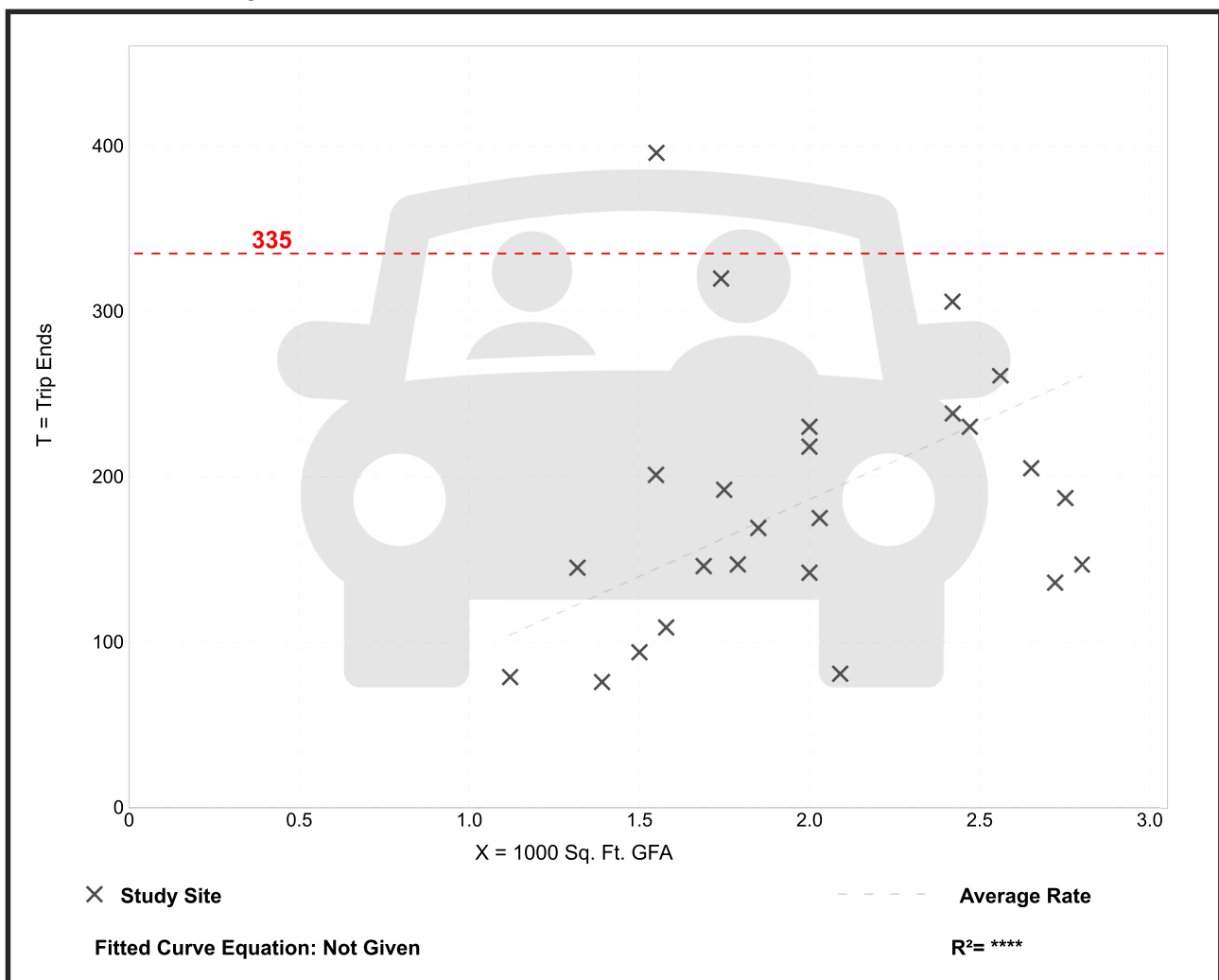
Coffee/Donut Shop without Drive-Through Window (936)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 25
 Avg. 1000 Sq. Ft. GFA: 2
 Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
93.08	38.76 - 255.48	42.71

Data Plot and Equation



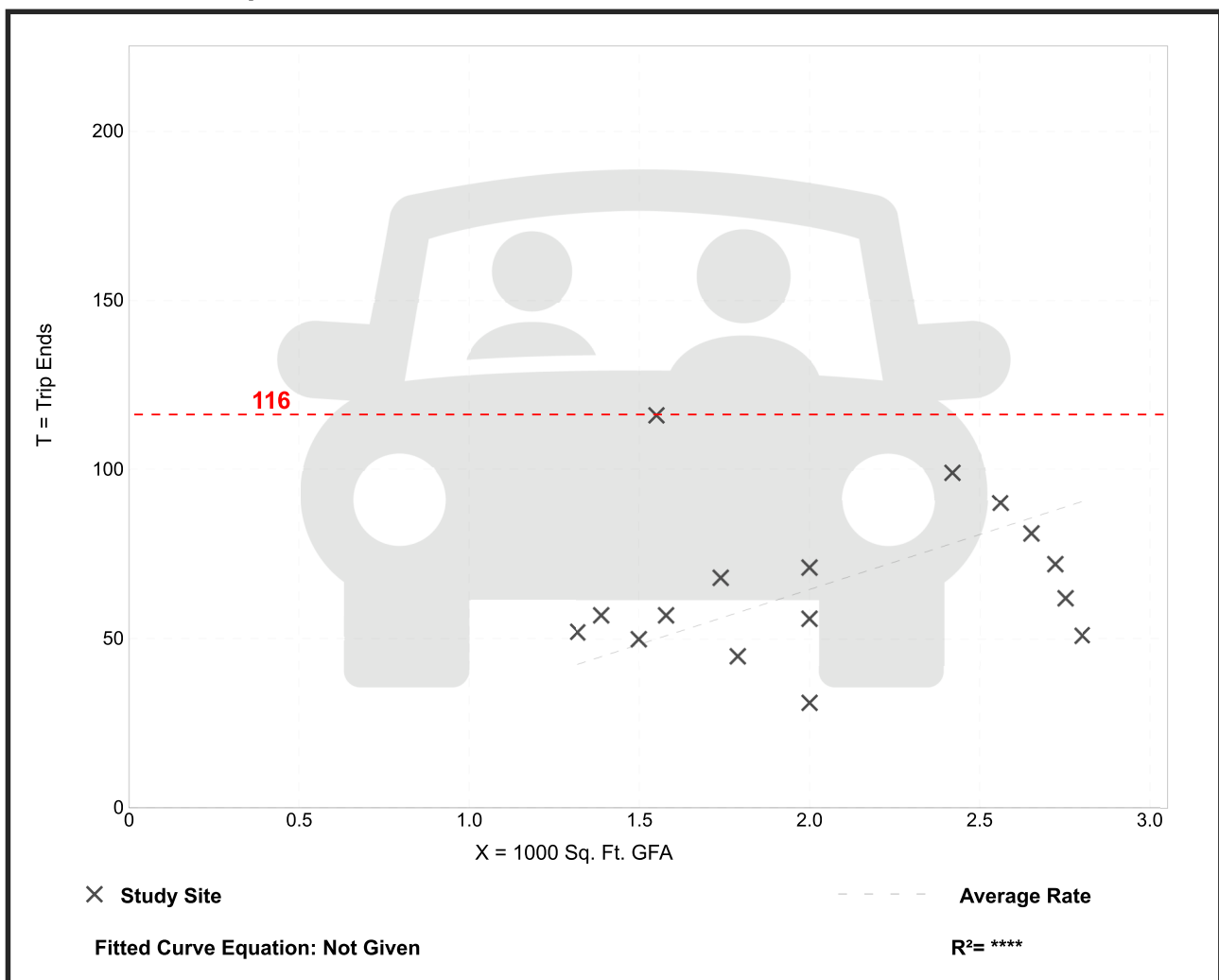
Coffee/Donut Shop without Drive-Through Window (936)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 16
 Avg. 1000 Sq. Ft. GFA: 2
 Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
32.29	15.50 - 74.84	12.64

Data Plot and Equation



Coffee/Donut Shop with Drive-Through Window (937)

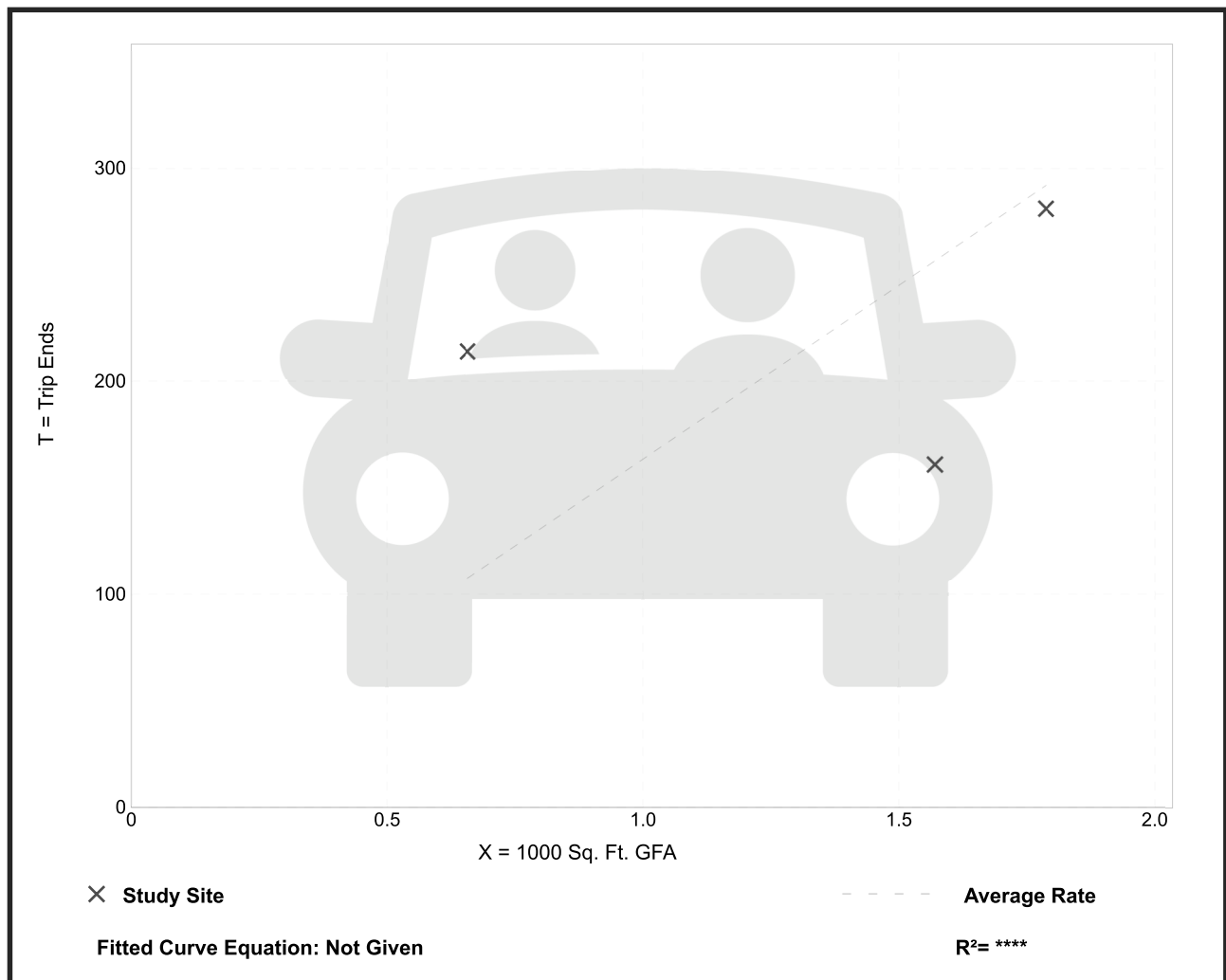
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 3
 Avg. 1000 Sq. Ft. GFA: 1
 Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
163.39	102.55 - 325.23	92.93

Data Plot and Equation

Caution – Small Sample Size



Coffee/Donut Shop with Drive-Through Window (937)

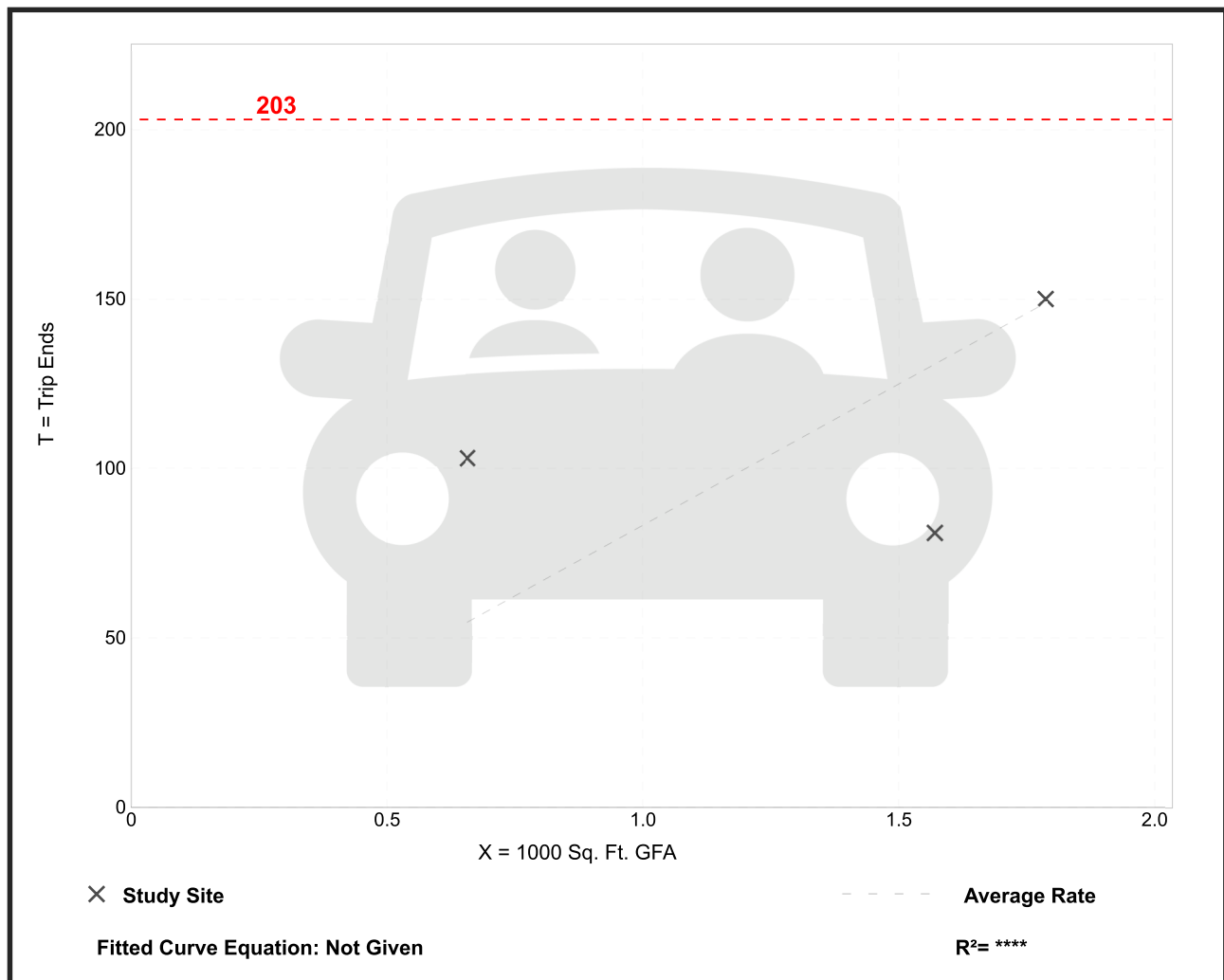
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 3
 Avg. 1000 Sq. Ft. GFA: 1
 Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
83.19	51.59 - 156.53	43.69

Data Plot and Equation

Caution – Small Sample Size



Appendix B

Internal Capture Estimation

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	Olia Village			Organization:	CMT
Project Location:	Creve Coeur, MO			Performed By:	RRS
Scenario Description:	AM Peak, Dense Multi-Use			Date:	2/28/2023
Analysis Year:	2022			Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	715, 760	259,226	SF	377	326	51
Retail	850,861,876	228,872	SF	495	286	209
Restaurant	31,932,933,93	80,199	SF	1060	570	490
Cinema/Entertainment	492	55,549	SF	73	37	36
Residential	220, 221	1,116	Dwellings	293	39	254
Hotel	310	251	Rooms	78	30	48
All Other Land Uses ²	160	36,476	SF	4	2	2
Total				2380	1290	1090

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.10	0%	0%
Restaurant	1.00	0%	0%	1.10	0%	0%
Cinema/Entertainment	1.00	0%	0%	1.10	0%	0%
Residential	1.00	0%	0%	1.10	0%	0%
Hotel	1.00	0%	0%	1.10	0%	0%
All Other Land Uses ²	1.00	0%	0%	1.10	0%	0%

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		14	32	0	0	0
Retail	13		30	0	1	0
Restaurant	46	23		0	2	1
Cinema/Entertainment	0	0	0		0	0
Residential	6	3	56	0		0
Hotel	10	7	5	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	2,484	1,290	1,194
Internal Capture Percentage	20%	19%	21%
External Vehicle-Trips ³	1,901	1,041	860
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	23%	90%
Retail	16%	19%
Restaurant	22%	13%
Cinema/Entertainment	0%	0%
Residential	8%	23%
Hotel	3%	42%

¹ Land Use Codes (LUCs) from <i>Trip Generation Informational Report</i> , published by the Institute of Transportation Engineers.
² Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator
³ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A
⁴ Person-Trips
*Indicates computation that has been rounded to the nearest whole number.
<i>Estimation Tool Developed by the Texas Transportation Institute</i>

Project Name:	Olia Village
Analysis Period:	AM Street Peak Hour

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	326	326	1.00	51	51
Retail	1.00	286	286	1.10	209	230
Restaurant	1.00	570	570	1.10	490	539
Cinema/Entertainment	1.00	37	37	1.10	36	40
Residential	1.00	39	39	1.10	254	279
Hotel	1.00	30	30	1.10	48	53

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		14	32	0	1	0
Retail	67		30	0	32	0
Restaurant	167	75		0	22	16
Cinema/Entertainment	0	0	0		0	0
Residential	6	3	56	0		0
Hotel	40	7	5	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		92	131	0	0	0
Retail	13		285	0	1	0
Restaurant	46	23		0	2	1
Cinema/Entertainment	0	0	0		0	0
Residential	10	49	114	0		0
Hotel	10	11	34	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	75	251	326	251	0	0
Retail	47	239	286	239	0	0
Restaurant	123	447	570	447	0	0
Cinema/Entertainment	0	37	37	37	0	0
Residential	3	36	39	36	0	0
Hotel	1	29	30	29	0	0
All Other Land Uses ³	0	2	2	2	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	46	5	51	5	0	0
Retail	44	186	230	169	0	0
Restaurant	72	467	539	425	0	0
Cinema/Entertainment	0	40	40	36	0	0
Residential	65	214	279	195	0	0
Hotel	22	31	53	28	0	0
All Other Land Uses ³	0	2	2	2	0	0

¹ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A
² Person-Trips
³ Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator
*Indicates computation that has been rounded to the nearest whole number.

NCHRP 8-51 Internal Trip Capture Estimation Tool					
Project Name:	Olia Village			Organization:	CMT
Project Location:	Creve Coeur, MO			Performed By:	RRS
Scenario Description:	PM Peak, Dense Multi-Use			Date:	2/28/2023
Analysis Year:	2022			Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	715, 760	259,226	SF	365	56	309
Retail	850,861,876,	228,872	SF	1087	533	554
Restaurant	31,932,933,93	80,199	SF	1270	721	549
Cinema/Entertainment	492	55,549	SF	169	96	73
Residential	220, 221	1,116	Dwellings	314	238	76
Hotel	310	251	Rooms	53	23	30
All Other Land Uses ²	160	36,476	SF	3	1	2
Total				3261	1668	1593

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.	% Transit	% Non-Motorized	Veh. Occ.	% Transit	% Non-Motorized
Office	1.00	0%	0%	1.00	0%	0%
Retail	1.00	0%	0%	1.00	0%	0%
Restaurant	1.00	0%	0%	1.00	0%	0%
Cinema/Entertainment	1.00	0%	0%	1.00	0%	0%
Residential	1.00	0%	0%	1.00	0%	0%
Hotel	1.00	0%	0%	1.00	0%	0%
All Other Land Uses ²	1.00	0%	0%	1.00	0%	0%

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		600	300		600	
Retail					900	
Restaurant					700	
Cinema/Entertainment					600	
Residential		900	800			
Hotel					1000	

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		38	12	0	6	0
Retail	11		161	22	109	4
Restaurant	16	225		31	38	16
Cinema/Entertainment	1	15	22		6	0
Residential	3	25	13	0		2
Hotel	0	5	20	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	3,261	1,668	1,593
Internal Capture Percentage	49%	48%	50%
External Vehicle-Trips ³	1,659	867	792
External Transit-Trips ⁴	0	0	0
External Non-Motorized Trips ⁴	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	55%	18%
Retail	58%	55%
Restaurant	32%	59%
Cinema/Entertainment	55%	60%
Residential	67%	57%
Hotel	96%	83%

¹ Land Use Codes (LUCs) from <i>Trip Generation Informational Report</i> , published by the Institute of Transportation Engineers.
² Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator
³ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P
⁴ Person-Trips
*Indicates computation that has been rounded to the nearest whole number.
<i>Estimation Tool Developed by the Texas Transportation Institute</i>

Project Name:	Olia Village
Analysis Period:	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	56	56	1.00	309	309
Retail	1.00	533	533	1.00	554	554
Restaurant	1.00	721	721	1.00	549	549
Cinema/Entertainment	1.00	96	96	1.00	73	73
Residential	1.00	238	238	1.00	76	76
Hotel	1.00	23	23	1.00	30	30

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		54	12	0	6	0
Retail	11		161	22	138	28
Restaurant	16	225		44	99	38
Cinema/Entertainment	1	15	23		6	1
Residential	3	25	13	0		2
Hotel	0	5	20	0	1	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		38	14	1	10	0
Retail	17		209	25	109	4
Restaurant	17	267		31	38	16
Cinema/Entertainment	3	21	22		10	0
Residential	32	42	83	0		3
Hotel	0	11	36	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	31	25	56	25	0	0
Retail	308	225	533	225	0	0
Restaurant	228	493	721	493	0	0
Cinema/Entertainment	53	43	96	43	0	0
Residential	159	79	238	79	0	0
Hotel	22	1	23	1	0	0
All Other Land Uses ³	0	1	1	1	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	56	253	309	253	0	0
Retail	307	247	554	247	0	0
Restaurant	326	223	549	223	0	0
Cinema/Entertainment	44	29	73	29	0	0
Residential	43	33	76	33	0	0
Hotel	25	5	30	5	0	0
All Other Land Uses ³	0	2	2	2	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

²Person-Trips

³Total estimate for all other land uses at mixed-use development site-not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

Appendix C

Synchro Analysis Results

2022 AM Existing.....	C-1
2022 PM Existing	C-23
2028 AM No-Build	C-45
2028 PM No-Build.....	C-67
2048 AM No-Build	C-89
2048 PM No-Build.....	C-111
2028 AM Build	C-133
2028 PM Build.....	C-159
2048 AM Build	C-183
2048 PM Build.....	C-209
2028 AM Build with Improvements	C-234
2028 PM Build with Improvements.....	C-237
2048 AM Build with Improvements	C-240
2048 PM Build with Improvements.....	C-243

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↖	↗↗
Traffic Volume (vph)	1216	134	96	1123	5	263
Future Volume (vph)	1216	134	96	1123	5	263
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		147				103
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.91	0.91	0.89	0.89	0.90	0.90
Adj. Flow (vph)	1336	147	108	1262	6	292
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1336	147	108	1262	6	292
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

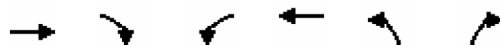
AM 2022 Creve Coeur Existing AM 2022 10:45 am 02/15/2023

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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	10.0	7.0	7.0	10.0	7.0	
Minimum Split (s)	38.4	44.2	20.0	56.5	44.2	
Total Split (s)	86.0	23.0	21.0	107.0	23.0	
Total Split (%)	66.2%	17.7%	16.2%	82.3%	17.7%	
Maximum Green (s)	79.6	14.8	13.5	100.5	14.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	85.9	104.8	9.5	102.8	12.5	29.5
Actuated g/C Ratio	0.66	0.81	0.07	0.79	0.10	0.23
v/c Ratio	0.57	0.11	0.43	0.45	0.04	0.41
Control Delay	4.8	0.5	67.1	11.1	52.2	28.3
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	4.9	0.5	67.1	11.1	52.2	28.3
LOS	A	A	E	B	D	C
Approach Delay	4.5			15.5	28.8	
Approach LOS	A			B	C	
Queue Length 50th (ft)	219	4	48	386	5	75
Queue Length 95th (ft)	108	1	81	245	18	118
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2339	1330	356	2798	201	740
Starvation Cap Reductn	108	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.60	0.11	0.30	0.45	0.03	0.39

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 124 (95%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.57

Intersection Signal Delay: 11.6

Intersection LOS: B

Intersection Capacity Utilization 59.2%

ICU Level of Service B

Analysis Period (min) 15

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

05/18/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R)		 Ø4	
107 s		23 s	
 Ø5	 Ø6 (R)		
21 s	86 s		

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↙↘	↑
Traffic Volume (vph)	1392	87	3	1063	156	177
Future Volume (vph)	1392	87	3	1063	156	177
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3400	3505	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3400	3505	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		87				166
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	1547	97	3	1155	177	201
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1547	97	3	1155	177	201
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	

AM 2022 Creve Coeur Existing AM 2022 10:45 am 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		6				4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	59.1	37.9	37.9
Total Split (s)	82.0	82.0	18.0	100.0	30.0	30.0
Total Split (%)	63.1%	63.1%	13.8%	76.9%	23.1%	23.1%
Maximum Green (s)	76.0	76.0	11.1	93.9	23.1	23.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	101.9	101.9	7.0	104.6	12.4	12.4
Actuated g/C Ratio	0.78	0.78	0.05	0.80	0.10	0.10
v/c Ratio	0.56	0.08	0.02	0.41	0.54	0.67
Control Delay	5.9	1.8	54.0	5.5	61.8	24.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	1.8	54.0	5.5	61.8	24.2
LOS	A	A	D	A	E	C
Approach Delay	5.7			5.6	41.8	
Approach LOS	A			A	D	
Queue Length 50th (ft)	131	0	1	120	74	28
Queue Length 95th (ft)	263	12	m3	251	106	99
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2774	1259	290	2819	610	417
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.08	0.01	0.41	0.29	0.48
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.67						
Intersection Signal Delay: 9.9				Intersection LOS: A		
Intersection Capacity Utilization 60.2%				ICU Level of Service B		
Analysis Period (min) 15						

Lanes, Volumes, Timings 5: NB Lindbergh & Olive

05/18/2023

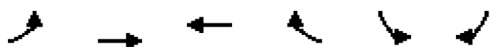
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R)		 Ø4	
100 s		30 s	
 Ø5	 Ø6 (R)		
18 s	82 s		

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



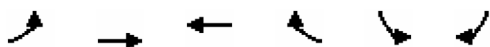
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	88	1481	1022	237	37	44
Future Volume (vph)	88	1481	1022	237	37	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3505	1568	1656	1482
Flt Permitted	0.220				0.950	
Satd. Flow (perm)	410	3539	3505	1568	1656	1482
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				255		52
Link Speed (mph)		40	40		40	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		11.8	
Peak Hour Factor	0.90	0.90	0.93	0.93	0.84	0.84
Heavy Vehicles (%)	2%	2%	3%	3%	9%	9%
Adj. Flow (vph)	98	1646	1099	255	44	52
Shared Lane Traffic (%)						
Lane Group Flow (vph)	98	1646	1099	255	44	52
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	

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Synchro 11 Report
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Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2			2		3
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	25.0	108.0	83.0	83.0	22.0	22.0
Total Split (%)	19.2%	83.1%	63.8%	63.8%	16.9%	16.9%
Maximum Green (s)	19.2	102.3	77.4	77.4	16.6	16.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	96.4	102.3	89.5	89.5	16.6	16.6
Actuated g/C Ratio	0.74	0.79	0.69	0.69	0.13	0.13
v/c Ratio	0.26	0.59	0.46	0.22	0.21	0.22
Control Delay	4.0	5.1	10.0	1.3	53.7	15.7
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	4.0	5.5	10.0	1.3	53.7	15.7
LOS	A	A	B	A	D	B
Approach Delay		5.4	8.4		33.1	
Approach LOS		A	A		C	
Queue Length 50th (ft)	6	55	202	0	34	0
Queue Length 95th (ft)	35	499	252	26	67	34
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	523	2784	2412	1158	211	234
Starvation Cap Reductn	0	575	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.75	0.46	0.22	0.21	0.22

Intersection Summary

Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 41 (32%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 56.0%	ICU Level of Service B
Analysis Period (min) 15	

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023

Splits and Phases: 17: Olive & Old Olive St E

 Ø1	 Ø2 (R)	 Ø3
25 s	83 s	22 s
 Ø6 (R)		
108 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1296	0	0	1027	101	0	0	0	54	0	7
Future Volume (vph)	14	1296	0	0	1027	101	0	0	0	54	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	0		210	0		20	150		0
Storage Lanes	1		1	0		1	0		1	1		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Flt Permitted	0.216									0.950		
Satd. Flow (perm)	402	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						127						121
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			176			526	
Travel Time (s)		17.9			13.3			4.0			14.3	
Peak Hour Factor	0.86	0.86	0.86	0.95	0.95	0.95	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	16	1507	0	0	1081	106	0	0	0	65	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1507	0	0	1081	106	0	0	0	65	0	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1		2	1	1	2	1	1		1
Detector Template	Left	Thru	Right		Thru	Right	Left	Thru	Right	Left		Right
Leading Detector (ft)	20	100	20		100	20	20	100	20	20		20
Trailing Detector (ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Position(ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Size(ft)	20	6	20		6	20	20	6	20	20		20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	D.P+P	NA	Perm		NA	Perm			Perm	Prot		Perm
Protected Phases	1	6			2		4	4		3		
Permitted Phases	2		6			2			4			3

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Lanes, Volumes, Timings

18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6		2	2	4	4	4	3		3
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0		10.0	10.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	12.8	15.5	15.5		15.6	15.6	13.0	13.0	13.0	13.3		13.3
Total Split (s)	16.0	92.0	92.0		76.0	76.0	8.0	8.0	8.0	30.0		30.0
Total Split (%)	12.3%	70.8%	70.8%		58.5%	58.5%	6.2%	6.2%	6.2%	23.1%		23.1%
Maximum Green (s)	10.2	86.5	86.5		70.4	70.4	2.0	2.0	2.0	23.7		23.7
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.8	1.5	1.5		1.6	1.6	2.0	2.0	2.0	2.3		2.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.5	5.5		5.6	5.6		6.0	6.0	6.3		6.3
Lead/Lag	Lag				Lead	Lead	Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max	C-Max		C-Max	C-Max	None	None	None	Max		Max
Act Effct Green (s)	91.9	94.5			88.0	88.0				23.7		23.7
Actuated g/C Ratio	0.71	0.73			0.68	0.68				0.18		0.18
v/c Ratio	0.04	0.59			0.45	0.10				0.20		0.02
Control Delay	1.9	4.3			3.2	0.5				47.1		0.1
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay	1.9	4.3			3.2	0.5				47.1		0.1
LOS	A	A			A	A				D		A
Approach Delay		4.3			2.9						41.9	
Approach LOS		A			A						D	
Queue Length 50th (ft)	3	137			68	0				47		0
Queue Length 95th (ft)	m2	56			67	0				83		0
Internal Link Dist (ft)		972			703			96			446	
Turn Bay Length (ft)	190					210				150		
Base Capacity (vph)	391	2572			2395	1112				322		387
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.04	0.59			0.45	0.10				0.20		0.02

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 125 (96%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.59

Intersection Signal Delay: 4.7

Intersection LOS: A

Intersection Capacity Utilization 47.1%

ICU Level of Service A

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Pavillion & Olive



Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	153	1189	6	19	968	47	4	5	21	100	8	302
Future Volume (vph)	153	1189	6	19	968	47	4	5	21	100	8	302
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.879			0.854	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1480	1369	0	1770	1591	0
Flt Permitted	0.249			0.168			0.274			0.737		
Satd. Flow (perm)	464	3539	1583	313	3539	1583	427	1369	0	1373	1591	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			78		25			308	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			119			409	
Travel Time (s)		8.9			17.9			2.7			9.3	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.84	0.84	0.84	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	22%	22%	22%	2%	2%	2%
Adj. Flow (vph)	168	1307	7	20	1008	49	5	6	25	102	8	308
Shared Lane Traffic (%)												
Lane Group Flow (vph)	168	1307	7	20	1008	49	5	31	0	102	316	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6	6		2	8			4		
Detector Phase	1	6	6	5	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.1	16.2	16.2	13.1	30.3	30.3	13.2	13.2		13.1	13.1	
Total Split (s)	27.0	77.0	77.0	23.0	73.0	73.0	30.0	30.0		30.0	30.0	
Total Split (%)	20.8%	59.2%	59.2%	17.7%	56.2%	56.2%	23.1%	23.1%		23.1%	23.1%	
Maximum Green (s)	20.9	70.8	70.8	16.9	66.7	66.7	23.8	23.8		23.9	23.9	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.1	2.2	2.2	2.1	2.3	2.3	2.2	2.2		2.1	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	6.2	6.1	6.3	6.3	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					17.0	17.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	97.0	93.8	93.8	100.7	88.6	88.6	14.6	14.6		14.7	14.7	
Actuated g/C Ratio	0.75	0.72	0.72	0.77	0.68	0.68	0.11	0.11		0.11	0.11	
v/c Ratio	0.39	0.51	0.01	0.05	0.42	0.04	0.11	0.18		0.66	0.70	
Control Delay	4.7	7.1	0.0	0.6	0.7	0.1	53.5	23.3		74.2	14.9	
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	4.7	7.2	0.0	0.6	0.7	0.1	53.5	23.3		74.2	14.9	
LOS	A	A	A	A	A	A	D	C		E	B	
Approach Delay		6.9			0.7			27.5			29.3	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	17	70	0	0	6	0	4	5		84	6	
Queue Length 95th (ft)	28	219	m0	m0	2	0	15	30		138	94	
Internal Link Dist (ft)		375			972			39			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	577	2554	1165	432	2411	1103	78	271		252	543	
Starvation Cap Reductn	0	337	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.29	0.59	0.01	0.05	0.42	0.04	0.06	0.11		0.40	0.58	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 116 (89%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.70												
Intersection Signal Delay: 8.0				Intersection LOS: A								
Intersection Capacity Utilization 73.1%				ICU Level of Service D								
Analysis Period (min) 15												

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spodee & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1214	63	85	1183	6	64	1	118	16	3	3
Future Volume (vph)	1	1214	63	85	1183	6	64	1	118	16	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850			0.850		0.925	
Flt Protected	0.950			0.950				0.953		0.950		
Satd. Flow (prot)	1770	3514	0	1770	3539	1583	0	1775	1583	1770	1723	0
Flt Permitted	0.171			0.121				0.724		0.708		
Satd. Flow (perm)	319	3514	0	225	3539	1583	0	1349	1583	1319	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				28			57		4	
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			9.3	
Peak Hour Factor	0.93	0.93	0.93	0.88	0.88	0.88	0.86	0.86	0.86	0.75	0.75	0.75
Adj. Flow (vph)	1	1305	68	97	1344	7	74	1	137	21	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1373	0	97	1344	7	0	75	137	21	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases		6		5	2			8	5		4	
Permitted Phases	2			6		2	8		8	4		

AM 2022 Creve Coeur Existing AM 2022 10:45 am 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings

20: Spoeede & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	30.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	103.0	83.0		20.0	103.0	103.0	27.0	27.0	20.0	27.0	27.0	
Total Split (%)	79.2%	63.8%		15.4%	79.2%	79.2%	20.8%	20.8%	15.4%	20.8%	20.8%	
Maximum Green (s)	96.7	76.8		14.0	96.7	96.7	20.7	20.7	14.0	20.7	20.7	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag	Lead			Lag			Lag			Lag		
Lead-Lag Optimize?	Yes			Yes			Yes			Yes		
Vehicle Extension (s)	4.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	Max	Max	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	17.0	23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	96.7	76.8		91.0	96.7	96.7		20.7	41.0	20.7	20.7	
Actuated g/C Ratio	0.74	0.59		0.70	0.74	0.74		0.16	0.32	0.16	0.16	
v/c Ratio	0.00	0.66		0.30	0.51	0.01		0.35	0.25	0.10	0.03	
Control Delay	4.0	19.7		7.0	2.9	0.0		54.0	20.4	48.2	35.7	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.0	19.7		7.0	3.1	0.0		54.0	20.4	48.2	35.7	
LOS	A	B		A	A	A		D	C	D	D	
Approach Delay	19.7			3.3			32.3				44.8	
Approach LOS	B			A			C				D	
Queue Length 50th (ft)	0	386		6	112	0		57	49	15	3	
Queue Length 95th (ft)	2	462		13	69	m0		102	95	34	15	
Internal Link Dist (ft)	501			375			414				261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	237	2078		323	2632	1184		214	538	210	277	
Starvation Cap Reductn	0	0		0	365	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.00	0.66		0.30	0.59	0.01		0.35	0.25	0.10	0.03	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 3 (2%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.66												
Intersection Signal Delay: 13.1				Intersection LOS: B								
Intersection Capacity Utilization 67.1%				ICU Level of Service C								
Analysis Period (min) 15												
m Volume for 95th percentile queue is metered by upstream signal.												

