



AGENDA
CITY OF CREVE COEUR
PLANNING AND ZONING
300 NORTH NEW BALLAS RD
SEPTEMBER 18, 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/89488579368>

Phone: 312 626 6799

Webinar ID: 894 8857 9368

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

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

APPROVAL OF MINUTES

- 1. September 5, 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

- 1. PUBLIC HEARING Application #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**

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. 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. The application was continued from the September 5, 2023 meeting.

NEW BUSINESS

- 1. Application #23-034: Site Development Plan for the Construction of A New 6, 504 Square Foot Plant Growth Building Within the Donald Danforth Plant Science Center Campus Located at 975 N. Warson Road**

Todd Hornburg, on behalf of the Danforth Center, has submitted an application for a site development plan for a new 6,504 square foot plant growth building attached to the main building. The new building will not be visible from Olive Boulevard or N. Warson Road and is internal to the campus and existing buildings. The exterior



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materials will be brick except for the side facing the existing greenhouses which will be metal to match those structures. In the RO-Research Office District, site development plans require review and approval by the Planning and Zoning Commission. City Council approval is not required.

2. PUBLIC HEARING. Application #23-033: Text Amendment to the Zoning Regulations Regarding the Procedures for the Review of Conditional Use Permits as Provided Within Section 405.1070.

3. PUBLIC HEARING. Application #23-032: Text Amendments to the Zoning Regulations Regarding Short Term Rentals

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 (Absent)
Mr. Larry Potashnick
Ms. Marjorie Richter
Mr. AJ Wang
Ms. Rhonda O'Brien
Mr. Thomas Buelter**

The following staff were also present:

**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

Ms. O'Brien made a motion to add a three-hour time limit to the meeting. Mr. Wang seconded. All in favor. Agenda approved as amended.

APPROVAL OF MINUTES

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

Mr. Wang made a motion to accept the minutes. Mr. Potashnick seconded. All in favor.

PUBLIC COMMENT

None

UNFINISHED BUSINESS

None



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NEW BUSINESS

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

Those speaking to the request were sworn in.

Ms. Bethany Moore, City Planner, stated that the subject property is located in the LI-Light Industrial zoning district and requires a conditional use permit.

Ms. Moore stated that no interior or exterior changes are proposed to the building or site.

Ms. Moore stated that the building will be used as warehouse storage of solar panels.

Ms. Moore stated that the existing landscaping is in good condition and there is an abundance of parking on the site.

Ms. Moore stated that the hours of operation will be 6AM - 3 PM Monday - Friday and staff has no concerns with the use.

Mr. Potashnick made a motion to recommend approval of the application as outlined in the draft ordinance. Ms. O'Brien seconded. All in favor.

RESULT: Approved

MOVER: Potashnick

SECONDER: O'Brien

AYES: Rhonda O'Brien, AJ Wang, Larry Potashnick, Thomas Buelter, Marjorie Richter, Julie LaBonte

NAYS: None

1. 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

Ms. LaBonte gave an overview of the hearing procedures.

Those speaking to the request were sworn in.



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Mr. Jason Jaggi, Director of Community Development, stated that the hearing is for three separate applications; first, a rezoning from "RO" to "PMD", a site development plan, and a preliminary plat.

Mr. Jaggi reminded the commission of the criteria to be met for a planned zoning district.

Mr. Jaggi gave a summary of the City's review process. He explained that the first step was to update the comprehensive plan and amend the planned zoning district ordinance.

Ms. Kristie Bailey, 90 Edwardsville Professional Park, Edwardsville, IL 62025, stated that Fireside Financial has been in the Creve Coeur area since 2013 with office and multi-family spaces.

Ms. Bailey stated that the development team has been working on the plans for about one year. She stated that to date, there has been a bus tour of the site for City officials, a community outreach meeting with Creve Coeur residents, and other workshops and meetings about the site.

Mr. Matt Pfund, 3925 Blackburn Rd., Edwardsville, IL 62025, stated that there are City of St. Louis Water conduits on the site that limit the buildable area and site work.

Mr. Pfund stated that the applicant plans to use the existing buildings on the site.

Mr. Pfund stated that the applicant understands that there are neighboring subdivisions, and plan to keep large buffers between the development and the neighbors.

Mr. Pfund stated that the applicant plans to subdivide the site into 17 lots. He also stated that the proposal is to keep the highest density uses close to Olive Blvd, and reduce the density to the south of the site.

Mr. Pfund stated that the applicant plans to limit surface parking as much as possible by having parking garages throughout the site.

Mr. Pfund stated that they plan to retain as many natural buffers on the site as possible. Mr. Pfund stated that the main street will be mostly retail and restaurant spaces with residential above. He explained that Main Street will remain a private street so that it can be closed for events.



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Mr. Pfund stated that the applicant has proposed two miles of sidewalks, a mile of wooded walking trails, and a shared-use path connecting Lindbergh and Olive. He also explained that 32 of the 96 acres will remain undeveloped.

Mr. Pfund stated that there will be a park at the west end of the site.

Mr. Pfund stated that 53.5% of the 6" caliper or larger trees will be removed. He noted that this is 166 trees more than allowed without replacement. Mr. Pfund explained that the applicant plans to plant 738 new trees on the site, including 516 street trees and 222 open space park trees.

Mr. Pfund stated that based on resident feedback, the applicant is considering planting additional trees to thicken the buffer between existing residential.

Mr. Pfund showed renderings of the elevation changes on the site.

Mr. Pfund stated that the current planned phasing schedule will begin on the west with the grocer and continue towards the southeast with the Main St corridor in 2026. He stated that construction of Main St will continue into 2027 and 2028, as well as construction of the southern residential with completion in 2029.

Mr. Buelter asked about retention of stormwater. Mr. Pfund stated that there will be retention ponds on the site, and the water runoff will be less than existing on the southern end of the site.

Mr. Buelter asked about emergency access to the site. Mr. Pfund stated that the applicant is meeting with the fire department on a monthly basis due to the scope of work.

Ms. O'Brien asked about pedestrian access. Mr. Pfund stated that the site will connect across Olive Blvd with a crosswalk and signal and will connect with Vantage Credit Union on the south end of the property. He explained that currently the pedestrian walkway loops around the eastern side of the site.

Ms. O'Brien had concerns regarding light spillage to neighboring subdivisions. Mr. Pfund stated that the landscape architect will do a study to determine what can be planted to help thicken the buffer.



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Ms. O'Brien asked how the intersection at the existing Schnucks will connect. Mr. Pfund stated that it will be rerouted to the south.

Ms. LaBonte asked for clarification on the walkways connecting to 39North. Mr. Pfund stated that they are working with staff and MODOT on this plan. Mr. Jaggi stated that Pavillion Dr is a privately maintained street with an easement for public access.

Mr. Wang asked if the utilities will be underground. Mr. Pfund confirmed they will.

Mr. Potashnick asked if there is a map showing the areas where the shortage of trees will occur. Mr. Pfund stated that that will be a part of the site concept plan.

Mr. Buelter asked if the tree removal will be phased and when the new will be planted. Mr. Pfund stated that the perimeter trees would be planted after the utilities are installed. He also stated that the buffer trees would be planted in the initial phase.

Ms. LaBonte asked about the community meeting attendance. Mr. Pfund stated that approximately 30 people attended. Ms. LaBonte asked if any amendments have been made since the community meeting. Mr. Pfund stated that buffer zones will be increased and some of the spaces will now be used for offices to avoid light pollution to neighbors.

Mr. Wang asked for clarification on the work being done above the existing water lines. Mr. Pfund stated that nothing can be built over the lines, and they have to monitor the amount of earth movement over the lines.

Mr. Jaggi outlined the City's long range planning documents including the Creve Coeur 2030 Comprehensive Plan, 39 North Master Plan, and Comprehensive Plan Amendment. He summarized the objectives of the comprehensive plan.

Mr. Jaggi stated that staff's analysis concludes the proposed project does provide a range of mixed-uses to support continued growth of the 39 North district. He explained that the proposed project will have higher density proposed for the center of the site and along Olive Blvd. He stated that the applicant has proposed three forms of pedestrian access and shared parking with several parking structures. Mr. Jaggi noted that there is no designated proposed parking for trail users.



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Mr. Jaggi stated that the applicant has proposed detention ponds to serve as an amenity. He stated that staff feels landscaping is sufficient at this stage of the project, but tree protection could be improved. Mr. Jaggi stated that the buffer area will be very important to this project due to the varying grades of the site.

Mr. Jaggi outlined the requirements of a planned zoning district for the commission.

Mr. Jaggi stated that a project of this size meets the eligibility criteria for a planned zoning district review. He explained that the public benefit will be determined by the Planning and Zoning Commission and City Council review and offered some examples associated with this project.

Mr. Jaggi stated that the proposed project is a planned mixed-use development. He stated that the key to this review is that it has to be a coordinated development. He explained that there are 13 design criteria that must be met in a planned mixed-use development.

Mr. Jaggi stated that staff believes the proposed project meets most of the design criteria outlined by the City at this stage. He explained that as the project review progresses, items that do not currently meet the criteria can be met through further discussion with the applicant.

Mr. Jaggi stated that direct impacts to public services and public improvements in the City are still under review.

Ms. LaBonte asked if there has been consideration of public restrooms on the site. Mr. Jaggi stated that it has not been discussed at this time.

Ms. Bethany Moore, City Planner, stated that the applicant has proposed 4 distinct districts for the site, including the Main Street development, mixed-use development, general office development, and the residential development. She explained that the proposed buildings will have maximum heights based on the districts.

Ms. Moore stated that the applicant has done a parking study, and at this stage they have a surplus of parking.

Ms. Moore presented the proposed phasing plan.



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Ms. Moore stated that currently there is a 35ft buffer when abutting residential. She stated that there is an additional 15ft residential building setback and an additional 40ft commercial building setback.

Ms. Moore stated that lot one has a proposed commercial building at the 75ft setback line. Mr. Buelter asked if the residential slope is higher or lower than the proposed commercial use. Ms. Moore confirmed it is higher.

Ms. Moore stated that Lots 1, 10, & 17 sit the closest to residential and should be considered more closely.

Ms. Moore stated that the tree preservation plan proposed to remove 61% with the maximum allowed being 50% removal without replacement. Ms. Moore stated that the applicant is working to save additional existing trees, as they are an important buffer between the proposed project and neighboring residents.

Ms. Moore stated that the concept landscape plan proposes new trees along Olive Blvd, the residential buffers, and along the proposed Main Street.

Ms. Moore presented the concept street plan. She explained that staff is still working with the applicant to determine which streets will be public and private.

Ms. O'Brien asked how the sidewalks will be maintained. Mr. Jaggi stated that there will be a restrictive covenant document addressing maintenance of common areas including sidewalks.

Ms. Moore presented the concept pedestrian plan. She explained that the applicant has proposed a nature trail, traditional sidewalks, and a shared-used path. She explained that the applicant is still working on final details and locations of the pedestrian pathways. Ms. Moore stated that staff has proposed that the pedestrian access path could connect to the existing neighborhoods to align with the goals of the comprehensive plan.

Mr. Jaggi added that pedestrian access through existing neighborhoods is a possibility to be explored. He explained that this would require consideration of the neighbors and other developments.

Ms. Moore presented the proposed architectural materials in the concept plan.



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Mr. Kyle Evans, Trekk Design Group, 17 Cassesn Ct, Fenton, MO 63026, presented the trip generation and adjustments table and discussed the trip generation during AM and PM peak hours.

Mr. Evans presented the 2022 existing intersection operational analysis. He stated that his focus for the study is mainly on the Olive Blvd intersections, as they have signals. He stated that most existing intersections in 2022 received A/B ratings, and the only intersection of concern is Lindbergh & Old Olive.

Mr. Evans presented the 2028/2048 No-Build intersection Operational Analysis. He stated that the Lindbergh & Old Olive intersection is the only one of concern as it is currently an unsignalized intersection.

Mr. LaBonte had concerns regarding the left turn at N Spoede Rd. Mr. Evans stated that he will review this for the next meeting.

Mr. Buelter asked if Mr. Evans believes the traffic will return to the pre-COVID level. Mr. Evans stated that he can only give his professional opinion, but he believes that many employers will continue offering work from home and hybrid options.

Mr. Evans presented the 2028/2048 Build Intersection Operational Analysis. He stated that the proposed traffic signal at Lindbergh and Old Olive is reflected on the chart, and the intersection is improved.

Mr. Evans stated that recommendations for the project include a future south bound right turn lane at Olive and Old Olive Street. He explained that proposed improvements to Olive and Pavillion Drive will adequately handle the proposed traffic.

Ms. Lindsey Evans, PGAV Planners, 200 N Broadway Ste 1000, St. Louis, MO 63102, discussed the housing proposal reviewed was a part of the concept plan submission. She explained that there have been some amendments to the plan since the initial review.



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Ms. Evans stated that for the analysis, PGAV looked at surrounding comparable multi-family and townhome properties. Ms. Evans stated that the average vacancy rate of the comparable multi-family properties is 5% and the average unit size is 865sqft. She stated that the average rate of rent per square foot for multi-family comparables is \$2.56/sqft.

Ms. Evans stated that the proposed rate of rent by the developer for multi-family is \$2.50-\$3.00/sqft, which is at the high end of the market.

Ms. Evans stated that there is not a lot of detail currently proposed for the townhomes. She explained that townhomes are not as currently prevalent in the area, making them popular and quick sales.

Ms. Evans stated that the townhome and condo component is popular and in high demand in the region. She stated that the developer estimated to sell the townhomes at \$275-\$300/sqft. She stated that the estimated median home value in Creve Coeur in 2028 is higher than the proposed rate for the townhomes.

Ms. Evans stated that the proposed project is well located for a higher density development, and creates a unique opportunity for the City of Creve Coeur.

Ms. Evans stated that the diversity of uses meets the criteria of the comprehensive plan. She explained that it spreads the cost risk of the project over multiple uses. Ms. Evans stated that continued analysis of the project will be submitted over the course of the project.

Mr. Wang asked if the school district has been notified of the proposed project. Ms. Evans stated that to her understanding, this is to be submitted at a later date.

Ms. Richter asked if Ms. Evans believes developers and rental companies will purchase these townhomes and condos. Ms. Evans stated that it is something to keep an eye on in the future. She also explained that there are restrictions that can be put in place regarding this.

Ms. LaBonte opened up the public comment. Those speaking to the request were sworn in.



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Mr. Tomislav Zigo, 9 Spoede Woods, stated that he has lived at his residence for the past 18 years. He explained that he has concerns regarding the buffer on the west side of the site. He stated that there is a significant watershed, and he believes that the proposed retaining wall would direct stormwater onto the adjacent neighbors. He also had concerns regarding the size of the proposed buffers.

Mr. Blake Eastwood, 14 Sunswept Dr, stated that he has concerns about increasing access to the Sunswept neighborhood. He explained that there are no sidewalks in the neighborhood, and it would overload the streets. He also had concerns with removing the cloverleaves north of Olive Blvd. He stated that he lives along the watershed and has concerns with added stormwater, and tying into the existing sewer system.

Ms. Angie Rose, 10335 N Sunswept Dr, stated that she has concerns regarding flooding from the creek and mosquito control in the proposed retention ponds. Ms. Rose is not in favor of adding access to the existing neighborhoods, and she had concerns regarding the location and visibility of the proposed pedestrian paths. She also had concerns regarding light pollution into the neighborhoods at night.

Mr. Cyrus Teymouri, 18 Spoede Woods, asked the commission to add as much buffering to adjacent existing residential uses as possible. Mr. Teymouri asked the commission to increase the size of the buffers adjacent to residential areas.

Ms Linda Rezny, 104 Graeser Acres, had concerns regarding the market study. She also had concerns with the drainage system during construction and once the construction is complete.

Ms. Gail Francis, 12 Spoede Hills Dr, spoke on behalf of her mother. She had concerns regarding stormwater runoff backing up onto her mother's lot. Ms. Francis asked for clarification if there will be a drastic change in the slope towards her mother's property.

Mr. David Singer, 6 Spoede Woods, stated that he has concerns with stormwater runoff during construction. He also had concerns with the walking paths proposed for the project.

Ms. Rachel Prozel, 12 Spoede Woods, stated that she would like to see less density proposed with more trees and buffers. She has concerns regarding how close the



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proposed buildings will be to her property and the proposed size of the buffer size. Ms. Prozel also had concerns regarding light and noise pollution from the development.

Ms. Susan Murphy, 10305 Sunswept, had concerns regarding sidewalk access to the neighborhood. Ms. Murphy also had concerns regarding the number of trees being removed and replanted.

Ms. Monica Morgigo, 9 Spoele Woods, had concerns regarding tree removal and the proposed buffer zone. She had concerns that none of the existing trees will survive the construction of the retaining wall proposed near the nature trail.

Ms. O'Brien asked for further clarification of the tree conservation plan, specifically the tree planting schedule.

Ms. Richter had concerns with access to the site through neighborhoods after hearing from the residents of the neighborhoods.

Ms. LaBonte had concerns with the proposed buildings being 8 stories tall and the proposed use table. Mr. Jaggi stated that the use table will be reviewed at the next meeting. Mr. Pfund stated that due to the elevation, some buildings will have more stories than others, but the height above grade will be less.

Mr. Pfund asked the commission to consider if they would prefer not to have a nature trail.

Mr. Buelter asked for clarification on the plan to protect the residents from stormwater runoff during construction.

Ms. LaBonte stated that she would like to see comments from the school district.

Mr. Potashnick asked if trustees were notified of the meeting. Mr. Jaggi stated that the notice was sent to adjacent properties within the 300ft buffer, but additional notices can be sent to trustees for the September 18th meeting.

Mr. Jaggi stated that several other permits will be necessary from other jurisdictions before a grading permit can be issued.



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Mr. Potashnick made a motion to continue the public hearing to the next meeting. Mr. Wang seconded. All in favor.

RESULT: Continued

MOVER: Potashnick

SECONDER: Wang

AYES: Rhonda O'Brien, AJ Wang, Larry Potashnick, Thomas Buelter, Marjorie Richter, Julie LaBonte

NAYS: None

WORK AGENDA

None

DEPARTMENT REPORTS

Mr. Jaggi stated that two text amendments will be on the next meeting agenda but should be continued to the October 2nd meeting due to time constraints.

Mr. Buelter asked for an update on the Chick-Fil-A road projects. Mr. Jaggi stated that the roadways would need to be done before the business can open.

ADJOURNMENT

The meeting adjourned at 8:44 PM.

Submitted by:

Recording Secretary

Chair



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 18, 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. The application was continued from the September 5, 2023 meeting.

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 September 13, 2023

PGAV Project Review dated September 14, 2023

Trekk Design Group Traffic Study Review dated September 13, 2023

BACKGROUND

At the previous meeting, staff and the Commission discussed the project and gave comments to the applicant. The Planning and Zoning Commission continued this item's discussion from the September 5, 2023, meeting to allow the applicant additional time to address comments raised by the Commission, Staff, and the residents and provide further information. The applicant has provided revised plan information in order to address those concerns. Discussion on other items pertaining to this application can be found in the previous staff report from September 5, 2023 along with prior versions of the plans and supplemental information.

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. Based on feedback from the Commission given at the September 5th meeting, an additional meeting date is requested in order to address comments received at tonight's meeting and to present a final draft version of the submission. A motion to continue the item until the October 2, 2023 Planning and Zoning Commission meeting date is therefore recommended. 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.

SUMMARY OF COMMENTS FROM SEPTMEBER 5, 2023 PLANNING & ZONING COMMISSION MEETING

The September 5th meeting public hearing allowed for the public to address the Commission and the applicant for the project with concerns that they had with the proposal as submitted. The majority of the public comments were from residents of the neighborhoods adjacent to the project. Below is a summary of the comments received:

- The location of the pedestrian path along the western portion of the site near the property line shared with residential properties running through Lots 1, 10 and 17 due to concerns including noise, safety, proximity to residential properties, and loss of trees to accommodate location.
- The size of the buffer yard proposed as 35 feet from the property line due to proximity of proposed commercial buildings to residential properties, loss of trees in buffer yard, lighting and noise levels and concerns about the view of the retaining wall from properties that are at a lower elevation.
- Proposed pedestrian access to the adjacent Sunswept neighborhood and concerns with safety and privacy.
- Storm water mitigation for the proposed project upon completion and on-site procedures to contain runoff during grading and tree removal.
- The Ladue School District's ability to accommodate new residential population anticipated within the residential developments proposed as part of the project.

The Planning and Zoning Commission also provided items for further discussion and comment summarized below:

- Additional details be provided for the proposed pedestrian trails throughout the development including proposed location, proposed screening, trail facilities such as trash, benches, signage for parking and bathrooms.
- Updated Tree Conservation Plan taking into account the concerns for trees within the buffer yard.
- Communication with school district about project impacts.

REVISED PLANS SUBMITTED IN RESPONSE TO SEPTMEBER 5TH COMMENTS

In response to the comments received at the September 5th Planning and Zoning Commission meeting, the applicant resubmitted plans with revisions to reflect the comments. The changes made to the Site Concept Plan will also be reflected in the Site Development Plans and all other relevant documents associated with this application and include revisions to the buffer between the project and the residential uses to the west, public and private streets, and pedestrian access throughout the site.

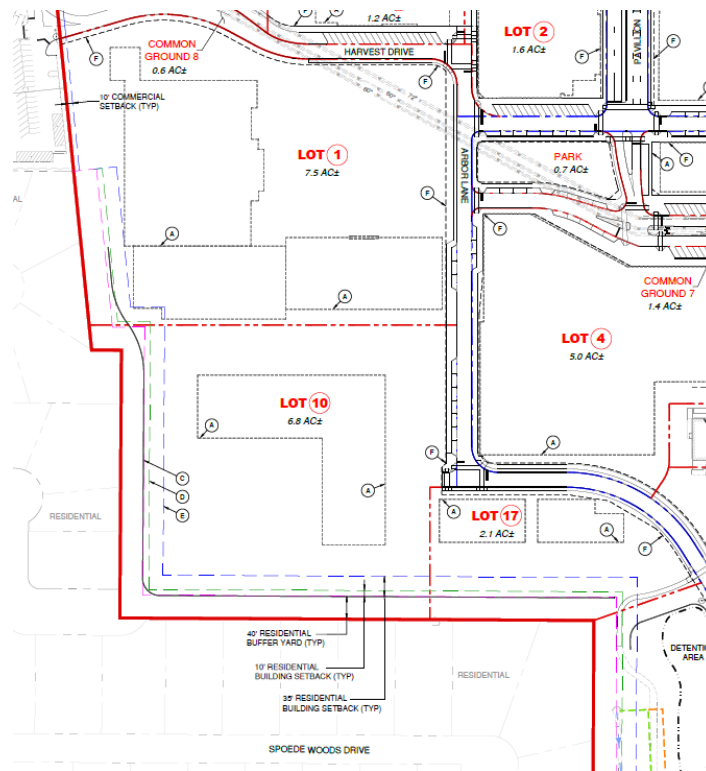


Figure 1: Sheet C-103, Setback and Buffer Plan showing revisions

The buffer yard for the development when adjacent to residential was previously proposed to be 35 feet from the property line when adjacent to residential uses. This was the minimum distance allowed by Ordinance 5844 which amended Section 405.390 of the zoning code which allowed for the creation of the Planned Mixed-Use development procedure. In response to comments received at the previous meeting, the applicant increased that buffer to 40 feet. Previously, the retaining wall for the site was allowed to be in the buffer yard as well as the pedestrian path that was proposed to sit on top of the retaining wall parallel to the property lines behind Lots 1, 10 and 17. The applicant has moved the location of the retaining wall to be 40 feet from the property line and outside of the buffer yard by straightening it behind Lots 1, 10 and 17. The pedestrian trail that was proposed for this location has been removed which will leave the 40 foot buffer yard and existing trees in place to help with a natural screening for the residential uses. Subsequently, the additional building setbacks for commercial and residential uses beyond the buffer yard were changed to 35 feet and 10 feet, respectively.

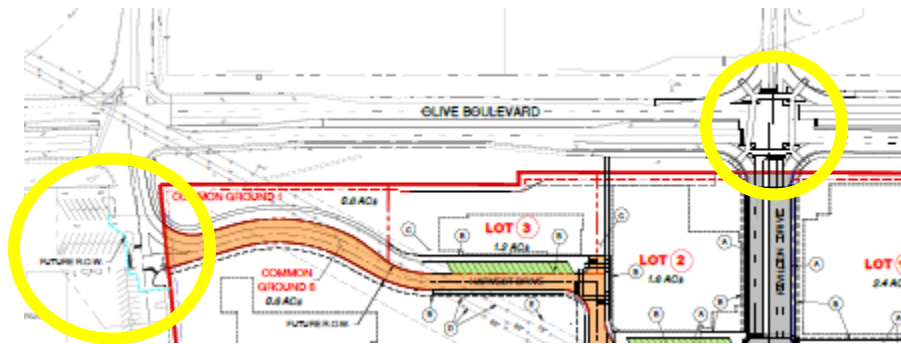


Figure 2: Sheet C-107, Street Plan revised

Sheet C-107 shows the street plan for the site. The Olive Boulevard and Pavilion Drive intersection has been updated to show the crosswalks connecting the sidewalk and shared use path systems to the other side of Olive Boulevard and up into the greater 39 North district. The right-of-way for Harvest Drive has been updated to indicate future right-of-way between the Schnucks' property and Arbor Lane to fulfill the City's request for continuous public access to the site connecting Olive Boulevard and the proposed public Harvest Drive within the development. The right-of-way for Bayer Drive has also been updated to indicate that the Bayer Drive overpass is to remain private per the City's request.

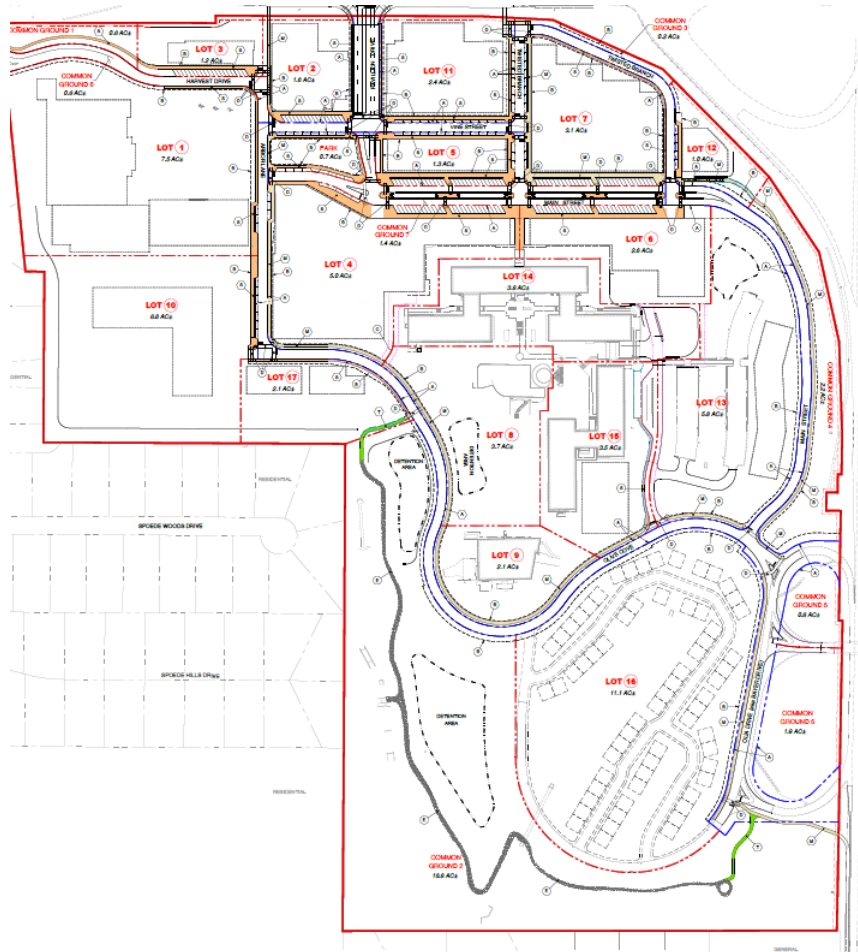


Figure 3: Sheet C-108, Pedestrian Plan, revised

Significant changes to the pedestrian path throughout the site have been made and are reflected on Sheet C-108, Pedestrian Plan. The location of the pedestrian path behind lots 1, 10 and 17 has been removed in favor of keeping more trees in the buffer yard. The applicant has proposed a new 8-foot-wide shared use path loop within the development that will provide an interior connection from Olive Boulevard to Lindbergh Boulevard and also replace the previously proposed regular sidewalk along the south side of Olive. The revised plans show the shared use path to be placed in front of the Main Street storefronts, which could be disruptive and create safety concern. Staff recommends the shared use path be relocated to the eastern side of Lot 7 to avoid this conflict.

The new rolled curb sidewalk along Lindbergh Boulevard to connect the pedestrian path through the site to the existing sidewalk system south of Vantage Credit Union is also shown. The existing nature path on the southern portion of the site will remain and will tie into the sidewalks system at Lot 17 and at the connection to the Lindbergh sidewalk at the southeastern corner of the site. A direct connection to the Sunswept neighborhood is not shown; however, further direction on this matter by the Planning and Zoning Commission is requested.

Traffic Study Update

The developer's project engineer has updated the Traffic Impact Study to include phasing for the pedestrian crossing at Olive and to account for a development proposal that has been submitted and is currently under staff review, for a mixed use commercial and multi-family development at the Creve Coeur Pavilion site.

The revised traffic study has been reviewed the City's traffic consultant and Mr. Evans' comments are attached to this staff report. The City's traffic consultant will be in attendance at the meeting to answer any additional questions regarding traffic impacts. Final acceptance of the Traffic Study by the City and MoDOT is recommended prior to approval by the Commission and City Council.

PRELIMINARY SUBDIVISION PLAT AND TREE CONSERVATION PLAN

Section 410.110 requires that 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 and to decide on the merits of the proposed subdivision. Once the Preliminary Plat and Tree Conservation Plan component have been reviewed and approved by the Planning and Zoning Commission, the applicant will submit the Subdivision Improvement Plans and Final Subdivision Plat for approval.

September 18, 2023

Page 6

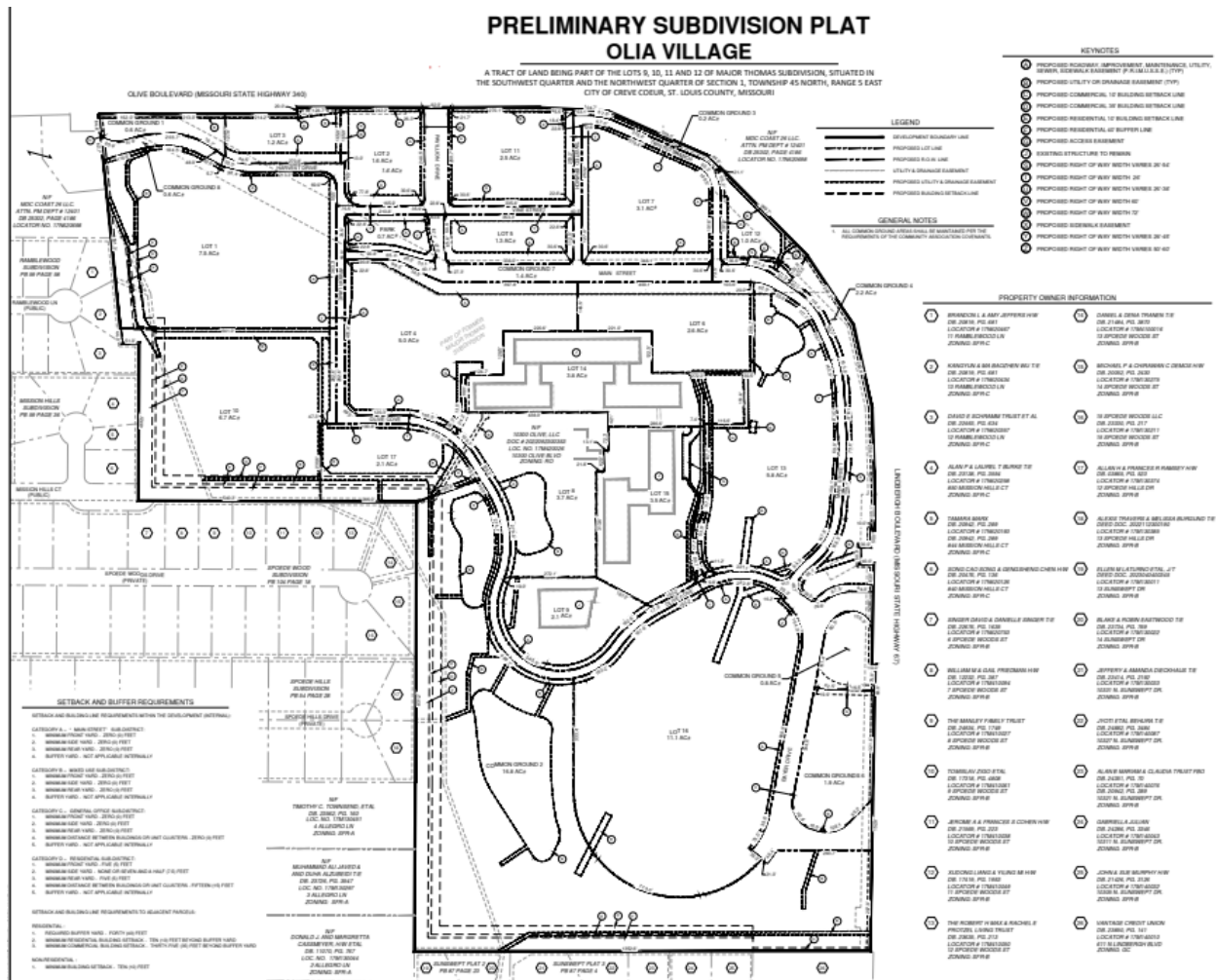


Figure 4: Preliminary Subdivision Plat

The Preliminary Plat shows the subject property split into 17 individual lots of varying width, depths and area along with 7 separate areas of common ground and a park. The common ground will be maintained per the requirements of the community association covenants to be submitted with the final plat at a later date. The plat includes the existing conditions of the property such as the existing buildings, watercourses, tree masses, and contours and including existing utilities, easements, rights of way, sanitary and storm sewers, culverts and other underground structures. The proposed location and width of streets, lots, right of way, buildings and setback lines, easements and boundaries of the proposed subdivision are also required to be shown on the plat. The submitted Preliminary Plat appears to meet all requirements of Section 410.110.

Tree Conservation Plan

The Tree Conservation Plan is a component of the Preliminary Subdivision Plat per Section 410.320. This section requires that all trees and tree masses of 6-inch diameter at breast height (DBH) be graphically recorded on the plan and indicated if they are to remain or to be removed. Not more than 50% of the tree masses or individual trees shall be proposed for removal. Any tree mass removal or tree removal not approved with the preliminary plat or subsequently approved by the City staff be replaced on the basis of a one-to-one ratio for trees 6 inches DBH or greater and two-to-one ratio for trees 20 inches DBH. The applicant has revised their previous Tree Conservation Plan submission to meet the 50% removal maximum and is now in compliance with this section by showing no more than 50% of all existing trees and tree masses on site to be removed. This 50% removal figure is down from the previous 61% of trees on site proposed for removal previously.



Figure 5: Tree Conservation Plan showing trees to be removed in red.

SITE DEVELOPMENT PLAN PHASE 1

After or in conjunction with the approval of the Site Concept Plan, a Site Development Plan must be submitted for each phase within the project for review and approval by the Planning and Zoning Commission. Of primary importance in the review of a site development plan will be a determination that the plan complies with the site concept plan approved for the total development or project. Olia Village is proposed to be constructed in 5 phases and the Site Development Plan submitted with this application is for Phase 1 of the development which includes site clearing, mass grading, site utilities, retaining wall and roadway construction for the development. The resubmitted Site Development Plans include revisions to address the comments and concerns brought up at the previous meeting including changes to the pedestrian path, the buffer yard and setbacks, the location of the retaining wall behind Lots 1, 10 and 17, the tree conservation plan, and new landscaped vegetative screen behind lots 1, 10 and 17 which Staff is requesting additional details on.

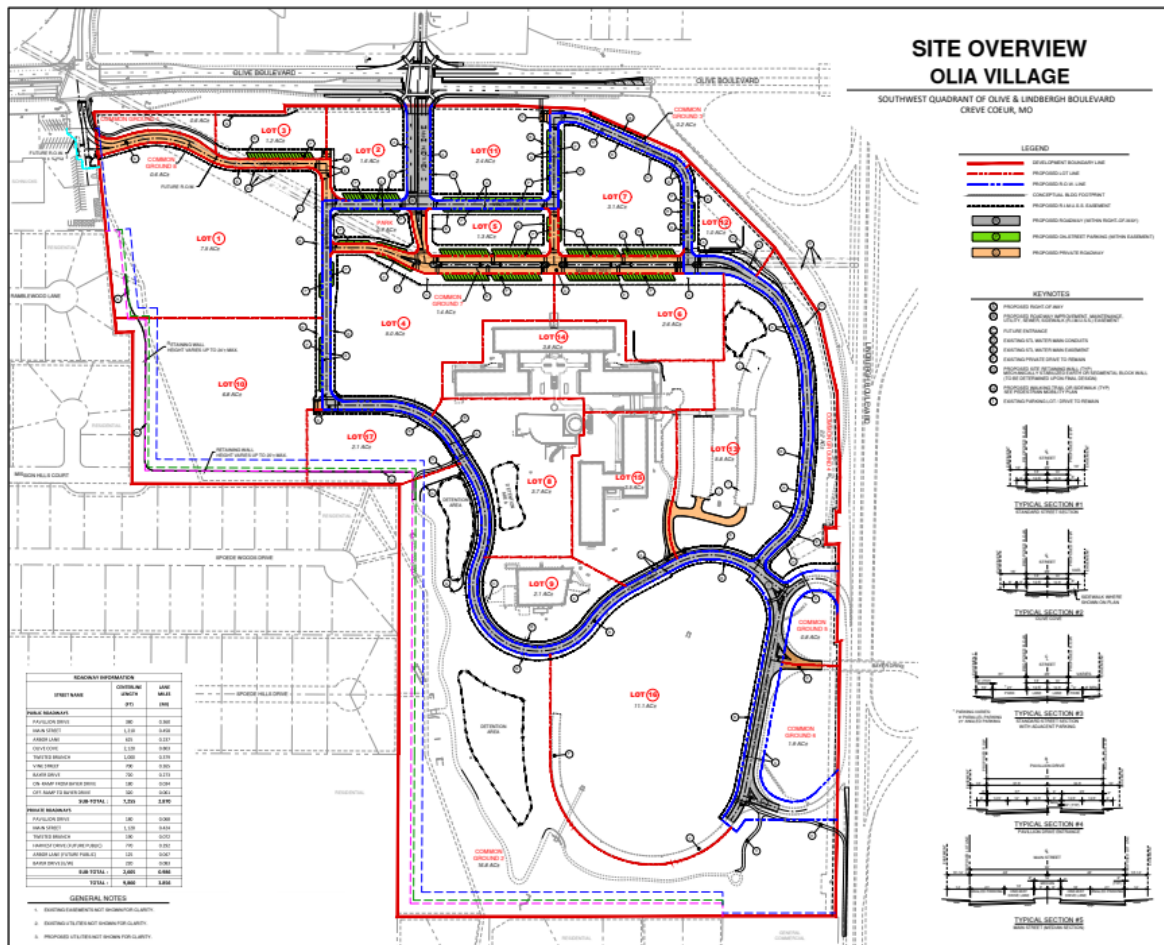


Figure 6: Sheet C-101, Site Overview.

Sheet C-101 includes the location of all roads on site showing the sections proposed to be private and public along with the location of on street parking, proposed lot lines, proposed right-of-way, proposed building footprints, existing St. Louis City watermain conduits and easements, existing buildings and roads to remain, proposed detention locations, proposed retaining wall location, proposed walking trail and sidewalks within easements and typical sections for streets within the development. The applicant is proposing 2.87 miles of public roadway and 0.99 miles of private roadway throughout the development.

Sheet C-103 includes the grading plan for the site and the location of the proposed storm sewer. Due to the existing topography and grade changes within the site, some areas require significant grading in order to prepare the property for future phases and building construction. Sheets A-103.1-4 contain the lighting plan/photometric information for the site including the lighting equipment ranging in height from 11 feet tall to 23 feet tall throughout the site.

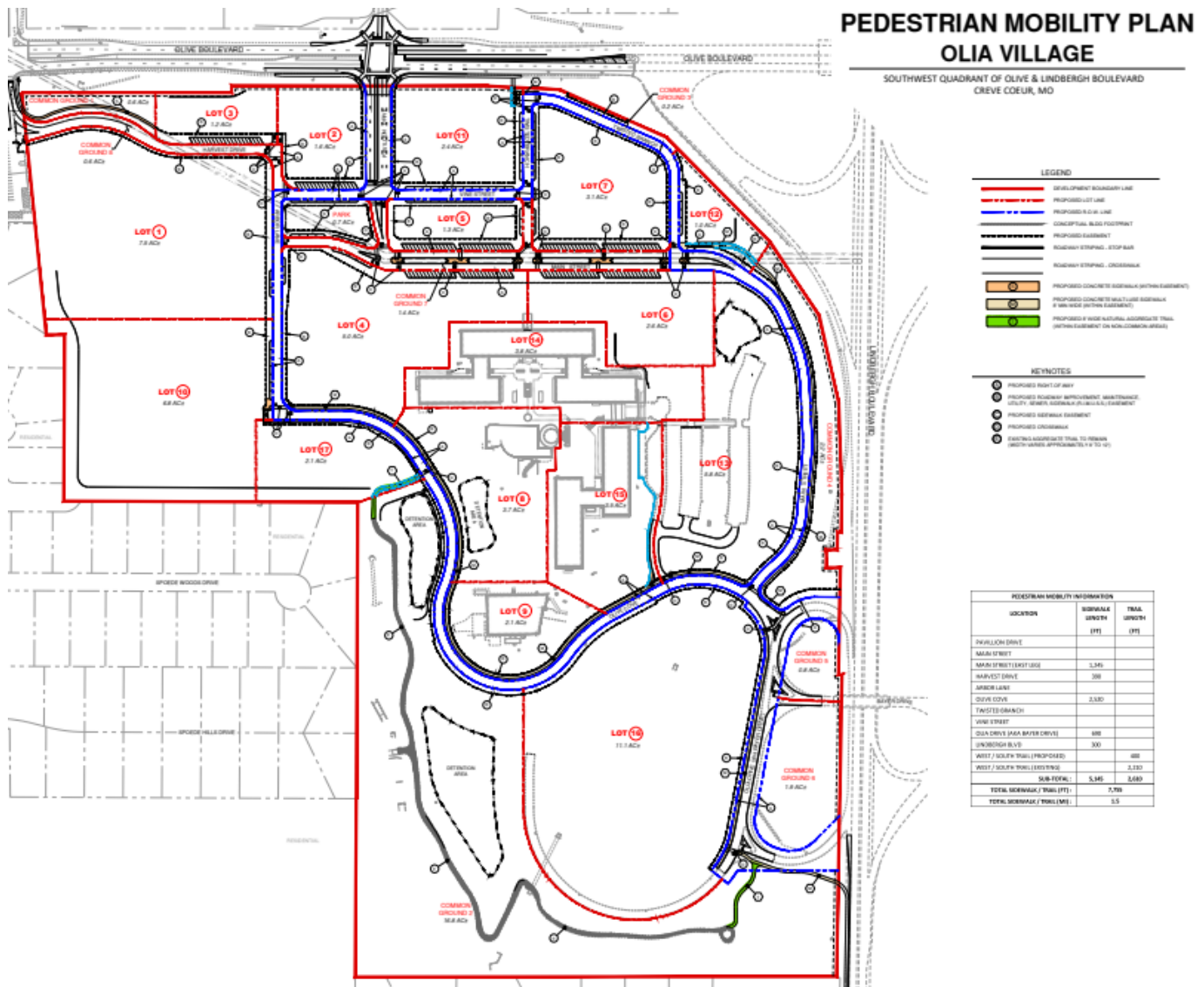


Figure 7: Sheet C-105, Pedestrian Mobility Plan

The Pedestrian Mobility Plan includes the location of all proposed crosswalks, sidewalks, and pedestrian trails throughout the site. The revised plans include the location of the proposed crosswalk at the entrance where Olive Boulevard and Pavilion Drive intersect, the proposed sidewalk along Lindbergh Boulevard and the revised location of the pedestrian path throughout the site including the multi-use sidewalk which will be an 8-foot-wide concrete sidewalk. The sidewalks and multi-use trail will be within easements and there will be a total of 1.5 miles total of sidewalks and trails throughout the site. The plans have been revised to reflect the removal of the pedestrian path behind Lots 1, 10 and 17 and to include the new location of the shared use path loop and the connection to the new sidewalk along Lindbergh Boulevard.

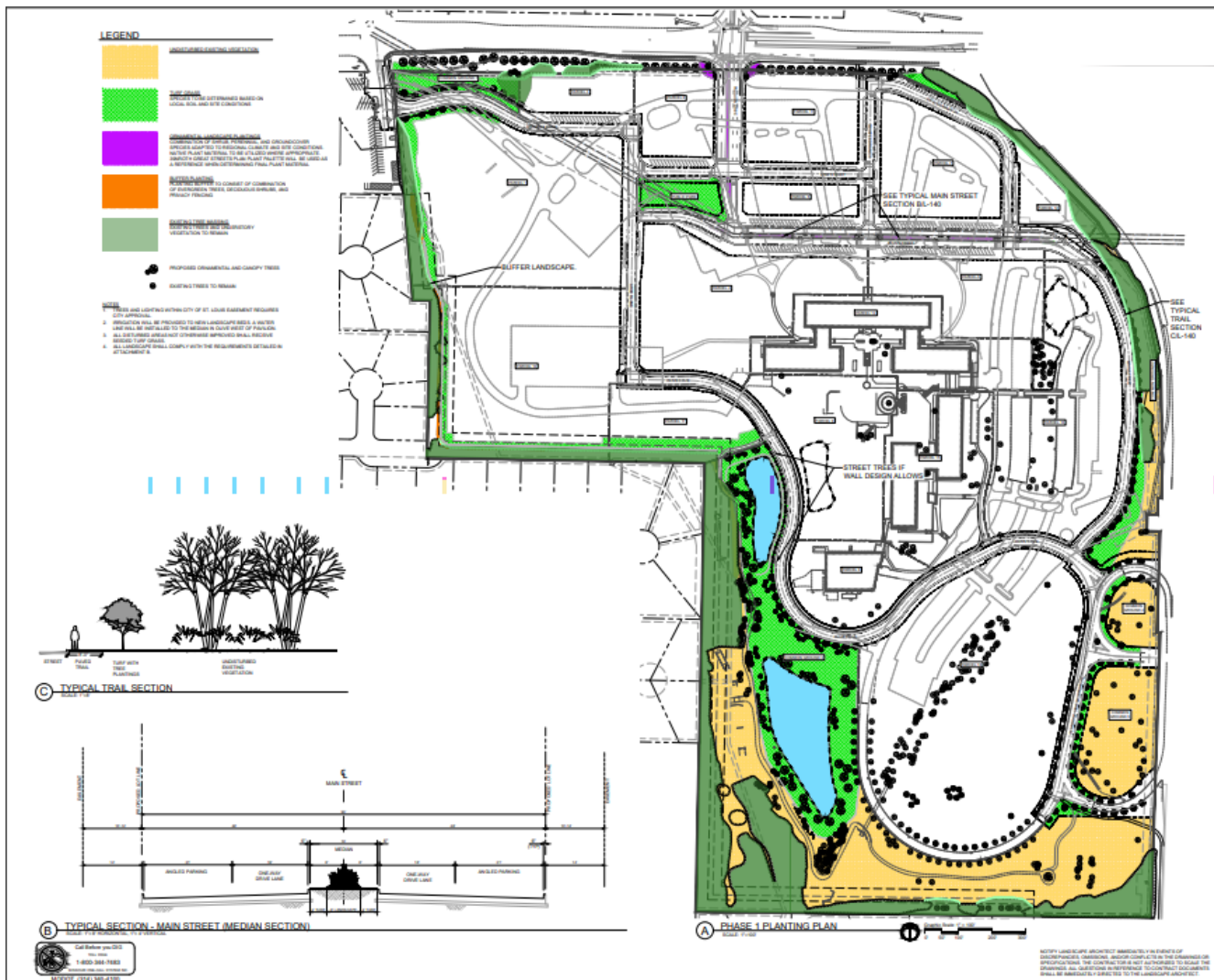


Figure 8: Sheet L-140, Phase 1 Concept Planting Plan

Sheet L-140 shows the concept planting plan for Phase 1 including new trees along Olive Boulevard, Harvest Drive, Olive Cove and Main Street. Several areas are color coded and highlighted for the installation of new turf grass, ornamental landscape plantings and buffer plantings. Specific details of these landscaped areas and the proposed additional buffer planting landscaping are needed including plant schedules and greater details of the plans. Staff requests that a detailed landscape plan be submitted for final review at the next meeting.

Sheet C-104 is the Utility and Drainage plan which includes the location of the existing and proposed on site utilities such as sanitary sewer, storm sewer, water main and the proposed easements and detention basins. Additional permits will be required for this work prior to construction including a State of Missouri Land Disturbance permit, Site Improvement Permit by City and approval by MSD. The Preliminary Buildout Stormwater Calculations are as follows:

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 (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.

In addition to the drainage plan, a preliminary stormwater management report has been prepared by the developer's engineering firm, CMT. This report documents the pre-developed and anticipated post-developed drainage conditions of the site along with the design methodology for the hydrologic analysis. The conclusion of the report states that the proposed detention facilities have sufficient volumes to meet drainage requirements for the build-out. The report notes that several aspects of the development are still under design including storm sewer plans and BMP's for water quality and volume reduction. Additional plans will be submitted to MSD and the City for final approval prior to construction. The preliminary stormwater report, dated July 7, 2023, has been attached for reference.

REZONING ORDINANCE-ATTACHMENT B

The applicant has submitted development standards, referred to as Attachment B with this application, to provide regulations specific for this development, along with the Site Concept Plan as a substitute to the traditional zoning ordinance requirements. Once approved, the Site Concept Plan and the planned district ordinance, including the specific requirements provided in Attachment B, will govern the use, parking, loading, signage, space and yard regulations applicable to the property. Attachment B includes the requirements for the site pertaining to permitted uses for the site, shown with the document as Table A, the sub-district category building standards for the 4 categories for the development, dimensional

regulations, bulk regulations, parking and loading regulations, landscaping and tree requirements, sign, light and architectural requirements, access management, public and private road improvements, pedestrian circulation, traffic impact study, public art requirements and miscellaneous. The following is a highlight summary of the document.

Permitted Uses

Table A lists the permitted uses for each of the four sub-district categories. The submitted table follows the City's land use table by utilizing NAICS Use Codes. All uses listed within the table are permitted and there will be no Conditional Uses which means that the Planning and Zoning Commission and City Council will not conduct further review over individual uses within the site after approval of this application. The allowable uses are organized by the four sub-district components of the project: Main Street, Mixed-Use, Office, and Residential.

Some uses are permitted but are subject to the additional requirement that they shall not be permitted on the street facing ground floor units within the Main Street District. These uses are denoted with an asterisk and would not be conducive to an active streetscape but would be an appropriate use in the office space above the retail units or elsewhere on the site as permitted. Generally, these uses are office-related and do not involve walk-in traffic.

There are a few uses that require additional discussion by the applicant and the Commission. New car and motorcycle dealers are listed as permitted in some areas of the development with no outside surface storage or display allowed. New car dealerships typically involve service departments which has not been addressed. Marijuana uses such as dispensaries, cultivation facilities, manufacturing facilities are also allowed within certain areas. Staff believes that dispensaries might be acceptable as a retail use, however all other marijuana-related facilities seem inappropriate and incompatible with the overall development. Drive-through services, except restaurants, would be allowed in the Mixed-Use District. There is not currently any information on whether drive through restaurants would be allowed and if so, in what districts.

For the residential component, high density multi-family (greater than 20 units an acre) would be allowed in the Main Street and Mixed Use Districts. For the residential district on the southern portion of the development, the table shows single family residential, attached single family, low and medium density multi-family as permitted uses. Allowing a wide variation of housing types in this district does not correspond with the Site Concept Plan which shows townhomes in this area. Staff believes only attached single family and perhaps detached villas such as what is found at Villas on Mosley should be permitted in this portion of the development.

Staff requests further discussion and direction by the Commission on the proposed uses.

Sub-District Category Standards

The Olia Village Planned Mixed-Use Development includes 4 subdistrict categories, Main Street, Mixed-use, General Office and Residential, which each include their own set of standards including building volume, building floor heights, projecting facade elements, and parking.

The Main Street development category will allow buildings to be built not to exceed 8 stories or 100 feet measured from the primary sidewalk entrance level while also permitting additional lower levels accessed from the side or rear. Parking shall not be permitted as a primary use in this category and private off-street surface parking is prohibited. Structured, public surface or on street parking is permitted.

The Mixed-Use development category will allow buildings to be built not to exceed 5 stories or 60 feet measured from the primary sidewalk entrance level while also permitting additional lower levels accessed from the side or rear. Structured, public surface, on street parking and private off-street parking are permitted.

The General Office development category will allow buildings to be built not to exceed 4 stories or 70 feet measured from the primary sidewalk entrance level while also permitting additional lower levels accessed from the side or rear. Structured, public surface, on street parking and private off-street parking are permitted.

The Residential development category has no placement requirements.

Dimensional Regulations

The maximum site coverage will be determined globally for the entire Planned Mixed-Use development, not by individual lot or site, and shall not exceed 70%. The Site Concept Plan shows proposed Site Coverage at approximately 54%. The maximum floor area ratio shall not exceed 0.7 for the entire site. Currently proposed is an FAR of 0.59. The lot size minimum requirements are determined based on the subcategory.

Parking and Loading

The required parking for the development is proposed to be calculated cumulatively for each phase of the development as shown on the Site Concept Plan based upon the square footage of individual land uses as described in the City's zoning code, with a 15% reduction in total spaces. The 15% reduction would not apply to the Residential District (D) on the southern end of the site.

At this stage of the plan review, the above approach to parking seems reasonable with the reduction accounting for the shared parking arrangement. Nonetheless, parking information will need to be submitted with each phase and reviewed against the specific uses that are proposed as part of that phase. Even then, it may not be known what specific tenants (such as restaurants) may occupy the buildings which could require variations in parking. One way to verify information based on specific tenants is for parking verification to be handled by staff as part of the occupancy permit phase. A shared parking agreement covering the entire development, with the exception of the Residential component (D) is expected to be submitted along with the restrictive covenants at the time of final plat approval.

The allocation for loading spaces are depicted in the document, however, flexibility is key based upon the shared, mixed-use nature of the development. Specific details for loading spaces will need to be submitted with the Site Development Plan for each phase.

Landscaping and Tree Requirements

The landscape standards appear to be adequate. It should be noted that the developer has included appropriate provisions for irrigation and notes the limitations of disturbance involved with the existing City of St. Louis Water easement. Of note is the request is for existing parking lots that are to remain, to be exempt from the City's landscaping requirements. The exemption would apply to Lots 8, 9, 12, 14 & 15. For some of these lots, the existing landscaping conditions seem acceptable, however, staff believes the City should reserve the right to review this on a case-by-case basis at the Site Development Plan stage for each phase to determine if any enhancements are needed within these parking areas.

Architectural Requirements, Signage & Public Art

The applicant has proposed general architectural standards that would apply to the development as a whole. Notably, the standards would require masonry and glass as the primary exterior building materials. Accent materials can include metal, cementitious siding, and EIFS.

Staff believes the proposed architectural standards are appropriate for this type of development to provide

general guidance with a detailed review occurring at the Site Development Plan stage. The only exception would be the allowance of EIFS, even as a secondary material. Staff believes there are more durable and higher quality products available compared to EIFS.

Signage will be approved based upon the submittal of a master sign plan for the entire development at a later date. Master Sign Plans require review and approval by the Commission and City Council.

Public art that is proposed for the project, will be reviewed the City's Arts Committee with final approval by the Planning and Zoning Commission based upon final maintenance agreements established by the City Council at the time of review.

Roadways and Access

The development standards include roadway details that have been reviewed by the City's Public Works Department. In general, these standards are acceptable pending final review by Public Works and MoDOT with respect to improvements on Olive Boulevard. As noted previously, right-of-way that is dedicated to the City will only involve pavement and curbs. Sidewalks, paths and trails as well as streetlights will be privately maintained.

MISCELLANEOUS

There were a few additional items that the Commission where further information was requested. These include public restrooms for the park and during special events, provisions for inclusionary housing, and security of the trails. This information has not been provided with this re-submittal, however, staff has discussed these items with the applicant, and their intention is to address these comments in their presentation. The applicant will also present more detailed information on the buffers including sightlines and the layering of landscaping and other screening treatments to mitigate noise and light concerns.

With the proposed changes staff believes most of the review and design criteria as well as the public benefits requirements of the Planned Zoning District ordinance (Section 405.390, sub-sections E, F.6.a., and I) have been satisfied. The exception is Review Criteria, item #14 which states the following:

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.

Staff has received preliminary information from the developer regarding the potential/anticipated revenue generated from this development. The City's planning consultant has reviewed this information with staff and they have requested additional information regarding these figures. In addition, the City is in the process of obtaining cost information for city services for street maintenance and policing. This information will be presented to the Commission at the following meeting.

Any further requests to satisfy the City's planned zoning district ordinance review, design and public benefit criteria should be discussed by the Commission with direction given to the applicant.

SUMMARY AND RECOMMENDATION

After the submission of the revisions, the majority of the requirements have been effectively addressed in the development. Staff recommends that the Commission hear from residents at the public hearing, and provide direction identifying areas to provide final comment to staff or the applicant before preparation of the ordinance for approval at the next meeting.

Areas of discussion that Staff would like the Commission to give the applicant direction on include the revisions to the wooded buffer between residential and the subject property, the proposed uses listed in Table A for the site, and the reconfigured pedestrian plan, including the shared use path and whether the Commission would like a direct neighborhood connection to the Sunswept neighborhood, if agreeable to

the credit union. Additional comments generated from the items presented to the Commission by the applicant at this meeting should also be considered.

No decision is requested at this time. Therefore, Staff requests that following presentations and disussion, the Planning and Zoning Commission then vote to continue the matter to the next regularly scheulded 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 October 2, 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





09/13/2023

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 revisions have been made to the Site Concept Plan, Site Development Plan & Preliminary Plat dated 08/11/23 in response to the PGAV memo dated 08/15/23, the City of Creve Coeur's 2nd staff review letter dated 08/23/23, as well as correspondence during the project review calls with staff on 08/24/23 & 09/05/23 and the 1st Planning & Zoning Public Hearing held on 09/05/23. Additionally, edits to Attachment B have been included.

SITE CONCEPT PLAN:

1. The Olive Boulevard & Pavilion Drive intersection has been updated to show crosswalks for both pedestrians and the shared use path across Olive.
2. The ROW for Bayer Drive has been updated to indicate the Bayer Drive overpass to remain private. The Roadway Information table on Sheet C-107 has been updated accordingly.
3. The ROW for Harvest Drive has been updated to indicate Future ROW between the Schnucks' property and Arbor Lane. The Roadway Information table on Sheet C-107 has been updated accordingly.
4. A new 8' wide looped shared use path has been provided within the development to connect Olive Boulevard to Lindbergh Boulevard. The existing sidewalk along the south side of Olive is now shown to be replaced with a new 8' wide shared use path. A new sidewalk / rolled curb extension at the northeast corner of the Vantage Credit Union property has been shown along the west side of Lindbergh Boulevard to extend north and to tie into the new shared use path just south of the existing southbound exit ramp.
5. The proposed Residential Buffer Yard has been extended to 40' for all sections of the development. The residential building setback has been changed to 10' (for a total of 50' – no change) and the commercial building setback has been changed to 35' (for a total of 75' – no change).
6. The retaining wall behind Lots 1, 10 & 17 has been straightened and placed 40' off the existing property line.
7. The new nature trail along Lots 1, 10 & 17 has been removed from the drawings. The existing nature trail to the south through the common ground areas has been shown to remain. Connections from the trail to the proposed sidewalk along Olive Cove on the north end and along Olia Drive on the south end will remain.
8. Sheet LD-100 has been further refined to include updates to the tree preservation plan based upon these changes along with further updates to the collection of data.

9. Sheet L-140 has been updated to include a new landscaped vegetative screen on the residential side of the retaining wall along Lots 1, 10 & 17.

SITE DEVELOPMENT PLAN:

1. The Olive Boulevard & Pavilion Drive intersection has been updated to show crosswalks for both pedestrians and the shared use path across Olive.
2. The ROW for Bayer Drive has been updated to indicate the Bayer Drive overpass to remain private. The Roadway Information table on Sheet C-107 has been updated accordingly.
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5. The proposed Residential Buffer Yard has been extended to 40' for all sections of the development. The residential building setback has been changed to 10' (for a total of 50' – no change) and the commercial building setback has been changed to 25' (for a total of 75' – no change).
6. The retaining wall behind Lots 1, 10 & 17 has been straightened and placed 40' off the existing property line.
7. The new nature trail along Lots 1, 10 & 17 has been removed from the drawings. The existing nature trail to the south through the common ground areas has been shown to remain. Connections from the trail to the proposed sidewalk along Olive Cove on the north end and along Olia Drive on the south end will remain.
8. Sheet LD-100 has been further refined to include updates to the tree preservation plan based upon these changes along with further updates to the collection of data.
9. Sheet L-140 has been updated to include a new landscaped vegetative screen on the residential side of the retaining wall along Lots 1, 10 & 17.
10. Sheet L-140 has been updated to include a turf grass hatch for the Public Park along Main Street. Please note that this is the intended finished condition of the park at the completion of the Phase 1 improvements. A separate Site Development Plan will be submitted at a later date specific to the hardscape and amenities to be included as part of the final development of the Public Park.

PRELIMINARY PLAT:

1. The ROW for Bayer Drive has been updated to indicate the Bayer Drive overpass to remain private. The Common Ground 6 acreage and the Roadway Information table on Sheet C-107 has been updated accordingly.
2. The ROW for Harvest Drive has been updated to indicate Future ROW between the Schnucks' property and Arbor Lane.
3. The proposed Residential Buffer Yard has been extended to 40' for all sections of the development. The residential building setback has been changed to 10' (for a total of 50' – no change) and the commercial building setback has been changed to 25' (for a total of 75' – no change).

4. A new sidewalk easement has been added for the shared use path along the east side of the development to connect Olive Boulevard to Lindbergh Boulevard.
5. The proposed Residential Buffer Yard has been extended to 40' for all sections of the development. The residential building setback has been changed to 10' (for a total of 50') and the commercial building setback has been changed to 25' (for a total of 75').