Splits and Phases: 20: Spoede & Olive

 Ø2 (R) 103 s	 Ø4 27 s
 Ø6 (R) 83 s	 Ø5 20 s
	 Ø8 27 s

Intersection												
Int Delay, s/veh	2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	↗
Traffic Vol, veh/h	0	0	105	0	0	160	0	1205	90	0	1785	210
Future Vol, veh/h	0	0	105	0	0	160	0	1205	90	0	1785	210
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Yield	-	-	Free	-	-	Free
Storage Length	-	-	0	-	-	0	-	-	-	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	114	0	0	174	0	1310	98	0	1940	228

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	970	-	-	655	-	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.98	-	-	6.98	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.34	-	-	3.34	-	-
Pot Cap-1 Maneuver	0	0	249	0	0	404	0	0
Stage 1	0	0	-	0	0	-	0	0
Stage 2	0	0	-	0	0	-	0	0
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	249	-	-	404	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	31.1	20.5	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	EBLn1	WBLn1	SBT
Capacity (veh/h)	-	249	404	-
HCM Lane V/C Ratio	-	0.458	0.43	-
HCM Control Delay (s)	-	31.1	20.5	-
HCM Lane LOS	-	D	C	-
HCM 95th %tile Q(veh)	-	2.2	2.1	-

Intersection

Intersection Delay, s/veh	7.3
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	23	0	0	0	42	0
Future Vol, veh/h	23	0	0	0	42	0
Peak Hour Factor	0.82	0.92	0.92	0.92	0.86	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	0	0	0	49	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.2	0	7.4
HCM LOS	A	-	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	100%	100%
Vol Right, %	0%	0%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	42	23	0
LT Vol	42	0	0
Through Vol	0	23	0
RT Vol	0	0	0
Lane Flow Rate	49	28	0
Geometry Grp	1	1	1
Degree of Util (X)	0.057	0.031	0
Departure Headway (Hd)	4.183	4.019	4.04
Convergence, Y/N	Yes	Yes	Yes
Cap	859	890	0
Service Time	2.195	2.046	2.073
HCM Lane V/C Ratio	0.057	0.031	0
HCM Control Delay	7.4	7.2	7.1
HCM Lane LOS	A	A	N
HCM 95th-tile Q	0.2	0.1	0

Intersection

Intersection Delay, s/veh 6.7

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	37	0	23	0	0
Future Vol, veh/h	5	37	0	23	0	0
Peak Hour Factor	0.86	0.86	0.92	0.82	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	43	0	28	0	0
Number of Lanes	1	0	1	1	0	0

Approach	WB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left NB		
Conflicting Lanes Left	2	0
Conflicting Approach Right		WB
Conflicting Lanes Right	0	1
HCM Control Delay	6.7	6.8
HCM LOS	A	A

Lane	NBLn1	NBLn2	WBLn1
Vol Left, %	0%	0%	12%
Vol Thru, %	100%	0%	0%
Vol Right, %	0%	100%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	0	23	42
LT Vol	0	0	5
Through Vol	0	0	0
RT Vol	0	23	37
Lane Flow Rate	0	28	49
Geometry Grp	7	7	2
Degree of Util (X)	0	0.031	0.047
Departure Headway (Hd)	4.619	3.918	3.478
Convergence, Y/N	Yes	Yes	Yes
Cap	0	917	1032
Service Time	2.327	1.626	1.49
HCM Lane V/C Ratio	0	0.031	0.047
HCM Control Delay	7.3	6.8	6.7
HCM Lane LOS	N	A	A
HCM 95th-tile Q	0	0.1	0.1

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	23	0	0	0	5
Future Vol, veh/h	0	23	0	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	82	92	92	92	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	28	0	0	0	6

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	6	-	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	6	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	1015	0	-	0	0	-
Stage 1	-	0	-	0	0	-
Stage 2	1017	0	-	0	0	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1015	-	-	-	-	-
Mov Cap-2 Maneuver	1015	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1017	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBT
Capacity (veh/h)	-	-
HCM Lane V/C Ratio	-	-
HCM Control Delay (s)	-	0
HCM Lane LOS	-	A
HCM 95th %tile Q(veh)	-	-

MOVEMENT SUMMARY

 **Site: 101 [2022 AM Existing (Site Folder: Eastmost Monsanto Intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]				mph
East: Monsanto															
1a	L1	All MCs	9	3.0	9	3.0	0.006	3.5	LOS A	0.0	0.0	0.00	0.43	0.00	23.7
6	T1	All MCs	1	3.0	1	3.0	0.006	0.0	LOS A	0.0	0.0	0.00	0.43	0.00	25.5
Approach			10	3.0	10	3.0	0.006	3.1	NA	0.0	0.0	0.00	0.43	0.00	23.9
West: Monsanto															
2	T1	All MCs	25	3.0	25	3.0	0.026	7.2	LOS A	0.1	2.3	0.05	1.06	0.05	20.1
Approach			25	3.0	25	3.0	0.026	7.2	LOS A	0.1	2.3	0.05	1.06	0.05	20.1
SouthWest: NB Ramp															
12ax	R1	All MCs	40	3.0	40	3.0	0.038	7.0	LOS A	0.2	4.2	0.11	0.93	0.11	20.1
Approach			40	3.0	40	3.0	0.038	7.0	LOS A	0.2	4.2	0.11	0.93	0.11	20.1
All Vehicles			75	3.0	75	3.0	0.038	6.6	NA	0.2	4.2	0.08	0.91	0.08	20.5

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard (HCM).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\05-2023 Updated Models\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↖	↗↗
Traffic Volume (vph)	1123	176	174	1617	21	149
Future Volume (vph)	1123	176	174	1617	21	149
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		167				124
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.93	0.93
Adj. Flow (vph)	1195	187	181	1684	23	160
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1195	187	181	1684	23	160
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

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Synchro 11 Report
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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	10.0	7.0	7.0	10.0	7.0	
Minimum Split (s)	38.4	44.2	14.5	56.5	44.2	
Total Split (s)	82.0	24.0	24.0	106.0	24.0	
Total Split (%)	63.1%	18.5%	18.5%	81.5%	18.5%	
Maximum Green (s)	75.6	15.8	16.5	99.5	15.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	87.9	102.1	12.2	107.4	7.9	27.5
Actuated g/C Ratio	0.68	0.79	0.09	0.83	0.06	0.21
v/c Ratio	0.50	0.15	0.56	0.58	0.21	0.23
Control Delay	6.3	0.6	62.9	7.9	62.4	12.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	0.6	62.9	7.9	62.4	12.0
LOS	A	A	E	A	E	B
Approach Delay	5.5			13.2	18.3	
Approach LOS	A			B	B	
Queue Length 50th (ft)	166	2	77	372	19	14
Queue Length 95th (ft)	203	0	114	355	48	44
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2391	1365	435	2924	215	764
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.14	0.42	0.58	0.11	0.21
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 105						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.58						
Intersection Signal Delay: 10.4				Intersection LOS: B		
Intersection Capacity Utilization 62.8%				ICU Level of Service B		
Analysis Period (min) 15						

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

05/18/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R)		 Ø4	
106 s		24 s	
 Ø5	 Ø6 (R)		
24 s		82 s	

Lanes, Volumes, Timings
5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↙↘	↑
Traffic Volume (vph)	1150	122	12	1609	182	180
Future Volume (vph)	1150	122	12	1609	182	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		128				188
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.95	0.95	0.92	0.92	0.96	0.96
Adj. Flow (vph)	1211	128	13	1749	190	188
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1211	128	13	1749	190	188
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4

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Synchro 11 Report
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Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	59.1	37.9	37.9
Total Split (s)	85.0	85.0	22.0	107.0	23.0	23.0
Total Split (%)	65.4%	65.4%	16.9%	82.3%	17.7%	17.7%
Maximum Green (s)	79.0	79.0	15.1	100.9	16.1	16.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	99.1	99.1	7.0	104.5	12.5	12.5
Actuated g/C Ratio	0.76	0.76	0.05	0.80	0.10	0.10
v/c Ratio	0.45	0.10	0.07	0.61	0.58	0.58
Control Delay	2.8	0.3	50.1	9.8	63.0	15.0
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	2.8	0.3	50.1	9.9	63.0	15.0
LOS	A	A	D	A	E	B
Approach Delay	2.5			10.2	39.1	
Approach LOS	A			B	D	
Queue Length 50th (ft)	39	0	5	352	80	0
Queue Length 95th (ft)	90	1	m9	517	117	70
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2696	1236	398	2845	425	360
Starvation Cap Reductn	0	0	0	260	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.45	0.10	0.03	0.68	0.45	0.52
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 2 (2%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.61						
Intersection Signal Delay: 10.4				Intersection LOS: B		
Intersection Capacity Utilization 61.1%				ICU Level of Service B		
Analysis Period (min) 15						
m Volume for 95th percentile queue is metered by upstream signal.						

Lanes, Volumes, Timings
 5: NB Lindbergh & Olive

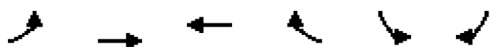
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Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R) 107 s		 Ø4 23 s	
 Ø5 22 s	 Ø6 (R) 85 s		

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



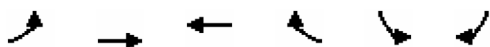
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	27	1303	1479	276	114	142
Future Volume (vph)	27	1303	1479	276	114	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.121				0.950	
Satd. Flow (perm)	225	3539	3539	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				285		159
Link Speed (mph)		40	40		30	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		15.8	
Peak Hour Factor	0.96	0.96	0.97	0.97	0.82	0.82
Adj. Flow (vph)	28	1357	1525	285	139	173
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	1357	1525	285	139	173
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	2			2		3

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Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	16.0	106.0	90.0	90.0	24.0	24.0
Total Split (%)	12.3%	81.5%	69.2%	69.2%	18.5%	18.5%
Maximum Green (s)	10.2	100.3	84.4	84.4	18.6	18.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	96.7	100.3	93.2	93.2	18.6	18.6
Actuated g/C Ratio	0.74	0.77	0.72	0.72	0.14	0.14
v/c Ratio	0.12	0.50	0.60	0.23	0.55	0.48
Control Delay	3.2	7.5	11.1	1.3	60.8	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.2	7.5	11.1	1.3	60.8	14.2
LOS	A	A	B	A	E	B
Approach Delay		7.4	9.6		35.0	
Approach LOS		A	A		C	
Queue Length 50th (ft)	2	392	346	0	110	10
Queue Length 95th (ft)	m6	251	419	28	163	58
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	292	2730	2536	1215	253	362
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.50	0.60	0.23	0.55	0.48

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 49 (38%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 58.8%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023

Splits and Phases: 17: Olive & Old Olive St E

 Ø1	 Ø2 (R)	 Ø3
16 s	90 s	24 s
 Ø6 (R)		
106 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	49	1193	0	0	1418	220	0	0	0	106	0	42
Future Volume (vph)	49	1193	0	0	1418	220	0	0	0	106	0	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	0		210	0		20	150		0
Storage Lanes	1		1	0		1	0		1	1		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Flt Permitted	0.084									0.950		
Satd. Flow (perm)	156	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						155						121
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			176			526	
Travel Time (s)		17.9			13.3			4.0			14.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	53	1283	0	0	1525	237	0	0	0	143	0	57
Shared Lane Traffic (%)												
Lane Group Flow (vph)	53	1283	0	0	1525	237	0	0	0	143	0	57
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1		2	1	1	2	1	1		1
Detector Template	Left	Thru	Right		Thru	Right	Left	Thru	Right	Left		Right
Leading Detector (ft)	20	100	20		100	20	20	100	20	20		20
Trailing Detector (ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Position(ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Size(ft)	20	6	20		6	20	20	6	20	20		20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	D.P+P	NA	Perm		NA	Perm			Perm	Prot		Perm
Protected Phases	1	6			2		4	4		3		
Permitted Phases	2		6			2			4			3

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Lanes, Volumes, Timings

18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6		2	2	4	4	4	3		3
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0		10.0	10.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	12.8	15.5	15.5		15.6	15.6	13.0	13.0	13.0	13.3		13.3
Total Split (s)	18.0	89.0	89.0		71.0	71.0	8.0	8.0	8.0	33.0		33.0
Total Split (%)	13.8%	68.5%	68.5%		54.6%	54.6%	6.2%	6.2%	6.2%	25.4%		25.4%
Maximum Green (s)	12.2	83.5	83.5		65.4	65.4	2.0	2.0	2.0	26.7		26.7
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.8	1.5	1.5		1.6	1.6	2.0	2.0	2.0	2.3		2.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.5	5.5		5.6	5.6		6.0	6.0	6.3		6.3
Lead/Lag	Lag				Lead	Lead	Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max	C-Max		C-Max	C-Max	None	None	None	Max		Max
Act Effct Green (s)	86.6	91.5			77.0	77.0				26.7		26.7
Actuated g/C Ratio	0.67	0.70			0.59	0.59				0.21		0.21
v/c Ratio	0.22	0.52			0.73	0.24				0.39		0.14
Control Delay	4.3	2.8			10.9	3.2				48.5		0.7
Queue Delay	0.0	0.0			0.1	0.0				0.0		0.0
Total Delay	4.3	2.8			11.0	3.2				48.5		0.7
LOS	A	A			B	A				D		A
Approach Delay		2.8			9.9						34.8	
Approach LOS		A			A						C	
Queue Length 50th (ft)	5	62			99	2				105		0
Queue Length 95th (ft)	8	68			228	48				138		0
Internal Link Dist (ft)		972			703			96			446	
Turn Bay Length (ft)	190					210				150		
Base Capacity (vph)	254	2490			2096	1000				363		421
Starvation Cap Reductn	0	0			52	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.21	0.52			0.75	0.24				0.39		0.14

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 125 (96%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 8.6

Intersection LOS: A

Intersection Capacity Utilization 54.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 18: Pavillion & Olive



Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	283	1104	10	47	1310	103	11	38	53	85	29	372
Future Volume (vph)	283	1104	10	47	1310	103	11	38	53	85	29	372
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.912			0.861	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1699	0	1770	1604	0
Flt Permitted	0.085			0.200			0.244			0.686		
Satd. Flow (perm)	158	3539	1583	373	3539	1583	455	1699	0	1278	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			78		48			338	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			119			409	
Travel Time (s)		8.9			17.9			2.7			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.87	0.87	0.87	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	298	1162	11	54	1506	118	12	40	56	92	32	404
Shared Lane Traffic (%)												
Lane Group Flow (vph)	298	1162	11	54	1506	118	12	96	0	92	436	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	2		6	6		2	8			4		

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.1	16.2	16.2	13.1	30.3	30.3	13.2	13.2		13.1	13.1	
Total Split (s)	30.0	82.0	82.0	16.0	68.0	68.0	32.0	32.0		32.0	32.0	
Total Split (%)	23.1%	63.1%	63.1%	12.3%	52.3%	52.3%	24.6%	24.6%		24.6%	24.6%	
Maximum Green (s)	23.9	75.8	75.8	9.9	61.7	61.7	25.8	25.8		25.9	25.9	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.1	2.2	2.2	2.1	2.3	2.3	2.2	2.2		2.1	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	6.2	6.1	6.3	6.3	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					17.0	17.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	95.2	88.4	88.4	96.4	74.1	74.1	16.4	16.4		16.5	16.5	
Actuated g/C Ratio	0.73	0.68	0.68	0.74	0.57	0.57	0.13	0.13		0.13	0.13	
v/c Ratio	0.80	0.48	0.01	0.14	0.75	0.13	0.21	0.38		0.57	0.88	
Control Delay	64.5	4.0	0.0	2.4	8.6	0.5	55.5	29.8		65.2	31.8	
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	64.5	4.2	0.0	2.4	8.6	0.5	55.5	29.8		65.2	31.8	
LOS	E	A	A	A	A	A	E	C		E	C	
Approach Delay		16.4			7.9			32.7			37.6	
Approach LOS		B			A			C			D	
Queue Length 50th (ft)	187	63	0	3	59	0	9	37		74	82	
Queue Length 95th (ft)	m225	88	m0	m4	543	m4	28	85		123	205	
Internal Link Dist (ft)		375			972			39			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	414	2407	1102	382	2017	936	90	375		254	590	
Starvation Cap Reductn	0	428	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.72	0.59	0.01	0.14	0.75	0.13	0.13	0.26		0.36	0.74	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 113 (87%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 16.0

Intersection LOS: B

Intersection Capacity Utilization 91.8%

ICU Level of Service F

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings 19: Olive & Old Olive St W

05/18/2023

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings
20: Spodee & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1260	107	103	1571	19	94	7	120	17	6	2
Future Volume (vph)	5	1260	107	103	1571	19	94	7	120	17	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850			0.850		0.959	
Flt Protected	0.950			0.950				0.956		0.950		
Satd. Flow (prot)	1770	3497	0	1770	3539	1583	0	1763	1568	1770	1786	0
Flt Permitted	0.102			0.064				0.734		0.621		
Satd. Flow (perm)	190	3497	0	119	3539	1583	0	1354	1568	1157	1786	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				81			80		3	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			7.8	
Peak Hour Factor	0.92	0.92	0.92	0.98	0.98	0.98	0.81	0.81	0.81	0.72	0.72	0.72
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	5	1370	116	105	1603	19	116	9	148	24	8	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1486	0	105	1603	19	0	125	148	24	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			8	5		4	

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Lanes, Volumes, Timings

20: Spoeede & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		2	8		8	4		
Detector Phase	1	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	16.0	74.0		28.0	86.0	86.0	28.0	28.0	28.0	28.0	28.0	
Total Split (%)	12.3%	56.9%		21.5%	66.2%	66.2%	21.5%	21.5%	21.5%	21.5%	21.5%	
Maximum Green (s)	9.7	67.8		22.0	79.7	79.7	21.7	21.7	22.0	21.7	21.7	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lag			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Vehicle Extension (s)	2.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max	None	None	None	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	94.4	67.8		90.0	93.0	93.0		21.7	50.0	21.7	21.7	
Actuated g/C Ratio	0.73	0.52		0.69	0.72	0.72		0.17	0.38	0.17	0.17	
v/c Ratio	0.02	0.81		0.29	0.63	0.02		0.55	0.23	0.12	0.04	
Control Delay	4.8	30.2		11.1	3.3	0.0		60.0	13.5	48.1	38.2	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.8	30.2		11.1	3.4	0.0		60.0	13.5	48.1	38.2	
LOS	A	C		B	A	A		E	B	D	D	
Approach Delay		30.1			3.8			34.8			45.0	
Approach LOS		C			A			C			D	
Queue Length 50th (ft)	1	526		20	69	0		98	37	17	6	
Queue Length 95th (ft)	4	628		m38	114	m0		148	70	36	19	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	256	1828		361	2533	1155		226	652	193	300	
Starvation Cap Reductn	0	0		0	177	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.02	0.81		0.29	0.68	0.02		0.55	0.23	0.12	0.04	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 119 (92%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.81												
Intersection Signal Delay: 17.7				Intersection LOS: B								
Intersection Capacity Utilization 77.3%				ICU Level of Service D								
Analysis Period (min) 15												

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Spoede & Olive



Intersection												
Int Delay, s/veh	11.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕↗			↕↕	↗
Traffic Vol, veh/h	0	0	100	0	0	395	0	1190	20	0	1500	250
Future Vol, veh/h	0	0	100	0	0	395	0	1190	20	0	1500	250
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Yield	-	-	Free	-	-	Free
Storage Length	-	-	0	-	-	0	-	-	-	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	109	0	0	429	0	1293	22	0	1630	272
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	815	-	-	647	-	0	-	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	321	0	0	~ 414	0	-	0	0	-	0
Stage 1	0	0	-	0	0	-	0	-	0	0	-	0
Stage 2	0	0	-	0	0	-	0	-	0	0	-	0
Platoon blocked, %							-		-			
Mov Cap-1 Maneuver	-	-	321	-	-	~ 414	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	21.9		86.3		0		0					
HCM LOS	C		F									
Minor Lane/Major Mvmt	NBT EBLn1WBLn1		SBT									
Capacity (veh/h)	-		321	414	-							
HCM Lane V/C Ratio	-		0.339	1.037	-							
HCM Control Delay (s)	-		21.9	86.3	-							
HCM Lane LOS	-		C	F	-							
HCM 95th %tile Q(veh)	-		1.5	13.7	-							
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Intersection

Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	14	0	0	10	15	0
Future Vol, veh/h	14	0	0	10	15	0
Peak Hour Factor	0.58	0.92	0.92	0.92	0.53	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	0	0	11	28	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.1	7.1	7.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	100%	100%
Vol Right, %	0%	0%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	15	14	10
LT Vol	15	0	0
Through Vol	0	14	10
RT Vol	0	0	0
Lane Flow Rate	28	24	11
Geometry Grp	1	1	1
Degree of Util (X)	0.033	0.027	0.012
Departure Headway (Hd)	4.195	3.992	4.001
Convergence, Y/N	Yes	Yes	Yes
Cap	856	898	895
Service Time	2.21	2.009	2.022
HCM Lane V/C Ratio	0.033	0.027	0.012
HCM Control Delay	7.4	7.1	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0

Intersection

Intersection Delay, s/veh 6.6

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	25	0	14	0	0
Future Vol, veh/h	0	25	0	14	0	0
Peak Hour Factor	0.92	0.78	0.92	0.58	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	0	24	0	0
Number of Lanes	1	0	1	1	0	0

Approach	WB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left NB		
Conflicting Lanes Left	2	0
Conflicting Approach Right		WB
Conflicting Lanes Right	0	1
HCM Control Delay	6.5	6.7
HCM LOS	A	A

Lane	NBLn1	NBLn2	WBLn1
Vol Left, %	0%	0%	0%
Vol Thru, %	100%	0%	0%
Vol Right, %	0%	100%	100%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	0	14	25
LT Vol	0	0	0
Through Vol	0	0	0
RT Vol	0	14	25
Lane Flow Rate	0	24	32
Geometry Grp	7	7	2
Degree of Util (X)	0	0.026	0.03
Departure Headway (Hd)	4.589	3.889	3.375
Convergence, Y/N	Yes	Yes	Yes
Cap	0	925	1064
Service Time	2.293	1.593	1.385
HCM Lane V/C Ratio	0	0.026	0.03
HCM Control Delay	7.3	6.7	6.5
HCM Lane LOS	N	A	A
HCM 95th-tile Q	0	0.1	0.1

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	0	14	0	0	0	0
Future Vol, veh/h	0	14	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	58	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	24	0	0	0	0

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1	-	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	1022	0	-	0	0	-
Stage 1	-	0	-	0	0	-
Stage 2	1022	0	-	0	0	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1022	-	-	-	-	-
Mov Cap-2 Maneuver	1022	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBT
Capacity (veh/h)	-	-
HCM Lane V/C Ratio	-	-
HCM Control Delay (s)	-	0
HCM Lane LOS	-	A
HCM 95th %tile Q(veh)	-	-

MOVEMENT SUMMARY

 **Site: 101 [2022 PM Existing (Site Folder: Eastmost Monsanto Intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] ft				mph
East: Monsanto															
1a	L1	All MCs	20	3.0	20	3.0	0.017	3.5	LOS A	0.0	0.0	0.00	0.31	0.00	24.6
6	T1	All MCs	11	3.0	11	3.0	0.017	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	26.6
Approach			30	3.0	30	3.0	0.017	2.3	NA	0.0	0.0	0.00	0.31	0.00	25.3
West: Monsanto															
2	T1	All MCs	15	3.0	15	3.0	0.016	7.3	LOS A	0.1	1.4	0.10	1.03	0.10	20.1
Approach			15	3.0	15	3.0	0.016	7.3	LOS A	0.1	1.4	0.10	1.03	0.10	20.1
SouthWest: NB Ramp															
12ax	R1	All MCs	10	3.0	10	3.0	0.009	7.0	LOS A	0.0	1.0	0.08	0.94	0.08	20.1
Approach			10	3.0	10	3.0	0.009	7.0	LOS A	0.0	1.0	0.08	0.94	0.08	20.1
All Vehicles			55	3.0	55	3.0	0.017	4.5	NA	0.1	1.4	0.04	0.62	0.04	22.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard (HCM).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\05-2023 Updated Models\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↖	↗↗
Traffic Volume (vph)	1253	138	99	1157	5	271
Future Volume (vph)	1253	138	99	1157	5	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		152				94
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.91	0.91	0.89	0.89	0.90	0.90
Adj. Flow (vph)	1377	152	111	1300	6	301
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1377	152	111	1300	6	301
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

AM 2028 Creve Coeur Existing AM 2028 3:07 pm 02/15/2023

Synchro 11 Report
Page 1

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	10.0	7.0	7.0	10.0	7.0	
Minimum Split (s)	38.4	44.2	20.0	56.5	44.2	
Total Split (s)	86.0	23.0	21.0	107.0	23.0	
Total Split (%)	66.2%	17.7%	16.2%	82.3%	17.7%	
Maximum Green (s)	79.6	14.8	13.5	100.5	14.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	85.4	104.7	9.6	102.4	12.9	30.0
Actuated g/C Ratio	0.66	0.81	0.07	0.79	0.10	0.23
v/c Ratio	0.59	0.12	0.44	0.47	0.03	0.42
Control Delay	5.1	0.5	67.6	11.4	52.0	30.0
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	5.1	0.5	67.6	11.4	52.0	30.0
LOS	A	A	E	B	D	C
Approach Delay	4.7			15.8	30.4	
Approach LOS	A			B	C	
Queue Length 50th (ft)	256	0	51	411	5	82
Queue Length 95th (ft)	110	1	82	248	18	126
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2326	1325	356	2788	201	733
Starvation Cap Reductn	105	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.62	0.11	0.31	0.47	0.03	0.41
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 124 (95%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 115						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.59						
Intersection Signal Delay: 11.9				Intersection LOS: B		
Intersection Capacity Utilization 60.4%				ICU Level of Service B		
Analysis Period (min) 15						

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

05/18/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R)		 Ø4	
107 s		23 s	
 Ø5	 Ø6 (R)		
21 s	86 s		

Lanes, Volumes, Timings
5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↙↘	↑
Traffic Volume (vph)	1434	90	3	1095	161	182
Future Volume (vph)	1434	90	3	1095	161	182
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3400	3505	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3400	3505	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		88				163
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	1593	100	3	1190	183	207
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1593	100	3	1190	183	207
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	

AM 2028 Creve Coeur Existing AM 2028 3:07 pm 02/15/2023

Synchro 11 Report
Page 4

Lanes, Volumes, Timings
5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		6				4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	59.1	37.9	37.9
Total Split (s)	82.0	82.0	18.0	100.0	30.0	30.0
Total Split (%)	63.1%	63.1%	13.8%	76.9%	23.1%	23.1%
Maximum Green (s)	76.0	76.0	11.1	93.9	23.1	23.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	101.6	101.6	7.0	104.2	12.8	12.8
Actuated g/C Ratio	0.78	0.78	0.05	0.80	0.10	0.10
v/c Ratio	0.58	0.08	0.02	0.42	0.54	0.69
Control Delay	6.1	1.8	54.0	6.0	61.4	26.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.1	1.8	54.0	6.0	61.4	26.3
LOS	A	A	D	A	E	C
Approach Delay	5.8			6.1	42.8	
Approach LOS	A			A	D	
Queue Length 50th (ft)	115	1	1	127	77	35
Queue Length 95th (ft)	272	12	m3	281	108	108
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2764	1256	290	2810	610	415
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	4	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.08	0.01	0.42	0.30	0.50
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.69						
Intersection Signal Delay: 10.3				Intersection LOS: B		
Intersection Capacity Utilization 61.7%				ICU Level of Service B		
Analysis Period (min) 15						

Lanes, Volumes, Timings 5: NB Lindbergh & Olive

05/18/2023

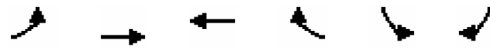
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R)		 Ø4	
100 s		30 s	
 Ø5	 Ø6 (R)		
18 s	82 s		

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



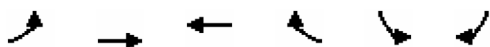
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	1526	1053	244	38	45
Future Volume (vph)	91	1526	1053	244	38	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3505	1568	1656	1482
Flt Permitted	0.211				0.950	
Satd. Flow (perm)	393	3539	3505	1568	1656	1482
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				262		54
Link Speed (mph)		40	40		40	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		11.8	
Peak Hour Factor	0.90	0.90	0.93	0.93	0.84	0.84
Heavy Vehicles (%)	2%	2%	3%	3%	9%	9%
Adj. Flow (vph)	101	1696	1132	262	45	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	1696	1132	262	45	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	

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Synchro 11 Report
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Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2			2		3
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	25.0	108.0	83.0	83.0	22.0	22.0
Total Split (%)	19.2%	83.1%	63.8%	63.8%	16.9%	16.9%
Maximum Green (s)	19.2	102.3	77.4	77.4	16.6	16.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	96.4	102.3	89.5	89.5	16.6	16.6
Actuated g/C Ratio	0.74	0.79	0.69	0.69	0.13	0.13
v/c Ratio	0.28	0.61	0.47	0.23	0.21	0.23
Control Delay	4.0	4.9	10.2	1.3	53.8	15.4
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0
Total Delay	4.0	5.4	10.2	1.3	53.8	15.4
LOS	A	A	B	A	D	B
Approach Delay		5.3	8.5		32.9	
Approach LOS		A	A		C	
Queue Length 50th (ft)	4	41	211	0	35	0
Queue Length 95th (ft)	36	534	264	27	68	35
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	512	2784	2412	1161	211	236
Starvation Cap Reductn	0	576	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.77	0.47	0.23	0.21	0.23

Intersection Summary

Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 41 (32%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.61	
Intersection Signal Delay: 7.5	Intersection LOS: A
Intersection Capacity Utilization 57.3%	ICU Level of Service B
Analysis Period (min) 15	

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023

Splits and Phases: 17: Olive & Old Olive St E

 Ø1	 Ø2 (R)	 Ø3
25 s	83 s	22 s
 Ø6 (R)		
108 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1335	0	0	1058	104	0	0	0	56	0	7
Future Volume (vph)	14	1335	0	0	1058	104	0	0	0	56	0	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	0		210	0		20	150		0
Storage Lanes	1		1	0		1	0		1	1		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Flt Permitted	0.206									0.950		
Satd. Flow (perm)	384	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						127						121
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			176			526	
Travel Time (s)		17.9			13.3			4.0			14.3	
Peak Hour Factor	0.86	0.86	0.86	0.95	0.95	0.95	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	16	1552	0	0	1114	109	0	0	0	67	0	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1552	0	0	1114	109	0	0	0	67	0	8
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1		2	1	1	2	1	1		1
Detector Template	Left	Thru	Right		Thru	Right	Left	Thru	Right	Left		Right
Leading Detector (ft)	20	100	20		100	20	20	100	20	20		20
Trailing Detector (ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Position(ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Size(ft)	20	6	20		6	20	20	6	20	20		20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	D.P+P	NA	Perm		NA	Perm			Perm	Prot		Perm
Protected Phases	1	6			2		4	4		3		
Permitted Phases	2		6			2			4			3

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Lanes, Volumes, Timings

18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6		2	2	4	4	4	3		3
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0		10.0	10.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	12.8	15.5	15.5		15.6	15.6	13.0	13.0	13.0	13.3		13.3
Total Split (s)	16.0	92.0	92.0		76.0	76.0	8.0	8.0	8.0	30.0		30.0
Total Split (%)	12.3%	70.8%	70.8%		58.5%	58.5%	6.2%	6.2%	6.2%	23.1%		23.1%
Maximum Green (s)	10.2	86.5	86.5		70.4	70.4	2.0	2.0	2.0	23.7		23.7
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.8	1.5	1.5		1.6	1.6	2.0	2.0	2.0	2.3		2.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.5	5.5		5.6	5.6		6.0	6.0	6.3		6.3
Lead/Lag	Lag				Lead	Lead	Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max	C-Max		C-Max	C-Max	None	None	None	Max		Max
Act Effct Green (s)	91.9	94.5			88.0	88.0				23.7		23.7
Actuated g/C Ratio	0.71	0.73			0.68	0.68				0.18		0.18
v/c Ratio	0.04	0.60			0.47	0.10				0.21		0.02
Control Delay	1.4	3.6			3.1	0.5				47.2		0.1
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay	1.4	3.6			3.1	0.5				47.2		0.1
LOS	A	A			A	A				D		A
Approach Delay		3.5			2.9						42.2	
Approach LOS		A			A						D	
Queue Length 50th (ft)	1	65			68	0				49		0
Queue Length 95th (ft)	m2	56			67	0				86		0
Internal Link Dist (ft)		972			703			96			446	
Turn Bay Length (ft)	190					210				150		
Base Capacity (vph)	380	2572			2395	1112				322		387
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.04	0.60			0.47	0.10				0.21		0.02

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 125 (96%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 4.3

Intersection LOS: A

Intersection Capacity Utilization 48.2%

ICU Level of Service A

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Pavillion & Olive

			
Ø4 Ø2 (R)	Ø1	Ø3	
76 s	16 s	30 s	8 s
			
Ø6 (R)			
92 s			

Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	1225	6	20	997	48	4	5	22	103	8	311
Future Volume (vph)	158	1225	6	20	997	48	4	5	22	103	8	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.878			0.854	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1480	1367	0	1770	1591	0
Flt Permitted	0.238			0.151			0.268			0.736		
Satd. Flow (perm)	443	3539	1583	281	3539	1583	417	1367	0	1371	1591	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			78		26			317	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			119			409	
Travel Time (s)		8.9			17.9			2.7			9.3	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.84	0.84	0.84	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	22%	22%	22%	2%	2%	2%
Adj. Flow (vph)	174	1346	7	21	1039	50	5	6	26	105	8	317
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	1346	7	21	1039	50	5	32	0	105	325	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6	6		2	8			4		
Detector Phase	1	6	6	5	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.1	16.2	16.2	13.1	30.3	30.3	13.2	13.2		13.1	13.1	
Total Split (s)	27.0	77.0	77.0	23.0	73.0	73.0	30.0	30.0		30.0	30.0	
Total Split (%)	20.8%	59.2%	59.2%	17.7%	56.2%	56.2%	23.1%	23.1%		23.1%	23.1%	
Maximum Green (s)	20.9	70.8	70.8	16.9	66.7	66.7	23.8	23.8		23.9	23.9	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.1	2.2	2.2	2.1	2.3	2.3	2.2	2.2		2.1	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	6.2	6.1	6.3	6.3	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					17.0	17.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	96.7	88.9	88.9	99.2	88.2	88.2	14.9	14.9		15.0	15.0	
Actuated g/C Ratio	0.74	0.68	0.68	0.76	0.68	0.68	0.11	0.11		0.12	0.12	
v/c Ratio	0.42	0.56	0.01	0.06	0.43	0.05	0.11	0.18		0.67	0.70	
Control Delay	5.4	9.3	0.0	0.7	0.8	0.1	53.2	22.9		74.2	14.7	
Queue Delay	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	5.4	9.4	0.0	0.7	0.8	0.1	53.2	22.9		74.2	14.7	
LOS	A	A	A	A	A	A	D	C		E	B	
Approach Delay		8.9			0.7			27.0			29.2	
Approach LOS		A			A			C			C	
Queue Length 50th (ft)	18	186	0	0	6	0	4	5		86	6	
Queue Length 95th (ft)	m29	240	m0	m0	2	0	15	31		142	95	
Internal Link Dist (ft)		375			972			39			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	563	2421	1108	408	2401	1099	76	271		252	551	
Starvation Cap Reductn	0	267	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.31	0.62	0.01	0.05	0.43	0.05	0.07	0.12		0.42	0.59	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 116 (89%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.70												
Intersection Signal Delay: 9.0						Intersection LOS: A						
Intersection Capacity Utilization 74.7%						ICU Level of Service D						
Analysis Period (min) 15												

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spodee & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1251	65	88	1219	6	66	1	122	16	3	3
Future Volume (vph)	1	1251	65	88	1219	6	66	1	122	16	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850			0.850		0.925	
Flt Protected	0.950			0.950				0.953		0.950		
Satd. Flow (prot)	1770	3514	0	1770	3539	1583	0	1775	1583	1770	1723	0
Flt Permitted	0.162			0.112				0.724		0.706		
Satd. Flow (perm)	302	3514	0	209	3539	1583	0	1349	1583	1315	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				28			51		4	
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			9.3	
Peak Hour Factor	0.93	0.93	0.93	0.88	0.88	0.88	0.86	0.86	0.86	0.75	0.75	0.75
Adj. Flow (vph)	1	1345	70	100	1385	7	77	1	142	21	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1415	0	100	1385	7	0	78	142	21	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases		6		5	2			8	5		4	
Permitted Phases	2			6		2	8		8	4		

AM 2028 Creve Coeur Existing AM 2028 3:07 pm 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings

20: Spodee & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	30.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	103.0	83.0		20.0	103.0	103.0	27.0	27.0	20.0	27.0	27.0	
Total Split (%)	79.2%	63.8%		15.4%	79.2%	79.2%	20.8%	20.8%	15.4%	20.8%	20.8%	
Maximum Green (s)	96.7	76.8		14.0	96.7	96.7	20.7	20.7	14.0	20.7	20.7	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag		Lead		Lag					Lag			
Lead-Lag Optimize?		Yes		Yes					Yes			
Vehicle Extension (s)	4.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	Max	Max	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	17.0	23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	96.7	76.8		91.0	96.7	96.7		20.7	41.0	20.7	20.7	
Actuated g/C Ratio	0.74	0.59		0.70	0.74	0.74		0.16	0.32	0.16	0.16	
v/c Ratio	0.00	0.68		0.32	0.53	0.01		0.36	0.27	0.10	0.03	
Control Delay	4.0	20.2		8.6	3.0	0.0		54.4	22.5	48.3	35.7	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.0	20.2		8.6	3.1	0.0		54.4	22.5	48.3	35.7	
LOS	A	C		A	A	A		D	C	D	D	
Approach Delay		20.2			3.4			33.8			44.8	
Approach LOS		C			A			C			D	
Queue Length 50th (ft)	0	406		6	115	0		59	56	15	3	
Queue Length 95th (ft)	2	485		21	71	m0		105	104	34	15	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	224	2078		314	2632	1184		214	534	209	277	
Starvation Cap Reductn	0	0		0	315	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.00	0.68		0.32	0.60	0.01		0.36	0.27	0.10	0.03	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 3 (2%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.68												
Intersection Signal Delay: 13.5						Intersection LOS: B						
Intersection Capacity Utilization 68.3%						ICU Level of Service C						
Analysis Period (min) 15												
m Volume for 95th percentile queue is metered by upstream signal.												

Splits and Phases: 20: Spoede & Olive



HCM 6th TWSC
10: Lindbergh & Old Olive

05/18/2023

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕↗			↕↗	↗
Traffic Vol, veh/h	0	0	108	0	0	165	0	1242	93	0	1839	216
Future Vol, veh/h	0	0	108	0	0	165	0	1242	93	0	1839	216
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Yield	-	-	Free	-	-	Free
Storage Length	-	-	0	-	-	0	-	-	-	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	117	0	0	179	0	1350	101	0	1999	235

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	1000	-	-	675	-	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.98	-	-	6.98	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.34	-	-	3.34	-	-
Pot Cap-1 Maneuver	0	0	238	0	0	392	0	0
Stage 1	0	0	-	0	0	-	0	0
Stage 2	0	0	-	0	0	-	0	0
Platoon blocked, %								
Mov Cap-1 Maneuver	-	-	238	-	-	392	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	34	21.7	0	0
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBT	EBLn1WBLn1	SBT
Capacity (veh/h)	-	238 392	-
HCM Lane V/C Ratio	-	0.493 0.458	-
HCM Control Delay (s)	-	34 21.7	-
HCM Lane LOS	-	D C	-
HCM 95th %tile Q(veh)	-	2.5 2.3	-

Intersection

Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	24	0	0	0	43	0
Future Vol, veh/h	24	0	0	0	43	0
Peak Hour Factor	0.82	0.92	0.92	0.92	0.86	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	0	0	0	50	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.2	0	7.5
HCM LOS	A	-	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	100%	100%
Vol Right, %	0%	0%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	43	24	0
LT Vol	43	0	0
Through Vol	0	24	0
RT Vol	0	0	0
Lane Flow Rate	50	29	0
Geometry Grp	1	1	1
Degree of Util (X)	0.058	0.033	0
Departure Headway (Hd)	4.185	4.021	4.043
Convergence, Y/N	Yes	Yes	Yes
Cap	858	890	0
Service Time	2.199	2.048	2.077
HCM Lane V/C Ratio	0.058	0.033	0
HCM Control Delay	7.5	7.2	7.1
HCM Lane LOS	A	A	N
HCM 95th-tile Q	0.2	0.1	0

Intersection

Intersection Delay, s/veh 6.7

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	5	38	0	24	0	0
Future Vol, veh/h	5	38	0	24	0	0
Peak Hour Factor	0.86	0.86	0.92	0.82	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	44	0	29	0	0
Number of Lanes	1	0	1	1	0	0

Approach	WB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left NB		
Conflicting Lanes Left	2	0
Conflicting Approach Right		WB
Conflicting Lanes Right	0	1
HCM Control Delay	6.7	6.8
HCM LOS	A	A

Lane	NBLn1	NBLn2	WBLn1
Vol Left, %	0%	0%	12%
Vol Thru, %	100%	0%	0%
Vol Right, %	0%	100%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	0	24	43
LT Vol	0	0	5
Through Vol	0	0	0
RT Vol	0	24	38
Lane Flow Rate	0	29	50
Geometry Grp	7	7	2
Degree of Util (X)	0	0.032	0.048
Departure Headway (Hd)	4.621	3.92	3.478
Convergence, Y/N	Yes	Yes	Yes
Cap	0	917	1033
Service Time	2.329	1.628	1.49
HCM Lane V/C Ratio	0	0.032	0.048
HCM Control Delay	7.3	6.8	6.7
HCM Lane LOS	N	A	A
HCM 95th-tile Q	0	0.1	0.2

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↰	↰	↰			↰
Traffic Vol, veh/h	0	24	0	0	0	5
Future Vol, veh/h	0	24	0	0	0	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	82	92	92	92	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	29	0	0	0	6

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	6	-	0
Stage 1	0	-	-
Stage 2	6	-	-
Critical Hdwy	6.42	-	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	-	-
Pot Cap-1 Maneuver	1015	0	0
Stage 1	-	0	0
Stage 2	1017	0	0
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1015	-	-
Mov Cap-2 Maneuver	1015	-	-
Stage 1	-	-	-
Stage 2	1017	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBT
Capacity (veh/h)	-	-
HCM Lane V/C Ratio	-	-
HCM Control Delay (s)	0	0
HCM Lane LOS	A	A
HCM 95th %tile Q(veh)	-	-

MOVEMENT SUMMARY

 **Site: 101 [2028 AM Existing (Site Folder: Eastmost Monsanto Intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]				mph
East: Monsanto															
1a	L1	All MCs	9	3.0	9	3.0	0.006	3.5	LOS A	0.0	0.0	0.00	0.43	0.00	23.7
6	T1	All MCs	1	3.0	1	3.0	0.006	0.0	LOS A	0.0	0.0	0.00	0.43	0.00	25.5
Approach			10	3.0	10	3.0	0.006	3.1	NA	0.0	0.0	0.00	0.43	0.00	23.9
West: Monsanto															
2	T1	All MCs	26	3.0	26	3.0	0.027	7.2	LOS A	0.1	2.4	0.05	1.06	0.05	20.1
Approach			26	3.0	26	3.0	0.027	7.2	LOS A	0.1	2.4	0.05	1.06	0.05	20.1
SouthWest: NB Ramp															
12ax	R1	All MCs	41	3.0	41	3.0	0.040	7.0	LOS A	0.2	4.3	0.11	0.92	0.11	20.1
Approach			41	3.0	41	3.0	0.040	7.0	LOS A	0.2	4.3	0.11	0.92	0.11	20.1
All Vehicles			77	3.0	77	3.0	0.040	6.6	NA	0.2	4.3	0.08	0.91	0.08	20.5

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard (HCM).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\05-2023 Updated Models\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↖	↗↘
Traffic Volume (vph)	1157	181	179	1666	22	154
Future Volume (vph)	1157	181	179	1666	22	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		158				114
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.93	0.93
Adj. Flow (vph)	1231	193	186	1735	24	166
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1231	193	186	1735	24	166
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

PM 2028 Creve Coeur Existing PM 2028 3:11 pm 02/15/2023

Synchro 11 Report
Page 1

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	10.0	7.0	7.0	10.0	7.0	
Minimum Split (s)	38.4	44.2	14.5	56.5	44.2	
Total Split (s)	82.0	24.0	24.0	106.0	24.0	
Total Split (%)	63.1%	18.5%	18.5%	81.5%	18.5%	
Maximum Green (s)	75.6	15.8	16.5	99.5	15.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	87.4	102.0	12.3	107.1	8.2	28.0
Actuated g/C Ratio	0.67	0.78	0.09	0.82	0.06	0.22
v/c Ratio	0.52	0.15	0.57	0.60	0.21	0.24
Control Delay	6.6	0.6	62.6	8.0	61.7	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.6	0.6	62.6	8.0	61.7	14.7
LOS	A	A	E	A	E	B
Approach Delay	5.8			13.3	20.6	
Approach LOS	A			B	C	
Queue Length 50th (ft)	173	0	79	374	20	20
Queue Length 95th (ft)	221	1	117	358	48	51
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2378	1358	435	2915	215	758
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.14	0.43	0.60	0.11	0.22
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 105						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.60						
Intersection Signal Delay: 10.6				Intersection LOS: B		
Intersection Capacity Utilization 64.1%				ICU Level of Service C		
Analvsis Period (min) 15						

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

05/18/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R)		 Ø4	
106 s		24 s	
 Ø5	 Ø6 (R)		
24 s		82 s	

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	1185	126	12	1658	188	185
Future Volume (vph)	1185	126	12	1658	188	185
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		133				193
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.95	0.95	0.92	0.92	0.96	0.96
Adj. Flow (vph)	1247	133	13	1802	196	193
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1247	133	13	1802	196	193
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4

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Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	59.1	37.9	37.9
Total Split (s)	85.0	85.0	22.0	107.0	23.0	23.0
Total Split (%)	65.4%	65.4%	16.9%	82.3%	17.7%	17.7%
Maximum Green (s)	79.0	79.0	15.1	100.9	16.1	16.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	98.8	98.8	7.0	104.3	12.7	12.7
Actuated g/C Ratio	0.76	0.76	0.05	0.80	0.10	0.10
v/c Ratio	0.46	0.11	0.07	0.63	0.59	0.59
Control Delay	2.8	0.3	51.2	10.4	63.0	14.8
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0
Total Delay	2.8	0.3	51.2	10.5	63.0	14.8
LOS	A	A	D	B	E	B
Approach Delay	2.5			10.8	39.1	
Approach LOS	A			B	D	
Queue Length 50th (ft)	45	0	5	384	82	0
Queue Length 95th (ft)	88	0	m10	530	120	71
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2690	1235	398	2839	425	365
Starvation Cap Reductn	0	0	0	251	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.11	0.03	0.70	0.46	0.53
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 2 (2%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.63						
Intersection Signal Delay: 10.7				Intersection LOS: B		
Intersection Capacity Utilization 62.5%				ICU Level of Service B		
Analysis Period (min) 15						
m Volume for 95th percentile queue is metered by upstream signal.						