PLANNED MIXED-USE DEVELOPMENT DISTRICT ORDINANCE (ATTACHMENT B):

1. A redlined version of Attachment B and accompanying Table A have been included for the City's review.

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

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Date: Wednesday, September 13, 2023 2:22:58 PM

SITE CONCEPT PLAN

OLIA VILLAGE

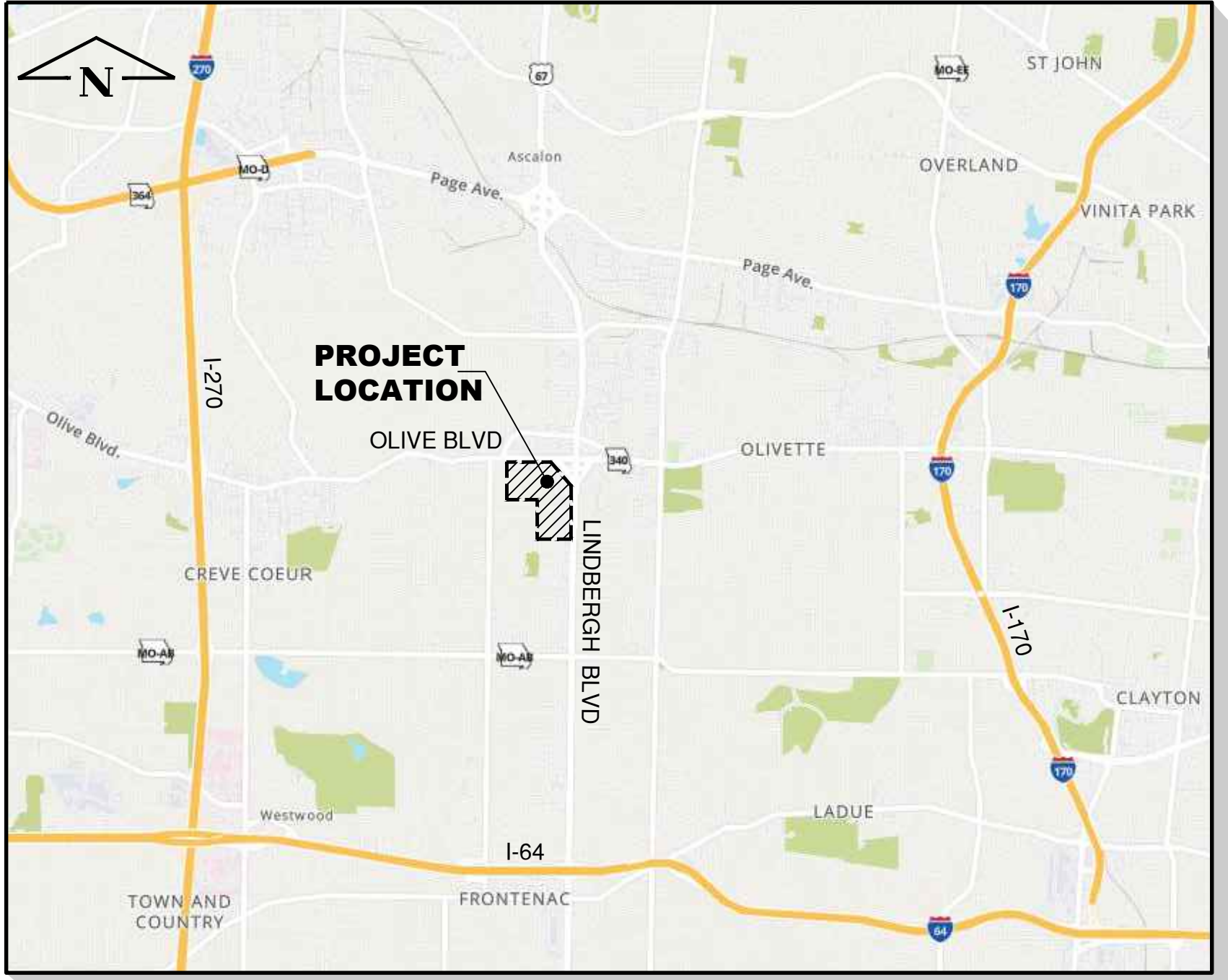
CREVE COEUR, MO

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

SEPTEMBER 13, 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	= NA (NO BUILDINGS PROPOSED)
BLDG. CONST. TYPE	= NA (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 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-103.1-4	SITE LIGHTING
A-104	ELEVATIONS
A-105	MATERIALS
A-106	RENDERED VIEW
LD-100	TREE PRESERVATION PLAN
L-140	OVERALL CONCEPT PLANTING PLAN
L-141	ENLARGEMENT PLANTING PLANS

FULL BUILD-OUT SITE CALCULATION NOTES

- 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 :
LOT ACREAGE = 64.7 AC
COMMON GROUND = 25.3 AC
PUBLIC ROADWAY = 5.8 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.

PREPARED BY:



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
SEPTEMBER 13, 2023

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

MARK	DATE	DESCRIPTION
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TITLE SHEET

C-100

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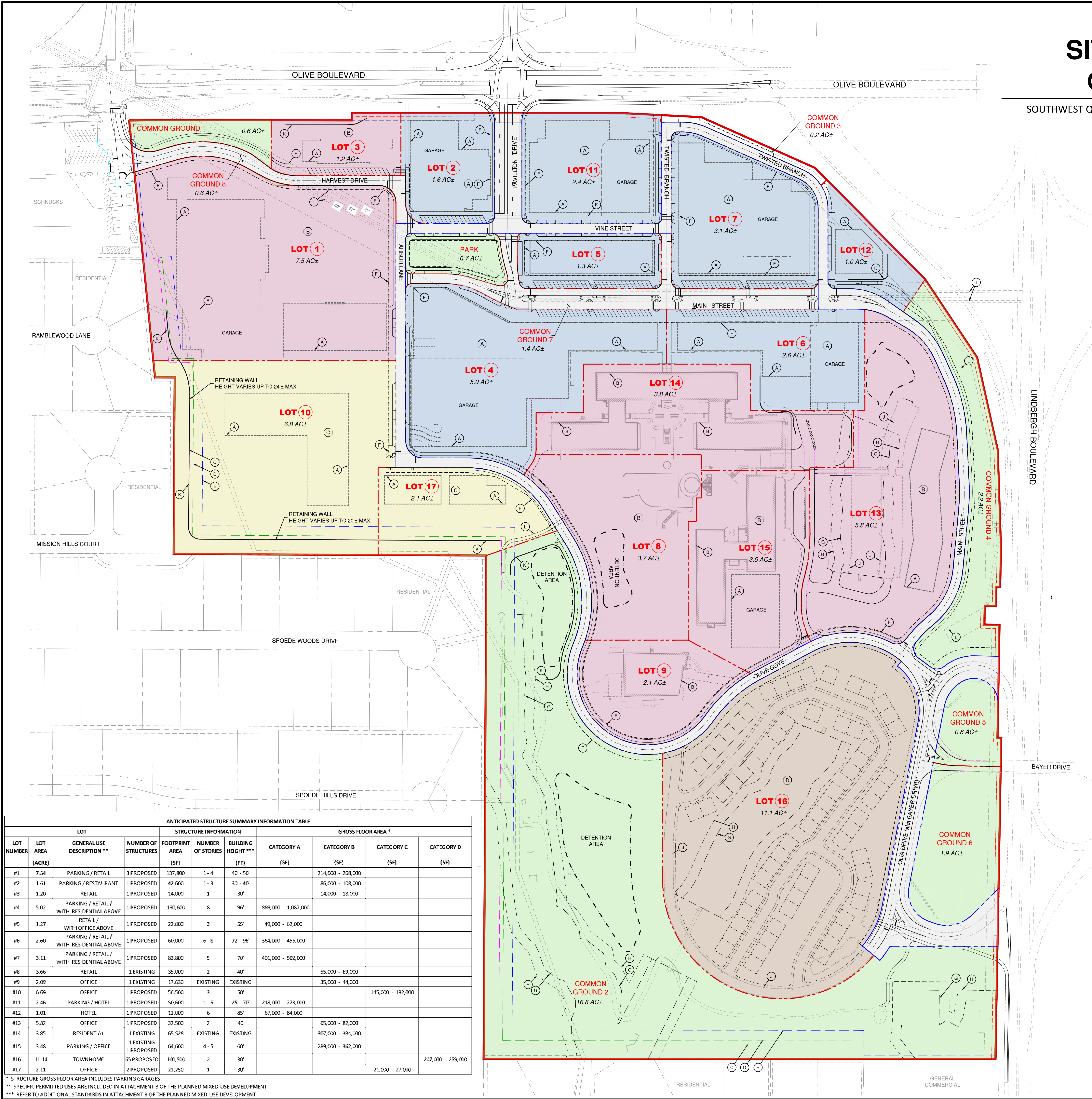
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ANTICIPATED STRUCTURE SUMMARY INFORMATION TABLE										
LOT			STRUCTURE INFORMATION			GROSS FLOOR AREA *				
LOT NUMBER	LOT AREA (ACRE)	GENERAL USE DESCRIPTION **	NUMBER OF STRUCTURES	FOOTPRINT AREA (SF)	NUMBER OF STORIES	BUILDING HEIGHT *** (FT)	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	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	1 EXISTING	17,630	EXISTING	EXISTING		35,000 - 44,000		
#10	6.69	OFFICE	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 - 394,000		
#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	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

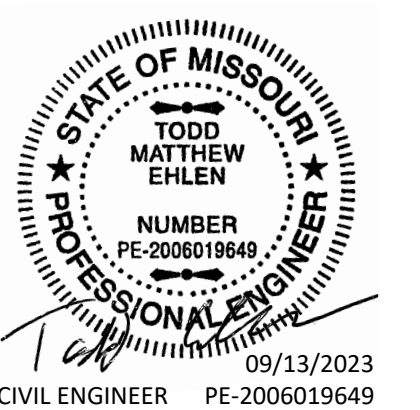
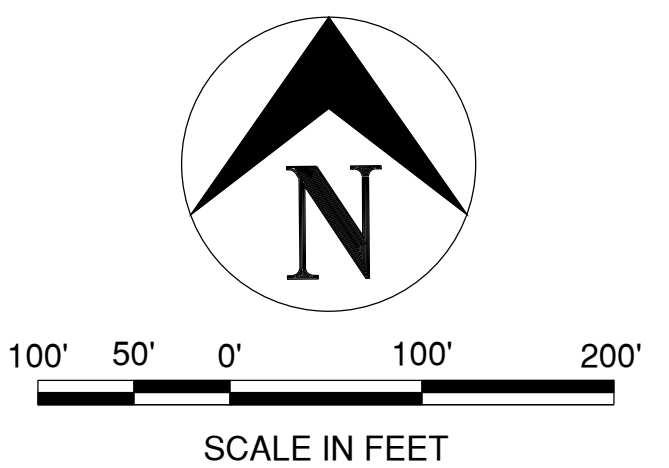
- (A) CONCEPTUAL BUILDING FOOTPRINT (TYP)
- (B) EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
- (C) 40' RESIDENTIAL BUFFER YARD (TYP)
- (D) 10' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
- (E) 35' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
- (F) 10' MINIMUM PROPOSED ROADWAY IMPROVEMENT MAINTENANCE UTILITY SEWER SIDEWALK EASEMENT (PRIMUSSE)
- (G) 50' NATURAL VEGETATION STREAM BUFFER
- (H) 25' NO-IMPERVIOUS STREAM 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
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OFFICE NO. (314) 436-5500
LICENSE NO. 184-000631

CONSULTANTS:

SITE CONCEPT PLAN



PRELIMINARY
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OLIA VILLAGE
DEVELOPMENT
LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

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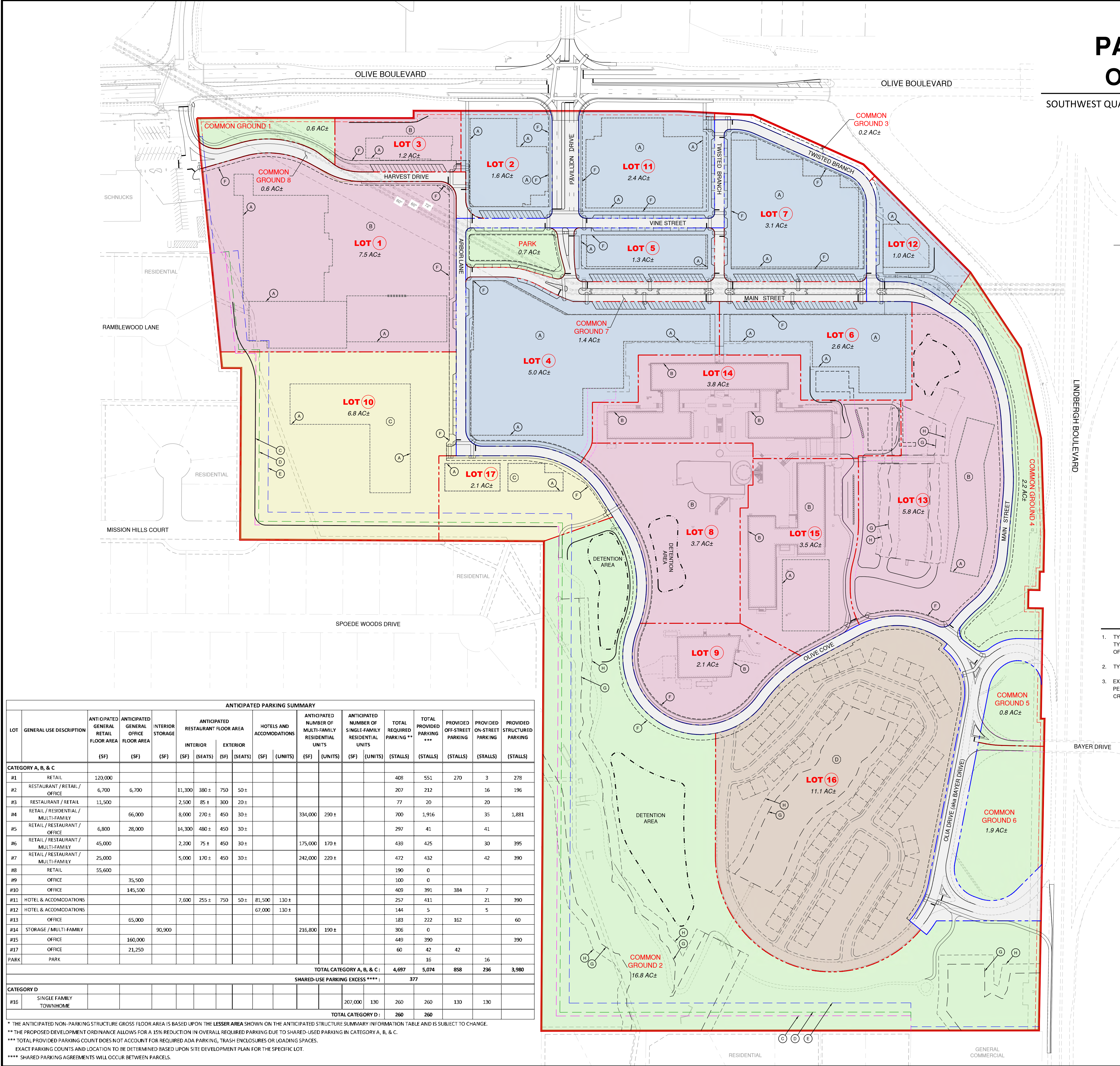
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ANTICIPATED PARKING SUMMARY																		
LOT	GENERAL USE DESCRIPTION	ANTICIPATED GENERAL RETAIL FLOOR AREA	ANTICIPATED GENERAL OFFICE FLOOR AREA	INTERIOR STORAGE	ANTICIPATED RESTAURANT FLOOR AREA		HOTELS AND ACCOMMODATIONS		ANTICIPATED NUMBER OF MULTI-FAMILY RESIDENTIAL UNITS		ANTICIPATED NUMBER OF SINGLE-FAMILY RESIDENTIAL UNITS		TOTAL REQUIRED PARKING **	TOTAL PROVIDED PARKING ***	PROVIDED OFF-STREET PARKING	PROV/DED 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		35,500											100	0			
#10	OFFICE		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		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.



PARCEL 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
- 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)
- 40' RESIDENTIAL BUFFER YARD (TYP)
- 10' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
- 35' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
- 10' SETBACK (TYP)
- 50' NATURAL VEGETATION BUFFER
- 25' NO-IMPERVIOUS BUFFER

PARKING NOTES

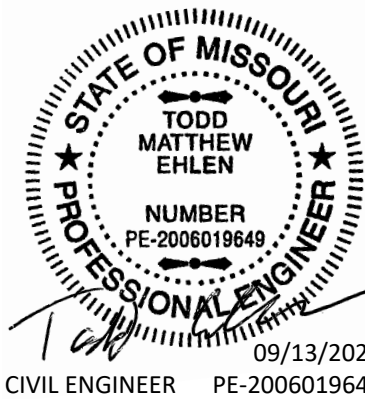
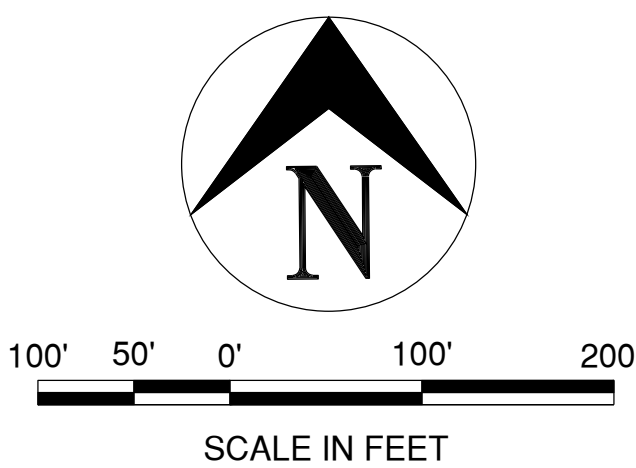
- TYPICAL PERPENDICULAR PARKING STALLS ARE 9' WIDE x 19' LONG.
TYPICAL ANGLED PARKING (60°) STALLS ARE 9' WIDE x 21' LONG TO FACE OF CURB (LENGTH MEASURED PERPENDICULAR TO FACE OF CURB).
- TYPICAL PARALLEL PARKING STALLS ARE 9' WIDE x 23' LONG.
- EXACT NUMBER AND LOCATION OF ADA STALLS TO BE DETERMINED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



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
SEPTEMBER 13, 2023

OLIA VILLAGE DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

MARK DATE DESCRIPTION

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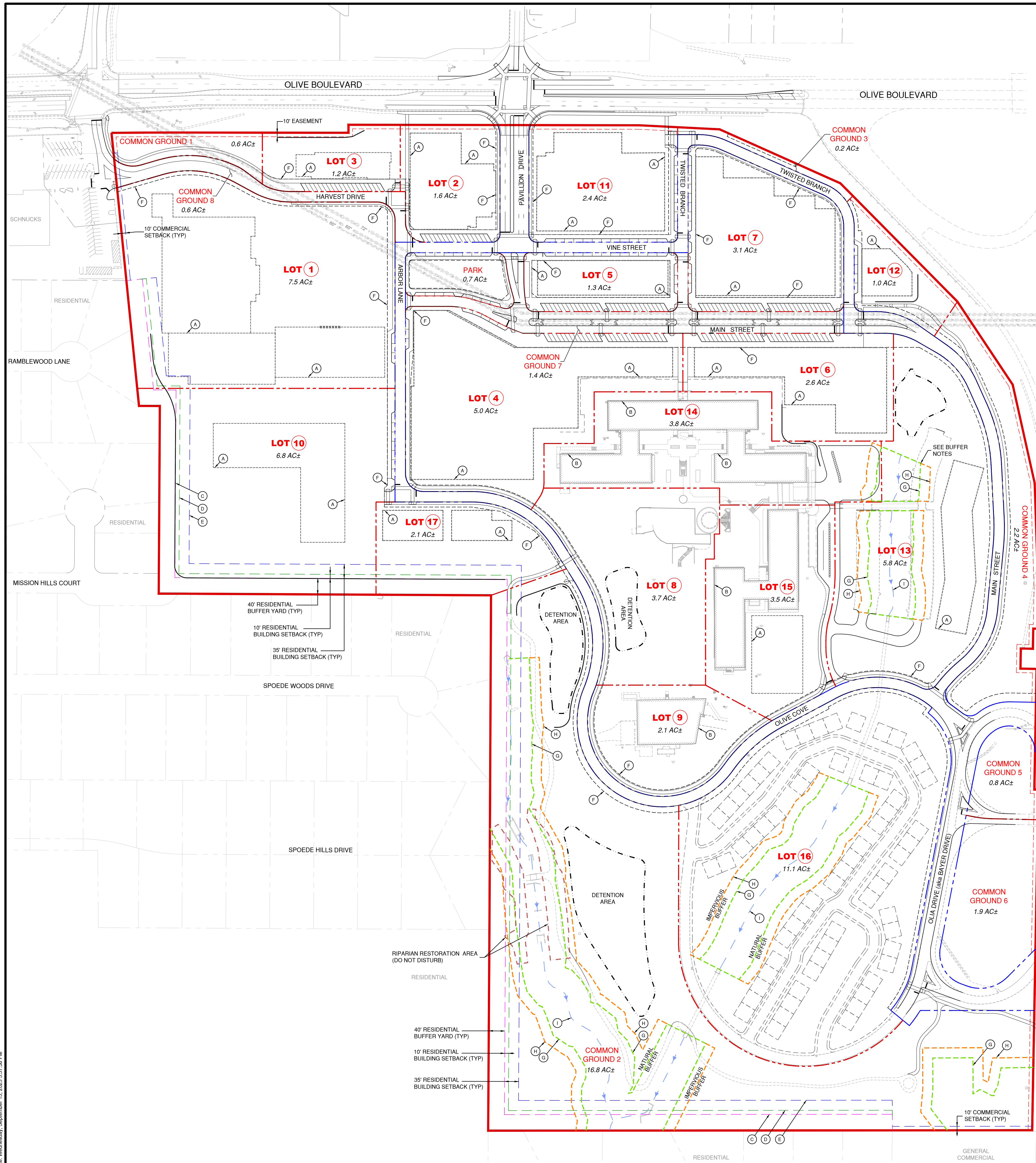
PARCEL PLAN

C-102

SHEET - OF --

SETBACK & BUFFER 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
 - PROPOSED BUILDING SETBACK

- KEYNOTES
- (A) CONCEPTUAL BUILDING FOOTPRINT (TYP)
 - (B) EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
 - (C) 40' RESIDENTIAL BUFFER YARD (TYP)
 - (D) 10' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
 - (E) 35' 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

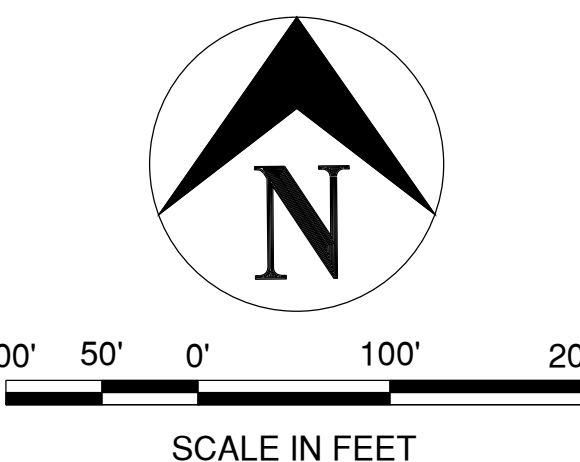
- SETBACK AND BUILDING LINE REQUIREMENTS TO ADJACENT PARCELS:
- RESIDENTIAL:
- REQUIRED BUFFER YARD - FORTY (40) FEET
 - MINIMUM RESIDENTIAL BUILDING SETBACK - TEN (10) FEET
 - MINIMUM COMMERCIAL BUILDING SETBACK - THIRTY-FIVE (35) FEET BEYOND BUFFER YARD
- NON-RESIDENTIAL:
- MINIMUM BUILDING SETBACK - TEN (10) FEET



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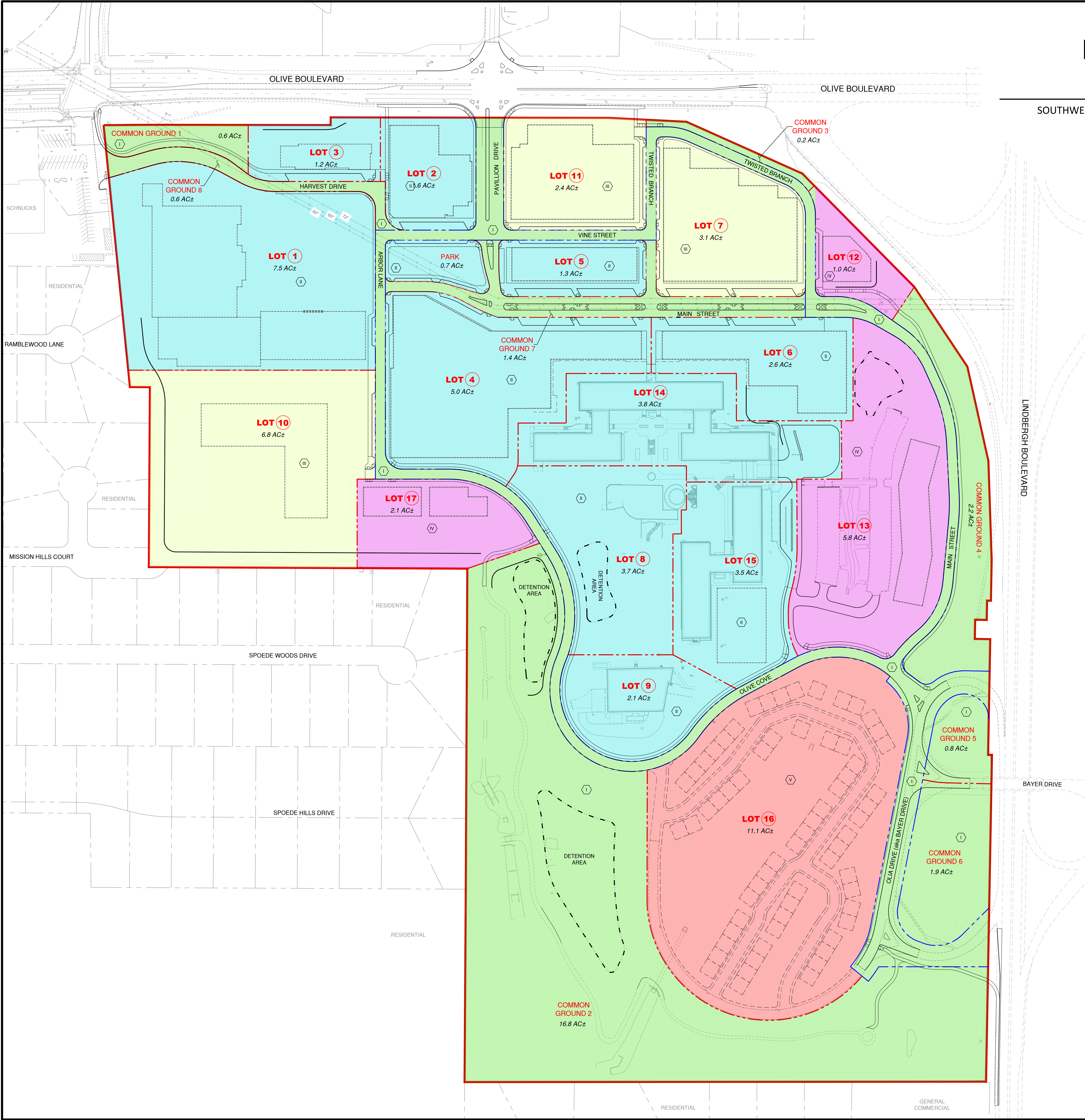
OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

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SHEET TITLE	SETBACK & BUFFER PLAN	
	C-103	
SHEET	OF	--



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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LICENSE NO. 184-000631

CONSULTANTS:

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SCALE IN FEET

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SEPTEMBER 13, 2023

**OLIA VILLAGE
DEVELOPMENT**

LINDBERGH & OLIVE BLVD

OLIA VILLAGE
THE HEART OF CREVE COEUR

CREVE COEUR, MO

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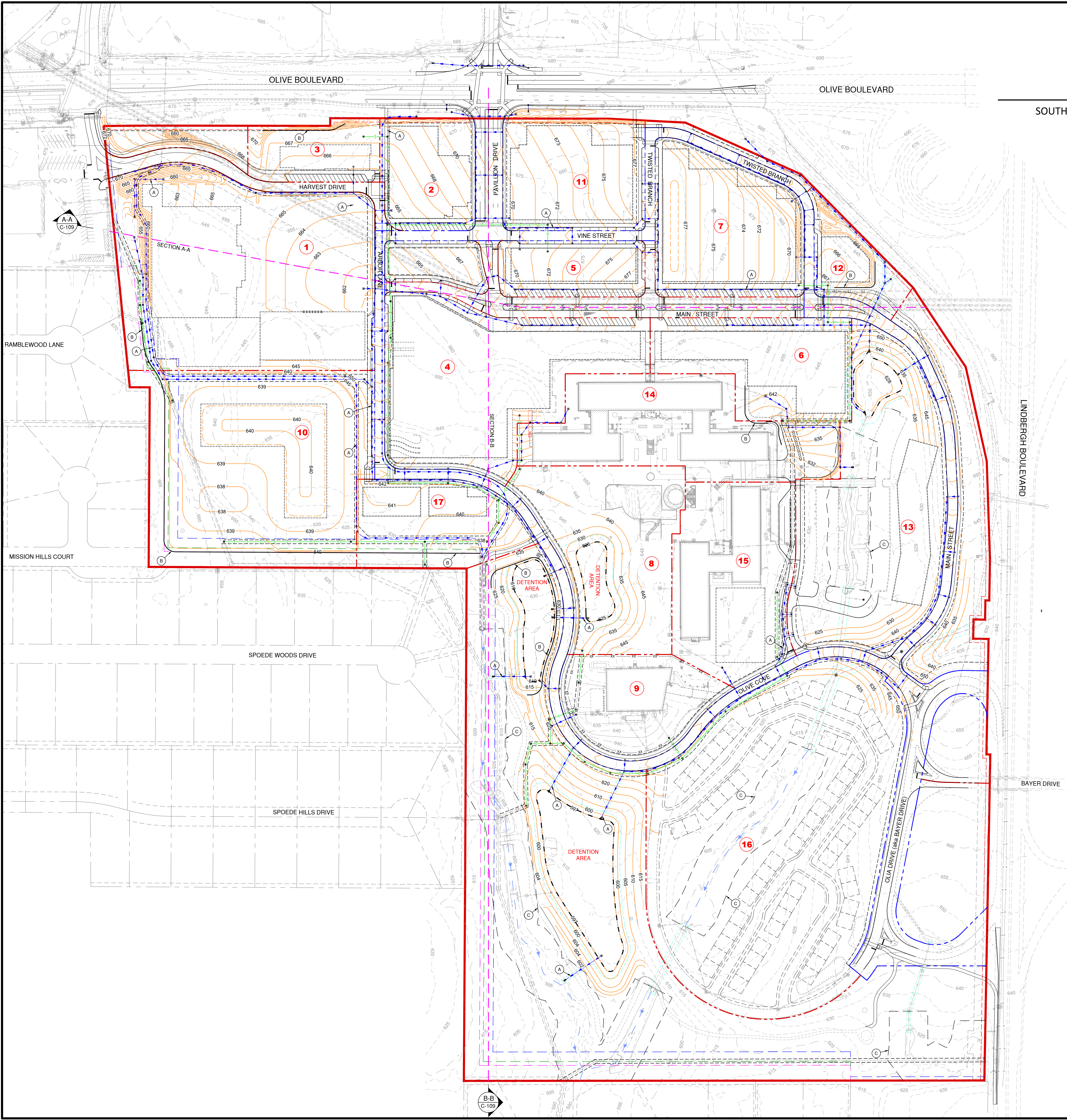
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PHASING PLAN

C-104

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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

PREPARED BY:

CMT
Crawford, Murphy & Tilly

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

CONSULTANTS:

SITE CONCEPT PLAN

100' 50' 0' 100' 200'

SCALE IN FEET

PRELIMINARY
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SEPTEMBER 13, 2023

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DEVELOPMENT**

LINDBERGH & OLIVE BLVD

OLIA VILLAGE

THE HEART OF CREVE COEUR

CREVE COEUR, MO

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SHEET TITLE

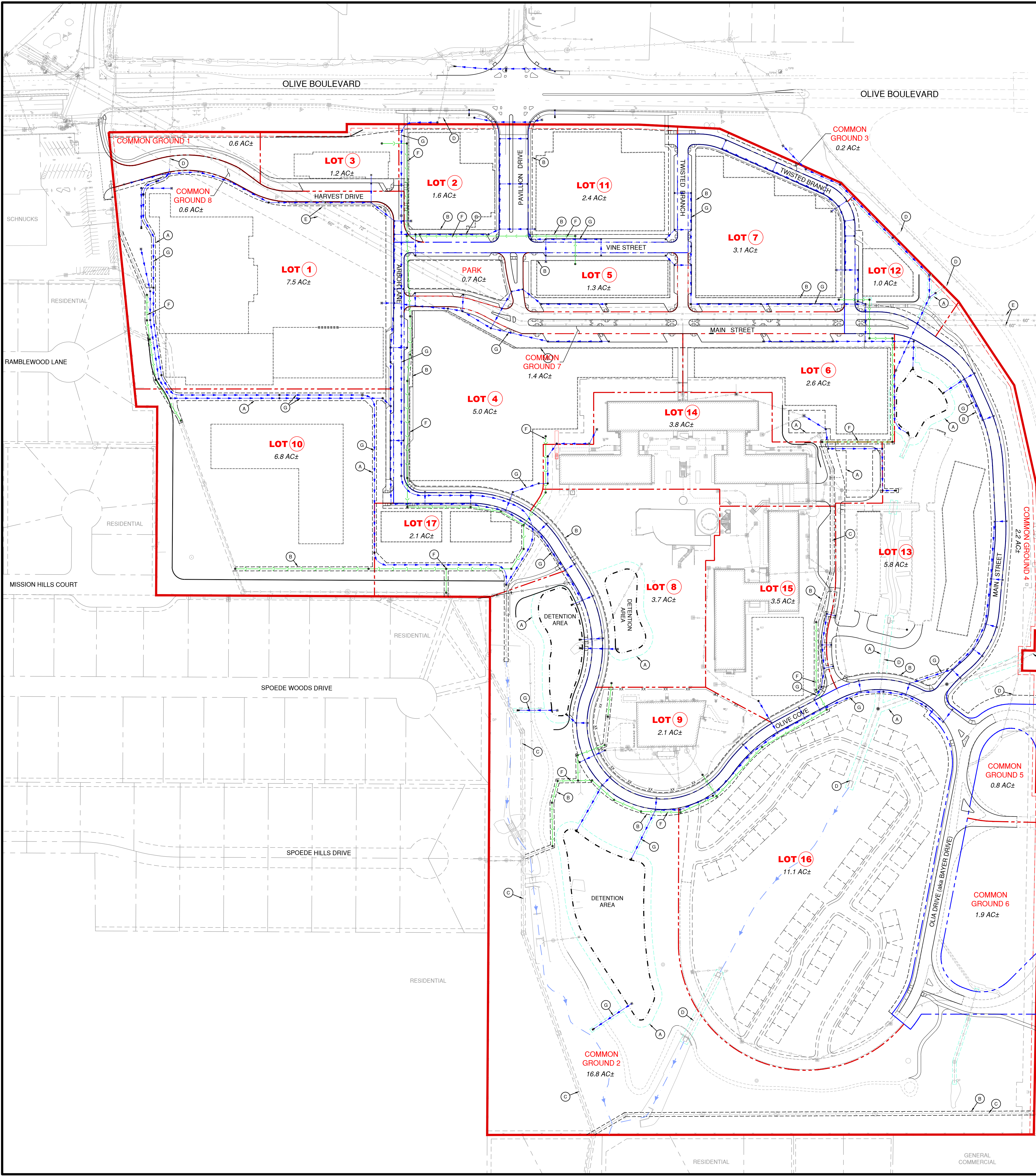
GRADING PLAN

C-105

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
 - 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

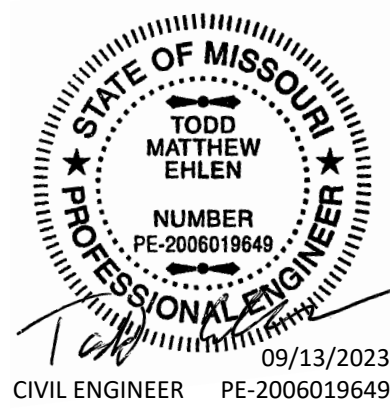
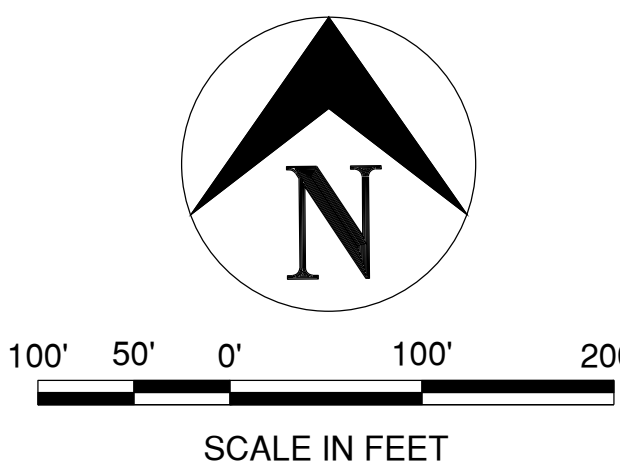
THIS PROJECT HAS BEEN SUBMITTED TO MSD FOR CONCEPTUAL REVIEW (23CNCBP-00003).
ALL STORM SEWER AND DETENTION FACILITY CALCULATIONS AND REPORTS WILL BE SUBMITTED TO MSD AND CITY OF CREVE COEUR FOR FINAL APPROVAL PRIOR TO CONSTRUCTION.



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
SEPTEMBER 13, 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

UTILITY & DRAINAGE
PLAN

C-106

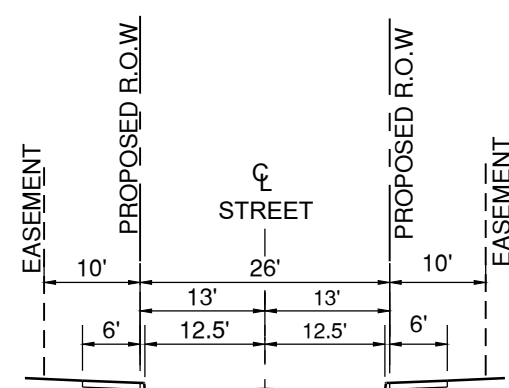
SHEET - OF --

STREET PLAN
OLIA VILLAGE

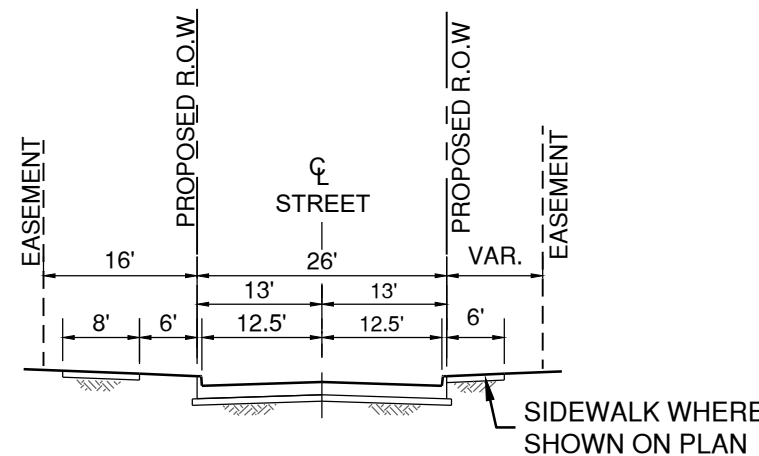
SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- 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

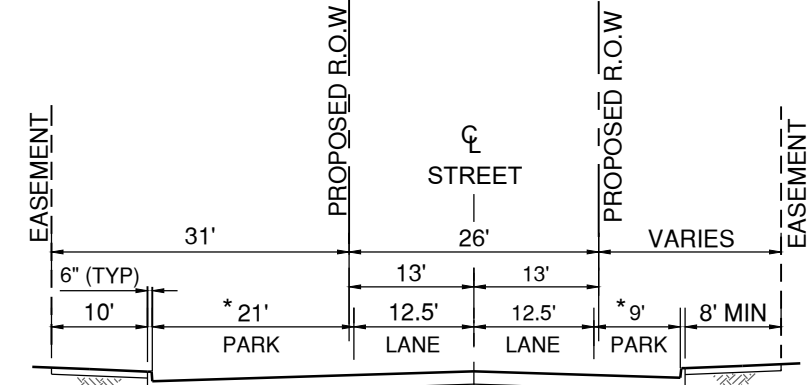
- KEYNOTES
- PROPOSED RIGHT-OF-WAY
 - PROPOSED ROADWAY IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, SIDEWALK (R.I.M.U.S.S.) EASEMENT
 - CONCEPTUAL FUTURE ENTRANCE
 - EXISTING STL WATER MAIN CONDUITS
 - EXISTING STL WATER MAIN EASEMENT



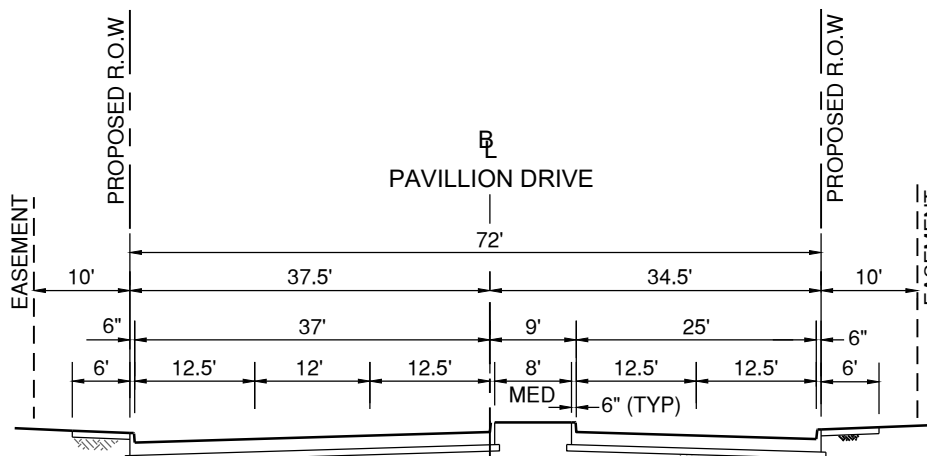
TYPICAL SECTION #1
STANDARD STREET SECTION



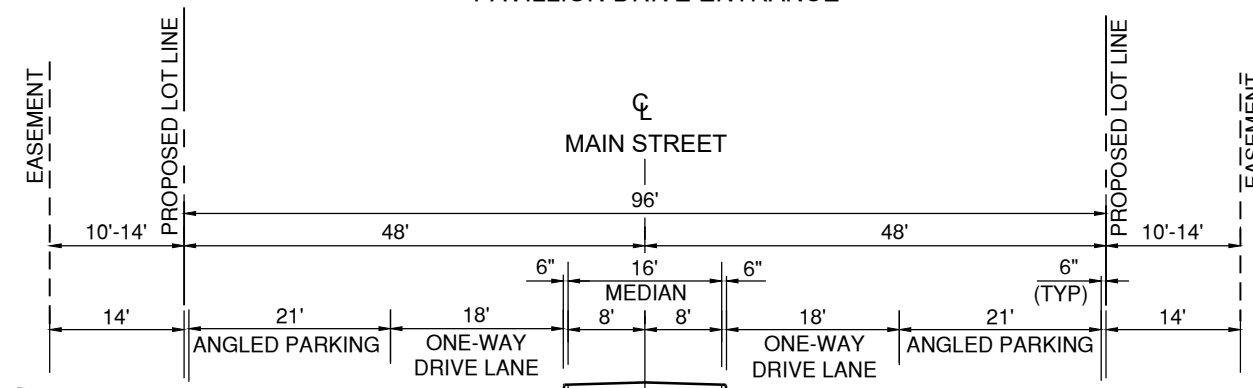
TYPICAL SECTION #2
OLIVE COVE



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
ARBOR LANE	625	0.237
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
SUB-TOTAL :	7,255	2.870
PRIVATE ROADWAYS		
PAVILLION DRIVE	180	0.068
MAIN STREET	1,120	0.424
TWISTED BRANCH	190	0.072
HARVEST DRIVE (FUTURE PUBLIC)	770	0.292
ARBOR LANE (FUTURE PUBLIC)	125	0.047
BAYER DRIVE (E/W)	220	0.083
SUB-TOTAL :	2,605	0.986
TOTAL :	9,860	3.856

GENERAL NOTES

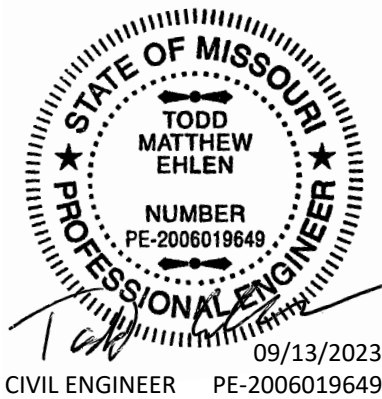
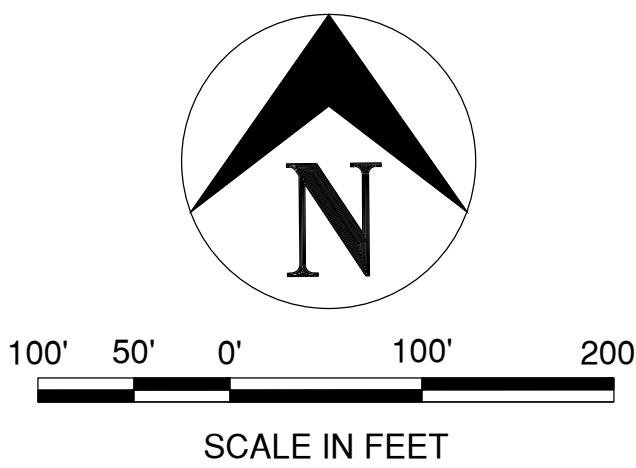
- EXISTING EASEMENTS NOT SHOWN FOR CLARITY.
- EXISTING UTILITIES NOT SHOWN FOR CLARITY.
- PROPOSED UTILITY EASEMENTS NOT SHOWN FOR CLARITY.
- PROPOSED UTILITIES NOT SHOWN FOR CLARITY.



ONE MEMORIAL DRIVE, SUITE 500
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CONSULTANTS:

SITE CONCEPT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 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

STREET PLAN

C-107

SHEET - OF --

PEDESTRIAN MOBILITY PLAN
OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

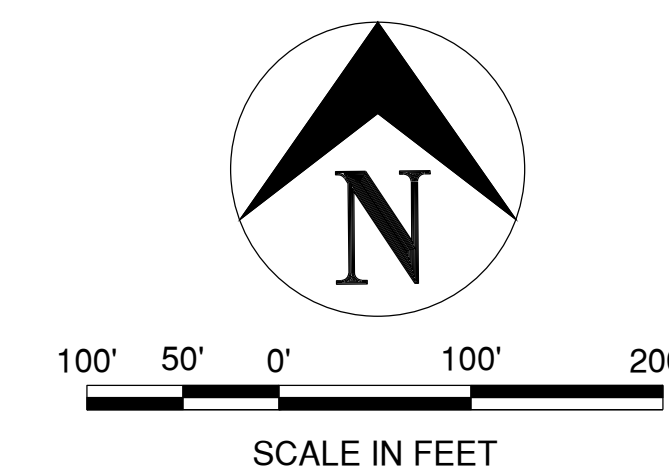
LEGEND

- 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 CONCRETE MULTI-USE SIDEWALK 8' MIN WIDE (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')

SITE CONCEPT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2023

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

PEDESTRIAN MOBILITY INFORMATION		
LOCATION	SIDEWALK LENGTH	TRAIL LENGTH
	(FT)	(FT)
PAVILLION DRIVE	840	
MAIN STREET	2,160	
MAIN STREET (EAST LEG)	1,245	
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	
LINDBERGH BLVD	300	
WEST / SOUTH TRAIL (PROPOSED)		400
WEST / SOUTH TRAIL (EXISTING)		2,210
SUB-TOTAL :	13,095	2,610
TOTAL SIDEWALK / TRAIL (FT) :	15,705	
TOTAL SIDEWALK / TRAIL (MI) :	3.0	

MARK	DATE	DESCRIPTION
PROJECT NO.:	23005201-00	
CAD DWG FILE:	ISITE-CONCEPT-PLAN.DWG	
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SHEET TITLE

PEDESTRIAN PLAN

C-108

SHEET - OF --



SHEET OF



BIRDS EYE VIEW LOOKING SOUTHWEST

PREPARED BY:



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

BIRDS EYE VIEW

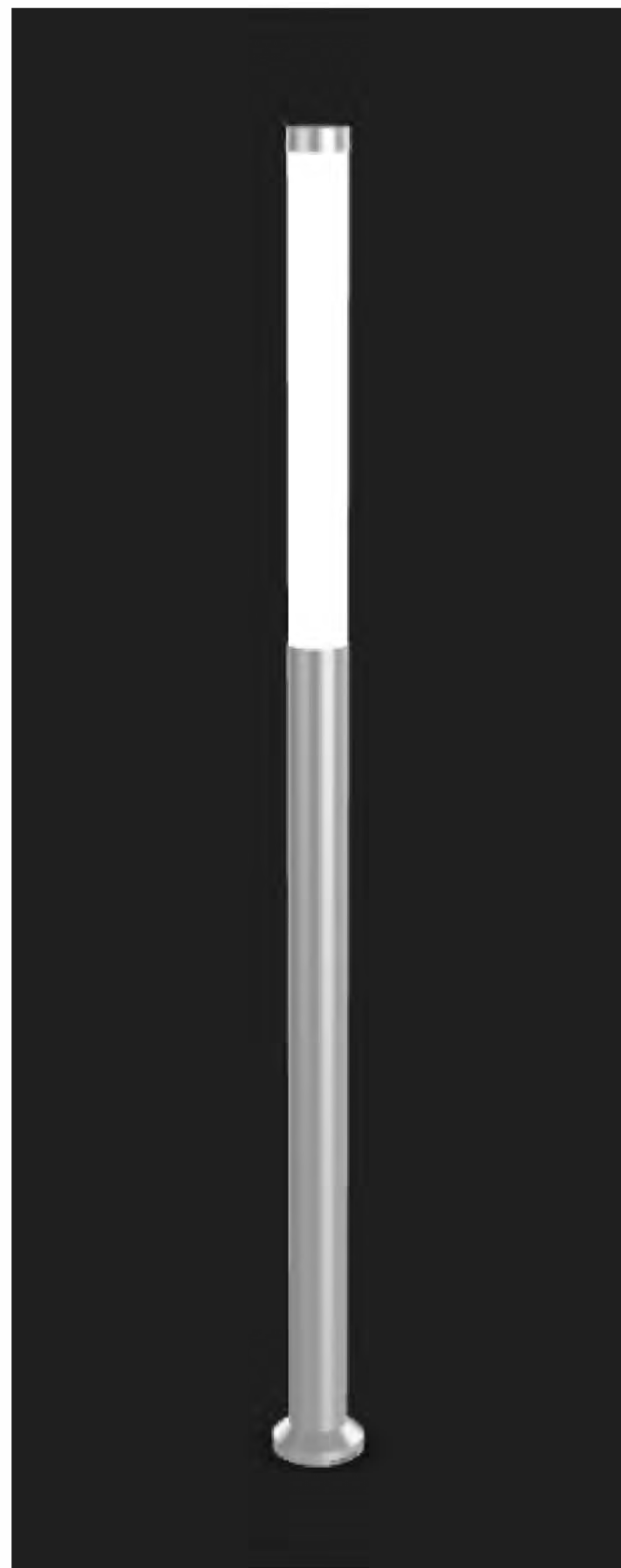
A-102
SHEET 2 OF 6

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

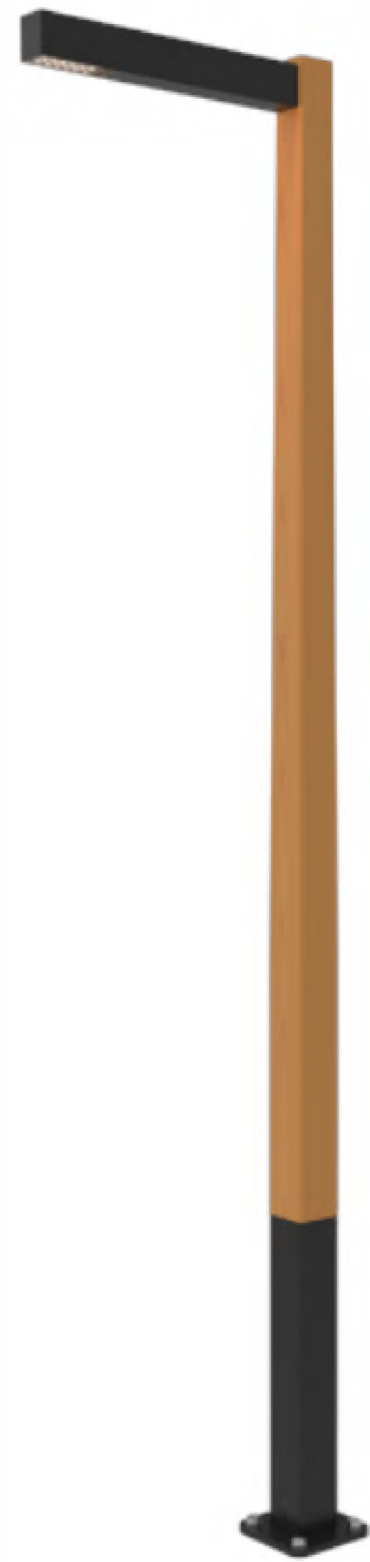
TYPE A1/A2



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



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
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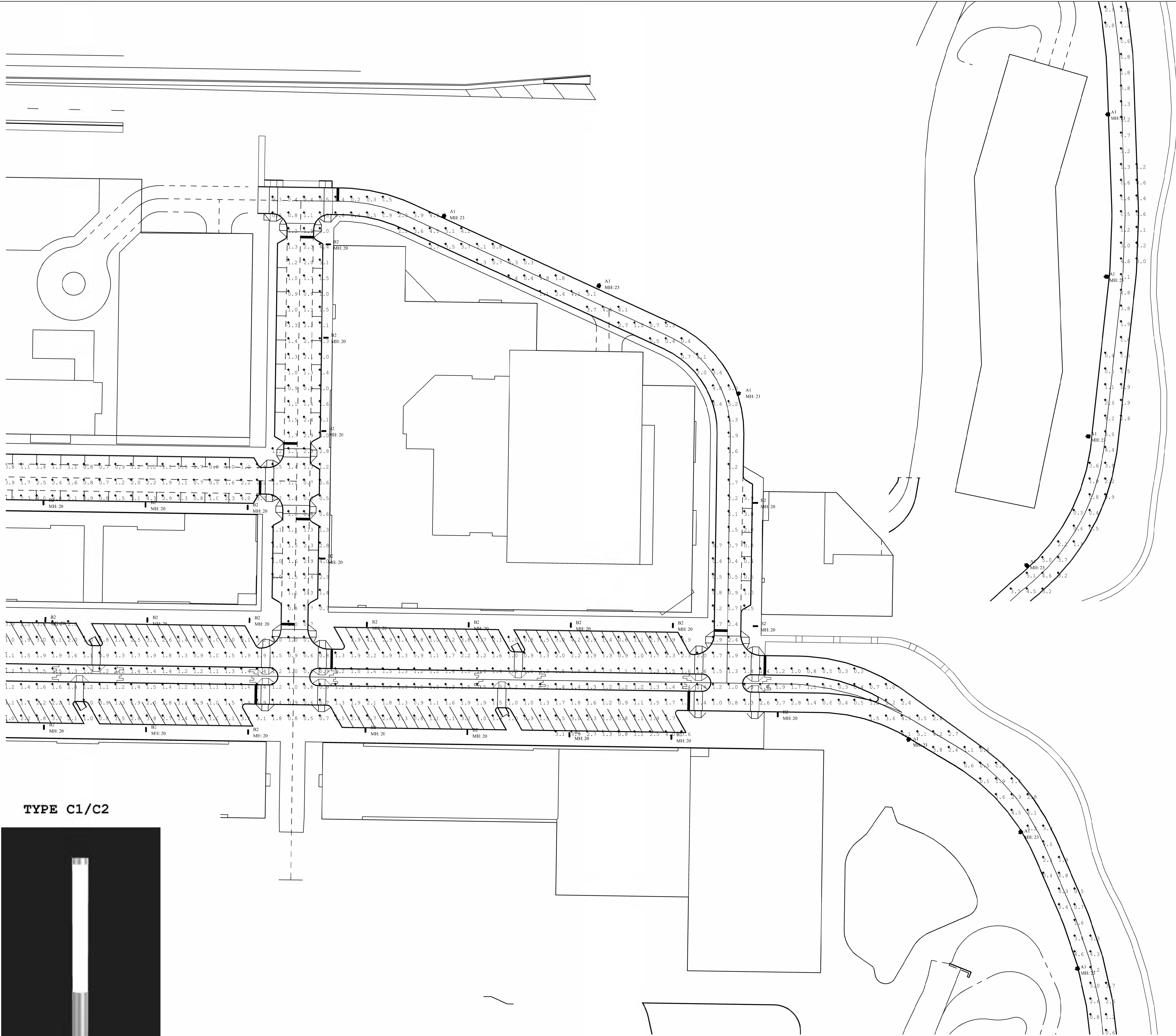
SHEET TITLE

SITE LIGHTING

A-103.1

SHEET

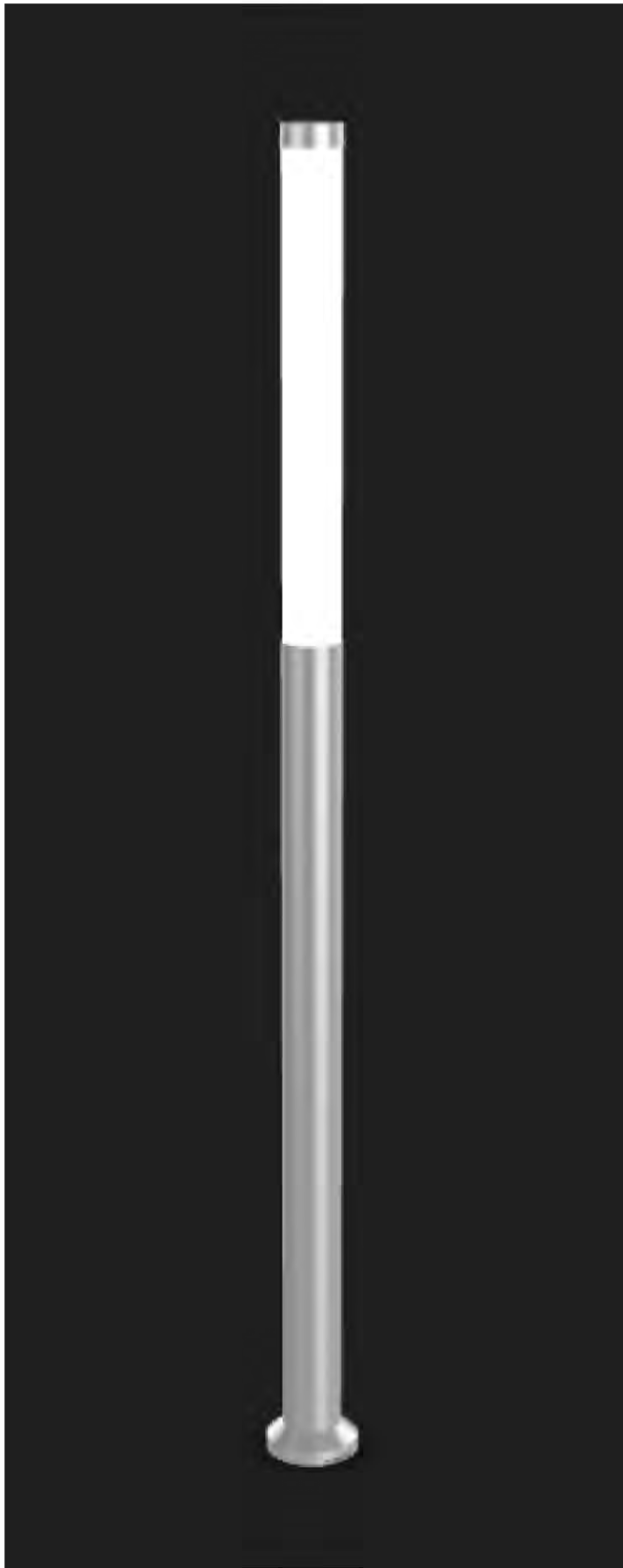
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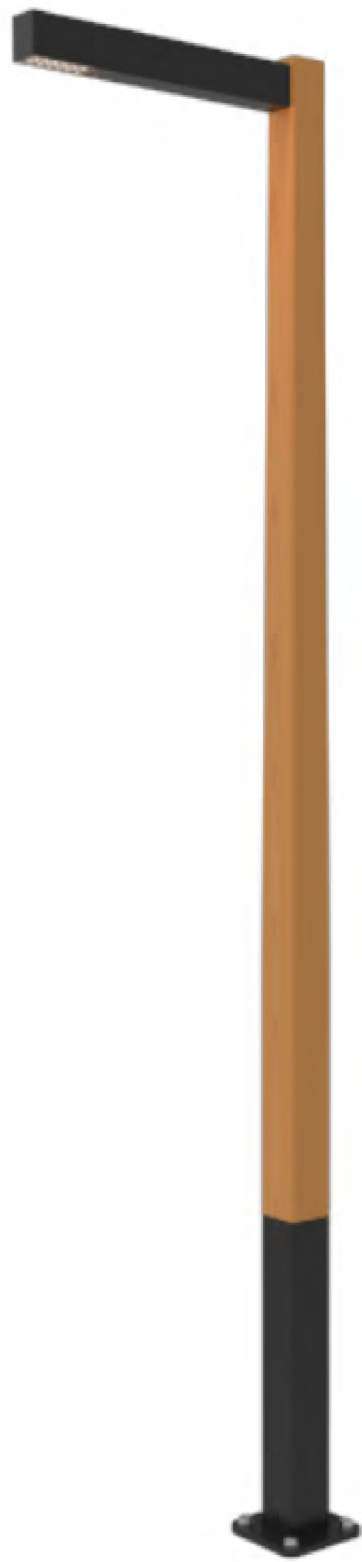
TYPE A1/A2



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-SL 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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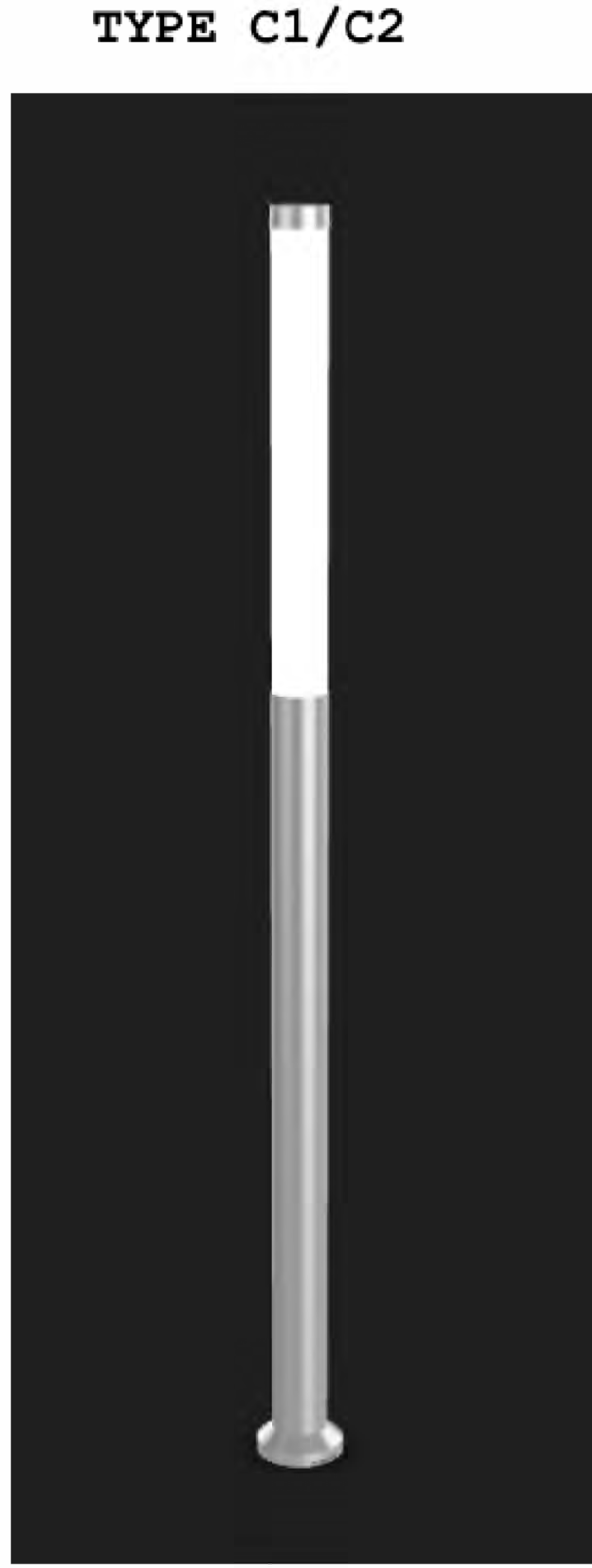
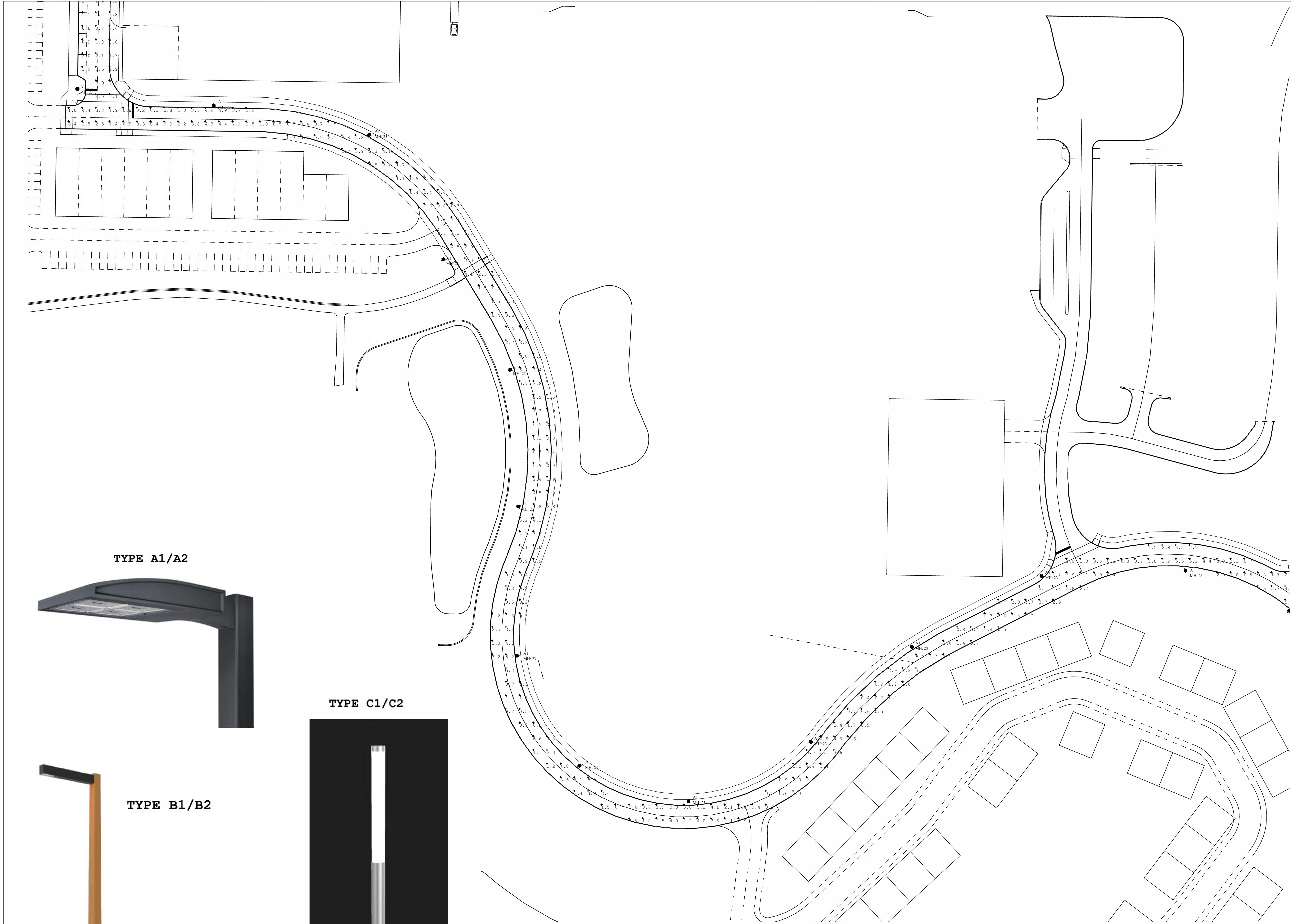
SHEET TITLE

SITE LIGHTING

A-103.2

SHEET

OF



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

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SHEET TITLE

SITE LIGHTING

A-103.3

SHEET

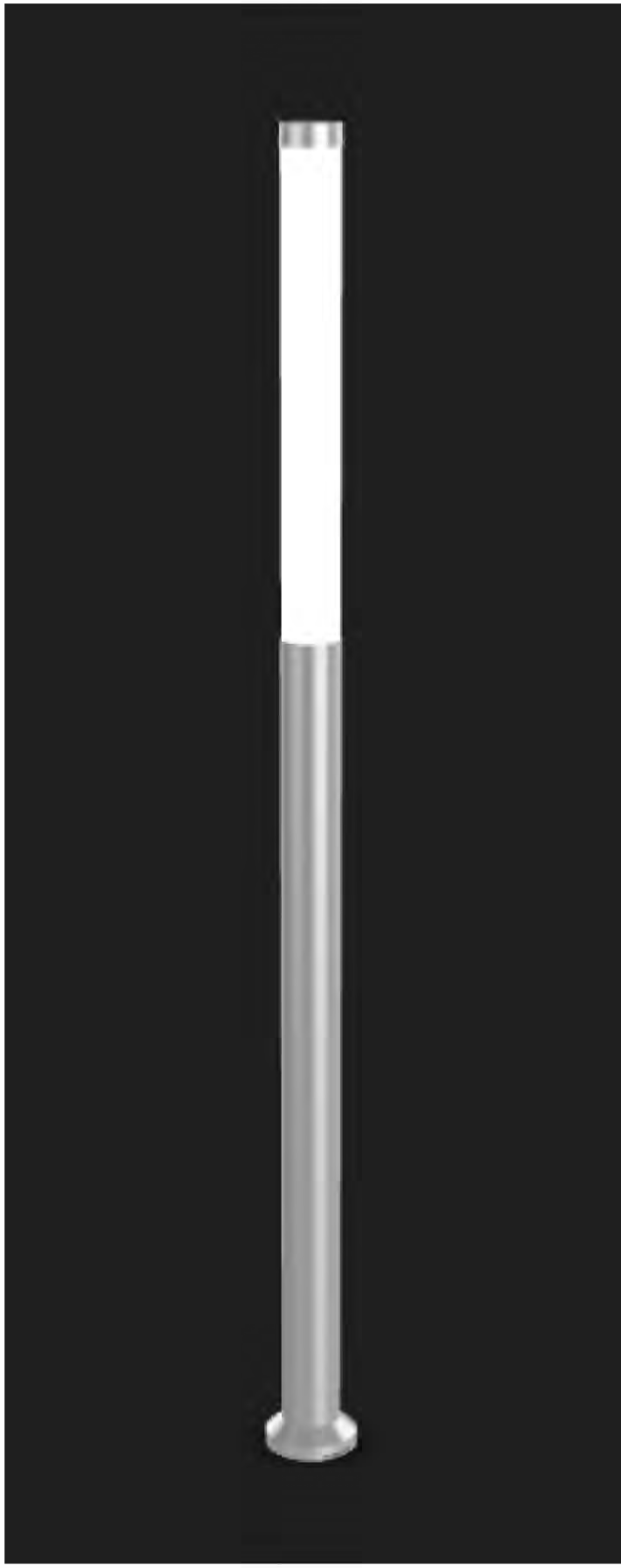
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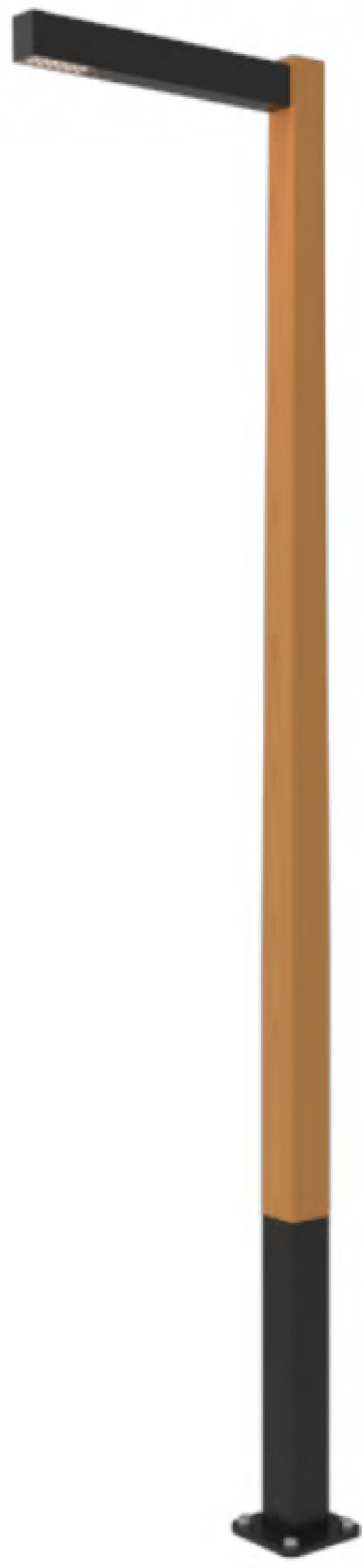
TYPE A1/A2



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-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
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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:

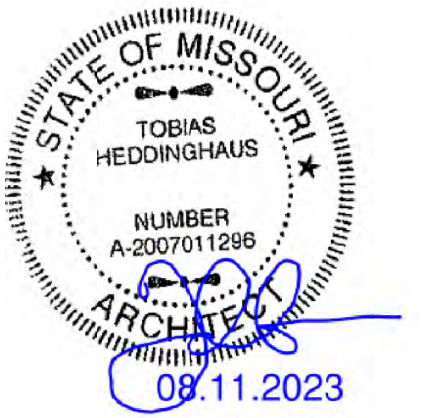
Conceptual Elevations are for illustrative purposes only and final elevations will be submitted as part of the Site Development Plan application for each phase.

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

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

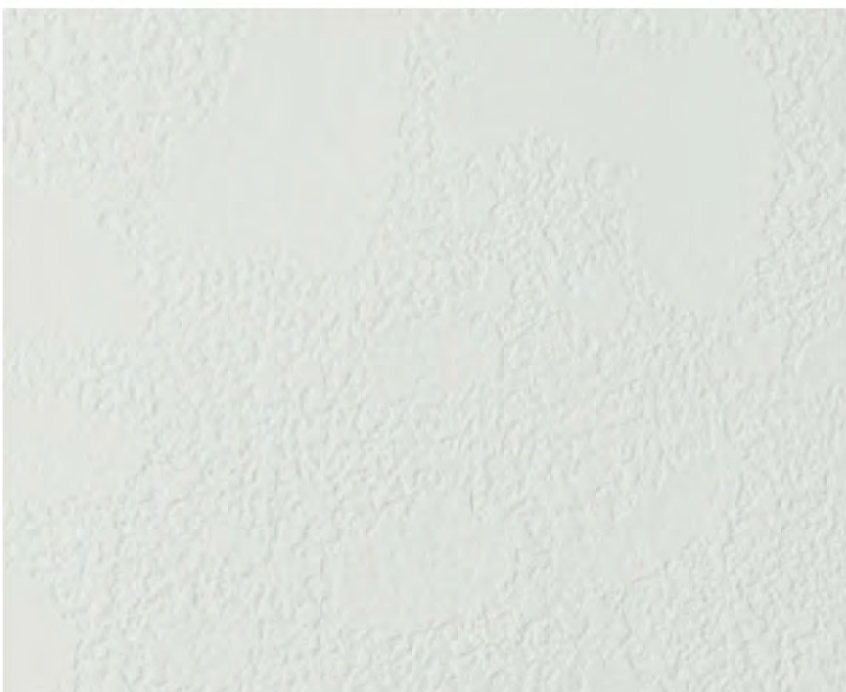
ELEVATIONS

A-104

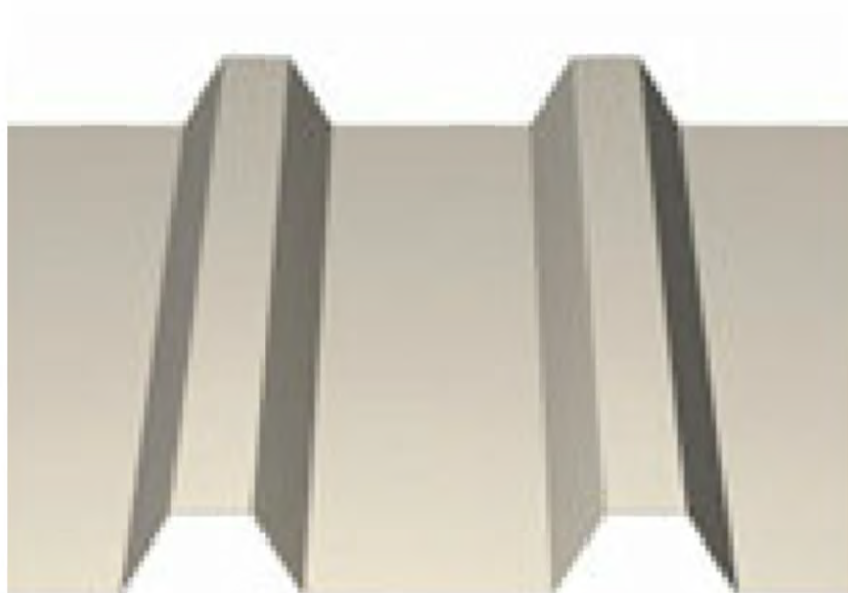
SHEET 4 OF 6



FIBER CEMENT PANEL



FIBER CEMENT PANEL



METAL PANEL



METAL PANEL



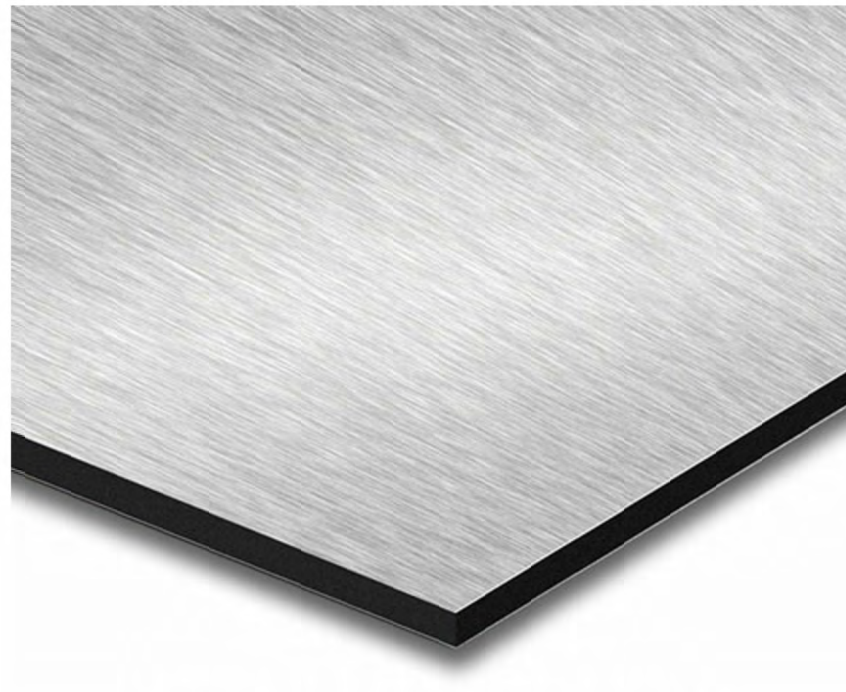
BRICK



STONE



COMPOSITE METAL PANEL



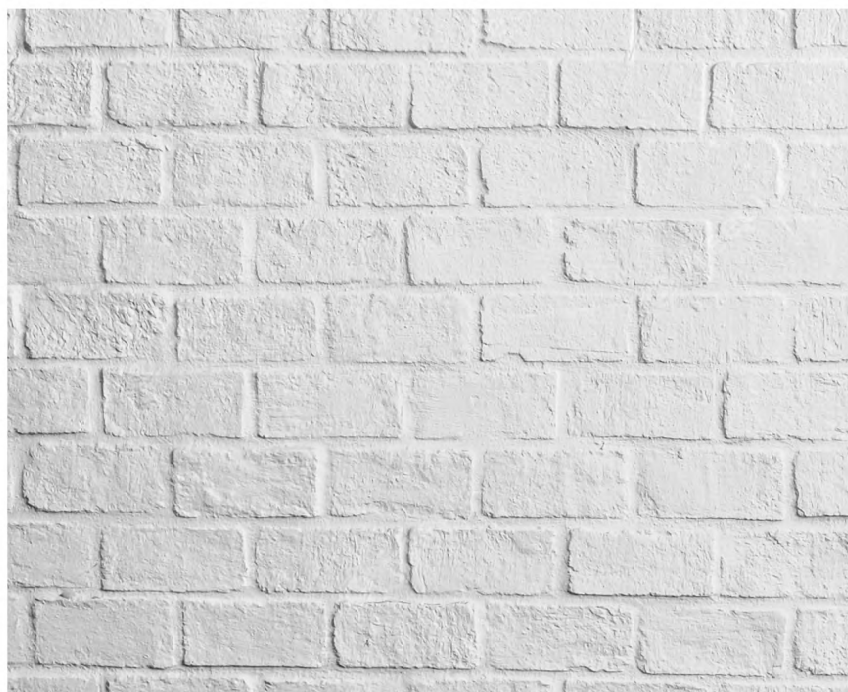
COMPOSITE METAL PANEL



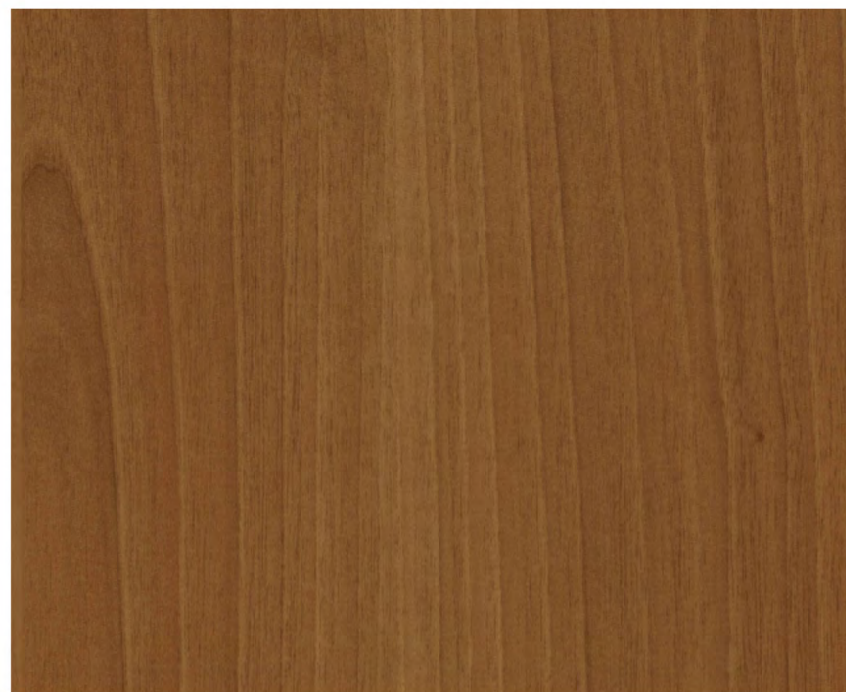
BRICK



BRICK

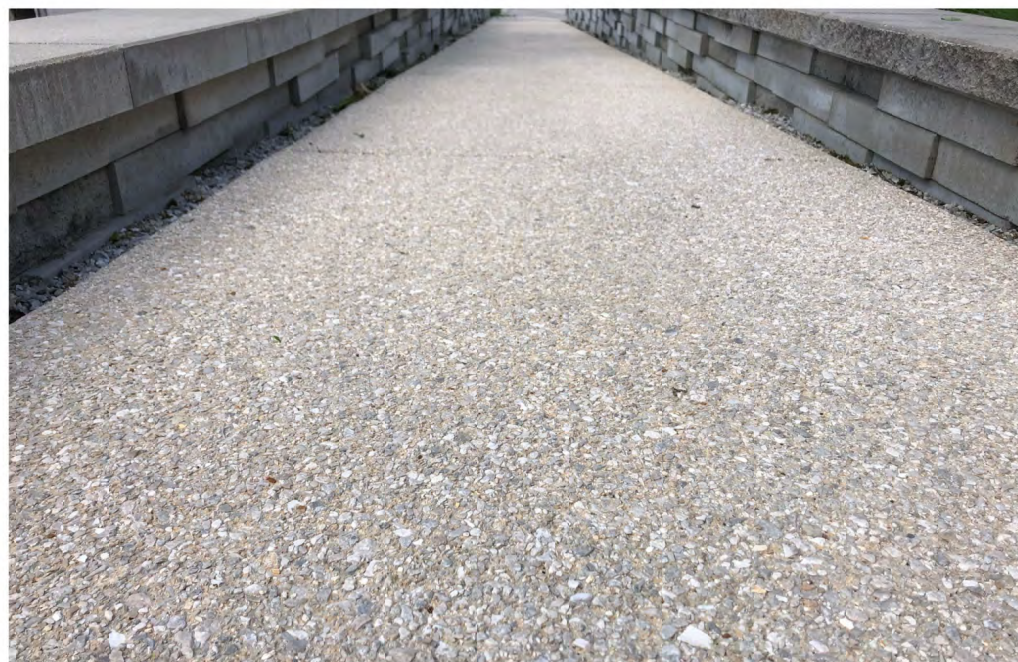


BRICK



WOOD PHENOLIC PANEL

ARCHITECTURAL MATERIALS



EXPOSED AGGREGATE SURFACES



PAVERS



PLANTERS



BENCHES



LANDSCAPE RAILS

SITE FURNISHINGS AND MATERIALS

PREPARED BY:

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:
		COPYRIGHT: GRAY DESIGN GROUP, INC. 2023

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 10:55:52 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.
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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:		
COPYRIGHT:	GRAY DESIGN GROUP, INC. 2023	
SHEET TITLE		
RENDERED VIEW		
A-106		
SHEET	6	OF 6

P:\10300\103001125712 - Bayview West Masterplanning\5-SD\ACAD\Zoning Documents\Gray Renderings A.dwg

Page 53 of 656



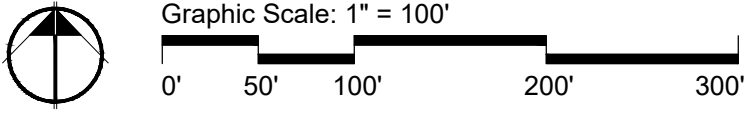
GENERAL NOTE
1. TREES SHOWN TO BE REMOVED AND TO REMAIN ARE BASED ON CONCEPTUAL SITE DESIGN AND GRADING DRAWINGS DATED 9/13/23 AND ARE SUBJECT TO CHANGE

LEGEND

	TREE OR TREE MASS TO REMAIN (50%)
	TREE OR TREE MASS TO BE REMOVED (50%)

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'



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.



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



PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2023

OLIA VILLAGE
DEVELOPMENT
LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
3	9/13/23	LANDSCAPE CONCEPT PLANS
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

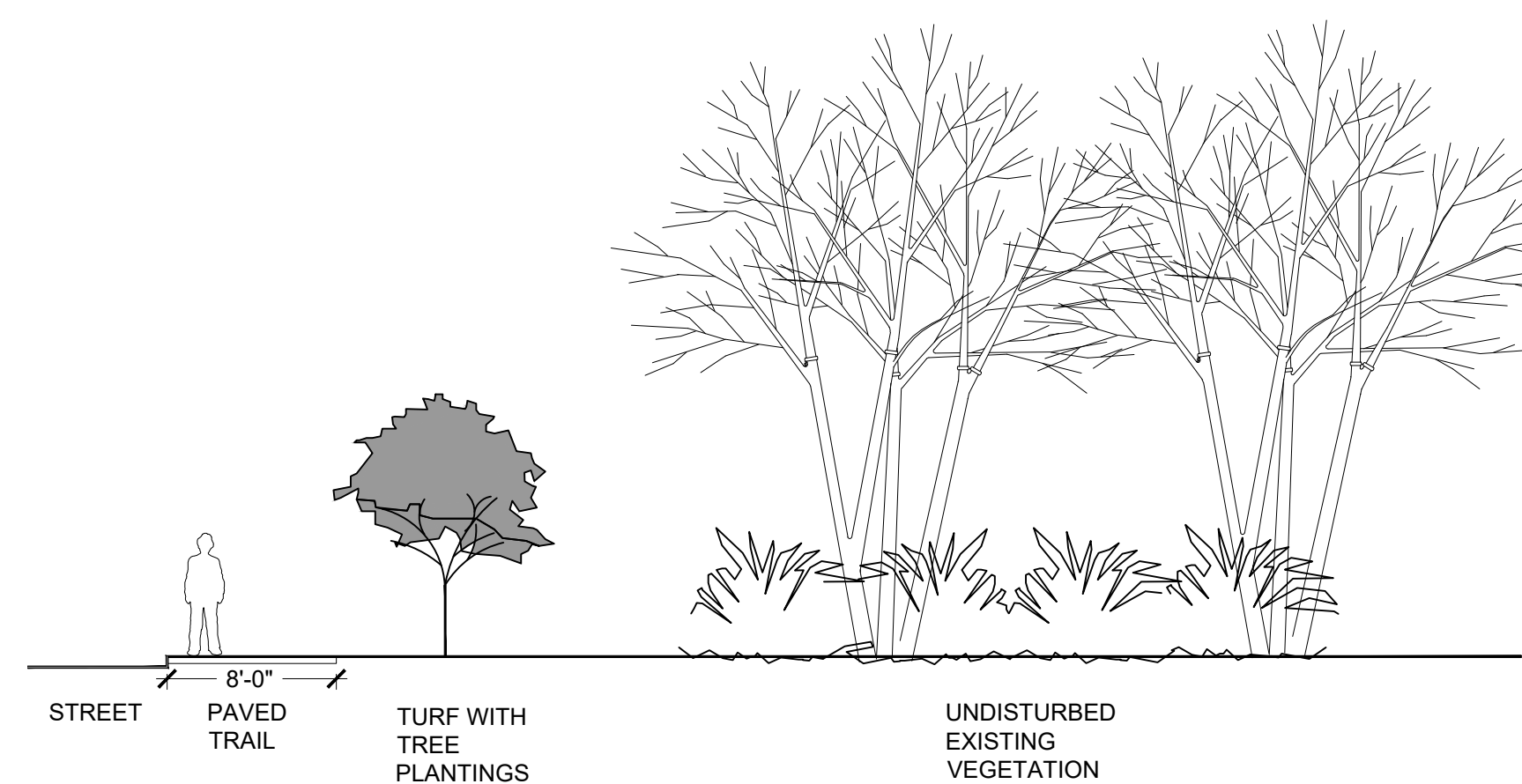
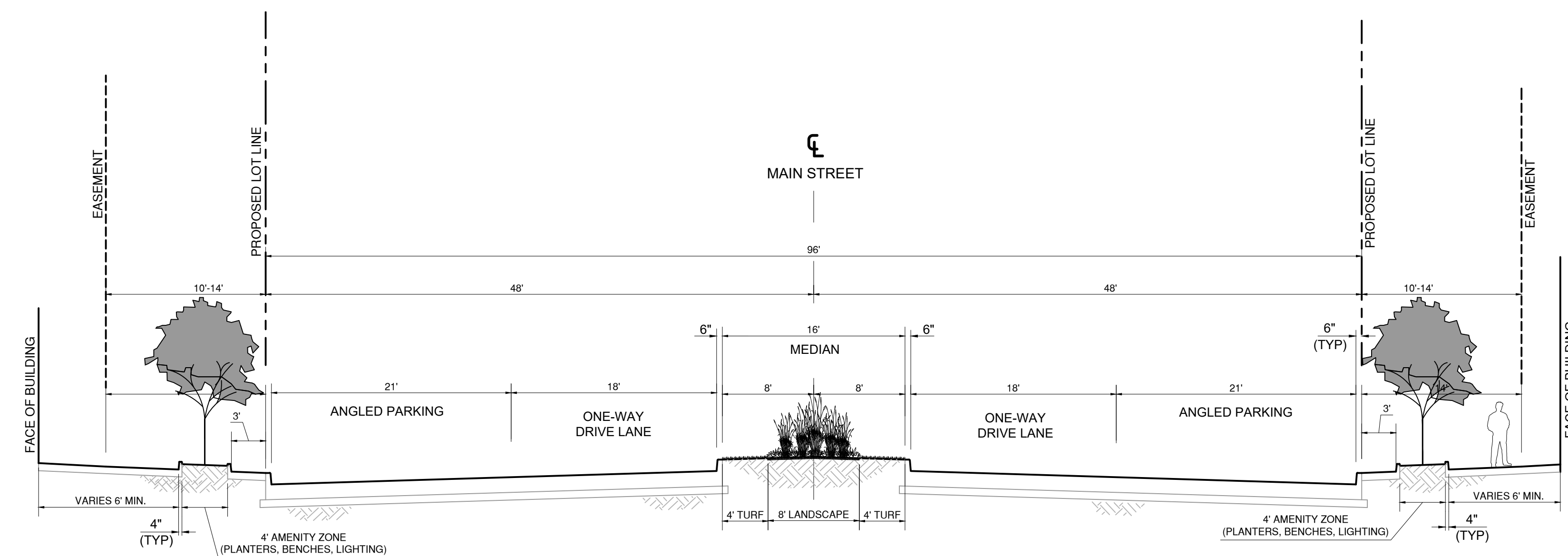
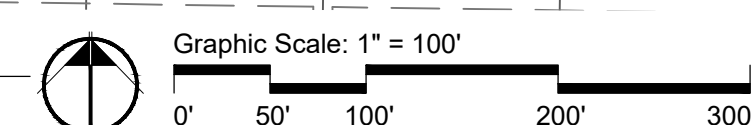
LD-100

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 PALLETTE WILL BE USED AS
A REFERENCE WHEN DETERMINING FINAL PLANT MATERIAL
- BUFFER PLANTING
PLANTING BUFFER TO CONSIST OF COMBINATION
OF EVERGREEN TREES, DECIDUOUS SHRUBS, AND
PRIVACY FENCING
- 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.

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

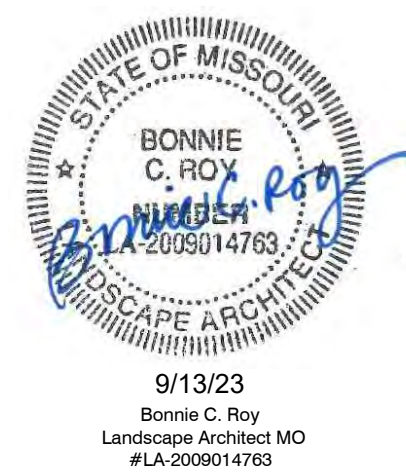


ONE MEMORIAL DRIVE, SUITE 500
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LICENSE NO. 184-000631

CONSULTANTS:



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



PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2023

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
3	9/13/23	LANDSCAPE CONCEPT PLANS
2	8/11/23	LANDSCAPE CONCEPT PLANS
1	7/21/23	LANDSCAPE CONCEPT PLANS

PROJECT NO: 230925201-00
CAD DWG FILE: 21585_01_SHEETS_PLANTING.DWG
DESIGNED BY: WH
DRAWN BY: MB/ZTS
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APPROVED BY: BR
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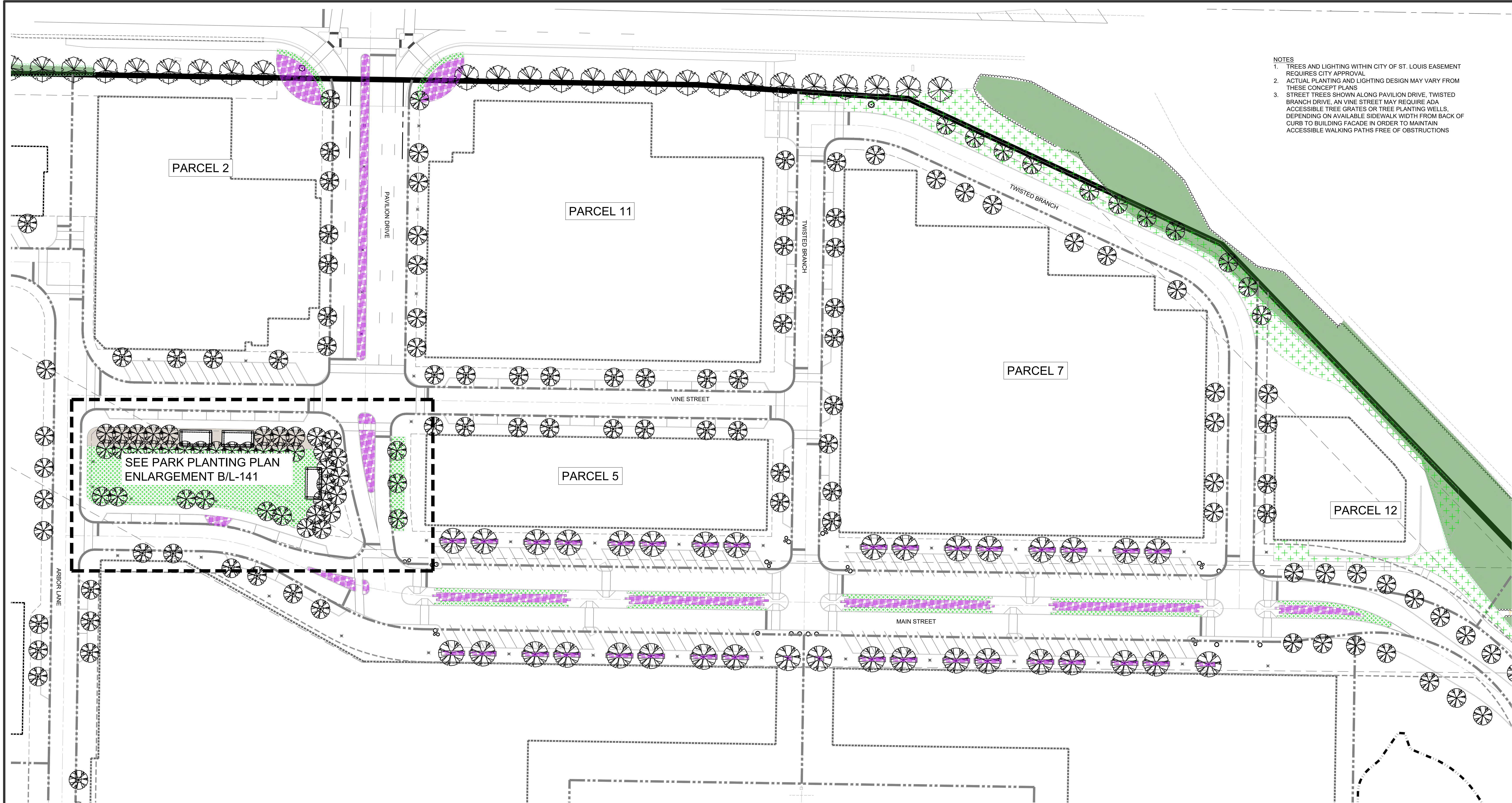
SHEET TITLE

OVERALL CONCEPT
PLANTING PLAN

L-140

SHEET 2 OF 3





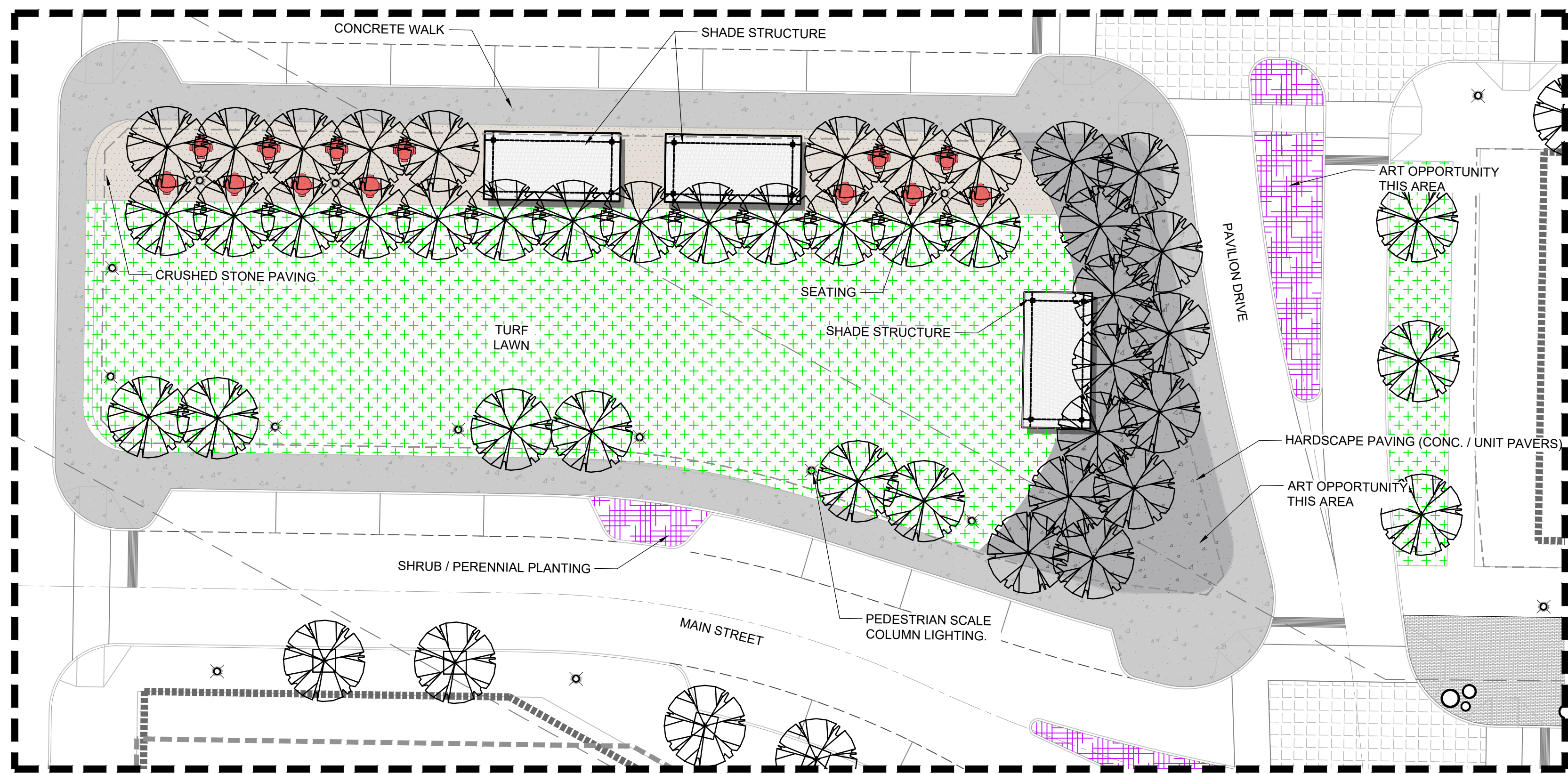
A MAIN STREET PLANTING PLAN
SCALE: 1"=40'

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.
39NROTH 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.



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
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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:



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



9/13/23
Bonnie C. Roy
Landscape Architect MO
#LA-000014783

PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2023

OLIA VILLAGE
DEVELOPMENT
LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD.
CREVE COEUR, MO 63141

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PROJECT NO.: 2309201-00		
CAD DWG FILE: 21585.01_SHEETS_PLANTING.DWG		
DESIGNED BY: WH		
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SHEET TITLE

ENLARGEMENT
PLANTING PLANS

L-141

SHEET 3 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.

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

SEPTEMBER 13, 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

SITE BENCHMARK :

13294 NAVD88 (SLC2011a) ELEV = 674.60 FIUS
NGVD29 ELEV = 674.91 FIUS

FOUND "SQ" ON TOP OF THE NORTH SIDE OF THE ROUND CONCRETE BASE OF A TRAFFIC SIGNAL
ON A TRAFFIC ISLAND SITUATED NORTHEAST OF THE INTERSECTION OF OLIVE BOULEVARD WITH
PAVILLION DRIVE, AND SOUTHWEST OF THE RIGHT TURN LANE FROM WESTBOUND OLIVE
BOULEVARD ONTO NORTHBOUND PAVILLION DRIVE

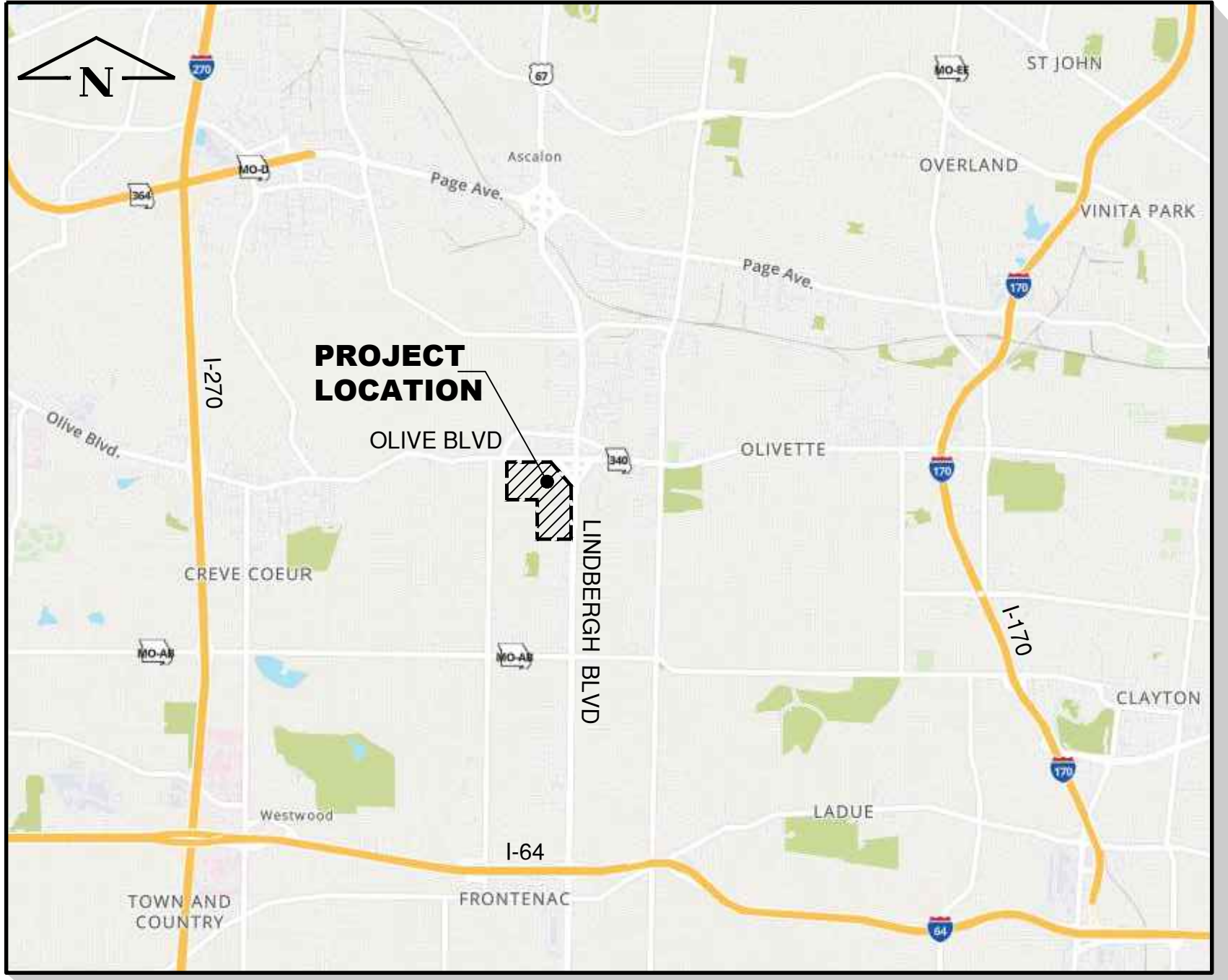
SP MO EAST N=315174± E=257868±
ROUGH NAD 83 LAT=38.673342° ± (N+) LONG=-90.409581° ± (W-)

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.



VICINITY MAP
(NOT TO SCALE)

SHEET INDEX	
C-100	TITLE SHEET
C-101	SITE OVERVIEW
C-102	SETBACK AND BUFFER PLAN
C-103	GRADING PLAN
C-104	UTILITY & DRAINAGE PLAN
C-105	PEDESTRIAN PLAN
C-106	SITE SECTIONS
A-103.1-4	SITE LIGHTING PLAN
LD-100	TREE PRESERVATION PLAN
L-140	PLANTING PLAN

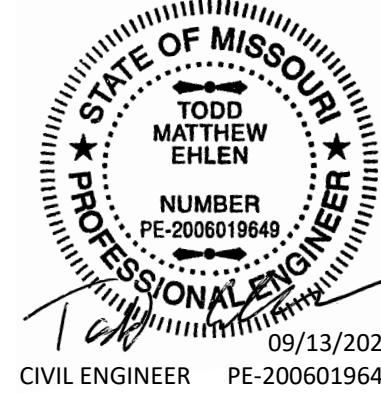
SITE DEVELOPMENT CALCULATION NOTES

- GROSS FLOOR AREA RATIO (FAR) = N/A
- IMPERVIOUS LAND COVERAGE SUMMARY:
IMPERVIOUS = 29.4 AC (30.7%)
PERVIOUS = 66.4 AC (69.3%)
TOTAL SITE = 95.8 AC (100%)
- LAND SUMMARY :
LOT ACREAGE = 64.7 AC
COMMON GROUND = 25.3 AC
PUBLIC ROADWAY = 5.8 AC
TOTAL SITE = 95.8 AC



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

CONSULTANTS:



PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 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

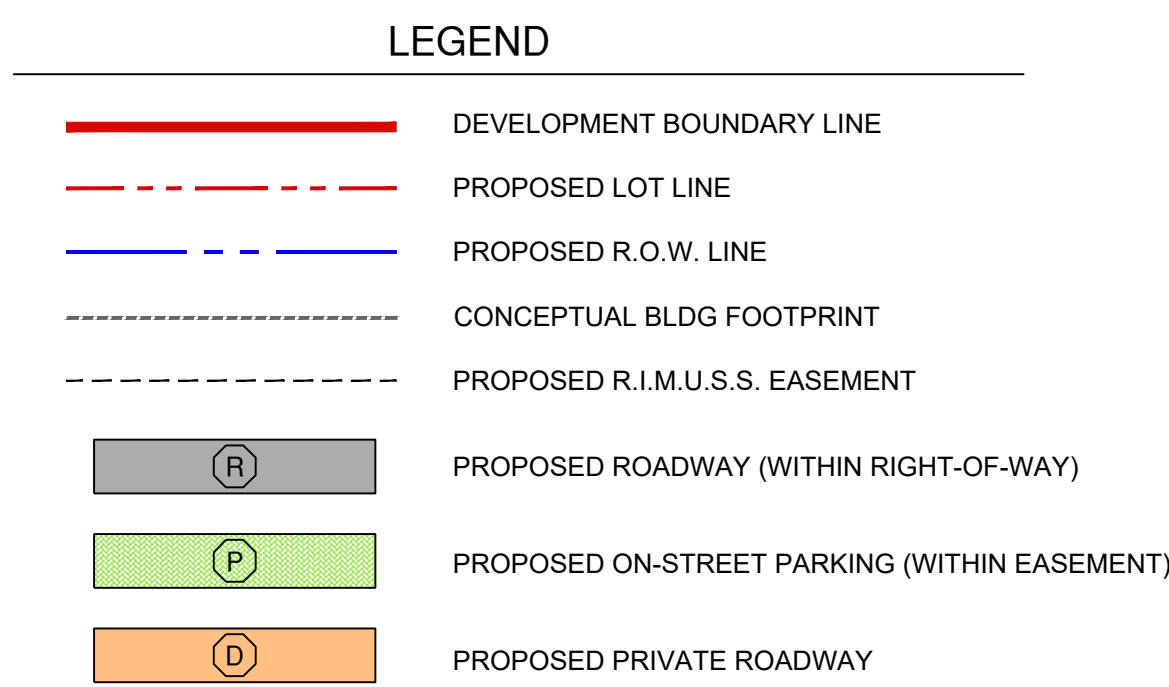
TITLE SHEET

C-100

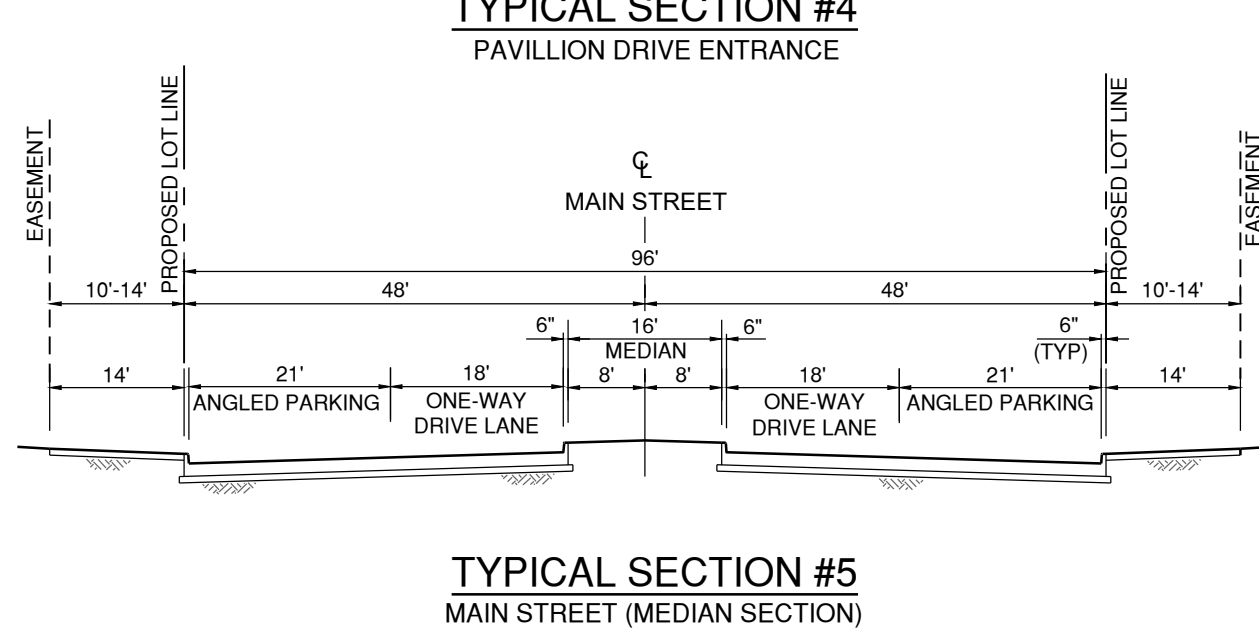
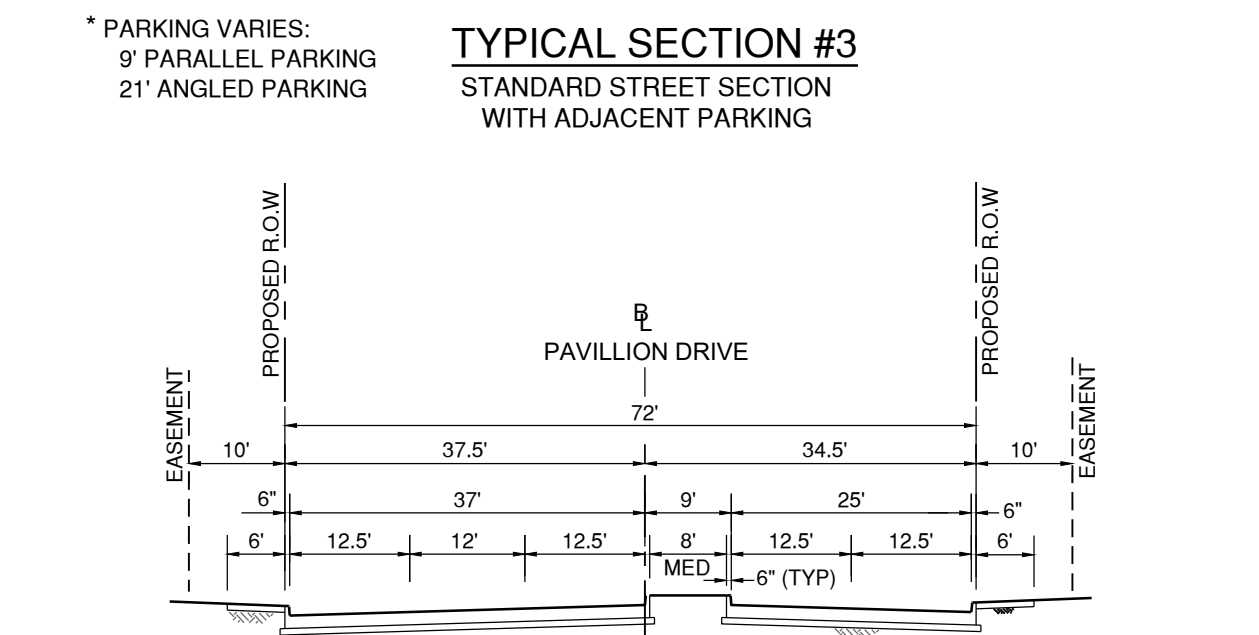
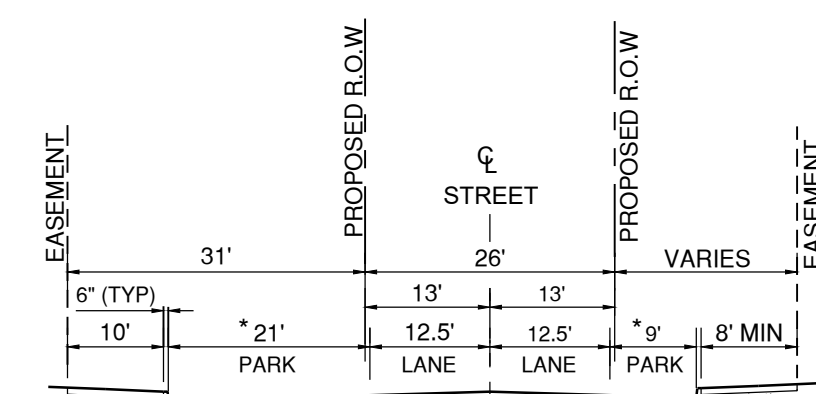
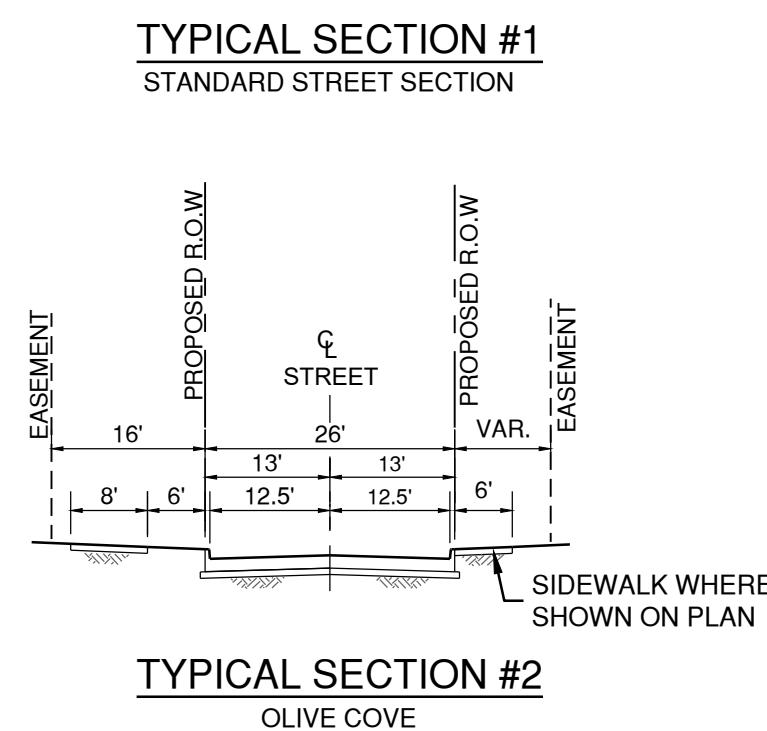
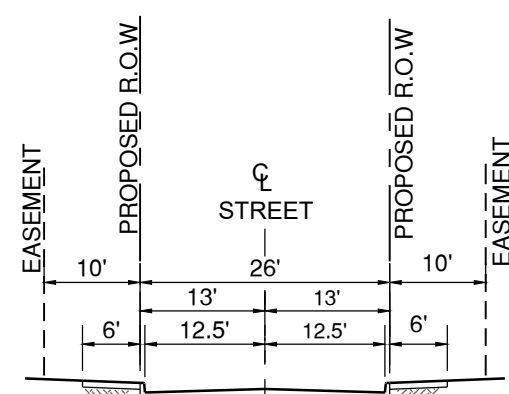
SHEET OF --

SITE OVERVIEW
OLIA VILLAGE

SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO



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



ROADWAY INFORMATION		
STREET NAME	CENTERLINE LENGTH (FT)	LANE MILES (MI)
PUBLIC ROADWAYS		
PAVILLION DRIVE	380	0.360
MAIN STREET	1,210	0.458
ARBOR LANE	625	0.237
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
SUB-TOTAL :	7,255	2.870
PRIVATE ROADWAYS		
PAVILLION DRIVE	180	0.068
MAIN STREET	1,120	0.424
TWISTED BRANCH	190	0.072
HARVEST DRIVE (FUTURE PUBLIC)	770	0.292
ARBOR LANE (FUTURE PUBLIC)	125	0.047
BAYER DRIVE (E/W)	220	0.083
SUB-TOTAL :	2,605	0.986
TOTAL :	9,860	3.856

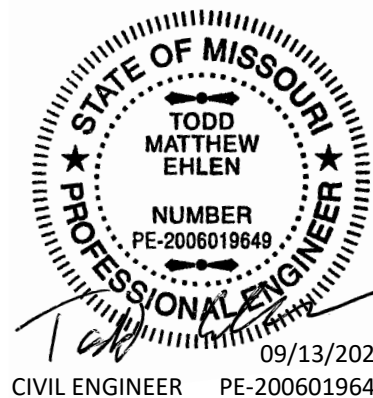
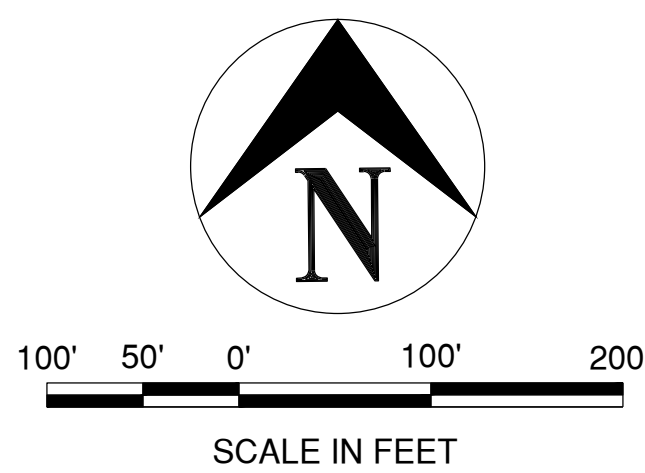
- GENERAL NOTES
- EXISTING EASEMENTS NOT SHOWN FOR CLARITY.
 - EXISTING UTILITIES NOT SHOWN FOR CLARITY.
 - PROPOSED UTILITIES NOT SHOWN FOR CLARITY.