Lanes, Volumes, Timings
 5: NB Lindbergh & Olive

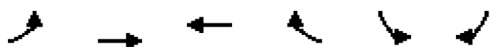
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Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R) 107 s		 Ø4 23 s	
 Ø5 22 s	 Ø6 (R) 85 s		

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



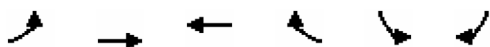
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	27	1303	1479	276	114	142
Future Volume (vph)	27	1303	1479	276	114	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.121				0.950	
Satd. Flow (perm)	225	3539	3539	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				285		159
Link Speed (mph)		40	40		30	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		15.8	
Peak Hour Factor	0.96	0.96	0.97	0.97	0.82	0.82
Adj. Flow (vph)	28	1357	1525	285	139	173
Shared Lane Traffic (%)						
Lane Group Flow (vph)	28	1357	1525	285	139	173
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	2			2		3

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Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	16.0	106.0	90.0	90.0	24.0	24.0
Total Split (%)	12.3%	81.5%	69.2%	69.2%	18.5%	18.5%
Maximum Green (s)	10.2	100.3	84.4	84.4	18.6	18.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	96.7	100.3	93.2	93.2	18.6	18.6
Actuated g/C Ratio	0.74	0.77	0.72	0.72	0.14	0.14
v/c Ratio	0.12	0.50	0.60	0.23	0.55	0.48
Control Delay	3.1	7.0	11.1	1.3	60.8	14.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	3.1	7.0	11.1	1.3	60.8	14.2
LOS	A	A	B	A	E	B
Approach Delay		6.9	9.6		35.0	
Approach LOS		A	A		C	
Queue Length 50th (ft)	2	389	346	0	110	10
Queue Length 95th (ft)	m6	187	419	28	163	58
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	292	2730	2536	1215	253	362
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.10	0.50	0.60	0.23	0.55	0.48

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 49 (38%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.60

Intersection Signal Delay: 10.8

Intersection LOS: B

Intersection Capacity Utilization 58.8%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023

Splits and Phases: 17: Olive & Old Olive St E

 Ø1	 Ø2 (R)	 Ø3
16 s	90 s	24 s
 Ø6 (R)		
106 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1229	0	0	1461	227	0	0	0	109	0	43
Future Volume (vph)	50	1229	0	0	1461	227	0	0	0	109	0	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	0		210	0		20	150		0
Storage Lanes	1		1	0		1	0		1	1		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Flt Permitted	0.075									0.950		
Satd. Flow (perm)	140	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						155						121
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			176			526	
Travel Time (s)		17.9			13.3			4.0			14.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	54	1322	0	0	1571	244	0	0	0	147	0	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	1322	0	0	1571	244	0	0	0	147	0	58
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1		2	1	1	2	1	1		1
Detector Template	Left	Thru	Right		Thru	Right	Left	Thru	Right	Left		Right
Leading Detector (ft)	20	100	20		100	20	20	100	20	20		20
Trailing Detector (ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Position(ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Size(ft)	20	6	20		6	20	20	6	20	20		20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	D.P+P	NA	Perm		NA	Perm			Perm	Prot		Perm
Protected Phases	1	6			2		4	4		3		
Permitted Phases	2		6			2			4			3

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Lanes, Volumes, Timings
18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6		2	2	4	4	4	3		3
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0		10.0	10.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	12.8	15.5	15.5		15.6	15.6	13.0	13.0	13.0	13.3		13.3
Total Split (s)	18.0	89.0	89.0		71.0	71.0	8.0	8.0	8.0	33.0		33.0
Total Split (%)	13.8%	68.5%	68.5%		54.6%	54.6%	6.2%	6.2%	6.2%	25.4%		25.4%
Maximum Green (s)	12.2	83.5	83.5		65.4	65.4	2.0	2.0	2.0	26.7		26.7
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.8	1.5	1.5		1.6	1.6	2.0	2.0	2.0	2.3		2.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.5	5.5		5.6	5.6		6.0	6.0	6.3		6.3
Lead/Lag	Lag				Lead	Lead	Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max	C-Max		C-Max	C-Max	None	None	None	Max		Max
Act Effct Green (s)	86.6	91.5			77.0	77.0				26.7		26.7
Actuated g/C Ratio	0.67	0.70			0.59	0.59				0.21		0.21
v/c Ratio	0.23	0.53			0.75	0.24				0.40		0.14
Control Delay	5.1	2.8			12.0	3.6				48.7		0.7
Queue Delay	0.0	0.0			0.1	0.0				0.0		0.0
Total Delay	5.1	2.8			12.1	3.6				48.7		0.7
LOS	A	A			B	A				D		A
Approach Delay		2.8			10.9						35.1	
Approach LOS		A			B						D	
Queue Length 50th (ft)	5	64			121	2				108		0
Queue Length 95th (ft)	8	71			250	53				141		0
Internal Link Dist (ft)		972			703			96			446	
Turn Bay Length (ft)	190					210				150		
Base Capacity (vph)	245	2490			2096	1000				363		421
Starvation Cap Reductn	0	0			52	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.22	0.53			0.77	0.24				0.40		0.14

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 125 (96%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 56.1%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 18: Pavillion & Olive



Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	1138	10	48	1350	106	11	39	55	88	30	383
Future Volume (vph)	292	1138	10	48	1350	106	11	39	55	88	30	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.912			0.861	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1699	0	1770	1604	0
Flt Permitted	0.072			0.188			0.234			0.678		
Satd. Flow (perm)	134	3539	1583	350	3539	1583	436	1699	0	1263	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			78		49			337	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			119			409	
Travel Time (s)		8.9			17.9			2.7			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.87	0.87	0.87	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	307	1198	11	55	1552	122	12	41	58	96	33	416
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1198	11	55	1552	122	12	99	0	96	449	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	2		6	6		2	8			4		

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.1	16.2	16.2	13.1	30.3	30.3	13.2	13.2		13.1	13.1	
Total Split (s)	30.0	82.0	82.0	16.0	68.0	68.0	32.0	32.0		32.0	32.0	
Total Split (%)	23.1%	63.1%	63.1%	12.3%	52.3%	52.3%	24.6%	24.6%		24.6%	24.6%	
Maximum Green (s)	23.9	75.8	75.8	9.9	61.7	61.7	25.8	25.8		25.9	25.9	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.1	2.2	2.2	2.1	2.3	2.3	2.2	2.2		2.1	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	6.2	6.1	6.3	6.3	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					17.0	17.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	94.5	87.7	87.7	95.7	72.9	72.9	17.1	17.1		17.2	17.2	
Actuated g/C Ratio	0.73	0.67	0.67	0.74	0.56	0.56	0.13	0.13		0.13	0.13	
v/c Ratio	0.84	0.50	0.01	0.15	0.78	0.13	0.21	0.37		0.57	0.89	
Control Delay	70.5	4.5	0.0	2.5	9.8	0.6	54.9	29.4		64.6	34.2	
Queue Delay	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	70.8	4.7	0.0	2.5	9.8	0.6	54.9	29.4		64.6	34.2	
LOS	E	A	A	A	A	A	D	C		E	C	
Approach Delay		18.1			8.9			32.1			39.6	
Approach LOS		B			A			C			D	
Queue Length 50th (ft)	209	68	0	3	62	0	9	38		77	96	
Queue Length 95th (ft)	m237	106	m0	m4	591	m4	28	87		128	223	
Internal Link Dist (ft)		375			972			39			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	400	2387	1093	366	1984	922	86	376		251	589	
Starvation Cap Reductn	6	419	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.78	0.61	0.01	0.15	0.78	0.13	0.14	0.26		0.38	0.76	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 113 (87%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.89												
Intersection Signal Delay: 17.4						Intersection LOS: B						
Intersection Capacity Utilization 94.2%						ICU Level of Service F						
Analysis Period (min) 15												
m Volume for 95th percentile queue is metered by upstream signal.												

Lanes, Volumes, Timings 19: Olive & Old Olive St W

05/18/2023

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spodee & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1298	110	106	1619	20	97	7	124	18	6	2
Future Volume (vph)	5	1298	110	106	1619	20	97	7	124	18	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850			0.850		0.959	
Flt Protected	0.950			0.950				0.956		0.950		
Satd. Flow (prot)	1770	3497	0	1770	3539	1583	0	1763	1568	1770	1786	0
Flt Permitted	0.093			0.064				0.733		0.610		
Satd. Flow (perm)	173	3497	0	119	3539	1583	0	1352	1568	1136	1786	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				81			80		3	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			7.8	
Peak Hour Factor	0.92	0.92	0.92	0.98	0.98	0.98	0.81	0.81	0.81	0.72	0.72	0.72
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	5	1411	120	108	1652	20	120	9	153	25	8	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1531	0	108	1652	20	0	129	153	25	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			8	5		4	

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Lanes, Volumes, Timings
20: Spodee & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		2	8		8	4		
Detector Phase	1	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	16.0	74.0		28.0	86.0	86.0	28.0	28.0	28.0	28.0	28.0	
Total Split (%)	12.3%	56.9%		21.5%	66.2%	66.2%	21.5%	21.5%	21.5%	21.5%	21.5%	
Maximum Green (s)	9.7	67.8		22.0	79.7	79.7	21.7	21.7	22.0	21.7	21.7	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lag			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Vehicle Extension (s)	2.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max	None	None	None	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	94.4	67.8		90.0	93.0	93.0		21.7	50.0	21.7	21.7	
Actuated g/C Ratio	0.73	0.52		0.69	0.72	0.72		0.17	0.38	0.17	0.17	
v/c Ratio	0.02	0.84		0.30	0.65	0.02		0.57	0.23	0.13	0.04	
Control Delay	4.8	31.5		11.1	3.3	0.0		61.0	13.9	48.3	38.2	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.8	31.5		11.1	3.5	0.0		61.0	13.9	48.3	38.2	
LOS	A	C		B	A	A		E	B	D	D	
Approach Delay		31.4			3.9			35.5			45.3	
Approach LOS		C			A			D			D	
Queue Length 50th (ft)	1	555		21	74	0		101	39	18	6	
Queue Length 95th (ft)	4	662		m37	119	m0		151	74	36	19	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	245	1828		361	2533	1155		225	652	189	300	
Starvation Cap Reductn	0	0		0	177	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.02	0.84		0.30	0.70	0.02		0.57	0.23	0.13	0.04	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 119 (92%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 110												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.84												
Intersection Signal Delay: 18.4						Intersection LOS: B						
Intersection Capacity Utilization 78.7%						ICU Level of Service D						
Analysis Period (min) 15												

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Spoede & Olive



Intersection												
Int Delay, s/veh	14.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	↗
Traffic Vol, veh/h	0	0	103	0	0	407	0	1226	21	0	1546	258
Future Vol, veh/h	0	0	103	0	0	407	0	1226	21	0	1546	258
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Yield	-	-	Free	-	-	Free
Storage Length	-	-	0	-	-	0	-	-	-	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	112	0	0	442	0	1333	23	0	1680	280
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	840	-	-	667	-	0	-	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	309	0	0	~ 401	0	-	0	0	-	0
Stage 1	0	0	-	0	0	-	0	-	0	0	-	0
Stage 2	0	0	-	0	0	-	0	-	0	0	-	0
Platoon blocked, %								-	-			
Mov Cap-1 Maneuver	-	-	309	-	-	~ 401	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	23.1		107.9		0		0					
HCM LOS	C		F									
Minor Lane/Major Mvmt	NBT EBLn1WBLn1		SBT									
Capacity (veh/h)	- 309 401		-									
HCM Lane V/C Ratio	- 0.362 1.103		-									
HCM Control Delay (s)	- 23.1 107.9		-									
HCM Lane LOS	- C F		-									
HCM 95th %tile Q(veh)	- 1.6 15.7		-									
Notes												
~: Volume exceeds capacity		\$: Delay exceeds 300s		+: Computation Not Defined				*: All major volume in platoon				

Intersection

Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	14	0	0	10	15	0
Future Vol, veh/h	14	0	0	10	15	0
Peak Hour Factor	0.58	0.92	0.92	0.92	0.53	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	0	0	11	28	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.1	7.1	7.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	100%	100%
Vol Right, %	0%	0%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	15	14	10
LT Vol	15	0	0
Through Vol	0	14	10
RT Vol	0	0	0
Lane Flow Rate	28	24	11
Geometry Grp	1	1	1
Degree of Util (X)	0.033	0.027	0.012
Departure Headway (Hd)	4.195	3.992	4.001
Convergence, Y/N	Yes	Yes	Yes
Cap	856	898	895
Service Time	2.21	2.009	2.022
HCM Lane V/C Ratio	0.033	0.027	0.012
HCM Control Delay	7.4	7.1	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0

Intersection

Intersection Delay, s/veh 6.6

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	26	0	14	0	0
Future Vol, veh/h	0	26	0	14	0	0
Peak Hour Factor	0.92	0.78	0.92	0.58	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	33	0	24	0	0
Number of Lanes	1	0	1	1	0	0

Approach	WB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left NB		
Conflicting Lanes Left	2	0
Conflicting Approach Right		WB
Conflicting Lanes Right	0	1
HCM Control Delay	6.5	6.7
HCM LOS	A	A

Lane	NBLn1	NBLn2	WBLn1
Vol Left, %	0%	0%	0%
Vol Thru, %	100%	0%	0%
Vol Right, %	0%	100%	100%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	0	14	26
LT Vol	0	0	0
Through Vol	0	0	0
RT Vol	0	14	26
Lane Flow Rate	0	24	33
Geometry Grp	7	7	2
Degree of Util (X)	0	0.026	0.031
Departure Headway (Hd)	4.593	3.893	3.375
Convergence, Y/N	Yes	Yes	Yes
Cap	0	925	1064
Service Time	2.295	1.595	1.385
HCM Lane V/C Ratio	0	0.026	0.031
HCM Control Delay	7.3	6.7	6.5
HCM Lane LOS	N	A	A
HCM 95th-tile Q	0	0.1	0.1

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	0	14	0	0	0	0
Future Vol, veh/h	0	14	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	58	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	24	0	0	0	0
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1	-	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	1022	0	-	0	0	-
Stage 1	-	0	-	0	0	-
Stage 2	1022	0	-	0	0	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1022	-	-	-	-	-
Mov Cap-2 Maneuver	1022	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1022	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT			
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	0	0	-	-	-
HCM Lane LOS	-	A	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-

MOVEMENT SUMMARY

 **Site: 101 [2028 PM Existing (Site Folder: Eastmost Monsanto Intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] ft				mph
East: Monsanto															
1a	L1	All MCs	21	3.0	21	3.0	0.018	3.5	LOS A	0.0	0.0	0.00	0.32	0.00	24.6
6	T1	All MCs	11	3.0	11	3.0	0.018	0.0	LOS A	0.0	0.0	0.00	0.32	0.00	26.6
Approach			32	3.0	32	3.0	0.018	2.3	NA	0.0	0.0	0.00	0.32	0.00	25.2
West: Monsanto															
2	T1	All MCs	15	3.0	15	3.0	0.016	7.3	LOS A	0.1	1.4	0.10	1.03	0.10	20.1
Approach			15	3.0	15	3.0	0.016	7.3	LOS A	0.1	1.4	0.10	1.03	0.10	20.1
SouthWest: NB Ramp															
12ax	R1	All MCs	10	3.0	10	3.0	0.009	7.0	LOS A	0.0	1.0	0.08	0.94	0.08	20.1
Approach			10	3.0	10	3.0	0.009	7.0	LOS A	0.0	1.0	0.08	0.94	0.08	20.1
All Vehicles			57	3.0	57	3.0	0.018	4.5	NA	0.1	1.4	0.04	0.62	0.04	22.7

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard (HCM).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\05-2023 Updated Models\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↖	↗↗
Traffic Volume (vph)	1384	153	109	1278	6	299
Future Volume (vph)	1384	153	109	1278	6	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		168				67
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.91	0.91	0.89	0.89	0.90	0.90
Adj. Flow (vph)	1521	168	122	1436	7	332
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1521	168	122	1436	7	332
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

AM 2048 Creve Coeur Existing AM 2048 3:08 pm 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	10.0	7.0	7.0	10.0	7.0	
Minimum Split (s)	38.4	44.2	20.0	56.5	44.2	
Total Split (s)	86.0	23.0	21.0	107.0	23.0	
Total Split (%)	66.2%	17.7%	16.2%	82.3%	17.7%	
Maximum Green (s)	79.6	14.8	13.5	100.5	14.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	84.0	104.3	10.0	101.4	13.9	31.4
Actuated g/C Ratio	0.65	0.80	0.08	0.78	0.11	0.24
v/c Ratio	0.67	0.13	0.46	0.52	0.04	0.46
Control Delay	5.8	0.5	69.0	12.1	52.0	34.9
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	0.5	69.0	12.1	52.0	34.9
LOS	A	A	E	B	D	C
Approach Delay	5.3			16.6	35.2	
Approach LOS	A			B	D	
Queue Length 50th (ft)	288	0	56	501	5	106
Queue Length 95th (ft)	113	2	89	257	21	153
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2286	1312	356	2758	201	747
Starvation Cap Reductn	101	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.13	0.34	0.52	0.03	0.44
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 124 (95%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 125						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.67						
Intersection Signal Delay: 13.0				Intersection LOS: B		
Intersection Capacity Utilization 64.7%				ICU Level of Service C		
Analvsis Period (min) 15						

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

05/18/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R)		 Ø4	
107 s		23 s	
 Ø5	 Ø6 (R)		
21 s	86 s		

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↙↘	↑
Traffic Volume (vph)	1585	99	3	1210	178	202
Future Volume (vph)	1585	99	3	1210	178	202
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3400	3505	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3400	3505	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		87				155
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	1761	110	3	1315	202	230
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1761	110	3	1315	202	230
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	

AM 2048 Creve Coeur Existing AM 2048 3:08 pm 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings
5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		6				4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	59.1	37.9	37.9
Total Split (s)	82.0	82.0	18.0	100.0	30.0	30.0
Total Split (%)	63.1%	63.1%	13.8%	76.9%	23.1%	23.1%
Maximum Green (s)	76.0	76.0	11.1	93.9	23.1	23.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	100.1	100.1	7.0	102.8	14.2	14.2
Actuated g/C Ratio	0.77	0.77	0.05	0.79	0.11	0.11
v/c Ratio	0.65	0.09	0.02	0.47	0.54	0.74
Control Delay	7.3	2.0	53.3	8.4	59.4	33.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	7.3	2.0	53.3	8.4	59.4	33.5
LOS	A	A	D	A	E	C
Approach Delay	7.0			8.6	45.6	
Approach LOS	A			A	D	
Queue Length 50th (ft)	222	4	1	195	85	61
Queue Length 95th (ft)	296	m12	m2	395	114	138
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2725	1239	290	2771	610	408
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	86	0	0	0	0	4
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.09	0.01	0.47	0.33	0.57
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 110						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.74						
Intersection Signal Delay: 12.2				Intersection LOS: B		
Intersection Capacity Utilization 67.1%				ICU Level of Service C		
Analysis Period (min) 15						

Lanes, Volumes, Timings 5: NB Lindbergh & Olive

05/18/2023

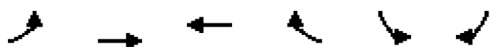
m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R)		 Ø4	
100 s		30 s	
 Ø5	 Ø6 (R)		
18 s	82 s		

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



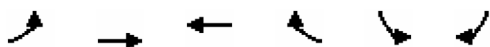
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1686	1164	270	42	50
Future Volume (vph)	100	1686	1164	270	42	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3505	1568	1656	1482
Flt Permitted	0.178				0.950	
Satd. Flow (perm)	332	3539	3505	1568	1656	1482
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				290		60
Link Speed (mph)		40	40		40	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		11.8	
Peak Hour Factor	0.90	0.90	0.93	0.93	0.84	0.84
Heavy Vehicles (%)	2%	2%	3%	3%	9%	9%
Adj. Flow (vph)	111	1873	1252	290	50	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	1873	1252	290	50	60
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	

AM 2048 Creve Coeur Existing AM 2048 3:08 pm 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2			2		3
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	25.0	108.0	83.0	83.0	22.0	22.0
Total Split (%)	19.2%	83.1%	63.8%	63.8%	16.9%	16.9%
Maximum Green (s)	19.2	102.3	77.4	77.4	16.6	16.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	96.4	102.3	89.3	89.3	16.6	16.6
Actuated g/C Ratio	0.74	0.79	0.69	0.69	0.13	0.13
v/c Ratio	0.34	0.67	0.52	0.25	0.24	0.25
Control Delay	5.1	6.4	11.0	1.3	54.3	14.9
Queue Delay	0.0	0.9	0.0	0.0	0.0	0.0
Total Delay	5.1	7.4	11.0	1.3	54.3	14.9
LOS	A	A	B	A	D	B
Approach Delay		7.2	9.1		32.8	
Approach LOS		A	A		C	
Queue Length 50th (ft)	8	77	247	0	39	0
Queue Length 95th (ft)	m26	800	307	28	73	36
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	473	2784	2407	1167	211	241
Starvation Cap Reductn	0	576	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.85	0.52	0.25	0.24	0.25

Intersection Summary

Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 41 (32%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.67	
Intersection Signal Delay: 8.8	Intersection LOS: A
Intersection Capacity Utilization 61.7%	ICU Level of Service B
Analysis Period (min) 15	

Lanes, Volumes, Timings 17: Olive & Old Olive St E

05/18/2023

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Olive & Old Olive St E

 Ø1	 Ø2 (R)	 Ø3
25 s	83 s	22 s
 Ø6 (R)		
108 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1475	0	0	1169	115	0	0	0	61	0	8
Future Volume (vph)	16	1475	0	0	1169	115	0	0	0	61	0	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	0		210	0		20	150		0
Storage Lanes	1		1	0		1	0		1	1		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Flt Permitted	0.174									0.950		
Satd. Flow (perm)	324	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						127						121
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			176			526	
Travel Time (s)		17.9			13.3			4.0			14.3	
Peak Hour Factor	0.86	0.86	0.86	0.95	0.95	0.95	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	19	1715	0	0	1231	121	0	0	0	73	0	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	1715	0	0	1231	121	0	0	0	73	0	10
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1		2	1	1	2	1	1		1
Detector Template	Left	Thru	Right		Thru	Right	Left	Thru	Right	Left		Right
Leading Detector (ft)	20	100	20		100	20	20	100	20	20		20
Trailing Detector (ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Position(ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Size(ft)	20	6	20		6	20	20	6	20	20		20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	D.P+P	NA	Perm		NA	Perm			Perm	Prot		Perm
Protected Phases	1	6			2		4	4		3		
Permitted Phases	2		6			2			4			3

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Lanes, Volumes, Timings

18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6		2	2	4	4	4	3		3
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0		10.0	10.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	12.8	15.5	15.5		15.6	15.6	13.0	13.0	13.0	13.3		13.3
Total Split (s)	16.0	92.0	92.0		76.0	76.0	8.0	8.0	8.0	30.0		30.0
Total Split (%)	12.3%	70.8%	70.8%		58.5%	58.5%	6.2%	6.2%	6.2%	23.1%		23.1%
Maximum Green (s)	10.2	86.5	86.5		70.4	70.4	2.0	2.0	2.0	23.7		23.7
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.8	1.5	1.5		1.6	1.6	2.0	2.0	2.0	2.3		2.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.5	5.5		5.6	5.6		6.0	6.0	6.3		6.3
Lead/Lag	Lag				Lead	Lead	Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max	C-Max		C-Max	C-Max	None	None	None	Max		Max
Act Effct Green (s)	91.9	94.5			88.0	88.0				23.7		23.7
Actuated g/C Ratio	0.71	0.73			0.68	0.68				0.18		0.18
v/c Ratio	0.06	0.67			0.51	0.11				0.23		0.03
Control Delay	1.5	3.9			3.0	0.5				47.5		0.1
Queue Delay	0.0	0.0			0.0	0.0				0.0		0.0
Total Delay	1.5	3.9			3.0	0.5				47.5		0.1
LOS	A	A			A	A				D		A
Approach Delay		3.8			2.8						41.8	
Approach LOS		A			A						D	
Queue Length 50th (ft)	1	71			67	0				53		0
Queue Length 95th (ft)	m2	59			66	0				91		0
Internal Link Dist (ft)		972			703			96			446	
Turn Bay Length (ft)	190					210				150		
Base Capacity (vph)	342	2572			2395	1112				322		387
Starvation Cap Reductn	0	0			0	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.06	0.67			0.51	0.11				0.23		0.03

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 125 (96%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 4.4

Intersection LOS: A

Intersection Capacity Utilization 52.1%

ICU Level of Service A

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Pavillion & Olive



Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1354	7	22	1102	54	5	6	24	114	9	344
Future Volume (vph)	174	1354	7	22	1102	54	5	6	24	114	9	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.879			0.854	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1480	1369	0	1770	1591	0
Flt Permitted	0.201			0.117			0.248			0.734		
Satd. Flow (perm)	374	3539	1583	218	3539	1583	386	1369	0	1367	1591	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			78		29			321	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			119			409	
Travel Time (s)		8.9			17.9			2.7			9.3	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.84	0.84	0.84	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	22%	22%	22%	2%	2%	2%
Adj. Flow (vph)	191	1488	8	23	1148	56	6	7	29	116	9	351
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	1488	8	23	1148	56	6	36	0	116	360	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6	6		2	8			4		
Detector Phase	1	6	6	5	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.1	16.2	16.2	13.1	30.3	30.3	13.2	13.2		13.1	13.1	
Total Split (s)	27.0	77.0	77.0	23.0	73.0	73.0	30.0	30.0		30.0	30.0	
Total Split (%)	20.8%	59.2%	59.2%	17.7%	56.2%	56.2%	23.1%	23.1%		23.1%	23.1%	
Maximum Green (s)	20.9	70.8	70.8	16.9	66.7	66.7	23.8	23.8		23.9	23.9	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.1	2.2	2.2	2.1	2.3	2.3	2.2	2.2		2.1	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	6.2	6.1	6.3	6.3	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					17.0	17.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	95.5	87.7	87.7	98.0	85.6	85.6	16.1	16.1		16.2	16.2	
Actuated g/C Ratio	0.73	0.67	0.67	0.75	0.66	0.66	0.12	0.12		0.12	0.12	
v/c Ratio	0.50	0.62	0.01	0.07	0.49	0.05	0.13	0.19		0.68	0.75	
Control Delay	10.4	11.3	0.0	1.1	1.3	0.1	53.2	21.8		73.4	18.8	
Queue Delay	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	10.4	11.5	0.0	1.1	1.3	0.1	53.2	21.8		73.4	18.8	
LOS	B	B	A	A	A	A	D	C		E	B	
Approach Delay		11.3			1.3			26.3			32.1	
Approach LOS		B			A			C			C	
Queue Length 50th (ft)	21	217	0	0	7	0	5	5		95	30	
Queue Length 95th (ft)	m48	314	m0	m1	17	0	17	33		152	131	
Internal Link Dist (ft)		375			972			39			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	516	2388	1094	366	2331	1069	70	274		251	554	
Starvation Cap Reductn	0	247	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.37	0.70	0.01	0.06	0.49	0.05	0.09	0.13		0.46	0.65	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 116 (89%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.75												
Intersection Signal Delay: 10.8						Intersection LOS: B						
Intersection Capacity Utilization 80.4%						ICU Level of Service D						
Analysis Period (min) 15												

Lanes, Volumes, Timings 19: Olive & Old Olive St W

05/18/2023

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spodee & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1382	72	97	1347	7	73	1	134	18	3	3
Future Volume (vph)	1	1382	72	97	1347	7	73	1	134	18	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850			0.850		0.925	
Flt Protected	0.950			0.950				0.953		0.950		
Satd. Flow (prot)	1770	3514	0	1770	3539	1583	0	1775	1583	1770	1723	0
Flt Permitted	0.132			0.081				0.723		0.701		
Satd. Flow (perm)	246	3514	0	151	3539	1583	0	1347	1583	1306	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		7				28			37		4	
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			9.3	
Peak Hour Factor	0.93	0.93	0.93	0.88	0.88	0.88	0.86	0.86	0.86	0.75	0.75	0.75
Adj. Flow (vph)	1	1486	77	110	1531	8	85	1	156	24	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1563	0	110	1531	8	0	86	156	24	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases		6		5	2			8	5		4	
Permitted Phases	2			6		2	8		8	4		

AM 2048 Creve Coeur Existing AM 2048 3:08 pm 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings

20: Spoeede & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	30.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	103.0	83.0		20.0	103.0	103.0	27.0	27.0	20.0	27.0	27.0	
Total Split (%)	79.2%	63.8%		15.4%	79.2%	79.2%	20.8%	20.8%	15.4%	20.8%	20.8%	
Maximum Green (s)	96.7	76.8		14.0	96.7	96.7	20.7	20.7	14.0	20.7	20.7	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag	Lead			Lag			Lag			Lag		
Lead-Lag Optimize?	Yes			Yes			Yes			Yes		
Vehicle Extension (s)	4.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	Max	Max	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	17.0	23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	96.7	76.8		91.0	96.7	96.7		20.7	41.0	20.7	20.7	
Actuated g/C Ratio	0.74	0.59		0.70	0.74	0.74		0.16	0.32	0.16	0.16	
v/c Ratio	0.01	0.75		0.39	0.58	0.01		0.40	0.30	0.12	0.03	
Control Delay	4.0	22.4		18.1	3.3	0.0		55.5	27.1	48.6	35.7	
Queue Delay	0.0	0.0		0.0	0.1	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.0	22.4		18.1	3.4	0.0		55.5	27.1	48.6	35.7	
LOS	A	C		B	A	A		E	C	D	D	
Approach Delay		22.4			4.4			37.2			45.3	
Approach LOS		C			A			D			D	
Queue Length 50th (ft)	0	483		12	127	0		66	74	18	3	
Queue Length 95th (ft)	2	576		m68	88	m0		115	126	37	15	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	182	2078		280	2632	1184		214	524	207	277	
Starvation Cap Reductn	0	0		0	225	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.01	0.75		0.39	0.64	0.01		0.40	0.30	0.12	0.03	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 3 (2%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.75												
Intersection Signal Delay: 15.1				Intersection LOS: B								
Intersection Capacity Utilization 72.5%				ICU Level of Service C								
Analysis Period (min) 15												
m Volume for 95th percentile queue is metered by upstream signal.												

Splits and Phases: 20: Spoede & Olive

 Ø2 (R)	 Ø4
103 s	27 s
 Ø6 (R)	 Ø8  Ø5
83 s	20 s 27 s

HCM 6th TWSC
10: Lindbergh & Old Olive

05/18/2023

Intersection												
Int Delay, s/veh	3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↗↘			↗↘	↗
Traffic Vol, veh/h	0	0	120	0	0	182	0	1372	103	0	2032	239
Future Vol, veh/h	0	0	120	0	0	182	0	1372	103	0	2032	239
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Yield	-	-	Free	-	-	Free
Storage Length	-	-	0	-	-	0	-	-	-	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	0	0	130	0	0	198	0	1491	112	0	2209	260

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	1105	-	-	746	-	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.98	-	-	6.98	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.34	-	-	3.34	-	-
Pot Cap-1 Maneuver	0	0	202	0	0	352	0	0
Stage 1	0	0	-	0	0	-	0	0
Stage 2	0	0	-	0	0	-	0	0
Platoon blocked, %								-
Mov Cap-1 Maneuver	-	-	202	-	-	352	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	50.5	27.6	0	0
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBT	EBLn1WBLn1	SBT
Capacity (veh/h)	-	202	352
HCM Lane V/C Ratio	-	0.646	0.562
HCM Control Delay (s)	-	50.5	27.6
HCM Lane LOS	-	F	D
HCM 95th %tile Q(veh)	-	3.8	3.3

Intersection

Intersection Delay, s/veh	7.4
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	26	0	0	0	48	0
Future Vol, veh/h	26	0	0	0	48	0
Peak Hour Factor	0.82	0.92	0.92	0.92	0.86	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	0	0	0	56	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.2	0	7.5
HCM LOS	A	-	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	100%	100%
Vol Right, %	0%	0%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	48	26	0
LT Vol	48	0	0
Through Vol	0	26	0
RT Vol	0	0	0
Lane Flow Rate	56	32	0
Geometry Grp	1	1	1
Degree of Util (X)	0.065	0.036	0
Departure Headway (Hd)	4.189	4.032	4.057
Convergence, Y/N	Yes	Yes	Yes
Cap	857	887	0
Service Time	2.205	2.062	2.093
HCM Lane V/C Ratio	0.065	0.036	0
HCM Control Delay	7.5	7.2	7.1
HCM Lane LOS	A	A	N
HCM 95th-tile Q	0.2	0.1	0

Intersection

Intersection Delay, s/veh 6.7

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	6	42	0	26	0	0
Future Vol, veh/h	6	42	0	26	0	0
Peak Hour Factor	0.86	0.86	0.92	0.82	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	49	0	32	0	0
Number of Lanes	1	0	1	1	0	0

Approach	WB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left NB		
Conflicting Lanes Left	2	0
Conflicting Approach Right		WB
Conflicting Lanes Right	0	1
HCM Control Delay	6.7	6.8
HCM LOS	A	A

Lane	NBLn1	NBLn2	WBLn1
Vol Left, %	0%	0%	12%
Vol Thru, %	100%	0%	0%
Vol Right, %	0%	100%	88%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	0	26	48
LT Vol	0	0	6
Through Vol	0	0	0
RT Vol	0	26	42
Lane Flow Rate	0	32	56
Geometry Grp	7	7	2
Degree of Util (X)	0	0.035	0.054
Departure Headway (Hd)	4.633	3.932	3.489
Convergence, Y/N	Yes	Yes	Yes
Cap	0	914	1029
Service Time	2.341	1.64	1.503
HCM Lane V/C Ratio	0	0.035	0.054
HCM Control Delay	7.3	6.8	6.7
HCM Lane LOS	N	A	A
HCM 95th-tile Q	0	0.1	0.2

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	0	26	0	0	0	6
Future Vol, veh/h	0	26	0	0	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	82	92	92	92	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	0	0	0	7
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	7	-	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	7	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	1014	0	-	0	0	-
Stage 1	-	0	-	0	0	-
Stage 2	1016	0	-	0	0	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1014	-	-	-	-	-
Mov Cap-2 Maneuver	1014	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1016	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT			
Capacity (veh/h)	-	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	0	0	-	-	-
HCM Lane LOS	-	A	A	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-	-

MOVEMENT SUMMARY

 **Site: 101 [2048 AM Existing (Site Folder: Eastmost Monsanto Intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] ft				mph
East: Monsanto															
1a	L1	All MCs	10	3.0	10	3.0	0.006	3.5	LOS A	0.0	0.0	0.00	0.44	0.00	23.7
6	T1	All MCs	1	3.0	1	3.0	0.006	0.0	LOS A	0.0	0.0	0.00	0.44	0.00	25.5
Approach			11	3.0	11	3.0	0.006	3.2	NA	0.0	0.0	0.00	0.44	0.00	23.8
West: Monsanto															
2	T1	All MCs	28	3.0	28	3.0	0.030	7.2	LOS A	0.1	2.6	0.06	1.06	0.06	20.1
Approach			28	3.0	28	3.0	0.030	7.2	LOS A	0.1	2.6	0.06	1.06	0.06	20.1
SouthWest: NB Ramp															
12ax	R1	All MCs	46	3.0	46	3.0	0.044	7.1	LOS A	0.2	4.8	0.12	0.92	0.12	20.1
Approach			46	3.0	46	3.0	0.044	7.1	LOS A	0.2	4.8	0.12	0.92	0.12	20.1
All Vehicles			85	3.0	85	3.0	0.044	6.6	NA	0.2	4.8	0.08	0.91	0.08	20.5

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard (HCM).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\05-2023 Updated Models\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↖	↗↗
Traffic Volume (vph)	1278	200	198	1841	24	170
Future Volume (vph)	1278	200	198	1841	24	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		128				83
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.93	0.93
Adj. Flow (vph)	1360	213	206	1918	26	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1360	213	206	1918	26	183
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

PM 2048 Creve Coeur Existing PM 2048 3:12 pm 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	10.0	7.0	7.0	10.0	7.0	
Minimum Split (s)	38.4	44.2	14.5	56.5	44.2	
Total Split (s)	82.0	24.0	24.0	106.0	24.0	
Total Split (%)	63.1%	18.5%	18.5%	81.5%	18.5%	
Maximum Green (s)	75.6	15.8	16.5	99.5	15.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	85.3	101.2	13.1	105.8	9.5	30.1
Actuated g/C Ratio	0.66	0.78	0.10	0.81	0.07	0.23
v/c Ratio	0.59	0.17	0.60	0.67	0.20	0.26
Control Delay	7.8	0.9	61.4	8.7	59.3	21.8
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	7.9	0.9	61.4	8.7	59.3	21.8
LOS	A	A	E	A	E	C
Approach Delay	6.9			13.8	26.4	
Approach LOS	A			B	C	
Queue Length 50th (ft)	195	0	89	383	21	38
Queue Length 95th (ft)	283	4	m123	366	51	69
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2322	1331	436	2880	215	738
Starvation Cap Reductn	201	0	0	83	0	0
Spillback Cap Reductn	0	0	0	34	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.16	0.47	0.69	0.12	0.25

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.7

Intersection LOS: B

Intersection Capacity Utilization 69.0%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

05/18/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R) 106 s		 Ø4 24 s	
 Ø5 24 s	 Ø6 (R) 82 s		

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↙↘	↑
Traffic Volume (vph)	1309	139	14	1832	207	205
Future Volume (vph)	1309	139	14	1832	207	205
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		146				214
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.95	0.95	0.92	0.92	0.96	0.96
Adj. Flow (vph)	1378	146	15	1991	216	214
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1378	146	15	1991	216	214
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4

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Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	59.1	37.9	37.9
Total Split (s)	85.0	85.0	22.0	107.0	23.0	23.0
Total Split (%)	65.4%	65.4%	16.9%	82.3%	17.7%	17.7%
Maximum Green (s)	79.0	79.0	15.1	100.9	16.1	16.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	98.3	98.3	7.0	103.7	13.3	13.3
Actuated g/C Ratio	0.76	0.76	0.05	0.80	0.10	0.10
v/c Ratio	0.52	0.12	0.08	0.71	0.62	0.61
Control Delay	3.4	0.4	49.1	12.9	63.6	14.4
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0
Total Delay	3.4	0.4	49.1	13.1	63.6	14.4
LOS	A	A	D	B	E	B
Approach Delay	3.1			13.4	39.1	
Approach LOS	A			B	D	
Queue Length 50th (ft)	71	0	6	548	91	0
Queue Length 95th (ft)	103	1	m9	642	130	76
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2675	1232	398	2824	425	383
Starvation Cap Reductn	0	0	0	242	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.12	0.04	0.77	0.51	0.56
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 2 (2%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.71						
Intersection Signal Delay: 12.2				Intersection LOS: B		
Intersection Capacity Utilization 67.4%				ICU Level of Service C		
Analysis Period (min) 15						
m Volume for 95th percentile queue is metered by upstream signal.						