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

CONSULTANTS:

SITE DEVELOPMENT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 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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SITE OVERVIEW

C-101

SHEET OF --

SETBACK & BUFFER 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
 - PROPOSED BUILDING SETBACK

- KEYNOTES
- OFF-SITE ROADWAY IMPROVEMENTS ON OLIVE BOULEVARD OR LINDBERGH BOULEVARD (TYP)
 - EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
 - 40' RESIDENTIAL BUFFER YARD (TYP)
 - 10' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
 - 35' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
 - 10' MINIMUM PROPOSED ROADWAY IMPROVEMENT MAINTENANCE UTILITY SEWER SIDEWALK EASEMENT (PRIMUMSSE)
 - 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 - FORTY (40) FEET
 - MINIMUM RESIDENTIAL BUILDING SETBACK - TEN (10) FEET
 - MINIMUM COMMERCIAL BUILDING SETBACK - THIRTY-FIVE (35) FEET BEYOND BUFFER YARD

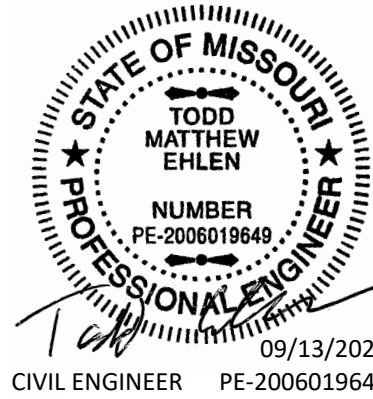
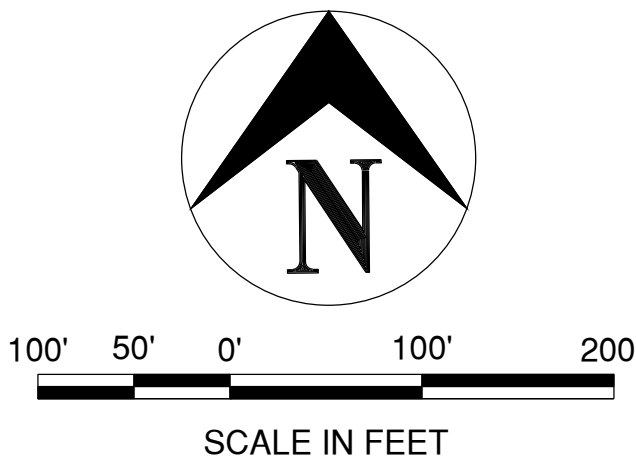
- NON-RESIDENTIAL:
- MINIMUM BUILDING SETBACK - TEN (10) FEET



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
SEPTEMBER 13, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD
CREVE COEUR, MO 63141

MARK DATE DESCRIPTION

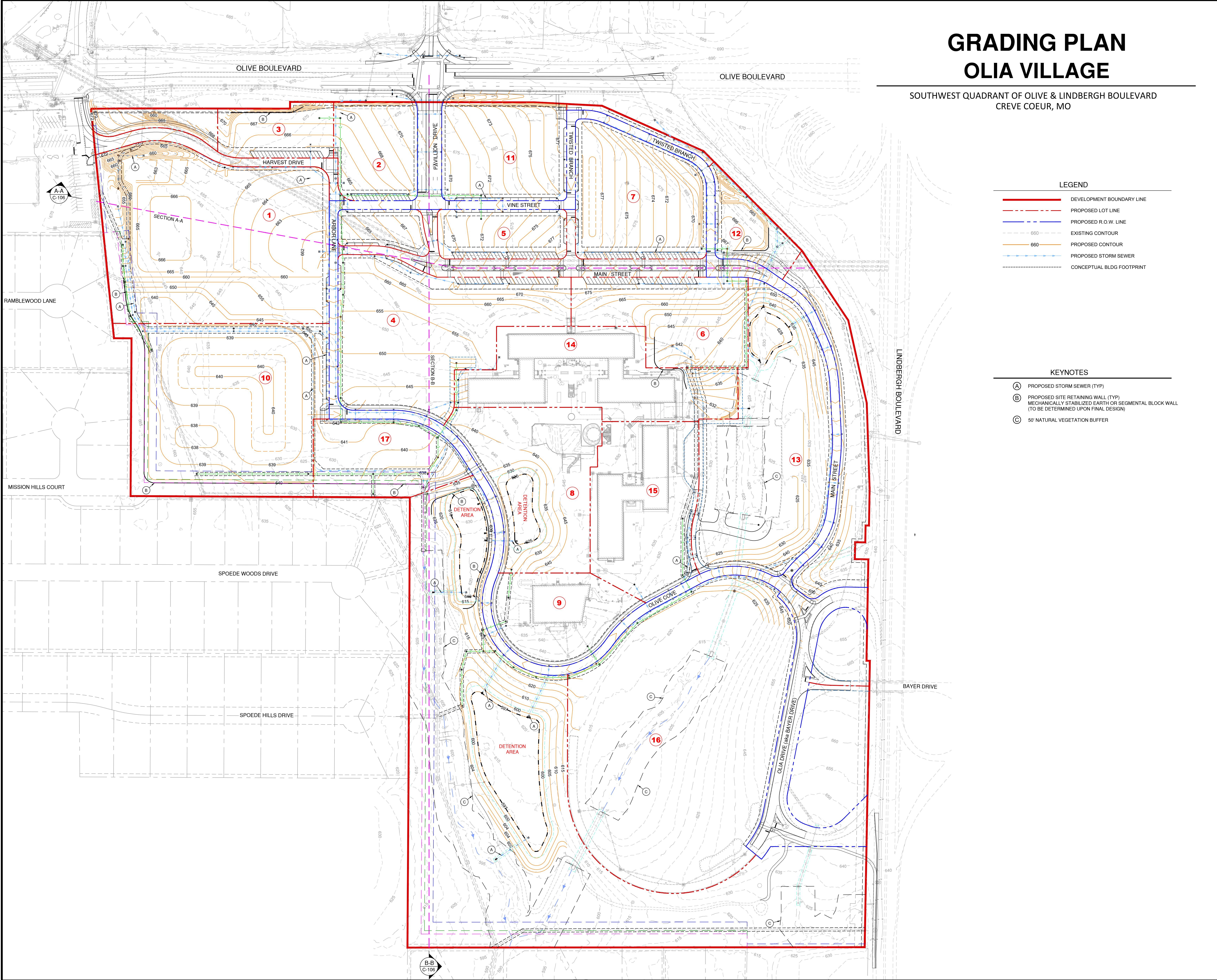
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CAD DWG FILE: ISITE-DEVELOPMENT-PLAN.DWG
DESIGNED BY: TME/JFM
DRAWN BY: JFM
CHECKED BY: CJS
APPROVED BY: ---
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SHEET TITLE

SETBACK & BUFFER
PLAN

C-102

SHEET OF --



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

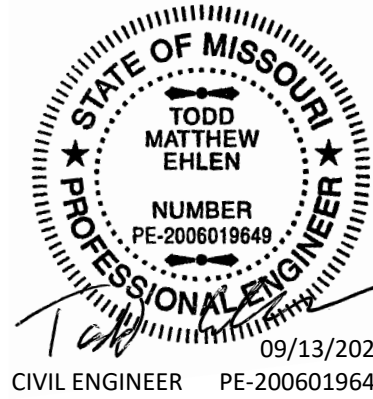
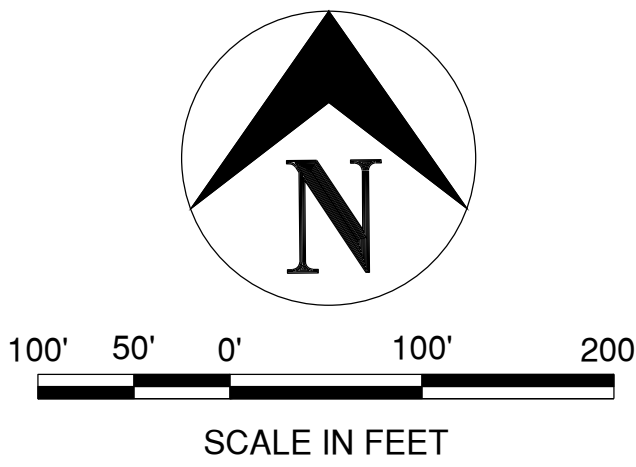
- KEYNOTES**
- (A) PROPOSED STORM SEWER (TYP)
 - (B) PROPOSED SITE RETAINING WALL (TYP)
MECHANICALLY STABILIZED EARTH OR SEGMENTAL BLOCK WALL
(TO BE DETERMINED UPON FINAL DESIGN)
 - (C) 50' NATURAL VEGETATION BUFFER



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

CONSULTANTS:

SITE DEVELOPMENT PLAN



PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2023

OLIA VILLAGE
LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD
CREVE COEUR, MO 63141

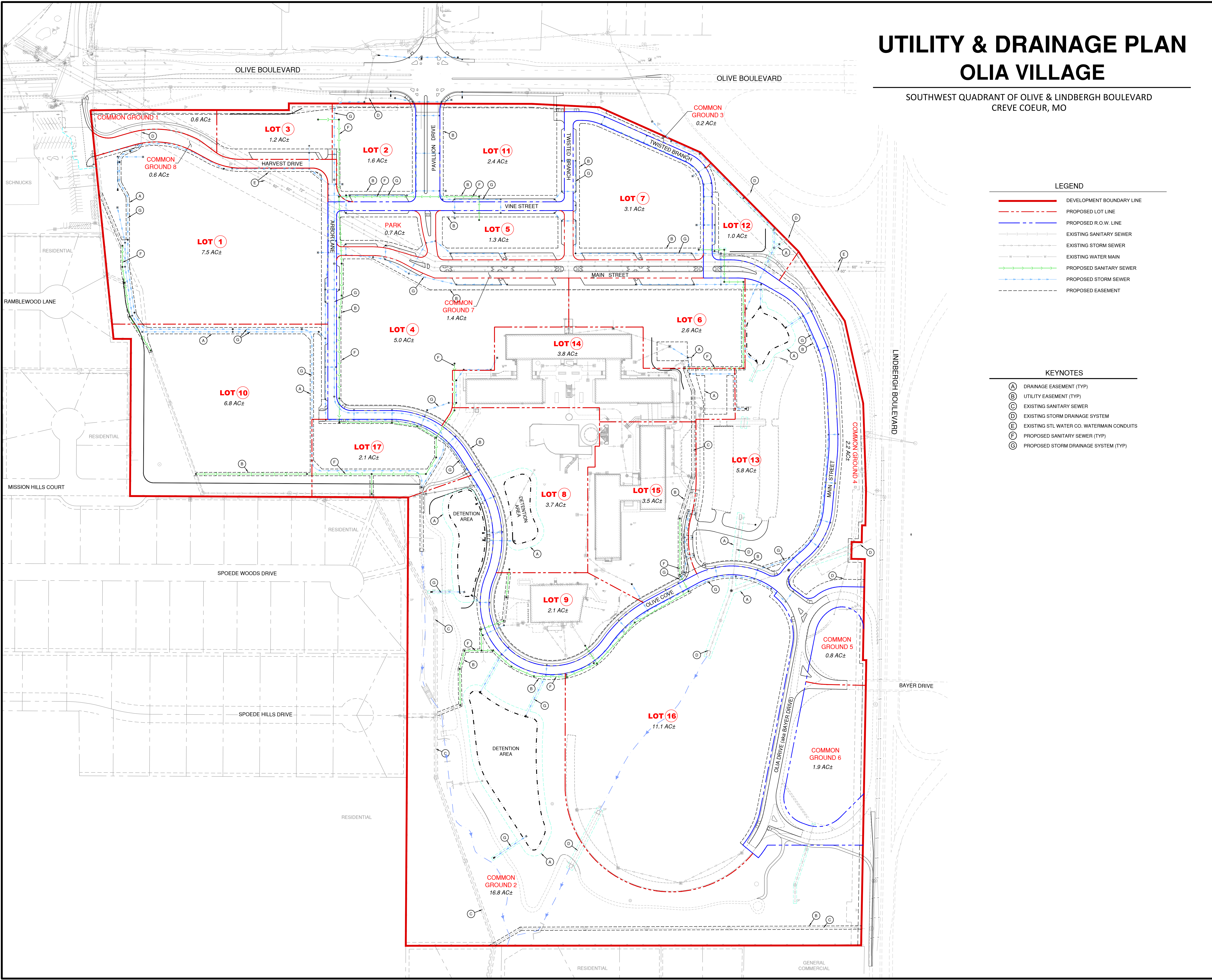
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CAD DWG FILE:	ISITE-DEVELOPMENT-PLAN.DWG	
DESIGNED BY:	TME/JFM	
DRAWN BY:	JFM	
CHECKED BY:	CJS	
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SHEET TITLE

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

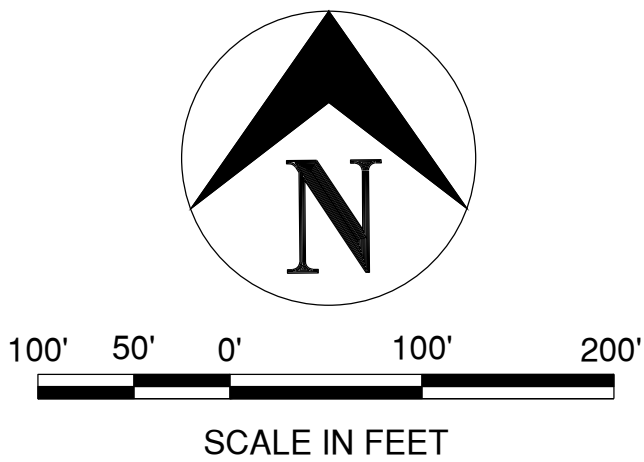
- KEYNOTES**
- (A) DRAINAGE EASEMENT (TYP)
 - (B) UTILITY EASEMENT (TYP)
 - (C) EXISTING SANITARY SEWER
 - (D) EXISTING STORM DRAINAGE SYSTEM
 - (E) EXISTING STL WATER CO. WATERMAIN CONDUITS
 - (F) PROPOSED SANITARY SEWER (TYP)
 - (G) PROPOSED STORM DRAINAGE SYSTEM (TYP)



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
SEPTEMBER 13, 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	
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CHECKED BY:	CJS	
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SHEET TITLE		
UTILITY & DRAINAGE PLAN		
C-104		
SHEET	OF	--

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Date: Wednesday, September 13, 2023 3:49:25 PM

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 CONCRETE MULTI-USE SIDEWALK 8' MIN WIDE (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)	1,245	
HARVEST DRIVE	390	
ARBOR LANE		
OLIVE COVE	2,520	
TWISTED BRANCH		
VINE STREET		
OLIA DRIVE (AKA BAYER DRIVE)	690	
LINDBERGH BLVD	300	
WEST / SOUTH TRAIL (PROPOSED)		400
WEST / SOUTH TRAIL (EXISTING)		2,210
SUB-TOTAL :	5,145	2,610
TOTAL SIDEWALK / TRAIL (FT) :	7,755	
TOTAL SIDEWALK / TRAIL (MI) :	1.5	

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

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

PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2023

OLIA VILLAGE
LINDBERGH & OLIVE BLVD

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

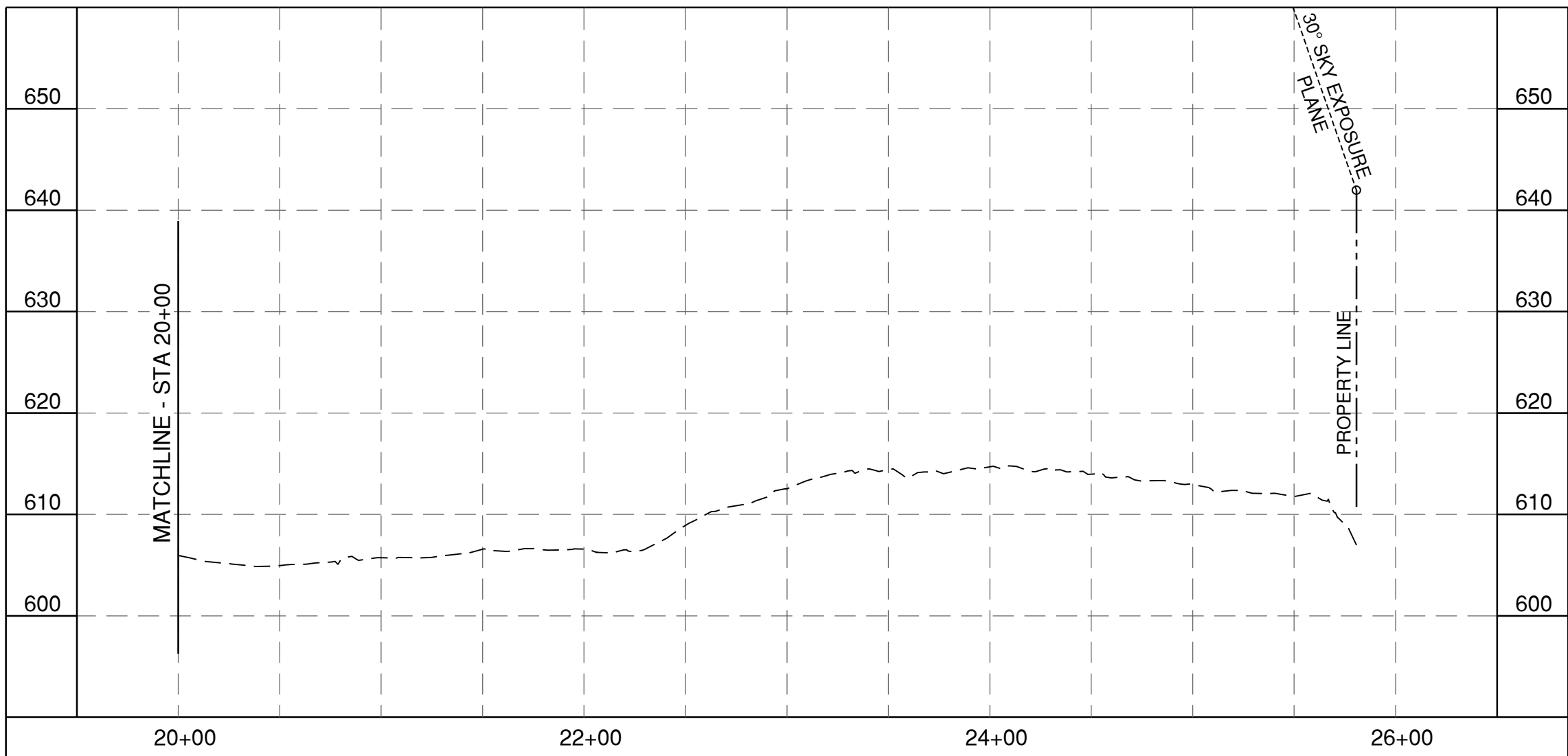
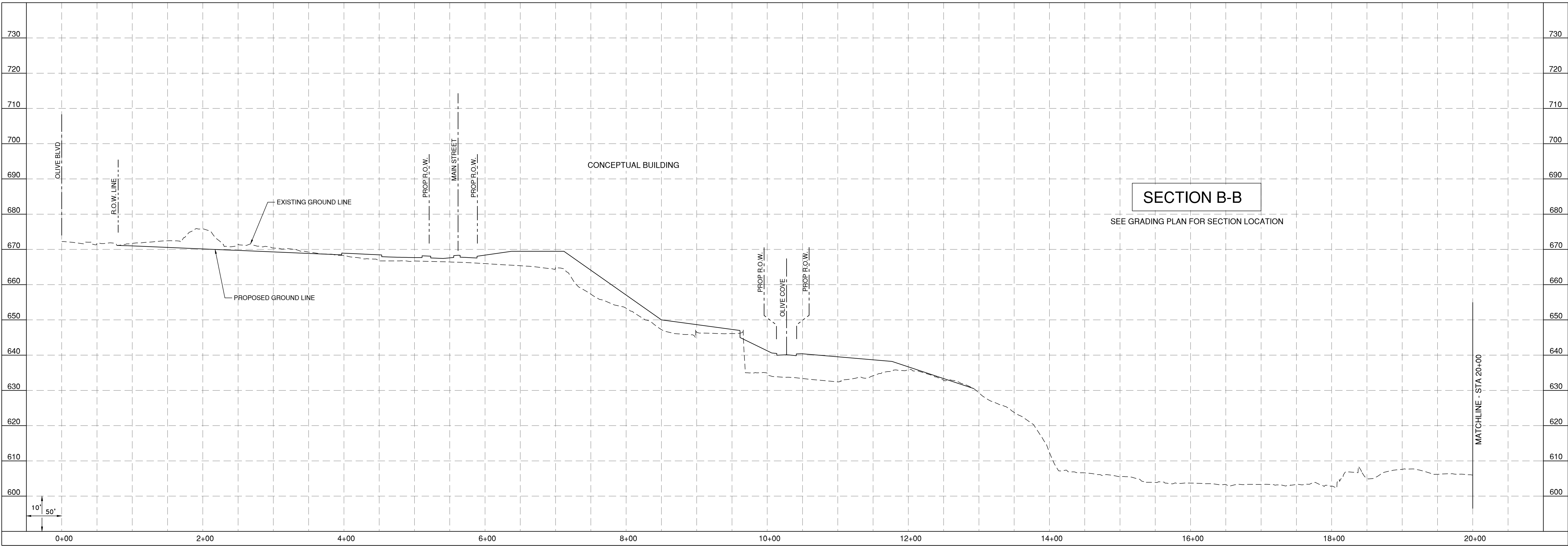
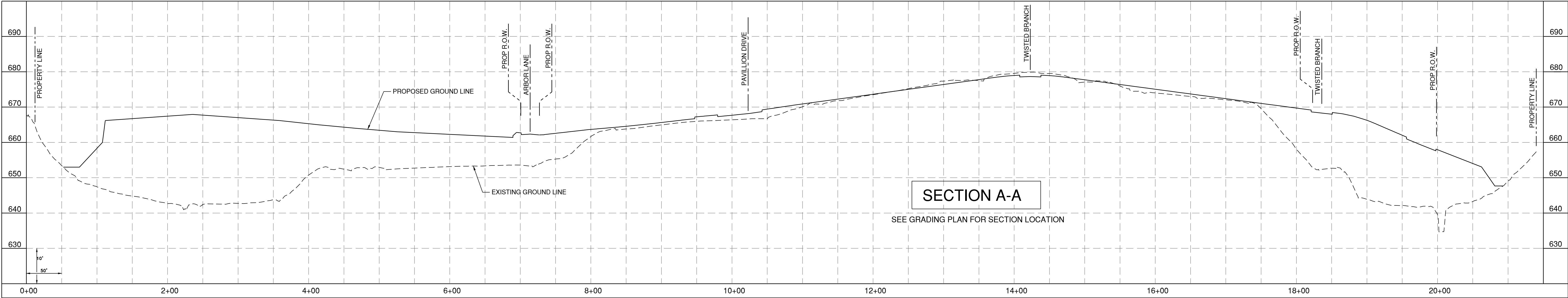
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PEDESTRIAN PLAN

C-105

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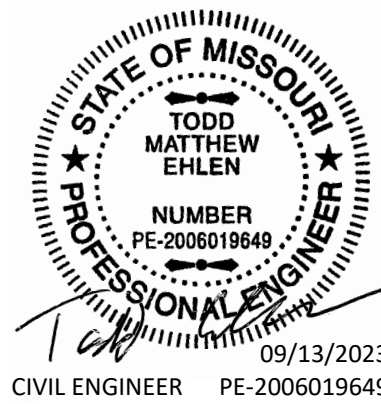
PREPARED BY:



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

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SITE DEVELOPMENT PLAN



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NOT FOR CONSTRUCTION
SEPTEMBER 13, 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
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SHEET TITLE

SITE SECTIONS

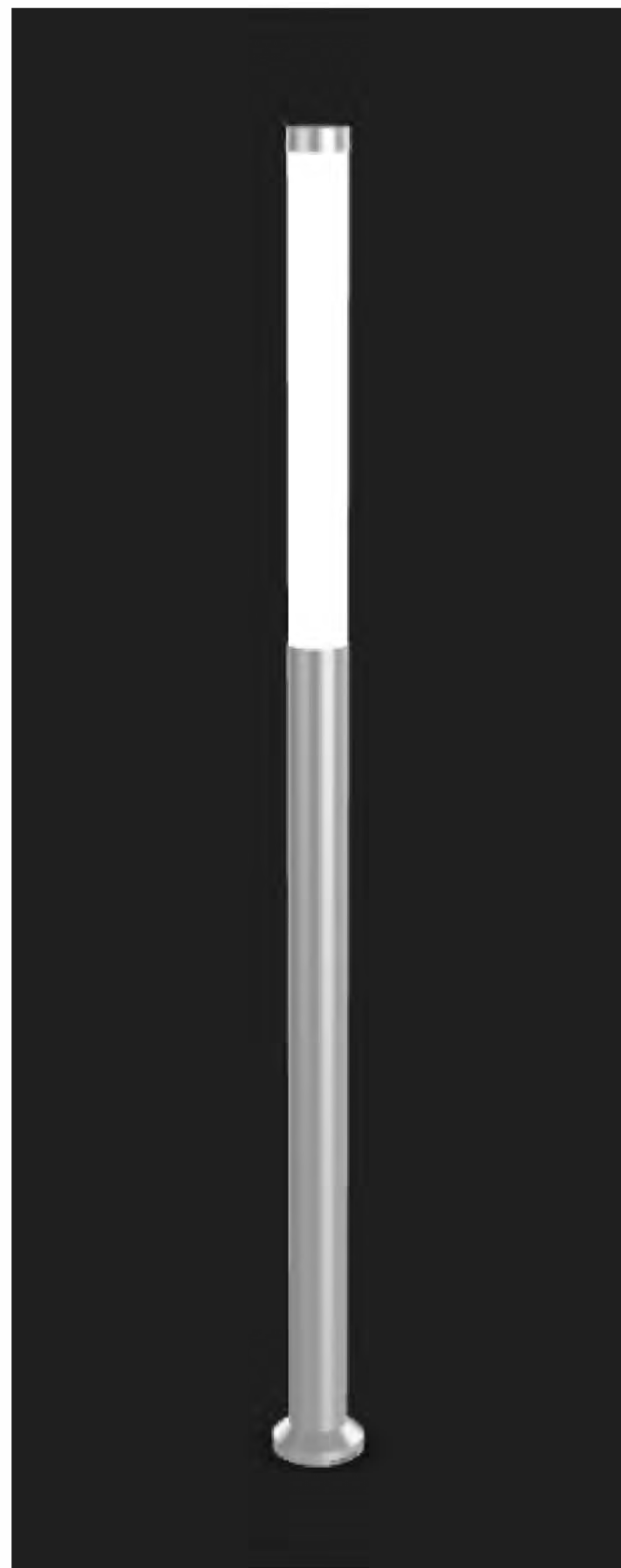
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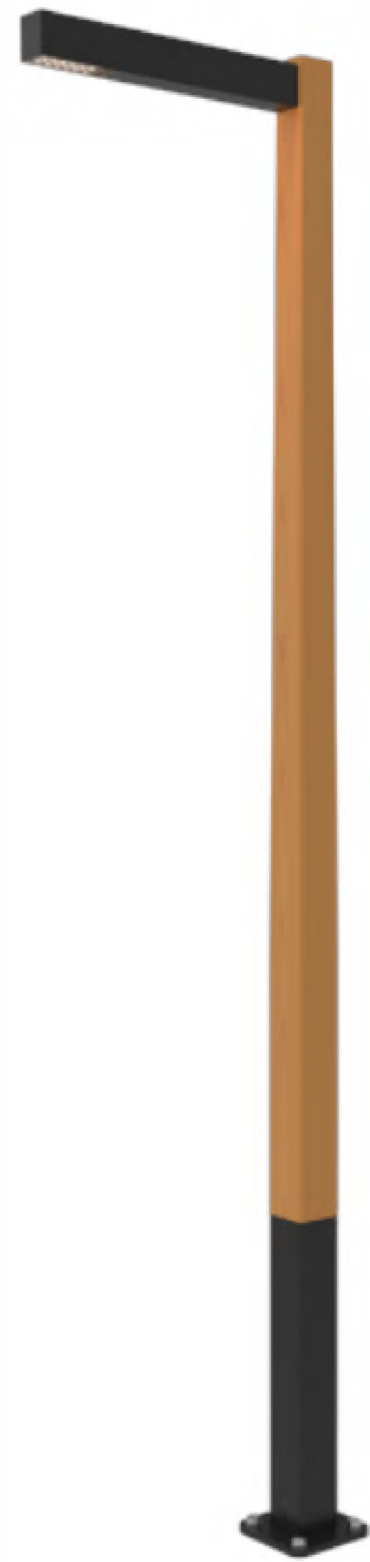
TYPE A1/A2



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-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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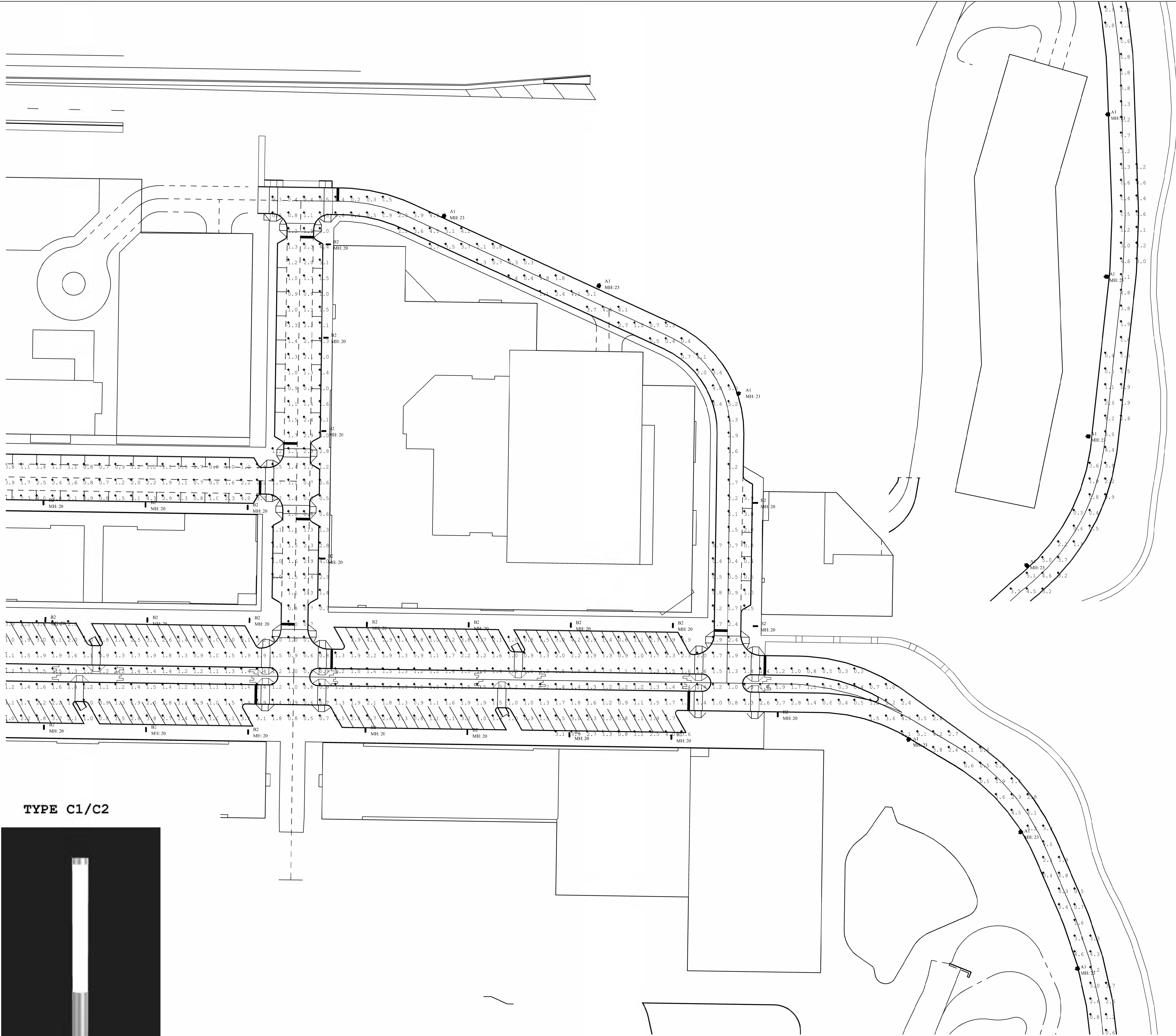
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SITE LIGHTING

A-103.1

SHEET

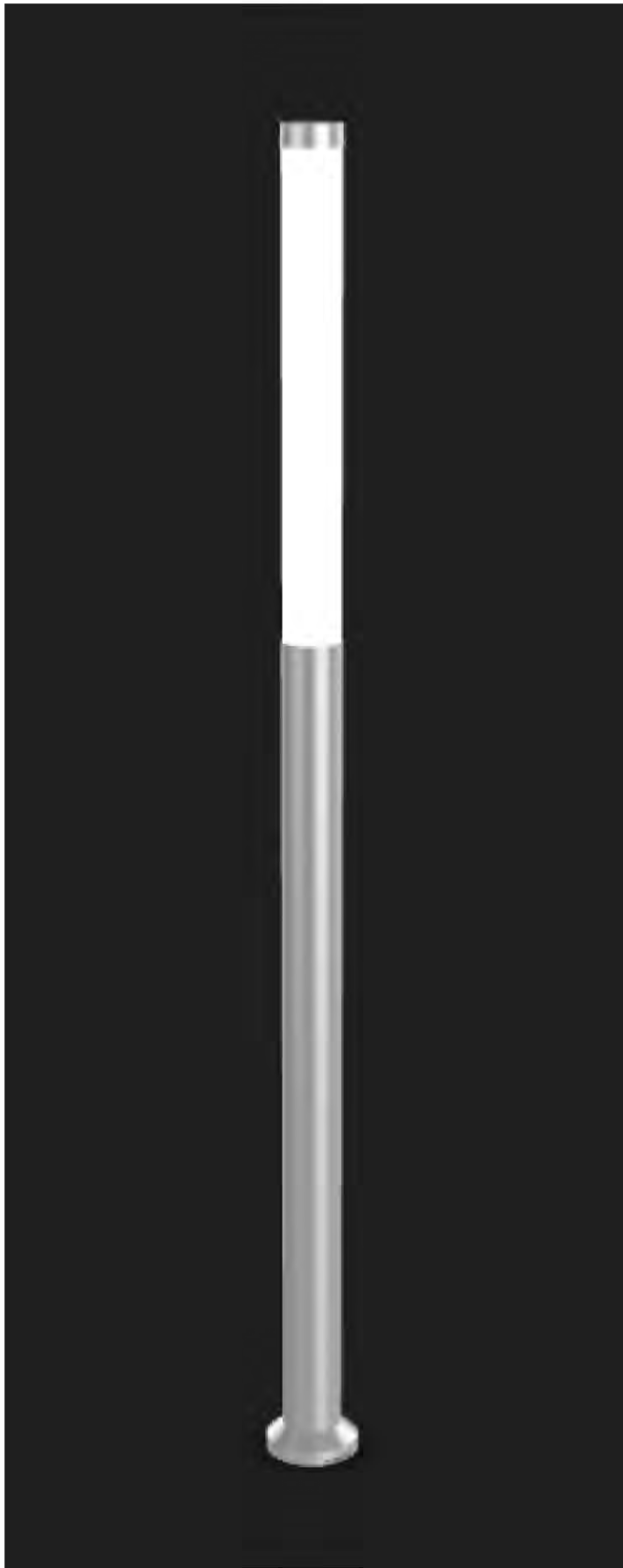
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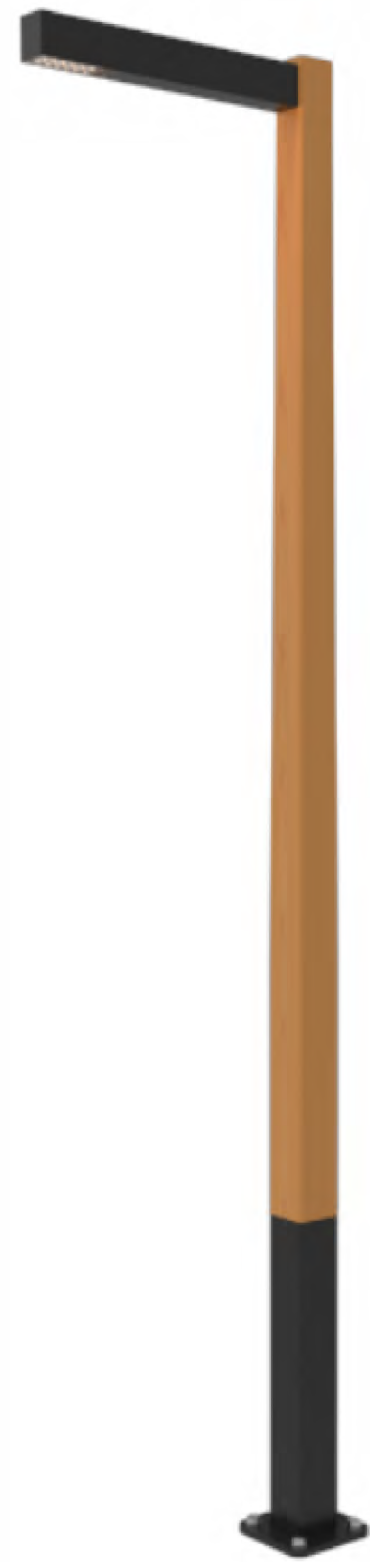
TYPE A1/A2



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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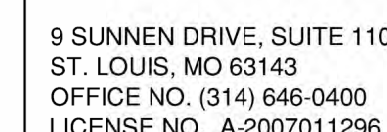
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SITE LIGHTING

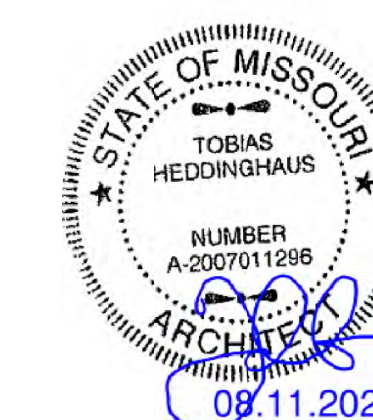
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SHEET

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
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PROJECT NO:	22478.00
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CAD DWG FILE: GRAY REM

DESIGNED BY: TD

DRAWN BY: TDH

DRAWN BY:	TDR
CHECKED BY:	

CHECKED BY:

APPROVED BY: _____

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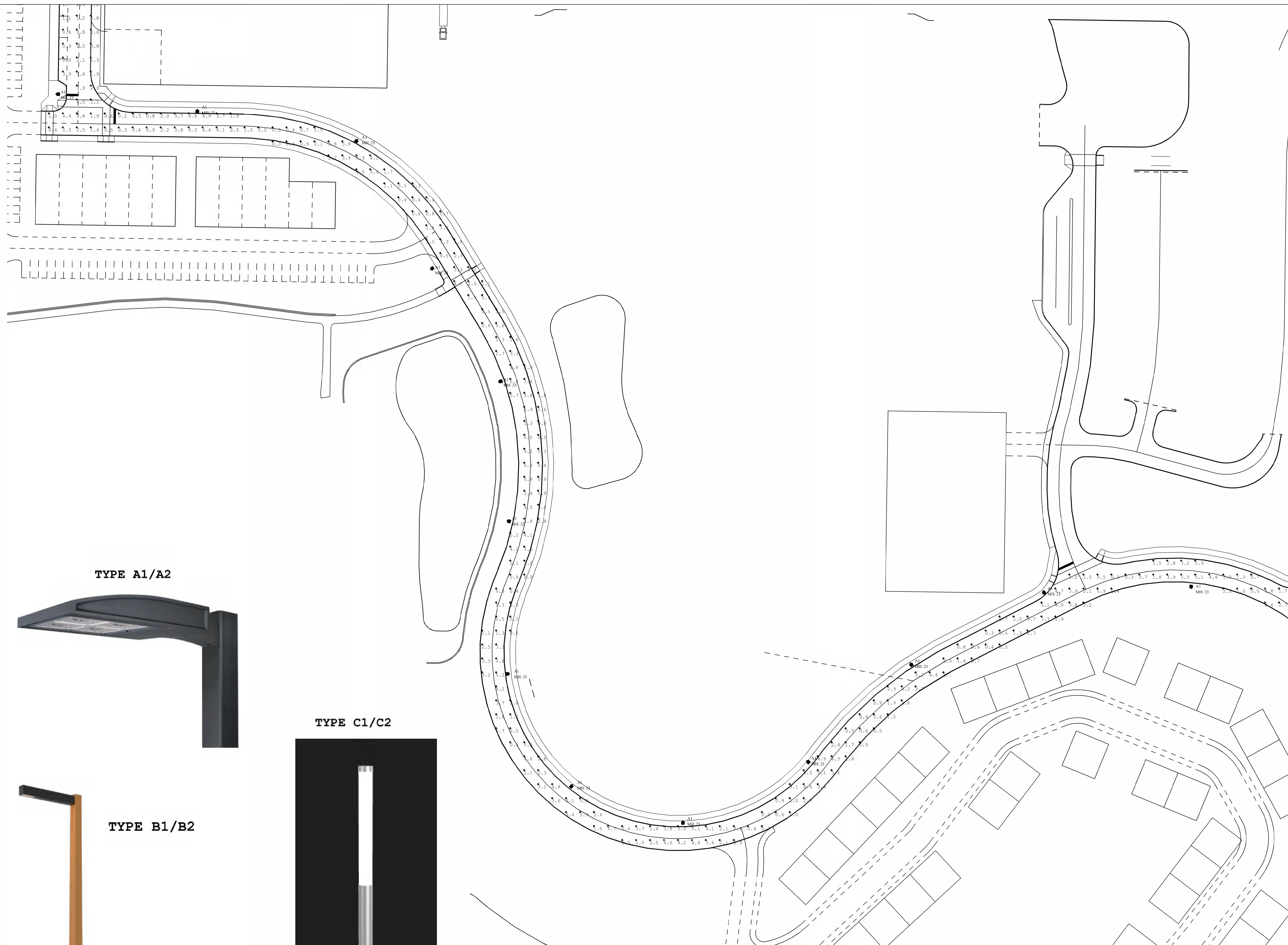
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SITE LIGHTING

A-103.3

SHEET

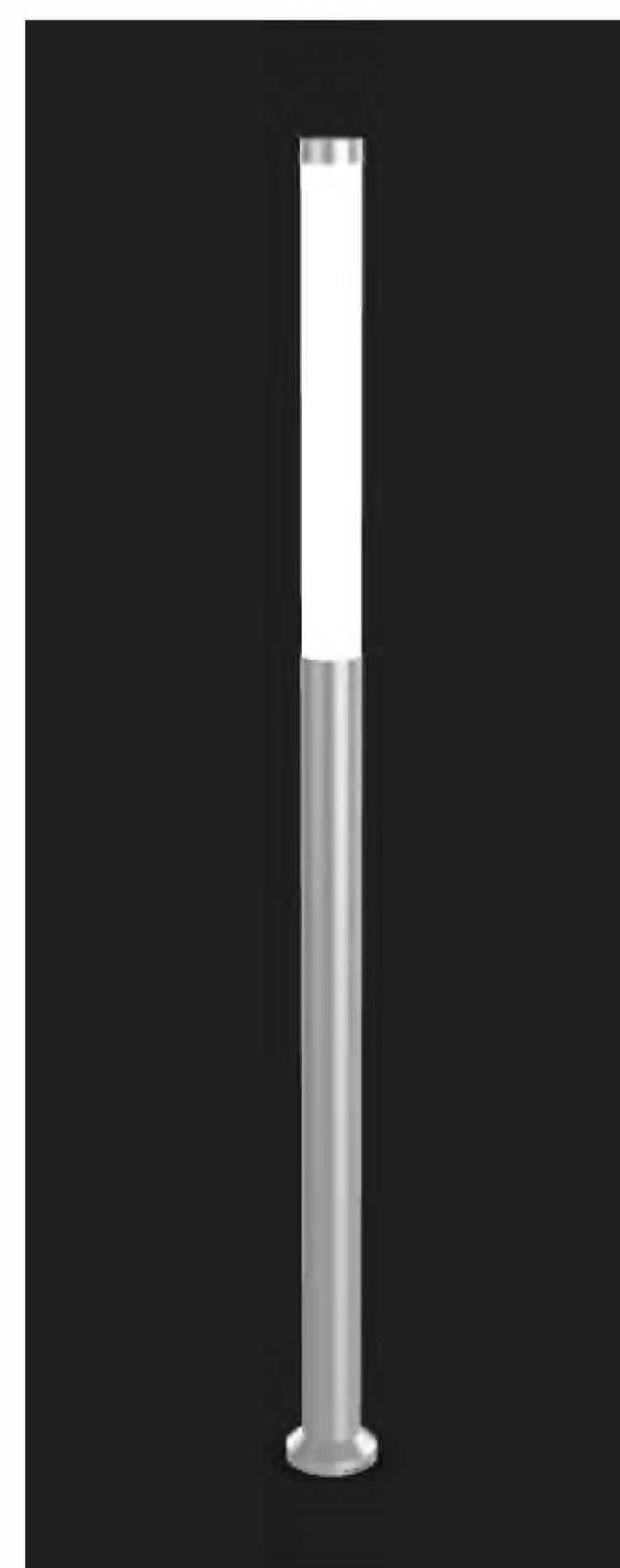
OF



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	

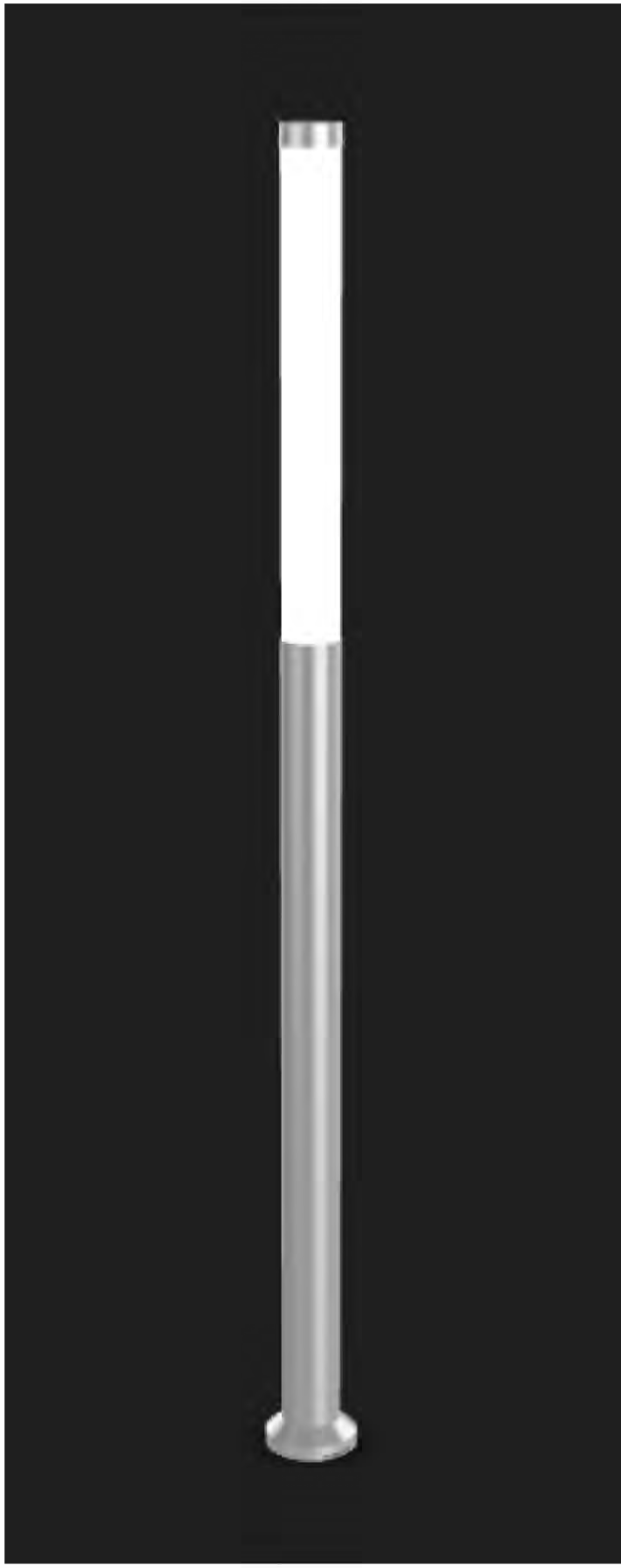
Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
Z-PAK	Illuminance	fc	0.62	1.4	0.2	3.1	7.0
SITE	Illuminance	Fc	1.95	6.8	0.2	9.8	34.0



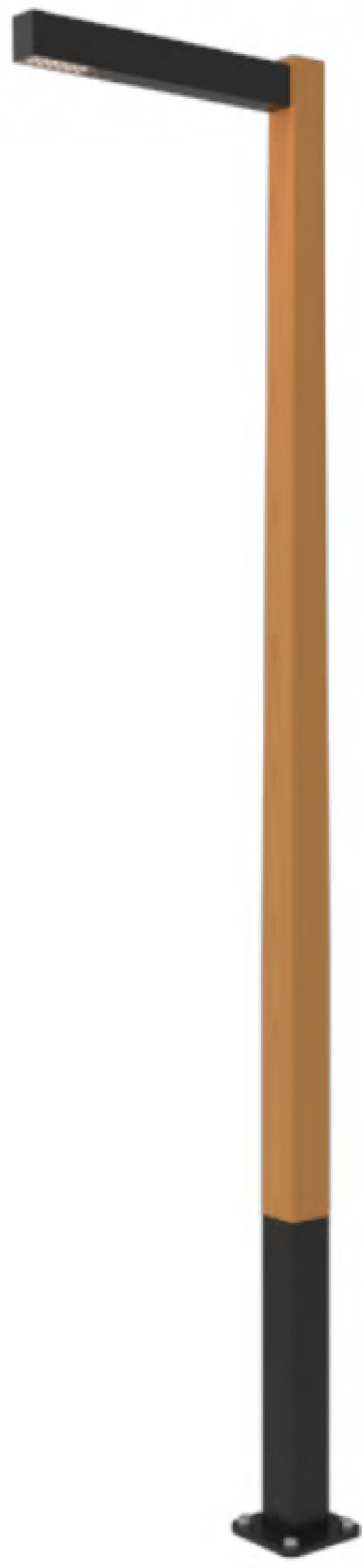
TYPE A1/A2



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 9/13/23 AND ARE SUBJECT TO CHANGE

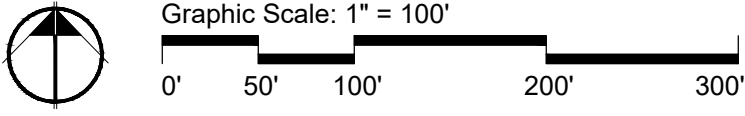
LEGEND

TREE OR TREE MASS TO REMAIN (50%)

TREE OR TREE MASS TO BE REMOVED (50%)

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'



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\21555_Olia Village\21555-01_Olia Village Schematic Design\02_Production\04_AutoCAD\21555-01_Sheets_General.dwg
Date: Wednesday, September 13, 2023 4:28:34 PM

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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

PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2023

**OLIA VILLAGE
DEVELOPMENT**

LINDBERGH & OLIVE BLVD

OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
3	9/13/23	LANDSCAPE CONCEPT PLANS
2	8/11/23	LANDSCAPE CONCEPT PLANS
1	7/21/23	LANDSCAPE CONCEPT PLANS

PROJECT NO.: 2309201-00
CAD DWG FILE: 21555-01_SHEETS_GENERAL.DWG
DESIGNED BY: WH
DRAWN BY: MB/ZTS
CHECKED BY: BR
APPROVED BY: BR
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**TREE PRESERVATION
PLAN**

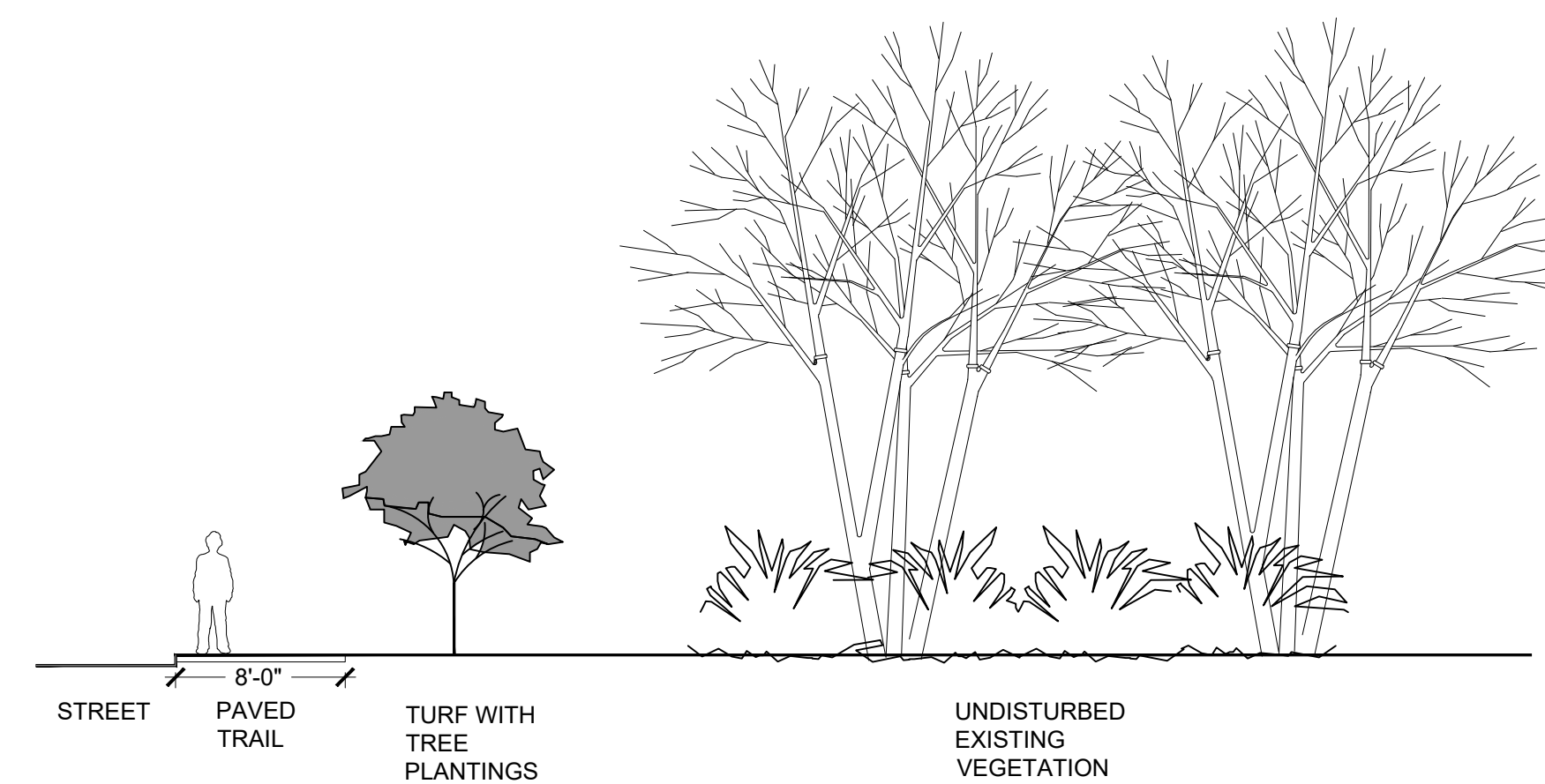
LD-100

SHEET 1 OF 3

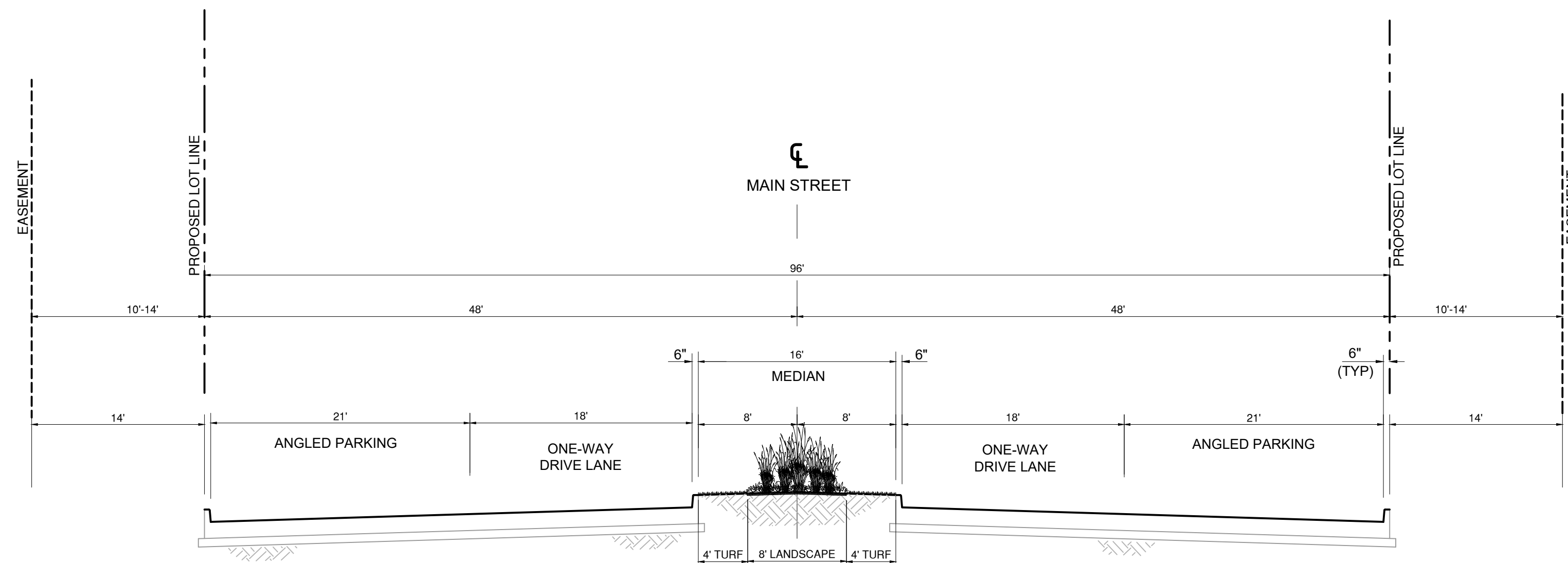
LEGEND

- 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.
39NORTH GREAT STREETS PLANT PALETTE WILL BE USED AS
A REFERENCE WHEN DETERMINING FINAL PLANT MATERIAL.
- BUFFER PLANTING
PLANTING BUFFER TO CONSIST OF COMBINATION
OF EVERGREEN TREES, DECIDUOUS SHRUBS, AND
PRIVACY FENCING
- EXISTING TREE MASSING
EXISTING TREES AND UNDERSTORY
VEGETATION TO REMAIN
- PROPOSED ORNAMENTAL AND CANOPY TREES
- EXISTING TREES TO REMAIN

- 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.



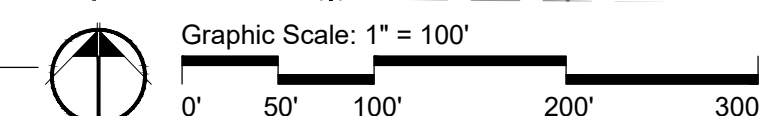
C TYPICAL TRAIL SECTION
SCALE: 1"=8'



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



A PHASE 1 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:

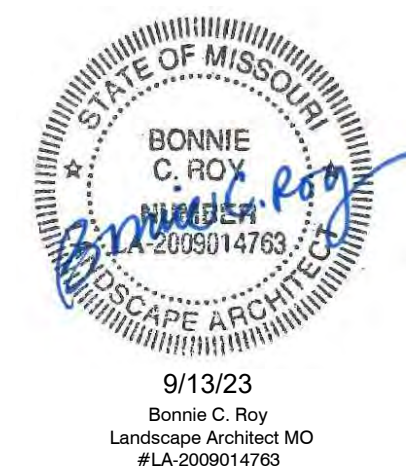


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PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 2023

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD.
CREVE COEUR, MO 63141

MARK	DATE	DESCRIPTION
2	9/13/23	PHASE 1 Resubmittal
1	8/11/23	PHASE 1 LANDSCAPE DEVELOPMENT PLANS

PROJECT NO: 230925201-00
CAD DWG FILE: 21585-01_SHEETS_PLANTING_PHASE
DESIGNED BY: WJW
DRAWN BY: MB/ZTS
CHECKED BY: BR
APPROVED BY: BR
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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

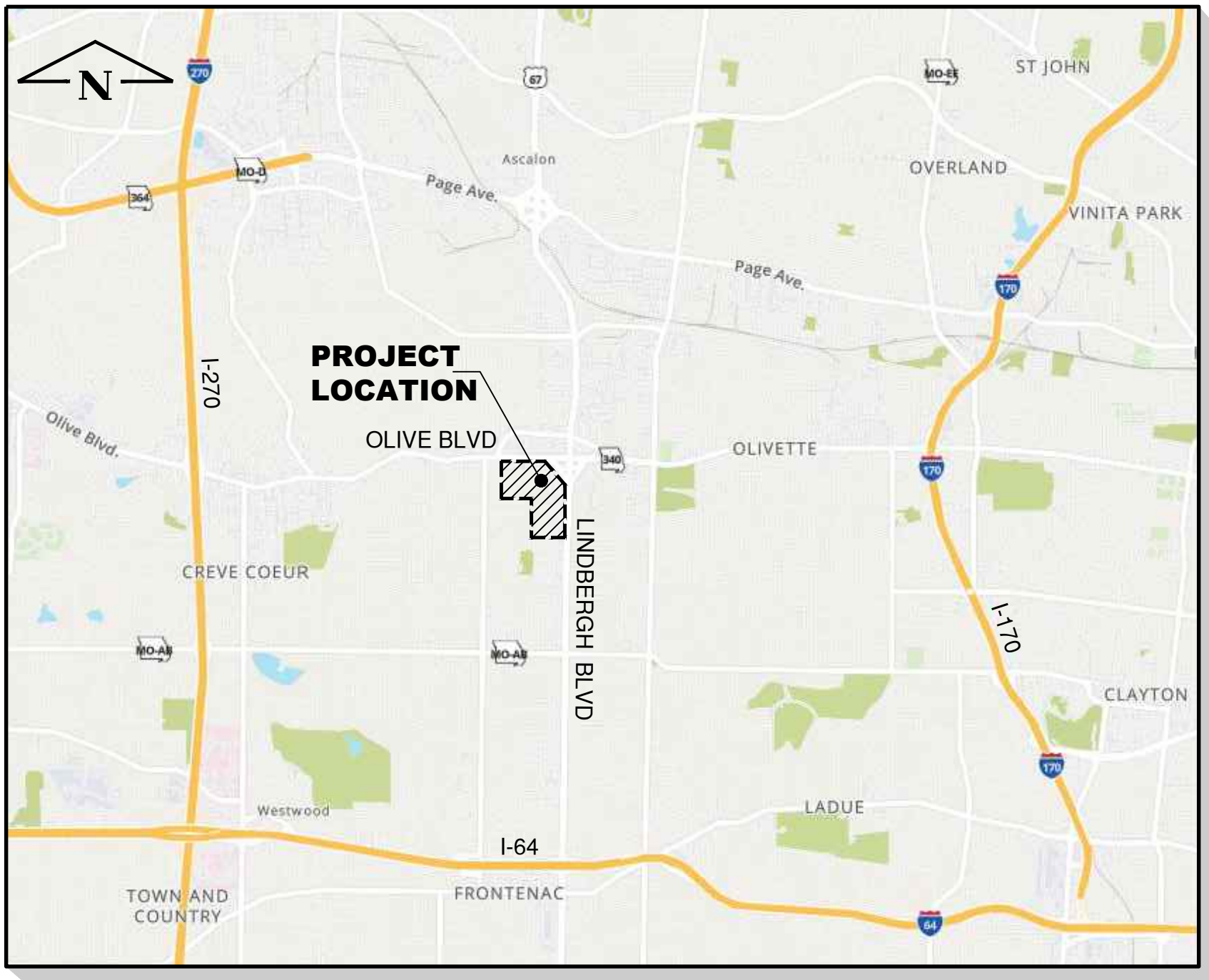
A TRACT OF LAND BEING PART OF LOTS 9, 10, 11 AND 12 OF MAJOR THOMAS SUBDIVISION
SITUATED IN THE SOUTHWEST QUARTER AND THE NORTHWEST QUARTER OF SECTION 1
TOWNSHIP 45 NORTH, RANGE 5 EAST, CITY OF CREVE COEUR, ST. LOUIS COUNTY, MISSOURI

SEPTEMBER 13, 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	
V-100	TITLE SHEET
V-101	PRELIMINARY SUBDIVISION PLAT
C-101	SITE 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.

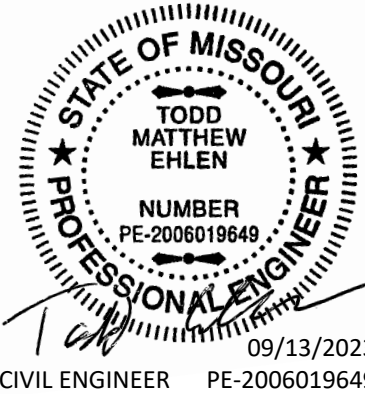
THE ABOVE DESCRIBED TRACT OF LAND CONTAINING 4,171,444 SQUARE FEET OR 95.763 ACRES IS BASED UPON AN ACTUAL URBAN CLASS BOUNDARY SURVEY DONE IN ACCORDANCE WITH THE CURRENT MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS, SUBJECT TO ALL EASEMENTS, RESTRICTIONS, RESERVATIONS, CONDITIONS OF RECORD AND NOT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

PREPARED BY:



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

CONSULTANTS:



SEPTEMBER 13, 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



10300 OLIVE BLVD
CREVE COEUR, MO 63141

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 :

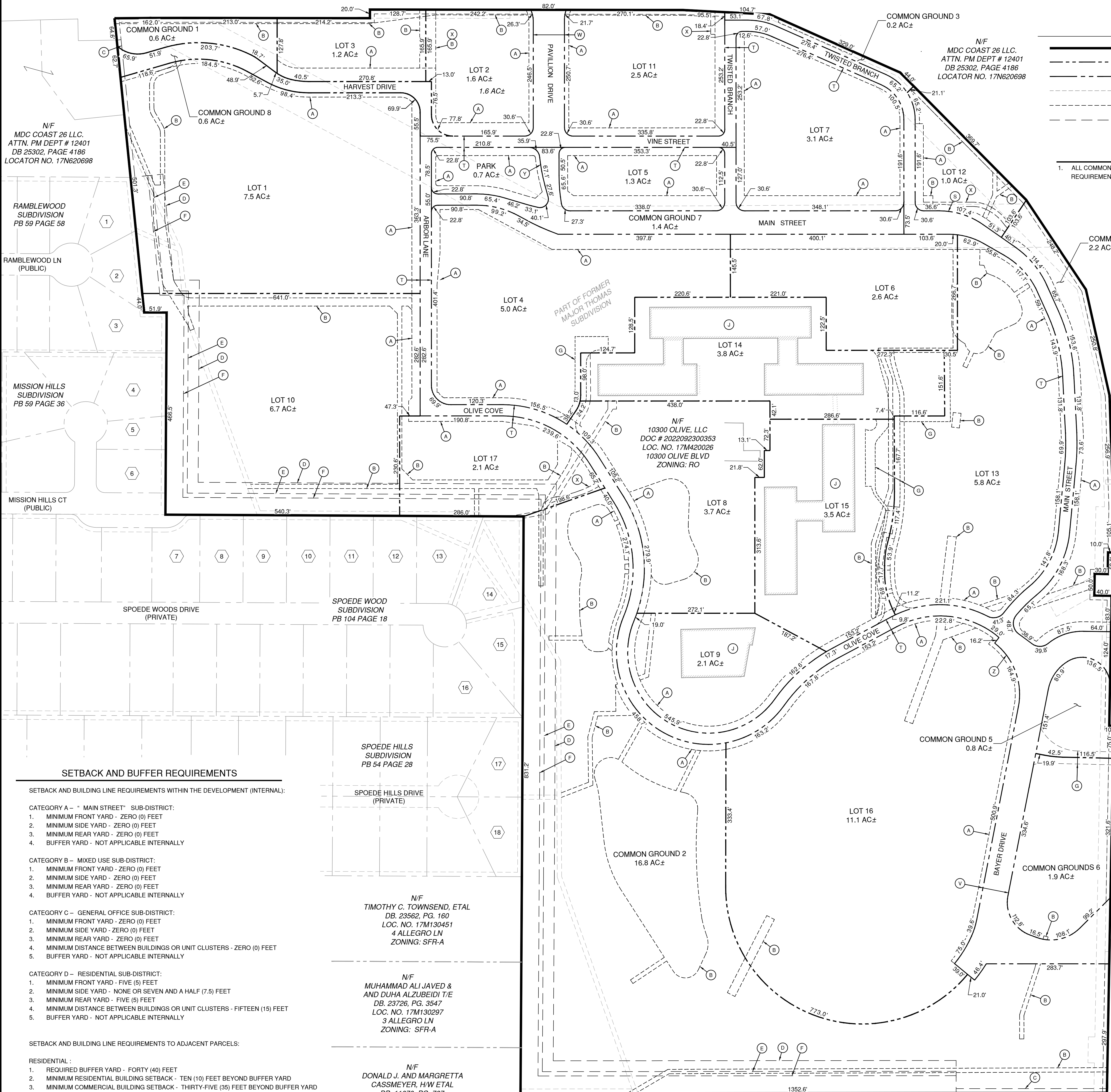
CRAWFORD, MURPHY & TILLY, INC. AND THE UNDERSIGNED ENGINEER HAVE NO RESPONSIBILITY FOR SERVICES PROVIDED BY OTHERS TO IMPLEMENT THE IMPROVEMENTS SHOWN ON THIS PLAN AND ALL OTHER DRAWINGS WHERE THE UNDERSIGNED ENGINEER'S SEAL APPEARS. THE CONSTRUCTION MEANS AND METHODS ARE THE SOLE RESPONSIBILITY OF THE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

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 35' BUILDING SETBACK LINE
- (E) PROPOSED RESIDENTIAL 10' BUILDING SETBACK LINE
- (F) PROPOSED RESIDENTIAL 40' BUFFER 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 # 17M130011
13 SUNSWEPT 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
10311 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 - 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 - FORTY (40) FEET
- MINIMUM RESIDENTIAL BUILDING SETBACK - TEN (10) FEET BEYOND BUFFER YARD
- MINIMUM COMMERCIAL BUILDING SETBACK - THIRTY-FIVE (35) 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

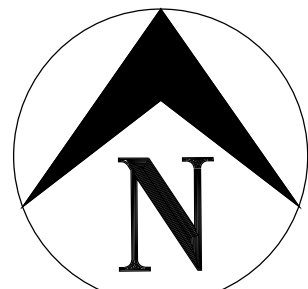
N/F
DONALD J. AND MARGARETTA
CASSMEYER, H/W ETAL
DB. 11070, PG. 767
LOC. NO. 17M130044
2 ALLEGRO LN
ZONING: SFR-A

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

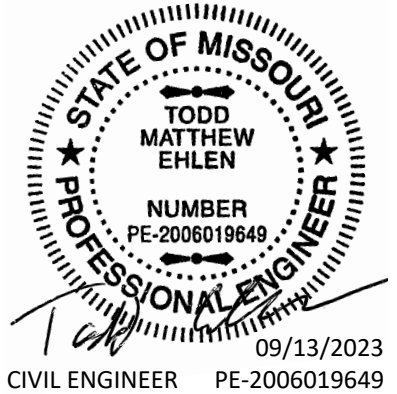
10300 OLIVE, LLC
1034 S. BRENTWOOD, SUITE 2300 PH-1D
ST. LOUIS, MO 63117
MATT PFUND
(618) 692-9502

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



SEPTEMBER 13, 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

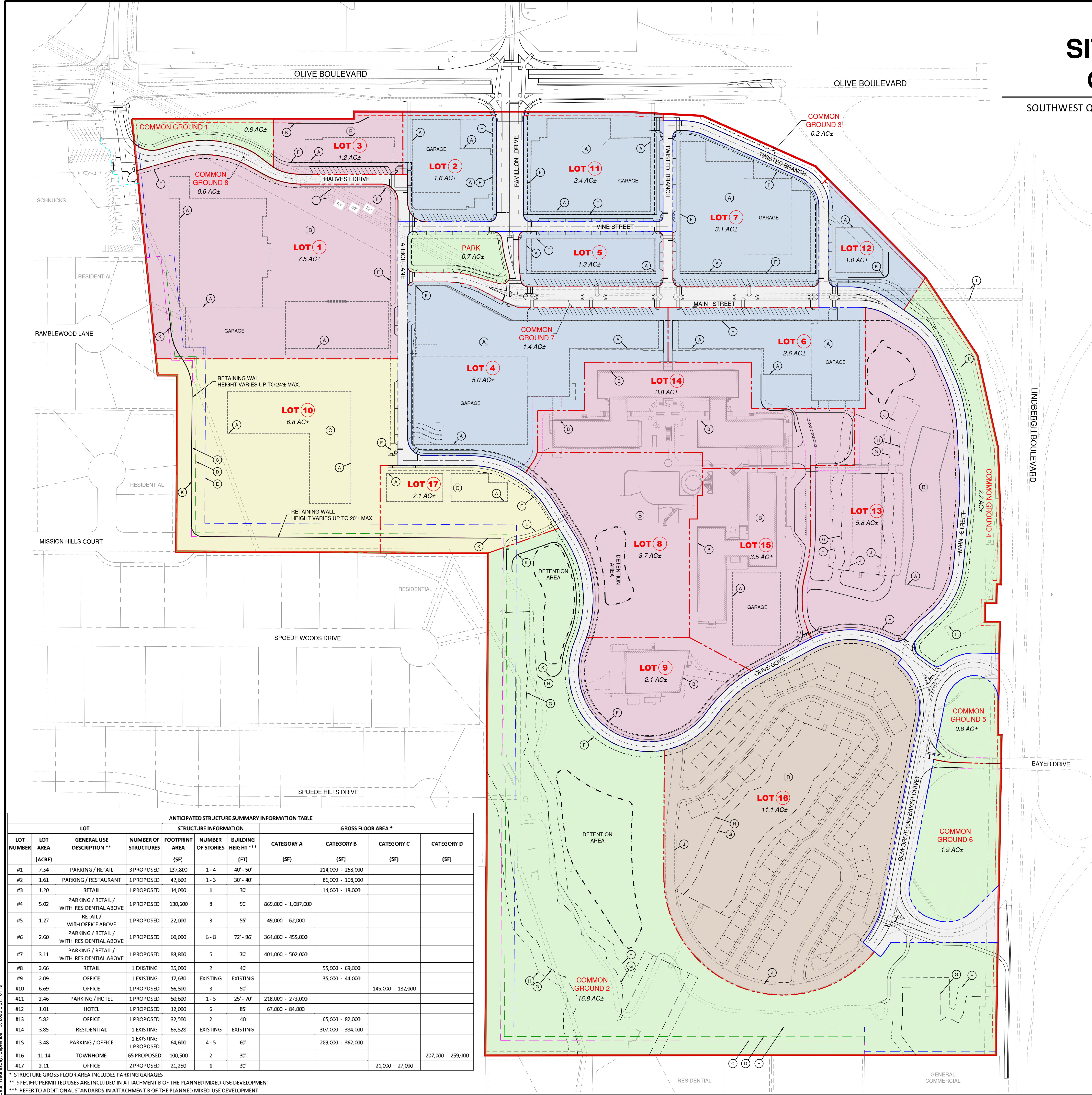
V-101

SHEET OF --

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Date: Wednesday, September 13, 2023 3:37:10 PM

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	1 EXISTING	17,630	EXISTING	EXISTING		35,000 - 44,000		
#10	6.69	OFFICE	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 - 394,000		
#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	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

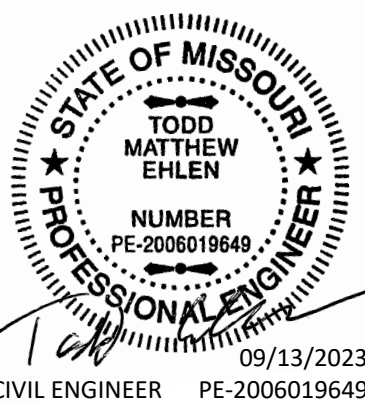
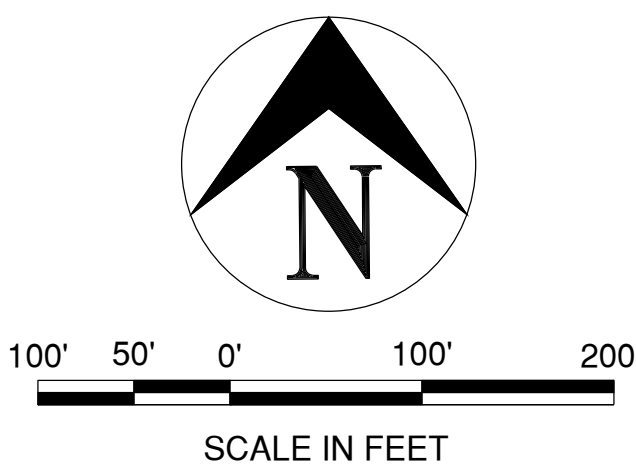
- (A) CONCEPTUAL BUILDING FOOTPRINT (TYP)
- (B) EXISTING BUILDING TO REMAIN AND BE REPURPOSED (TYP)
- (C) 40' RESIDENTIAL BUFFER YARD (TYP)
- (D) 10' RESIDENTIAL BUILDING SETBACK (BEYOND BUFFER)
- (E) 35' COMMERCIAL BUILDING SETBACK (BEYOND BUFFER)
- (F) 10' MINIMUM PROPOSED ROADWAY IMPROVEMENT MAINTENANCE UTILITY SEWER SIDEWALK EASEMENT (PRIMUSSE)
- (G) 50' NATURAL VEGETATION STREAM BUFFER
- (H) 25' NO-IMPERVIOUS STREAM 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
SEPTEMBER 13, 2023

OLIA VILLAGE DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

MARK DATE DESCRIPTION

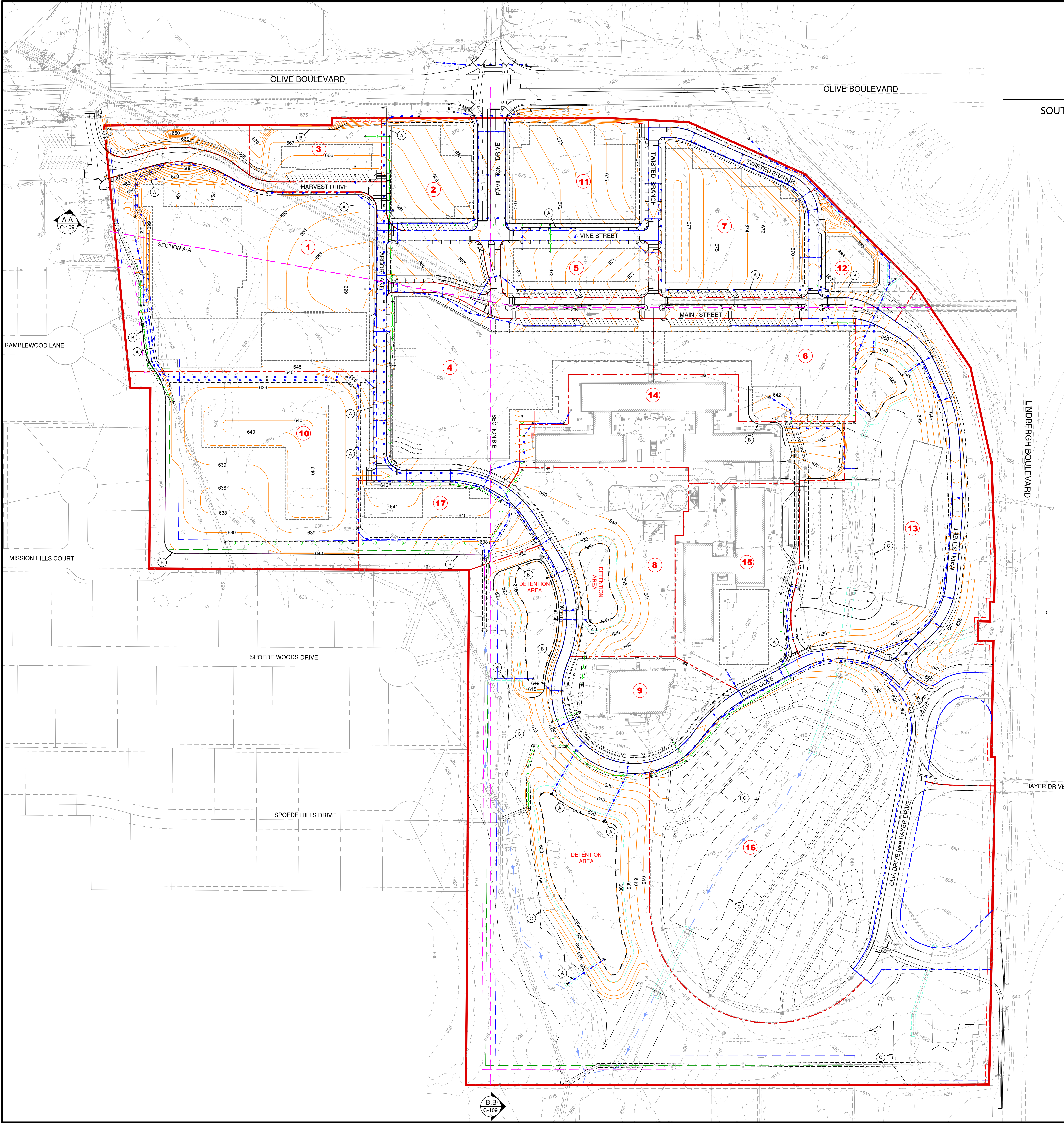
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CAD DWG FILE: ISITE-CONCEPT-PLAN.DWG
DESIGNED BY: TME/JFM
DRAWN BY: JFM
CHECKED BY: CJS
APPROVED BY: ---
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SHEET TITLE

SITE OVERVIEW

C-101

SHEET - OF --



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

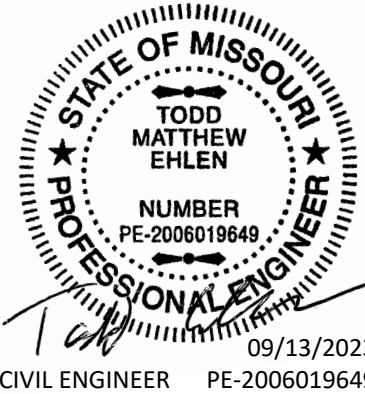
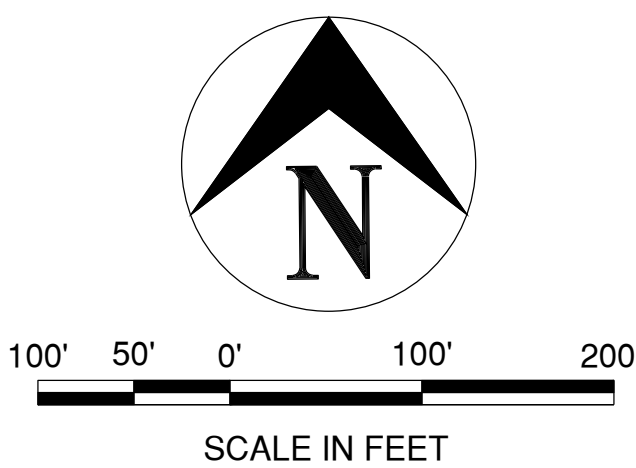
- KEYNOTES**
- (A) PROPOSED STORM SEWER (TYP)
 - (B) PROPOSED SITE RETAINING WALL (TYP)
 - (C) 50' NATURAL VEGETATION BUFFER



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
SEPTEMBER 13, 2023

OLIA VILLAGE
DEVELOPMENT

LINDBERGH & OLIVE BLVD



CREVE COEUR, MO

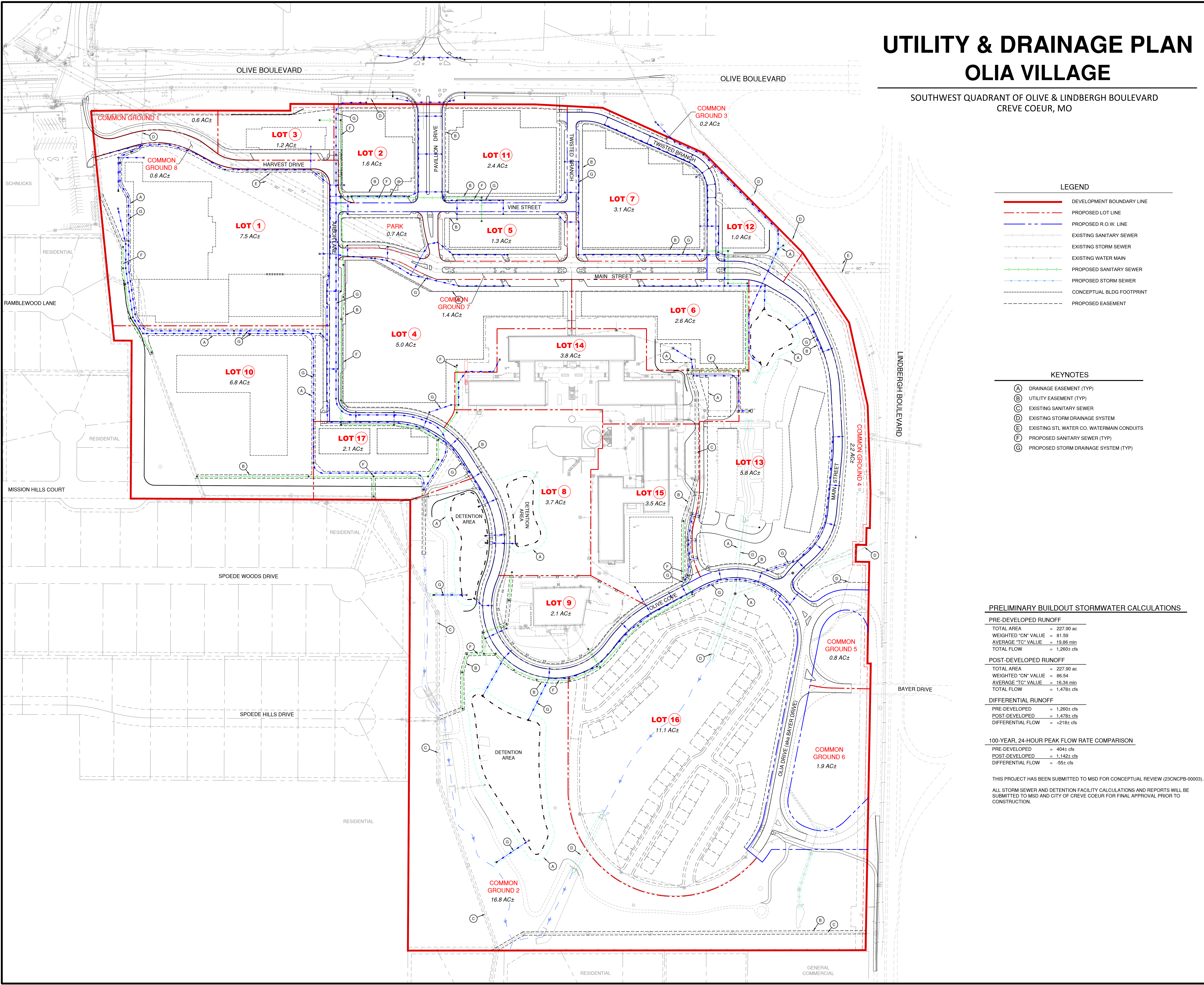
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PROJECT NO.	23005201-00	
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DESIGNED BY:	TME/JFM	
DRAWN BY:	JFM	
CHECKED BY:	CJS	
APPROVED BY:	---	
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SHEET TITLE

GRADING PLAN

C-105

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
 - 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 (23CNCBP-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

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

PRELIMINARY
NOT FOR CONSTRUCTION
SEPTEMBER 13, 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		
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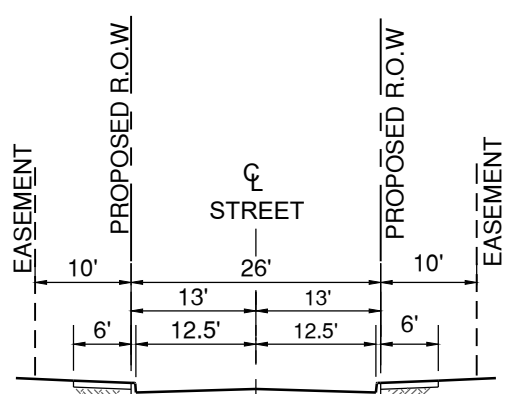
SHEET TITLE
UTILITY & DRAINAGE
PLAN
C-106
SHEET - OF --

STREET PLAN
OLIA VILLAGE

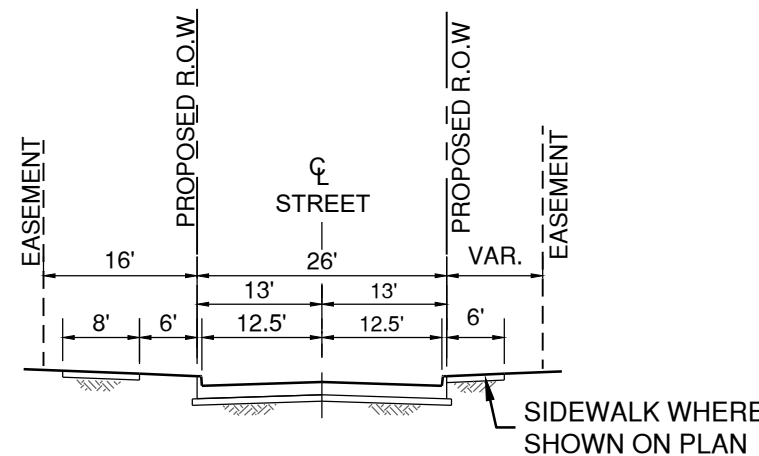
SOUTHWEST QUADRANT OF OLIVE & LINDBERGH BOULEVARD
CREVE COEUR, MO

- 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

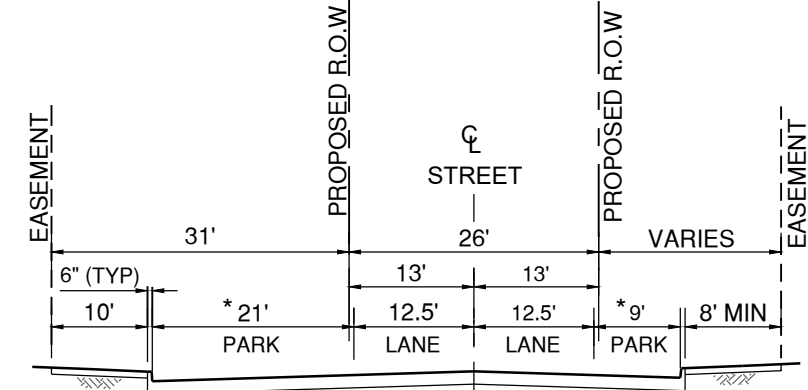
- KEYNOTES
- PROPOSED RIGHT-OF-WAY
 - PROPOSED ROADWAY IMPROVEMENT, MAINTENANCE, UTILITY, SEWER, SIDEWALK (R.I.M.U.S.S.) EASEMENT
 - CONCEPTUAL FUTURE ENTRANCE
 - EXISTING STL WATER MAIN CONDUITS
 - EXISTING STL WATER MAIN EASEMENT



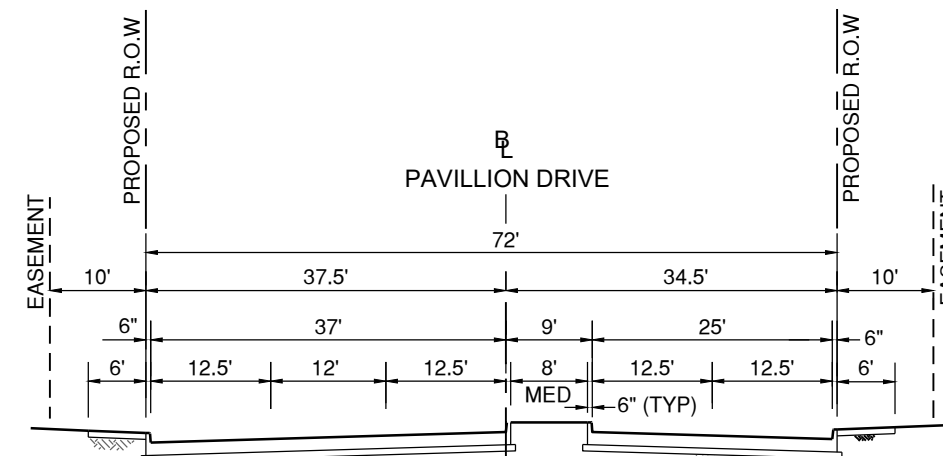
TYPICAL SECTION #1
STANDARD STREET SECTION



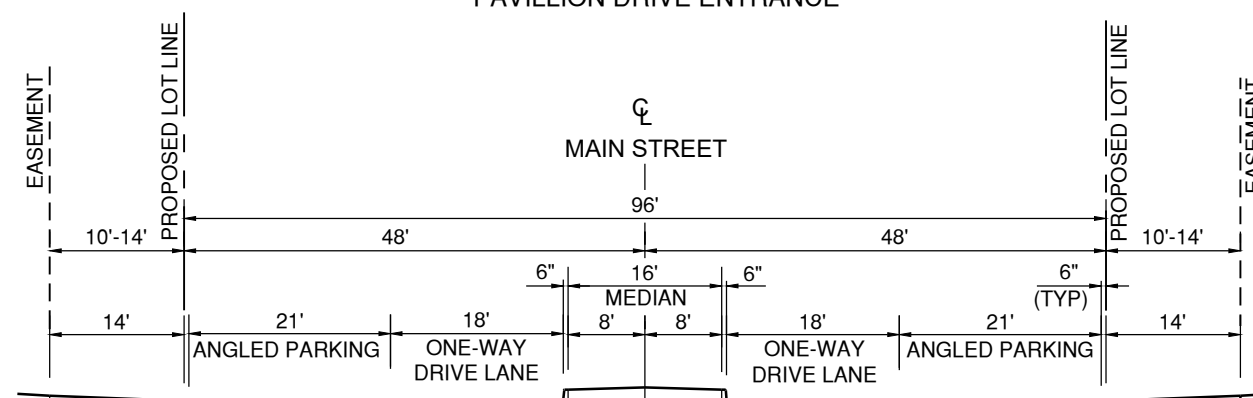
TYPICAL SECTION #2
OLIVE COVE



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
ARBOR LANE	625	0.237
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
SUB-TOTAL :	7,255	2.870
PRIVATE ROADWAYS		
PAVILLION DRIVE	180	0.068
MAIN STREET	1,120	0.424
TWISTED BRANCH	190	0.072
HARVEST DRIVE (FUTURE PUBLIC)	770	0.292
ARBOR LANE (FUTURE PUBLIC)	125	0.047
BAYER DRIVE (E/W)	220	0.083
SUB-TOTAL :	2,605	0.986
TOTAL :	9,860	3.856

GENERAL NOTES

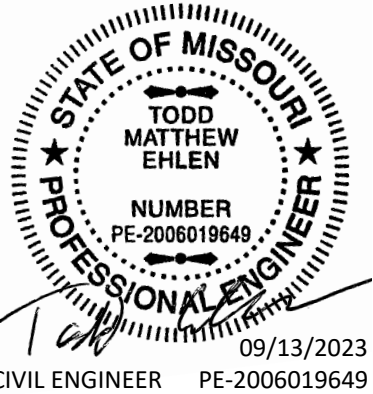
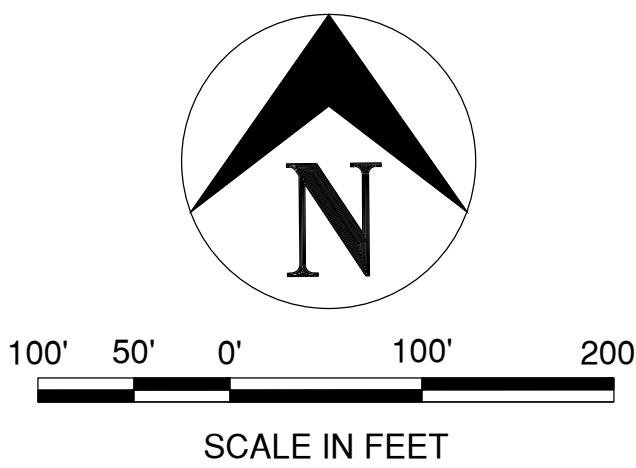
- EXISTING EASEMENTS NOT SHOWN FOR CLARITY.
- EXISTING UTILITIES NOT SHOWN FOR CLARITY.
- PROPOSED UTILITY EASEMENTS NOT SHOWN FOR CLARITY.
- PROPOSED UTILITIES NOT SHOWN FOR CLARITY.



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
SEPTEMBER 13, 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

STREET PLAN

C-107

SHEET - OF --

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: Shall not be permitted as a primary use. 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

C. 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.

D. 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. Buffer, 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 single-family residential development shall only be required to meet the following requirements below:
 - ii. Provide a forty (40) foot buffer yard on all sides of the PMUD development that abut a single-family development, except if the abutting or adjoining proposed uses are residential of equal or lesser density relative to the existing residential uses then such buffer yard shall be twenty-five (25) feet. The buffer yard shall otherwise be as defined in amended Section 405.390 of the City of Creve Coeur's zoning ordinance.
 - iii. No new residential building may be located closer than fifteen (10) feet to any property line or any required buffer yard.
 - iv. No new commercial building may be located closer than forty (35) 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.

E. 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 per phase of development (as designated on the approved Phase Plan) 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 spaces. Parking within the Residential Development District (CATEGORY D) shall not be provided with a fifteen percent (15%) reduction in the total number of spaces and shall adhere to the rate required by the City of Creve Coeur Code.
- ii. Required parking 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. 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.
 - e. 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.
 - f. All existing surface parking lots to remain on Lots 8, 9, 12, 14 & 15 shall not be required to meet Article V of the City of Creve Coeur Code.
 - g. 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.

- h. 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 submitted to the City of Creve Coeur as a sign package.

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. Masonry and glass are preferred. Metal, cementitious siding, and EFIS should not be used as the primary material on the building.
- 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 8-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.

H. PUBLIC ART REQUIREMENTS

An Individual public art package shall meet City of Creve Coeur ordinances. Final art selected will be specifically governed by this performance standard and shall be submitted to the City of Creve Coeur as an art package and will meet the requirements of the City's Public Art Package.

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
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		
311811	Retail Bakeries	P	P		
311812	Commercial Bakeries	P	P		
311813	Frozen Cakes, Pies, and Other Pastries 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 (No outside surface storage or display allowed)	P	P		
441228	Motorcycle, ATV, and All Other Motor Vehicle Dealers (No outside surface storage or display allowed)	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		
453110	Florists	P	P		
453210	Office Supplies and Stationery 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		
492210	Local Messengers and Local Delivery	P	P		
512240	Sound Recording Industries	P	P	P	
512290	Other Sound Recording Industries	P	P	P	

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

Use Code	2012 NAICS Title	P = Permitted Use			
		Zoning District - Olia PMD			
		A Main	B Mixed	C Office	D Residential
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	
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	
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	
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	
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	

* Use shall note be permitted in the street facing ground floor within Main Street District

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
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	
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	

* Use shall note be permitted in the street facing ground floor within Main Street District

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

Use Code	2012 NAICS Title	P = Permitted Use			
		Zoning District - Olia PMD			
		A Main	B Mixed	C Office	D Residential
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	
713940	Fitness and Recreational Sports Centers	P	P	P	
713950	Bowling Centers	P	P	P	
713990	All Other Amusement and Recreation Industries (except gun and shooting clubs)	P	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	
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		
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
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	
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	

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: Shall not be permitted as a primary use. 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

C. 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.

D. 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. Buffer, 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 single-family residential development shall only be required to meet the following setbacks requirements below:-

ii. Provide a forty (40) foot buffer yard on all sides of the PMUD development that abut a single-family development, except if the abutting or adjoining proposed uses are residential of equal or lesser density relative to the existing residential uses then such buffer yard shall be twenty-five (25) feet. The buffer yard shall otherwise be as defined in amended Section 405.390 of the City of Creve Coeur's zoning ordinance.

~~iii.~~ No new residential building may be located closer than fifteen (105) feet to any property line or any required buffer yard.

~~iv.~~ No new commercial building may be located closer than forty (3540) 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.

E. 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:

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- i. ~~Required parking shall be calculated cumulatively per phase of development (as designated on the approved Phase Plan) 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 spaces. Parking within the Residential Development District (CATEGORY D) shall not be provided with a fifteen percent (15%) reduction in the total number of spaces and shall adhere to the rate required by the City of Creve Coeur Code.~~ 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-d. 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-e. 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.f.~~ All existing surface parking lots to remain on Lots 8, 9, 12, 14 & 15 shall not be required to meet Article V of the City of Creve Coeur Code.

~~h.g.~~ 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.

~~h.h.~~ 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 submitted to the City of Creve Coeur as a sign package 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. Masonry and glass are preferred. Metal, cementitious siding, and EFIS should not be used as the primary material on the building.
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 ~~68~~-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.

H. PUBLIC ART REQUIREMENTS

An Individual public art package shall meet City of Creve Coeur ordinances. Final art selected will be specifically governed by this performance standard and shall be submitted to the City of Creve Coeur as an art package and will meet the requirements of the City’s Public Art Package.

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

Use Code	2012 NAICS Title	P = Permitted Use			
		Zoning District - Olia PMD			
		A Main	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	Confectionary 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 (No outside surface storage or display allowed)	P	P		
441120	Used Car Dealers	P	P		
441228	Motorcycle, ATV, and All Other Motor Vehicle Dealers (No outside surface storage or display allowed)	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		
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		

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

Use Code	2012 NAICS Title	P = Permitted Use			
		Zoning District - Olia PMD			
		A Main	B Mixed	C Office	D Residential
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	
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	
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	

* Use shall note be permitted in the street facing ground floor within Main Street District

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
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	
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	

* Use shall note be permitted in the street facing ground floor within Main Street District

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

Use Code	2012 NAICS Title	P = Permitted Use			
		Zoning District - Olia PMD			
		A Main	B Mixed	C Office	D Residential
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	
713940	Golf Course and Country Clubs		P	P	
713940	Fitness and Recreational Sports Centers	P	P	P	
713950	Bowling Centers	P	P	P	
713990	All Other Amusement and Recreation Industries (except gun and shooting clubs)	P	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		
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
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	

* Use shall not be permitted in the street facing ground floor within Main Street District

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
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	

PRELIMINARY STORMWATER MANAGEMENT REPORT

OLIA VILLAGE CREVE COEUR, MO



OLIA VILLAGE

THE HEART OF CREVE COEUR

July 7, 2023

Prepared by:



CRAWFORD, MURPHY & TILLY, INC.
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Stormwater Management Report

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APPENDICES

APPENDIX A: PRE-DEVELOPED DRAINAGE AREA MAP

APPENDIX B: POST-DEVELOPED DRAINAGE AREA MAP

APPENDIX C: CALCULATIONS

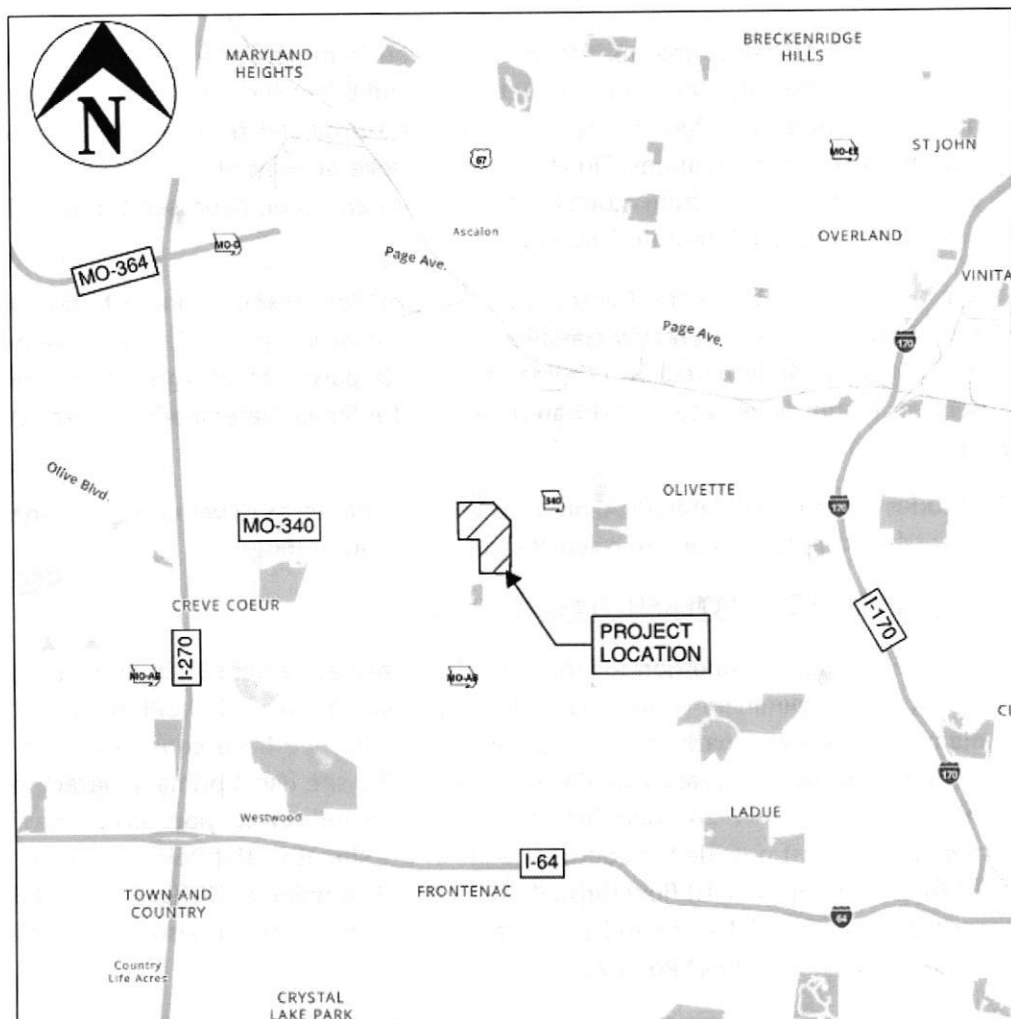
APPENDIX D: SOURCE DATA

EXECUTIVE SUMMARY

This report was prepared by Crawford, Murphy, & Tilly, Inc. (CMT), on behalf of Jack Matthews Development for the construction of the approximately 95-acre Olia Village Development within the City of Creve Coeur, MO.

The purpose of this preliminary report is to document the pre-developed and anticipated post-developed drainage conditions of the site as well as the design methodology for the hydrologic analysis. Many aspects of the proposed development are still being designed including the storm sewer plans and BMPs for water quality and volume reduction. The purpose of this report is to provide a preliminary analysis of the proposed detention facilities to confirm that they will have sufficient volume for the proposed development. The project location is shown in the Vicinity Map below:

Figure 1. VICINITY MAP



I) INTRODUCTION

A. GOVERNING CRITERIA AND METHODOLOGY

The Authority having jurisdiction over the development will be the Metropolitan St. Louis Sewer District (MSD). As such, the proposed design will follow the MSD Drainage Manual.

Section 4.060.02 states that the detention system for the property shall be designed to control the peak rate of discharge from the property for the 2-year (24-hour) and 100-year (24-hour) storm events. The SCS Method from Technical Release 55 shall be used with Type II distribution and rainfall quantities of 3.1" for 2-year and 7.2" for 100-year storm events. Our preliminary calculations only show results for the 100-year storm as this will be the controlling event for maximum pond volume. Outlet structures will be designed to control the 2-year event as the plans are further developed.

Section 4.060.04 states that maximum fluctuation from permanent pool elevation to maximum ponding elevation shall be 6 feet for wet ponds and 8 feet for dry ponds. Section 4.060.03 states that a minimum of 1 foot of freeboard shall be provided from the top of the basin to the maximum ponding elevations. Finally, there are several acres of offsite flow that come onto the Olia Village site. Per Section 4.060.02, these flows are to be bypassed through the site and not enter the proposed detention facilities.

Per the Natural Resources Conservation Service Soil Resource Report, the soils within the proposed project are primarily classified in Hydrologic soil group C. The curve numbers for the analysis were determined by utilizing the U.S. Department of Agriculture, Soil Conservation Service, Technical Release 55, "Urban Hydrology for Small Watersheds". Source Data is shown in Appendix D.

Autodesk Storm and Sanitary Analysis (SSA) was utilized to develop the existing and proposed watershed runoff rates and to calculate the detention routing.

B. PRE-DEVELOPED WATERSHED CONDITIONS

The pre-developed condition for the Olia Village project is defined as the natural conditions of the site per preliminary conceptual review by MSD (Ref. No. 23CNCPB-00003). While there are many buildings and parking lots present on the site, we have considered the pre-developed conditions to be fully grass with CN value of 74. The site has 3 primary watersheds (E-1A, E-2A, and E-3A). E-1A and E-2A drain through the western and central portions of the site respectively and combine just outside the southern edge of the site at Outlet Point 1. Offsite Watersheds (E-1B to E-1G, E2-B to E2-H) flow through the site and combine at Outlet Point 1. E-3A includes the southeast corner of the site and drains to Outlet Point 2. There is also a small offsite watershed, E-3B, that flows to Outlet Point 2.

The pre-developed watershed map can be seen in Appendix A. A summary of all pre-developed watershed information is shown in Table 1 below. TC, CN, and output Q calculations are shown in Appendix C.

TABLE 1: EXISTING DRAINAGE AREAS (PRE-DEVELOPMENT)				
DRAINAGE AREA	TOTAL AREA (AC)	WEIGHTED "CN" VALUE	TC (MIN)	Q (CFS)
E-1A	48.35	74.00	28.32	186.38
E-1B	7.81	83.60	10.19	55.29
E-1C	3.67	98.00	13.00	28.52
E-1D	2.57	85.94	16.11	16.61
E-1E	6.76	91.70	15.80	47.34
E-1F	18.02	93.72	17.88	122.62
E-1G	0.56	89.52	11.58	4.21
E-1H	0.47	91.03	10.41	3.65
E-2A	41.34	74.00	22.00	182.94
E-2B	1.09	86.49	11.36	7.85
E-2C	10.07	86.87	15.89	66.23
E-2D	1.22	85.25	13.33	8.31
E-2E	1.93	81.09	14.36	11.95
E-2F	22.15	85.78	17.49	138.21
E-2G	1.43	86.01	7.31	11.31
E-2H	51.94	84.84	17.77	317.10
E-2I	0.42	89.15	11.40	3.16
E-2J	1.52	85.72	13.98	10.28
E-3A	6.08	74.00	11.12	34.60
E-3B	0.52	90.98	14.35	3.72

C. POST-DEVELOPED WATERSHED CONDITIONS

In the post-developed watershed conditions, drainage patterns will be maintained to the two existing outlet points. Two dry detention basins and three wet ponds are proposed to detain runoff from the site. Basin 1 is in the northeast corner of the site and detains flow from P5-1. Basin 2 is in the southeast corner of the site and detains flow from P14-1A. Pond 1 is in the center of the site and detains flow from P4-1. Pond 2 is in the central portion of the site located near the western property line and detains flow from P2-1 as well as the outflow from Pond 1. Pond 3 is in the southwestern portion of the site and detains flow from P6-1, P7-1, and P9-1. P-14-1A, P14-1B, and 16-P?-1 flow to Outlet Point 2.

All other watersheds drain to Outlet Point 1. The post-developed watershed map can be seen in Appendix B. A summary of undetained post-developed watershed information can be found in Table 2 below. TC, CN, and output Q calculations are shown in Appendix C.

TABLE 2: PROPOSED DRAINAGE AREAS (POST-DEVELOPMENT)				
DRAINAGE AREA	TOTAL AREA (AC)	WEIGHTED "CN" VALUE	TC	Q (CFS)
P1-1	6.02	74.79	28.32	23.7
P2-1	28.12	92.05	15.00	201.29
P3-1	6.57	91.67	15.00	46.81
P4-1	4.34	78.41	15.00	25.07
01-P?-1	7.81	83.60	10.19	55.29
02-P?-1	3.67	98.00	13.00	28.52
03-P?-1	2.57	85.94	16.11	16.61
04-P?-1	6.76	91.70	15.80	47.34
05-P?-1	18.02	93.72	17.88	122.62
06-P?-1	0.47	91.03	10.41	3.65
07-P?-1	0.56	89.52	11.58	4.21
P5-1	7.76	90.95	22.00	54.92
P6-1	2.64	92.65	15.00	19.03
P7-1	1.71	90.03	15.00	11.95
P8-1	4.74	83.52	15.00	30.21
P9-1	11.05	82.32	15.00	68.94
P10-1	2.13	75.53	15.00	11.54
P11-1	11.23	83.95	15.00	72.01
P12-1	1.19	80.60	15.00	7.18
P13-1	1.91	74.73	15.00	10.14
08-P?-1	1.09	86.49	11.36	7.85
09-P?-1	10.07	86.87	15.89	66.23
10-P?-1	22.15	85.78	17.49	138.21
11-P?-1	1.43	86.01	7.31	11.31
12-P?-1	1.22	85.25	13.33	8.31
13-P?-1	1.93	81.09	14.36	11.95
14-P?-1	1.52	85.72	13.98	10.28
15-P?-1	0.42	89.15	11.40	3.16
16-P?-1	0.52	90.98	14.35	3.72
17-P?-1	51.93	84.84	17.77	317.1
P14-1A	3.89	76.11	11.12	23.82
P14-1B	2.68	77.17	0.00	15.47

D. DETENTION FACILITY INFORMATION

A summary of information for each Detention Facility is shown in Table 3 below. Calculations are shown for the 100-year, 24-hour storm event. The calculations show that 1 foot freeboard is maintained from the maximum water surface to the top of berm in each detention facility. Detailed calculations output from SSA are shown in Appendix C.

TABLE 3. DETENTION FACILITY SUMMARY					
DETENTION FACILITY	INFLOW (CFS)	OUTFLOW (CFS)	NORMAL POOL ELEVATION	MAXIMUM WATER SURFACE ELEVATION	TOP OF BERM ELEVATION
BASIN 1	32.89	13.76	625.00	630.80	632.00
BASIN 2	53.56	19.32	615.00	620.67	622.00
POND 1	24.03	0.70	624.00	626.82	631.00
POND 2	196.81	97.99	610.00	616.02	617.00
POND 3	96.86	19.14	597.00	598.99	604.00

II) COMPARISON OF PRE-DEVELOPED AND POST-DEVELOPED CONDITIONS

The pre- and post-development flow rates to each of the two outlet points are shown in Table 4 below. These include flows from all the proposed detention facilities described above and include all offsite flows that will bypass the proposed detention facilities to the proposed outlet points. Detailed calculations output from SSA are shown in Appendix C.

TABLE 4. 100-YEAR, 24-HOUR PEAK FLOW RATE COMPARISON				
ANALYSIS POINT	STORM EVENT	PRE-DEVELOPED FLOW RATE (cfs)	POST-DEVELOPED FLOW RATE (cfs)	FLOW RATE DIFFERENTIAL (cfs)
OUTLET POINT 1	100-YEAR	1158.81	1109.43	-49.38
OUTLE POINT 2	100-YEAR	38.25	32.89	-5.36

III) CONCLUSION

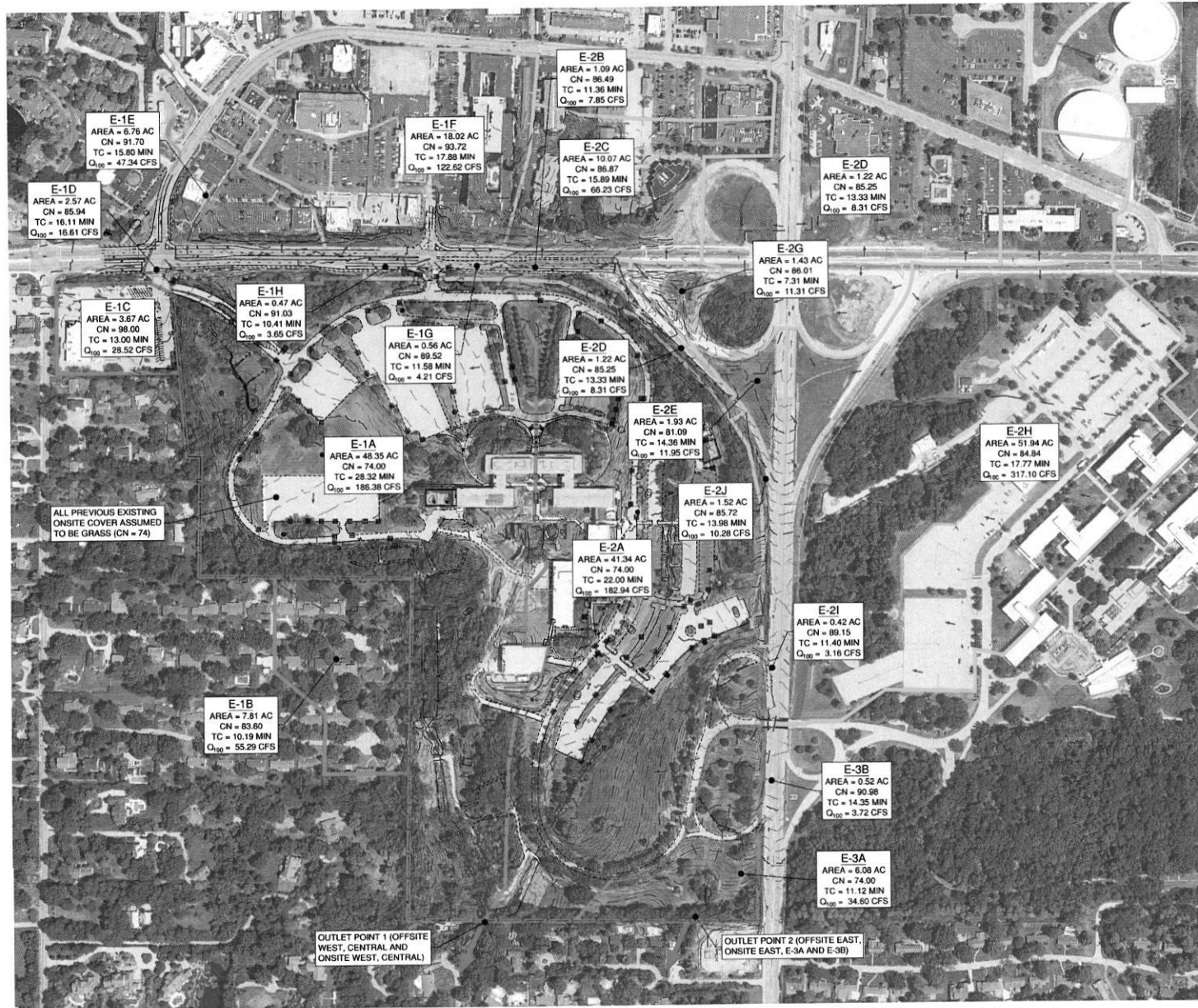
As mentioned in the Executive Summary, this preliminary report documents the pre-developed and anticipated post-developed drainage conditions of the site as well as the design methodology for the hydrologic analysis. This report demonstrates that the proposed detention facilities have sufficient volume to meet drainage requirements by showing no increase in flow at the outlet points and 1 foot of freeboard at each detention facility.

Many aspects of the development are still being designed including the storm sewer conveyance plans and BMPs for water quality and volume reduction. As the plans are developed, complete drainage reports will be completed with all required information and will be submitted to both the City of Creve Coeur and MSD for final approval prior to construction.

APPENDIX A: PRE-DEVELOPED DRAINAGE AREA MAP



200' 100' 0' 200' 400'
SCALE 1 in. = 200 ft.



License No. 184-000531

PRELIMINARY PLANS
DESIGN DEVELOPMENT
JULY 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BOULEVARD
CREVE COEUR, MO

MARK DATE DESCRIPTION

PROJECT NO: 23005201-00
CAD DWG FILE: PRE-DEV. JPDG. DRAINAGE AREA MAP ON VALLES.DWG
DESIGNED BY: DGS
DRAWN BY: DGS
CHECKED BY: TME
APPROVED BY: --
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SHEET TITLE

PRE-DEVELOPED
DRAINAGE AREA MAP

1
OF

APPENDIX B: POST-DEVELOPED DRAINAGE AREA MAP



200' 100' 0' 200' 400'
SCALE 1 in. = 200 ft.