Lanes, Volumes, Timings
 5: NB Lindbergh & Olive

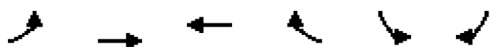
05/18/2023

Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R) 107 s		 Ø4 23 s	
 Ø5 22 s	 Ø6 (R) 85 s		

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



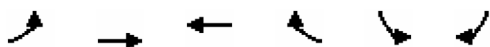
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	31	1483	1684	314	130	162
Future Volume (vph)	31	1483	1684	314	130	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.084				0.950	
Satd. Flow (perm)	156	3539	3539	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				308		144
Link Speed (mph)		40	40		30	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		15.8	
Peak Hour Factor	0.96	0.96	0.97	0.97	0.82	0.82
Adj. Flow (vph)	32	1545	1736	324	159	198
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	1545	1736	324	159	198
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	2			2		3

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Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	16.0	106.0	90.0	90.0	24.0	24.0
Total Split (%)	12.3%	81.5%	69.2%	69.2%	18.5%	18.5%
Maximum Green (s)	10.2	100.3	84.4	84.4	18.6	18.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	Max	Max
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	96.7	100.3	93.1	93.1	18.6	18.6
Actuated g/C Ratio	0.74	0.77	0.72	0.72	0.14	0.14
v/c Ratio	0.17	0.57	0.69	0.27	0.63	0.57
Control Delay	4.2	7.2	12.9	1.5	64.5	22.8
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	4.2	7.6	12.9	1.5	64.5	22.8
LOS	A	A	B	A	E	C
Approach Delay		7.5	11.1		41.3	
Approach LOS		A	B		D	
Queue Length 50th (ft)	2	488	441	4	128	41
Queue Length 95th (ft)	m7	116	533	34	184	96
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	245	2730	2534	1221	253	349
Starvation Cap Reductn	0	578	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.72	0.69	0.27	0.63	0.57

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 49 (38%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 12.4

Intersection LOS: B

Intersection Capacity Utilization 65.7%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
17: Olive & Old Olive St E

05/18/2023

Splits and Phases: 17: Olive & Old Olive St E

 Ø1	 Ø2 (R)	 Ø3
16 s	90 s	24 s
 Ø6 (R)		
106 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 							
Traffic Volume (vph)	56	1358	0	0	1614	250	0	0	0	121	0	48
Future Volume (vph)	56	1358	0	0	1614	250	0	0	0	121	0	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	0		210	0		20	150		0
Storage Lanes	1		1	0		1	0		1	1		1
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt						0.850						0.850
Flt Protected	0.950									0.950		
Satd. Flow (prot)	1770	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Flt Permitted	0.053									0.950		
Satd. Flow (perm)	99	3539	1863	0	3539	1583	0	1863	1863	1770	0	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)						154						121
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			176			526	
Travel Time (s)		17.9			13.3			4.0			14.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	60	1460	0	0	1735	269	0	0	0	164	0	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	1460	0	0	1735	269	0	0	0	164	0	65
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1		2	1	1	2	1	1		1
Detector Template	Left	Thru	Right		Thru	Right	Left	Thru	Right	Left		Right
Leading Detector (ft)	20	100	20		100	20	20	100	20	20		20
Trailing Detector (ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Position(ft)	0	0	0		0	0	0	0	0	0		0
Detector 1 Size(ft)	20	6	20		6	20	20	6	20	20		20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Queue (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 1 Delay (s)	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0
Detector 2 Position(ft)		94			94			94				
Detector 2 Size(ft)		6			6			6				
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex				
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0				
Turn Type	D.P+P	NA	Perm		NA	Perm			Perm	Prot		Perm
Protected Phases	1	6			2		4	4		3		
Permitted Phases	2		6			2			4			3

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Lanes, Volumes, Timings

18: Pavillion & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6		2	2	4	4	4	3		3
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0		10.0	10.0	7.0	7.0	7.0	7.0		7.0
Minimum Split (s)	12.8	15.5	15.5		15.6	15.6	13.0	13.0	13.0	13.3		13.3
Total Split (s)	18.0	89.0	89.0		71.0	71.0	8.0	8.0	8.0	33.0		33.0
Total Split (%)	13.8%	68.5%	68.5%		54.6%	54.6%	6.2%	6.2%	6.2%	25.4%		25.4%
Maximum Green (s)	12.2	83.5	83.5		65.4	65.4	2.0	2.0	2.0	26.7		26.7
Yellow Time (s)	4.0	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0		4.0
All-Red Time (s)	1.8	1.5	1.5		1.6	1.6	2.0	2.0	2.0	2.3		2.3
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0		0.0
Total Lost Time (s)	5.8	5.5	5.5		5.6	5.6		6.0	6.0	6.3		6.3
Lead/Lag	Lag				Lead	Lead	Lag	Lag	Lag	Lead		Lead
Lead-Lag Optimize?	Yes				Yes	Yes	Yes	Yes	Yes	Yes		Yes
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0		3.0
Recall Mode	None	C-Max	C-Max		C-Max	C-Max	None	None	None	Max		Max
Act Effct Green (s)	86.6	91.5			77.0	77.0				26.7		26.7
Actuated g/C Ratio	0.67	0.70			0.59	0.59				0.21		0.21
v/c Ratio	0.29	0.59			0.83	0.27				0.45		0.15
Control Delay	11.1	2.8			15.9	5.5				49.9		0.8
Queue Delay	0.0	0.0			0.2	0.0				0.0		0.0
Total Delay	11.1	2.8			16.2	5.5				49.9		0.8
LOS	B	A			B	A				D		A
Approach Delay		3.1			14.7						35.9	
Approach LOS		A			B						D	
Queue Length 50th (ft)	5	68			198	24				122		0
Queue Length 95th (ft)	m29	78			323	76				156		0
Internal Link Dist (ft)		972			703			96			446	
Turn Bay Length (ft)	190					210				150		
Base Capacity (vph)	222	2490			2096	1000				363		421
Starvation Cap Reductn	0	0			52	0				0		0
Spillback Cap Reductn	0	0			0	0				0		0
Storage Cap Reductn	0	0			0	0				0		0
Reduced v/c Ratio	0.27	0.59			0.85	0.27				0.45		0.15

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 125 (96%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 11.3

Intersection LOS: B

Intersection Capacity Utilization 61.2%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Pavillion & Olive

														
Ø4	Ø2 (R)			Ø1		Ø3								
71 s				18 s		33 s						8 s		
Ø6 (R)														
89 s														

Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	1257	11	54	1491	117	13	43	60	97	33	424
Future Volume (vph)	322	1257	11	54	1491	117	13	43	60	97	33	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.912			0.861	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1699	0	1770	1604	0
Flt Permitted	0.058			0.150			0.199			0.660		
Satd. Flow (perm)	108	3539	1583	279	3539	1583	371	1699	0	1229	1604	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			80			78		48			334	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			119			409	
Travel Time (s)		8.9			17.9			2.7			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.87	0.87	0.87	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	339	1323	12	62	1714	134	14	45	63	105	36	461
Shared Lane Traffic (%)												
Lane Group Flow (vph)	339	1323	12	62	1714	134	14	108	0	105	497	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	Perm	NA		Perm	NA	
Protected Phases	1	6		5	2			8			4	
Permitted Phases	2		6	6		2	8			4		

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	8	8		4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	7.0	10.0	10.0	7.0	7.0		7.0	7.0	
Minimum Split (s)	13.1	16.2	16.2	13.1	30.3	30.3	13.2	13.2		13.1	13.1	
Total Split (s)	30.0	82.0	82.0	16.0	68.0	68.0	32.0	32.0		32.0	32.0	
Total Split (%)	23.1%	63.1%	63.1%	12.3%	52.3%	52.3%	24.6%	24.6%		24.6%	24.6%	
Maximum Green (s)	23.9	75.8	75.8	9.9	61.7	61.7	25.8	25.8		25.9	25.9	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0		4.0	4.0	
All-Red Time (s)	2.1	2.2	2.2	2.1	2.3	2.3	2.2	2.2		2.1	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	6.2	6.1	6.3	6.3	6.2	6.2		6.1	6.1	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag						
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes						
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5	4.5	2.5	2.5		2.5	2.5	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None		None	None	
Walk Time (s)					7.0	7.0						
Flash Dont Walk (s)					17.0	17.0						
Pedestrian Calls (#/hr)					0	0						
Act Effct Green (s)	91.5	84.7	84.7	92.7	68.6	68.6	20.1	20.1		20.2	20.2	
Actuated g/C Ratio	0.70	0.65	0.65	0.71	0.53	0.53	0.15	0.15		0.16	0.16	
v/c Ratio	0.93	0.57	0.01	0.20	0.92	0.15	0.25	0.36		0.55	0.94	
Control Delay	79.9	5.6	0.0	3.0	17.0	0.7	56.0	29.4		60.2	43.1	
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	79.9	5.9	0.0	3.0	17.0	0.7	56.0	29.4		60.2	43.1	
LOS	E	A	A	A	B	A	E	C		E	D	
Approach Delay		20.9			15.4			32.4			46.1	
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	227	80	0	3	512	0	10	43		80	145	
Queue Length 95th (ft)	m252	m125	m0	m5	#871	m4	31	97		139	#333	
Internal Link Dist (ft)		375			972			39			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	382	2306	1059	312	1866	872	73	375		244	587	
Starvation Cap Reductn	0	383	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.89	0.69	0.01	0.20	0.92	0.15	0.19	0.29		0.43	0.85	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 113 (87%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green

Natural Cycle: 110

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 22.3

Intersection LOS: C

Intersection Capacity Utilization 102.4%

ICU Level of Service G

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Lanes, Volumes, Timings

19: Olive & Old Olive St W

05/18/2023

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spodee & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1434	122	117	1789	22	107	8	137	19	7	2
Future Volume (vph)	6	1434	122	117	1789	22	107	8	137	19	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850			0.850		0.965	
Flt Protected	0.950			0.950				0.956		0.950		
Satd. Flow (prot)	1770	3497	0	1770	3539	1583	0	1763	1568	1770	1798	0
Flt Permitted	0.065			0.064				0.732		0.575		
Satd. Flow (perm)	121	3497	0	119	3539	1583	0	1350	1568	1071	1798	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				81			80		3	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			7.8	
Peak Hour Factor	0.92	0.92	0.92	0.98	0.98	0.98	0.81	0.81	0.81	0.72	0.72	0.72
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	7	1559	133	119	1826	22	132	10	169	26	10	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1692	0	119	1826	22	0	142	169	26	13	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			8	5		4	

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Synchro 11 Report
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Lanes, Volumes, Timings

20: Spoeede & Olive

05/18/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		2	8		8	4		
Detector Phase	1	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	16.0	74.0		28.0	86.0	86.0	28.0	28.0	28.0	28.0	28.0	
Total Split (%)	12.3%	56.9%		21.5%	66.2%	66.2%	21.5%	21.5%	21.5%	21.5%	21.5%	
Maximum Green (s)	9.7	67.8		22.0	79.7	79.7	21.7	21.7	22.0	21.7	21.7	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag	Lead	Lead		Lag	Lag	Lag			Lag			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Vehicle Extension (s)	2.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max	None	None	None	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	94.4	67.8		90.0	93.0	93.0		21.7	50.0	21.7	21.7	
Actuated g/C Ratio	0.73	0.52		0.69	0.72	0.72		0.17	0.38	0.17	0.17	
v/c Ratio	0.04	0.93		0.33	0.72	0.02		0.63	0.26	0.15	0.04	
Control Delay	5.2	38.6		11.0	4.4	0.0		64.1	15.2	48.7	38.8	
Queue Delay	0.0	0.0		0.0	0.2	0.0		0.0	0.0	0.0	0.0	
Total Delay	5.2	38.6		11.0	4.6	0.0		64.1	15.2	48.7	38.8	
LOS	A	D		B	A	A		E	B	D	D	
Approach Delay		38.4			5.0			37.5			45.4	
Approach LOS		D			A			D			D	
Queue Length 50th (ft)	1	669		27	95	0		113	49	19	7	
Queue Length 95th (ft)	5	#810		m33	132	m0		165	85	37	21	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	211	1828		361	2533	1155		225	652	178	302	
Starvation Cap Reductn	0	0		0	182	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.03	0.93		0.33	0.78	0.02		0.63	0.26	0.15	0.04	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 119 (92%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 120												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.93												
Intersection Signal Delay: 22.0				Intersection LOS: C								
Intersection Capacity Utilization 84.1%				ICU Level of Service E								
Analysis Period (min) 15												

Lanes, Volumes, Timings

20: Spoede & Olive

05/18/2023

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Spoede & Olive



Intersection												
Int Delay, s/veh	26.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↱			↱		↱↲			↱↲	↱
Traffic Vol, veh/h	0	0	114	0	0	450	0	1355	23	0	1708	285
Future Vol, veh/h	0	0	114	0	0	450	0	1355	23	0	1708	285
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	Stop	-	-	Yield	-	-	Free	-	-	Free
Storage Length	-	-	0	-	-	0	-	-	-	-	-	300
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	124	0	0	489	0	1473	25	0	1857	310

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	929	-	-	737	-	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.94	-	-	6.94	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.32	-	-	3.32	-	-
Pot Cap-1 Maneuver	0	0	269	0	0	~ 361	0	0
Stage 1	0	0	-	0	0	-	0	0
Stage 2	0	0	-	0	0	-	0	0
Platoon blocked, %								-
Mov Cap-1 Maneuver	-	-	269	-	-	~ 361	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	29.3	206.4	0	0
HCM LOS	D	F		

Minor Lane/Major Mvmt	NBT	EBLn1	WBLn1	SBT
Capacity (veh/h)	-	269	361	-
HCM Lane V/C Ratio	-	0.461	1.355	-
HCM Control Delay (s)	-	29.3	206.4	-
HCM Lane LOS	-	D	F	-
HCM 95th %tile Q(veh)	-	2.3	23.7	-

Notes			
~: Volume exceeds capacity	\$. Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection

Intersection Delay, s/veh	7.2
Intersection LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	16	0	0	11	17	0
Future Vol, veh/h	16	0	0	11	17	0
Peak Hour Factor	0.58	0.92	0.92	0.92	0.53	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	28	0	0	12	32	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.1	7.1	7.4
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	100%	100%
Vol Right, %	0%	0%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	17	16	11
LT Vol	17	0	0
Through Vol	0	16	11
RT Vol	0	0	0
Lane Flow Rate	32	28	12
Geometry Grp	1	1	1
Degree of Util (X)	0.037	0.031	0.013
Departure Headway (Hd)	4.204	4.001	4.012
Convergence, Y/N	Yes	Yes	Yes
Cap	854	896	893
Service Time	2.22	2.018	2.033
HCM Lane V/C Ratio	0.037	0.031	0.013
HCM Control Delay	7.4	7.1	7.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.1	0

Intersection

Intersection Delay, s/veh 6.6

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	28	0	16	0	0
Future Vol, veh/h	0	28	0	16	0	0
Peak Hour Factor	0.92	0.78	0.92	0.58	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	36	0	28	0	0
Number of Lanes	1	0	1	1	0	0

Approach	WB	NB
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left NB		
Conflicting Lanes Left	2	0
Conflicting Approach Right		WB
Conflicting Lanes Right	0	1
HCM Control Delay	6.5	6.7
HCM LOS	A	A

Lane	NBLn1	NBLn2	WBLn1
Vol Left, %	0%	0%	0%
Vol Thru, %	100%	0%	0%
Vol Right, %	0%	100%	100%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	0	16	28
LT Vol	0	0	0
Through Vol	0	0	0
RT Vol	0	16	28
Lane Flow Rate	0	28	36
Geometry Grp	7	7	2
Degree of Util (X)	0	0.03	0.034
Departure Headway (Hd)	4.597	3.897	3.383
Convergence, Y/N	Yes	Yes	Yes
Cap	0	923	1061
Service Time	2.301	1.601	1.393
HCM Lane V/C Ratio	0	0.03	0.034
HCM Control Delay	7.3	6.7	6.5
HCM Lane LOS	N	A	A
HCM 95th-tile Q	0	0.1	0.1

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↘	↗	↑			↑
Traffic Vol, veh/h	0	16	0	0	0	0
Future Vol, veh/h	0	16	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	58	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	28	0	0	0	0

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1	-	0	-	-	-
Stage 1	0	-	-	-	-	-
Stage 2	1	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	1022	0	-	0	0	-
Stage 1	-	0	-	0	0	-
Stage 2	1022	0	-	0	0	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	1022	-	-	-	-	-
Mov Cap-2 Maneuver	1022	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	1022	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBT
Capacity (veh/h)	-	-
HCM Lane V/C Ratio	-	-
HCM Control Delay (s)	-	0
HCM Lane LOS	-	A
HCM 95th %tile Q(veh)	-	-

MOVEMENT SUMMARY

 **Site: 101 [2048 PM Existing (Site Folder: Eastmost Monsanto Intersection)]**

Output produced by SIDRA INTERSECTION Version: 9.1.2.202

New Site
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist]				mph
East: Monsanto															
1a	L1	All MCs	22	3.0	22	3.0	0.019	3.5	LOS A	0.0	0.0	0.00	0.31	0.00	24.6
6	T1	All MCs	12	3.0	12	3.0	0.019	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	26.6
Approach			34	3.0	34	3.0	0.019	2.3	NA	0.0	0.0	0.00	0.31	0.00	25.3
West: Monsanto															
2	T1	All MCs	17	3.0	17	3.0	0.019	7.3	LOS A	0.1	1.6	0.10	1.03	0.10	20.1
Approach			17	3.0	17	3.0	0.019	7.3	LOS A	0.1	1.6	0.10	1.03	0.10	20.1
SouthWest: NB Ramp															
12ax	R1	All MCs	11	3.0	11	3.0	0.010	7.0	LOS A	0.0	1.1	0.09	0.94	0.09	20.1
Approach			11	3.0	11	3.0	0.010	7.0	LOS A	0.0	1.1	0.09	0.94	0.09	20.1
All Vehicles			62	3.0	62	3.0	0.019	4.5	NA	0.1	1.6	0.04	0.62	0.04	22.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard (HCM).

Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

Gap-Acceptance Capacity Formula: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\05-2023 Updated Models\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↖	↗↗
Traffic Volume (vph)	1420	220	135	1377	100	271
Future Volume (vph)	1420	220	135	1377	100	271
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		159				62
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.91	0.91	0.89	0.89	0.90	0.90
Adj. Flow (vph)	1560	242	152	1547	111	301
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1560	242	152	1547	111	301
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

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Synchro 11 Report
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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	10.0	7.0	7.0	10.0	7.0	
Minimum Split (s)	38.4	44.2	20.0	56.5	44.2	
Total Split (s)	86.0	23.0	21.0	107.0	23.0	
Total Split (%)	66.2%	17.7%	16.2%	82.3%	17.7%	
Maximum Green (s)	79.6	14.8	13.5	100.5	14.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	81.9	100.8	13.5	102.8	12.5	33.5
Actuated g/C Ratio	0.63	0.78	0.10	0.79	0.10	0.26
v/c Ratio	0.70	0.19	0.43	0.55	0.65	0.39
Control Delay	7.5	0.7	58.3	6.2	74.2	32.5
Queue Delay	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	7.8	0.7	58.3	6.2	74.2	32.5
LOS	A	A	E	A	E	C
Approach Delay	6.8			10.9	43.7	
Approach LOS	A			B	D	
Queue Length 50th (ft)	126	6	57	161	91	93
Queue Length 95th (ft)	148	m7	89	216	154	138
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2228	1234	356	2797	201	812
Starvation Cap Reductn	204	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.77	0.20	0.43	0.55	0.55	0.37
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 1 (1%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 125						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.70						
Intersection Signal Delay: 12.5				Intersection LOS: B		
Intersection Capacity Utilization 69.3%				ICU Level of Service C		
Analysis Period (min) 15						
m Volume for 95th percentile queue is metered by upstream signal.						

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

06/16/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R) 107 s		 Ø4 23 s	
 Ø6 (R) 86 s		 Ø5 21 s	

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↙↘	↑
Traffic Volume (vph)	1524	167	3	1260	251	211
Future Volume (vph)	1524	167	3	1260	251	211
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3400	3505	3433	1583
Flt Permitted			0.095		0.950	
Satd. Flow (perm)	3539	1583	340	3505	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		153				158
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	1693	186	3	1370	285	240
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1693	186	3	1370	285	240
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	D.P+P	NA	Prot	Perm
Protected Phases	6		5	2	4	

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Synchro 11 Report
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Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		6	6			4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	20.0	37.9	37.9
Total Split (s)	82.0	82.0	18.0	100.0	30.0	30.0
Total Split (%)	63.1%	63.1%	13.8%	76.9%	23.1%	23.1%
Maximum Green (s)	76.0	76.0	11.1	93.9	23.1	23.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	97.9	97.9	98.4	100.6	16.4	16.4
Actuated g/C Ratio	0.75	0.75	0.76	0.77	0.13	0.13
v/c Ratio	0.64	0.15	0.01	0.51	0.66	0.71
Control Delay	4.4	0.8	5.3	6.6	61.2	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	4.4	0.8	5.3	6.6	61.2	30.9
LOS	A	A	A	A	E	C
Approach Delay	4.1			6.6	47.3	
Approach LOS	A			A	D	
Queue Length 50th (ft)	114	3	0	190	120	65
Queue Length 95th (ft)	175	m9	m1	283	155	144
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2665	1230	520	2711	610	411
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.15	0.01	0.51	0.47	0.58
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green						
Natural Cycle: 105						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.71						
Intersection Signal Delay: 11.0				Intersection LOS: B		
Intersection Capacity Utilization 65.9%				ICU Level of Service C		
Analysis Period (min) 15						

Lanes, Volumes, Timings 5: NB Lindbergh & Olive

06/16/2023

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R) 100 s		 Ø4 30 s	
 Ø5 18 s	 Ø6 (R) 82 s		

Lanes, Volumes, Timings
10: Lindbergh & Old Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	108	5	5	165	15	1361	93	50	2004	216
Future Volume (vph)	5	5	108	5	5	165	15	1361	93	50	2004	216
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	200		200	200		300
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.856			0.854				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1564	0	1736	1560	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.385			0.436			0.950			0.950		
Satd. Flow (perm)	703	1564	0	797	1560	0	1736	3471	1553	1736	3471	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		68			121				101			235
Link Speed (mph)		30			40			40			40	
Link Distance (ft)		510			490			3486			497	
Travel Time (s)		11.6			8.4			59.4			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	5	5	117	5	5	179	16	1479	101	54	2178	235
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	122	0	5	184	0	16	1479	101	54	2178	235
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	

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Synchro 11 Report
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Lanes, Volumes, Timings
10: Lindbergh & Old Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0		20.0	20.0		8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0		20.0	20.0		8.0	87.0	87.0	13.0	92.0	92.0
Total Split (%)	16.7%	16.7%		16.7%	16.7%		6.7%	72.5%	72.5%	10.8%	76.7%	76.7%
Maximum Green (s)	16.0	16.0		16.0	16.0		4.0	83.0	83.0	9.0	88.0	88.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	10.4	10.4		10.4	10.4		4.0	85.7	85.7	8.0	92.6	92.6
Actuated g/C Ratio	0.09	0.09		0.09	0.09		0.04	0.75	0.75	0.07	0.81	0.81
v/c Ratio	0.08	0.60		0.07	0.73		0.27	0.57	0.08	0.45	0.77	0.18
Control Delay	49.2	36.1		48.4	36.0		66.4	8.3	1.3	63.9	9.6	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.2	36.1		48.4	36.0		66.4	8.3	1.3	63.9	9.6	0.9
LOS	D	D		D	D		E	A	A	E	A	A
Approach Delay		36.6			36.3			8.5			10.0	
Approach LOS		D			D			A			A	
Queue Length 50th (ft)	3	38		3	45		12	237	0	38	263	0
Queue Length 95th (ft)	16	100		16	121		37	353	16	84	681	20
Internal Link Dist (ft)		430			410			3406			417	
Turn Bay Length (ft)	200			200			200		200	200		300
Base Capacity (vph)	98	278		111	322		60	2608	1192	137	2817	1304
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.44		0.05	0.57		0.27	0.57	0.08	0.39	0.77	0.18
Intersection Summary												
Area Type: Other												
Cycle Length: 120												
Actuated Cycle Length: 114.1												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.77												
Intersection Signal Delay: 11.3												
Intersection LOS: B												
Intersection Capacity Utilization 72.5%												
ICU Level of Service C												
Analysis Period (min) 15												

Lanes, Volumes, Timings 10: Lindbergh & Old Olive

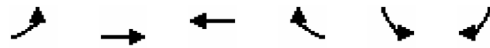
06/16/2023

Splits and Phases: 10: Lindbergh & Old Olive

 Ø1	 Ø2	 Ø4
13 s	87 s	20 s
 Ø5	 Ø6	 Ø8
8 s	92 s	20 s

Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023



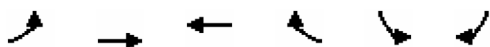
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	91	1645	1218	244	38	45
Future Volume (vph)	91	1645	1218	244	38	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3505	1568	1656	1482
Flt Permitted	0.181				0.950	
Satd. Flow (perm)	337	3539	3505	1568	1656	1482
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				262		54
Link Speed (mph)		40	40		40	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		11.8	
Peak Hour Factor	0.90	0.90	0.93	0.93	0.84	0.84
Heavy Vehicles (%)	2%	2%	3%	3%	9%	9%
Adj. Flow (vph)	101	1828	1310	262	45	54
Shared Lane Traffic (%)						
Lane Group Flow (vph)	101	1828	1310	262	45	54
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	

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Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2			2		3
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	17.0	113.0	96.0	96.0	17.0	17.0
Total Split (%)	13.1%	86.9%	73.8%	73.8%	13.1%	13.1%
Maximum Green (s)	11.2	107.3	90.4	90.4	11.6	11.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	106.4	113.5	99.8	99.8	9.1	9.1
Actuated g/C Ratio	0.82	0.87	0.77	0.77	0.07	0.07
v/c Ratio	0.29	0.59	0.49	0.21	0.39	0.35
Control Delay	3.4	3.1	7.0	1.0	67.2	20.8
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	3.4	3.5	7.0	1.0	67.2	20.8
LOS	A	A	A	A	E	C
Approach Delay		3.5	6.0		41.8	
Approach LOS		A	A		D	
Queue Length 50th (ft)	8	84	202	0	37	0
Queue Length 95th (ft)	m4	251	277	23	72	36
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	410	3088	2691	1264	147	181
Starvation Cap Reductn	0	629	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.74	0.49	0.21	0.31	0.30

Intersection Summary

Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 32 (25%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.59	
Intersection Signal Delay: 5.6	Intersection LOS: A
Intersection Capacity Utilization 60.6%	ICU Level of Service B
Analysis Period (min) 15	

Lanes, Volumes, Timings 17: Olive & Old Olive St E

06/16/2023

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Olive & Old Olive St E

 Ø1 17 s	 Ø2 (R) 96 s	 Ø3 17 s
 Ø6 (R) 113 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1286	146	369	1004	104	118	24	298	56	30	7
Future Volume (vph)	14	1286	146	369	1004	104	118	24	298	56	30	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	500		210	0		0	150		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1812	0
Flt Permitted	0.229			0.062			0.728			0.740		
Satd. Flow (perm)	427	3539	1583	115	3539	1583	1356	1863	1583	1378	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			152			109			104		7	
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			400			526	
Travel Time (s)		17.9			13.3			9.1			14.3	
Peak Hour Factor	0.86	0.86	0.86	0.95	0.95	0.95	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	16	1495	170	388	1057	109	128	26	324	67	36	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1495	170	388	1057	109	128	26	324	67	44	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			20			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	pm+ov	D.P+P	NA	
Protected Phases	1	6		5	2		3	8	5	7	4	
Permitted Phases	2		6	6		2	4		8	8		

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Lanes, Volumes, Timings
18: Pavillion & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	5	7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	4.0	10.0	10.0	4.0	7.0	4.0	4.0	7.0	
Minimum Split (s)	12.8	15.5	15.5	8.0	15.6	15.6	8.0	13.0	8.0	8.0	13.0	
Total Split (s)	19.0	69.0	69.0	31.0	81.0	81.0	8.0	22.0	31.0	8.0	22.0	
Total Split (%)	14.6%	53.1%	53.1%	23.8%	62.3%	62.3%	6.2%	16.9%	23.8%	6.2%	16.9%	
Maximum Green (s)	13.2	63.5	63.5	27.0	75.4	75.4	4.0	16.0	27.0	4.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	1.8	1.5	1.5	0.5	1.6	1.6	0.5	2.0	0.5	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8	5.5	5.5	4.0	5.6	5.6	4.0	6.0	4.0	4.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	98.1	69.1	69.1	98.2	93.0	93.0	16.6	7.8	36.5	17.4	8.5	
Actuated g/C Ratio	0.75	0.53	0.53	0.76	0.72	0.72	0.13	0.06	0.28	0.13	0.07	
v/c Ratio	0.04	0.80	0.19	0.89	0.42	0.09	0.65	0.23	0.63	0.31	0.35	
Control Delay	3.9	16.5	0.8	59.9	6.7	1.9	66.3	63.0	28.9	50.9	57.9	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	3.9	16.5	0.8	59.9	6.7	1.9	66.3	63.0	28.9	50.9	57.9	
LOS	A	B	A	E	A	A	E	E	C	D	E	
Approach Delay		14.8			19.7			40.8			53.7	
Approach LOS		B			B			D			D	
Queue Length 50th (ft)	2	257	0	277	5	0	99	21	123	50	30	
Queue Length 95th (ft)	m4	235	9	#465	300	18	156	52	204	84	63	
Internal Link Dist (ft)		972			703			320			446	
Turn Bay Length (ft)	190		300	500		210				150		
Base Capacity (vph)	458	1880	912	451	2532	1163	197	229	529	215	229	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.03	0.80	0.19	0.86	0.42	0.09	0.65	0.11	0.61	0.31	0.19	
Intersection Summary												
Area Type: Other												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 98 (75%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.89												
Intersection Signal Delay: 21.1						Intersection LOS: C						
Intersection Capacity Utilization 82.1%						ICU Level of Service E						
Analysis Period (min) 15												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

Lanes, Volumes, Timings

18: Pavillion & Olive

06/16/2023

Splits and Phases: 18: Pavillion & Olive

 Ø3 Ø2 (R) 81 s		 Ø1 19 s	 Ø4 22 s	 Ø5 8 s
 Ø5 31 s	 Ø6 (R) 69 s	 Ø8 22 s		 Ø9 8 s

Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	1318	78	20	1059	51	62	27	22	106	35	311
Future Volume (vph)	158	1318	78	20	1059	51	62	27	22	106	35	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.933			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1480	1453	0	1770	1611	0
Flt Permitted	0.181			0.110			0.252			0.719		
Satd. Flow (perm)	337	3539	1583	205	3539	1583	392	1453	0	1339	1611	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			79			60		25			278	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			211			409	
Travel Time (s)		8.9			17.9			4.8			9.3	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.84	0.84	0.84	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	22%	22%	22%	2%	2%	2%
Adj. Flow (vph)	174	1448	86	21	1103	53	74	32	26	108	36	317
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	1448	86	21	1103	53	74	58	0	108	353	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases	1	6	3	5	2	7	3	8		7	4	

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6	6		2	4			8		
Detector Phase	1	6	3	5	2	7	3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	4.0	7.0	10.0	4.0	4.0	7.0		4.0	7.0	
Minimum Split (s)	13.1	16.2	8.0	13.1	30.3	8.0	8.0	13.2		8.0	13.1	
Total Split (s)	24.0	81.0	16.0	11.0	68.0	18.0	16.0	20.0		18.0	22.0	
Total Split (%)	18.5%	62.3%	12.3%	8.5%	52.3%	13.8%	12.3%	15.4%		13.8%	16.9%	
Maximum Green (s)	17.9	74.8	12.0	4.9	61.7	14.0	12.0	13.8		14.0	15.9	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	3.5	3.5	4.0		3.5	4.0	
All-Red Time (s)	2.1	2.2	0.5	2.1	2.3	0.5	0.5	2.2		0.5	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	4.0	6.1	6.3	4.0	4.0	6.2		4.0	6.1	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	4.5	3.0	2.5	4.5	3.0	3.0	2.5		3.0	2.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	Max		None	Max	
Walk Time (s)					7.0							
Flash Dont Walk (s)					17.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	81.8	81.2	95.0	84.2	71.5	85.9	28.0	13.8		28.0	15.9	
Actuated g/C Ratio	0.63	0.62	0.73	0.65	0.55	0.66	0.22	0.11		0.22	0.12	
v/c Ratio	0.54	0.66	0.07	0.11	0.57	0.05	0.44	0.33		0.33	0.80	
Control Delay	17.1	11.0	0.3	4.7	16.2	3.1	46.9	39.2		42.9	27.6	
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	17.1	11.3	0.3	4.7	16.2	3.1	46.9	39.2		42.9	27.6	
LOS	B	B	A	A	B	A	D	D		D	C	
Approach Delay		11.3			15.4			43.5			31.2	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	24	227	0	2	245	4	49	26		73	59	
Queue Length 95th (ft)	66	183	m3	m5	377	m25	85	64		124	#207	
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	423	2210	1200	191	1947	1088	189	176		355	441	
Starvation Cap Reductn	0	225	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.41	0.73	0.07	0.11	0.57	0.05	0.39	0.33		0.30	0.80	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 118 (91%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 75												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.80												
Intersection Signal Delay: 16.5						Intersection LOS: B						
Intersection Capacity Utilization 85.4%						ICU Level of Service E						
Analysis Period (min) 15												

Lanes, Volumes, Timings

19: Olive & Old Olive St W

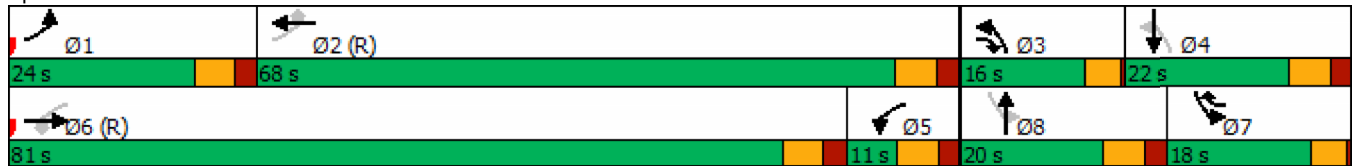
06/16/2023

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spodee & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1415	65	88	1338	6	66	1	122	16	3	3
Future Volume (vph)	1	1415	65	88	1338	6	66	1	122	16	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850			0.850		0.925	
Flt Protected	0.950			0.950				0.953		0.950		
Satd. Flow (prot)	1770	3514	0	1770	3539	1583	0	1775	1583	1770	1723	0
Flt Permitted	0.150			0.113				0.724		0.706		
Satd. Flow (perm)	279	3514	0	210	3539	1583	0	1349	1583	1315	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				28			27		4	
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			9.3	
Peak Hour Factor	0.93	0.93	0.93	0.88	0.88	0.88	0.86	0.86	0.86	0.75	0.75	0.75
Adj. Flow (vph)	1	1522	70	100	1520	7	77	1	142	21	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1592	0	100	1520	7	0	78	142	21	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases		6		5	2			8	5		4	
Permitted Phases	2			6		2	8		8	4		

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Synchro 11 Report
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Lanes, Volumes, Timings

20: Spoeede & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	30.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	91.6	78.0		13.6	91.6	91.6	38.4	38.4	13.6	38.4	38.4	
Total Split (%)	70.5%	60.0%		10.5%	70.5%	70.5%	29.5%	29.5%	10.5%	29.5%	29.5%	
Maximum Green (s)	85.3	71.8		7.6	85.3	85.3	32.1	32.1	7.6	32.1	32.1	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag		Lead		Lag					Lag			
Lead-Lag Optimize?		Yes		Yes					Yes			
Vehicle Extension (s)	4.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	17.0	23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	108.8	94.1		101.9	108.8	108.8		12.5	23.7	12.5	12.5	
Actuated g/C Ratio	0.84	0.72		0.78	0.84	0.84		0.10	0.18	0.10	0.10	
v/c Ratio	0.00	0.63		0.39	0.51	0.01		0.60	0.46	0.17	0.05	
Control Delay	3.0	11.6		11.3	2.8	0.0		74.7	40.9	54.8	38.8	
Queue Delay	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Delay	3.0	11.7		11.3	2.8	0.0		74.7	40.9	54.8	38.8	
LOS	A	B		B	A	A		E	D	D	D	
Approach Delay		11.6			3.3			52.9			50.4	
Approach LOS		B			A			D			D	
Queue Length 50th (ft)	0	344		9	94	0		64	85	17	3	
Queue Length 95th (ft)	2	482		m28	134	m0		108	134	35	15	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	233	2544		255	2963	1329		333	310	324	428	
Starvation Cap Reductn	0	0		0	140	0		0	0	0	0	
Spillback Cap Reductn	0	47		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.00	0.64		0.39	0.54	0.01		0.23	0.46	0.06	0.02	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 3 (2%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.63												
Intersection Signal Delay: 10.7						Intersection LOS: B						
Intersection Capacity Utilization 72.8%						ICU Level of Service C						
Analysis Period (min) 15												
m Volume for 95th percentile queue is metered by upstream signal.												