License No. 184-000831

PRELIMINARY PLANS
DESIGN DEVELOPMENT
JULY 2023

OLIA VILLAGE

LINDBERGH & OLIVE BLVD



OLIA VILLAGE

THE HEART OF CREVE COEUR

10300 OLIVE BOULEVARD
CREVE COEUR, MO

MARK	DATE	DESCRIPTION
PROJECT NO.	23005201-00	
CAD DWG FILE:	POST-DEVELOPED DRAINAGE AREA MAP\OLIAVILLAGE.DWG	
DESIGNED BY:	DOS	
DRAWN BY:	DOS	
CHECKED BY:	TME	
APPROVED BY:	-	
COPYRIGHT: CRAWFORD, MURPHY & TILLY, INC. 2023		

SHEET TITLE
POST-DEVELOPED
DRAINAGE AREA MAP

2
OF

APPENDIX C: CALCULATIONS

LIST OF CALCULATIONS

1. PRE-DEVELOPED: TIME OF CONCENTRATION CALCULATIONS
2. POST-DEVELOPED: TIME OF CONCENTRATION CALCULATIONS
3. PRE-DEVELOPED: CN CALCULATIONS
4. POST-DEVELOPED: CN CALCULATIONS
5. PRE-DEVELOPED: 100-YEAR, 24-HOUR STORM EVENT SSA SUMMARY
6. POST-DEVELOPED: 100-YEAR, 24-HOUR STORM EVENT SSA SUMMARY

APPENDIX C: PRE-DEVELOPED: TIME OF CONCENTRATIONS

CMT				PROJECT : <i>Boyer Site Design</i>		REVISIONS:									
CRAWFORD, MURPHY & TILLY, INC.				JOB CODE : <i>23005201-00</i>											
CONSULTING ENGINEERS				DESIGNED : <i>DGS</i>	CHECKED : <i>TME</i>										
				DATE : <i>7/7/2023</i>	DATE : <i>7/7/2023</i>										
EXISTING DRAINAGE AREAS (PRE-DEVELOPMENT)															
DRAINAGE AREA	K	n (roughness coefficient)	Length	Upstream El.	Downstream El.	Slope	Overland Travel Time (min)		K	Length	Upstream El.	Downstream El.	Slope	Open Channel Flow Travel Time (min)	Total Travel Time (min)
WESTERN TRIBUTARY STREAM (OUTLET POINT 1)															
ON-SITE DRAINAGE AREAS															
E-1A	0.83	0.3	100	680.00	678.00	0.0200	10.29		0.0078	3580	678.00	594.00	0.0235	18.03	28.32
OFF-SITE DRAINAGE AREAS															
E-1B	0.83	0.3	100	646.00	634.00	0.1200	6.76		0.0078	510	634.00	616.00	0.0353	3.44	10.19
E-1C	0.83	0.3	100	679.00	674.80	0.0420	8.65		0.0078	506	674.80	665.27	0.0188	4.35	13.00
E-1D	0.83	0.3	100	679.00	677.73	0.0127	11.45		0.0078	366	677.73	674.71	0.0083	4.66	16.11
E-1E	0.83	0.3	100	682.00	680.00	0.0200	10.29		0.0078	560	680.00	673.00	0.0125	5.51	15.80
E-1F	0.83	0.3	100	682.00	680.00	0.0200	10.29		0.0078	713	680.00	673.71	0.0088	7.58	17.88
E-1G	0.83	0.3	100	676.33	674.00	0.0233	9.93		0.0078	130	674.00	672.00	0.0154	1.65	11.58
E-1H	0.83	0.3	100	672.00	669.00	0.0300	9.36		0.0078	104	669.00	665.66	0.0321	1.05	10.41
CENTRAL TRIBUTARY STREAM (OUTLET POINT 1)															
ON-SITE DRAINAGE AREAS															
E-2A	0.83	0.3	100	681.81	677.00	0.0481	8.38		0.0078	2874	677.00	587.00	0.0313	13.62	22.00
OFF-SITE DRAINAGE AREAS															
E-2B	0.83	0.3	100	690.00	688.00	0.0200	10.29		0.0078	114	688.00	683.80	0.0368	1.07	11.36
E-2C	0.83	0.3	100	710.00	708.00	0.0200	10.29		0.0078	923	708.00	678.00	0.0325	5.60	15.89
E-2D	0.83	0.3	100	690.00	689.00	0.0100	12.12		0.0078	219	689.00	668.00	0.0959	1.22	13.33
E-2E	0.83	0.3	100	676.00	674.36	0.0164	10.79		0.0078	248	674.36	672.49	0.0075	3.57	14.36
E-2F	0.83	0.3	100	712.00	710.00	0.0200	10.29		0.0078	1447	710.00	649.68	0.0417	7.19	17.49
E-2G	0.83	0.3	100	691.00	678.00	0.1300	6.63		0.0078	115	678.00	664.00	0.1217	0.68	7.31
E-2H	0.83	0.3	100	700.00	675.00	0.2500	5.69		0.0078	1835	675.00	643.00	0.0174	12.08	17.77
E-2I	0.83	0.3	100	656.00	654.00	0.0200	10.29		0.0078	89	654.00	652.20	0.0202	1.11	11.40
E-2J	0.83	0.3	100	667.70	665.60	0.0210	10.18		0.0078	730	665.60	624.94	0.0557	3.80	13.98
EASTERN TRIBUTARY STREAM (OUTLET POINT 2)															
ON-SITE DRAINAGE AREAS															
E-3A	0.83	0.3	100	673.83	662.26	0.1157	6.81		0.0078	874	662.26	611.68	0.0579	4.30	11.12
OFF-SITE DRAINAGE AREAS															
E-3B	0.83	0.3	100	656.50	655.50	0.0100	12.12		0.0078	225	655.50	650.76	0.0211	2.23	14.35
NOTES:															

APPENDIX C: POST-DEVELOPED: TIME OF CONCENTRATIONS

			PROJECT : <i>Bayer Site Design</i>				REVISIONS:									
CRAWFORD, MURPHY & TILLY, INC.			JOB CODE : <i>23005201-00</i>													
CONSULTING ENGINEERS			DESIGNED : <i>DGS</i>		CHECKED : <i>TME</i>											
			DATE : <i>7/7/2023</i>		DATE : <i>7/7/2023</i>											
PROPOSED DRAINAGE AREAS (POST-DEVELOPMENT)																
DRAINAGE AREA	K	n (roughness coefficient)	Length	Upstream El.	Downstream El.	Slope	Overland Travel Time (min)		K	Length	Upstream El.	Downstream El.	Slope	Open Channel Flow Travel Time (min)	Total Travel Time (min)	
WESTERN TRIBUTARY STREAM (OUTLET POINT 1)																
ON-SITE DRAINAGE AREAS																
P1-1	0.83	0.3	100	680.00	678.00	0.0200	10.29		0.0078	3580	678.00	594.00	0.0235	18.03	28.32	
P2-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P3-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P4-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
OFF-SITE DRAINAGE AREAS																
01-P7-1	0.83	0.3	100	646.00	634.00	0.1200	6.76		0.0078	510	634.00	616.00	0.0353	3.44	10.19	
02-P7-1	0.83	0.3	100	679.00	674.80	0.0420	8.65		0.0078	506	674.80	665.27	0.0188	4.35	13.00	
03-P7-1	0.83	0.3	100	679.00	677.73	0.0127	11.45		0.0078	366	677.73	674.71	0.0083	4.66	16.11	
04-P7-1	0.83	0.3	100	682.00	680.00	0.0200	10.29		0.0078	560	680.00	673.00	0.0125	5.51	15.80	
05-P7-1	0.83	0.3	100	682.00	680.00	0.0200	10.29		0.0078	713	680.00	673.71	0.0088	7.58	17.88	
06-P7-1	0.83	0.3	100	672.00	669.00	0.0300	9.36		0.0078	104	669.00	665.66	0.0321	1.05	10.41	
07-P7-1	0.83	0.3	100	676.33	674.00	0.0233	9.93		0.0078	130	674.00	672.00	0.0154	1.65	11.58	
CENTRAL TRIBUTARY STREAM (OUTLET POINT 1)																
ON-SITE DRAINAGE AREAS																
P5-1	0.83	0.3	100	681.81	677.00	0.0481	8.38		0.0078	2874	677.00	587.00	0.0313	13.62	22.00	
P6-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P7-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P8-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P9-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P10-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P11-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P12-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
P13-1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15.00	
OFF-SITE DRAINAGE AREAS																
08-P7-1	0.83	0.3	100	690.00	688.00	0.0200	10.29		0.0078	114	688.00	683.80	0.0368	1.07	11.36	
09-P7-1	0.83	0.3	100	710.00	708.00	0.0200	10.29		0.0078	923	708.00	678.00	0.0325	5.60	15.89	
10-P7-1	0.83	0.3	100	712.00	710.00	0.0200	10.29		0.0078	1447	710.00	649.68	0.0417	7.19	17.49	
11-P7-1	0.83	0.3	100	691.00	678.00	0.1300	6.63		0.0078	115	678.00	664.00	0.1217	0.68	7.31	
12-P7-1	0.83	0.3	100	690.00	689.00	0.0100	12.12		0.0078	219	689.00	668.00	0.0959	1.22	13.33	
13-P7-1	0.83	0.3	100	676.00	674.36	0.0164	10.79		0.0078	248	674.36	672.49	0.0075	3.57	14.36	
14-P7-1	0.83	0.3	100	667.70	665.60	0.0210	10.18		0.0078	730	665.60	624.94	0.0557	3.80	13.98	
15-P7-1	0.83	0.3	100	656.00	654.00	0.0200	10.29		0.0078	89	654.00	652.20	0.0202	1.11	11.40	
17-P7-1	0.83	0.3	100	700.00	675.00	0.2500	5.69		0.0078	1835	675.00	643.00	0.0174	12.08	17.77	
EASTERN TRIBUTARY STREAM (OUTLET POINT 2)																
ON-SITE DRAINAGE AREAS																
P14-1A	0.83	0.3	100	673.83	662.26	0.1157	6.81		0.0078	874	662.26	611.68	0.0579	4.30	11.12	
P14-1B	0.83	0.3	100	673.83	662.26	0.1157	6.81		0.0078	874	662.26	611.68	0.0579	4.30	11.12	
OFF-SITE DRAINAGE AREAS																
16-P7-1	0.83	0.3	100	656.50	655.50	0.0100	12.12		0.0078	225	655.50	650.76	0.0211	2.23	14.35	
NOTES:																
1. TC FOR ONSITE DRAINAGE AREAS WILL BE UPDATED WHEN GRADING AND STORM SEWER PLANS ARE COMPLETED.																

APPENDIX C: PRE-DEVELOPED: CN CALCULATIONS

 CRAWFORD, MURPHY & TILLY, INC. CONSULTING ENGINEERS		PROJECT : <i>Bayer Site Design</i>		REVISIONS:					
		JOB CODE : <i>23005201-00</i>							
		DESIGNED : <i>DGS</i>	CHECKED : <i>TME</i>						
		DATE : <i>7/7/2023</i>	DATE : <i>7/7/2023</i>						
EXISTING DRAINAGE AREAS (PRE-DEVELOPMENT)									
DRAINAGE AREA	SITE INFORMATION				WEIGHTED "CN" VALUE				COMMENTS
	TOTAL AREA (sf)	100% IMPERVIOUS (ROOF) (sf)	100% IMPERVIOUS (PVTM) (sf)	5% IMPERVIOUS (GRASS) (sf)	TOTAL AREA (ac)	CN = 98 IMPERVIOUS PAVEMENT (ac)	CN = 74 GRASS (GOOD) (ac)	WEIGHTED "CN" VALUE	
WESTERN TRIBUTARY STREAM (OUTLET POINT 1)									
ON-SITE DRAINAGE AREAS									
E-1A	2,106,065	0	0	2,106,065	48.35	0.00	48.35	74.00	
SUB-TOTAL:	48.35 ac	0.00 ac	0.00 ac	48.35 ac					
OFF-SITE DRAINAGE AREAS									
E-1B	340,180	0	136,072	204,108	7.81	3.12	4.69	83.60	
E-1C	159,787	0	159,787	0	3.67	3.67	0.00	98.00	
E-1D	111,815	0	55,631	56,184	2.57	1.28	1.29	85.94	
E-1E	294,668	0	217,278	77,390	6.76	4.99	1.78	91.70	
E-1F	784,992	0	645,093	139,899	18.02	14.81	3.21	93.72	
E-1G	24,187	0	15,645	8,542	0.56	0.36	0.20	89.52	
E-1H	20,327	0	14,422	5,905	0.47	0.33	0.14	91.03	
SUB-TOTAL:	39.85 ac	0.00 ac	28.56 ac	11.30 ac					
CENTRAL TRIBUTARY STREAM (OUTLET POINT 1)									
ON-SITE DRAINAGE AREAS									
E-2A	1,800,847	0	0	1,800,847	41.34	0.00	41.34	74.00	
SUB-TOTAL:	41.34 ac	0.00 ac	0.00 ac	41.34 ac					
OFF-SITE DRAINAGE AREAS									
E-2B	47,309	0	24,629	22,680	1.09	0.57	0.52	86.49	
E-2C	438,457	0	235,120	203,338	10.07	5.40	4.67	86.87	
E-2D	53,220	0	24,938	28,282	1.22	0.57	0.65	85.25	
E-2E	84,124	0	24,847	59,277	1.93	0.57	1.36	81.09	
E-2F	964,757	0	473,450	491,307	22.15	10.87	11.28	85.78	
E-2G	62,149	0	31,093	31,056	1.43	0.71	0.71	86.01	
E-2H	2,262,339	0	1,022,006	1,240,333	51.94	23.46	28.47	84.84	
E-2I	18,172	0	11,475	6,697	0.42	0.26	0.15	89.15	
E-2J	66,372	0	32,414	33,959	1.52	0.74	0.78	85.72	
SUB-TOTAL:	91.76 ac	0.00 ac	43.16 ac	48.60 ac					
EASTERN TRIBUTARY STREAM (OUTLET POINT 2)									
ON-SITE DRAINAGE AREAS									
E-3A	264,661	0	0	264,661	6.08	0.00	6.08	74.00	
SUB-TOTAL:	6.08 ac	0.00 ac	0.00 ac	6.08 ac					
OFF-SITE DRAINAGE AREAS									
E-3B	22,833	0	16,158	6,675	0.52	0.37	0.15	90.98	
SUB-TOTAL:	0.52 ac	0.00 ac	0.37 ac	0.15 ac					
TOTAL:	227.90 ac	0.00 ac	72.09 ac	155.81 ac					
NOTES:									

APPENDIX C: POST-DEVELOPED: CN CALCULATIONS

 CRAWFORD, MURPHY & TILLY, INC. CONSULTING ENGINEERS		PROJECT : Bayer Site Design			REVISIONS:					
		JOB CODE : 23005201-00								
		DESIGNED : DGS	CHECKED : TME							
		DATE : 7/7/2023	DATE : 7/7/2023							
PROPOSED DRAINAGE AREAS (POST-DEVELOPMENT)										
TRIBUTARY DRAINAGE STRUCTURE NUMBER	DRAINAGE AREA	SITE INFORMATION				WEIGHTED "CN" VALUE				COMMENTS
		TOTAL AREA (sf)	100% IMPERVIOUS (ROOF)	100% IMPERVIOUS (PVTMT) (sf)	5% IMPERVIOUS (GRASS) (sf)	TOTAL AREA (ac)	CN = 98 IMPERVIOUS PAVEMENT (ac)	CN = 74 GRASS (GOOD) (ac)	WEIGHTED "CN" VALUE	
WESTERN TRIBUTARY STREAM (OUTLET POINT 1)										
ON-SITE DRAINAGE AREAS										
--	P1-1	262,206	8,616	0	253,590	6.02	0.20	5.82	74.79	UNDISTURBED STREAM
	P2-1	1,224,864	437,080	483,937	303,847	28.12	21.14	6.98	92.05	
	P3-1	286,115	56,428	154,178	75,508	6.57	4.83	1.73	91.67	
	P4-1	189,260	16,552	18,244	154,464	4.34	0.80	3.55	78.41	
	SUB-TOTAL:	45.05 ac	11.91 ac	15.07 ac	18.08 ac					
OFF-SITE DRAINAGE AREAS										
--	01-P?-1	340,180	0	136,072	204,108	7.81	3.12	4.69	83.60	SEE NOTE 2
	02-P?-1	159,787	0	159,787	0	3.67	3.67	0.00	98.00	
	03-P?-1	111,815	0	55,631	56,184	2.57	1.28	1.29	85.94	
	04-P?-1	294,668	0	217,278	77,390	6.76	4.99	1.78	91.70	
	05-P?-1	784,992	0	645,093	139,899	18.02	14.81	3.21	93.72	
	06-P?-1	20,327	0	14,422	5,905	0.47	0.33	0.14	91.03	
	07-P?-1	24,187	0	15,645	8,542	0.56	0.36	0.20	89.52	
	SUB-TOTAL:	39.85 ac	0.00 ac	28.56 ac	11.30 ac					
CENTRAL TRIBUTARY STREAM (OUTLET POINT 1)										
ON-SITE DRAINAGE AREAS										
	P5-1	337,985	109,944	128,798	99,243	7.76	5.48	2.28	90.95	
	P6-1	114,808	12,831	76,397	25,580	2.64	2.05	0.59	92.65	
	P7-1	74,298	33,339	16,294	24,665	1.71	1.14	0.57	90.03	
	P8-1	206,635	49,414	32,523	124,698	4.74	1.88	2.86	83.52	
	P9-1	481,225	24,594	142,168	314,463	11.05	3.83	7.22	82.32	
	P10-1	92,842	0	5,902	86,940	2.13	0.14	2.00	75.53	
	P11-1	488,994	99,615	103,189	286,190	11.23	4.66	6.57	83.95	
	P12-1	51,792	0	14,250	37,542	1.19	0.33	0.86	80.60	
	P13-1	83,162	0	2,536	80,626	1.91	0.06	1.85	74.73	
	SUB-TOTAL:	44.35 ac	7.57 ac	11.98 ac	24.79 ac					
OFF-SITE DRAINAGE AREAS										
	08-P?-1	47,309	0	24,629	22,680	1.09	0.57	0.52	86.49	
	09-P?-1	438,457	0	235,120	203,338	10.07	5.40	4.67	86.87	
	10-P?-1	964,757	0	473,450	491,307	22.15	10.87	11.28	85.78	
	11-P?-1	62,149	0	31,093	31,056	1.43	0.71	0.71	86.01	
	12-P?-1	53,220	0	24,938	28,282	1.22	0.57	0.65	85.25	
	13-P?-1	84,124	0	24,847	59,277	1.93	0.57	1.36	81.09	
	14-P?-1	66,372	0	32,414	33,959	1.52	0.74	0.78	85.72	
	15-P?-1	18,172	0	11,475	6,697	0.42	0.26	0.15	89.15	
	17-P?-1	2,262,270	0	1,022,006	1,240,264	51.93	23.46	28.47	84.84	
	SUB-TOTAL:	91.75 ac	0.00 ac	43.16 ac	48.60 ac					
EASTERN TRIBUTARY STREAM (OUTLET POINT 2)										
ON-SITE DRAINAGE AREAS										
	P14-1A	169,402	0	22,362	147,040	3.89	0.51	3.38	77.17	
	P14-1B	116,674	0	2,770	113,904	2.68	0.06	2.61	74.57	
	SUB-TOTAL:	6.57 ac	0.00 ac	0.58 ac	5.99 ac					
OFF-SITE DRAINAGE AREAS										
	16-P?-1	22,833	0	16,158	6,675	0.52	0.37	0.15	90.98	
	SUB-TOTAL:	0.52 ac	0.00 ac	0.37 ac	0.15 ac					
	TOTAL:	228.10 ac	19.48 ac	99.72 ac	108.90 ac					
NOTES:										

APPENDIX C: PRE-DEVELOPED: 100-YEAR, 24-HOUR STORM EVENT SSA SUMMARY

Autodesk® Storm and Sanitary Analysis 2016 - Version 13.4.304 (Build 0)

Project Description

File Name EXISTING DRAINAGE COMBINED OUTLETS.SPF

Analysis Options

Flow Units cfs
Subbasin Hydrograph Method. SCS TR-55
Time of Concentration..... User-Defined
Link Routing Method Hydrodynamic
Storage Node Exfiltration.. None
Starting Date JUL-03-2023 00:00:00
Ending Date JUL-04-2023 00:00:00
Report Time Step 00:05:00

Element Count

Number of rain gages 1
Number of subbasins 20
Number of nodes 3
Number of links 1

Raingage Summary

Gage ID	Data Source	Data Type	Recording Interval	min
Rain Gage-01	TS-02	INTENSITY	6.00	

Subbasin Summary

Subbasin ID	Total Area acres	Peak Rate Factor
E-1A	48.35	484.00
E-1B	7.81	484.00
E-1C	3.67	484.00
E-1D	2.57	484.00
E-1E	6.76	484.00
E-1F	18.02	484.00
E-1G	0.56	484.00
E-1H	0.47	484.00
E-2A	41.34	484.00
E-2B	1.09	484.00
E-2C	10.07	484.00
E-2D	1.22	484.00
E-2E	1.93	484.00
E-2F	22.15	484.00
E-2G	1.43	484.00
E-2H	51.94	484.00
E-2I	0.42	484.00
E-2J	1.52	484.00

E-3A	6.08	484.00
E-3B	0.52	484.00

Node Summary

Node ID	Element Type	Invert Elevation ft	Maximum Elev. ft	Ponded Area ft ²	External Inflow
JUNC.OFF.W	JUNCTION	0.00	6.00	0.00	
OUTLET1	OUTFALL	0.00	0.00	0.00	
OUTLET2	OUTFALL	0.00	0.00	0.00	

Link Summary

Link ID	From Node	To Node	Element Type	Length ft	Slope %	Manning's Roughness
Link-01	JUNC.OFF.W	OUTLET1	DIRECT	400.0	0.0003	0.0150

Cross Section Summary

Link Design ID Flow	Shape	Depth/ Diameter ft	Width ft	No. of Barrels	Cross Sectional Area ft ²	Full Flow Hydraulic Radius ft
Capacity cfs						

Link-01	DUMMY	0.00	0.00	1	0.00	0.00
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Runoff Quantity Continuity

	Volume acre-ft	Depth inches
Total Precipitation	138.443	7.289
Surface Runoff	9.583	0.505
Continuity Error (%)	-0.001	

Flow Routing Continuity

	Volume acre-ft	Volume Mgallons
External Inflow	0.000	0.000
External Outflow	95.773	31.209
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.000	0.000
Continuity Error (%)	0.000	

Composite Curve Number Computations Report

Subbasin E-1A

Soil/Surface Description	Area (acres)	Soil Group	CN
-	46.91	-	74.00
Composite Area & Weighted CN	46.91		74.00

Subbasin E-1B

Soil/Surface Description	Area (acres)	Soil Group	CN
-	7.81	-	83.60
Composite Area & Weighted CN	7.81		83.60

Subbasin E-1C

Soil/Surface Description	Area (acres)	Soil Group	CN
-	3.67	-	98.00
Composite Area & Weighted CN	3.67		98.00

Subbasin E-1D

Soil/Surface Description	Area (acres)	Soil Group	CN
-	2.57	-	85.94
Composite Area & Weighted CN	2.57		85.94

Subbasin E-1E

Soil/Surface Description	Area (acres)	Soil Group	CN
-	6.80	-	91.70
Composite Area & Weighted CN	6.80		91.70

Subbasin E-1F

Soil/Surface Description	Area (acres)	Soil Group	CN
-	18.02	-	93.72
Composite Area & Weighted CN	18.02		93.72

Subbasin E-1G

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.57	-	89.52
Composite Area & Weighted CN	0.57		89.52

Subbasin E-1H

Soil/Surface Description	Area (acres)	Soil Group	CN
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-	0.47	-	91.03
Composite Area & Weighted CN	0.47		91.03

Subbasin E-2A

Soil/Surface Description	Area (acres)	Soil Group	CN
-	41.04	-	74.00
Composite Area & Weighted CN	41.04		74.00

Subbasin E-2B

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.09	-	86.49
Composite Area & Weighted CN	1.09		86.49

Subbasin E-2C

Soil/Surface Description	Area (acres)	Soil Group	CN
-	10.05	-	86.87
Composite Area & Weighted CN	10.05		86.87

Subbasin E-2D

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.22	-	85.25
Composite Area & Weighted CN	1.22		85.25

Subbasin E-2E

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.93	-	81.09
Composite Area & Weighted CN	1.93		81.09

Subbasin E-2F

Soil/Surface Description	Area (acres)	Soil Group	CN
-	22.15	-	85.78
Composite Area & Weighted CN	22.15		85.78

Subbasin E-2G

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.43	-	86.01
Composite Area & Weighted CN	1.43		86.01

Subbasin E-2H

Soil/Surface Description	Area (acres)	Soil Group	CN
-	51.94	-	84.84
Composite Area & Weighted CN	51.94		84.84

Subbasin E-2I

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.42	-	89.15
Composite Area & Weighted CN	0.42		89.15

Subbasin E-2J

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.52	-	85.72
Composite Area & Weighted CN	1.52		85.72

Subbasin E-3A

Soil/Surface Description	Area (acres)	Soil Group	CN
-	6.08	-	74.00
Composite Area & Weighted CN	6.08		74.00

Subbasin E-3B

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.52	-	90.98
Composite Area & Weighted CN	0.52		90.98

Subbasin Runoff Summary

Subbasin ID	Total Precip in	Total Runoff in	Peak Runoff cfs	Weighted Curve Number	Time of Concentration days hh:mm:ss
E-1A	7.20	4.22	186.38	74.000	0 00:28:19
E-1B	7.20	5.29	55.29	83.600	0 00:10:11
E-1C	7.20	6.96	28.52	98.000	0 00:13:00
E-1D	7.20	5.55	16.61	85.940	0 00:16:06
E-1E	7.20	6.22	47.34	91.700	0 00:15:48
E-1F	7.20	6.45	122.62	93.720	0 00:17:52
E-1G	7.20	5.96	4.21	89.520	0 00:11:34
E-1H	7.20	6.14	3.65	91.030	0 00:10:24
E-2A	7.20	4.22	182.94	74.000	0 00:22:00
E-2B	7.20	5.61	7.85	86.490	0 00:11:21
E-2C	7.20	5.66	66.23	86.870	0 00:15:53
E-2D	7.20	5.47	8.31	85.250	0 00:13:19
E-2E	7.20	5.00	11.95	81.090	0 00:14:21
E-2F	7.20	5.53	138.21	85.780	0 00:17:29

E-2G	7.20	5.56	11.31	86.010	0	00:07:18
E-2H	7.20	5.43	317.10	84.840	0	00:17:46
E-2I	7.20	5.92	3.16	89.150	0	00:11:24
E-2J	7.20	5.53	10.28	85.720	0	00:13:58
E-3A	7.20	4.22	34.60	74.000	0	00:11:07
E-3B	7.20	6.13	3.72	90.980	0	00:14:21

Node Depth Summary

Node ID	Average Depth Attained ft	Maximum Depth Attained ft	Maximum HGL Attained ft	Time of Max Occurrence days hh:mm	Total Flooded Volume acre-in	Total Time Flooded minutes	Retention Time hh:mm:ss
JUNC.OFF.W	0.00	0.00	0.00	0 00:00	0	0	0:00:00
OUTLET1	0.00	0.00	0.00	0 00:00	0	0	0:00:00
OUTLET2	0.00	0.00	0.00	0 00:00	0	0	0:00:00

Node Flow Summary

Node ID	Element Type	Maximum Lateral Inflow cfs	Peak Inflow cfs	Time of Peak Inflow Occurrence days hh:mm	Maximum Flooding Overflow cfs	Time of Peak Flooding Occurrence days hh:mm
JUNC.OFF.W	JUNCTION	266.88	266.88	0 12:05	0.00	
OUTLET1	OUTFALL	905.42	1158.81	0 12:10	0.00	
OUTLET2	OUTFALL	38.25	38.25	0 12:05	0.00	

Outfall Loading Summary

Outfall Node ID	Flow Frequency (%)	Average Flow cfs	Peak Inflow cfs
OUTLET1	97.05	48.50	1158.81
OUTLET2	88.02	1.37	38.25
System	92.54	49.87	1190.47

Link Flow Summary

Link ID	Ratio of Total Time	Element Reported Type Condition	Time of Peak Flow Occurrence	Maximum Velocity Attained	Length Factor	Peak Flow during Analysis	Design Flow Capacity	Ratio of Maximum /Design
Flow Surcharged								

Depth	minutes	days hh:mm	ft/sec	cfs	cfs	Flow
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Link-01	DIRECT	0 12:05		266.88		
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Highest Flow Instability Indexes

All links are stable.

WARNING 004 : Minimum elevation drop used for Conduit Link-01.

Analysis began on: Thu Jul 6 11:17:29 2023
Analysis ended on: Thu Jul 6 11:17:32 2023
Total elapsed time: 00:00:03

APPENDIX C: POST-DEVELOPED: 100-YEAR, 24-HOUR STORM EVENT SSA SUMMARY

Autodesk® Storm and Sanitary Analysis 2016 - Version 13.4.304 (Build 0)

Project Description

File Name PROPOSED DRAINAGE COMBINED OUTLETS.SPF

Analysis Options

Flow Units cfs
Subbasin Hydrograph Method. SCS TR-55
Time of Concentration..... User-Defined
Link Routing Method Hydrodynamic
Storage Node Exfiltration.. None
Starting Date JUL-03-2023 00:00:00
Ending Date JUL-04-2023 00:00:00
Report Time Step 00:05:00

Element Count

Number of rain gages 1
Number of subbasins 32
Number of nodes 8
Number of links 6

Raingage Summary

Gage ID	Data Source	Data Type	Recording Interval	min
Rain Gage-01	TS-02	INTENSITY	6.00	

Subbasin Summary

Subbasin ID	Total Area acres	Peak Rate Factor
01-P?-1	7.81	484.00
02-P?-1	3.67	484.00
03-P?-1	2.57	484.00
04-P?-1	6.76	484.00
05-P?-1	18.02	484.00
06-P?-1	0.47	484.00
07-P?-1	0.56	484.00
08-P?-1	1.09	484.00
09-P?-1	10.07	484.00
10-P?-1	22.15	484.00
11-P?-1	1.43	484.00
12-P?-1	1.22	484.00
13-P?-1	1.93	484.00
14-P?-1	1.52	484.00
15-P?-1	0.42	484.00
16-P?-1	0.52	484.00
17-P?-1	51.94	484.00
P10-1	2.13	484.00

P1-1	6.02	484.00
P11-1	11.23	484.00
P12-1	1.19	484.00
P13-1	1.91	484.00
P14-1A	3.89	484.00
P14-1B	2.68	484.00
P2-1	28.12	484.00
P3-1	6.57	484.00
P4-1	4.34	484.00
P5-1	7.76	484.00
P6-1	2.64	484.00
P7-1	1.71	484.00
P8-1	4.74	484.00
P9-1	11.05	484.00

Node Summary

Node ID	Element Type	Invert Elevation ft	Maximum Elev. ft	Ponded Area ft ²	External Inflow
JUNC.ON.C	JUNCTION	590.50	700.00	0.00	
OUTLET1	OUTFALL	0.00	5.00	0.00	
OUTLET2	OUTFALL	613.00	614.50	0.00	
BASIN1	STORAGE	625.00	632.00	0.00	
BASIN2	STORAGE	615.00	622.00	0.00	
POND1	STORAGE	624.00	631.00	0.00	
POND2	STORAGE	610.00	617.00	0.00	
POND3	STORAGE	597.00	604.00	0.00	

Link Summary

Link ID	From Node	To Node	Element Type	Length ft	Slope %	Manning's Roughness
Link-01	BASIN1	JUNC.ON.C	ORIFICE			
Link-02	POND1	POND2	ORIFICE			
Link-03	POND2	JUNC.ON.C	ORIFICE			
Link-04	POND3	JUNC.ON.C	ORIFICE			
Link-05	JUNC.ON.C	OUTLET1	ORIFICE			
Link-07	BASIN2	OUTLET2	ORIFICE			

***** Runoff Quantity Continuity *****	Volume acre-ft	Depth inches
Total Precipitation	138.571	7.289
Surface Runoff	10.658	0.561
Continuity Error (%)	-0.002	

***** Flow Routing Continuity *****	Volume acre-ft	Volume Mgallons
External Inflow	0.000	0.000
External Outflow	104.556	34.071
Initial Stored Volume	0.000	0.000
Final Stored Volume	1.952	0.636
Continuity Error (%)	0.000	

Composite Curve Number Computations Report

Subbasin 01-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	7.81	-	83.60
Composite Area & Weighted CN	7.81		83.60

Subbasin 02-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	3.67	-	98.00
Composite Area & Weighted CN	3.67		98.00

Subbasin 03-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	2.57	-	85.94
Composite Area & Weighted CN	2.57		85.94

Subbasin 04-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	6.80	-	91.70
Composite Area & Weighted CN	6.80		91.70

Subbasin 05-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	18.02	-	93.72
Composite Area & Weighted CN	18.02		93.72

Subbasin 06-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.47	-	91.03
Composite Area & Weighted CN	0.47		91.03

Subbasin 07-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.57	-	89.52
Composite Area & Weighted CN	0.57		89.52

Subbasin 08-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.09	-	86.49
Composite Area & Weighted CN	1.09		86.49

Subbasin 09-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	10.05	-	86.87
Composite Area & Weighted CN	10.05		86.87

Subbasin 10-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	22.15	-	85.78
Composite Area & Weighted CN	22.15		85.78

Subbasin 11-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.43	-	86.01
Composite Area & Weighted CN	1.43		86.01

Subbasin 12-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.22	-	85.25
Composite Area & Weighted CN	1.22		85.25

Subbasin 13-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.93	-	81.09
Composite Area & Weighted CN	1.93		81.09

Subbasin 14-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.52	-	85.72
Composite Area & Weighted CN	1.52		85.72

Subbasin 15-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
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-	0.42	-	89.15
Composite Area & Weighted CN	0.42		89.15

Subbasin 16-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	0.52	-	90.98
Composite Area & Weighted CN	0.52		90.98

Subbasin 17-P?-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	51.94	-	84.84
Composite Area & Weighted CN	51.94		84.84

Subbasin P10-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	2.13	-	75.53
Composite Area & Weighted CN	2.13		75.53

Subbasin P1-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	6.02	-	74.79
Composite Area & Weighted CN	6.02		74.79

Subbasin P11-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	11.23	-	83.95
Composite Area & Weighted CN	11.23		83.95

Subbasin P12-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.19	-	80.60
Composite Area & Weighted CN	1.19		80.60

Subbasin P13-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	1.91	-	74.73
Composite Area & Weighted CN	1.91		74.73

Subbasin P14-1A

Soil/Surface Description	Area (acres)	Soil Group	CN
-	3.89	-	77.17
Composite Area & Weighted CN	3.89		77.17

Subbasin P14-1B

Soil/Surface Description	Area (acres)	Soil Group	CN
-	2.68	-	74.57
Composite Area & Weighted CN	2.68		74.57

Subbasin P2-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	28.12	-	92.05
Composite Area & Weighted CN	28.12		92.05

Subbasin P3-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	6.57	-	91.67
Composite Area & Weighted CN	6.57		91.67

Subbasin P4-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	4.34	-	78.41
Composite Area & Weighted CN	4.34		78.41

Subbasin P5-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	7.76	-	90.95
Composite Area & Weighted CN	7.76		90.95

Subbasin P6-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	2.64	-	92.65
Composite Area & Weighted CN	2.64		92.65

Subbasin P7-1

Soil/Surface Description	Area (acres)	Soil Group	CN
--------------------------	-----------------	---------------	----

-	1.71	-	90.03
Composite Area & Weighted CN	1.71		90.03

Subbasin P8-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	4.74	-	83.52
Composite Area & Weighted CN	4.74		83.52

Subbasin P9-1

Soil/Surface Description	Area (acres)	Soil Group	CN
-	11.05	-	82.32
Composite Area & Weighted CN	11.05		82.32

Subbasin Runoff Summary

Subbasin ID	Total Precip in	Total Runoff in	Peak Runoff cfs	Weighted Curve Number	Time of Concentration days	hh:mm:ss
01-P?-1	7.20	5.29	55.29	83.600	0	00:10:11
02-P?-1	7.20	6.96	28.52	98.000	0	00:13:00
03-P?-1	7.20	5.55	16.61	85.940	0	00:16:06
04-P?-1	7.20	6.22	47.34	91.700	0	00:15:48
05-P?-1	7.20	6.45	122.62	93.720	0	00:17:52
06-P?-1	7.20	6.14	3.65	91.030	0	00:10:24
07-P?-1	7.20	5.96	4.21	89.520	0	00:11:34
08-P?-1	7.20	5.61	7.85	86.490	0	00:11:21
09-P?-1	7.20	5.66	66.23	86.870	0	00:15:53
10-P?-1	7.20	5.53	138.21	85.780	0	00:17:29
11-P?-1	7.20	5.56	11.31	86.010	0	00:07:18
12-P?-1	7.20	5.47	8.31	85.250	0	00:13:19
13-P?-1	7.20	5.00	11.95	81.090	0	00:14:21
14-P?-1	7.20	5.53	10.28	85.720	0	00:13:58
15-P?-1	7.20	5.92	3.16	89.150	0	00:11:24
16-P?-1	7.20	6.13	3.72	90.980	0	00:14:21
17-P?-1	7.20	5.43	317.10	84.840	0	00:17:46
P10-1	7.20	4.38	11.54	75.530	0	00:15:00
P1-1	7.20	4.30	23.70	74.790	0	00:28:19
P11-1	7.20	5.32	72.01	83.950	0	00:15:00
P12-1	7.20	4.95	7.18	80.600	0	00:15:00
P13-1	7.20	4.30	10.14	74.730	0	00:15:00
P14-1A	7.20	4.57	23.82	77.170	0	00:11:07
P14-1B	7.20	4.28	15.47	74.570	0	00:11:07
P2-1	7.20	6.26	201.29	92.050	0	00:15:00
P3-1	7.20	6.21	46.81	91.670	0	00:15:00
P4-1	7.20	4.70	25.07	78.410	0	00:15:00
P5-1	7.20	6.13	54.92	90.950	0	00:15:00
P6-1	7.20	6.33	19.03	92.650	0	00:15:00
P7-1	7.20	6.02	11.95	90.030	0	00:15:00
P8-1	7.20	5.28	30.21	83.520	0	00:15:00
P9-1	7.20	5.14	68.94	82.320	0	00:15:00

Node Depth Summary

Node ID	Average Depth Attained ft	Maximum Depth Attained ft	Maximum HGL Attained ft	Time of Max Occurrence days hh:mm		Total Flooded Volume acre-in	Total Time Flooded minutes	Retention Time hh:mm:ss
JUNC.ON.C	0.77	4.47	594.97	0	12:19	0	0	0:00:00
OUTLET1	0.00	0.00	0.00	0	00:00	0	0	0:00:00
OUTLET2	0.00	0.00	613.00	0	00:00	0	0	0:00:00
BASIN1	0.74	5.80	630.80	0	12:25	0	0	0:00:00
BASIN2	0.30	5.67	620.67	0	12:11	0	0	0:00:00
POND1	1.36	2.82	626.82	0	16:01	0	0	0:00:00
POND2	0.70	6.02	616.02	0	12:18	0	0	0:00:00
POND3	0.48	1.99	598.99	0	12:30	0	0	0:00:00

Node Flow Summary

Node ID	Element Type	Maximum Lateral Inflow cfs	Peak Inflow cfs	Time of Peak Inflow Occurrence days hh:mm		Maximum Flooding Overflow cfs	Time of Peak Flooding Occurrence days hh:mm
JUNC.ON.C	JUNCTION	0.00	129.49	0	12:19	0.00	
OUTLET1	OUTFALL	997.21	1109.43	0	12:10	0.00	
OUTLET2	OUTFALL	15.46	32.89	0	12:05	0.00	
BASIN1	STORAGE	53.56	53.56	0	12:05	0.00	
BASIN2	STORAGE	27.46	27.46	0	12:05	0.00	
POND1	STORAGE	24.03	24.03	0	12:05	0.00	
POND2	STORAGE	196.36	196.81	0	12:05	0.00	
POND3	STORAGE	96.86	96.86	0	12:05	0.00	

Storage Node Summary

Storage Node ID		Maximum Total Ponded Volume 1000 ft ³	Maximum Ponded Volume (%)	Time of Max Ponded days hh:mm		Average Ponded Volume 1000 ft ³	Average Ponded Volume (%)	Maximum Storage Node Outflow cfs
Maximum Time of Max.	Exfiltration Rate cfm	Exfiltration Rate 1000 ft ³	Exfiltration Rate 1000 ft ³	Exfiltration Rate 1000 ft ³	Exfiltration Rate 1000 ft ³	Exfiltration Rate 1000 ft ³	Exfiltration Rate 1000 ft ³	Exfiltration Rate 1000 ft ³
	hh:mm:ss							
BASIN1		60.312	76	0	12:25	6.247	8	13.76
0.00	0:00:00	0.000						
BASIN2		7.913	65	0	12:11	0.198	2	19.32
0.00	0:00:00	0.000						
POND1		50.272	32	0	16:01	24.031	15	0.70
0.00	0:00:00	0.000						
POND2		170.699	84	0	12:18	18.105	9	97.99
0.00	0:00:00	0.000						
POND3		149.304	25	0	12:30	35.018	6	19.14
0.00	0:00:00	0.000						

 Outfall Loading Summary

Outfall Node ID	Flow Frequency (%)	Average Flow cfs	Peak Inflow cfs
OUTLET1	97.05	52.91	1109.43
OUTLET2	87.09	1.56	32.89
System	92.07	54.46	1141.22

 Link Flow Summary

Link ID	Ratio of Total Maximum Flow Depth	Element Reported Type Condition	Time of Peak Flow Occurrence days hh:mm	Maximum Velocity Attained ft/sec	Length Factor	Peak Flow during Analysis cfs	Design Flow Capacity cfs	Ratio of Maximum /Design Flow
Link-01	1.00	ORIFICE	0 12:25			13.76		
Link-02	1.00	ORIFICE	0 16:01			0.70		
Link-03	1.00	ORIFICE	0 12:18			97.99		
Link-04	0.79	ORIFICE	0 12:30			19.14		
Link-05	0.89	ORIFICE	0 12:20			129.51		
Link-07	1.00	ORIFICE	0 12:12			19.32		

 Highest Flow Instability Indexes

 All links are stable.

WARNING 107 : Initial water surface elevation defined for Junction JUNC.ON.C is below junction invert elevation.

Assumed initial water surface elevation equal to invert elevation.

WARNING 108 : Surge elevation defined for Junction JUNC.ON.C is below junction maximum elevation. Assumed surge elevation equal to maximum elevation.

WARNING 110 : Initial water surface elevation defined for Storage Node BASIN2 is below storage node invert elevation.

Assumed initial water surface elevation equal to invert elevation.
WARNING 118 : Orifice crest elevation defined for Orifice Link-05 is below upstream node invert elevation.
Assumed orifice crest elevation equal to upstream node invert elevation.

Analysis began on: Thu Jul 6 11:29:08 2023
Analysis ended on: Thu Jul 6 11:29:11 2023
Total elapsed time: 00:00:03

APPENDIX D: SOURCE DATA

LIST OF SOURCE DATA

1. NATURAL RESOURCES CONSERVATION SERVICE SOIL RESOURCE REPORT
2. UNITED STATES ARMY CORPS OF ENGINEERS SCS TR-55 RUNOFF CURVE NUMBERS



United States
Department of
Agriculture

NRCS

Natural
Resources
Conservation
Service

A product of the National
Cooperative Soil Survey,
a joint effort of the United
States Department of
Agriculture and other
Federal agencies, State
agencies including the
Agricultural Experiment
Stations, and local
participants

Custom Soil Resource Report for St. Louis County and St. Louis City, Missouri



Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (<http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/>) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (<https://offices.sc.egov.usda.gov/locator/app?agency=nrcs>) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

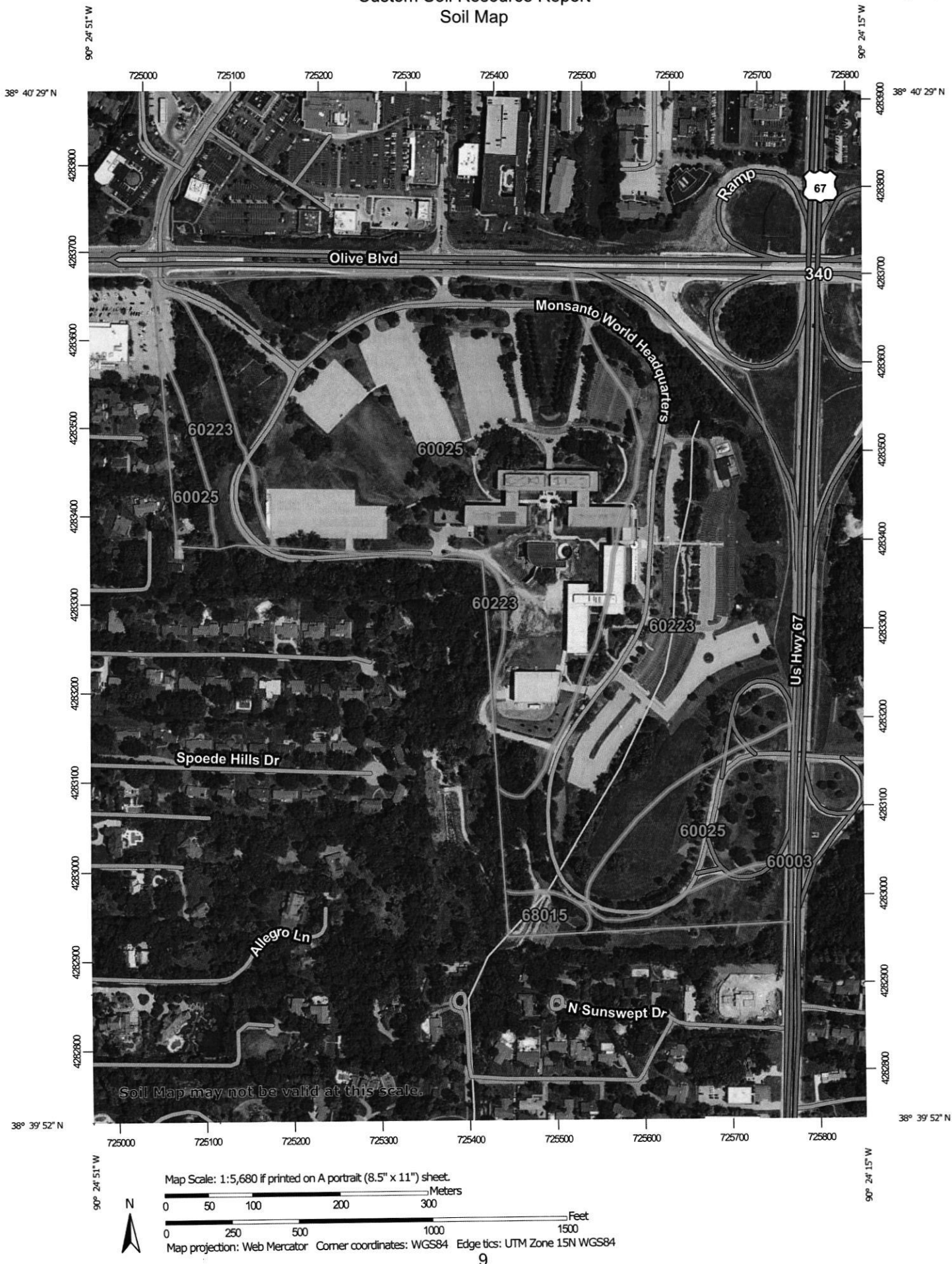
Custom Soil Resource Report

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report Soil Map



MAP LEGEND

Area of Interest (AOI)

 Area of Interest (AOI)

Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

Special Point Features

 Blowout

 Borrow Pit

 Clay Spot

 Closed Depression

 Gravel Pit

 Gravelly Spot

 Landfill

 Lava Flow

 Marsh or swamp

 Mine or Quarry

 Miscellaneous Water

 Perennial Water

 Rock Outcrop

 Saline Spot

 Sandy Spot

 Severely Eroded Spot

 Sinkhole

 Slide or Slip

 Sodic Spot

 Spoil Area

 Stony Spot

 Very Stony Spot

 Wet Spot

 Other

 Special Line Features

Water Features

 Streams and Canals

Transportation

 Rails

 Interstate Highways

 US Routes

 Major Roads

 Local Roads

Background

 Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: St. Louis County and St. Louis City, Missouri

Survey Area Data: Version 23, Sep 7, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 22, 2022—Aug 25, 2022

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
60003	Menfro silt loam, 9 to 14 percent slopes, eroded	0.0	0.0%
60025	Urban land-Harvester complex, 2 to 9 percent slopes	49.5	57.0%
60223	Urban land-Harvester complex, 9 to 20 percent slopes	36.3	41.8%
68015	Fishpot-Urban land-Freeburg complex, 0 to 3 percent slopes	1.0	1.2%
Totals for Area of Interest		86.8	100.0%

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

St. Louis County and St. Louis City, Missouri

60003—Menfro silt loam, 9 to 14 percent slopes, eroded

Map Unit Setting

National map unit symbol: 2qp0b
Elevation: 400 to 900 feet
Mean annual precipitation: 37 to 47 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 184 to 228 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Menfro and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Menfro

Setting

Landform: Hillslopes
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Convex
Across-slope shape: Convex
Parent material: Loess

Typical profile

Ap - 0 to 4 inches: silt loam
BE - 4 to 9 inches: silt loam
Bt1 - 9 to 35 inches: silty clay loam
Bt2 - 35 to 60 inches: silt loam

Properties and qualities

Slope: 9 to 14 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 11.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: C
Ecological site: F115XB003MO - Deep Loess Protected Backslope Forest,
F115XB043MO - Deep Loess Exposed Backslope Woodland
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Minor Components

Winfield

Percent of map unit: 10 percent
Landform: Hillslopes, ridges
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F115XB003MO - Deep Loess Protected Backslope Forest,
F115XB043MO - Deep Loess Exposed Backslope Woodland
Hydric soil rating: No

60025—Urban land-Harvester complex, 2 to 9 percent slopes

Map Unit Setting

National map unit symbol: 2qp0t
Elevation: 310 to 1,020 feet
Mean annual precipitation: 37 to 47 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 184 to 228 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 55 percent
Harvester and similar soils: 40 percent
Minor components: 5 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Description of Harvester

Setting

Landform: Hillslopes, interfluves
Landform position (two-dimensional): Shoulder, summit
Landform position (three-dimensional): Side slope, interfluve
Down-slope shape: Convex, linear
Across-slope shape: Convex, linear
Parent material: Loess

Typical profile

C1 - 0 to 7 inches: silt loam
C2 - 7 to 31 inches: silty clay loam
C3 - 31 to 80 inches: clay loam

Properties and qualities

Slope: 2 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Moderately well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)
Depth to water table: About 30 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: C
Ecological site: F115XB061MO - Anthropic Deep Loess Upland
Other vegetative classification: Trees/Timber (Woody Vegetation)
Hydric soil rating: No

Minor Components

Winfield

Percent of map unit: 5 percent
Landform: Hillslopes, ridges
Landform position (two-dimensional): Backslope, summit
Landform position (three-dimensional): Side slope, crest
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: F115XB003MO - Deep Loess Protected Backslope Forest,
F115XB043MO - Deep Loess Exposed Backslope Woodland
Hydric soil rating: No

60223—Urban land-Harvester complex, 9 to 20 percent slopes

Map Unit Setting

National map unit symbol: 2qp6z
Elevation: 390 to 820 feet
Mean annual precipitation: 36 to 47 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 180 to 200 days
Farmland classification: Not prime farmland

Map Unit Composition

Urban land: 60 percent
Harvester and similar soils: 30 percent
Minor components: 10 percent

Custom Soil Resource Report

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Urban Land

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: No

Description of Harvester

Setting

Landform: Hillslopes

Landform position (two-dimensional): Backslope

Landform position (three-dimensional): Side slope

Down-slope shape: Linear

Across-slope shape: Linear

Parent material: Loess

Typical profile

C1 - 0 to 7 inches: silt loam

C2 - 7 to 31 inches: silty clay loam

C3 - 31 to 80 inches: clay loam

Properties and qualities

Slope: 9 to 20 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Moderately well drained

Runoff class: High

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: About 30 to 36 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: Moderate (about 8.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: C

Ecological site: F115XB061MO - Anthropic Deep Loess Upland

Other vegetative classification: Trees/Timber (Woody Vegetation)

Hydric soil rating: No

Minor Components

Winfield

Percent of map unit: 10 percent

Landform: Hillslopes, ridges

Landform position (two-dimensional): Summit

Landform position (three-dimensional): Side slope, crest

Down-slope shape: Convex

Across-slope shape: Convex

Ecological site: F115XB001MO - Deep Loess Upland Woodland

Hydric soil rating: No

68015—Fishpot-Urban land-Freeburg complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: 2zhxx
Elevation: 360 to 660 feet
Mean annual precipitation: 37 to 47 inches
Mean annual air temperature: 52 to 57 degrees F
Frost-free period: 184 to 228 days
Farmland classification: Prime farmland if drained

Map Unit Composition

Fishpot and similar soils: 45 percent
Urban land: 25 percent
Freeburg and similar soils: 20 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Fishpot

Setting

Landform: Stream terraces, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Human-transported material over alluvium

Typical profile

^Au - 0 to 12 inches: silt loam
^Cu - 12 to 26 inches: silty clay loam
2Aub - 26 to 40 inches: silt loam
2Cg - 40 to 79 inches: silt loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat poorly drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high
(0.57 to 1.98 in/hr)
Depth to water table: About 20 to 53 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water supply, 0 to 60 inches: High (about 12.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 2w
Hydrologic Soil Group: C
Ecological site: F115XB060MO - Anthropic Wet Terrace

Hydric soil rating: No

Description of Urban Land

Setting

Down-slope shape: Linear

Across-slope shape: Linear

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8

Hydric soil rating: No

Description of Freeburg

Setting

Landform: Drainageways

Landform position (three-dimensional): Head slope

Down-slope shape: Concave

Across-slope shape: Linear

Parent material: Alluvium

Typical profile

Ap - 0 to 8 inches: silt loam

E - 8 to 18 inches: silt loam

Bt - 18 to 37 inches: silty clay loam

Btg - 37 to 79 inches: silty clay loam

Properties and qualities

Slope: 0 to 2 percent

Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat poorly drained

Runoff class: Medium

Capacity of the most limiting layer to transmit water (Ksat): Moderately high (0.20 to 0.57 in/hr)

Depth to water table: About 12 to 30 inches

Frequency of flooding: None

Frequency of ponding: None

Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

Available water supply, 0 to 60 inches: High (about 10.9 inches)

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 2w

Hydrologic Soil Group: C/D

Ecological site: F115XB025MO - Wet Terrace Forest

Hydric soil rating: No

Minor Components

Winfield

Percent of map unit: 10 percent

Landform: Hillslopes

Landform position (two-dimensional): Footslope, toeslope

Landform position (three-dimensional): Side slope

Down-slope shape: Convex

Across-slope shape: Convex

Ecological site: F115XB001MO - Deep Loess Upland Woodland

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Hydric soil rating: No

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Table 2-2a Runoff curve numbers for urban areas ^{1/}

Cover description		Curve numbers for hydrologic soil group			
Cover type and hydrologic condition	Average percent impervious area ^{2/}	A	B	C	D
<i>Fully developed urban areas (vegetation established)</i>					
Open space (lawns, parks, golf courses, cemeteries, etc.) ^{3/} :					
Poor condition (grass cover < 50%)		68	79	86	89
Fair condition (grass cover 50% to 75%)		49	69	79	84
Good condition (grass cover > 75%)		39	61	74	80
Impervious areas:					
Paved parking lots, roofs, driveways, etc. (excluding right-of-way)		98	98	98	98
Streets and roads:					
Paved; curbs and storm sewers (excluding right-of-way)		98	98	98	98
Paved; open ditches (including right-of-way)		83	89	92	93
Gravel (including right-of-way)		76	85	89	91
Dirt (including right-of-way)		72	82	87	89
Western desert urban areas:					
Natural desert landscaping (pervious areas only) ^{4/}		63	77	85	88
Artificial desert landscaping (impervious weed barrier, desert shrub with 1- to 2-inch sand or gravel mulch and basin borders)		96	96	96	96
Urban districts:					
Commercial and business	85	89	92	94	95
Industrial	72	81	88	91	93
Residential districts by average lot size:					
1/8 acre or less (town houses)	65	77	85	90	92
1/4 acre	38	61	75	83	87
1/3 acre	30	57	72	81	86
1/2 acre	25	54	70	80	85
1 acre	20	51	68	79	84
2 acres	12	46	65	77	82
<i>Developing urban areas</i>					
Newly graded areas (pervious areas only, no vegetation) ^{5/}		77	86	91	94
Idle lands (CN's are determined using cover types similar to those in table 2-2c).					

¹ Average runoff condition, and $I_a = 0.2S$.² The average percent impervious area shown was used to develop the composite CN's. Other assumptions are as follows: impervious areas are directly connected to the drainage system, impervious areas have a CN of 98, and pervious areas are considered equivalent to open space in good hydrologic condition. CN's for other combinations of conditions may be computed using figure 2-3 or 2-4.³ CN's shown are equivalent to those of pasture. Composite CN's may be computed for other combinations of open space cover type.⁴ Composite CN's for natural desert landscaping should be computed using figures 2-3 or 2-4 based on the impervious area percentage (CN = 98) and the pervious area CN. The pervious area CN's are assumed equivalent to desert shrub in poor hydrologic condition.⁵ Composite CN's to use for the design of temporary measures during grading and construction should be computed using figure 2-3 or 2-4 based on the degree of development (impervious area percentage) and the CN's for the newly graded pervious areas.

MEMORANDUM

Re: Olia Village (Creve Coeur)
Planning and Zoning Commission Meeting
Follow Up Items
Date: September 14, 2023

To: Jason Jaggi, Director of Community
Development
Bethany Moore, City Planner
From: Andy Struckhoff, AICP, President
Catherine Hamacher, AICP, Assoc. Director
Lindsey Evans, Senior Project Manager

Below is a list of follow-up items based on the September 5, 2023, Creve Coeur Planning and Zoning Commission Meeting and additional updated materials received from the Developer.

- Updated documents indicate Lots 10, 17, and 13 as “Office”. Previous documents listed Research / Office. This connection to the 39 North campus through the potential Research uses was an important one. Why was this removed?
- Are there any public restrooms as part of the development? Potential to include public restrooms in the lobby of one of the mixed-use buildings on Main Street in lieu of including restrooms in the Park?
- Recommendation to include a full landscape plan for Phase 1 as part of the initial materials.
- Regarding use types, several changes are recommended:
 - Allow New Car Dealers (441110) and Motorcycle, ATV, and All Other Motor Vehicle Dealers (441228) in Main and Mixed Districts with the caveat that the uses do not allow ground floor car storage or surface parking lots.
 - Remove Tobacco Stores (453998) from the use table as they are not compatible with adjacent or adjoining residential uses.
 - The following uses should be permitted in the Main, Mixed, and Office Districts, with the caveat that they shall not be permitted on the street facing ground floor within the Main Street District (note: those shown in blue were not indicated as such on the Attachment B Ordinance as received on 9/13/23):
 - 518210 – Data Processing, Hosting, and Related Services
 - 519110 – News Syndicates
 - 519130 – Internet Publishing and Broadcasting and Web Search Portals
 - 519190 – All other Information Services
 - 522293 – [International Trade Financing](#)
 - 522294 – [Secondary Market Financing](#)
 - 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
 - 524113 – [Direct Life Insurance Carriers](#)
 - 524114 – [Direct Health and Medical Insurance Carriers](#)

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- 524126 – Direct Property and Casualty Insurance Carriers
- 524127 – Direct Title Insurance Carriers
- 524128 – Other Direct Insurance (except Life, Health, and Medical) Carriers
- 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
- 531110 Lessors of Non-Residential Buildings and Dwellings
- 531120 Lessors of Non-Residential Buildings (except Miniwarehouses)
- 531190 Lessors of Other Real Estate Property
- 531320 – Offices of Real Estate Appraisers
- 541214 – Payroll Services
- 541219 – Other Accounting Services
- 541380 – Testing Laboratories
- CC541381 – Medical Marijuana Testing Facility
- 541511 – Custom Computer Programming Services
- 541512 – Computer Systems Design Services
- 541513 – Computer Facilities Management Services
- 541519 – Other Computer Related Services
- 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
- 541830 – Media Buying Agencies
- 541840 – Media Representatives
- 541850 – Outdoor Advertising
- 541860 – Direct Mail Advertising
- 541870 – Advertising Material Distribution Services
- 541910 – Marketing Research and Public Opinion Polling
- 551111 – Offices of Bank Holding Companies
- 551112 – Offices of Other Holding Companies
- 551114 – Corporate, Subsidiary, and Regional Managing Offices
- 561110 – Office Administrative Services
- 561210 – Facilities Support Services
- 561312 – Executive Search Services
- 561320 – Temporary Help Services
- 561330 – Professional Employer Organizations
- 561410 – Document Preparation Services
- 561421 – Telephone Answering Service
- 561422 – Telemarketing Bureaus and Other Contact Centers
- 561440 – Collection Agencies
- 561450 – Credit Bureaus

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- 561491 – Repossession Services
- 561492 – Court Reporting and Stenotype Services

In addition to the feedback above, PGAV provided a memo dated September 6th summarizing requested changes or clarifications to the development materials. Several comments are outstanding, not addressed by the most recent documents, including:

Construction / Stormwater / Utilities

- Narrative of the clearing, site preparation, grading, utilities, roadway, pedestrian pathway, and planting scopes that are anticipated to be included in Phase 1. If there are components that can be included in future phases, please indicate.
- Description of how runoff, tree removal and replacement, and construction traffic will be managed throughout construction.
- Narrative regarding utilities. What will remain and what is being updated? Include status of discussions with utility providers on loads and readiness of systems.

Residential Uses

- Provide additional information on residential typologies within the project.
- Developer response letter (dated 08-30-23) states, “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.”
- Are there any condos proposed to be included in the multifamily buildings?
- Will there be a mix of apartment types, or will all buildings provide the same product?
- What are the proposed bedroom sizes of apartments/condos/townhomes?
- Are the proposed villa style units stacked or next to each other like rowhouses?
- There don’t seem to be sidewalks proposed in Lot 16, the townhomes. Why not?
- Provide any narrative, data, or conversations that have taken place with the Ladue School District about the impact of residential units.
- With these units being proposed as high-end market rate units, is the developer proposing any EV charging stations as an amenity to the apartments/condos/townhomes?
- Provide a response to inclusionary housing considerations included in the Housing Study.

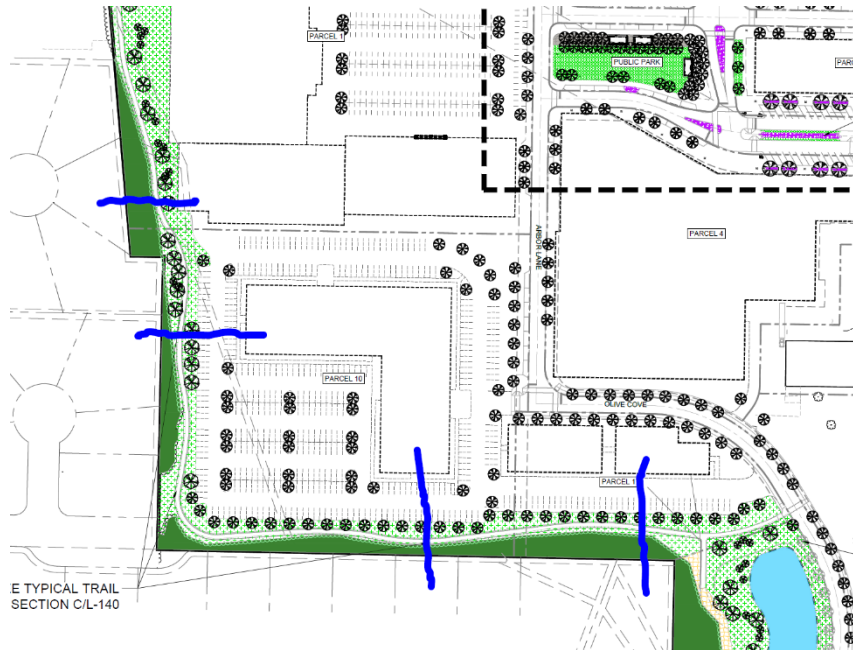
Light & Sound Pollution

- Narrative or footcandle calculations confirming intentions and/or compliance with light pollution requirements.
- Will there be a fence around the portions of the property line bordering single-family residential areas in order to mitigate light and sound pollution? Will the development fund the construction of and maintain this fence?

Buffer Areas

- Specify type/size of new trees.
- Provide additional detail and response to buffer concerns including:
 - Size/height of trees when planted and time to mature.
 - Illustrated section diagrams of residential properties directly adjacent to Lots 1, 10, and 17. These diagrams should illustrate height of proposed retaining walls, distance from property line and residential structure, tree removal/additions.
 - Suggestion to provide at least four of these in the following general locations:

MEMORANDUM



Memorandum

To: Jason Jaggi, AICP (City of Creve Coeur)
Bethany Moore, AICP (City of Creve Coeur)

From: Kyle Evans, PE, PTOE

Date: September 13, 2023

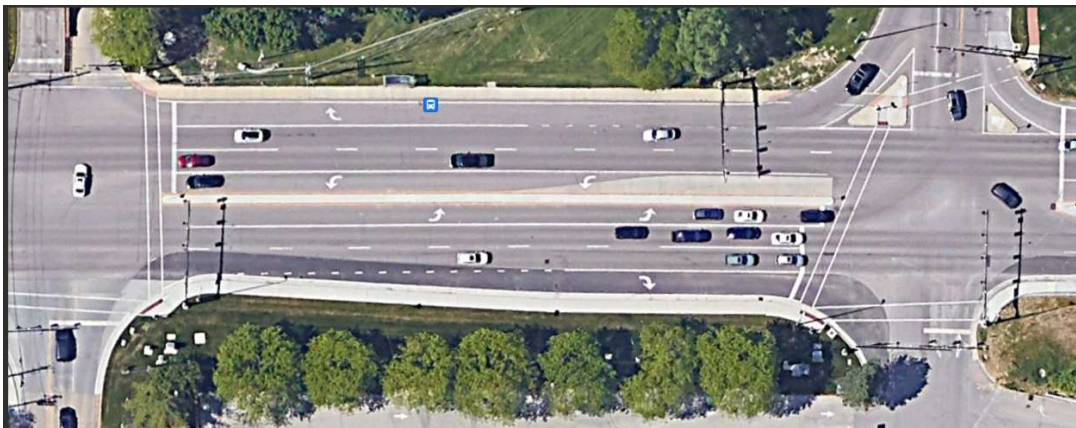
Re: Olia Village – Olive Blvd & Spoede Rd/Old Olive West Left Turn Lane Review and Review of September 13, 2023 TIS Revisions
Trek Project: 23-0384

During the September 5, 2023 Planning and Zoning Commission meeting a question was brought up by the commission related to the current geometric layout along Olive Boulevard between Spoede Rd and Old Olive West. It was mentioned that the revisions to the intersection are confusing and there are some concerns about the correct procedures with regards to the solid white lane near the left turn lane. The following figures capture the previous and current geometrics in that location.

Figure 1: Roadway Geometrics in July 2021



Figure 2: Roadway Geometrics in July 2023



From review of the images, it appears that MoDOT widened the existing segment of roadway between the two intersections in order to allow room to extend the existing storage length of the eastbound and westbound turn lanes. The existing westbound left turn lane had room for approximately six (6) vehicles to queue while waiting to make the left turn. The eastbound approach provided less storage and had room for approximately four (4) vehicles.

The revised layout provides storage for approximately fourteen (14) vehicles in each direction helping to remove them from the through lanes and improving traffic flow along the mainline.

The solid white lines delineate the left turn lane from the through lanes and serve as a deterrent from drivers trying to utilize the turn lane as another through lane on Olive Boulevard.

While this setup may seem counterintuitive, drivers are allowed to enter the left turn lane at any point along the turn lane as long as it is open. For the westbound direction, the various shades of pavements may still present drivers with a visual barrier from entering the left turn lane at the beginning of the block.

September 13, 2023 TIS Revisions Review

The applicant submitted a revision to the June 19, 2023 TIS to address comments from the City to address the following items:

1. Potential residential/commercial redevelopment in the northeast quadrant of Olive Boulevard and Old Olive West in the Creve Coeur Pavilion; and
2. The operational impacts of adding a pedestrian phase to the intersection of Olive Boulevard and Pavilion Drive.

Regarding the potential Altus Development, the revised TIS accounts for the additional trip generation associated with the potential redevelopment. The internal trip capture is applied in the same method that it was done for the Olia Village Development. While the applicant did not go through the full process of developing peak hour internal capture rates for the Altus Development with regards to the NCHRP 684 calculations, it is considered an acceptable assumption considering many of the proposed land use types match respectively with what is existing and proposed within the Creve Coeur Pavilion. When comparing **Tables 16** and **Table 18** from the revised TIS, the impacts to the individual approaches and the intersection, as a whole, are minor. The 2048 Peak Hour calculations do include the exclusive southbound right turn lane improvement.

The revised TIS documents the addition of the pedestrian phase to the intersection of Olive Boulevard and Pavilion Drive to allow pedestrians to cross Olive Boulevard. The document mentions that the pedestrian phase is estimated to be 24 seconds of walk and pedestrian clearance time. **Table 19** provides the results of the analyzed results from Synchro. It would be beneficial to see the revised printouts from Synchro to fully understand the results presented in the table. It would be assumed that the addition of the pedestrian phase would require an increase in phase time for the North/South phases while reducing available green time for Olive Boulevard, thus increasing delays. However, the results shown in **Table 19** show some improvements over the operations presented in **Table 18**, which documents the traffic impacts at Olive Boulevard and Pavilion Drive based on the additional traffic from the proposed Altus Development. The applicant should verify the results and provide an explanation of the results, along with the Synchro Outputs, for the peak hour scenarios with pedestrian accommodations.

Olia Village Development

Traffic Impact Study Report

September 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

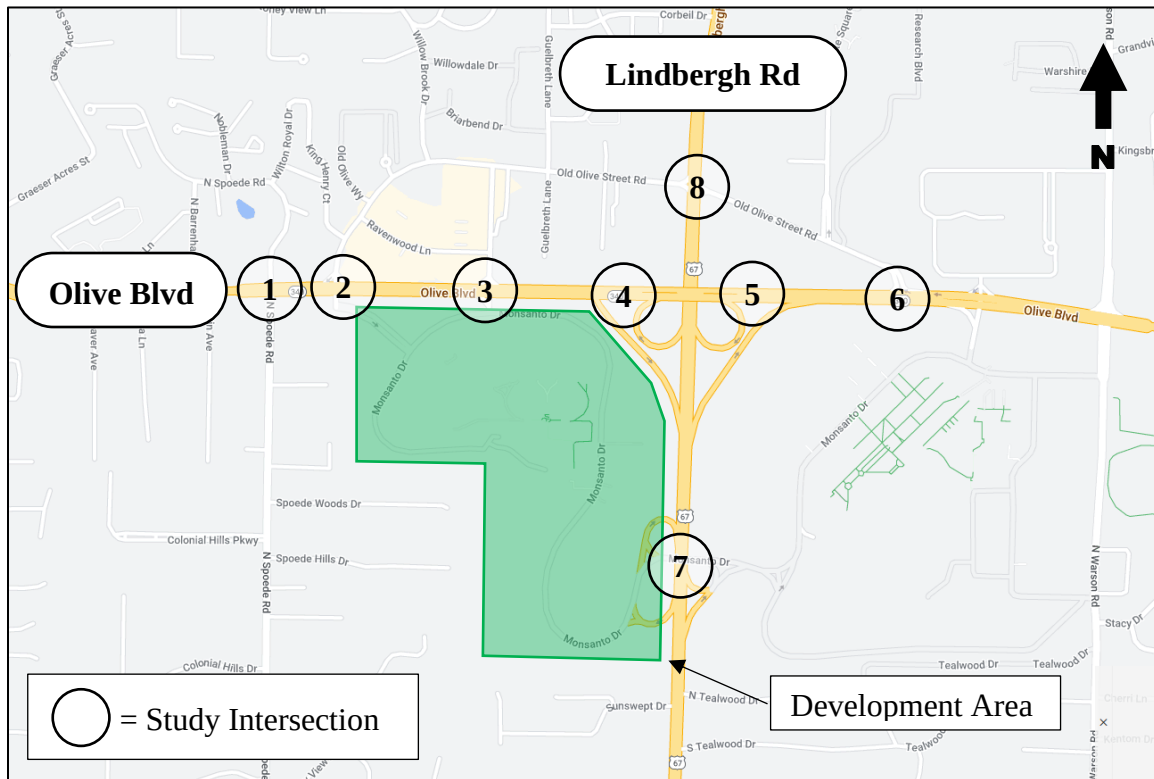


Figure 2 - Study Area

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.

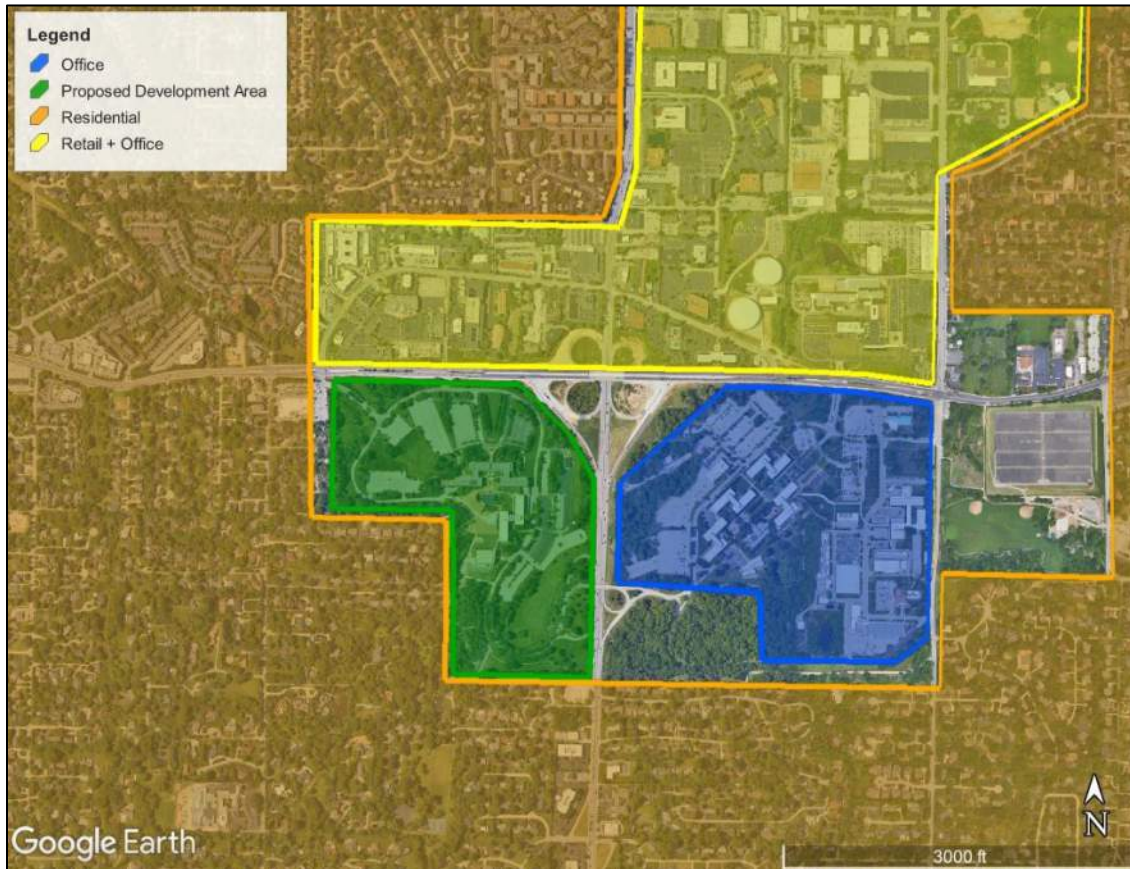


Figure 4 – Existing Off-Site Land Uses

3.4 Site Accessibility

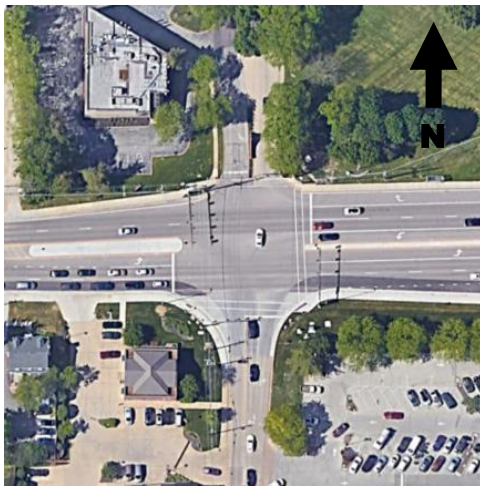
Access to the proposed development is located along Olive Boulevard at Old Olive Street Road West and Pavillion Drive and along Lindbergh Boulevard at the Monsanto Drive interchange. These access points are study intersections 2, 3, and 7, respectively, as labeled in **Figure 2**. The Olive Boulevard 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

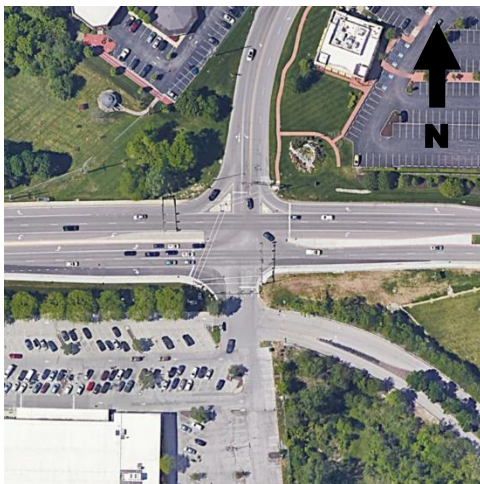
This section describes the existing conditions of the study area with an overview of study intersection configurations and existing traffic conditions.

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 Spoele 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.



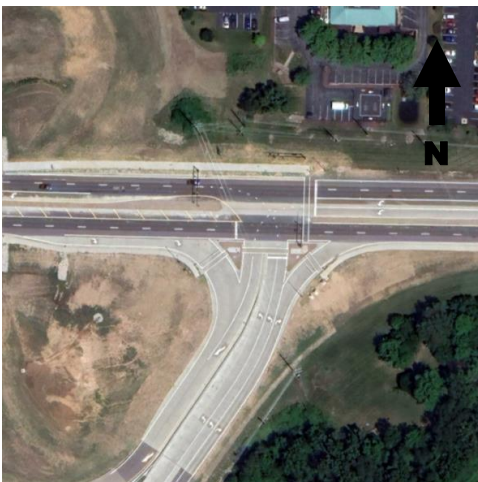
2. Missouri Route 340 (Olive Blvd) and Old Olive Street Road (West) – A four-legged signalized intersection. The northbound and southbound legs consist of a left turn lane and shared through / right turn lane. The eastbound and westbound approaches have a left turn lane, a right turn lane, and two through 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

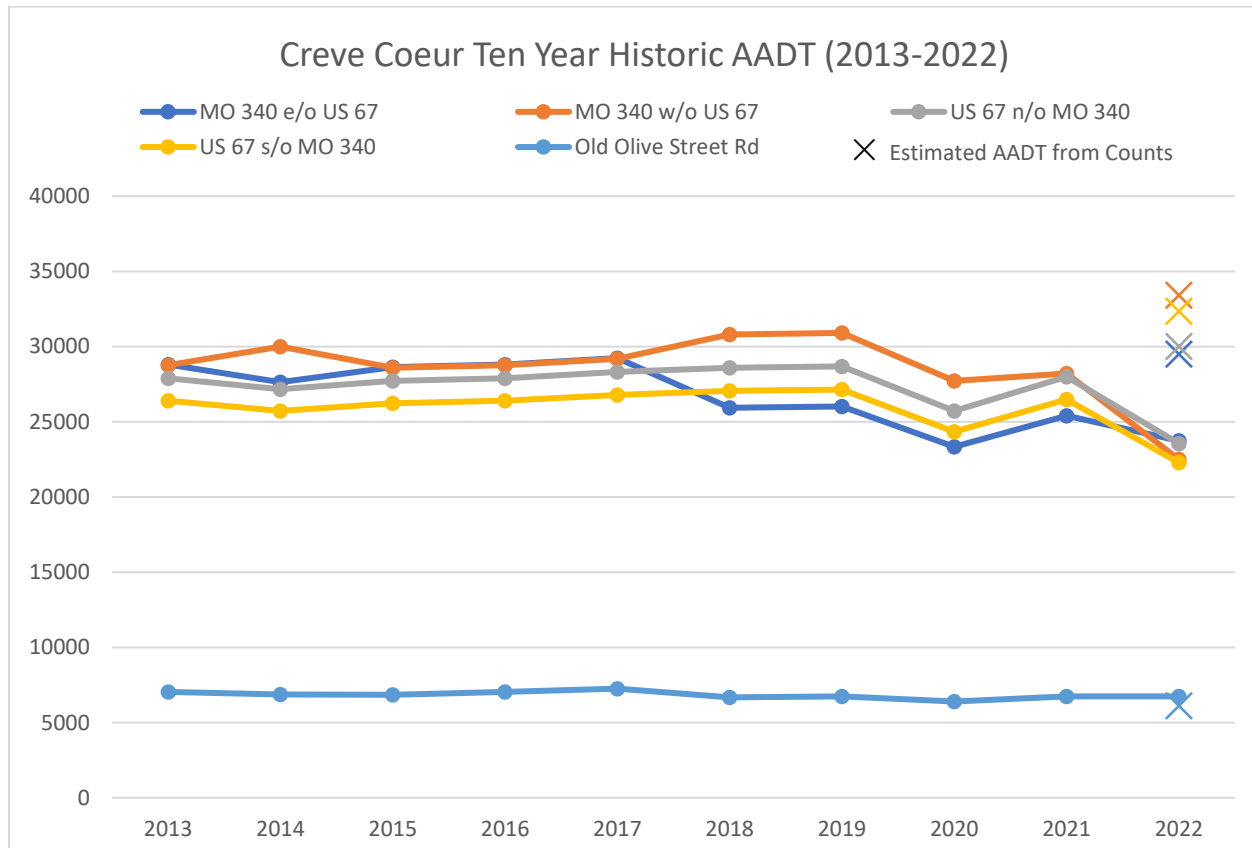


Figure 5 - Creve Coeur Historic Average Annual Daily Traffic

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.

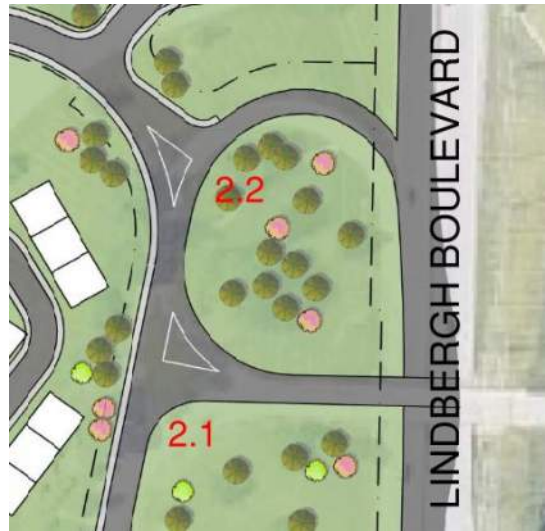
Table 13 – No-Build Lindbergh Operational Analysis

		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.

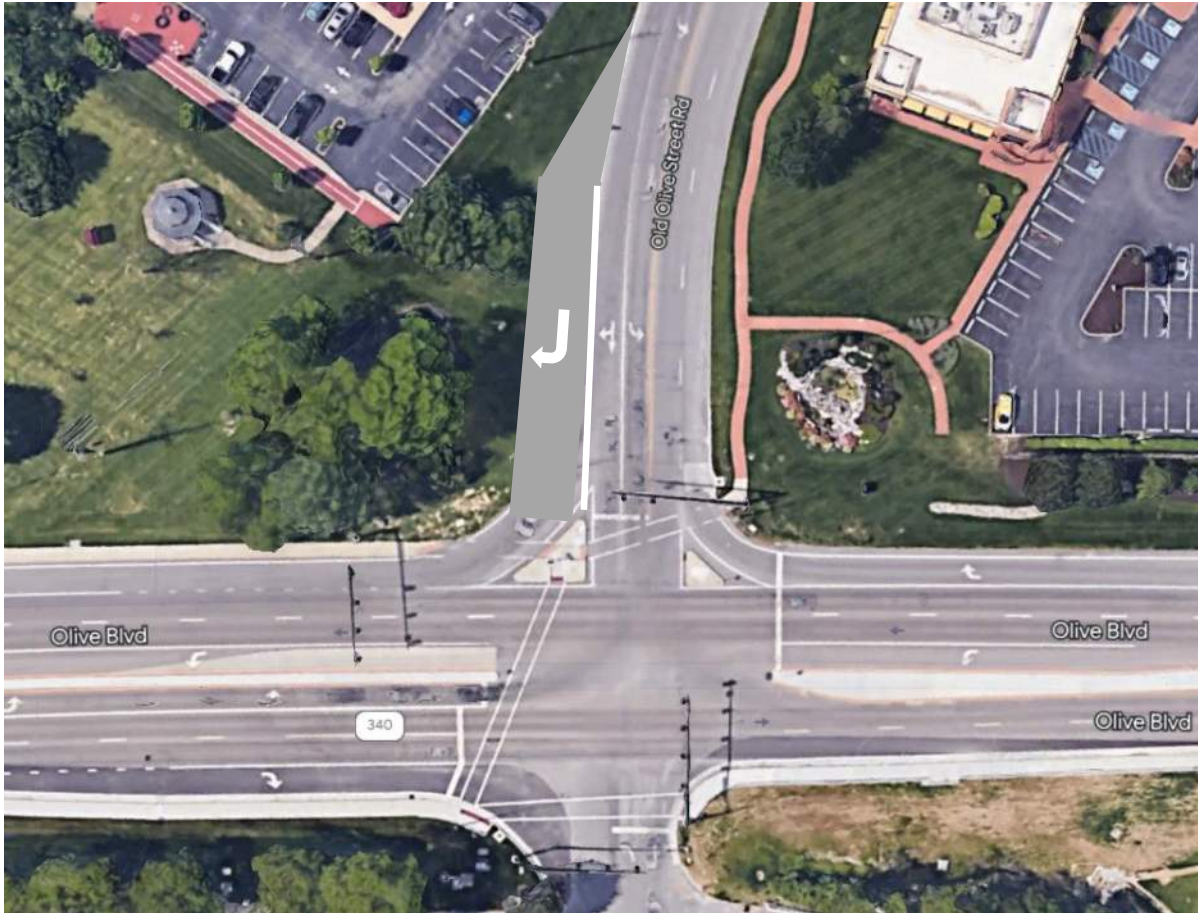


Figure 6 – Southbound Old Olive Street (West) Right Turn Lane

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 Additional Considerations

7.1 Adjacent Development

An additional adjacent development is proposed by Altus in Creve Coeur at the northeast corner of Olive and Old Olive Road. The proposed development consists of a mixed-use building with 229 apartment units and 4,700 square feet of ground floor commercial space. This development would replace a vacant restaurant and an active California Pizza Kitchen.



Figure 7 – Adjacent Altus Development

Trips Generated by the adjacent Altus development are shown in Table 17, which accounts for the removal of the existing restaurant and associated trips and the mixed used nature of this new development and the adjacent Creve Coeur Pavilion development.

Table 17 – Altus Development Trip Generation

ITE Code	Land Use	Units	Value	AM Enter	AM Exit	PM Enter	PM Exit
221	Multifamily Housing (Mid-Rise)	Dwellings	229	21	68	55	35
822	Strip Retail Plaza (<40k)	SF	4,700	10	7	23	23
932	High-Turnover (Sit-Down) Restaurant	SF	5,700	0	0	(31)	(21)
Subtotal – All Trips				31	75	47	37
Internal Capture (20%/49%)				(6)	(15)	(23)	(18)
Total External Trip Generation				25	60	24	19

The resulting trips were added to the study roadway network with an assumed even trip distribution of thirds going west on Olive Blvd, east on Olive Blvd, and north on Old Olive Road. The additional trips were added to the development intersections and the resulting delays are shown in Table 18. As shown in the table the additional trips have a small impact on average delays at these intersections, but they still operate effectively.

Table 18 – Build Operational Analysis with Additional Development Trips

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	11.5 (B)	15.9 (B)	232	334	13.0 (B)	20.4 (C)	281	337
	WB	15.5 (B)	26.8 (C)	380	546	18.0 (B)	53.1 (D)	548	894
	NB	40.3 (D)	39.6 (D)	85	121	39.8 (D)	40.5 (D)	85	130
	SB	24.2 (C)	29.6 (C)	144	211	27.1 (C)	37.5 (D)	155	330
	ALL	15.7 (B)	23.5 (C)			17.6 (B)	37.6 (D)		
Olive & Pavilion	EB	15.6 (B)	14.9 (B)	288	400	20.4 (C)	19.3 (B)	721	534
	WB	19.8 (B)	14.4 (B)	467	385	19.8 (B)	16.5 (B)	468	323
	NB	40.8 (D)	30.0 (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	21.5 (C)	17.7 (B)			23.4 (C)	20.2 (C)		

7.2 Pedestrian Accommodations

Pedestrian connectivity between Olia Village and the north side of Olive Boulevard could be provided through crosswalks at Pavilion Drive. The additional of crosswalks at this signalized intersection would include push buttons that would call a pedestrian phase across Olive Boulevard that would extend the northbound and southbound through phases to allow time for the pedestrian intervals to serve any pedestrian demands. The pedestrian phase is estimated to be 24 seconds which includes a walk indication and the required pedestrian clearance time.

Table 19 summarizes the operations of the Olive Blvd and Pavilion Drive intersection when the pedestrian interval is called, and the signal timing is adjusted. The adjusted signal timing has a minor impact on the average delays at the intersection and it remains operating efficiently.

Table 19 – Build Operational Analysis with Pedestrian Phases

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 & Pavilion	EB	15.4 (B)	14.7 (B)	284	393	20.0 (C)	20.4 (C)	721	544
	WB	19.8 (B)	14.4 (B)	469	377	19.8 (B)	17.5 (B)	470	349
	NB	40.3 (D)	27.2 (C)	201	170	40.3 (D)	26.1 (C)	201	167
	SB	53.4 (D)	39.8 (D)	83	136	53.2 (D)	39.8 (D)	88	149
	ALL	21.4 (C)	17.3 (B)			23.2 (C)	20.6 (C)		

8 Recommendations and Conclusion

Based upon the analysis of the traffic impacts of the Olivia 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	488 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

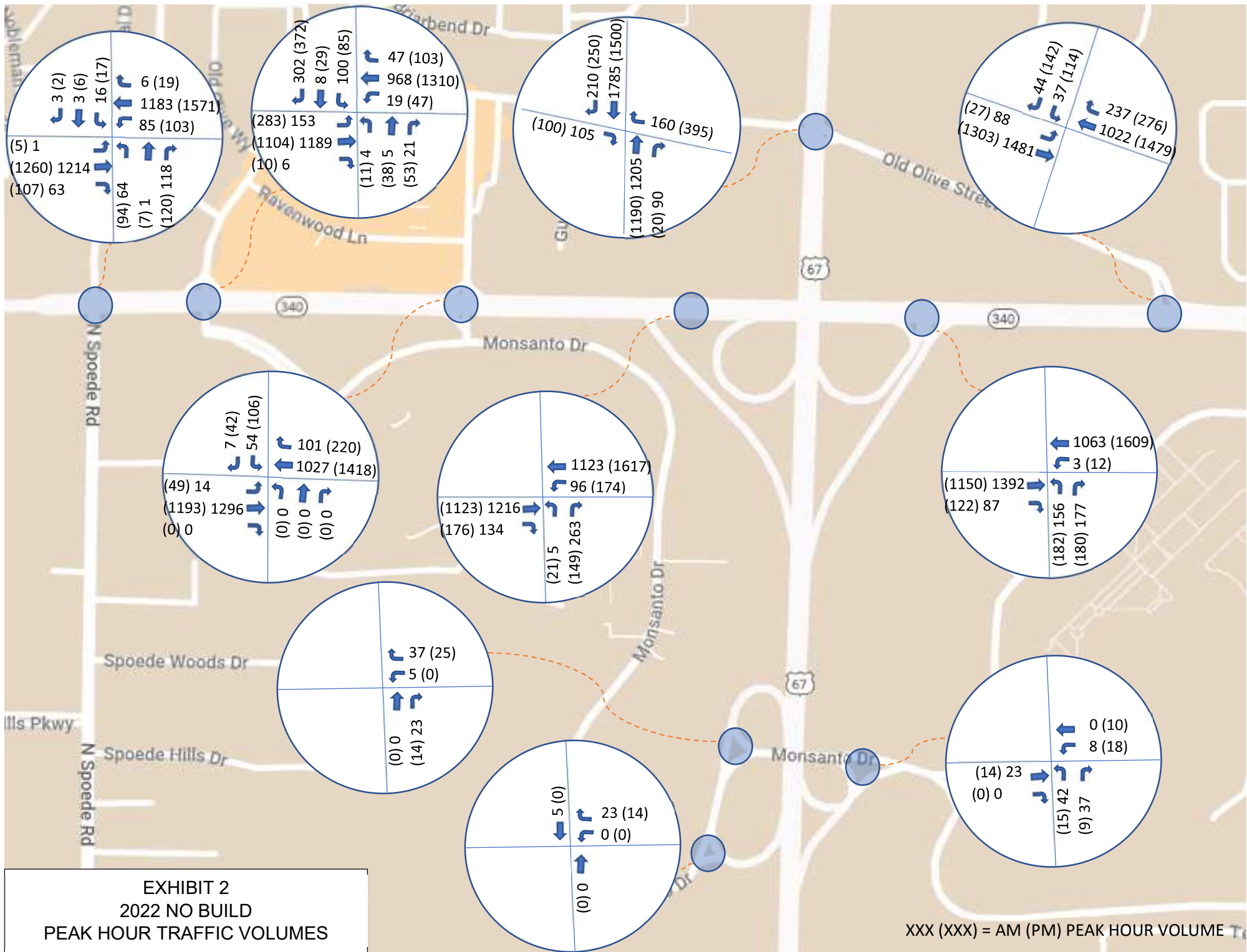
OLIA VILLAGE

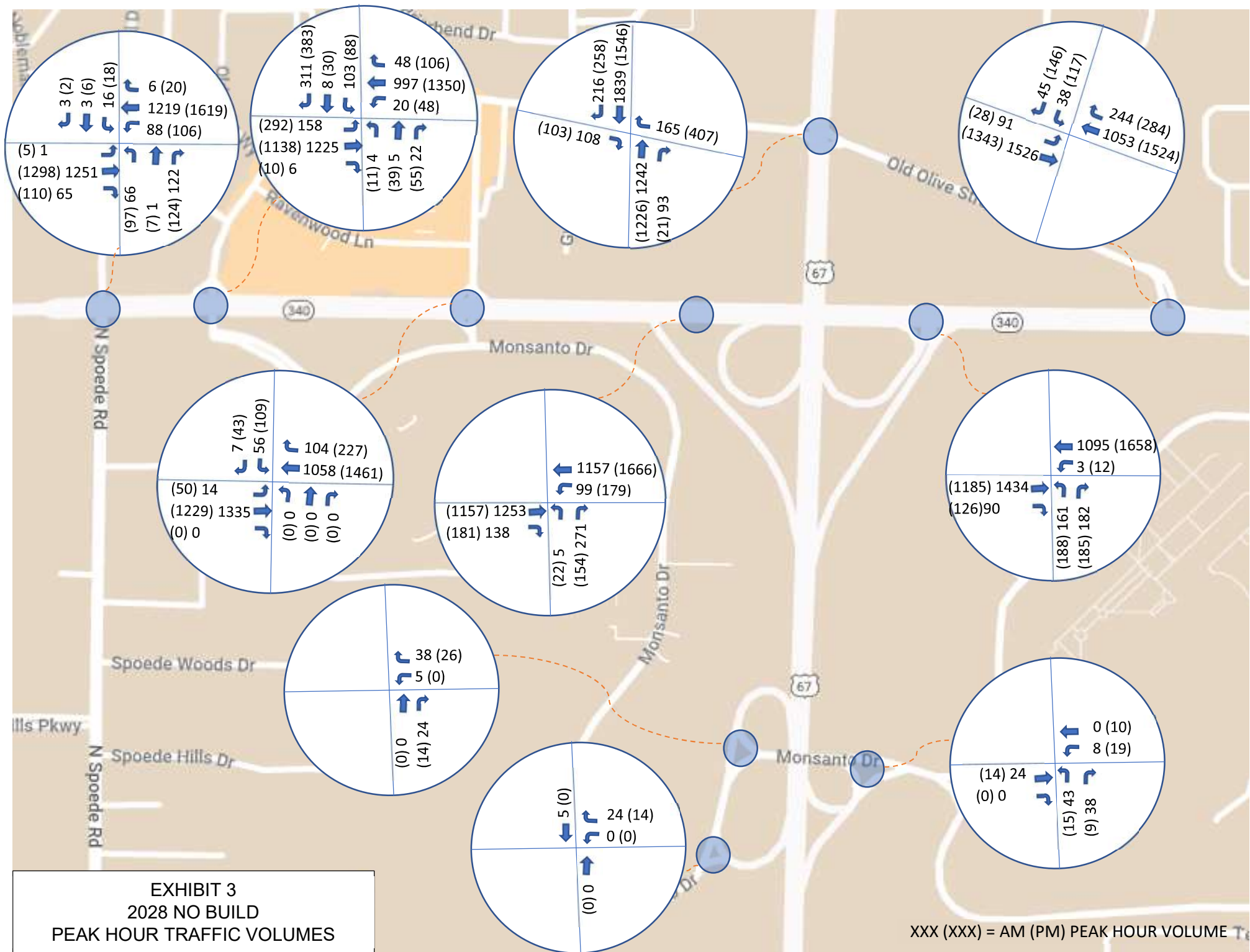
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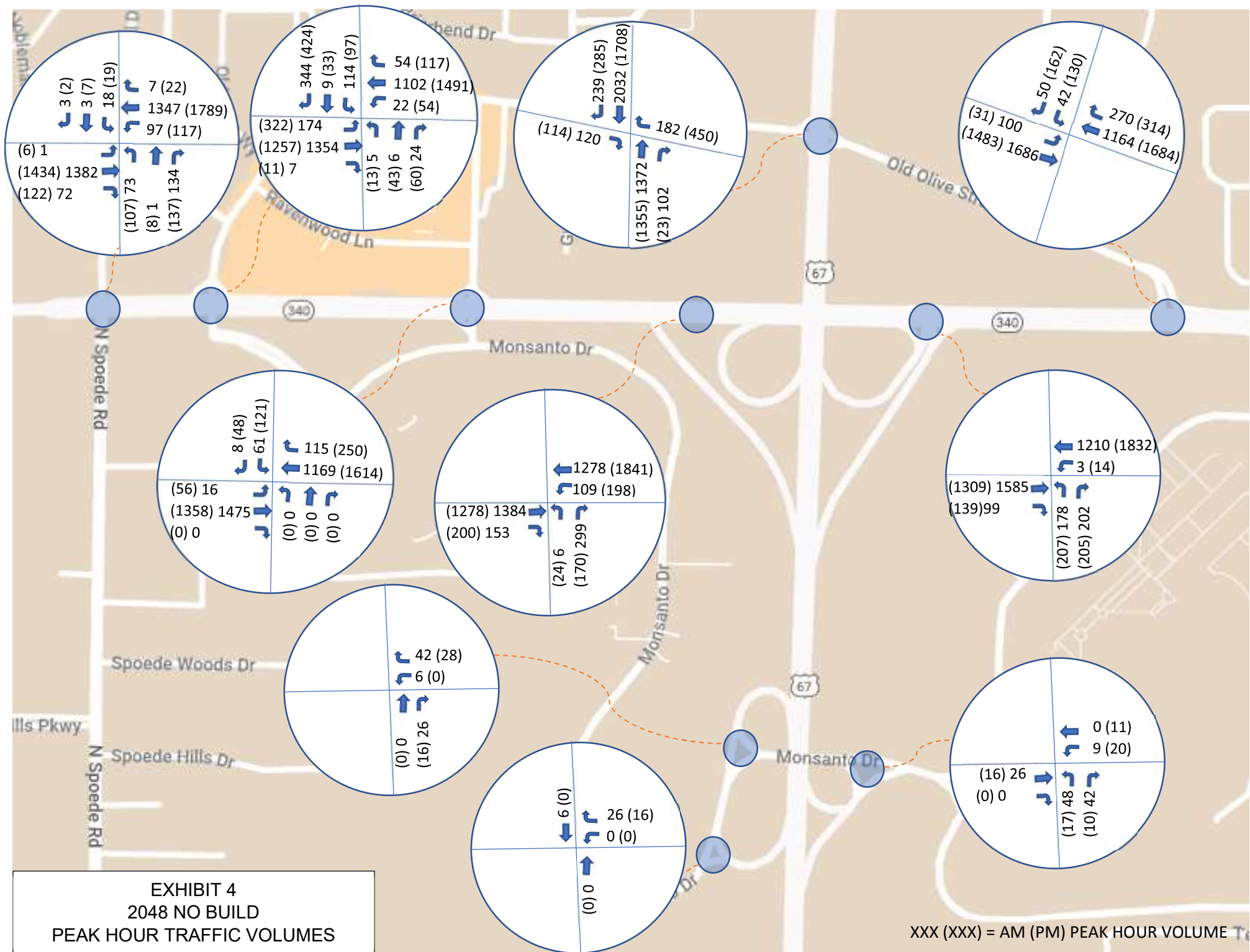
MASTER PLAN

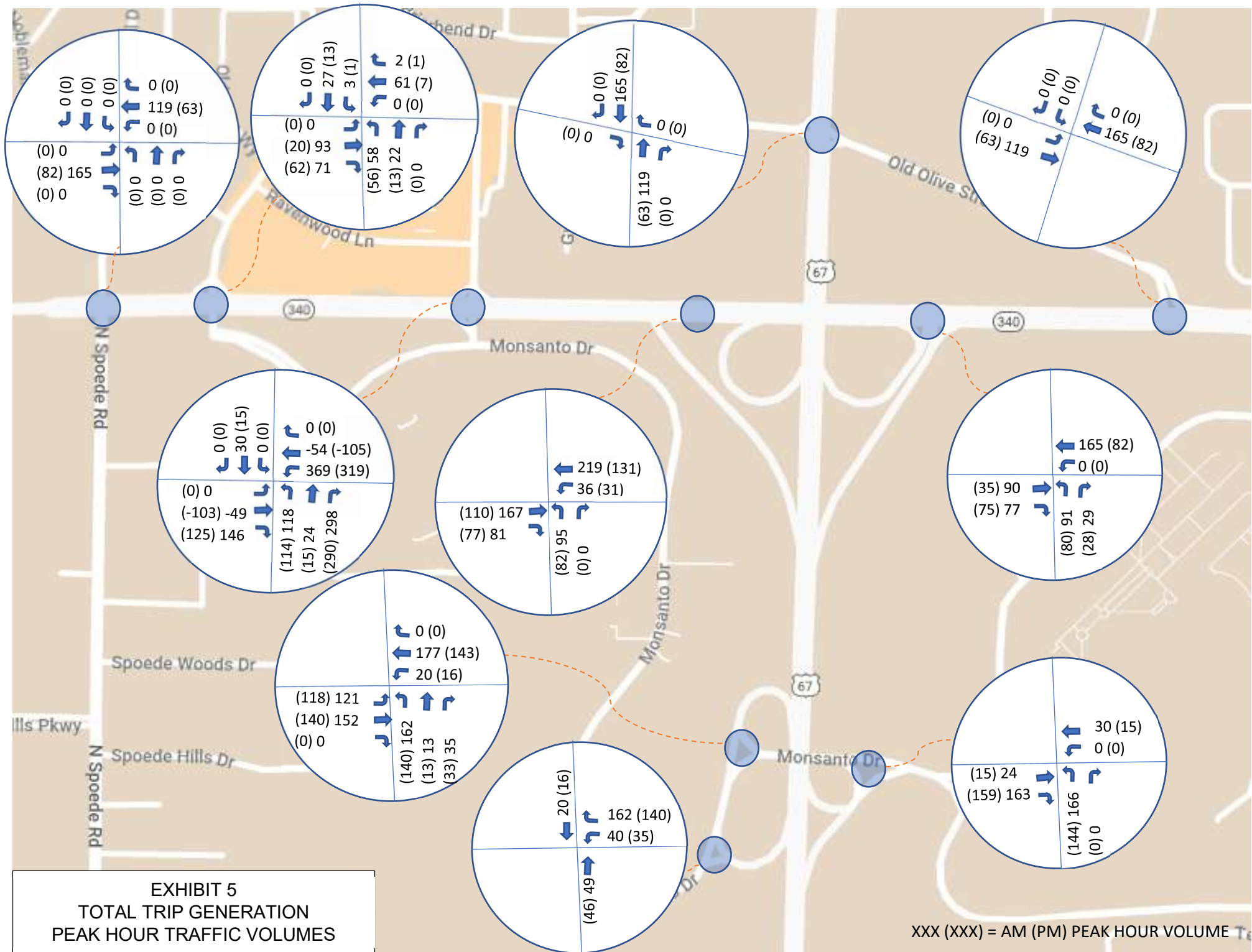
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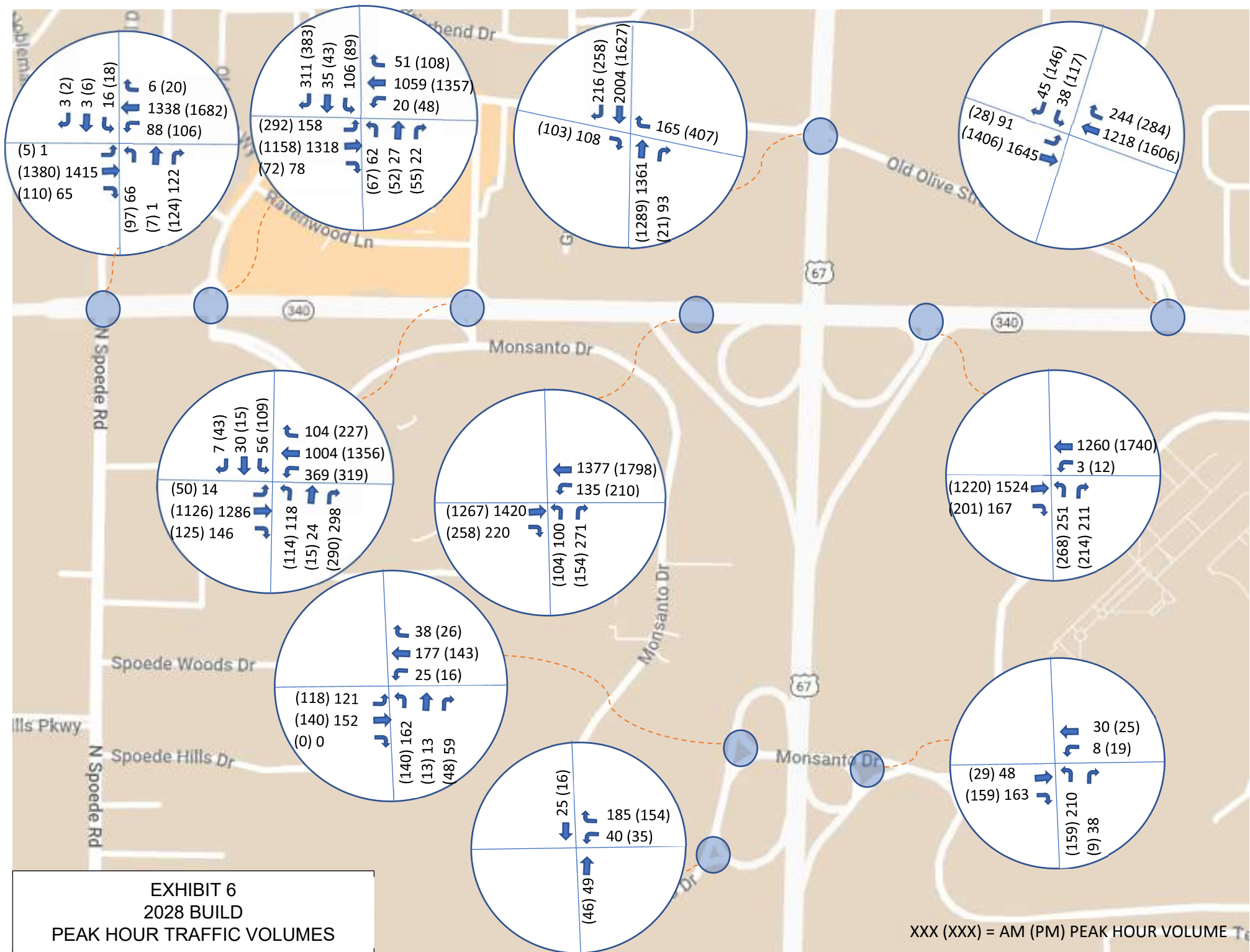
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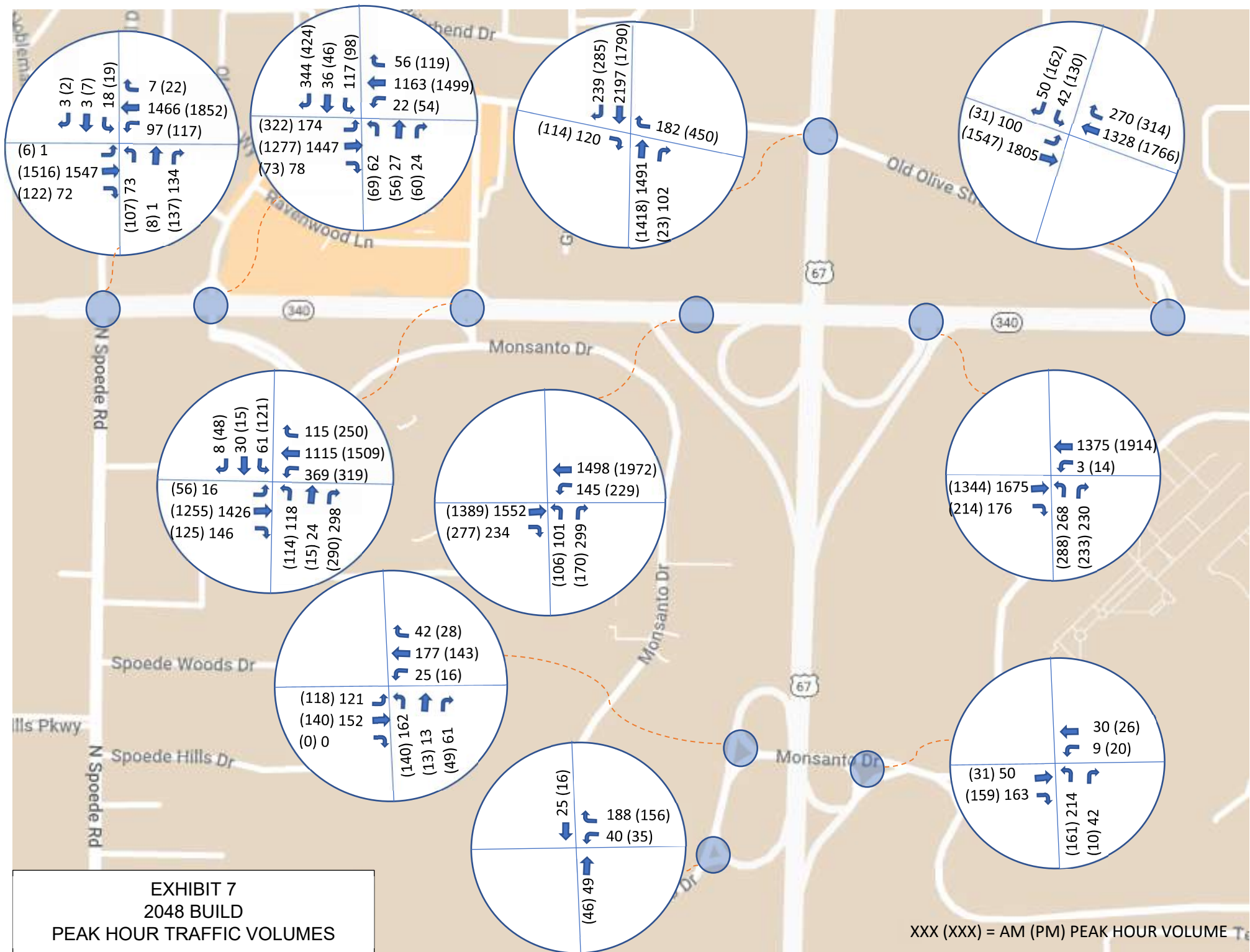












Appendix A

Trip Generation Reports and Graphs

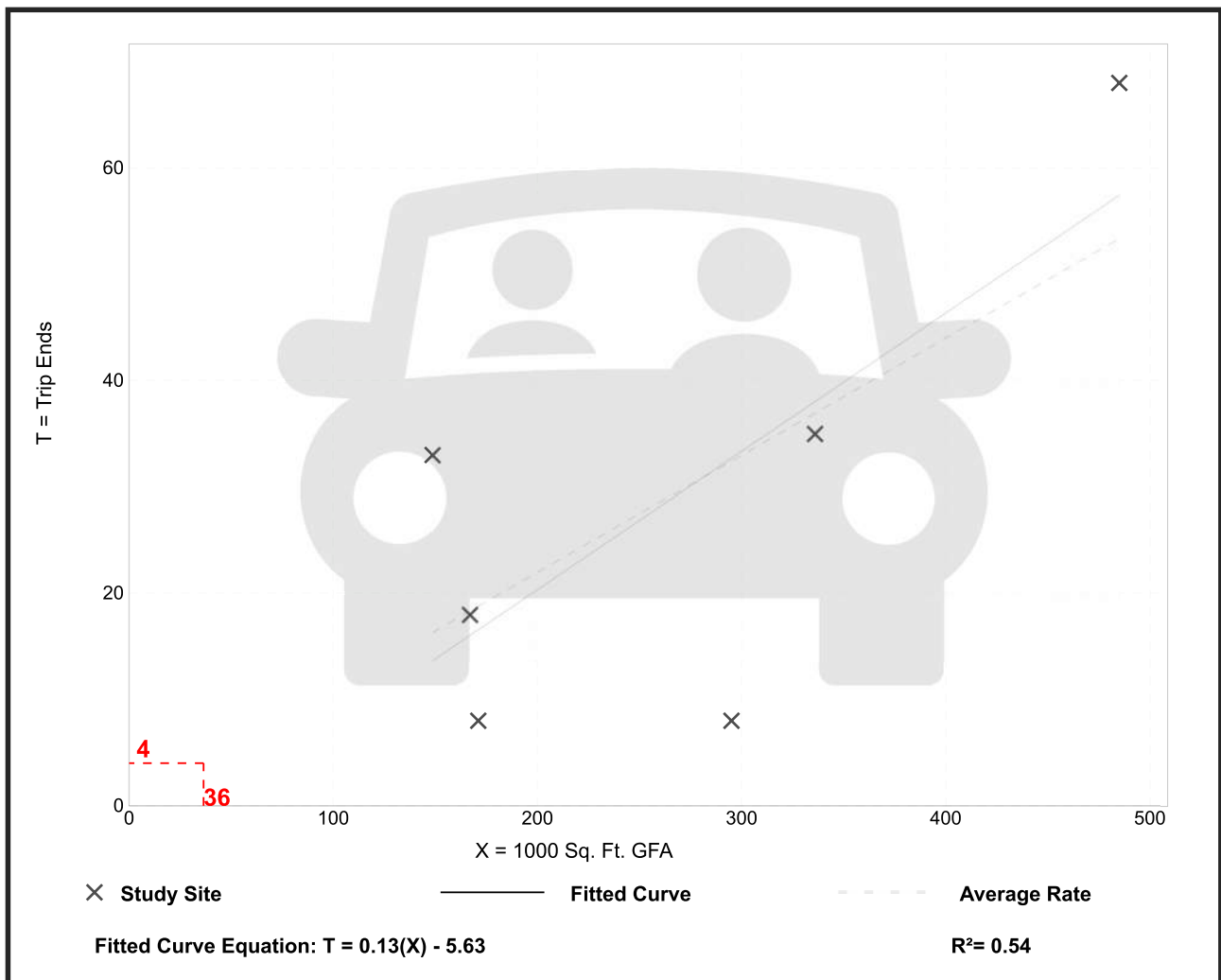
Data Center (160)

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)

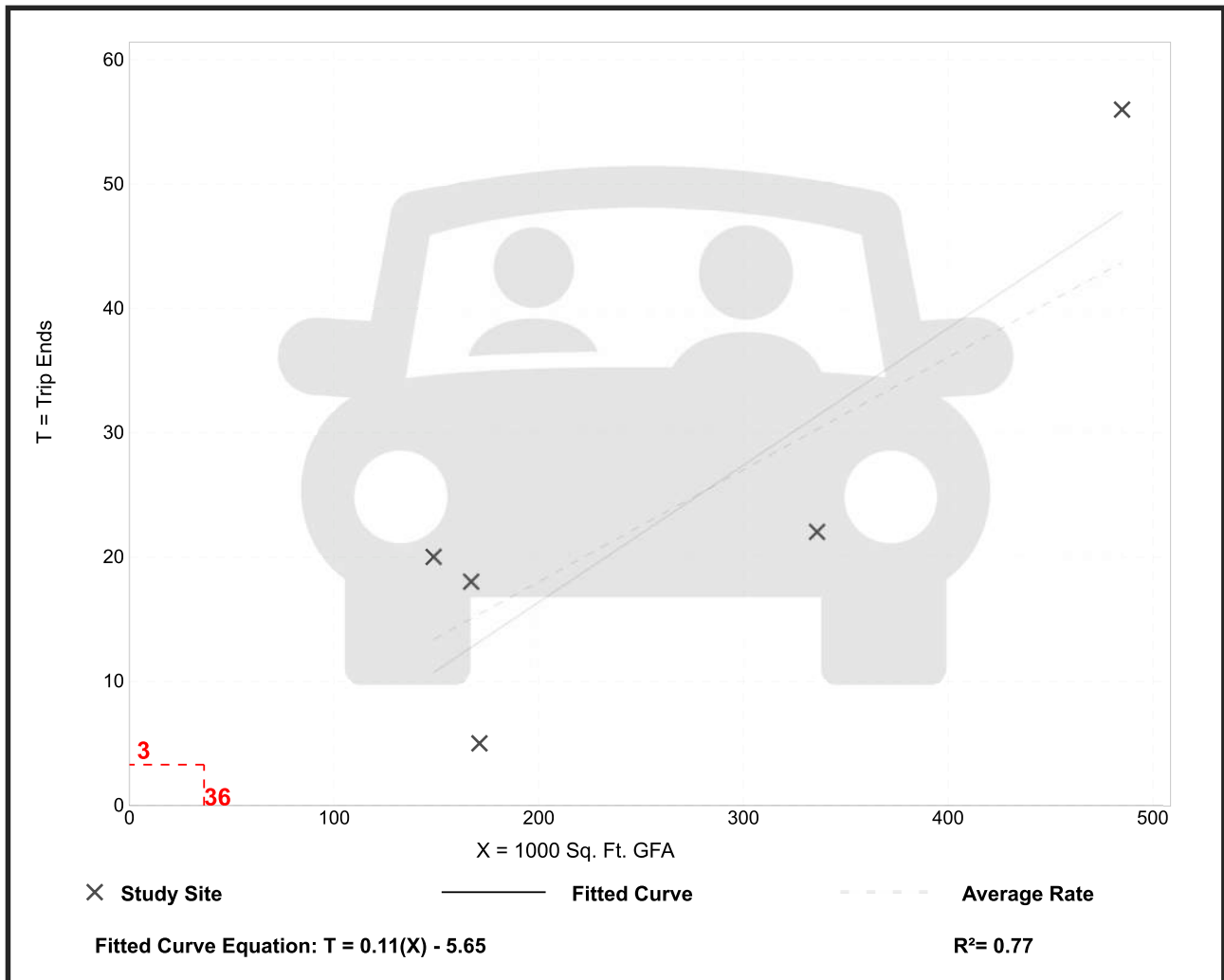
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GFA: 262
 Directional Distribution: 30% entering, 70% exiting

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

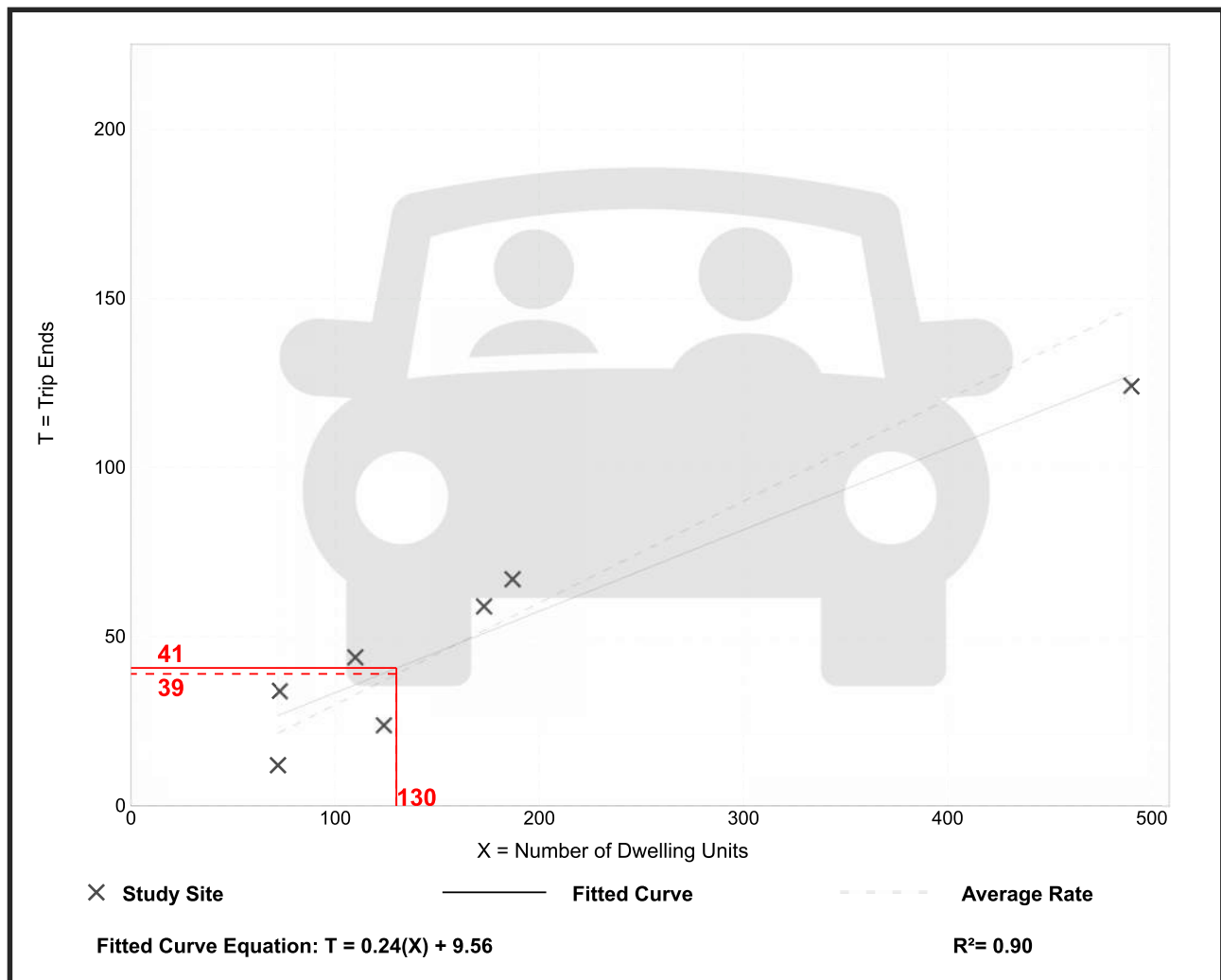
Avg. Num. of Dwelling Units: 176

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

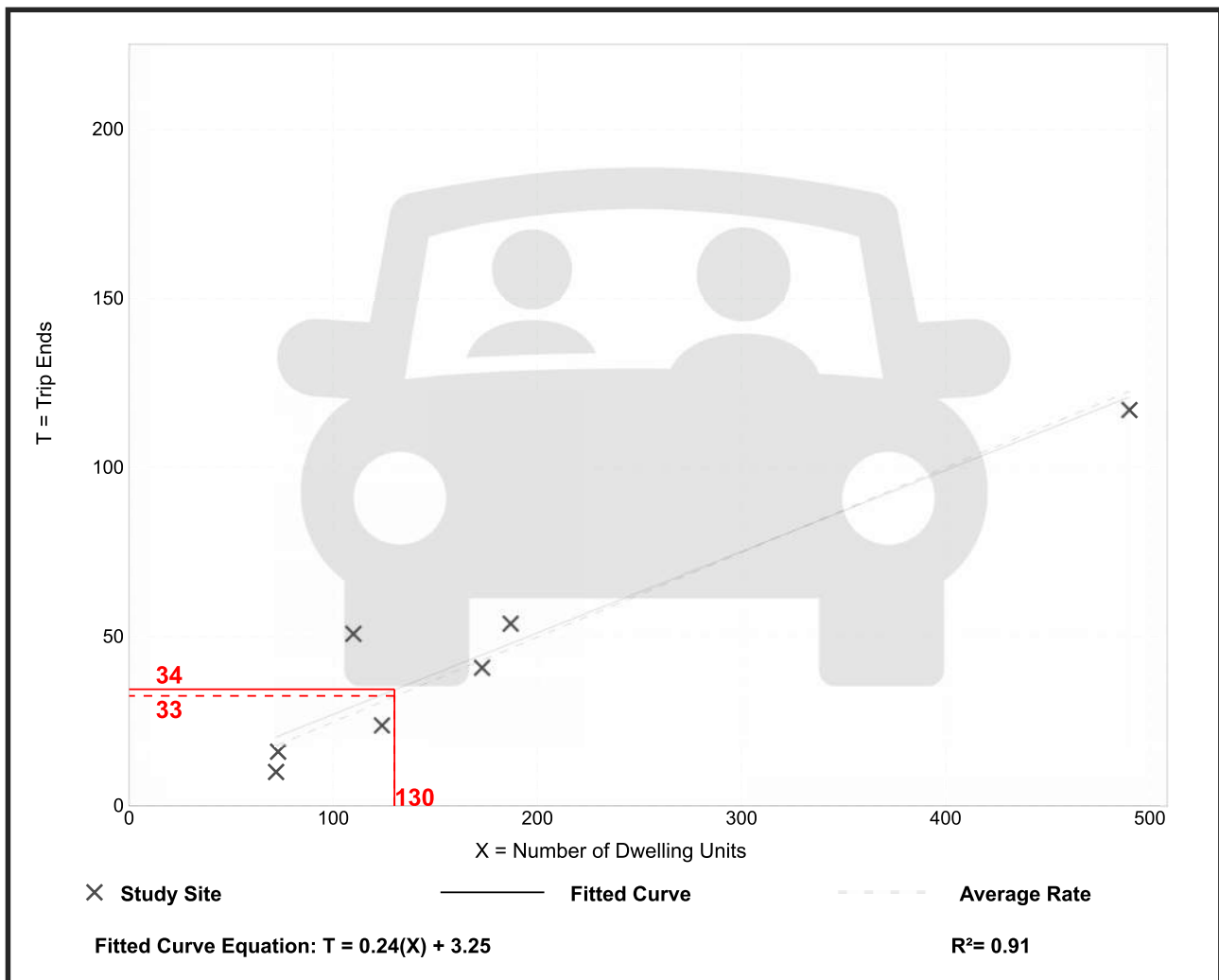
Avg. Num. of Dwelling Units: 176

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

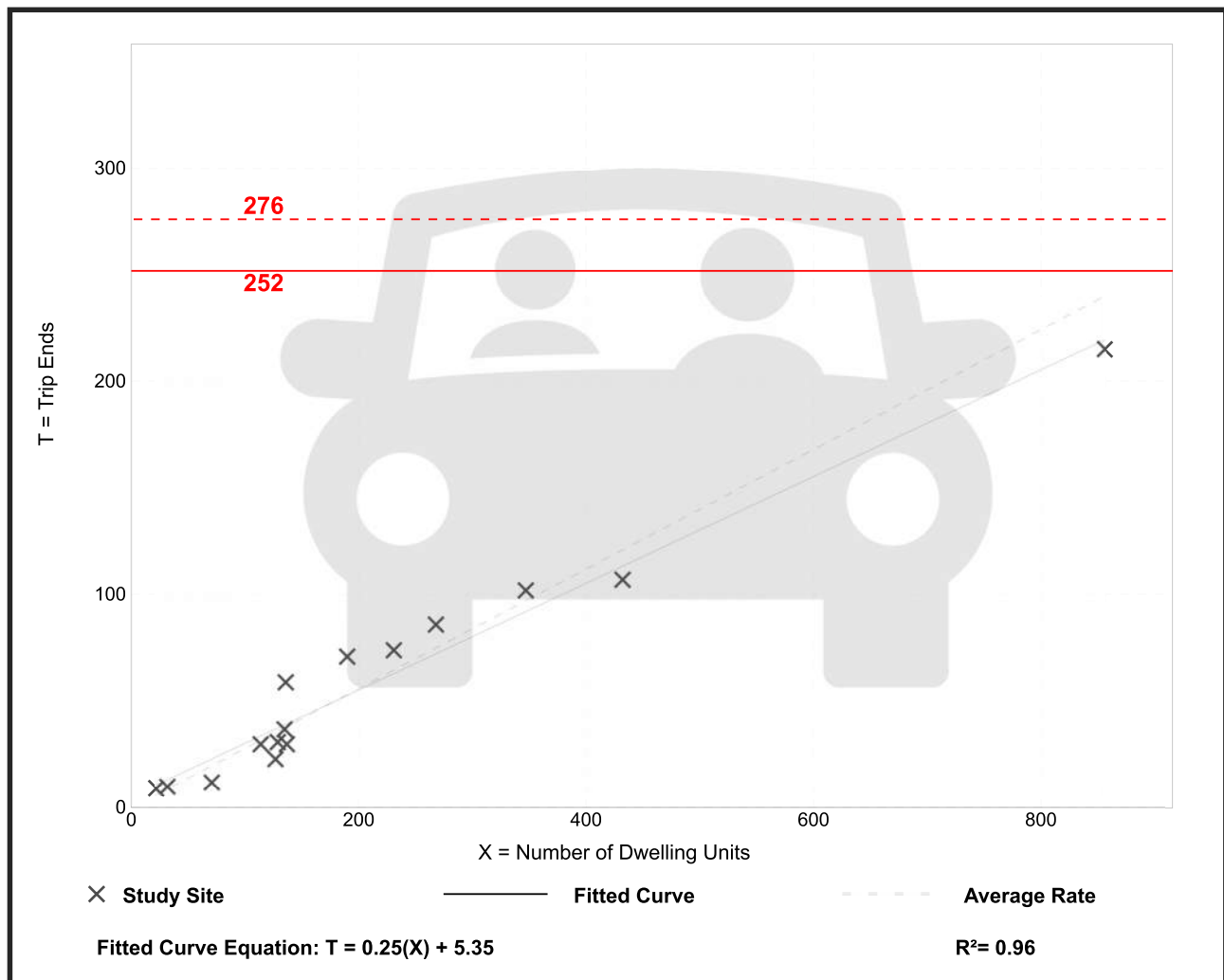
Avg. Num. of Dwelling Units: 215

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

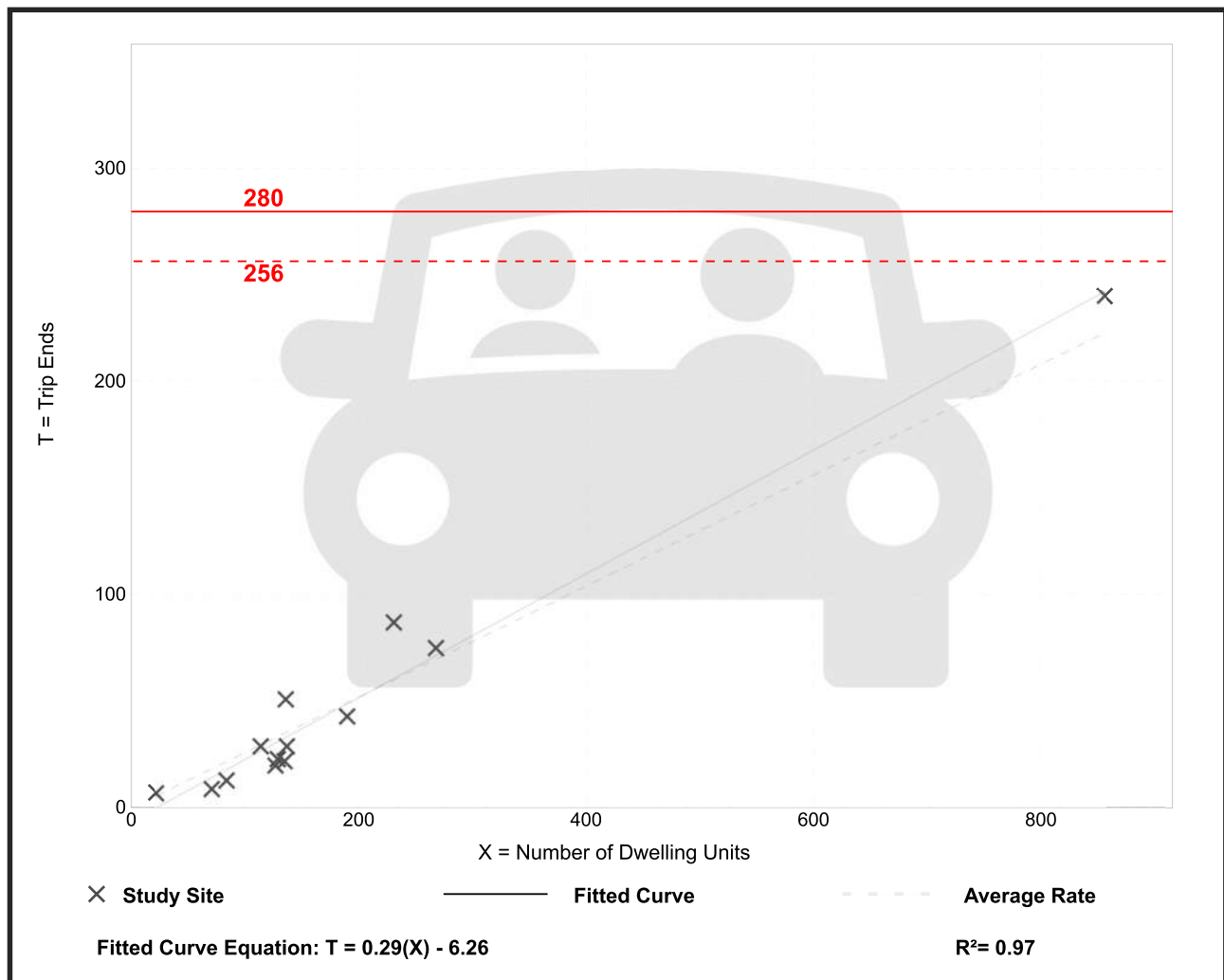
Avg. Num. of Dwelling Units: 192

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)