Splits and Phases: 20: Spoede & Olive



Intersection

Intersection Delay, s/veh 9.2

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	48	163	0	30	210	0
Future Vol, veh/h	48	163	0	30	210	0
Peak Hour Factor	0.82	0.92	0.92	0.92	0.86	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	59	177	0	33	244	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.7	8	9.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	23%	100%
Vol Right, %	0%	77%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	210	211	30
LT Vol	210	0	0
Through Vol	0	48	30
RT Vol	0	163	0
Lane Flow Rate	244	236	33
Geometry Grp	1	1	1
Degree of Util (X)	0.319	0.27	0.043
Departure Headway (Hd)	4.71	4.123	4.798
Convergence, Y/N	Yes	Yes	Yes
Cap	764	874	747
Service Time	2.739	2.138	2.825
HCM Lane V/C Ratio	0.319	0.27	0.044
HCM Control Delay	9.9	8.7	8
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.4	1.1	0.1

Intersection

Intersection Delay, s/veh 9.7

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	215	175	59	152	0
Future Vol, veh/h	25	215	175	59	152	0
Peak Hour Factor	0.86	0.86	0.92	0.82	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	250	190	72	165	0
Number of Lanes	1	0	1	1	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left NB			WB
Conflicting Lanes Left	2	0	1
Conflicting Approach Right SB		WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.8	9.6	9.9
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	SBLn1
Vol Left, %	0%	0%	10%	100%
Vol Thru, %	100%	0%	0%	0%
Vol Right, %	0%	100%	90%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	175	59	240	152
LT Vol	0	0	25	152
Through Vol	175	0	0	0
RT Vol	0	59	215	0
Lane Flow Rate	190	72	279	165
Geometry Grp	7	7	2	5
Degree of Util (X)	0.282	0.093	0.345	0.238
Departure Headway (Hd)	5.34	4.634	4.45	5.191
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	670	767	807	687
Service Time	3.106	2.4	2.493	3.262
HCM Lane V/C Ratio	0.284	0.094	0.346	0.24
HCM Control Delay	10.2	7.9	9.8	9.9
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.2	0.3	1.5	0.9

Intersection						
Int Delay, s/veh	3.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	185	49	0	0	25
Future Vol, veh/h	40	185	49	0	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	82	92	92	92	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	226	53	0	0	29
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	82	-	0	-	-	-
Stage 1	53	-	-	-	-	-
Stage 2	29	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	920	0	-	0	0	-
Stage 1	970	0	-	0	0	-
Stage 2	994	0	-	0	0	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	920	-	-	-	-	-
Mov Cap-2 Maneuver	920	-	-	-	-	-
Stage 1	970	-	-	-	-	-
Stage 2	994	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9.1	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT			
Capacity (veh/h)	- 920		-			
HCM Lane V/C Ratio	- 0.047		-			
HCM Control Delay (s)	- 9.1		0			
HCM Lane LOS	- A		A			
HCM 95th %tile Q(veh)	- 0.1		-			

Intersection	
Intersection Delay, s/veh	12.5
Intersection LOS	B

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	338	52	121	152	0	0
Future Vol, veh/h	338	52	121	152	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	367	57	132	165	0	0
Number of Lanes	0	1	1	0	0	0

Approach	NB	SE
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left	SE	
Conflicting Lanes Left	1	0
Conflicting Approach Right		NB
Conflicting Lanes Right	0	1
HCM Control Delay	13.7	10.8
HCM LOS	B	B

Lane	NBLn1	SELn1
Vol Left, %	87%	44%
Vol Thru, %	0%	0%
Vol Right, %	13%	56%
Sign Control	Stop	Stop
Traffic Vol by Lane	390	273
LT Vol	338	121
Through Vol	0	0
RT Vol	52	152
Lane Flow Rate	424	297
Geometry Grp	1	1
Degree of Util (X)	0.559	0.391
Departure Headway (Hd)	4.746	4.738
Convergence, Y/N	Yes	Yes
Cap	759	757
Service Time	2.797	2.785
HCM Lane V/C Ratio	0.559	0.392
HCM Control Delay	13.7	10.8
HCM Lane LOS	B	B
HCM 95th-tile Q	3.5	1.9

MOVEMENT SUMMARY

 **Site: 101 [2028 AM Build (Site Folder: Eastmost Monsanto Intersection)]**

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] ft				mph
East: Monsanto														
1a	L1	8	3.0	9	3.0	0.023	3.5	LOS A	0.0	0.0	0.00	0.10	0.00	27.5
6	T1	30	3.0	33	3.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	28.8
Approach		38	3.0	41	3.0	0.023	0.7	NA	0.0	0.0	0.00	0.10	0.00	28.5
West: Monsanto														
2	T1	48	3.0	52	3.0	0.056	7.3	LOS A	0.2	5.0	0.10	1.03	0.10	20.7
Approach		48	3.0	52	3.0	0.056	7.3	LOS A	0.2	5.0	0.10	1.03	0.10	20.7
SouthWest: NB Ramp														
12ax	R1	38	3.0	41	3.0	0.041	7.2	LOS A	0.2	4.4	0.17	0.90	0.17	20.6
Approach		38	3.0	41	3.0	0.041	7.2	LOS A	0.2	4.4	0.17	0.90	0.17	20.6
All Vehicles		124	3.0	135	3.0	0.056	5.3	NA	0.2	5.0	0.09	0.71	0.09	22.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\06-2023 Updated Models - v5 Trip Gen\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↖	↗↘
Traffic Volume (vph)	1267	258	210	1798	104	154
Future Volume (vph)	1267	258	210	1798	104	154
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		111				86
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.93	0.93
Adj. Flow (vph)	1348	274	219	1873	112	166
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1348	274	219	1873	112	166
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

06/16/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	38.4	44.2	14.5	56.5	44.2	
Total Split (s)	82.0	24.0	24.0	106.0	24.0	
Total Split (%)	63.1%	18.5%	18.5%	81.5%	18.5%	
Maximum Green (s)	75.6	15.8	16.5	99.5	15.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	81.5	100.9	13.4	102.4	12.9	33.9
Actuated g/C Ratio	0.63	0.78	0.10	0.79	0.10	0.26
v/c Ratio	0.61	0.22	0.62	0.67	0.64	0.21
Control Delay	14.2	2.4	60.3	10.9	72.2	17.6
Queue Delay	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	2.4	60.3	10.9	72.2	17.6
LOS	B	A	E	B	E	B
Approach Delay	12.2			16.1	39.6	
Approach LOS	B			B	D	
Queue Length 50th (ft)	245	20	90	406	92	28
Queue Length 95th (ft)	303	19	130	396	154	57
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2219	1285	435	2786	215	776
Starvation Cap Reductn	102	0	0	73	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.64	0.21	0.50	0.69	0.52	0.21

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green

Natural Cycle: 105

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 67.7%

ICU Level of Service C

Analysis Period (min) 15

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

06/16/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R)		 Ø4	
106 s		24 s	
 Ø5	 Ø6 (R)		
24 s	82 s		

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	1220	201	12	1740	268	214
Future Volume (vph)	1220	201	12	1740	268	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		212				223
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.95	0.95	0.92	0.92	0.96	0.96
Adj. Flow (vph)	1284	212	13	1891	279	223
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1284	212	13	1891	279	223
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4

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Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	59.1	37.9	37.9
Total Split (s)	85.0	85.0	22.0	107.0	23.0	23.0
Total Split (%)	65.4%	65.4%	16.9%	82.3%	17.7%	17.7%
Maximum Green (s)	79.0	79.0	15.1	100.9	16.1	16.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	96.8	96.8	7.0	102.3	14.7	14.7
Actuated g/C Ratio	0.74	0.74	0.05	0.79	0.11	0.11
v/c Ratio	0.49	0.17	0.07	0.68	0.72	0.59
Control Delay	5.8	1.1	49.0	10.4	66.4	13.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.8	1.1	49.0	10.4	66.4	13.5
LOS	A	A	D	B	E	B
Approach Delay	5.2			10.7	42.9	
Approach LOS	A			B	D	
Queue Length 50th (ft)	98	2	5	338	117	0
Queue Length 95th (ft)	151	13	m8	531	165	76
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2635	1232	398	2783	425	391
Starvation Cap Reductn	0	0	0	40	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.17	0.03	0.69	0.66	0.57
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 2 (2%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.72						
Intersection Signal Delay: 12.7				Intersection LOS: B		
Intersection Capacity Utilization 66.6%				ICU Level of Service C		
Analysis Period (min) 15						
m Volume for 95th percentile queue is metered by upstream signal.						

Lanes, Volumes, Timings 5: NB Lindbergh & Olive

06/16/2023

Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R) 107 s		 Ø4 23 s	
 Ø5 22 s	 Ø6 (R) 85 s		

Lanes, Volumes, Timings
10: Lindbergh & Old Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	10	103	40	15	407	30	1289	21	5	1627	258
Future Volume (vph)	15	10	103	40	15	407	30	1289	21	5	1627	258
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	200		200	200		300
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.863			0.855				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1608	0	1770	1593	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.120			0.619			0.950			0.950		
Satd. Flow (perm)	224	1608	0	1153	1593	0	1770	3539	1583	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		71			96				42			261
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		510			490			3486			497	
Travel Time (s)		11.6			11.1			79.2			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	11	112	43	16	442	33	1401	23	5	1768	280
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	123	0	43	458	0	33	1401	23	5	1768	280
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6

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Lanes, Volumes, Timings

10: Lindbergh & Old Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0		10.0	10.0		8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	42.0	42.0		42.0	42.0		8.0	80.0	80.0	8.0	80.0	80.0
Total Split (%)	32.3%	32.3%		32.3%	32.3%		6.2%	61.5%	61.5%	6.2%	61.5%	61.5%
Maximum Green (s)	38.0	38.0		38.0	38.0		4.0	76.0	76.0	4.0	76.0	76.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Act Effct Green (s)	33.2	33.2		33.2	33.2		4.0	81.1	81.1	4.0	76.5	76.5
Actuated g/C Ratio	0.27	0.27		0.27	0.27		0.03	0.65	0.65	0.03	0.62	0.62
v/c Ratio	0.27	0.26		0.14	0.92		0.58	0.60	0.02	0.09	0.81	0.26
Control Delay	48.9	17.5		35.6	60.2		98.4	14.8	1.2	64.6	23.6	2.5
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.9	17.5		35.6	60.2		98.4	14.8	1.2	64.6	23.6	2.5
LOS	D	B		D	E		F	B	A	E	C	A
Approach Delay		21.1			58.1			16.4			20.8	
Approach LOS		C			E			B			C	
Queue Length 50th (ft)	10	32		27	298		28	339	0	4	620	6
Queue Length 95th (ft)	35	83		58	#487		#84	486	6	19	735	44
Internal Link Dist (ft)		430			410			3406			417	
Turn Bay Length (ft)	200			200			200		200	200		300
Base Capacity (vph)	69	545		356	557		57	2317	1050	57	2184	1076
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.23	0.23		0.12	0.82		0.58	0.60	0.02	0.09	0.81	0.26

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 123.9

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 23.8

Intersection LOS: C

Intersection Capacity Utilization 77.6%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

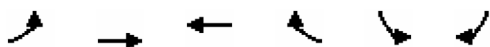
Queue shown is maximum after two cycles.

Splits and Phases: 10: Lindbergh & Old Olive

		
8 s	80 s	42 s
		
8 s	80 s	42 s

Lanes, Volumes, Timings
17: Olive & Old Olive St E

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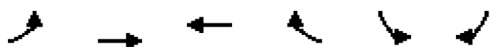
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	28	1406	1606	284	117	146
Future Volume (vph)	28	1406	1606	284	117	146
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.103				0.950	
Satd. Flow (perm)	192	3539	3539	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				293		108
Link Speed (mph)		40	40		30	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		15.8	
Peak Hour Factor	0.96	0.96	0.97	0.97	0.82	0.82
Adj. Flow (vph)	29	1465	1656	293	143	178
Shared Lane Traffic (%)						
Lane Group Flow (vph)	29	1465	1656	293	143	178
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	2			2		3

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Synchro 11 Report
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Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	12.0	103.0	91.0	91.0	27.0	27.0
Total Split (%)	9.2%	79.2%	70.0%	70.0%	20.8%	20.8%
Maximum Green (s)	6.2	97.3	85.4	85.4	21.6	21.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	99.6	103.2	96.1	96.1	15.7	15.7
Actuated g/C Ratio	0.77	0.79	0.74	0.74	0.12	0.12
v/c Ratio	0.13	0.52	0.63	0.24	0.67	0.62
Control Delay	6.7	6.7	11.3	1.3	69.3	31.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.7	6.7	11.3	1.3	69.3	31.3
LOS	A	A	B	A	E	C
Approach Delay		6.7	9.8		48.2	
Approach LOS		A	A		D	
Queue Length 50th (ft)	1	31	373	0	117	55
Queue Length 95th (ft)	m12	456	520	30	163	106
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	222	2808	2615	1246	294	353
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.52	0.63	0.24	0.49	0.50

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 58 (45%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 65

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

Intersection Signal Delay: 11.8

Intersection LOS: B

Intersection Capacity Utilization 62.6%

ICU Level of Service B

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023

Splits and Phases: 17: Olive & Old Olive St E

 Ø2 (R)	 Ø1	 Ø3
91 s	12 s	27 s
 Ø6 (R)		
103 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	1126	125	319	1356	227	114	15	290	109	15	43
Future Volume (vph)	50	1126	125	319	1356	227	114	15	290	109	15	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	500		210	0		0	150		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.888	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1654	0
Flt Permitted	0.105			0.119			0.706			0.747		
Satd. Flow (perm)	196	3539	1583	222	3539	1583	1315	1863	1583	1391	1654	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			134			201			121		58	
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			400			526	
Travel Time (s)		17.9			13.3			9.1			14.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	54	1211	134	343	1458	244	124	16	315	147	20	58
Shared Lane Traffic (%)												
Lane Group Flow (vph)	54	1211	134	343	1458	244	124	16	315	147	78	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			20			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	pm+ov	D.P+P	NA	
Protected Phases	1	6		5	2		3	8	5	7	4	
Permitted Phases	2		6	6		2	4		8	8		

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Lanes, Volumes, Timings

18: Pavillion & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	5	7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	4.0	10.0	10.0	4.0	7.0	4.0	4.0	7.0	
Minimum Split (s)	12.8	15.5	15.5	8.0	15.6	15.6	8.0	13.0	8.0	8.0	13.0	
Total Split (s)	14.0	64.0	64.0	32.0	82.0	82.0	14.0	16.0	32.0	18.0	20.0	
Total Split (%)	10.8%	49.2%	49.2%	24.6%	63.1%	63.1%	10.8%	12.3%	24.6%	13.8%	15.4%	
Maximum Green (s)	8.2	58.5	58.5	28.0	76.4	76.4	10.0	10.0	28.0	14.0	14.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	1.8	1.5	1.5	0.5	1.6	1.6	0.5	2.0	0.5	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8	5.5	5.5	4.0	5.6	5.6	4.0	6.0	4.0	4.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	None	None	Max	
Act Effct Green (s)	85.9	63.6	63.6	88.3	79.5	79.5	25.7	10.0	35.2	25.7	14.0	
Actuated g/C Ratio	0.66	0.49	0.49	0.68	0.61	0.61	0.20	0.08	0.27	0.20	0.11	
v/c Ratio	0.24	0.70	0.16	0.80	0.67	0.23	0.42	0.11	0.61	0.47	0.34	
Control Delay	9.1	16.4	1.4	38.5	10.5	0.8	46.8	57.9	22.1	49.4	23.9	
Queue Delay	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	9.1	16.4	1.4	38.5	10.7	0.8	46.8	57.9	22.1	49.4	23.9	
LOS	A	B	A	D	B	A	D	E	C	D	C	
Approach Delay		14.7			14.2			30.1			40.6	
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	9	121	0	129	377	4	87	13	104	105	15	
Queue Length 95th (ft)	m20	393	13	252	184	0	146	37	170	136	44	
Internal Link Dist (ft)		972			703			320			446	
Turn Bay Length (ft)	190		300	500		210				150		
Base Capacity (vph)	228	1732	843	488	2165	1046	298	143	570	319	229	
Starvation Cap Reductn	0	0	0	0	143	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.24	0.70	0.16	0.70	0.72	0.23	0.42	0.11	0.55	0.46	0.34	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 11 (8%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green

Natural Cycle: 70

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 17.5

Intersection LOS: B

Intersection Capacity Utilization 74.7%

ICU Level of Service D

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Pavillion & Olive



Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	1158	72	48	1357	108	67	52	55	89	43	383
Future Volume (vph)	292	1158	72	48	1357	108	67	52	55	89	43	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.923			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1719	0	1770	1611	0
Flt Permitted	0.067			0.156			0.175			0.643		
Satd. Flow (perm)	125	3539	1583	291	3539	1583	326	1719	0	1198	1611	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			85		34			297	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			211			409	
Travel Time (s)		8.9			17.9			4.8			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.87	0.87	0.87	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	307	1219	76	55	1560	124	71	55	58	97	47	416
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1219	76	55	1560	124	71	113	0	97	463	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases	1	6	3	5	2	7	3	8		7	4	
Permitted Phases	2		6	6		2	4			8		

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	3	5	2	7	3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	4.0	7.0	10.0	4.0	4.0	7.0		4.0	7.0	
Minimum Split (s)	13.1	16.2	8.0	13.1	30.3	8.0	8.0	13.2		8.0	13.1	
Total Split (s)	26.0	79.9	8.0	13.1	67.0	11.0	8.0	26.0		11.0	29.0	
Total Split (%)	20.0%	61.5%	6.2%	10.1%	51.5%	8.5%	6.2%	20.0%		8.5%	22.3%	
Maximum Green (s)	19.9	73.7	4.0	7.0	60.7	7.0	4.0	19.8		7.0	22.9	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	3.5	3.5	4.0		3.5	4.0	
All-Red Time (s)	2.1	2.2	0.5	2.1	2.3	0.5	0.5	2.2		0.5	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	4.0	6.1	6.3	4.0	4.0	6.2		4.0	6.1	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	4.5	3.0	2.5	4.5	3.0	3.0	2.5		3.0	2.5	
Recall Mode	Max	C-Max	None	None	C-Max	None	None	Max		None	Max	
Walk Time (s)					7.0							
Flash Dont Walk (s)					17.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	80.8	76.3	86.5	82.0	60.7	70.0	29.0	19.8		29.0	22.9	
Actuated g/C Ratio	0.62	0.59	0.67	0.63	0.47	0.54	0.22	0.15		0.22	0.18	
v/c Ratio	0.93	0.59	0.07	0.21	0.94	0.14	0.61	0.39		0.33	0.88	
Control Delay	54.3	5.0	0.2	3.8	29.3	2.2	62.2	38.8		42.2	37.1	
Queue Delay	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.0		0.0	0.0	
Total Delay	54.3	5.5	0.2	3.8	29.7	2.2	62.2	38.8		42.2	37.1	
LOS	D	A	A	A	C	A	E	D		D	D	
Approach Delay		14.6			26.9			47.9			38.0	
Approach LOS		B			C			D			D	
Queue Length 50th (ft)	207	62	1	5	208	1	47	60		65	146	
Queue Length 95th (ft)	m#318	75	m0	m8	#551	m29	#100	121		114	#340	
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	329	2077	1079	263	1652	891	117	290		298	528	
Starvation Cap Reductn	0	379	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	10	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.93	0.72	0.07	0.21	0.95	0.14	0.61	0.39		0.33	0.88	
Intersection Summary												
Area Type: Other												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 12 (9%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 100												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.94												
Intersection Signal Delay: 24.5						Intersection LOS: C						
Intersection Capacity Utilization 102.1%						ICU Level of Service G						
Analysis Period (min) 15												
# 95th percentile volume exceeds capacity, queue may be longer.												

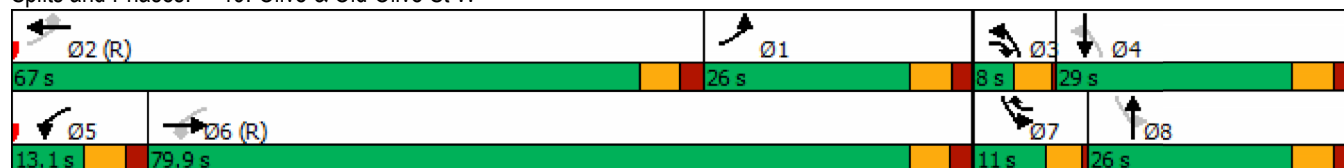
Lanes, Volumes, Timings 19: Olive & Old Olive St W

06/16/2023

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spodee & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1380	110	106	1682	20	97	7	124	18	6	2
Future Volume (vph)	5	1380	110	106	1682	20	97	7	124	18	6	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989				0.850			0.850		0.959	
Flt Protected	0.950			0.950				0.956		0.950		
Satd. Flow (prot)	1770	3500	0	1770	3539	1583	0	1763	1568	1770	1786	0
Flt Permitted	0.054			0.058				0.733		0.649		
Satd. Flow (perm)	101	3500	0	108	3539	1583	0	1352	1568	1209	1786	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				81			81		3	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			7.8	
Peak Hour Factor	0.92	0.92	0.92	0.98	0.98	0.98	0.81	0.81	0.81	0.72	0.72	0.72
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	5	1500	120	108	1716	20	120	9	153	25	8	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	1620	0	108	1716	20	0	129	153	25	11	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			8	5		4	

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Synchro 11 Report
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Lanes, Volumes, Timings

20: Spoele & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		2	8		8	4		
Detector Phase	1	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	13.0	79.0		12.0	78.0	78.0	39.0	39.0	12.0	39.0	39.0	
Total Split (%)	10.0%	60.8%		9.2%	60.0%	60.0%	30.0%	30.0%	9.2%	30.0%	30.0%	
Maximum Green (s)	6.7	72.8		6.0	71.7	71.7	32.7	32.7	6.0	32.7	32.7	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag	Lag	Lag		Lead	Lead	Lead			Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Vehicle Extension (s)	2.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max	None	Max	Max	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	83.4	72.8		79.0	82.1	82.1		32.7	45.0	32.7	32.7	
Actuated g/C Ratio	0.64	0.56		0.61	0.63	0.63		0.25	0.35	0.25	0.25	
v/c Ratio	0.03	0.82		0.76	0.77	0.02		0.38	0.26	0.08	0.02	
Control Delay	9.8	27.8		48.1	4.8	0.0		44.2	15.6	38.3	30.8	
Queue Delay	0.0	0.0		0.0	1.6	0.0		0.0	0.0	0.0	0.0	
Total Delay	9.8	27.8		48.1	6.4	0.0		44.2	15.6	38.3	30.8	
LOS	A	C		D	A	A		D	B	D	C	
Approach Delay		27.8			8.8			28.7			36.0	
Approach LOS		C			A			C			D	
Queue Length 50th (ft)	1	560		41	126	0		90	41	16	5	
Queue Length 95th (ft)	6	666		m48	m166	m0		135	79	32	17	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	150	1964		142	2234	1029		340	595	304	451	
Starvation Cap Reductn	0	0		0	322	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.03	0.82		0.76	0.90	0.02		0.38	0.26	0.08	0.02	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 9 (7%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 110												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.82												
Intersection Signal Delay: 18.7				Intersection LOS: B								
Intersection Capacity Utilization 80.5%				ICU Level of Service D								
Analysis Period (min) 15												

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Spoede & Olive



Intersection

Intersection Delay, s/veh 9.8

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	29	159	0	25	159	0
Future Vol, veh/h	29	159	0	25	159	0
Peak Hour Factor	0.58	0.92	0.92	0.92	0.53	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	50	173	0	27	300	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.7	8.2	10.7
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	15%	100%
Vol Right, %	0%	85%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	159	188	25
LT Vol	159	0	0
Through Vol	0	29	25
RT Vol	0	159	0
Lane Flow Rate	300	223	27
Geometry Grp	1	1	1
Degree of Util (X)	0.39	0.26	0.037
Departure Headway (Hd)	4.678	4.207	4.928
Convergence, Y/N	Yes	Yes	Yes
Cap	768	856	726
Service Time	2.709	2.229	2.963
HCM Lane V/C Ratio	0.391	0.261	0.037
HCM Control Delay	10.7	8.7	8.2
HCM Lane LOS	B	A	A
HCM 95th-tile Q	1.9	1	0.1

Intersection

Intersection Delay, s/veh 9.2

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	169	153	48	140	0
Future Vol, veh/h	16	169	153	48	140	0
Peak Hour Factor	0.92	0.78	0.92	0.58	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	217	166	83	152	0
Number of Lanes	1	0	1	1	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left NB			WB
Conflicting Lanes Left	2	0	1
Conflicting Approach Right SB		WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.1	9	9.5
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	SBLn1
Vol Left, %	0%	0%	9%	100%
Vol Thru, %	100%	0%	0%	0%
Vol Right, %	0%	100%	91%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	153	48	185	140
LT Vol	0	0	16	140
Through Vol	153	0	0	0
RT Vol	0	48	169	0
Lane Flow Rate	166	83	234	152
Geometry Grp	7	7	2	5
Degree of Util (X)	0.24	0.103	0.283	0.213
Departure Headway (Hd)	5.205	4.5	4.352	5.049
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	689	793	824	708
Service Time	2.954	2.249	2.382	3.1
HCM Lane V/C Ratio	0.241	0.105	0.284	0.215
HCM Control Delay	9.6	7.8	9.1	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.3	1.2	0.8

Intersection						
Int Delay, s/veh	3.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	154	46	0	0	16
Future Vol, veh/h	35	154	46	0	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	58	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	266	50	0	0	17
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	67	-	0	-	-	-
Stage 1	50	-	-	-	-	-
Stage 2	17	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	938	0	-	0	0	-
Stage 1	972	0	-	0	0	-
Stage 2	1006	0	-	0	0	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	938	-	-	-	-	-
Mov Cap-2 Maneuver	938	-	-	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT			
Capacity (veh/h)	- 938		-			
HCM Lane V/C Ratio	- 0.041		-			
HCM Control Delay (s)	- 9		0			
HCM Lane LOS	- A		A			
HCM 95th %tile Q(veh)	- 0.1		-			

Intersection

Intersection Delay, s/veh	11
Intersection LOS	B

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	283	39	118	140	0	0
Future Vol, veh/h	283	39	118	140	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	308	42	128	152	0	0
Number of Lanes	0	1	1	0	0	0

Approach	NB	SE
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left	SE	
Conflicting Lanes Left	1	0
Conflicting Approach Right		NB
Conflicting Lanes Right	0	1
HCM Control Delay	11.7	10.1
HCM LOS	B	B

Lane	NBLn1	SELn1
Vol Left, %	88%	46%
Vol Thru, %	0%	0%
Vol Right, %	12%	54%
Sign Control	Stop	Stop
Traffic Vol by Lane	322	258
LT Vol	283	118
Through Vol	0	0
RT Vol	39	140
Lane Flow Rate	350	280
Geometry Grp	1	1
Degree of Util (X)	0.457	0.355
Departure Headway (Hd)	4.698	4.563
Convergence, Y/N	Yes	Yes
Cap	766	788
Service Time	2.736	2.597
HCM Lane V/C Ratio	0.457	0.355
HCM Control Delay	11.7	10.1
HCM Lane LOS	B	B
HCM 95th-tile Q	2.4	1.6

MOVEMENT SUMMARY

 **Site: 101 [2028 PM Build (Site Folder: Eastmost Monsanto Intersection)]**

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] ft				mph
East: Monsanto														
1a	L1	19	3.0	21	3.0	0.026	3.5	LOS A	0.0	0.0	0.00	0.21	0.00	26.4
6	T1	25	3.0	27	3.0	0.026	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	27.6
Approach		44	3.0	48	3.0	0.026	1.5	NA	0.0	0.0	0.00	0.21	0.00	27.1
West: Monsanto														
2	T1	29	3.0	32	3.0	0.034	7.4	LOS A	0.1	3.0	0.12	1.02	0.12	20.7
Approach		29	3.0	32	3.0	0.034	7.4	LOS A	0.1	3.0	0.12	1.02	0.12	20.7
SouthWest: NB Ramp														
12ax	R1	9	3.0	10	3.0	0.010	7.1	LOS A	0.0	1.0	0.12	0.92	0.12	20.6
Approach		9	3.0	10	3.0	0.010	7.1	LOS A	0.0	1.0	0.12	0.92	0.12	20.6
All Vehicles		82	3.0	89	3.0	0.034	4.2	NA	0.1	3.0	0.05	0.57	0.05	23.7

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\06-2023 Updated Models - v5 Trip Gen\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↖	↗↗
Traffic Volume (vph)	1552	234	145	1498	101	299
Future Volume (vph)	1552	234	145	1498	101	299
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		137				44
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.91	0.91	0.89	0.89	0.90	0.90
Adj. Flow (vph)	1705	257	163	1683	112	332
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1705	257	163	1683	112	332
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

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Synchro 11 Report
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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	10.0	7.0	7.0	10.0	7.0	
Minimum Split (s)	38.4	44.2	20.0	56.5	44.2	
Total Split (s)	86.0	23.0	21.0	107.0	23.0	
Total Split (%)	66.2%	17.7%	16.2%	82.3%	17.7%	
Maximum Green (s)	79.6	14.8	13.5	100.5	14.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lead		Lag			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	81.8	100.8	13.5	102.7	12.6	33.6
Actuated g/C Ratio	0.63	0.78	0.10	0.79	0.10	0.26
v/c Ratio	0.77	0.20	0.46	0.60	0.65	0.44
Control Delay	7.4	0.8	58.9	6.9	74.3	36.4
Queue Delay	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	8.0	0.8	58.9	6.9	74.3	36.4
LOS	A	A	E	A	E	D
Approach Delay	7.1			11.5	46.0	
Approach LOS	A			B	D	
Queue Length 50th (ft)	129	6	59	173	92	114
Queue Length 95th (ft)	151	m6	96	225	156	163
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2227	1228	356	2796	201	799
Starvation Cap Reductn	202	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.21	0.46	0.60	0.56	0.42
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 1 (1%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 135						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.77						
Intersection Signal Delay: 13.0				Intersection LOS: B		
Intersection Capacity Utilization 73.0%				ICU Level of Service C		
Analysis Period (min) 15						
m Volume for 95th percentile queue is metered by upstream signal.						

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

06/16/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R) 107 s		 Ø4 23 s	
 Ø6 (R) 86 s		 Ø5 21 s	

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↘↙	↑
Traffic Volume (vph)	1675	176	3	1375	268	230
Future Volume (vph)	1675	176	3	1375	268	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3400	3505	3433	1583
Flt Permitted			0.068		0.950	
Satd. Flow (perm)	3539	1583	243	3505	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		147				151
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.90	0.90	0.92	0.92	0.88	0.88
Heavy Vehicles (%)	2%	2%	3%	3%	2%	2%
Adj. Flow (vph)	1861	196	3	1495	305	261
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1861	196	3	1495	305	261
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	D.P+P	NA	Prot	Perm
Protected Phases	6		5	2	4	

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Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Permitted Phases		6	6			4
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	20.0	37.9	37.9
Total Split (s)	82.0	82.0	18.0	100.0	30.0	30.0
Total Split (%)	63.1%	63.1%	13.8%	76.9%	23.1%	23.1%
Maximum Green (s)	76.0	76.0	11.1	93.9	23.1	23.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	97.0	97.0	97.5	99.7	17.3	17.3
Actuated g/C Ratio	0.75	0.75	0.75	0.77	0.13	0.13
v/c Ratio	0.70	0.16	0.01	0.56	0.67	0.77
Control Delay	5.7	1.0	6.3	8.1	60.6	37.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.7	1.0	6.3	8.1	60.6	37.2
LOS	A	A	A	A	E	D
Approach Delay	5.2			8.1	49.8	
Approach LOS	A			A	D	
Queue Length 50th (ft)	137	5	0	227	128	91
Queue Length 95th (ft)	197	m9	m1	394	163	174
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2640	1218	453	2687	610	405
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	45	0	0	0	0	1
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.72	0.16	0.01	0.56	0.50	0.65
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBWB, Start of 1st Green						
Natural Cycle: 115						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.77						
Intersection Signal Delay: 12.4				Intersection LOS: B		
Intersection Capacity Utilization 71.3%				ICU Level of Service C		
Analysis Period (min) 15						

Lanes, Volumes, Timings 5: NB Lindbergh & Olive

06/16/2023

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 5: NB Lindbergh & Olive

 Ø2 (R)		 Ø4	
100 s		30 s	
 Ø5	 Ø6 (R)		
18 s	82 s		

Lanes, Volumes, Timings
10: Lindbergh & Old Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	5	120	5	5	182	15	1491	102	50	2197	239
Future Volume (vph)	5	5	120	5	5	182	15	1491	102	50	2197	239
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	200		200	200		300
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.856			0.854				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1736	1564	0	1736	1560	0	1736	3471	1553	1736	3471	1553
Flt Permitted	0.336			0.414			0.950			0.950		
Satd. Flow (perm)	614	1564	0	756	1560	0	1736	3471	1553	1736	3471	1553
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		62			106				111			260
Link Speed (mph)		30			40			40			40	
Link Distance (ft)		510			490			3486			497	
Travel Time (s)		11.6			8.4			59.4			8.5	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
Adj. Flow (vph)	5	5	130	5	5	198	16	1621	111	54	2388	260
Shared Lane Traffic (%)												
Lane Group Flow (vph)	5	135	0	5	203	0	16	1621	111	54	2388	260
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	

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Lanes, Volumes, Timings
10: Lindbergh & Old Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	4			8					2			6
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	20.0	20.0		20.0	20.0		8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	20.0	20.0		20.0	20.0		8.0	87.0	87.0	13.0	92.0	92.0
Total Split (%)	16.7%	16.7%		16.7%	16.7%		6.7%	72.5%	72.5%	10.8%	76.7%	76.7%
Maximum Green (s)	16.0	16.0		16.0	16.0		4.0	83.0	83.0	9.0	88.0	88.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Walk Time (s)	5.0	5.0		5.0	5.0			5.0	5.0		5.0	5.0
Flash Dont Walk (s)	11.0	11.0		11.0	11.0			11.0	11.0		11.0	11.0
Pedestrian Calls (#/hr)	0	0		0	0			0	0		0	0
Act Effct Green (s)	11.9	11.9		11.9	11.9		4.0	85.3	85.3	8.0	92.1	92.1
Actuated g/C Ratio	0.10	0.10		0.10	0.10		0.03	0.74	0.74	0.07	0.80	0.80
v/c Ratio	0.08	0.62		0.06	0.79		0.27	0.63	0.09	0.45	0.86	0.20
Control Delay	48.8	40.1		47.8	46.3		67.4	10.0	1.3	64.9	13.8	0.9
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.8	40.1		47.8	46.3		67.4	10.0	1.3	64.9	13.8	0.9
LOS	D	D		D	D		E	A	A	E	B	A
Approach Delay		40.4			46.3			9.9			13.5	
Approach LOS		D			D			A			B	
Queue Length 50th (ft)	4	52		3	71		12	313	0	40	426	0
Queue Length 95th (ft)	16	118		16	156		37	417	17	84	909	20
Internal Link Dist (ft)		430			410			3406			417	
Turn Bay Length (ft)	200			200			200		200	200		300
Base Capacity (vph)	85	271		105	308		60	2571	1179	136	2777	1294
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.50		0.05	0.66		0.27	0.63	0.09	0.40	0.86	0.20
Intersection Summary												
Area Type: Other												
Cycle Length: 120												
Actuated Cycle Length: 115.1												
Natural Cycle: 90												
Control Type: Actuated-Uncoordinated												
Maximum v/c Ratio: 0.86												
Intersection Signal Delay: 14.4												
Intersection LOS: B												
Intersection Capacity Utilization 78.9%												
ICU Level of Service D												
Analysis Period (min) 15												

Lanes, Volumes, Timings 10: Lindbergh & Old Olive

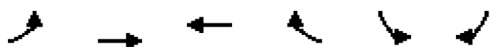
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Splits and Phases: 10: Lindbergh & Old Olive

 Ø1 13 s	 Ø2 87 s	 Ø4 20 s
 Ø5 8 s	 Ø6 92 s	 Ø8 20 s

Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023



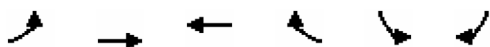
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	100	1805	1328	270	42	50
Future Volume (vph)	100	1805	1328	270	42	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3505	1568	1656	1482
Flt Permitted	0.154				0.950	
Satd. Flow (perm)	287	3539	3505	1568	1656	1482
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				290		60
Link Speed (mph)		40	40		40	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		11.8	
Peak Hour Factor	0.90	0.90	0.93	0.93	0.84	0.84
Heavy Vehicles (%)	2%	2%	3%	3%	9%	9%
Adj. Flow (vph)	111	2006	1428	290	50	60
Shared Lane Traffic (%)						
Lane Group Flow (vph)	111	2006	1428	290	50	60
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	

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Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Permitted Phases	2			2		3
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	17.0	113.0	96.0	96.0	17.0	17.0
Total Split (%)	13.1%	86.9%	73.8%	73.8%	13.1%	13.1%
Maximum Green (s)	11.2	107.3	90.4	90.4	11.6	11.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lead		Lag	Lag		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	106.2	113.2	99.5	99.5	9.3	9.3
Actuated g/C Ratio	0.82	0.87	0.77	0.77	0.07	0.07
v/c Ratio	0.35	0.65	0.53	0.23	0.42	0.37
Control Delay	4.9	4.4	7.7	1.0	68.2	20.0
Queue Delay	0.0	0.7	0.0	0.0	0.0	0.0
Total Delay	4.9	5.0	7.7	1.0	68.2	20.0
LOS	A	A	A	A	E	C
Approach Delay		5.0	6.5		41.9	
Approach LOS		A	A		D	
Queue Length 50th (ft)	11	114	237	0	41	0
Queue Length 95th (ft)	m2	120	321	23	77	38
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	371	3082	2681	1267	147	186
Starvation Cap Reductn	0	634	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.82	0.53	0.23	0.34	0.32

Intersection Summary

Area Type:	Other
Cycle Length: 130	
Actuated Cycle Length: 130	
Offset: 32 (25%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.65	
Intersection Signal Delay: 6.7	Intersection LOS: A
Intersection Capacity Utilization 65.0%	ICU Level of Service C
Analysis Period (min) 15	

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 17: Olive & Old Olive St E

 Ø1	 Ø2 (R)	 Ø3
17 s	96 s	17 s
 Ø6 (R)		
113 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	1426	146	369	1115	115	118	24	298	61	30	8
Future Volume (vph)	16	1426	146	369	1115	115	118	24	298	61	30	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	500		210	0		0	150		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.967	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1801	0
Flt Permitted	0.195			0.060			0.727			0.740		
Satd. Flow (perm)	363	3539	1583	112	3539	1583	1354	1863	1583	1378	1801	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			137			121			104		9	
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			400			526	
Travel Time (s)		17.9			13.3			9.1			14.3	
Peak Hour Factor	0.86	0.86	0.86	0.95	0.95	0.95	0.92	0.92	0.92	0.83	0.83	0.83
Adj. Flow (vph)	19	1658	170	388	1174	121	128	26	324	73	36	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	19	1658	170	388	1174	121	128	26	324	73	46	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			20			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	pm+ov	D.P+P	NA	
Protected Phases	1	6		5	2		3	8	5	7	4	
Permitted Phases	2		6	6		2	4		8	8		

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Lanes, Volumes, Timings
18: Pavillion & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	5	7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	4.0	10.0	10.0	4.0	7.0	4.0	4.0	7.0	
Minimum Split (s)	12.8	15.5	15.5	8.0	15.6	15.6	8.0	13.0	8.0	8.0	13.0	
Total Split (s)	19.0	69.0	69.0	31.0	81.0	81.0	8.0	22.0	31.0	8.0	22.0	
Total Split (%)	14.6%	53.1%	53.1%	23.8%	62.3%	62.3%	6.2%	16.9%	23.8%	6.2%	16.9%	
Maximum Green (s)	13.2	63.5	63.5	27.0	75.4	75.4	4.0	16.0	27.0	4.0	16.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	1.8	1.5	1.5	0.5	1.6	1.6	0.5	2.0	0.5	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8	5.5	5.5	4.0	5.6	5.6	4.0	6.0	4.0	4.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lag	Lead	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	None	None	None	None	
Act Effct Green (s)	98.1	69.1	69.1	98.2	93.0	93.0	16.6	7.8	36.5	17.4	8.6	
Actuated g/C Ratio	0.75	0.53	0.53	0.76	0.72	0.72	0.13	0.06	0.28	0.13	0.07	
v/c Ratio	0.05	0.88	0.19	0.89	0.46	0.10	0.65	0.23	0.63	0.34	0.37	
Control Delay	4.6	21.2	1.7	59.4	8.5	2.7	66.4	63.0	28.9	51.7	56.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	4.6	21.2	1.7	59.4	8.5	2.7	66.4	63.0	28.9	51.7	56.4	
LOS	A	C	A	E	A	A	E	E	C	D	E	
Approach Delay		19.3			19.8			40.8			53.5	
Approach LOS		B			B			D			D	
Queue Length 50th (ft)	2	508	1	263	6	0	99	21	123	54	30	
Queue Length 95th (ft)	m5	#596	m19	#468	351	28	156	52	204	89	64	
Internal Link Dist (ft)		972			703			320			446	
Turn Bay Length (ft)	190		300	500		210				150		
Base Capacity (vph)	416	1880	905	449	2532	1167	197	229	529	216	229	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.05	0.88	0.19	0.86	0.46	0.10	0.65	0.11	0.61	0.34	0.20	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 98 (75%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.89												
Intersection Signal Delay: 23.0						Intersection LOS: C						
Intersection Capacity Utilization 86.0%						ICU Level of Service E						
Analysis Period (min) 15												
# 95th percentile volume exceeds capacity, queue may be longer.												
Queue shown is maximum after two cycles.												
m Volume for 95th percentile queue is metered by upstream signal.												

Lanes, Volumes, Timings

18: Pavillion & Olive

06/16/2023

Splits and Phases: 18: Pavillion & Olive

 Ø3 Ø2 (R) 81 s		 Ø1 19 s	 Ø4 22 s	 Ø 8 s
 Ø5 31 s	 Ø6 (R) 69 s	 Ø8 22 s		 Ø 8 s

Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1447	78	22	1163	56	62	27	24	117	36	344
Future Volume (vph)	174	1447	78	22	1163	56	62	27	24	117	36	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.929			0.864	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1480	1447	0	1770	1609	0
Flt Permitted	0.143			0.081			0.252			0.717		
Satd. Flow (perm)	266	3539	1583	151	3539	1583	392	1447	0	1336	1609	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			79			60		28			299	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			211			409	
Travel Time (s)		8.9			17.9			4.8			9.3	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.84	0.84	0.84	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	22%	22%	22%	2%	2%	2%
Adj. Flow (vph)	191	1590	86	23	1211	58	74	32	29	119	37	351
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	1590	86	23	1211	58	74	61	0	119	388	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases	1	6	3	5	2	7	3	8		7	4	

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6	6		2	4			8		
Detector Phase	1	6	3	5	2	7	3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	4.0	7.0	10.0	4.0	4.0	7.0		4.0	7.0	
Minimum Split (s)	13.1	16.2	8.0	13.1	30.3	8.0	8.0	13.2		8.0	13.1	
Total Split (s)	24.0	81.0	16.0	11.0	68.0	18.0	16.0	20.0		18.0	22.0	
Total Split (%)	18.5%	62.3%	12.3%	8.5%	52.3%	13.8%	12.3%	15.4%		13.8%	16.9%	
Maximum Green (s)	17.9	74.8	12.0	4.9	61.7	14.0	12.0	13.8		14.0	15.9	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	3.5	3.5	4.0		3.5	4.0	
All-Red Time (s)	2.1	2.2	0.5	2.1	2.3	0.5	0.5	2.2		0.5	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	4.0	6.1	6.3	4.0	4.0	6.2		4.0	6.1	
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead		Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	4.5	3.0	2.5	4.5	3.0	3.0	2.5		3.0	2.5	
Recall Mode	None	C-Max	None	None	C-Max	None	None	Max		None	Max	
Walk Time (s)					7.0							
Flash Dont Walk (s)					17.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	81.8	81.2	95.0	84.2	69.7	84.0	28.0	13.8		28.0	15.9	
Actuated g/C Ratio	0.63	0.62	0.73	0.65	0.54	0.65	0.22	0.11		0.22	0.12	
v/c Ratio	0.63	0.72	0.07	0.15	0.64	0.06	0.44	0.34		0.36	0.85	
Control Delay	27.6	10.9	0.3	5.9	18.6	3.6	46.9	38.1		43.8	31.3	
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Delay	27.6	11.3	0.3	5.9	18.6	3.6	46.9	38.1		43.8	31.3	
LOS	C	B	A	A	B	A	D	D		D	C	
Approach Delay		12.5			17.7			43.0			34.3	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	31	280	0	2	272	5	49	26		81	72	
Queue Length 95th (ft)	m110	200	m2	m4	548	m30	85	65		135	#243	
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	383	2210	1200	158	1897	1067	189	178		355	459	
Starvation Cap Reductn	0	220	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	0.50	0.80	0.07	0.15	0.64	0.05	0.39	0.34		0.34	0.85	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 118 (91%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.85												
Intersection Signal Delay: 18.2						Intersection LOS: B						
Intersection Capacity Utilization 91.1%						ICU Level of Service F						
Analysis Period (min) 15												

Lanes, Volumes, Timings

19: Olive & Old Olive St W

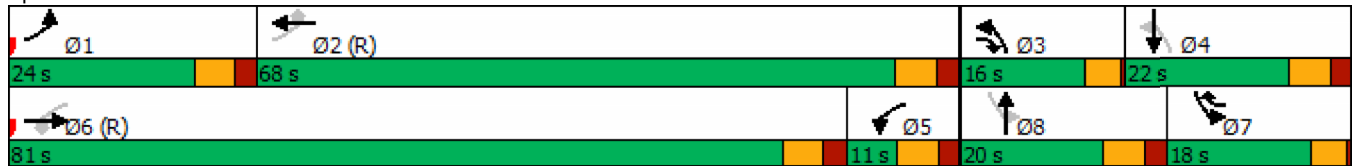
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95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spodee & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	1	1547	72	97	1466	7	73	1	134	18	3	3
Future Volume (vph)	1	1547	72	97	1466	7	73	1	134	18	3	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.993				0.850			0.850		0.925	
Flt Protected	0.950			0.950				0.953		0.950		
Satd. Flow (prot)	1770	3514	0	1770	3539	1583	0	1775	1583	1770	1723	0
Flt Permitted	0.121			0.084				0.723		0.701		
Satd. Flow (perm)	225	3514	0	156	3539	1583	0	1347	1583	1306	1723	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		6				28			27		4	
Link Speed (mph)		35			35			30			25	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			9.3	
Peak Hour Factor	0.93	0.93	0.93	0.88	0.88	0.88	0.86	0.86	0.86	0.75	0.75	0.75
Adj. Flow (vph)	1	1663	77	110	1666	8	85	1	156	24	4	4
Shared Lane Traffic (%)												
Lane Group Flow (vph)	1	1740	0	110	1666	8	0	86	156	24	8	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.Pm	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases		6		5	2			8	5		4	
Permitted Phases	2			6		2	8		8	4		

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Lanes, Volumes, Timings

20: Spoeede & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	2	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	10.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	30.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	91.6	78.0		13.6	91.6	91.6	38.4	38.4	13.6	38.4	38.4	
Total Split (%)	70.5%	60.0%		10.5%	70.5%	70.5%	29.5%	29.5%	10.5%	29.5%	29.5%	
Maximum Green (s)	85.3	71.8		7.6	85.3	85.3	32.1	32.1	7.6	32.1	32.1	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag		Lead		Lag					Lag			
Lead-Lag Optimize?		Yes		Yes					Yes			
Vehicle Extension (s)	4.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	C-Max	C-Max		None	C-Max	C-Max	None	None	None	None	None	
Walk Time (s)	7.0	7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)	17.0	23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)	0	0			0	0	0	0				
Act Effct Green (s)	104.2	90.7		98.5	104.2	104.2		13.2	27.1	13.2	13.2	
Actuated g/C Ratio	0.80	0.70		0.76	0.80	0.80		0.10	0.21	0.10	0.10	
v/c Ratio	0.01	0.71		0.52	0.59	0.01		0.63	0.44	0.18	0.04	
Control Delay	4.0	14.4		20.1	3.4	0.0		75.3	40.1	54.2	38.0	
Queue Delay	0.0	0.1		0.0	0.1	0.0		0.0	0.0	0.0	0.0	
Total Delay	4.0	14.5		20.1	3.5	0.0		75.3	40.1	54.2	38.0	
LOS	A	B		C	A	A		E	D	D	D	
Approach Delay		14.5			4.5			52.6			50.2	
Approach LOS		B			A			D			D	
Queue Length 50th (ft)	0	417		10	106	0		71	95	19	3	
Queue Length 95th (ft)	2	588		m55	143	m0		116	146	38	15	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	180	2453		212	2836	1274		332	351	322	428	
Starvation Cap Reductn	0	0		0	140	0		0	0	0	0	
Spillback Cap Reductn	0	63		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.01	0.73		0.52	0.62	0.01		0.26	0.44	0.07	0.02	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 3 (2%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 110												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.71												
Intersection Signal Delay: 12.5						Intersection LOS: B						
Intersection Capacity Utilization 77.1%						ICU Level of Service D						
Analysis Period (min) 15												
m Volume for 95th percentile queue is metered by upstream signal.												

Splits and Phases: 20: Spoede & Olive



Intersection

Intersection Delay, s/veh 9.3

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	50	163	0	30	214	0
Future Vol, veh/h	50	163	0	30	214	0
Peak Hour Factor	0.82	0.92	0.92	0.92	0.86	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	61	177	0	33	249	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.7	8.1	10
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	23%	100%
Vol Right, %	0%	77%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	214	213	30
LT Vol	214	0	0
Through Vol	0	50	30
RT Vol	0	163	0
Lane Flow Rate	249	238	33
Geometry Grp	1	1	1
Degree of Util (X)	0.326	0.274	0.044
Departure Headway (Hd)	4.716	4.139	4.813
Convergence, Y/N	Yes	Yes	Yes
Cap	761	869	744
Service Time	2.748	2.158	2.843
HCM Lane V/C Ratio	0.327	0.274	0.044
HCM Control Delay	10	8.7	8.1
HCM Lane LOS	A	A	A
HCM 95th-tile Q	1.4	1.1	0.1

Intersection

Intersection Delay, s/veh 9.8

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	25	219	175	61	152	0
Future Vol, veh/h	25	219	175	61	152	0
Peak Hour Factor	0.86	0.86	0.92	0.82	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	255	190	74	165	0
Number of Lanes	1	0	1	1	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left NB			WB
Conflicting Lanes Left	2	0	1
Conflicting Approach Right SB		WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.9	9.6	9.9
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	SBLn1
Vol Left, %	0%	0%	10%	100%
Vol Thru, %	100%	0%	0%	0%
Vol Right, %	0%	100%	90%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	175	61	244	152
LT Vol	0	0	25	152
Through Vol	175	0	0	0
RT Vol	0	61	219	0
Lane Flow Rate	190	74	284	165
Geometry Grp	7	7	2	5
Degree of Util (X)	0.283	0.096	0.351	0.239
Departure Headway (Hd)	5.353	4.647	4.455	5.208
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	668	765	806	684
Service Time	3.12	2.414	2.499	3.278
HCM Lane V/C Ratio	0.284	0.097	0.352	0.241
HCM Control Delay	10.2	7.9	9.9	9.9
HCM Lane LOS	B	A	A	A
HCM 95th-tile Q	1.2	0.3	1.6	0.9

Intersection						
Int Delay, s/veh	3.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	40	188	49	0	0	25
Future Vol, veh/h	40	188	49	0	0	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	82	92	92	92	86
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	43	229	53	0	0	29

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	82	-	0
Stage 1	53	-	-
Stage 2	29	-	-
Critical Hdwy	6.42	-	-
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	-	-
Pot Cap-1 Maneuver	920	0	0
Stage 1	970	0	0
Stage 2	994	0	0
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	920	-	-
Mov Cap-2 Maneuver	920	-	-
Stage 1	970	-	-
Stage 2	994	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBTWBLn1WBLn2	SBT
Capacity (veh/h)	- 920	-
HCM Lane V/C Ratio	- 0.047	-
HCM Control Delay (s)	- 9.1	0
HCM Lane LOS	- A	A
HCM 95th %tile Q(veh)	- 0.1	-

Intersection	
Intersection Delay, s/veh	12.6
Intersection LOS	B

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	338	56	121	152	0	0
Future Vol, veh/h	338	56	121	152	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	367	61	132	165	0	0
Number of Lanes	0	1	1	0	0	0

Approach	NB	SE
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left	SE	
Conflicting Lanes Left	1	0
Conflicting Approach Right		NB
Conflicting Lanes Right	0	1
HCM Control Delay	13.8	10.8
HCM LOS	B	B

Lane	NBLn1	SELn1
Vol Left, %	86%	44%
Vol Thru, %	0%	0%
Vol Right, %	14%	56%
Sign Control	Stop	Stop
Traffic Vol by Lane	394	273
LT Vol	338	121
Through Vol	0	0
RT Vol	56	152
Lane Flow Rate	428	297
Geometry Grp	1	1
Degree of Util (X)	0.564	0.391
Departure Headway (Hd)	4.74	4.748
Convergence, Y/N	Yes	Yes
Cap	758	757
Service Time	2.79	2.795
HCM Lane V/C Ratio	0.565	0.392
HCM Control Delay	13.8	10.8
HCM Lane LOS	B	B
HCM 95th-tile Q	3.6	1.9

MOVEMENT SUMMARY

 **Site: 101 [2048 AM Build (Site Folder: Eastmost Monsanto Intersection)]**

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] ft				mph
East: Monsanto														
1a	L1	9	3.0	10	3.0	0.023	3.5	LOS A	0.0	0.0	0.00	0.11	0.00	27.4
6	T1	30	3.0	33	3.0	0.023	0.0	LOS A	0.0	0.0	0.00	0.11	0.00	28.7
Approach		39	3.0	42	3.0	0.023	0.8	NA	0.0	0.0	0.00	0.11	0.00	28.4
West: Monsanto														
2	T1	50	3.0	54	3.0	0.059	7.3	LOS A	0.2	5.3	0.10	1.03	0.10	20.7
Approach		50	3.0	54	3.0	0.059	7.3	LOS A	0.2	5.3	0.10	1.03	0.10	20.7
SouthWest: NB Ramp														
12ax	R1	42	3.0	46	3.0	0.046	7.2	LOS A	0.2	4.9	0.18	0.90	0.18	20.6
Approach		42	3.0	46	3.0	0.046	7.2	LOS A	0.2	4.9	0.18	0.90	0.18	20.6
All Vehicles		131	3.0	142	3.0	0.059	5.4	NA	0.2	5.3	0.10	0.71	0.10	22.5

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\06-2023 Updated Models - v5 Trip Gen\Monsanto Interchange.sip9

Lanes, Volumes, Timings

2: SB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↘↙	↑↑	↖	↗↗
Traffic Volume (vph)	1389	277	229	1972	106	170
Future Volume (vph)	1389	277	229	1972	106	170
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		450	450		0	0
Storage Lanes		1	2		1	2
Taper Length (ft)			100		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	1.00	0.88
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	1770	2787
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	1770	2787
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		89				62
Link Speed (mph)	40			40	40	
Link Distance (ft)	783			1095	517	
Travel Time (s)	13.3			18.7	8.8	
Peak Hour Factor	0.94	0.94	0.96	0.96	0.93	0.93
Adj. Flow (vph)	1478	295	239	2054	114	183
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1478	295	239	2054	114	183
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	24			32	24	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	pm+ov	Prot	NA	Prot	pt+ov
Protected Phases	6	4	5	2	4	4 5
Permitted Phases		6				

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Synchro 11 Report
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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

06/16/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	4	5	2	4	4 5
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	38.4	44.2	14.5	56.5	44.2	
Total Split (s)	82.0	24.0	24.0	106.0	24.0	
Total Split (%)	63.1%	18.5%	18.5%	81.5%	18.5%	
Maximum Green (s)	75.6	15.8	16.5	99.5	15.8	
Yellow Time (s)	4.3	4.0	4.0	4.3	4.0	
All-Red Time (s)	2.1	4.2	3.5	2.2	4.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.4	8.2	7.5	6.5	8.2	
Lead/Lag	Lag		Lead			
Lead-Lag Optimize?	Yes		Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	C-Max	None	None	C-Max	None	
Walk Time (s)	8.0	10.0			10.0	
Flash Dont Walk (s)	24.0	26.0			26.0	
Pedestrian Calls (#/hr)	0	0			0	
Act Effct Green (s)	80.9	100.3	14.0	102.3	13.0	34.5
Actuated g/C Ratio	0.62	0.77	0.11	0.79	0.10	0.27
v/c Ratio	0.67	0.24	0.65	0.74	0.64	0.23
Control Delay	16.5	2.5	60.8	11.3	72.5	24.0
Queue Delay	0.1	0.0	0.0	0.1	0.0	0.0
Total Delay	16.6	2.5	60.8	11.3	72.5	24.0
LOS	B	A	E	B	E	C
Approach Delay	14.2			16.5	42.6	
Approach LOS	B			B	D	
Queue Length 50th (ft)	271	22	98	414	93	44
Queue Length 95th (ft)	368	m18	m135	436	155	75
Internal Link Dist (ft)	703			1015	437	
Turn Bay Length (ft)		450	450			
Base Capacity (vph)	2201	1273	435	2783	215	758
Starvation Cap Reductn	98	0	0	73	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.70	0.23	0.55	0.76	0.53	0.24

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 126 (97%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green

Natural Cycle: 115

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 17.4

Intersection LOS: B

Intersection Capacity Utilization 72.6%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings 2: SB Lindbergh & Olive

06/16/2023

Splits and Phases: 2: SB Lindbergh & Olive

 Ø2 (R)		 Ø4	
106 s		24 s	
 Ø5	 Ø6 (R)		
24 s		82 s	

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↙↘	↑
Traffic Volume (vph)	1344	214	14	1914	288	233
Future Volume (vph)	1344	214	14	1914	288	233
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		25	
Lane Util. Factor	0.95	1.00	0.97	0.95	0.97	1.00
Frt		0.850				0.850
Flt Protected			0.950		0.950	
Satd. Flow (prot)	3539	1583	3433	3539	3433	1583
Flt Permitted			0.950		0.950	
Satd. Flow (perm)	3539	1583	3433	3539	3433	1583
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		225				215
Link Speed (mph)	40			40	40	
Link Distance (ft)	1095			928	634	
Travel Time (s)	18.7			15.8	10.8	
Peak Hour Factor	0.95	0.95	0.92	0.92	0.96	0.96
Adj. Flow (vph)	1415	225	15	2080	300	243
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1415	225	15	2080	300	243
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	32			32	32	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		60	60		60	60
Number of Detectors	2	1	1	2	1	1
Detector Template	Thru	Right	Left	Thru	Left	Right
Leading Detector (ft)	100	20	20	100	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	6	20	20	6	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	Cl+Ex			Cl+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type	NA	Perm	Prot	NA	Prot	Perm
Protected Phases	6		5	2	4	
Permitted Phases		6				4

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Synchro 11 Report
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Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	6	6	5	2	4	4
Switch Phase						
Minimum Initial (s)	10.0	10.0	7.0	10.0	7.0	7.0
Minimum Split (s)	32.0	32.0	13.9	59.1	37.9	37.9
Total Split (s)	85.0	85.0	22.0	107.0	23.0	23.0
Total Split (%)	65.4%	65.4%	16.9%	82.3%	17.7%	17.7%
Maximum Green (s)	79.0	79.0	15.1	100.9	16.1	16.1
Yellow Time (s)	4.3	4.3	4.0	4.3	4.0	4.0
All-Red Time (s)	1.7	1.7	2.9	1.8	2.9	2.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.9	6.1	6.9	6.9
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	C-Max	C-Max	None	C-Max	None	None
Walk Time (s)	7.0	7.0			7.0	7.0
Flash Dont Walk (s)	19.0	19.0			24.0	24.0
Pedestrian Calls (#/hr)	0	0			0	0
Act Effct Green (s)	96.5	96.5	7.0	101.9	15.1	15.1
Actuated g/C Ratio	0.74	0.74	0.05	0.78	0.12	0.12
v/c Ratio	0.54	0.18	0.08	0.75	0.76	0.65
Control Delay	6.4	1.1	47.9	13.0	68.3	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	1.1	47.9	13.1	68.3	18.8
LOS	A	A	D	B	E	B
Approach Delay	5.7			13.3	46.1	
Approach LOS	A			B	D	
Queue Length 50th (ft)	124	5	6	482	126	21
Queue Length 95th (ft)	164	12	m9	613	177	108
Internal Link Dist (ft)	1015			848	554	
Turn Bay Length (ft)		250	350			
Base Capacity (vph)	2626	1232	398	2774	425	384
Starvation Cap Reductn	0	0	0	40	0	0
Spillback Cap Reductn	0	0	0	10	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.18	0.04	0.76	0.71	0.63
Intersection Summary						
Area Type:	Other					
Cycle Length: 130						
Actuated Cycle Length: 130						
Offset: 2 (2%), Referenced to phase 2:WBT and 6:EBT, Start of 1st Green						
Natural Cycle: 100						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.76						
Intersection Signal Delay: 14.5				Intersection LOS: B		
Intersection Capacity Utilization 72.0%				ICU Level of Service C		
Analysis Period (min) 15						
m Volume for 95th percentile queue is metered by upstream signal.						

Lanes, Volumes, Timings 5: NB Lindbergh & Olive

06/16/2023

Splits and Phases: 5: NB Lindbergh & Olive

← Ø2 (R) 107 s		↖ Ø4 23 s	
↙ Ø5 22 s	→ Ø6 (R) 85 s		

Lanes, Volumes, Timings
10: Lindbergh & Old Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	10	114	40	15	450	30	1418	23	5	1790	285
Future Volume (vph)	15	10	114	40	15	450	30	1418	23	5	1790	285
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	200		0	200		0	200		200	200		300
Storage Lanes	1		0	1		0	1		1	1		1
Taper Length (ft)	25			25			25			25		
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt		0.862			0.855				0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1606	0	1770	1593	0	1770	3539	1583	1770	3539	1583
Flt Permitted	0.109			0.605			0.950			0.950		
Satd. Flow (perm)	203	1606	0	1127	1593	0	1770	3539	1583	1770	3539	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		65			84				42			262
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		510			490			3486			497	
Travel Time (s)		11.6			11.1			79.2			11.3	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	11	124	43	16	489	33	1541	25	5	1946	310
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	135	0	43	505	0	33	1541	25	5	1946	310
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane		Yes										
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	60		60	60		60	60		60	60		60
Number of Detectors	1	2		1	2		1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100		20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0		0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Perm	NA		Perm	NA		Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6

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Lanes, Volumes, Timings

10: Lindbergh & Old Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	4	4		8	8		5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	10.0		10.0	10.0		8.0	20.0	20.0	8.0	20.0	20.0
Total Split (s)	42.0	42.0		42.0	42.0		8.0	80.0	80.0	8.0	80.0	80.0
Total Split (%)	32.3%	32.3%		32.3%	32.3%		6.2%	61.5%	61.5%	6.2%	61.5%	61.5%
Maximum Green (s)	38.0	38.0		38.0	38.0		4.0	76.0	76.0	4.0	76.0	76.0
Yellow Time (s)	3.5	3.5		3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5		0.5	0.5		0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0		4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag							Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?							Yes	Yes	Yes	Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Max	Max	None	Max	Max
Act Effct Green (s)	36.8	36.8		36.8	36.8		4.0	80.9	80.9	4.0	76.2	76.2
Actuated g/C Ratio	0.29	0.29		0.29	0.29		0.03	0.64	0.64	0.03	0.60	0.60
v/c Ratio	0.28	0.26		0.13	0.97		0.60	0.69	0.02	0.09	0.92	0.29
Control Delay	49.9	20.0		35.3	70.4		102.0	17.6	1.5	64.8	32.0	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.9	20.0		35.3	70.4		102.0	17.6	1.5	64.8	32.0	3.2
LOS	D	B		D	E		F	B	A	E	C	A
Approach Delay		23.1			67.6			19.1			28.2	
Approach LOS		C			E			B			C	
Queue Length 50th (ft)	10	44		27	363		28	398	0	4	759	17
Queue Length 95th (ft)	36	98		58	#593		#84	570	6	19	#930	57
Internal Link Dist (ft)		430			410			3406			417	
Turn Bay Length (ft)	200			200			200		200	200		300
Base Capacity (vph)	60	526		337	535		55	2248	1020	55	2117	1052
Starvation Cap Reductn	0	0		0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.26		0.13	0.94		0.60	0.69	0.02	0.09	0.92	0.29

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 127.3

Natural Cycle: 80

Control Type: Semi Act-Uncoord

Maximum v/c Ratio: 0.97

Intersection LOS: C

ICU Level of Service E

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

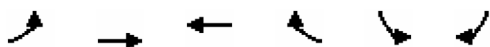
Queue shown is maximum after two cycles.

Splits and Phases: 10: Lindbergh & Old Olive

Upk and Auker: 10. Lindeberg & Old Olive		
		
8 s	80 s	42 s
		
8 s	80 s	42 s

Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023



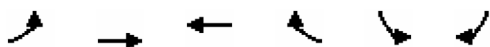
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	31	1547	1766	314	130	162
Future Volume (vph)	31	1547	1766	314	130	162
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	220			0	0	0
Storage Lanes	1			1	1	1
Taper Length (ft)	100				25	
Lane Util. Factor	1.00	0.95	0.95	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	3539	1583	1770	1583
Flt Permitted	0.076				0.950	
Satd. Flow (perm)	142	3539	3539	1583	1770	1583
Right Turn on Red				Yes		Yes
Satd. Flow (RTOR)				300		98
Link Speed (mph)		40	40		30	
Link Distance (ft)		928	392		695	
Travel Time (s)		15.8	6.7		15.8	
Peak Hour Factor	0.96	0.96	0.97	0.97	0.82	0.82
Adj. Flow (vph)	32	1611	1821	324	159	198
Shared Lane Traffic (%)						
Lane Group Flow (vph)	32	1611	1821	324	159	198
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Left	Left	Right	Left	Right
Median Width(ft)		16	16		12	
Link Offset(ft)		0	0		0	
Crosswalk Width(ft)		16	16		16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15			9	15	9
Number of Detectors	1	2	2	1	1	1
Detector Template	Left	Thru	Thru	Right	Left	Right
Leading Detector (ft)	20	100	100	20	20	20
Trailing Detector (ft)	0	0	0	0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	6	20	20	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)		94	94			
Detector 2 Size(ft)		6	6			
Detector 2 Type		Cl+Ex	Cl+Ex			
Detector 2 Channel						
Detector 2 Extend (s)		0.0	0.0			
Turn Type	D.P+P	NA	NA	Perm	Prot	Perm
Protected Phases	1	6	2		3	
Permitted Phases	2			2		3

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Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Detector Phase	1	6	2	2	3	3
Switch Phase						
Minimum Initial (s)	6.0	12.0	12.0	12.0	7.0	7.0
Minimum Split (s)	11.8	17.7	32.7	32.7	12.4	12.4
Total Split (s)	12.0	103.0	91.0	91.0	27.0	27.0
Total Split (%)	9.2%	79.2%	70.0%	70.0%	20.8%	20.8%
Maximum Green (s)	6.2	97.3	85.4	85.4	21.6	21.6
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.8	1.7	1.6	1.6	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.8	5.7	5.6	5.6	5.4	5.4
Lead/Lag	Lag		Lead	Lead		
Lead-Lag Optimize?	Yes		Yes	Yes		
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max	C-Max	C-Max	None	None
Walk Time (s)			7.0	7.0		
Flash Dont Walk (s)			20.0	20.0		
Pedestrian Calls (#/hr)			0	0		
Act Effct Green (s)	98.7	102.3	95.2	95.2	16.6	16.6
Actuated g/C Ratio	0.76	0.79	0.73	0.73	0.13	0.13
v/c Ratio	0.17	0.58	0.70	0.26	0.70	0.69
Control Delay	10.0	8.3	13.2	1.7	70.4	39.1
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0
Total Delay	10.0	8.7	13.2	1.7	70.4	39.1
LOS	A	A	B	A	E	D
Approach Delay		8.8	11.5		53.1	
Approach LOS		A	B		D	
Queue Length 50th (ft)	3	311	464	6	130	80
Queue Length 95th (ft)	m11	556	627	39	179	135
Internal Link Dist (ft)		848	312		615	
Turn Bay Length (ft)	220					
Base Capacity (vph)	185	2784	2590	1239	294	344
Starvation Cap Reductn	0	575	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.73	0.70	0.26	0.54	0.58

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 58 (45%), Referenced to phase 2:EBWB and 6:EBT, Start of 1st Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 14.0

Intersection LOS: B

Intersection Capacity Utilization 68.0%

ICU Level of Service C

Analysis Period (min) 15

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings
17: Olive & Old Olive St E

06/16/2023

Splits and Phases: 17: Olive & Old Olive St E

 Ø2 (R)	 Ø1	 Ø3
91 s	12 s	27 s
 Ø6 (R)		
103 s		

Lanes, Volumes, Timings
18: Pavillion & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	56	1255	125	319	1509	250	114	15	290	121	15	48
Future Volume (vph)	56	1255	125	319	1509	250	114	15	290	121	15	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	190		300	500		210	0		0	150		0
Storage Lanes	1		1	1		1	1		1	1		0
Taper Length (ft)	50			25			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850			0.850		0.885	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1863	1583	1770	1649	0
Flt Permitted	0.073			0.077			0.702			0.747		
Satd. Flow (perm)	136	3539	1583	143	3539	1583	1308	1863	1583	1391	1649	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			124			199			121		65	
Link Speed (mph)		40			40			30			25	
Link Distance (ft)		1052			783			400			526	
Travel Time (s)		17.9			13.3			9.1			14.3	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.92	0.92	0.92	0.74	0.74	0.74
Adj. Flow (vph)	60	1349	134	343	1623	269	124	16	315	164	20	65
Shared Lane Traffic (%)												
Lane Group Flow (vph)	60	1349	134	343	1623	269	124	16	315	164	85	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			16			20			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2	1	1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	Perm	D.P+P	NA	Perm	D.P+P	NA	pm+ov	D.P+P	NA	
Protected Phases	1	6		5	2		3	8	5	7	4	
Permitted Phases	2		6	6		2	4		8	8		

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Lanes, Volumes, Timings
18: Pavillion & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	5	7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	4.0	10.0	10.0	4.0	7.0	4.0	4.0	7.0	
Minimum Split (s)	12.8	15.5	15.5	8.0	15.6	15.6	8.0	13.0	8.0	8.0	13.0	
Total Split (s)	14.0	64.0	64.0	32.0	82.0	82.0	14.0	16.0	32.0	18.0	20.0	
Total Split (%)	10.8%	49.2%	49.2%	24.6%	63.1%	63.1%	10.8%	12.3%	24.6%	13.8%	15.4%	
Maximum Green (s)	8.2	58.5	58.5	28.0	76.4	76.4	10.0	10.0	28.0	14.0	14.0	
Yellow Time (s)	4.0	4.0	4.0	3.5	4.0	4.0	3.5	4.0	3.5	3.5	4.0	
All-Red Time (s)	1.8	1.5	1.5	0.5	1.6	1.6	0.5	2.0	0.5	0.5	2.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.8	5.5	5.5	4.0	5.6	5.6	4.0	6.0	4.0	4.0	6.0	
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lead	Lag	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	C-Max	C-Max	None	C-Max	C-Max	None	Max	None	None	Max	
Act Effct Green (s)	85.9	62.3	62.3	88.3	79.5	79.5	25.7	10.0	36.5	25.7	14.0	
Actuated g/C Ratio	0.66	0.48	0.48	0.68	0.61	0.61	0.20	0.08	0.28	0.20	0.11	
v/c Ratio	0.32	0.80	0.16	0.85	0.75	0.26	0.42	0.11	0.59	0.52	0.36	
Control Delay	14.5	20.9	2.1	50.9	11.2	0.8	46.8	57.9	21.2	51.4	22.9	
Queue Delay	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	14.5	20.9	2.1	50.9	11.6	0.8	46.8	57.9	21.2	51.4	22.9	
LOS	B	C	A	D	B	A	D	E	C	D	C	
Approach Delay		19.0			16.3			29.5			41.6	
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	11	307	0	180	380	2	87	13	101	118	15	
Queue Length 95th (ft)	m20	524	m13	#321	311	m0	146	37	170	151	45	
Internal Link Dist (ft)		972			703			320			446	
Turn Bay Length (ft)	190		300	500		210				150		
Base Capacity (vph)	193	1696	823	449	2165	1045	297	143	570	319	235	
Starvation Cap Reductn	0	0	0	0	135	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.31	0.80	0.16	0.76	0.80	0.26	0.42	0.11	0.55	0.51	0.36	

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 11 (8%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green

Natural Cycle: 80

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 20.0

Intersection LOS: B

Intersection Capacity Utilization 78.7%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Lanes, Volumes, Timings

18: Pavillion & Olive

06/16/2023

Splits and Phases: 18: Pavillion & Olive

 Ø2 (R) 82 s		 Ø1 14 s	 Ø3 14 s	 Ø4 20 s
 Ø5 32 s	 Ø6 (R) 64 s	 Ø8 16 s		 Ø7 18 s

Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	1277	73	54	1499	119	69	56	60	98	46	424
Future Volume (vph)	322	1277	73	54	1499	119	69	56	60	98	46	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		0
Storage Lanes	0		1	1		1	1		0	1		0
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.923			0.865	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1719	0	1770	1611	0
Flt Permitted	0.067			0.124			0.175			0.617		
Satd. Flow (perm)	125	3539	1583	231	3539	1583	326	1719	0	1149	1611	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			85		35			293	
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			211			409	
Travel Time (s)		8.9			17.9			4.8			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.87	0.87	0.87	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	339	1344	77	62	1723	137	73	59	63	107	50	461
Shared Lane Traffic (%)												
Lane Group Flow (vph)	339	1344	77	62	1723	137	73	122	0	107	511	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	
Protected Phases	1	6	3	5	2	7	3	8		7	4	
Permitted Phases	2		6	6		2	4			8		

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	3	5	2	7	3	8		7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	4.0	7.0	10.0	4.0	4.0	7.0		4.0	7.0	
Minimum Split (s)	13.1	16.2	8.0	13.1	30.3	8.0	8.0	13.2		8.0	13.1	
Total Split (s)	26.0	79.9	8.0	13.1	67.0	11.0	8.0	26.0		11.0	29.0	
Total Split (%)	20.0%	61.5%	6.2%	10.1%	51.5%	8.5%	6.2%	20.0%		8.5%	22.3%	
Maximum Green (s)	19.9	73.7	4.0	7.0	60.7	7.0	4.0	19.8		7.0	22.9	
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	3.5	3.5	4.0		3.5	4.0	
All-Red Time (s)	2.1	2.2	0.5	2.1	2.3	0.5	0.5	2.2		0.5	2.1	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Total Lost Time (s)	6.1	6.2	4.0	6.1	6.3	4.0	4.0	6.2		4.0	6.1	
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	
Vehicle Extension (s)	2.5	4.5	3.0	2.5	4.5	3.0	3.0	2.5		3.0	2.5	
Recall Mode	Max	C-Max	None	None	C-Max	None	None	Max		None	Max	
Walk Time (s)					7.0							
Flash Dont Walk (s)					17.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	80.8	76.3	86.5	82.0	60.7	70.0	29.0	19.8		29.0	22.9	
Actuated g/C Ratio	0.62	0.59	0.67	0.63	0.47	0.54	0.22	0.15		0.22	0.18	
v/c Ratio	1.03	0.65	0.07	0.27	1.04	0.15	0.62	0.42		0.37	0.97	
Control Delay	72.5	5.5	0.1	5.0	53.8	2.8	63.8	40.2		43.4	56.1	
Queue Delay	0.0	0.7	0.0	0.0	5.4	0.0	0.0	0.0		0.0	0.3	
Total Delay	72.5	6.2	0.1	5.0	59.2	2.8	63.8	40.2		43.4	56.4	
LOS	E	A	A	A	E	A	E	D		D	E	
Approach Delay		18.7			53.5			49.0			54.2	
Approach LOS		B			D			D			D	
Queue Length 50th (ft)	~254	70	1	6	~806	7	48	66		72	206	
Queue Length 95th (ft)	m#320	m98	m0	m10	#893	m29	#104	130		124	#439	
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						
Base Capacity (vph)	329	2077	1079	228	1652	891	117	291		289	525	
Starvation Cap Reductn	0	375	0	0	0	0	0	0		0	0	
Spillback Cap Reductn	0	0	0	0	22	0	0	0		0	1	
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	
Reduced v/c Ratio	1.03	0.79	0.07	0.27	1.06	0.15	0.62	0.42		0.37	0.98	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 12 (9%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 140												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 1.04												
Intersection Signal Delay: 39.8						Intersection LOS: D						
Intersection Capacity Utilization 110.5%						ICU Level of Service H						
Analysis Period (min) 15												
~ Volume exceeds capacity, queue is theoretically infinite.												

Lanes, Volumes, Timings

19: Olive & Old Olive St W

06/16/2023

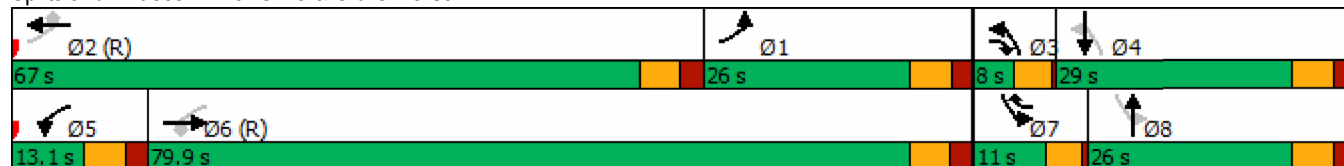
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings
20: Spodee & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1516	122	117	1852	22	107	8	137	19	7	2
Future Volume (vph)	6	1516	122	117	1852	22	107	8	137	19	7	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	70		0	150		0	0		70	0		0
Storage Lanes	1		0	0		1	0		1	1		0
Taper Length (ft)	230			25			25			25		
Lane Util. Factor	1.00	0.95	0.95	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.989				0.850			0.850		0.965	
Flt Protected	0.950			0.950				0.956		0.950		
Satd. Flow (prot)	1770	3500	0	1770	3539	1583	0	1763	1568	1770	1798	0
Flt Permitted	0.052			0.055				0.732		0.625		
Satd. Flow (perm)	97	3500	0	102	3539	1583	0	1350	1568	1164	1798	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		10				81			81		3	
Link Speed (mph)		35			35			30			30	
Link Distance (ft)		581			455			494			341	
Travel Time (s)		11.3			8.9			11.2			7.8	
Peak Hour Factor	0.92	0.92	0.92	0.98	0.98	0.98	0.81	0.81	0.81	0.72	0.72	0.72
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	3%	3%	3%	2%	2%	2%
Adj. Flow (vph)	7	1648	133	119	1890	22	132	10	169	26	10	3
Shared Lane Traffic (%)												
Lane Group Flow (vph)	7	1781	0	119	1890	22	0	142	169	26	13	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24			16			0			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	
Detector 1 Type	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA		D.P+P	NA	Perm	Perm	NA	pm+ov	Perm	NA	
Protected Phases	1	6		5	2			8	5		4	

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Lanes, Volumes, Timings

20: Spoeede & Olive

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2			6		2	8		8	4		
Detector Phase	1	6		5	2	2	8	8	5	4	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0		7.0	10.0	10.0	7.0	7.0	7.0	7.0	7.0	
Minimum Split (s)	13.3	36.2		13.0	30.3	30.3	38.3	38.3	13.0	13.3	13.3	
Total Split (s)	13.0	79.0		12.0	78.0	78.0	39.0	39.0	12.0	39.0	39.0	
Total Split (%)	10.0%	60.8%		9.2%	60.0%	60.0%	30.0%	30.0%	9.2%	30.0%	30.0%	
Maximum Green (s)	6.7	72.8		6.0	71.7	71.7	32.7	32.7	6.0	32.7	32.7	
Yellow Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	2.3	2.2		2.0	2.3	2.3	2.3	2.3	2.0	2.3	2.3	
Lost Time Adjust (s)	0.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.3	6.2		6.0	6.3	6.3		6.3	6.0	6.3	6.3	
Lead/Lag	Lag	Lag		Lead	Lead	Lead			Lead			
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes			Yes			
Vehicle Extension (s)	2.5	4.5		2.5	4.5	4.5	2.5	2.5	2.5	2.5	2.5	
Recall Mode	None	C-Max		None	C-Max	C-Max	Max	Max	None	Max	Max	
Walk Time (s)		7.0			7.0	7.0	7.0	7.0				
Flash Dont Walk (s)		23.0			17.0	17.0	25.0	25.0				
Pedestrian Calls (#/hr)		0			0	0	0	0				
Act Effct Green (s)	83.4	72.8		79.0	82.1	82.1		32.7	45.0	32.7	32.7	
Actuated g/C Ratio	0.64	0.56		0.61	0.63	0.63		0.25	0.35	0.25	0.25	
v/c Ratio	0.05	0.91		0.86	0.85	0.02		0.42	0.28	0.09	0.03	
Control Delay	10.5	33.5		44.6	5.4	0.0		45.2	17.1	38.4	31.2	
Queue Delay	0.0	0.0		0.0	7.8	0.0		0.0	0.0	0.0	0.0	
Total Delay	10.5	33.5		44.6	13.2	0.0		45.2	17.1	38.4	31.2	
LOS	B	C		D	B	A		D	B	D	C	
Approach Delay		33.4			14.9			29.9			36.0	
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	2	674		52	148	0		101	51	17	6	
Queue Length 95th (ft)	8	802		m50	m167	m0		147	91	33	19	
Internal Link Dist (ft)		501			375			414			261	
Turn Bay Length (ft)	70			150					70			
Base Capacity (vph)	148	1964		138	2234	1029		339	595	292	454	
Starvation Cap Reductn	0	0		0	324	0		0	0	0	0	
Spillback Cap Reductn	0	0		0	0	0		0	0	0	0	
Storage Cap Reductn	0	0		0	0	0		0	0	0	0	
Reduced v/c Ratio	0.05	0.91		0.86	0.99	0.02		0.42	0.28	0.09	0.03	
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 9 (7%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 120												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.91												
Intersection Signal Delay: 24.2				Intersection LOS: C								
Intersection Capacity Utilization 85.8%				ICU Level of Service E								
Analysis Period (min) 15												

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 20: Spoede & Olive



Intersection

Intersection Delay, s/veh 9.9

Intersection LOS A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	31	159	0	26	161	0
Future Vol, veh/h	31	159	0	26	161	0
Peak Hour Factor	0.58	0.92	0.92	0.92	0.53	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	53	173	0	28	304	0
Number of Lanes	1	0	0	1	1	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.8	8.2	10.8
HCM LOS	A	A	B

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	100%	0%	0%
Vol Thru, %	0%	16%	100%
Vol Right, %	0%	84%	0%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	161	190	26
LT Vol	161	0	0
Through Vol	0	31	26
RT Vol	0	159	0
Lane Flow Rate	304	226	28
Geometry Grp	1	1	1
Degree of Util (X)	0.396	0.266	0.039
Departure Headway (Hd)	4.691	4.226	4.946
Convergence, Y/N	Yes	Yes	Yes
Cap	766	851	723
Service Time	2.724	2.248	2.982
HCM Lane V/C Ratio	0.397	0.266	0.039
HCM Control Delay	10.8	8.8	8.2
HCM Lane LOS	B	A	A
HCM 95th-tile Q	1.9	1.1	0.1

Intersection

Intersection Delay, s/veh 9.2

Intersection LOS A

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	16	171	153	49	140	0
Future Vol, veh/h	16	171	153	49	140	0
Peak Hour Factor	0.92	0.78	0.92	0.58	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	219	166	84	152	0
Number of Lanes	1	0	1	1	0	1

Approach	WB	NB	SB
Opposing Approach		SB	NB
Opposing Lanes	0	1	2
Conflicting Approach Left NB			WB
Conflicting Lanes Left	2	0	1
Conflicting Approach Right SB		WB	
Conflicting Lanes Right	1	1	0
HCM Control Delay	9.1	9	9.5
HCM LOS	A	A	A

Lane	NBLn1	NBLn2	WBLn1	SBLn1
Vol Left, %	0%	0%	9%	100%
Vol Thru, %	100%	0%	0%	0%
Vol Right, %	0%	100%	91%	0%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	153	49	187	140
LT Vol	0	0	16	140
Through Vol	153	0	0	0
RT Vol	0	49	171	0
Lane Flow Rate	166	84	237	152
Geometry Grp	7	7	2	5
Degree of Util (X)	0.241	0.106	0.286	0.214
Departure Headway (Hd)	5.212	4.507	4.354	5.057
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	687	792	823	708
Service Time	2.961	2.256	2.388	3.109
HCM Lane V/C Ratio	0.242	0.106	0.288	0.215
HCM Control Delay	9.6	7.8	9.1	9.5
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.9	0.4	1.2	0.8

Intersection						
Int Delay, s/veh	3.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	35	156	46	0	0	16
Future Vol, veh/h	35	156	46	0	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	Free	-	None	-	None
Storage Length	0	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	58	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	269	50	0	0	17
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	67	-	0	-	-	-
Stage 1	50	-	-	-	-	-
Stage 2	17	-	-	-	-	-
Critical Hdwy	6.42	-	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	-	-	-	-	-
Pot Cap-1 Maneuver	938	0	-	0	0	-
Stage 1	972	0	-	0	0	-
Stage 2	1006	0	-	0	0	-
Platoon blocked, %		-				-
Mov Cap-1 Maneuver	938	-	-	-	-	-
Mov Cap-2 Maneuver	938	-	-	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	1006	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	9	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBTWBLn1WBLn2		SBT			
Capacity (veh/h)	- 938		-			
HCM Lane V/C Ratio	- 0.041		-			
HCM Control Delay (s)	- 9		0			
HCM Lane LOS	- A		A			
HCM 95th %tile Q(veh)	- 0.1		-			

Intersection	
Intersection Delay, s/veh	11
Intersection LOS	B

Movement	NBL	NBR	SEL	SER	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	283	42	118	140	0	0
Future Vol, veh/h	283	42	118	140	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	308	46	128	152	0	0
Number of Lanes	0	1	1	0	0	0

Approach	NB	SE
Opposing Approach		
Opposing Lanes	0	0
Conflicting Approach Left	SE	
Conflicting Lanes Left	1	0
Conflicting Approach Right		NB
Conflicting Lanes Right	0	1
HCM Control Delay	11.7	10.1
HCM LOS	B	B

Lane	NBLn1	SELn1
Vol Left, %	87%	46%
Vol Thru, %	0%	0%
Vol Right, %	13%	54%
Sign Control	Stop	Stop
Traffic Vol by Lane	325	258
LT Vol	283	118
Through Vol	0	0
RT Vol	42	140
Lane Flow Rate	353	280
Geometry Grp	1	1
Degree of Util (X)	0.46	0.356
Departure Headway (Hd)	4.692	4.571
Convergence, Y/N	Yes	Yes
Cap	767	785
Service Time	2.731	2.602
HCM Lane V/C Ratio	0.46	0.357
HCM Control Delay	11.7	10.1
HCM Lane LOS	B	B
HCM 95th-tile Q	2.4	1.6

MOVEMENT SUMMARY

 **Site: 101 [2048 PM Build (Site Folder: Eastmost Monsanto Intersection)]**

New Site

Site Category: (None)

Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %	v/c	sec		[Veh. veh	Dist] ft				mph
East: Monsanto														
1a	L1	20	3.0	22	3.0	0.028	3.5	LOS A	0.0	0.0	0.00	0.21	0.00	26.4
6	T1	26	3.0	28	3.0	0.028	0.0	LOS A	0.0	0.0	0.00	0.21	0.00	27.6
Approach		46	3.0	50	3.0	0.028	1.5	NA	0.0	0.0	0.00	0.21	0.00	27.1
West: Monsanto														
2	T1	31	3.0	34	3.0	0.037	7.4	LOS A	0.1	3.2	0.12	1.02	0.12	20.7
Approach		31	3.0	34	3.0	0.037	7.4	LOS A	0.1	3.2	0.12	1.02	0.12	20.7
SouthWest: NB Ramp														
12ax	R1	10	3.0	11	3.0	0.011	7.1	LOS A	0.0	1.1	0.13	0.91	0.13	20.6
Approach		10	3.0	11	3.0	0.011	7.1	LOS A	0.0	1.1	0.13	0.91	0.13	20.6
All Vehicles		87	3.0	95	3.0	0.037	4.3	NA	0.1	3.2	0.06	0.58	0.06	23.6

Site Level of Service (LOS) Method: Delay & Degree of Saturation (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

Minor Road Approach LOS values are based on average delay for all movements (v/c not used).

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: HCM Queue Formula.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Project: M:\JackMatthewsDev\22005028-00_CreveCoeurTIS\Eng_Study\Comps\Synchro\06-2023 Updated Models - v5 Trip Gen\Monsanto Interchange.sip9

Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	158	1318	78	20	1059	51	62	27	22	106	35	311
Future Volume (vph)	158	1318	78	20	1059	51	62	27	22	106	35	311
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		200
Storage Lanes	0		1	1		1	1		0	1		1
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.933				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1480	1453	0	1770	1863	1583
Flt Permitted	0.181			0.110			0.734			0.719		
Satd. Flow (perm)	337	3539	1583	205	3539	1583	1143	1453	0	1339	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			79			60			25			317
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			211			409	
Travel Time (s)		8.9			17.9			4.8			9.3	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.84	0.84	0.84	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	22%	22%	22%	2%	2%	2%
Adj. Flow (vph)	174	1448	86	21	1103	53	74	32	26	108	36	317
Shared Lane Traffic (%)												
Lane Group Flow (vph)	174	1448	86	21	1103	53	74	58	0	108	36	317
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	1	6	3	5	2	7	3	8		7	4	

AM 2028 Creve Coeur Build AM 2028 2:32 pm 06/08/2023

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6	6		2	4			8		4
Detector Phase	1	6	3	5	2	7	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	4.0	7.0	10.0	4.0	4.0	7.0		4.0	7.0	7.0
Minimum Split (s)	13.1	16.2	8.0	13.1	30.3	8.0	8.0	13.2		8.0	13.1	13.1
Total Split (s)	24.0	81.0	16.0	11.0	68.0	18.0	16.0	20.0		18.0	22.0	22.0
Total Split (%)	18.5%	62.3%	12.3%	8.5%	52.3%	13.8%	12.3%	15.4%		13.8%	16.9%	16.9%
Maximum Green (s)	17.9	74.8	12.0	4.9	61.7	14.0	12.0	13.8		14.0	15.9	15.9
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	3.5	3.5	4.0		3.5	4.0	4.0
All-Red Time (s)	2.1	2.2	0.5	2.1	2.3	0.5	0.5	2.2		0.5	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.2	4.0	6.1	6.3	4.0	4.0	6.2		4.0	6.1	6.1
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	4.5	3.0	2.5	4.5	3.0	3.0	2.5		3.0	2.5	2.5
Recall Mode	None	C-Max	None	None	C-Max	None	None	Max		None	Max	Max
Walk Time (s)					7.0							
Flash Dont Walk (s)					17.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	81.8	81.2	95.0	84.2	71.5	85.9	28.0	13.8		28.0	15.9	15.9
Actuated g/C Ratio	0.63	0.62	0.73	0.65	0.55	0.66	0.22	0.11		0.22	0.12	0.12
v/c Ratio	0.54	0.66	0.07	0.11	0.57	0.05	0.27	0.33		0.33	0.16	0.67
Control Delay	17.1	11.0	0.3	4.7	16.2	3.1	41.2	39.2		42.9	53.1	13.3
Queue Delay	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	17.1	11.3	0.3	4.7	16.2	3.1	41.2	39.2		42.9	53.1	13.3
LOS	B	B	A	A	B	A	D	D		D	D	B
Approach Delay		11.3			15.4			40.3			23.3	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	24	227	0	2	245	4	49	26		73	28	0
Queue Length 95th (ft)	66	183	m3	m5	377	m25	85	64		124	62	92
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						200
Base Capacity (vph)	423	2210	1200	191	1947	1088	292	176		355	227	471
Starvation Cap Reductn	0	225	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.41	0.73	0.07	0.11	0.57	0.05	0.25	0.33		0.30	0.16	0.67
Intersection Summary												
Area Type:	Other											
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 118 (91%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.67												
Intersection Signal Delay: 15.4						Intersection LOS: B						
Intersection Capacity Utilization 70.1%						ICU Level of Service C						
Analysis Period (min) 15												

Lanes, Volumes, Timings 19: Olive & Old Olive St W

06/16/2023

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W

 Ø1 24 s	 Ø2 (R) 68 s	 Ø3 16 s	 Ø4 22 s
 Ø6 (R) 81 s	 Ø5 11 s	 Ø8 20 s	 Ø7 18 s

Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	292	1158	72	48	1357	108	67	52	55	89	43	383
Future Volume (vph)	292	1158	72	48	1357	108	67	52	55	89	43	383
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		200
Storage Lanes	0		1	1		1	1		0	1		1
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.923				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1719	0	1770	1863	1583
Flt Permitted	0.067			0.156			0.726			0.643		
Satd. Flow (perm)	125	3539	1583	291	3539	1583	1352	1719	0	1198	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			85		34				317
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			211			409	
Travel Time (s)		8.9			17.9			4.8			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.87	0.87	0.87	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	307	1219	76	55	1560	124	71	55	58	97	47	416
Shared Lane Traffic (%)												
Lane Group Flow (vph)	307	1219	76	55	1560	124	71	113	0	97	47	416
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	1	6	3	5	2	7	3	8		7	4	
Permitted Phases	2		6	6		2	4			8		4

PM 2028 Creve Coeur Build PM 2028 2:24 pm 06/08/2023

Synchro 11 Report
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Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	3	5	2	7	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	4.0	7.0	10.0	4.0	4.0	7.0		4.0	7.0	7.0
Minimum Split (s)	13.1	16.2	8.0	13.1	30.3	8.0	8.0	13.2		8.0	13.1	13.1
Total Split (s)	26.0	79.9	8.0	13.1	67.0	11.0	8.0	26.0		11.0	29.0	29.0
Total Split (%)	20.0%	61.5%	6.2%	10.1%	51.5%	8.5%	6.2%	20.0%		8.5%	22.3%	22.3%
Maximum Green (s)	19.9	73.7	4.0	7.0	60.7	7.0	4.0	19.8		7.0	22.9	22.9
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	3.5	3.5	4.0		3.5	4.0	4.0
All-Red Time (s)	2.1	2.2	0.5	2.1	2.3	0.5	0.5	2.2		0.5	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.2	4.0	6.1	6.3	4.0	4.0	6.2		4.0	6.1	6.1
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	4.5	3.0	2.5	4.5	3.0	3.0	2.5		3.0	2.5	2.5
Recall Mode	Max	C-Max	None	None	C-Max	None	None	Max		None	Max	Max
Walk Time (s)					7.0							
Flash Dont Walk (s)					17.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	80.8	76.3	86.5	82.0	60.7	70.0	29.0	19.8		29.0	22.9	22.9
Actuated g/C Ratio	0.62	0.59	0.67	0.63	0.47	0.54	0.22	0.15		0.22	0.18	0.18
v/c Ratio	0.93	0.59	0.07	0.21	0.94	0.14	0.23	0.39		0.33	0.14	0.77
Control Delay	54.3	5.0	0.2	3.8	29.3	2.2	40.8	38.8		42.2	46.7	23.3
Queue Delay	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	54.3	5.5	0.2	3.8	29.6	2.2	40.8	38.8		42.2	46.7	23.3
LOS	D	A	A	A	C	A	D	D		D	D	C
Approach Delay		14.6			26.9			39.6			28.5	
Approach LOS		B			C			D			C	
Queue Length 50th (ft)	207	62	1	5	208	1	47	60		65	34	76
Queue Length 95th (ft)	m#318	75	m0	m8	#551	m29	89	121		114	70	210
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						200
Base Capacity (vph)	329	2077	1079	263	1652	891	314	290		298	328	540
Starvation Cap Reductn	0	379	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	9	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.93	0.72	0.07	0.21	0.95	0.14	0.23	0.39		0.33	0.14	0.77

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 12 (9%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green

Natural Cycle: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.94

Intersection Signal Delay: 22.8

Intersection LOS: C

Intersection Capacity Utilization 80.7%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

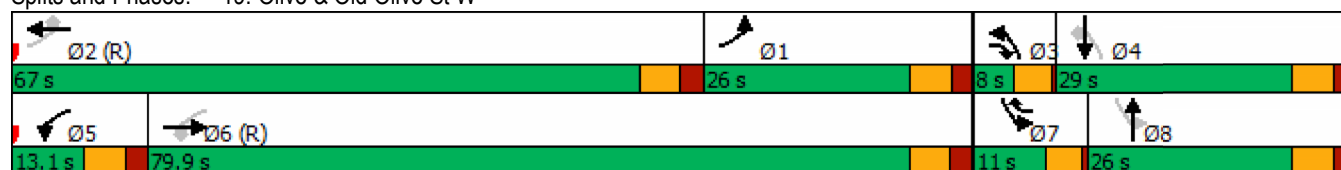
Lanes, Volumes, Timings 19: Olive & Old Olive St W

06/16/2023

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	174	1447	78	22	1163	56	62	27	24	117	36	344
Future Volume (vph)	174	1447	78	22	1163	56	62	27	24	117	36	344
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		200
Storage Lanes	0		1	1		1	1		0	1		1
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.929				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1480	1447	0	1770	1863	1583
Flt Permitted	0.143			0.081			0.733			0.717		
Satd. Flow (perm)	266	3539	1583	151	3539	1583	1142	1447	0	1336	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			79			60		28				346
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			211			409	
Travel Time (s)		8.9			17.9			4.8			9.3	
Peak Hour Factor	0.91	0.91	0.91	0.96	0.96	0.96	0.84	0.84	0.84	0.98	0.98	0.98
Heavy Vehicles (%)	2%	2%	2%	2%	2%	2%	22%	22%	22%	2%	2%	2%
Adj. Flow (vph)	191	1590	86	23	1211	58	74	32	29	119	37	351
Shared Lane Traffic (%)												
Lane Group Flow (vph)	191	1590	86	23	1211	58	74	61	0	119	37	351
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	1	6	3	5	2	7	3	8		7	4	

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Synchro 11 Report
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Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Permitted Phases	2		6	6		2	4			8		4
Detector Phase	1	6	3	5	2	7	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	4.0	7.0	10.0	4.0	4.0	7.0		4.0	7.0	7.0
Minimum Split (s)	13.1	16.2	8.0	13.1	30.3	8.0	8.0	13.2		8.0	13.1	13.1
Total Split (s)	24.0	81.0	16.0	11.0	68.0	18.0	16.0	20.0		18.0	22.0	22.0
Total Split (%)	18.5%	62.3%	12.3%	8.5%	52.3%	13.8%	12.3%	15.4%		13.8%	16.9%	16.9%
Maximum Green (s)	17.9	74.8	12.0	4.9	61.7	14.0	12.0	13.8		14.0	15.9	15.9
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	3.5	3.5	4.0		3.5	4.0	4.0
All-Red Time (s)	2.1	2.2	0.5	2.1	2.3	0.5	0.5	2.2		0.5	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.2	4.0	6.1	6.3	4.0	4.0	6.2		4.0	6.1	6.1
Lead/Lag	Lead	Lead	Lead	Lag	Lag	Lag	Lead	Lead		Lag	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	4.5	3.0	2.5	4.5	3.0	3.0	2.5		3.0	2.5	2.5
Recall Mode	None	C-Max	None	None	C-Max	None	None	Max		None	Max	Max
Walk Time (s)					7.0							
Flash Dont Walk (s)					17.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	81.8	81.2	95.0	84.2	69.7	84.0	28.0	13.8		28.0	15.9	15.9
Actuated g/C Ratio	0.63	0.62	0.73	0.65	0.54	0.65	0.22	0.11		0.22	0.12	0.12
v/c Ratio	0.63	0.72	0.07	0.15	0.64	0.06	0.27	0.34		0.36	0.16	0.71
Control Delay	27.6	10.9	0.3	5.9	18.6	3.6	41.2	38.1		43.8	53.2	14.2
Queue Delay	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	27.6	11.3	0.3	5.9	18.6	3.6	41.2	38.1		43.8	53.2	14.2
LOS	C	B	A	A	B	A	D	D		D	D	B
Approach Delay		12.5			17.7			39.8			24.0	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	31	280	0	2	272	5	49	26		81	28	4
Queue Length 95th (ft)	m110	200	m2	m4	548	m30	85	65		135	64	103
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						200
Base Capacity (vph)	383	2210	1200	158	1897	1067	292	178		355	227	497
Starvation Cap Reductn	0	220	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	0.50	0.80	0.07	0.15	0.64	0.05	0.25	0.34		0.34	0.16	0.71
Intersection Summary												
Area Type: Other												
Cycle Length: 130												
Actuated Cycle Length: 130												
Offset: 118 (91%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green												
Natural Cycle: 90												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.72												
Intersection Signal Delay: 16.7												
Intersection LOS: B												
Intersection Capacity Utilization 74.3%												
ICU Level of Service D												
Analysis Period (min) 15												

Lanes, Volumes, Timings

19: Olive & Old Olive St W

06/16/2023

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W

 Ø1	 Ø2 (R)	 Ø3	 Ø4
24 s	68 s	16 s	22 s
 Ø6 (R)	 Ø5	 Ø8	 Ø7
81 s	11 s	20 s	18 s

Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	322	1277	73	54	1499	119	69	56	60	98	46	424
Future Volume (vph)	322	1277	73	54	1499	119	69	56	60	98	46	424
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Storage Length (ft)	75		130	150		210	0		0	0		200
Storage Lanes	0		1	1		1	1		0	1		1
Taper Length (ft)	25			100			25			25		
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt			0.850			0.850		0.923				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	3539	1583	1770	3539	1583	1770	1719	0	1770	1863	1583
Flt Permitted	0.067			0.124			0.724			0.617		
Satd. Flow (perm)	125	3539	1583	231	3539	1583	1349	1719	0	1149	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			78			85			35			313
Link Speed (mph)		35			40			30			30	
Link Distance (ft)		455			1052			211			409	
Travel Time (s)		8.9			17.9			4.8			9.3	
Peak Hour Factor	0.95	0.95	0.95	0.87	0.87	0.87	0.95	0.95	0.95	0.92	0.92	0.92
Adj. Flow (vph)	339	1344	77	62	1723	137	73	59	63	107	50	461
Shared Lane Traffic (%)												
Lane Group Flow (vph)	339	1344	77	62	1723	137	73	122	0	107	50	461
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		16			24			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2	1	1	2	1	1	2		1	2	1
Detector Template	Left	Thru	Right	Left	Thru	Right	Left	Thru		Left	Thru	Right
Leading Detector (ft)	20	100	20	20	100	20	20	100		20	100	20
Trailing Detector (ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Position(ft)	0	0	0	0	0	0	0	0		0	0	0
Detector 1 Size(ft)	20	6	20	20	6	20	20	6		20	6	20
Detector 1 Type	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex	Cl+Ex		Cl+Ex	Cl+Ex	Cl+Ex
Detector 1 Channel												
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)		6			6			6			6	
Detector 2 Type		Cl+Ex			Cl+Ex			Cl+Ex			Cl+Ex	
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	D.P+P	NA	pm+ov	D.P+P	NA	pm+ov	D.P+P	NA		D.P+P	NA	Perm
Protected Phases	1	6	3	5	2	7	3	8		7	4	
Permitted Phases	2		6	6		2	4			8		4

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Lanes, Volumes, Timings
19: Olive & Old Olive St W

06/16/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	3	5	2	7	3	8		7	4	4
Switch Phase												
Minimum Initial (s)	7.0	10.0	4.0	7.0	10.0	4.0	4.0	7.0		4.0	7.0	7.0
Minimum Split (s)	13.1	16.2	8.0	13.1	30.3	8.0	8.0	13.2		8.0	13.1	13.1
Total Split (s)	26.0	79.9	8.0	13.1	67.0	11.0	8.0	26.0		11.0	29.0	29.0
Total Split (%)	20.0%	61.5%	6.2%	10.1%	51.5%	8.5%	6.2%	20.0%		8.5%	22.3%	22.3%
Maximum Green (s)	19.9	73.7	4.0	7.0	60.7	7.0	4.0	19.8		7.0	22.9	22.9
Yellow Time (s)	4.0	4.0	3.5	4.0	4.0	3.5	3.5	4.0		3.5	4.0	4.0
All-Red Time (s)	2.1	2.2	0.5	2.1	2.3	0.5	0.5	2.2		0.5	2.1	2.1
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Lost Time (s)	6.1	6.2	4.0	6.1	6.3	4.0	4.0	6.2		4.0	6.1	6.1
Lead/Lag	Lag	Lag	Lead	Lead	Lead	Lead	Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	2.5	4.5	3.0	2.5	4.5	3.0	3.0	2.5		3.0	2.5	2.5
Recall Mode	Max	C-Max	None	None	C-Max	None	None	Max		None	Max	Max
Walk Time (s)					7.0							
Flash Dont Walk (s)					17.0							
Pedestrian Calls (#/hr)					0							
Act Effct Green (s)	80.8	76.3	86.5	82.0	60.7	70.0	29.0	19.8		29.0	22.9	22.9
Actuated g/C Ratio	0.62	0.59	0.67	0.63	0.47	0.54	0.22	0.15		0.22	0.18	0.18
v/c Ratio	1.03	0.65	0.07	0.27	1.04	0.15	0.23	0.42		0.37	0.15	0.86
Control Delay	72.5	5.5	0.1	5.0	53.8	2.8	41.0	40.2		43.4	46.8	33.2
Queue Delay	0.0	0.7	0.0	0.0	5.2	0.0	0.0	0.0		0.0	0.0	0.1
Total Delay	72.5	6.2	0.1	5.0	59.0	2.8	41.0	40.2		43.4	46.8	33.3
LOS	E	A	A	A	E	A	D	D		D	D	C
Approach Delay		18.7			53.2			40.5			36.1	
Approach LOS		B			D			D			D	
Queue Length 50th (ft)	~254	70	1	6	~806	7	48	66		72	36	129
Queue Length 95th (ft)	m#320	m98	m0	m10	#893	m29	90	130		124	74	#318
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						200
Base Capacity (vph)	329	2077	1079	228	1652	891	313	291		289	328	536
Starvation Cap Reductn	0	375	0	0	0	0	0	0		0	0	0
Spillback Cap Reductn	0	0	0	0	21	0	0	0		0	0	1
Storage Cap Reductn	0	0	0	0	0	0	0	0		0	0	0
Reduced v/c Ratio	1.03	0.79	0.07	0.27	1.06	0.15	0.23	0.42		0.37	0.15	0.86

Intersection Summary

Area Type: Other

Cycle Length: 130

Actuated Cycle Length: 130

Offset: 12 (9%), Referenced to phase 2:EBWB and 6:EBWB, Start of 1st Green

Natural Cycle: 140

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 1.04

Intersection Signal Delay: 36.8

Intersection LOS: D

Intersection Capacity Utilization 86.8%

ICU Level of Service E

Analysis Period (min) 15

~ Volume exceeds capacity, queue is theoretically infinite.

Lanes, Volumes, Timings

19: Olive & Old Olive St W

06/16/2023

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Appendix D

HCS Freeways Analysis Results

2022 AM Existing.....	D-1
2022 PM Existing	D-11
2028 AM No-Build	D-21
2028 PM No-Build.....	D-31
2048 AM No-Build	D-41
2048 PM No-Build.....	D-51
2028 AM Build	D-61
2028 PM Build.....	D-71
2048 AM Build	D-81
2048 PM Build.....	D-91

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1609	79
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1801	88
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.47	0.05

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.5
Flow in Lanes 1 and 2 (v12), pc/h	1801	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Ramp Junction Speed (S), mi/h	43.5
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	20.7
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	17.6

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1197	8	0	333
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1340	9	0	373
Weaving Flow Rate (vw), pc/h	382	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1340	Density-Based Capacity (ciWL × N × fHV), veh/h		5546
Total Flow Rate (v), pc/h	1722	Demand Flow-Based Capacity (ciW × fHV), veh/h		10497
Volume Ratio (VR)	0.222	Weaving Area Capacity (cw), veh/h		5546
Minimum Lane Change Rate (LCMIN), lc/h	382	Adjusted Weaving Area Capacity (cWA), veh/h		5546
Maximum Weaving Length (LMAX), ft	4762	Demand-to-Capacity Ratio (v/c)		0.30

Speed and Density

Non-Weaving Vehicle Index (INW)	120	Average Weaving Speed (SW), mi/h	40.2
Non-Weaving Lane Change Rate (LCNW), lc/h	183	Average Non-Weaving Speed (SNW), mi/h	39.5
Weaving Lane Change Rate (LCW), lc/h	531	Average Speed (S), mi/h	39.7
Weaving Lane Change Rate (LCAII), lc/h	714	Density (D), pc/mi/ln	14.5

Weaving Intensity Factor (W)	0.189	Level of Service (LOS)	B
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HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1205	90
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1349	101
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.38	0.05

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1349	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1450	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	16.5
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	14.5

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	20.0
Segment Length (L) / Deceleration Length (LD), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1890	268
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2116	300
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.56	0.16

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.0
Flow in Lanes 1 and 2 (v12), pc/h	2116	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Ramp Junction Speed (S), mi/h	43.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	24.6
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	18.8

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1622	230
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1816	257
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.55	0.13

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1816	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2073	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	23.6
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	19.9

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	AM Peak HOur
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1829	37	0	23
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2047	41	0	26
Weaving Flow Rate (vw), pc/h	67	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2047	Density-Based Capacity (ciWL × N × fHV), veh/h		5843
Total Flow Rate (v), pc/h	2114	Demand Flow-Based Capacity (ciW × fHV), veh/h		72825
Volume Ratio (VR)	0.032	Weaving Area Capacity (cW), veh/h		5843
Minimum Lane Change Rate (LCMIN), lc/h	67	Adjusted Weaving Area Capacity (cWA), veh/h		5843
Maximum Weaving Length (LMAX), ft	2892	Demand-to-Capacity Ratio (v/c)		0.35

Speed and Density

Non-Weaving Vehicle Index (INW)	74	Average Weaving Speed (SW), mi/h	41.9
Non-Weaving Lane Change Rate (LCNW), lc/h	39	Average Non-Weaving Speed (SNW), mi/h	41.1
Weaving Lane Change Rate (LCW), lc/h	114	Average Speed (S), mi/h	41.1
Weaving Lane Change Rate (LCAII), lc/h	153	Density (D), pc/mi/ln	17.1
Weaving Intensity Factor (W)	0.115	Level of Service (LOS)	B

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF _{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V _i), veh/h	1444	24
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (f _{HV})	0.971	0.971
Flow Rate (v _i), pc/h	1616	27
Capacity (c _{md}), pc/h	3800	1900
Initial Adjusted Capacity (c _{mda}), pc/h	3800	-
Final Adjusted Capacity (c _{mda}), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.43	0.01

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (S _R), mi/h	43.5
Flow in Lanes 1 and 2 (v ₁₂), pc/h	1616	Outer Lanes Freeway Speed (S _O), mi/h	49.4
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Ramp Junction Speed (S), mi/h	43.5
Number of Outer Lanes on Freeway (N _O), ln	0	Average Density (D), pc/mi/ln	18.6
Level of Service (LOS)	B	Density in Ramp Influence Area (D _R), pc/mi/ln	16.0

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1058	18	0	362
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1184	20	0	405
Weaving Flow Rate (vw), pc/h	425	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1184	Density-Based Capacity (ciWL × N × fHV), veh/h		5450
Total Flow Rate (v), pc/h	1609	Demand Flow-Based Capacity (ciW × fHV), veh/h		8827
Volume Ratio (VR)	0.264	Weaving Area Capacity (cw), veh/h		5450
Minimum Lane Change Rate (LCMIN), lc/h	425	Adjusted Weaving Area Capacity (cWA), veh/h		5450
Maximum Weaving Length (LMAX), ft	5201	Demand-to-Capacity Ratio (v/c)		0.29

Speed and Density

Non-Weaving Vehicle Index (INW)	106	Average Weaving Speed (SW), mi/h	40.2
Non-Weaving Lane Change Rate (LCNW), lc/h	151	Average Non-Weaving Speed (SNW), mi/h	39.4
Weaving Lane Change Rate (LCW), lc/h	574	Average Speed (S), mi/h	39.6
Weaving Lane Change Rate (LCAI), lc/h	725	Density (D), pc/mi/ln	13.5

Weaving Intensity Factor (W)	0.191	Level of Service (LOS)	B
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HCS  Freeways Version 2023
2022 PM NB Monsanto Weave - No Build.xuf

Generated: 06/19/2023 14:40:22

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1076	134
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1204	150
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.36	0.08

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1204	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1354	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	15.4
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	13.7

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg SB - Olive Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	20.0
Segment Length (L) / Deceleration Length (LD), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1600	170
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1791	190
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.47	0.10

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.1
Flow in Lanes 1 and 2 (v12), pc/h	1791	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vr12), pc/h	-	Ramp Junction Speed (S), mi/h	43.1
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	20.8
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	16.1

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg SB - Olive On Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1430	350
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1601	392
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.52	0.20

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1601	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1993	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	22.6
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	19.2

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2022
Jurisdiction	MoDOT	Time Analyzed	PM Peak HOur
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1766	25	0	14
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1977	28	0	16
Weaving Flow Rate (vw), pc/h	44	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1977	Density-Based Capacity (ciWL × N × fHV), veh/h		5864
Total Flow Rate (v), pc/h	2021	Demand Flow-Based Capacity (ciW × fHV), veh/h		105927
Volume Ratio (VR)	0.022	Weaving Area Capacity (cW), veh/h		5864
Minimum Lane Change Rate (LCMIN), lc/h	44	Adjusted Weaving Area Capacity (cWA), veh/h		5864
Maximum Weaving Length (LMAX), ft	2799	Demand-to-Capacity Ratio (v/c)		0.33

Speed and Density

Non-Weaving Vehicle Index (INW)	71	Average Weaving Speed (SW), mi/h	42.5
Non-Weaving Lane Change Rate (LCNW), lc/h	25	Average Non-Weaving Speed (SNW), mi/h	41.4
Weaving Lane Change Rate (LCW), lc/h	91	Average Speed (S), mi/h	41.4
Weaving Lane Change Rate (LCAII), lc/h	116	Density (D), pc/mi/ln	16.3
Weaving Intensity Factor (W)	0.092	Level of Service (LOS)	B

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1658	81
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1856	91
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.49	0.05

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.5
Flow in Lanes 1 and 2 (v12), pc/h	1856	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vr12), pc/h	-	Ramp Junction Speed (S), mi/h	43.5
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	21.3
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	18.1

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1234	8	0	343
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1381	9	0	384
Weaving Flow Rate (vw), pc/h	393	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1381	Density-Based Capacity (ciWL × N × fHV), veh/h		5546
Total Flow Rate (v), pc/h	1774	Demand Flow-Based Capacity (ciW × fHV), veh/h		10497
Volume Ratio (VR)	0.222	Weaving Area Capacity (cw), veh/h		5546
Minimum Lane Change Rate (LCMIN), lc/h	393	Adjusted Weaving Area Capacity (cWA), veh/h		5546
Maximum Weaving Length (LMAX), ft	4762	Demand-to-Capacity Ratio (v/c)		0.31

Speed and Density

Non-Weaving Vehicle Index (INW)	124	Average Weaving Speed (SW), mi/h	40.1
Non-Weaving Lane Change Rate (LCNW), lc/h	192	Average Non-Weaving Speed (SNW), mi/h	39.3
Weaving Lane Change Rate (LCW), lc/h	542	Average Speed (S), mi/h	39.5
Weaving Lane Change Rate (LCAII), lc/h	734	Density (D), pc/mi/ln	15.0

Weaving Intensity Factor (W)	0.193	Level of Service (LOS)	B
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HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1242	93
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1390	104
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.39	0.05

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1390	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1494	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	17.0
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	14.8

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	20.0
Segment Length (L) / Deceleration Length (LD), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1947	276
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2180	309
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.57	0.16

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.0
Flow in Lanes 1 and 2 (v12), pc/h	2180	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Ramp Junction Speed (S), mi/h	43.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	25.3
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	19.4

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive On Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1671	237
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1871	265
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.56	0.13

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1871	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2136	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	24.3
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	20.4

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak HOur
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1884	38	0	24
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2109	43	0	27
Weaving Flow Rate (vw), pc/h	70	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2109	Density-Based Capacity (ciWL × N × fHV), veh/h		5843
Total Flow Rate (v), pc/h	2179	Demand Flow-Based Capacity (ciW × fHV), veh/h		72825
Volume Ratio (VR)	0.032	Weaving Area Capacity (cW), veh/h		5843
Minimum Lane Change Rate (LCMIN), lc/h	70	Adjusted Weaving Area Capacity (cWA), veh/h		5843
Maximum Weaving Length (LMAX), ft	2892	Demand-to-Capacity Ratio (v/c)		0.36

Speed and Density

Non-Weaving Vehicle Index (INW)	76	Average Weaving Speed (SW), mi/h	41.7
Non-Weaving Lane Change Rate (LCNW), lc/h	52	Average Non-Weaving Speed (SNW), mi/h	41.0
Weaving Lane Change Rate (LCW), lc/h	117	Average Speed (S), mi/h	41.0
Weaving Lane Change Rate (LCAII), lc/h	169	Density (D), pc/mi/ln	17.7
Weaving Intensity Factor (W)	0.124	Level of Service (LOS)	B

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF _{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V _i), veh/h	1488	25
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (f _{HV})	0.971	0.971
Flow Rate (v _i), pc/h	1666	28
Capacity (c _{md}), pc/h	3800	1900
Initial Adjusted Capacity (c _{mda}), pc/h	3800	-
Final Adjusted Capacity (c _{mda}), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.44	0.01

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (S _R), mi/h	43.5
Flow in Lanes 1 and 2 (v ₁₂), pc/h	1666	Outer Lanes Freeway Speed (S _O), mi/h	49.4
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Ramp Junction Speed (S), mi/h	43.5
Number of Outer Lanes on Freeway (N _O), ln	0	Average Density (D), pc/mi/ln	19.1
Level of Service (LOS)	B	Density in Ramp Influence Area (D _R), pc/mi/ln	16.4

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1090	19	0	373
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1220	21	0	418
Weaving Flow Rate (vw), pc/h	439	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1220	Density-Based Capacity (ciWL × N × fHV), veh/h		5447
Total Flow Rate (v), pc/h	1659	Demand Flow-Based Capacity (ciW × fHV), veh/h		8794
Volume Ratio (VR)	0.265	Weaving Area Capacity (cw), veh/h		5447
Minimum Lane Change Rate (LCMIN), lc/h	439	Adjusted Weaving Area Capacity (cWA), veh/h		5447
Maximum Weaving Length (LMAX), ft	5211	Demand-to-Capacity Ratio (v/c)		0.30

Speed and Density

Non-Weaving Vehicle Index (INW)	109	Average Weaving Speed (SW), mi/h	40.1
Non-Weaving Lane Change Rate (LCNW), lc/h	159	Average Non-Weaving Speed (SNW), mi/h	39.2
Weaving Lane Change Rate (LCW), lc/h	588	Average Speed (S), mi/h	39.4
Weaving Lane Change Rate (LCAI), lc/h	747	Density (D), pc/mi/ln	14.0

Weaving Intensity Factor (W)	0.196	Level of Service (LOS)	B
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HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1109	138
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1241	154
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.37	0.08

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1241	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1395	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	15.9
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	14.0

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1821	26	0	14
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2038	29	0	16
Weaving Flow Rate (vw), pc/h	45	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2038	Density-Based Capacity (ciWL × N × fHV), veh/h		5864
Total Flow Rate (v), pc/h	2083	Demand Flow-Based Capacity (ciW × fHV), veh/h		105927
Volume Ratio (VR)	0.022	Weaving Area Capacity (cW), veh/h		5864
Minimum Lane Change Rate (LCMIN), lc/h	45	Adjusted Weaving Area Capacity (cWA), veh/h		5864
Maximum Weaving Length (LMAX), ft	2799	Demand-to-Capacity Ratio (v/c)		0.34

Speed and Density

Non-Weaving Vehicle Index (INW)	73	Average Weaving Speed (SW), mi/h	42.2
Non-Weaving Lane Change Rate (LCNW), lc/h	37	Average Non-Weaving Speed (SNW), mi/h	41.3
Weaving Lane Change Rate (LCW), lc/h	92	Average Speed (S), mi/h	41.3
Weaving Lane Change Rate (LCAII), lc/h	129	Density (D), pc/mi/ln	16.8
Weaving Intensity Factor (W)	0.101	Level of Service (LOS)	B

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg SB - Olive On Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1474	361
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1650	404
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.54	0.20

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1650	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2054	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	23.3
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	19.7

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1821	26	0	14
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2038	29	0	16
Weaving Flow Rate (vw), pc/h	45	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2038	Density-Based Capacity (ciWL × N × fHV), veh/h		5864
Total Flow Rate (v), pc/h	2083	Demand Flow-Based Capacity (ciW × fHV), veh/h		105927
Volume Ratio (VR)	0.022	Weaving Area Capacity (cW), veh/h		5864
Minimum Lane Change Rate (LCMIN), lc/h	45	Adjusted Weaving Area Capacity (cWA), veh/h		5864
Maximum Weaving Length (LMAX), ft	2799	Demand-to-Capacity Ratio (v/c)		0.34

Speed and Density

Non-Weaving Vehicle Index (INW)	73	Average Weaving Speed (SW), mi/h	42.2
Non-Weaving Lane Change Rate (LCNW), lc/h	37	Average Non-Weaving Speed (SNW), mi/h	41.3
Weaving Lane Change Rate (LCW), lc/h	92	Average Speed (S), mi/h	41.3
Weaving Lane Change Rate (LCAII), lc/h	129	Density (D), pc/mi/ln	16.8
Weaving Intensity Factor (W)	0.101	Level of Service (LOS)	B

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1832	90
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2051	101
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.54	0.05

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.5
Flow in Lanes 1 and 2 (v12), pc/h	2051	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vr12), pc/h	-	Ramp Junction Speed (S), mi/h	43.5
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	23.6
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	19.7

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1363	9	0	379
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1526	10	0	424
Weaving Flow Rate (vw), pc/h	434	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1526	Density-Based Capacity (ciWL × N × fHV), veh/h		5549
Total Flow Rate (v), pc/h	1960	Demand Flow-Based Capacity (ciW × fHV), veh/h		10545
Volume Ratio (VR)	0.221	Weaving Area Capacity (cw), veh/h		5549
Minimum Lane Change Rate (LCMIN), lc/h	434	Adjusted Weaving Area Capacity (cWA), veh/h		5549
Maximum Weaving Length (LMAX), ft	4752	Demand-to-Capacity Ratio (v/c)		0.34

Speed and Density

Non-Weaving Vehicle Index (INW)	137	Average Weaving Speed (SW), mi/h	39.8
Non-Weaving Lane Change Rate (LCNW), lc/h	222	Average Non-Weaving Speed (SNW), mi/h	38.7
Weaving Lane Change Rate (LCW), lc/h	583	Average Speed (S), mi/h	38.9
Weaving Lane Change Rate (LCAII), lc/h	805	Density (D), pc/mi/ln	16.8

Weaving Intensity Factor (W)	0.208	Level of Service (LOS)	B
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HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1372	102
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1536	114
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.43	0.06

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1536	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1650	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	18.8
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	16.0

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	2083	42	0	26
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2332	47	0	29
Weaving Flow Rate (vw), pc/h	76	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2332	Density-Based Capacity (ciWL × N × fHV), veh/h		5843
Total Flow Rate (v), pc/h	2408	Demand Flow-Based Capacity (ciW × fHV), veh/h		72825
Volume Ratio (VR)	0.032	Weaving Area Capacity (cW), veh/h		5843
Minimum Lane Change Rate (LCMIN), lc/h	76	Adjusted Weaving Area Capacity (cWA), veh/h		5843
Maximum Weaving Length (LMAX), ft	2892	Demand-to-Capacity Ratio (v/c)		0.40

Speed and Density

Non-Weaving Vehicle Index (INW)	84	Average Weaving Speed (SW), mi/h	41.0
Non-Weaving Lane Change Rate (LCNW), lc/h	98	Average Non-Weaving Speed (SNW), mi/h	40.6
Weaving Lane Change Rate (LCW), lc/h	123	Average Speed (S), mi/h	40.6
Weaving Lane Change Rate (LCAII), lc/h	221	Density (D), pc/mi/ln	19.8
Weaving Intensity Factor (W)	0.154	Level of Service (LOS)	B

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive On Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1847	262
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2068	293
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.62	0.15

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	2068	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2361	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	26.8
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	22.1

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	2083	42	0	26
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2332	47	0	29
Weaving Flow Rate (vw), pc/h	76	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2332	Density-Based Capacity (ciWL × N × fHV), veh/h		5843
Total Flow Rate (v), pc/h	2408	Demand Flow-Based Capacity (ciW × fHV), veh/h		72825
Volume Ratio (VR)	0.032	Weaving Area Capacity (cw), veh/h		5843
Minimum Lane Change Rate (LCMIN), lc/h	76	Adjusted Weaving Area Capacity (cWA), veh/h		5843
Maximum Weaving Length (LMAX), ft	2892	Demand-to-Capacity Ratio (v/c)		0.40

Speed and Density

Non-Weaving Vehicle Index (INW)	84	Average Weaving Speed (SW), mi/h	41.0
Non-Weaving Lane Change Rate (LCNW), lc/h	98	Average Non-Weaving Speed (SNW), mi/h	40.6
Weaving Lane Change Rate (LCW), lc/h	123	Average Speed (S), mi/h	40.6
Weaving Lane Change Rate (LCAII), lc/h	221	Density (D), pc/mi/ln	19.8
Weaving Intensity Factor (W)	0.154	Level of Service (LOS)	B

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF _{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V _i), veh/h	1644	27
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (f _{HV})	0.971	0.971
Flow Rate (v _i), pc/h	1840	30
Capacity (c _{md}), pc/h	3800	1900
Initial Adjusted Capacity (c _{mda}), pc/h	3800	-
Final Adjusted Capacity (c _{mda}), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.48	0.02

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (S _R), mi/h	43.5
Flow in Lanes 1 and 2 (v ₁₂), pc/h	1840	Outer Lanes Freeway Speed (S _O), mi/h	49.4
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Ramp Junction Speed (S), mi/h	43.5
Number of Outer Lanes on Freeway (N _O), ln	0	Average Density (D), pc/mi/ln	21.1
Level of Service (LOS)	B	Density in Ramp Influence Area (D _R), pc/mi/ln	17.9

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1205	20	0	412
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1349	22	0	461
Weaving Flow Rate (vw), pc/h	483	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1349	Density-Based Capacity (ciWL × N × fHV), veh/h		5450
Total Flow Rate (v), pc/h	1832	Demand Flow-Based Capacity (ciW × fHV), veh/h		8827
Volume Ratio (VR)	0.264	Weaving Area Capacity (cw), veh/h		5450
Minimum Lane Change Rate (LCMIN), lc/h	483	Adjusted Weaving Area Capacity (cWA), veh/h		5450
Maximum Weaving Length (LMAX), ft	5201	Demand-to-Capacity Ratio (v/c)		0.33

Speed and Density

Non-Weaving Vehicle Index (INW)	121	Average Weaving Speed (SW), mi/h	39.8
Non-Weaving Lane Change Rate (LCNW), lc/h	185	Average Non-Weaving Speed (SNW), mi/h	38.6
Weaving Lane Change Rate (LCW), lc/h	632	Average Speed (S), mi/h	38.9
Weaving Lane Change Rate (LCAII), lc/h	817	Density (D), pc/mi/ln	15.7

Weaving Intensity Factor (W)	0.210	Level of Service (LOS)	B
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HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1225	153
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1371	171
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.41	0.09

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1371	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1542	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	17.5
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	15.1

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	2010	28	0	16
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2250	31	0	18
Weaving Flow Rate (vw), pc/h	49	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2250	Density-Based Capacity (ciWL × N × fHV), veh/h		5867
Total Flow Rate (v), pc/h	2299	Demand Flow-Based Capacity (ciW × fHV), veh/h		110971
Volume Ratio (VR)	0.021	Weaving Area Capacity (cW), veh/h		5867
Minimum Lane Change Rate (LCMIN), lc/h	49	Adjusted Weaving Area Capacity (cWA), veh/h		5867
Maximum Weaving Length (LMAX), ft	2790	Demand-to-Capacity Ratio (v/c)		0.38

Speed and Density

Non-Weaving Vehicle Index (INW)	81	Average Weaving Speed (SW), mi/h	41.6
Non-Weaving Lane Change Rate (LCNW), lc/h	81	Average Non-Weaving Speed (SNW), mi/h	41.0
Weaving Lane Change Rate (LCW), lc/h	96	Average Speed (S), mi/h	41.0
Weaving Lane Change Rate (LCAII), lc/h	177	Density (D), pc/mi/ln	18.7
Weaving Intensity Factor (W)	0.129	Level of Service (LOS)	B

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg SB - Olive On Ramp - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1628	398
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1822	446
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.60	0.22

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1822	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2268	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	25.8
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	21.3

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - No Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	2010	28	0	16
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2250	31	0	18
Weaving Flow Rate (vw), pc/h	49	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2250	Density-Based Capacity (ciWL × N × fHV), veh/h		5867
Total Flow Rate (v), pc/h	2299	Demand Flow-Based Capacity (ciW × fHV), veh/h		110971
Volume Ratio (VR)	0.021	Weaving Area Capacity (cw), veh/h		5867
Minimum Lane Change Rate (LCMIN), lc/h	49	Adjusted Weaving Area Capacity (cWA), veh/h		5867
Maximum Weaving Length (LMAX), ft	2790	Demand-to-Capacity Ratio (v/c)		0.38

Speed and Density

Non-Weaving Vehicle Index (INW)	81	Average Weaving Speed (SW), mi/h	41.6
Non-Weaving Lane Change Rate (LCNW), lc/h	81	Average Non-Weaving Speed (SNW), mi/h	41.0
Weaving Lane Change Rate (LCW), lc/h	96	Average Speed (S), mi/h	41.0
Weaving Lane Change Rate (LCAII), lc/h	177	Density (D), pc/mi/ln	18.7
Weaving Intensity Factor (W)	0.129	Level of Service (LOS)	B

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF _{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V _i), veh/h	1822	248
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (f _{HV})	0.971	0.971
Flow Rate (v _i), pc/h	2040	278
Capacity (c _{md}), pc/h	3800	1900
Initial Adjusted Capacity (c _{mda}), pc/h	3800	-
Final Adjusted Capacity (c _{mda}), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.54	0.15

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (S _R), mi/h	43.4
Flow in Lanes 1 and 2 (v ₁₂), pc/h	2040	Outer Lanes Freeway Speed (S _O), mi/h	49.4
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Ramp Junction Speed (S), mi/h	43.4
Number of Outer Lanes on Freeway (N _O), ln	0	Average Density (D), pc/mi/ln	23.5
Level of Service (LOS)	B	Density in Ramp Influence Area (D _R), pc/mi/ln	19.6

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1111	172	0	463
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1244	193	0	518
Weaving Flow Rate (vw), pc/h	711	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1244	Density-Based Capacity (ciWL × N × fHV), veh/h		5208
Total Flow Rate (v), pc/h	1955	Demand Flow-Based Capacity (ciW × fHV), veh/h		6402
Volume Ratio (VR)	0.364	Weaving Area Capacity (cW), veh/h		5208
Minimum Lane Change Rate (LCMIN), lc/h	711	Adjusted Weaving Area Capacity (cWA), veh/h		5208
Maximum Weaving Length (LMAX), ft	6281	Demand-to-Capacity Ratio (v/c)		0.36

Speed and Density

Non-Weaving Vehicle Index (INW)	111	Average Weaving Speed (SW), mi/h	39.0
Non-Weaving Lane Change Rate (LCNW), lc/h	164	Average Non-Weaving Speed (SNW), mi/h	36.8
Weaving Lane Change Rate (LCW), lc/h	860	Average Speed (S), mi/h	37.6
Weaving Lane Change Rate (LCAII), lc/h	1024	Density (D), pc/mi/ln	17.3
Weaving Intensity Factor (W)	0.251	Level of Service (LOS)	B

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1283	170
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1436	190
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.43	0.10

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1436	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1626	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	18.5
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	15.8

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive Off Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	20.0
Segment Length (L) / Deceleration Length (LD), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	2112	371
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2364	415
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.62	0.22

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.0
Flow in Lanes 1 and 2 (v12), pc/h	2364	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Ramp Junction Speed (S), mi/h	43.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	27.5
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	21.0

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1741	354
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1949	396
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.62	0.20

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1949	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2345	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	26.6
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	22.0

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1869	173	0	226
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2092	194	0	253
Weaving Flow Rate (vw), pc/h	447	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2092	Density-Based Capacity (ciWL × N × fHV), veh/h		5532
Total Flow Rate (v), pc/h	2539	Demand Flow-Based Capacity (ciW × fHV), veh/h		13241
Volume Ratio (VR)	0.176	Weaving Area Capacity (cW), veh/h		5532
Minimum Lane Change Rate (LCMIN), lc/h	447	Adjusted Weaving Area Capacity (cWA), veh/h		5532
Maximum Weaving Length (LMAX), ft	4292	Demand-to-Capacity Ratio (v/c)		0.45

Speed and Density

Non-Weaving Vehicle Index (INW)	75	Average Weaving Speed (SW), mi/h	37.9
Non-Weaving Lane Change Rate (LCNW), lc/h	48	Average Non-Weaving Speed (SNW), mi/h	37.7
Weaving Lane Change Rate (LCW), lc/h	494	Average Speed (S), mi/h	37.7
Weaving Lane Change Rate (LCAII), lc/h	542	Density (D), pc/mi/ln	22.4
Weaving Intensity Factor (W)	0.312	Level of Service (LOS)	B

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAF _{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V _i), veh/h	1570	169
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (f _{HV})	0.971	0.971
Flow Rate (v _i), pc/h	1757	189
Capacity (c _{md}), pc/h	3800	1900
Initial Adjusted Capacity (c _{mda}), pc/h	3800	-
Final Adjusted Capacity (c _{mda}), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.46	0.10

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (v _{OA}), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (S _R), mi/h	43.5
Flow in Lanes 1 and 2 (v ₁₂), pc/h	1757	Outer Lanes Freeway Speed (S _O), mi/h	49.4
Flow Entering Ramp-Infl. Area (v _{R12}), pc/h	-	Ramp Junction Speed (S), mi/h	43.5
Number of Outer Lanes on Freeway (N _O), ln	0	Average Density (D), pc/mi/ln	20.2
Level of Service (LOS)	B	Density in Ramp Influence Area (D _R), pc/mi/ln	17.2

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	920	178	0	481
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1030	199	0	538
Weaving Flow Rate (vw), pc/h	737	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1030	Density-Based Capacity (ciWL × N × fHV), veh/h		5077
Total Flow Rate (v), pc/h	1767	Demand Flow-Based Capacity (ciW × fHV), veh/h		5588
Volume Ratio (VR)	0.417	Weaving Area Capacity (cW), veh/h		5077
Minimum Lane Change Rate (LCMIN), lc/h	737	Adjusted Weaving Area Capacity (cWA), veh/h		5077
Maximum Weaving Length (LMAX), ft	6872	Demand-to-Capacity Ratio (v/c)		0.34

Speed and Density

Non-Weaving Vehicle Index (INW)	92	Average Weaving Speed (SW), mi/h	39.0
Non-Weaving Lane Change Rate (LCNW), lc/h	119	Average Non-Weaving Speed (SNW), mi/h	36.9
Weaving Lane Change Rate (LCW), lc/h	886	Average Speed (S), mi/h	37.7
Weaving Lane Change Rate (LCAII), lc/h	1005	Density (D), pc/mi/ln	15.6
Weaving Intensity Factor (W)	0.248	Level of Service (LOS)	B

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1098	213
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1229	238
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.39	0.13

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1229	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1467	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	16.7
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	14.5

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg SB - Olive Off Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	20.0
Segment Length (L) / Deceleration Length (LD), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1730	257
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1937	288
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.51	0.15

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.1
Flow in Lanes 1 and 2 (v12), pc/h	1937	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Ramp Junction Speed (S), mi/h	43.1
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	22.5
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	17.3

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg SB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1473	468
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1649	524
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.57	0.26

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1649	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2173	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	24.7
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	20.6

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2028
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1752	157	0	189
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1961	176	0	212
Weaving Flow Rate (vw), pc/h	388	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1961	Density-Based Capacity (ciWL × N × fHV), veh/h		5558
Total Flow Rate (v), pc/h	2349	Demand Flow-Based Capacity (ciW × fHV), veh/h		14124
Volume Ratio (VR)	0.165	Weaving Area Capacity (cW), veh/h		5558
Minimum Lane Change Rate (LCMIN), lc/h	388	Adjusted Weaving Area Capacity (cWA), veh/h		5558
Maximum Weaving Length (LMAX), ft	4181	Demand-to-Capacity Ratio (v/c)		0.41

Speed and Density

Non-Weaving Vehicle Index (INW)	71	Average Weaving Speed (SW), mi/h	38.6
Non-Weaving Lane Change Rate (LCNW), lc/h	21	Average Non-Weaving Speed (SNW), mi/h	38.4
Weaving Lane Change Rate (LCW), lc/h	435	Average Speed (S), mi/h	38.4
Weaving Lane Change Rate (LCAII), lc/h	456	Density (D), pc/mi/ln	20.4
Weaving Intensity Factor (W)	0.272	Level of Service (LOS)	B

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1996	256
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2234	287
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.59	0.15

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.4
Flow in Lanes 1 and 2 (v12), pc/h	2234	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vr12), pc/h	-	Ramp Junction Speed (S), mi/h	43.4
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	25.7
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	21.3

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1241	173	0	499
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1389	194	0	559
Weaving Flow Rate (vw), pc/h	753	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1389	Density-Based Capacity (ciWL × N × fHV), veh/h		5238
Total Flow Rate (v), pc/h	2142	Demand Flow-Based Capacity (ciW × fHV), veh/h		6620
Volume Ratio (VR)	0.352	Weaving Area Capacity (cW), veh/h		5238
Minimum Lane Change Rate (LCMIN), lc/h	753	Adjusted Weaving Area Capacity (cWA), veh/h		5238
Maximum Weaving Length (LMAX), ft	6148	Demand-to-Capacity Ratio (v/c)		0.40

Speed and Density

Non-Weaving Vehicle Index (INW)	124	Average Weaving Speed (SW), mi/h	38.7
Non-Weaving Lane Change Rate (LCNW), lc/h	193	Average Non-Weaving Speed (SNW), mi/h	36.2
Weaving Lane Change Rate (LCW), lc/h	902	Average Speed (S), mi/h	37.0
Weaving Lane Change Rate (LCAII), lc/h	1095	Density (D), pc/mi/ln	19.3
Weaving Intensity Factor (W)	0.265	Level of Service (LOS)	B

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1414	179
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1583	200
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.47	0.11

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1583	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1783	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	20.3
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	17.0

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive Off Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	20.0
Segment Length (L) / Deceleration Length (LD), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	2316	400
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2593	448
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.68	0.24

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.0
Flow in Lanes 1 and 2 (v12), pc/h	2593	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Ramp Junction Speed (S), mi/h	43.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	30.2
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	23.0

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak
Project Description	Lindberg SB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1916	379
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2145	424
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.68	0.21

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	43.9
Flow in Lanes 1 and 2 (v12), pc/h	2145	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2569	Ramp Junction Speed (S), mi/h	43.9
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	29.3
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	23.7

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	AM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	2067	177	0	228
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2314	198	0	255
Weaving Flow Rate (vw), pc/h	453	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2314	Density-Based Capacity (ciWL × N × fHV), veh/h		5558
Total Flow Rate (v), pc/h	2767	Demand Flow-Based Capacity (ciW × fHV), veh/h		14210
Volume Ratio (VR)	0.164	Weaving Area Capacity (cW), veh/h		5558
Minimum Lane Change Rate (LCMIN), lc/h	453	Adjusted Weaving Area Capacity (cWA), veh/h		5558
Maximum Weaving Length (LMAX), ft	4171	Demand-to-Capacity Ratio (v/c)		0.48

Speed and Density

Non-Weaving Vehicle Index (INW)	83	Average Weaving Speed (SW), mi/h	37.5
Non-Weaving Lane Change Rate (LCNW), lc/h	94	Average Non-Weaving Speed (SNW), mi/h	37.3
Weaving Lane Change Rate (LCW), lc/h	500	Average Speed (S), mi/h	37.3
Weaving Lane Change Rate (LCAII), lc/h	594	Density (D), pc/mi/ln	24.7
Weaving Intensity Factor (W)	0.336	Level of Service (LOS)	C

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Monsanto Off Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	30.0
Segment Length (L) / Deceleration Length (LD), ft	1500	240
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1726	171
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1932	191
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.51	0.10

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.5
Flow in Lanes 1 and 2 (v12), pc/h	1932	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vr12), pc/h	-	Ramp Junction Speed (S), mi/h	43.5
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	22.2
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	18.7

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg NB - Monsanto/Olive Weave - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	895	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1034	179	0	521
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	1157	200	0	583
Weaving Flow Rate (vw), pc/h	783	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	1157	Density-Based Capacity (ciWL × N × fHV), veh/h		5109
Total Flow Rate (v), pc/h	1940	Demand Flow-Based Capacity (ciW × fHV), veh/h		5768
Volume Ratio (VR)	0.404	Weaving Area Capacity (cW), veh/h		5109
Minimum Lane Change Rate (LCMIN), lc/h	783	Adjusted Weaving Area Capacity (cWA), veh/h		5109
Maximum Weaving Length (LMAX), ft	6726	Demand-to-Capacity Ratio (v/c)		0.37

Speed and Density

Non-Weaving Vehicle Index (INW)	104	Average Weaving Speed (SW), mi/h	38.8
Non-Weaving Lane Change Rate (LCNW), lc/h	146	Average Non-Weaving Speed (SNW), mi/h	36.3
Weaving Lane Change Rate (LCW), lc/h	932	Average Speed (S), mi/h	37.3
Weaving Lane Change Rate (LCAII), lc/h	1078	Density (D), pc/mi/ln	17.3
Weaving Intensity Factor (W)	0.262	Level of Service (LOS)	B

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg NB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	25.0
Segment Length (L) / Acceleration Length (LA), ft	925	375
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1213	227
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1358	254
Capacity (cmd), pc/h	3800	1900
Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.42	0.13

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1358	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	1612	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	18.3
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	15.7

HCS Freeway Diverge Report

Project Information

Analyst	BSE	Date	6/17/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg SB - Olive Off Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	20.0
Segment Length (L) / Deceleration Length (LD), ft	1500	400
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1903	276
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	2130	309
Capacity (cmd), pc/h	3800	1900
Initial Adjusted Capacity (cmda), pc/h	3800	-
Final Adjusted Capacity (cmda), pc/h	3800	1900
Volume-to-Capacity Ratio (v/c)	0.56	0.16

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	Off-Ramp Influence Area Speed (SR), mi/h	43.0
Flow in Lanes 1 and 2 (v12), pc/h	2130	Outer Lanes Freeway Speed (SO), mi/h	49.4
Flow Entering Ramp-Infl. Area (vR12), pc/h	-	Ramp Junction Speed (S), mi/h	43.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	24.8
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), pc/mi/ln	19.0

HCS Freeway Merge Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak
Project Description	Lindberg SB - Olive On Ramp - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

	Freeway	Ramp
Number of Lanes (N), ln	2	1
Free-Flow Speed (FFS), mi/h	45.0	35.0
Segment Length (L) / Acceleration Length (LA), ft	780	270
Terrain Type	Level	Level
Percent Grade, %	-	-
Segment Type / Ramp Type	Highway/CD Roadway	Right-Sided One-Lane

Adjustment Factors

Driver Population	All Familiar	All Familiar
Weather Type	Non-Severe Weather	Non-Severe Weather
Incident Type	No Incident	-
Proportion of CAVs in Traffic Stream	0	-
Final Speed Adjustment Factor (SAF)	1.000	1.000
Demand Adjustment Factor (DAF)	1.000	1.000
Capacity Adjustment Factor for CAVs, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1627	506
Peak Hour Factor (PHF)	0.92	0.92
Total Trucks, %	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971
Flow Rate (vi), pc/h	1821	566
Capacity (cmd), pc/h	3800	2000
Adjusted Capacity (cmda), pc/h	3800	2000
Volume-to-Capacity Ratio (v/c)	0.63	0.28

Speed and Density

Upstream Equilibrium Distance (LEQ), ft	-	Flow Outer Lanes (vOA), pc/h/ln	-
Downstream Equilibrium Distance (LEQ), ft	-	On-Ramp Influence Area Speed (SR), mi/h	44.0
Flow in Lanes 1 and 2 (v12), pc/h	1821	Outer Lanes Freeway Speed (SO), mi/h	45.0
Flow Entering Ramp-Infl. Area (vR12), pc/h	2387	Ramp Junction Speed (S), mi/h	44.0
Number of Outer Lanes on Freeway (NO), ln	0	Average Density (D), pc/mi/ln	27.1
Level of Service (LOS)	C	Density in Ramp Influence Area (DR), pc/mi/ln	22.2

HCS Freeway Weaving Report

Project Information

Analyst	BSE	Date	6/19/2023
Agency	CMT	Analysis Year	2048
Jurisdiction	MoDOT	Time Analyzed	PM Peak Hour
Project Description	Lindberg SB - Monsanto Weave - Build - Olia Village Development	Units	U.S. Customary

Geometric Data

Number of Lanes (N), ln	3	Segment Type	Highway/CD Roadway
Segment Length (Ls), ft	360	Number of Maneuver Lanes (NWL), ln	2
Weaving Configuration	One-Sided	Ramp-to-Freeway Lane Changes (LCRF), lc	1
Terrain Type	Level	Freeway-to-Ramp Lane Changes (LCFR), lc	1
Percent Grade, %	-	Ramp-to-Ramp Lane Changes (LCRR), lc	0
Interchange Density (ID), int/mi	1.00	Cross Weaving Managed Lane	No

Adjustment Factors

Driver Population	All Familiar	Final Speed Adjustment Factor (SAF)	1.000
Weather Type	Non-Severe Weather	Demand Adjustment Factor (DAF)	1.000
Incident Type	No Incident	Capacity Adjustment Factor for CAVs, CAFCAV	1.000
Proportion of CAVs in Traffic Stream	0	Final Capacity Adjustment Factor (CAF)	1.000

Demand and Capacity

	FF	RF	RR	FR
Demand Volume (Vi), veh/h	1942	159	0	191
Peak Hour Factor (PHF)	0.92	0.92	0.92	0.92
Total Trucks, %	3.00	3.00	3.00	3.00
Heavy Vehicle Adjustment Factor (fHV)	0.971	0.971	0.971	0.971
Flow Rate (vi), pc/h	2174	178	0	214
Weaving Flow Rate (vw), pc/h	392	Ideal Conditions Capacity (ciFL), pc/h/ln		2200
Non-Weaving Flow Rate (vNW), pc/h	2174	Density-Based Capacity (ciWL × N × fHV), veh/h		5584
Total Flow Rate (v), pc/h	2566	Demand Flow-Based Capacity (ciW × fHV), veh/h		15231
Volume Ratio (VR)	0.153	Weaving Area Capacity (cW), veh/h		5584
Minimum Lane Change Rate (LCMIN), lc/h	392	Adjusted Weaving Area Capacity (cWA), veh/h		5584
Maximum Weaving Length (LMAX), ft	4061	Demand-to-Capacity Ratio (v/c)		0.45

Speed and Density

Non-Weaving Vehicle Index (INW)	78	Average Weaving Speed (SW), mi/h	38.2
Non-Weaving Lane Change Rate (LCNW), lc/h	65	Average Non-Weaving Speed (SNW), mi/h	38.1
Weaving Lane Change Rate (LCW), lc/h	439	Average Speed (S), mi/h	38.1
Weaving Lane Change Rate (LCAII), lc/h	504	Density (D), pc/mi/ln	22.4
Weaving Intensity Factor (W)	0.295	Level of Service (LOS)	B

MEMO

To: Jason Jaggi, AICP (City of Creve Coeur)
Bethany Moore, AICP (City of Creve Coeur)

From: Kyle Evans, PE, PTOE

Date: July 31, 2023

Subject: Olia Village Revised TIS Review
Lochmueller Project: 522-0072-03T

As requested, Lochmueller staff have completed a third review of the traffic impact study report submitted in association with the proposed Olia Village Development, located in Creve Coeur, Missouri in the southwest of the Lindbergh Boulevard (Route 67) and Olive Boulevard (Route 370) interchange. The originally submitted study was prepared by Crawford, Murphy & Tilly and submitted in April 2023 with a revised document submitted in May of 2023. This revision was submitted on June 19, 2023 and included revisions based on comments by the City of Creve Coeur, Lochmueller staff on behalf of the City and the Missouri Department of Transportation (MoDOT). Based on the submitted comments, trip generation numbers were revised, Synchro analysis was redone, and additional analysis for highway ramp operations was added.

Summary of Revised TIS Review

1. The internal capture trips included in **Table 6** are stated to be based on NCHRP 684 and the ITE Trip Generation Handbook. The calculation spreadsheets were provided and reviewed and the calculations follow standard practice. Lochmueller staff is in agreement with the new internal capture reduction rates of 20% and 49% used for analysis.
2. The revision of trip generator types for the property did not result in a large increase in total generated trips. The AM peak hour shows an increase of 66 total entering and exiting trips while the PM peak hour had an increase of 93 total trips.
3. The Lindbergh and Monsanto Drive interchange entrance and exit ramp operations were included in the revised memo and the results show no negative impacts based on the additional proposed site traffic.
4. To address the issue that could have been present with anticipated queues extending beyond available turn lane storage, the revised document shows a proposed turn lane with 500' of storage, which will address previously noted concerns. The consultant should provide a brief overview of the operational impacts of constructing a dual left-turn lane for this location.
5. The recommendations portion should provide the potential layout/control features of study intersection number 7.2. As it serves as another potential entrance into the development.

July 31, 2023

Page 2

6. Additional review of the intersection of “Harvest Drive” with the Old Olive West Drive entrance should be reviewed for operations, access and safety as it relates to that location for existing conditions or any future potential redevelopment.
7. All other items noted in the review document dated May 23, 2023 have been addressed.



8/11/2023

Mr. Jason Jaggi
Director of Community Development
300 North New Ballas Road
City of Creve Coeur, MO 63141

Re: **Lochmueller Group – TIS Review**
Olia Village Mixed-Use Development
CMT Project No. 22005028.00

Mr. Jaggi,

The following responses are in reference to the Lochmueller Group's review letter dated 07/31/23 sent by email to CMT on 08/02/23.

GENERAL COMMENTS:

1. The internal capture trips included in Table 6 are stated to be based on NCHRP 684 and the ITE Trip Generation Handbook. The calculation spreadsheets were provided and reviewed, and the calculations follow standard practice. Lochmueller staff is in agreement with the new internal capture reduction rates of 20% and 49% used for analysis.
CMT Response: Comment noted. No further response required.
2. The revising of trip generator types for the property did not result in a large increase in total generated trips. The AM peak hour shows an increase of 66 total entering and exiting trips while the PM peak hour had an increase of 93 total trips.
CMT Response: Comment noted. No further response required.
3. The Lindbergh & Monsanto Drive interchange entrance and exit ramp operations were included in the revised memo and the results show no negative impacts based on the additional proposed site traffic.
CMT Response: Comment noted. No further response required.
4. To address the issue that could have been present with anticipated queues extending beyond available turn lane storage, the revised document shows a proposed turn lane with 500' of storage, which will address previously noted concerns. The consultant should provide a brief overview of the operational impacts of constructing a dual left-turn lane for this location.
CMT Response: Our traffic engineering team started correspondence with MoDOT staff in November 2022 regarding the necessary improvements to the adjacent MoDOT controlled roadways as a result of this development. We have been through several in person & virtual meetings with their staff regarding this matter and have made three formal submittals during that time, each with a copy to the City. Throughout this process, the westbound left turn has always been discussed as a single left turn lane. The current proposal to include a single westbound turn lane with 500' of storage was submitted to MoDOT on June 20th and it appears MoDOT is on the cusp of approving this plan pending the City's response to their email from June 9th (which does not speak to any concerns with the Olive & Pavilion intersection). Based upon our review of the traffic data provided for both existing and projected traffic over the next 20 years, the calculations support the proposal of a single 500' long westbound

left turn lane by showing acceptable levels of service for all approaches and intersections. It is our intent to make a final submittal for approval to MoDOT & the city with no further changes to this approach at this time.

Please note the impacts of adding a dual left turn lane will undoubtedly create a ripple effect through the corridor. The extra lane width would likely require additional ROW to be purchased on the north side of the intersection, and with the steep existing slopes could create impacts to the existing retaining walls at the NW and NE corners, and possibly require partial relocation of the existing overhead electric lines on the north side of the intersection. Additionally, the added lane would require modifications to the proposed signal timings due to eliminating the permissive left turn movements (requiring more time be provided to the protected movements) and eventual lengthening of required pedestrian crossing timings. While the actual impacts are unknown at this time, eliminating the permissive lefts may impact the level of service for the remainder of the approach legs. Further design and traffic analysis would be needed to determine the exact impacts.

While it is possible that growth beyond these reasonable projections will occur at some point in the future, the trigger for additional improvements at this or nearby intersections could either be a result from the Olia Development itself, or from future growth of surrounding parcels. Both of which would impact projected base traffic on Olive Boulevard. The south leg of the proposed Pavilion Drive intersection will provide accommodations for two inbound lanes, thus making available the necessary room for adding dual lefts in the future should that need occur. Please note that Section L of proposed Attachment B states that if “the proposed trip generations for the entire PMD District increase by more than 10% from the density assumed in the traffic impact study approved by MoDOT within five (5) year of the initial approved Site Concept Plan, an updated traffic study may be required by the City of Creve Coeur.” It is our belief that this clause will protect the city from unanticipated growth as a direct result of this development and puts the risk on the developer within this timeframe.

5. The recommendations portion should provide the potential layout/control features of study intersection number 7.2. As it serves as another potential entrance into the development.

CMT Response: Phase 1 construction of the proposed development will include modifications to intersection number 7.2 as well as 7.1. Due to proposed changes to the internal roadway network, the geometry of both intersections will be modified to become more traditional “T” intersections. Inbound traffic for both intersections will be converted to stop controlled. Northbound traffic at 7.1 will also be stop-controlled due to the proposed pedestrian crossing. Southbound traffic at 7.1, as well as northbound and southbound traffic at 7.2 will remain uncontrolled. A paragraph will be added to the Recommendations & Conclusion section of the report to provide the necessary details as requested.

6. Additional review of the intersection of “Harvest Drive” with Old Olive West Drive entrance should be reviewed for operations, access, and safety as it relates to that location for existing conditions or any future development.

CMT Response: Please be assured that our team has taken these items into consideration with the previous report submittal as noted in the recommendations section and have included said changes in the model currently under review. Please note that the property in question is privately owned. The Olia Village development team is committed to working with the existing Schnuck’s property landlord, when the time is right, to not only secure their approval of the changes, but also negotiate the additional ROW required between the current MoDOT ROW for Olive Boulevard and the proposed Olia Village ROW for Harvest Drive.

7. All other items noted in the review document dated May 23, 2023 have been addressed.

CMT Response: Comment noted. No further response required.

If you have any questions regarding these responses, please feel free to reach out and discuss.

Thank you,

Christopher J. Stritzel, P.E.
Project Manager - CMT

CC: Matt Pfund, Jack Matthews Development
Kristie Bailey, Fireside Financial
Michael Bailey, Fireside Financial
Brian Eads – CMT

Memorandum

To: Jason Jaggi, AICP (City of Creve Coeur)
Bethany Moore, AICP (City of Creve Coeur)

From: Kyle Evans, PE, PTOE

CC: Click to enter text

Date: August 28, 2023

Re: Olia Village – Olive Blvd & Pavillion Dr Dual Left Turn Lane Review
Trek Project: 23-0384

As requested, Trekk Design Group staff have completed a review related to the proposed geometrics suggested for the intersection of Olive Blvd and Pavillion Dr in association with the proposed Olia Village Development, located in Creve Coeur, Missouri in the southwest of the Lindbergh Boulevard (Route 67) and Olive Boulevard (Route 370) interchange. This review was completed at the City's request in order to determine the operational impacts of constructing westbound dual left turn lanes at the intersection.

The review is based off information provided by Crawford, Murphy & Tilly in a revised TIS submitted to the City on June 19, 2023. As part of that study, the proposed development is anticipated to generate 330 and 320 westbound left turning vehicles during the AM and PM peak hours respectively.

The existing Synchro files were modified for the addition of a westbound dual left and the signal timings at the intersection were optimized for the dual left operation. The following table highlights the delay (seconds), LOS, and 95th percentile queue length (in feet) for four approaches of the study intersection for the originally proposed operations and with a dual left configuration.

Table 1: Synchro Analysis Results Comparison

Intersection Approach	2048											
	AM Peak						PM Peak					
	Single Left			Dual Left			Single Left			Dual Left		
	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS	Queue	Delay	LOS	Queue
Westbound												
Left Turn	22.0	C	392	5.3	A	114	10.8	B	328	61.4	E	192
Overall Approach	12.1	B	393	4.3	A	373	11.2	B	665	20.1	C	665
Eastbound												
Overall Approach	1.7	A	415	0.9	A	158	2.2	A	524	2.3	A	243
Northbound												
Right Turn	75.5	E	220	360.1	F	253	82.5	F	142	67.7	E	163
Overall Approach	68.2	E	220	264.1	F	253	72.3	E	142	62.0	E	163
Southbound												
Left Turn	52.9	E	89	59.5	E	93	54.5	D	151	54.5	D	151
Overall Approach	55.6	E	89	60.1	E	93	54.4	D	151	54.4	D	151
Overall Intersection	15.6			B			37.3			D		
							15.7			B		
										19.0		
										B		

The results of the analysis show that the construction of a dual left turn lane would have a fairly significant impact on the westbound approach, however, the overall operations of the intersection would suffer. Most notably, would be the impact the dual left would have on northbound operations. This is a result of over 300 northbound right turns exiting the development.

In both turn lane scenarios, an overlap phase is present which provides a protected green arrow for the northbound right turns while the westbound left turn is operating. In the dual left scenario, the green time provided for the westbound left turn is reduced from 16.9 seconds to 10.8 seconds reducing the capacity of the northbound right turning movement substantially.

Based on the impacts of the analysis, a westbound dual left turn lane should not be recommended at this location.



Jason Jaggi <jjaggi@crevecoeurmo.gov>

Olia Village Project

1 message

Rachel Protzel <rachelprotzel@gmail.com>

Thu, Aug 31, 2023 at 12:18 PM

To: "jjaggi@crevecoeurmo.gov" <jjaggi@crevecoeurmo.gov>

Dear Mr. Jaggi,

I am writing to express some of my concerns about the Olia Village proposal. I live at 12 Spoede Woods so this development will be directly behind my home and I am concerned about how it may negatively impact our property, our neighborhood, and local community. I have reviewed the concept and development plans online and also attended the open house where I was able to voice my concerns to the developer directly. I shared with them that I am worried about the view, the noise, the light, the sewage, the traffic and the potential crowding in schools.

My primary concern is that there is not enough buffer between the property line and where they plan to build. In the more southern areas of the new development, they plan to put in ponds and retain far more of the existing natural buffer between the homes and the new development, but in the northern half of the development, there will be very little natural buffer between the private residences and the new structures. They plan to remove quite a lot of the wooded area that is there now which will leave us with a view of a retaining wall, an office building, a very high parking garage, and possible greenhouses. They explained to me how the land would be graded such that there will be a retaining wall and that the structures that will be behind my house were going to be graded even higher up than the retaining wall. I explained to them that while I currently have a beautiful view of woods, I am going to be left looking at a retaining wall and a massive parking garage over the trees which sounds really awful.

Aside from the aesthetics, I am concerned that having this development so close to our home will bring excessive noise and light at night. We enjoy spending a lot of time in our backyard, and as it is, we can already hear some of the traffic noise from Olive and we have a lot of light pollution at night from the greenhouses at the Danforth Center such that it never gets really dark. Having this massive development right behind our house will only exacerbate these problems. My other concern that I shared with the developer is that I have a sewer opening at the back of my yard and was concerned about the excess sewage run off but they assured me it would be diverted away to another area. They were also able to explain how the traffic would flow and addressed my concerns about possible school crowding and I was satisfied with their explanations on those issues.

The developer and his team were very respectful, listened openly to my concerns, and promised to take them under consideration. I was even pleasantly surprised to receive an e-mail from the developer the following day saying that he was working with the architect on some possible options to help address the issues I raised. I truly appreciate that, but I'm still skeptical about what accommodations they will be willing to make. To be clear, I am not opposed to the development as a whole. I think it could be a great addition to our community and I personally am looking forward to having more restaurant and retail options close by. However, I really think that they are trying to cram way too much into the space and some adjustments need to be made out of respect for us neighboring residents whose homes are immediately adjacent to this massive development. I would really prefer it if the quantity and size of the structures could be scaled down a bit, leaving more room for buffer, greenspace and natural features. I hope you will take these concerns under consideration as you go through the planning process. Please let me know if there is anything else I can do to try to get my concerns heard and addressed. I am planning to attend the meetings on September 5 and September 18.

Thank you so much,
Rachel Protzel