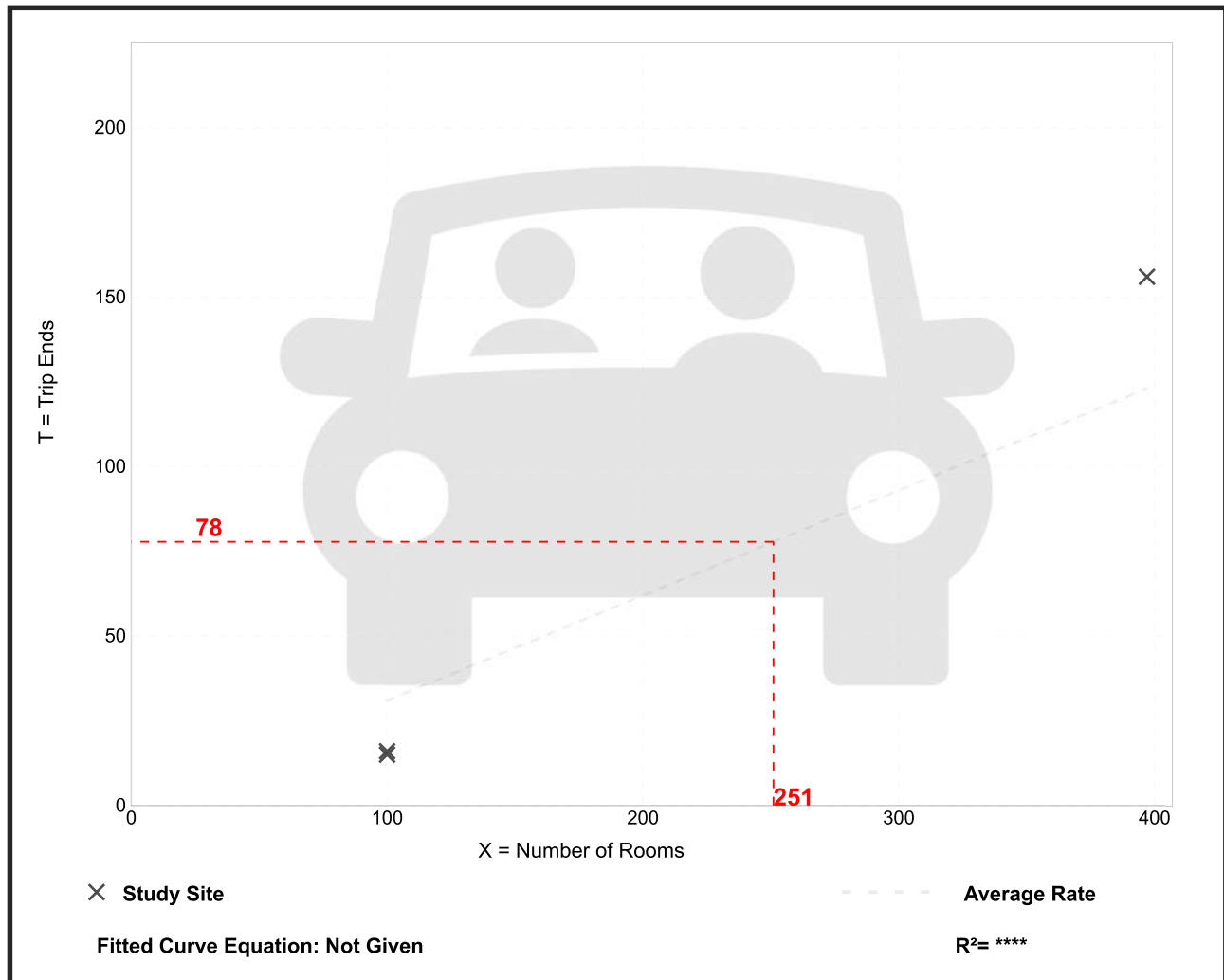
Vehicle Trip Ends vs: Rooms
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: Dense Multi-Use Urban
 Number of Studies: 3
 Avg. Num. of Rooms: 199
 Directional Distribution: 39% entering, 61% exiting

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)

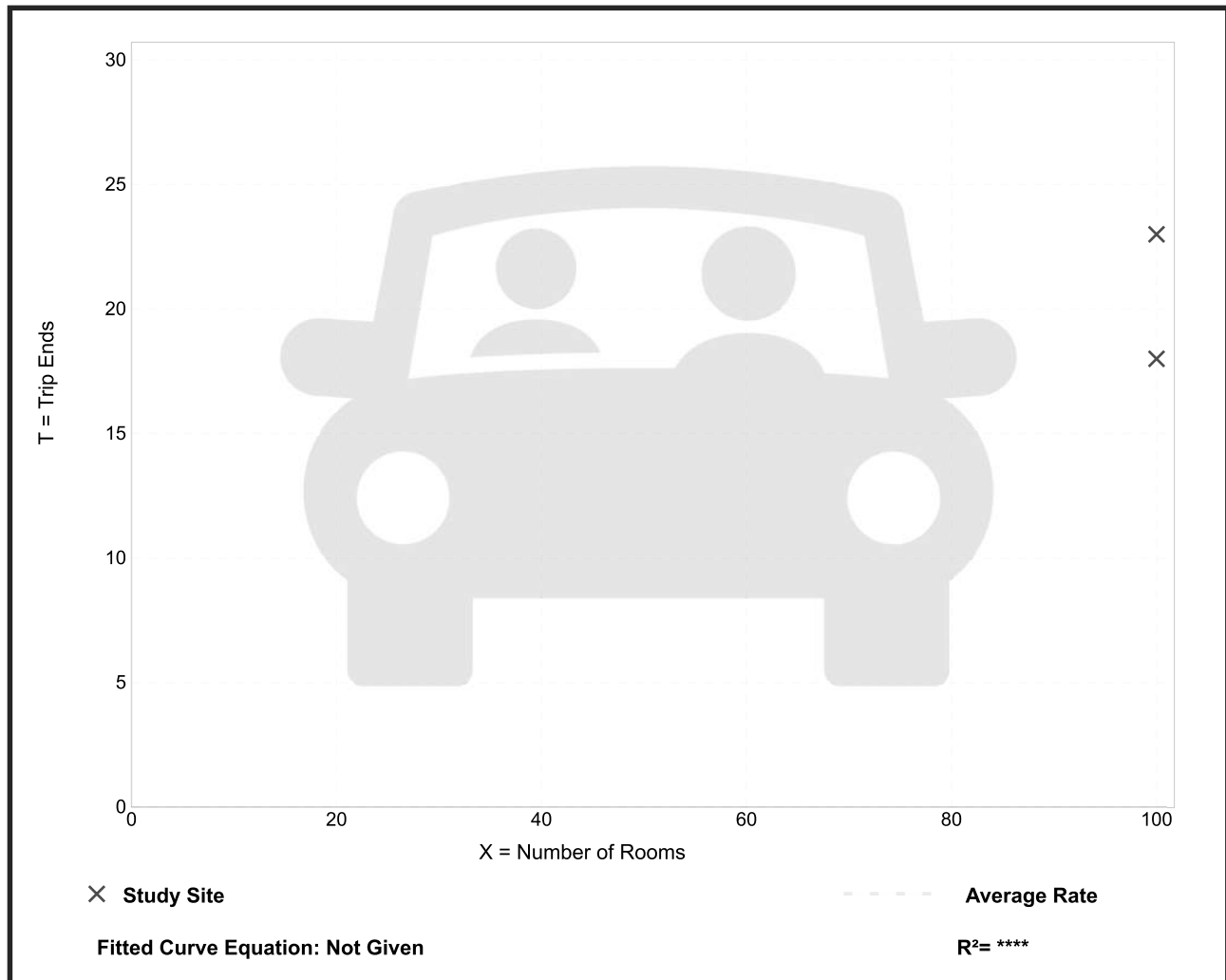
Vehicle Trip Ends vs: Rooms
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: Dense Multi-Use Urban
Number of Studies: 2
Avg. Num. of Rooms: 100
Directional Distribution: 44% entering, 56% exiting

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



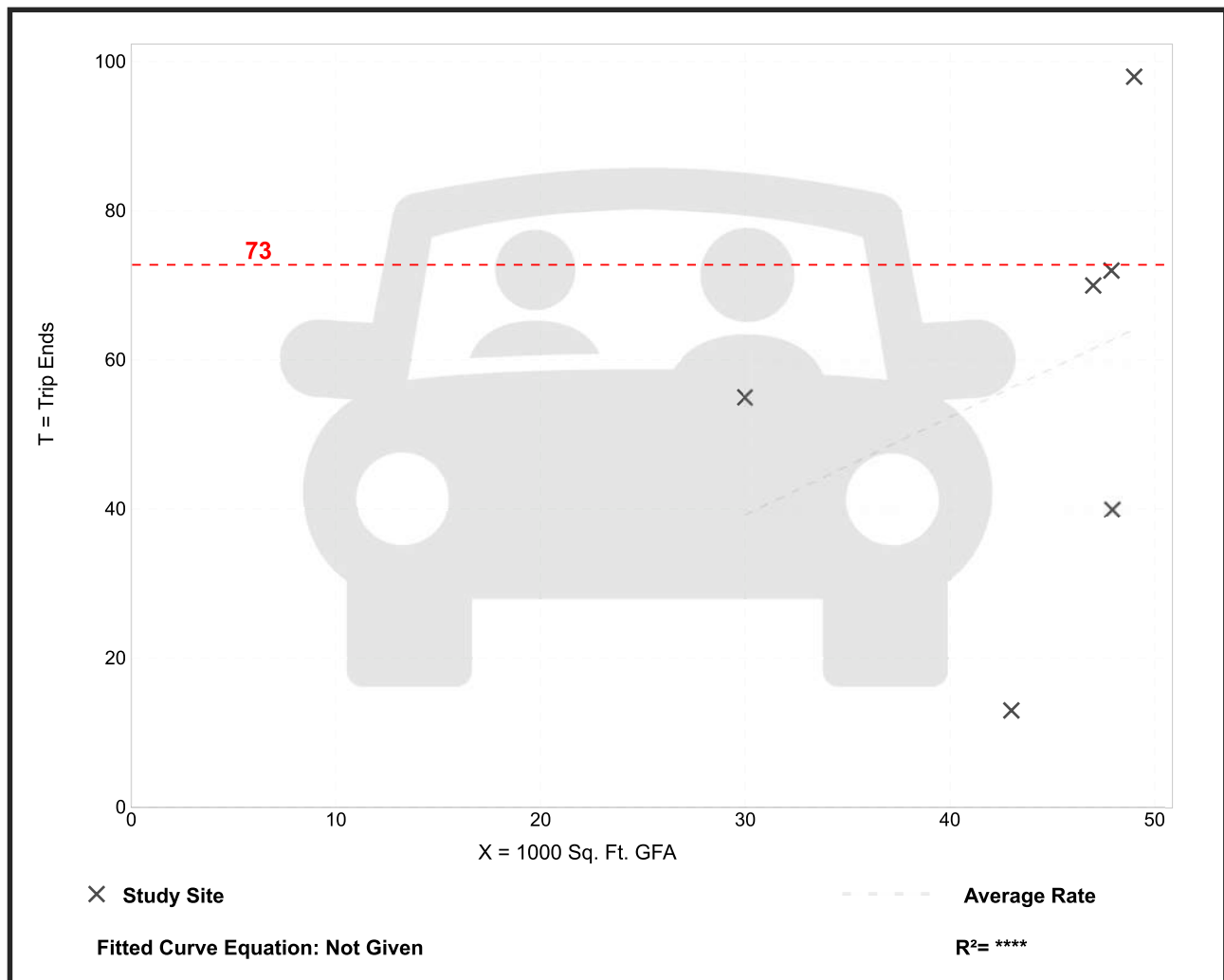
Health/Fitness Club (492)

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



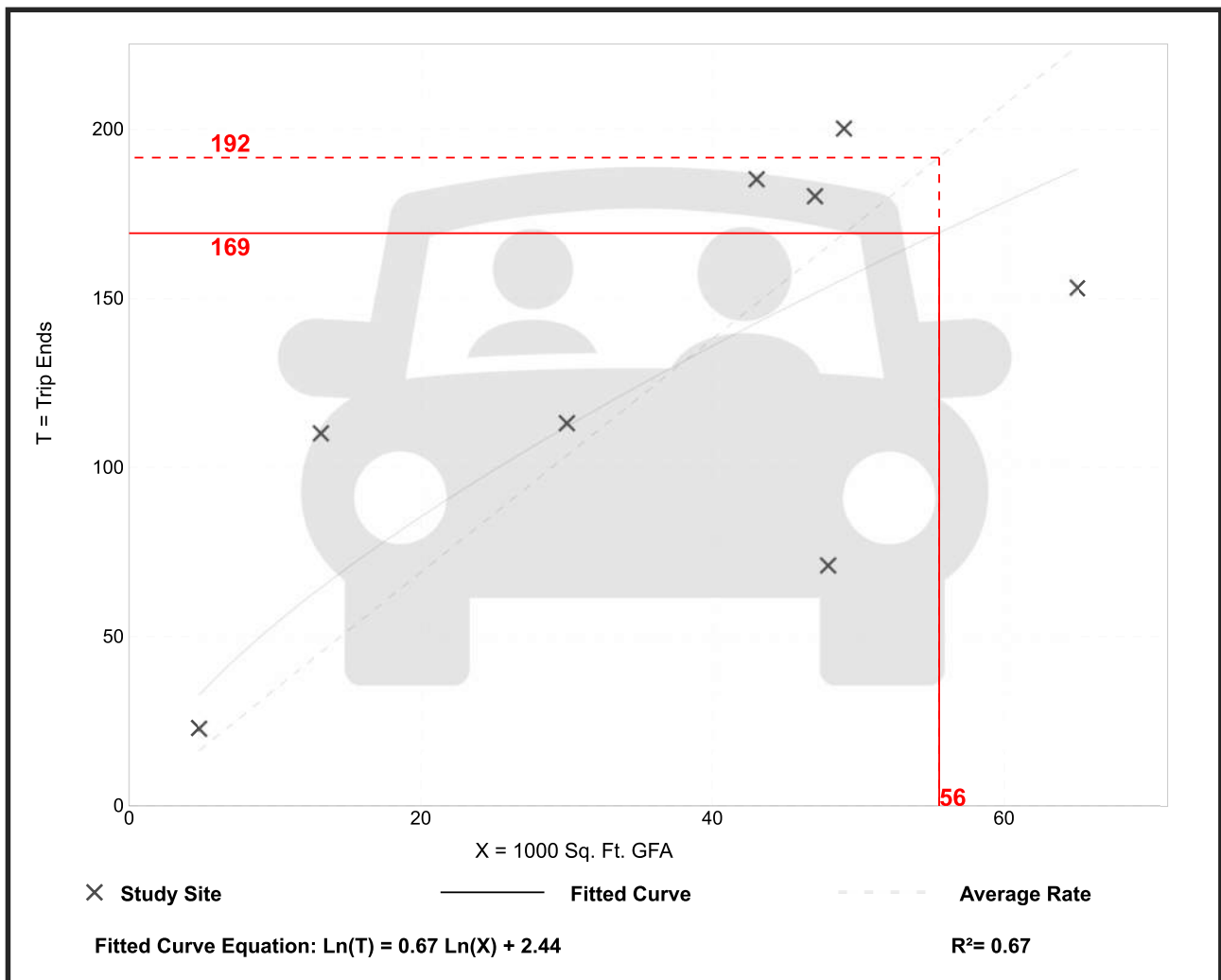
Health/Fitness Club (492)

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



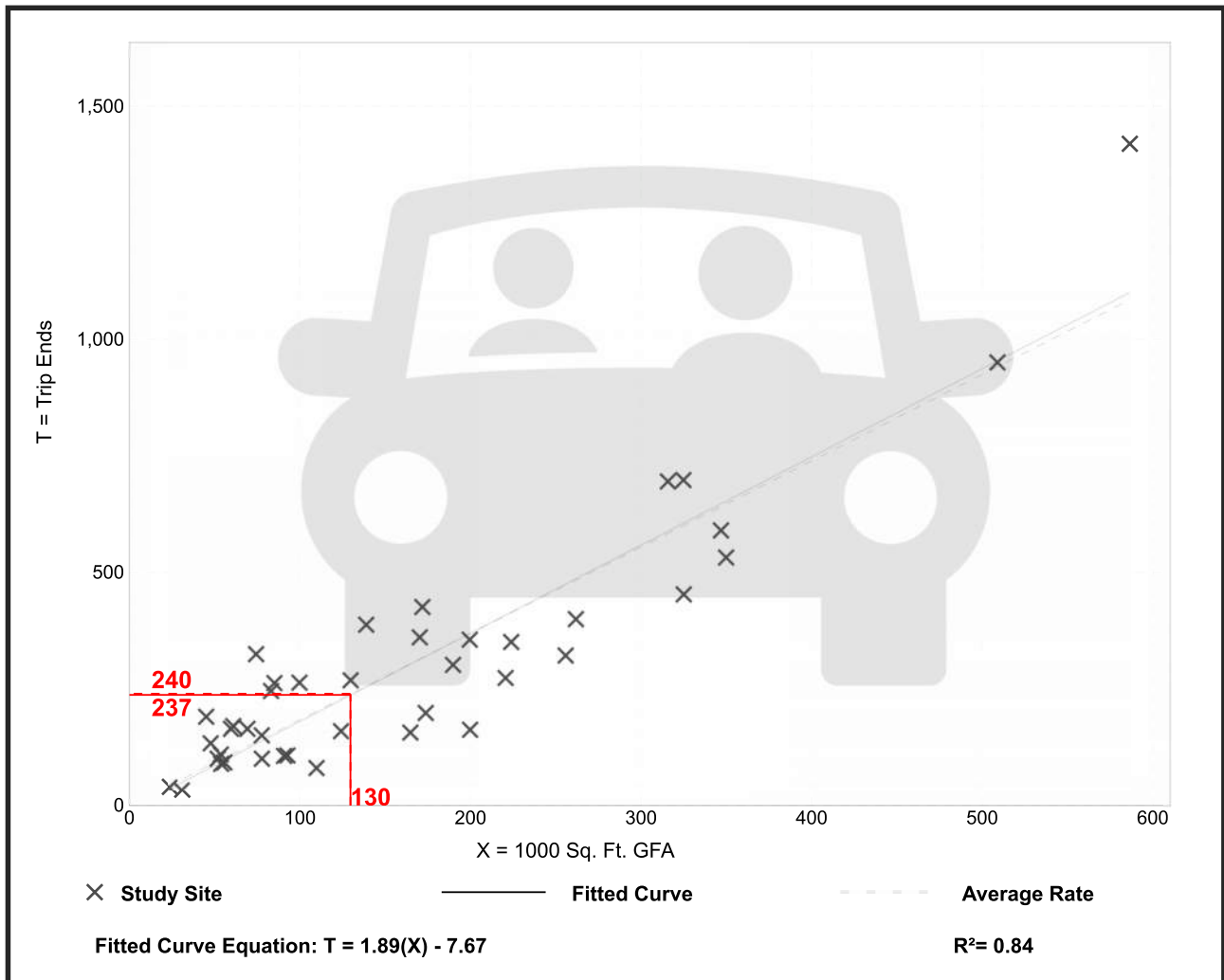
Single Tenant Office Building (715)

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



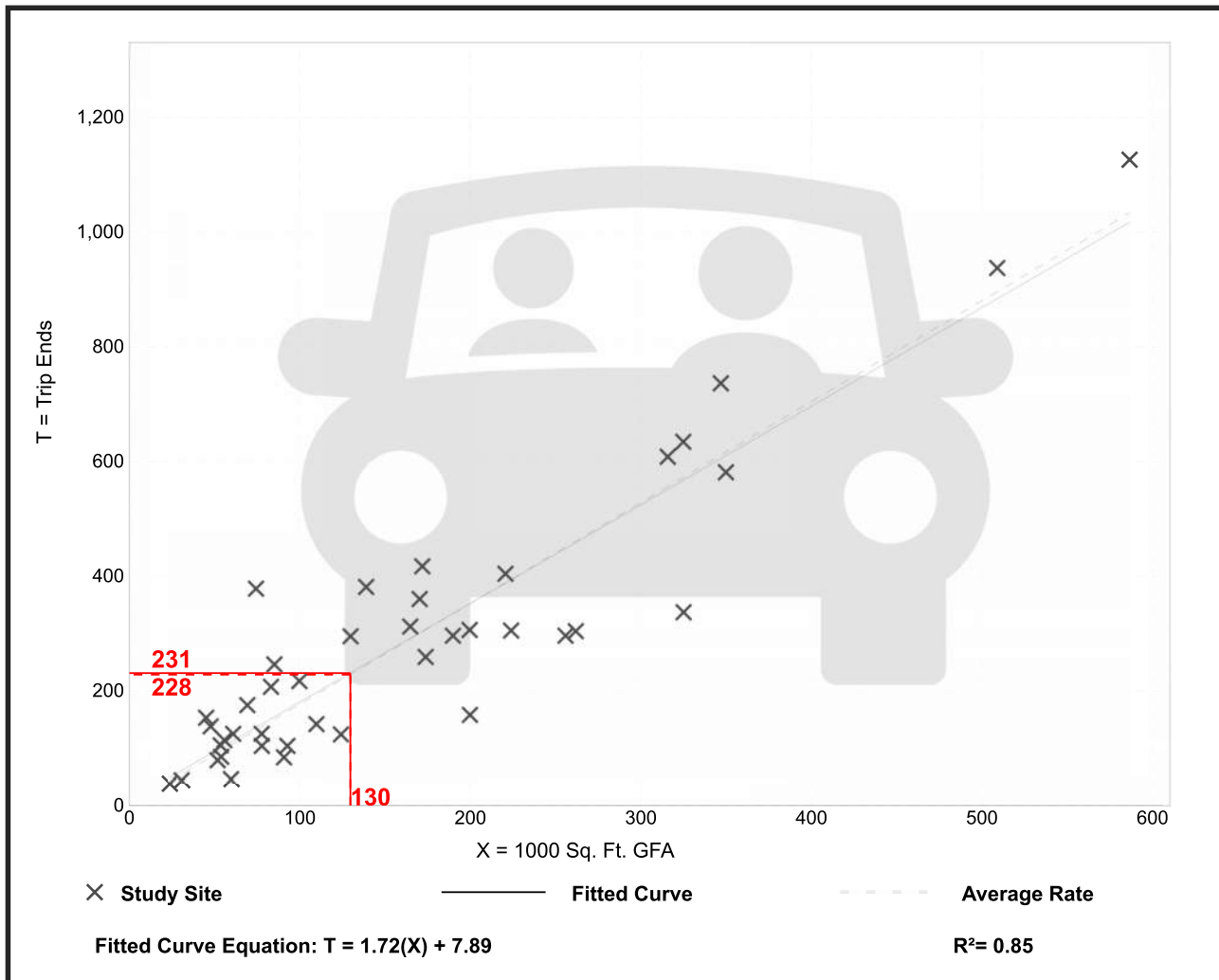
Single Tenant Office Building (715)

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



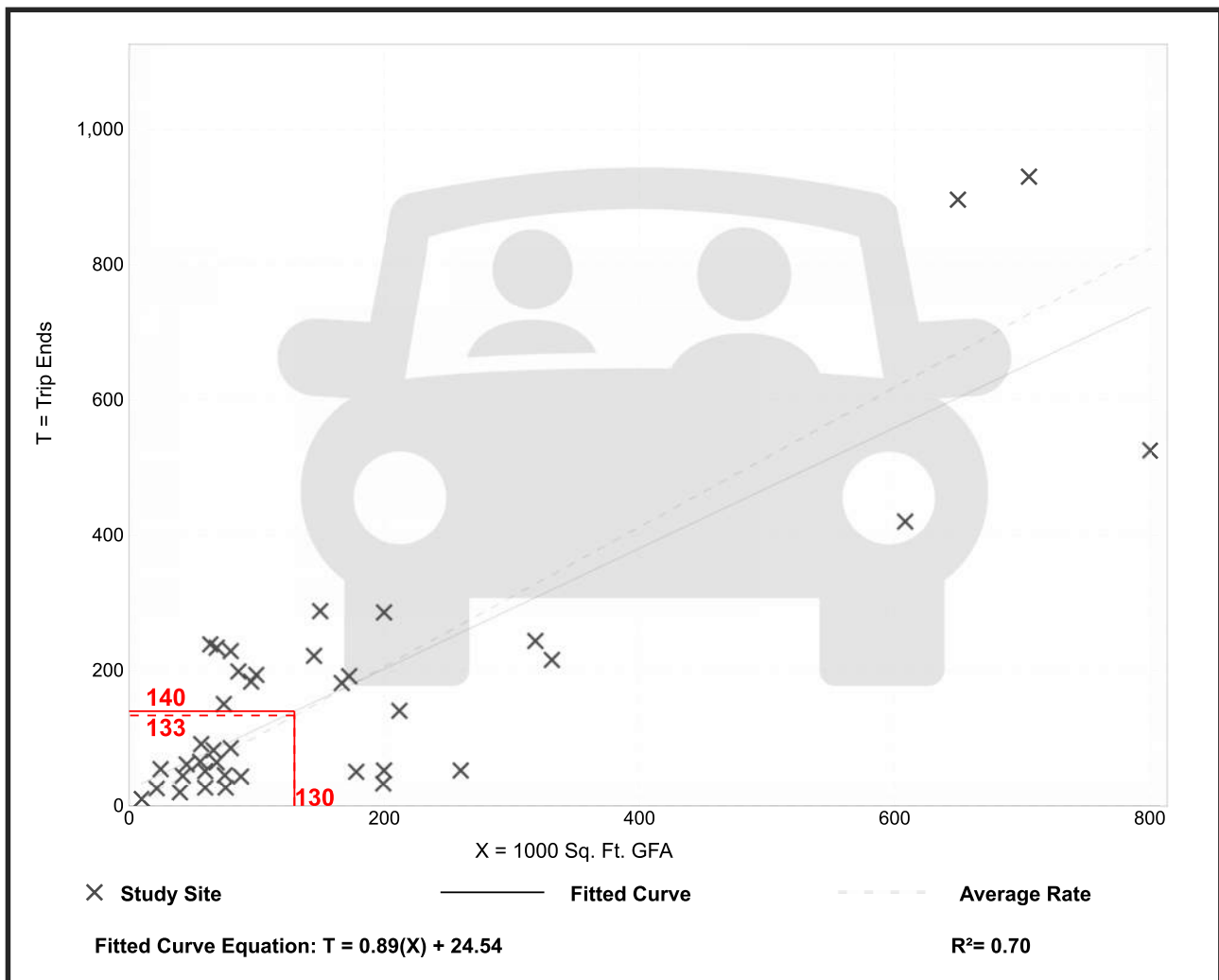
Research and Development Center (760)

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



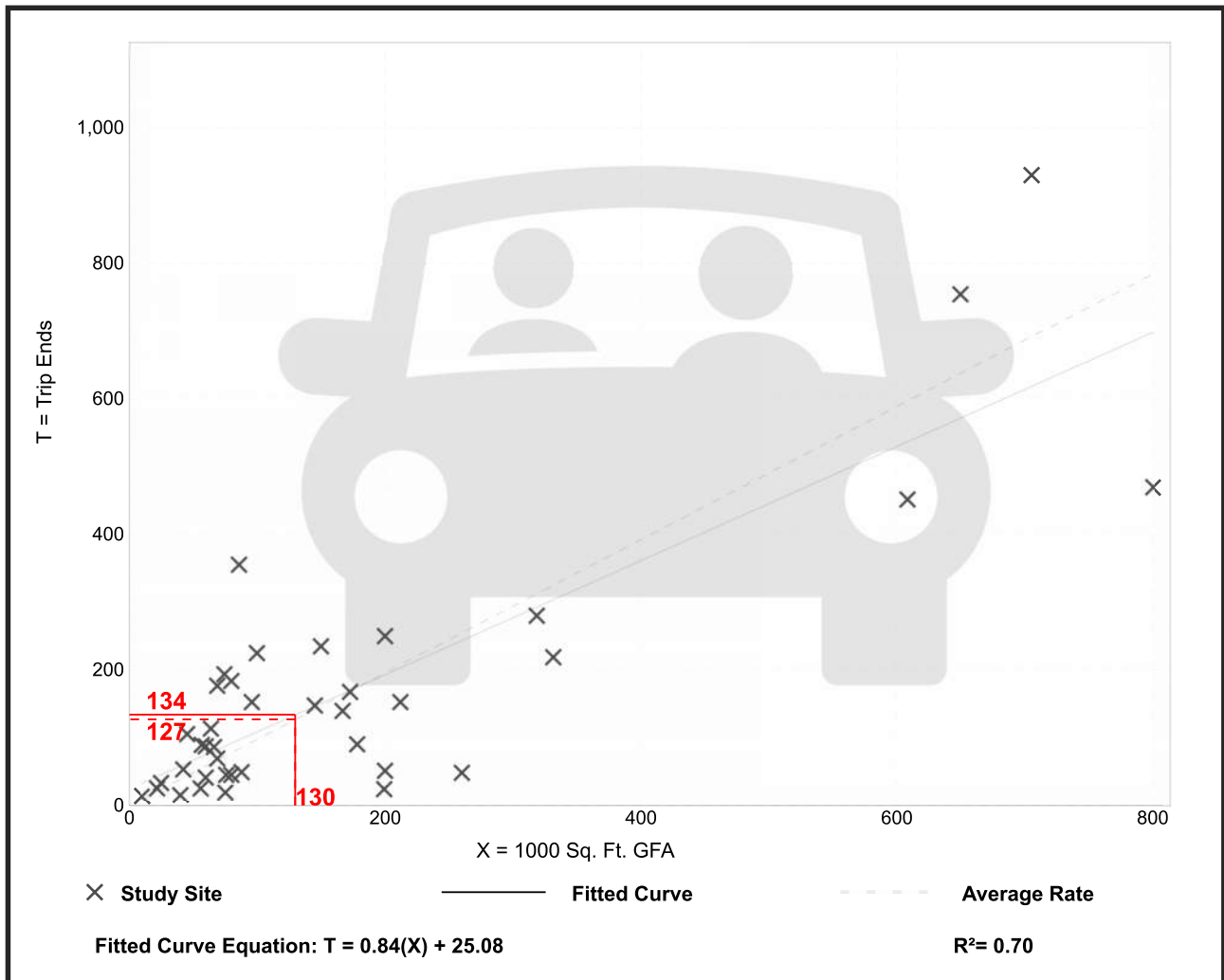
Research and Development Center (760)

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)

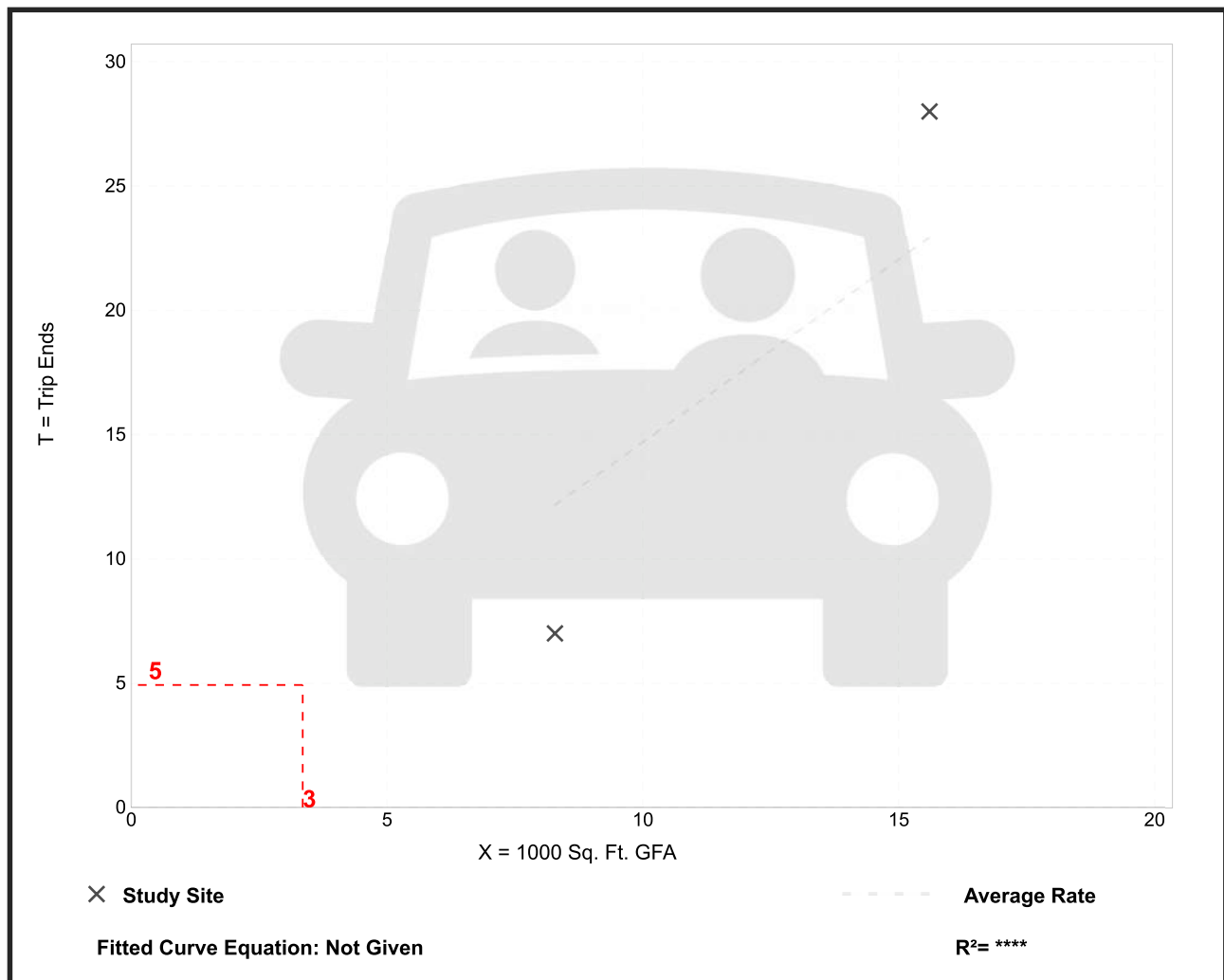
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 12
 Directional Distribution: 57% entering, 43% exiting

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)

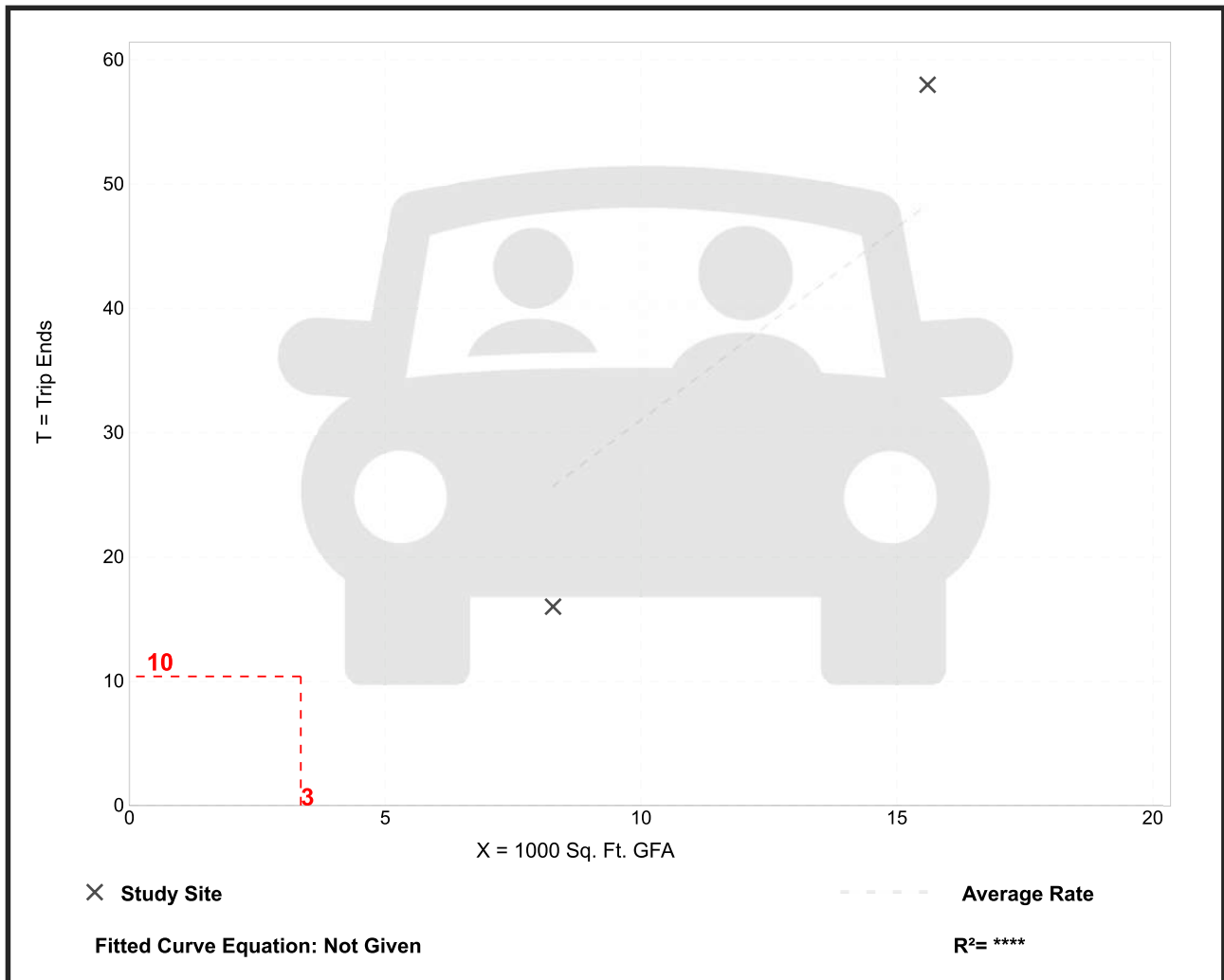
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 12
 Directional Distribution: 51% entering, 49% exiting

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)

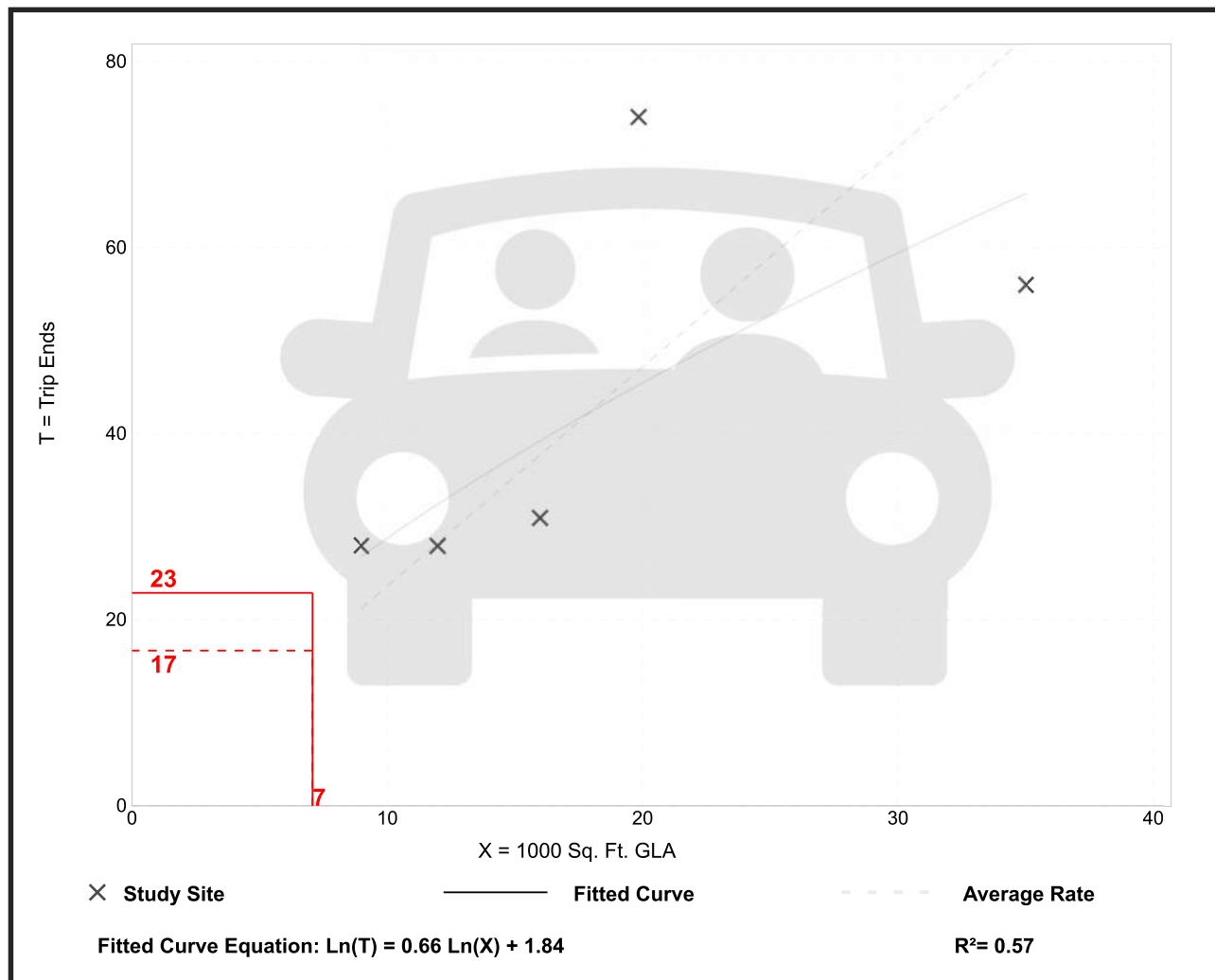
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GLA: 18
 Directional Distribution: 60% entering, 40% exiting

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



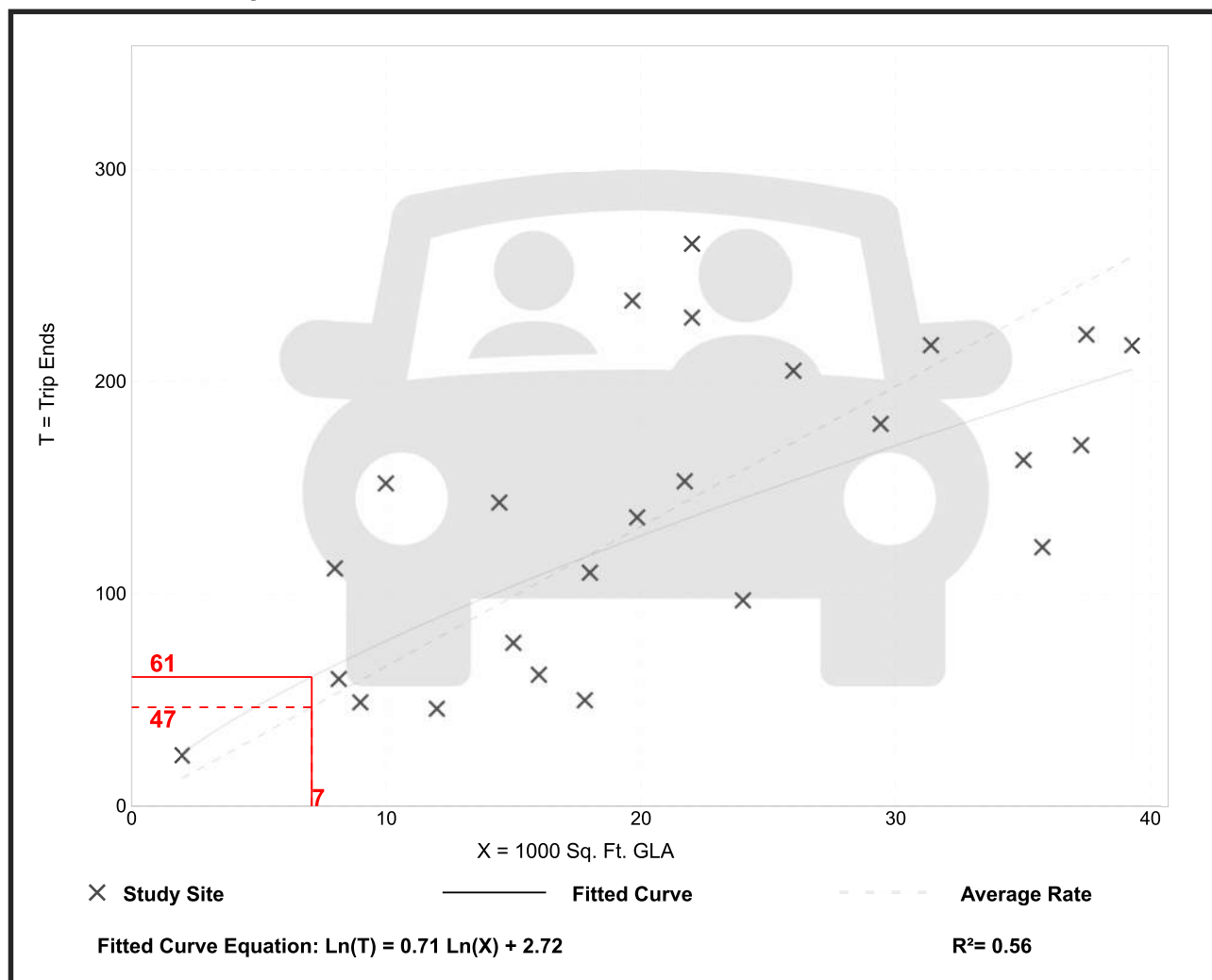
Strip Retail Plaza (<40k) (822)

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)

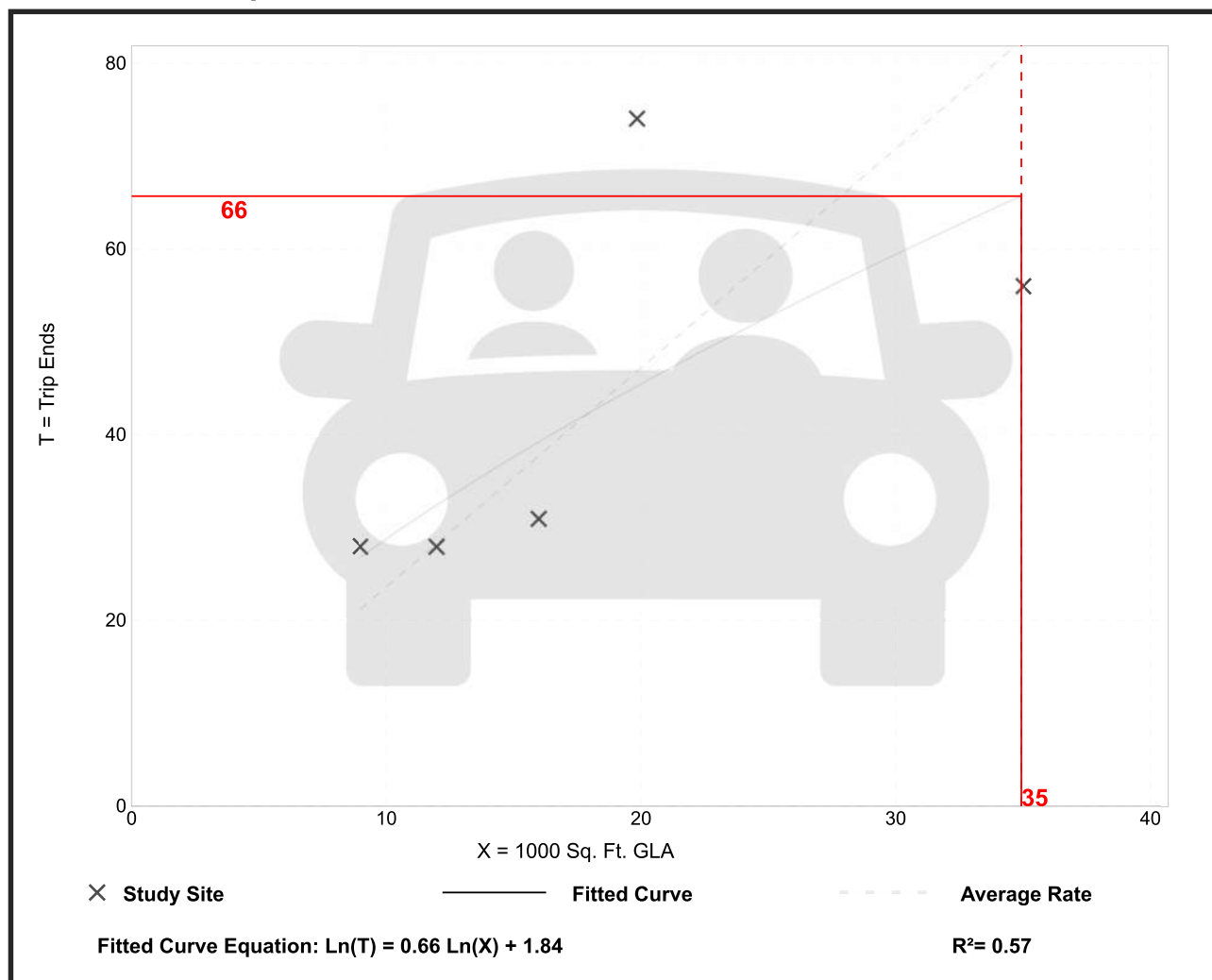
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 5
 Avg. 1000 Sq. Ft. GLA: 18
 Directional Distribution: 60% entering, 40% exiting

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



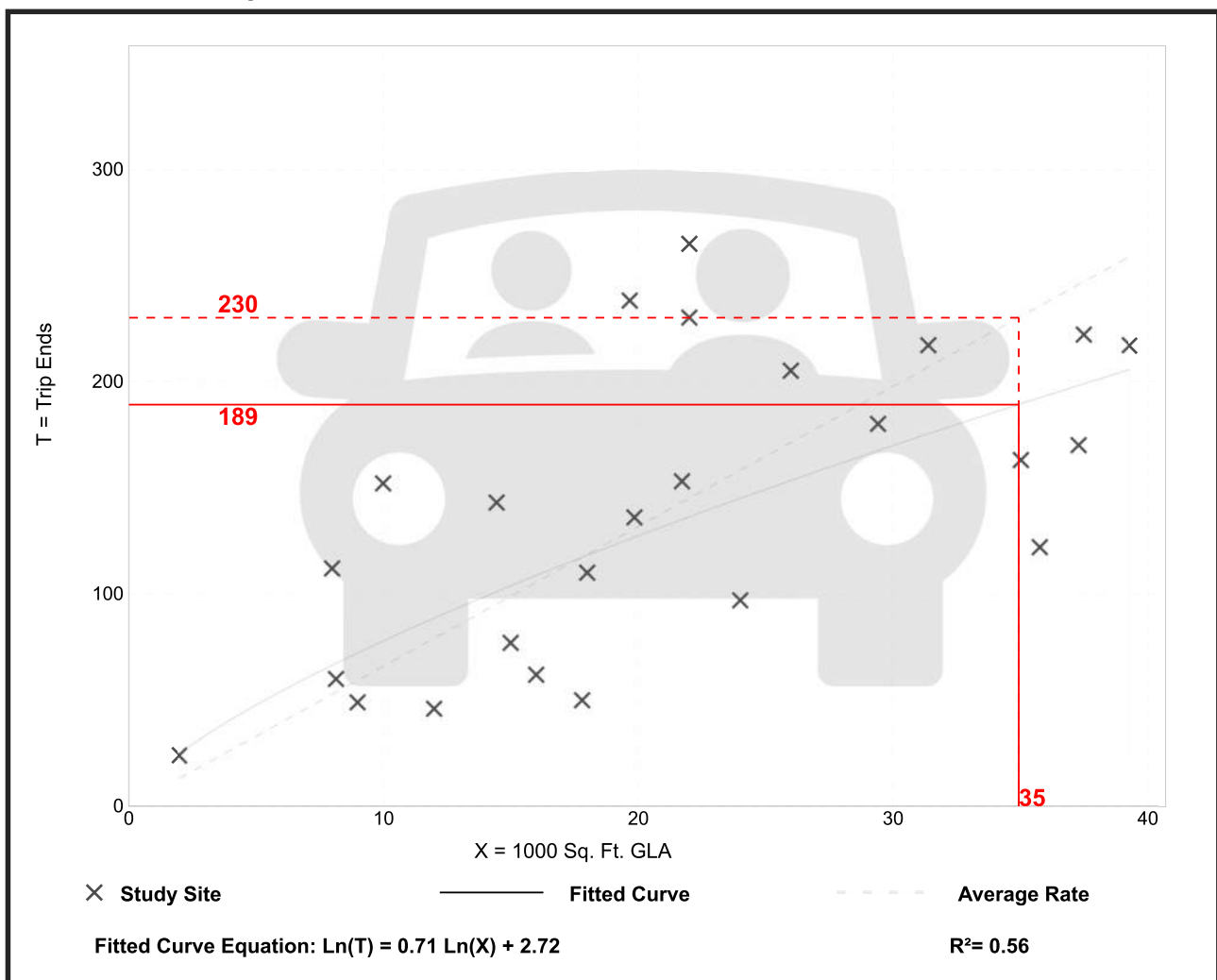
Strip Retail Plaza (<40k) (822)

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



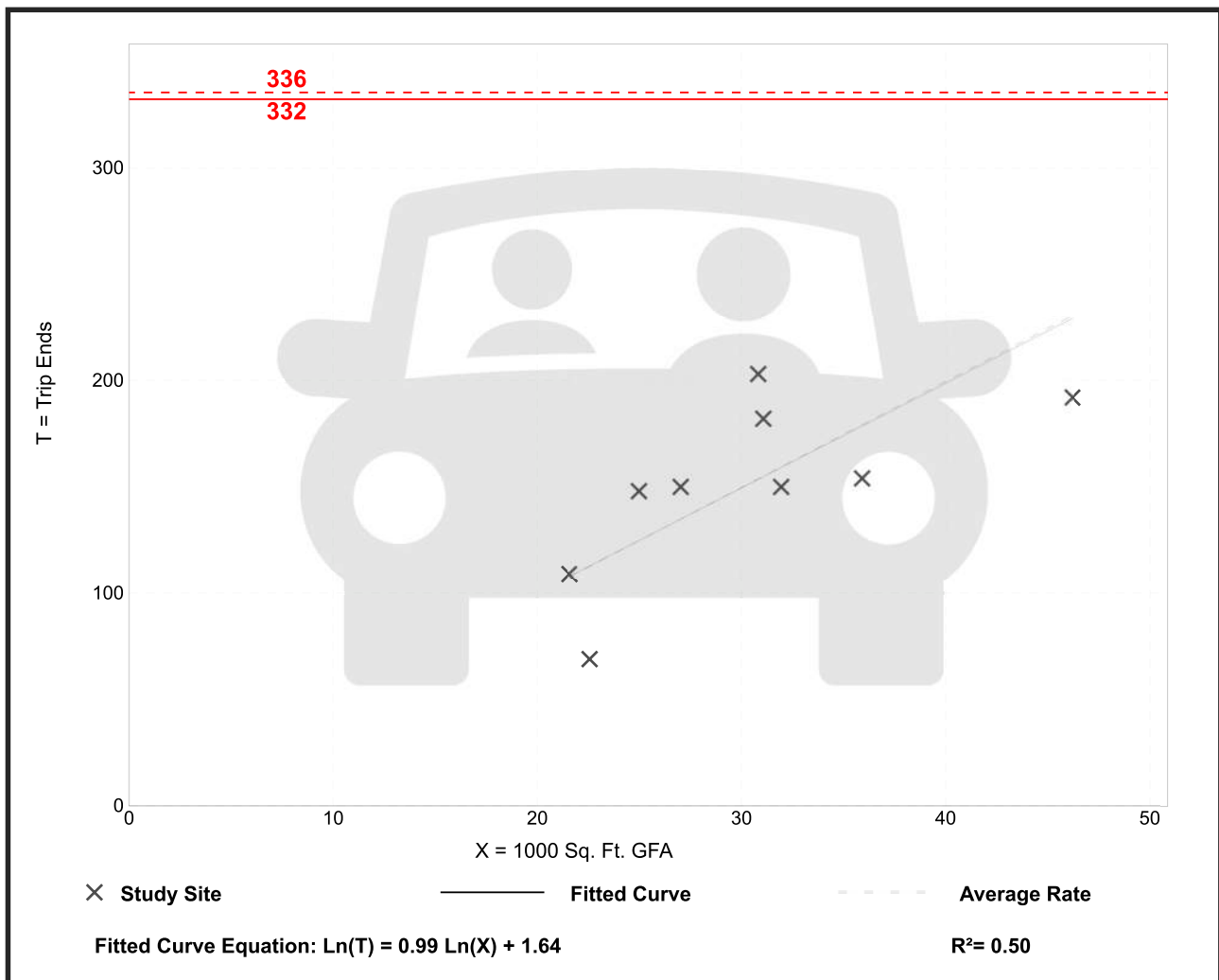
Supermarket (850)

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



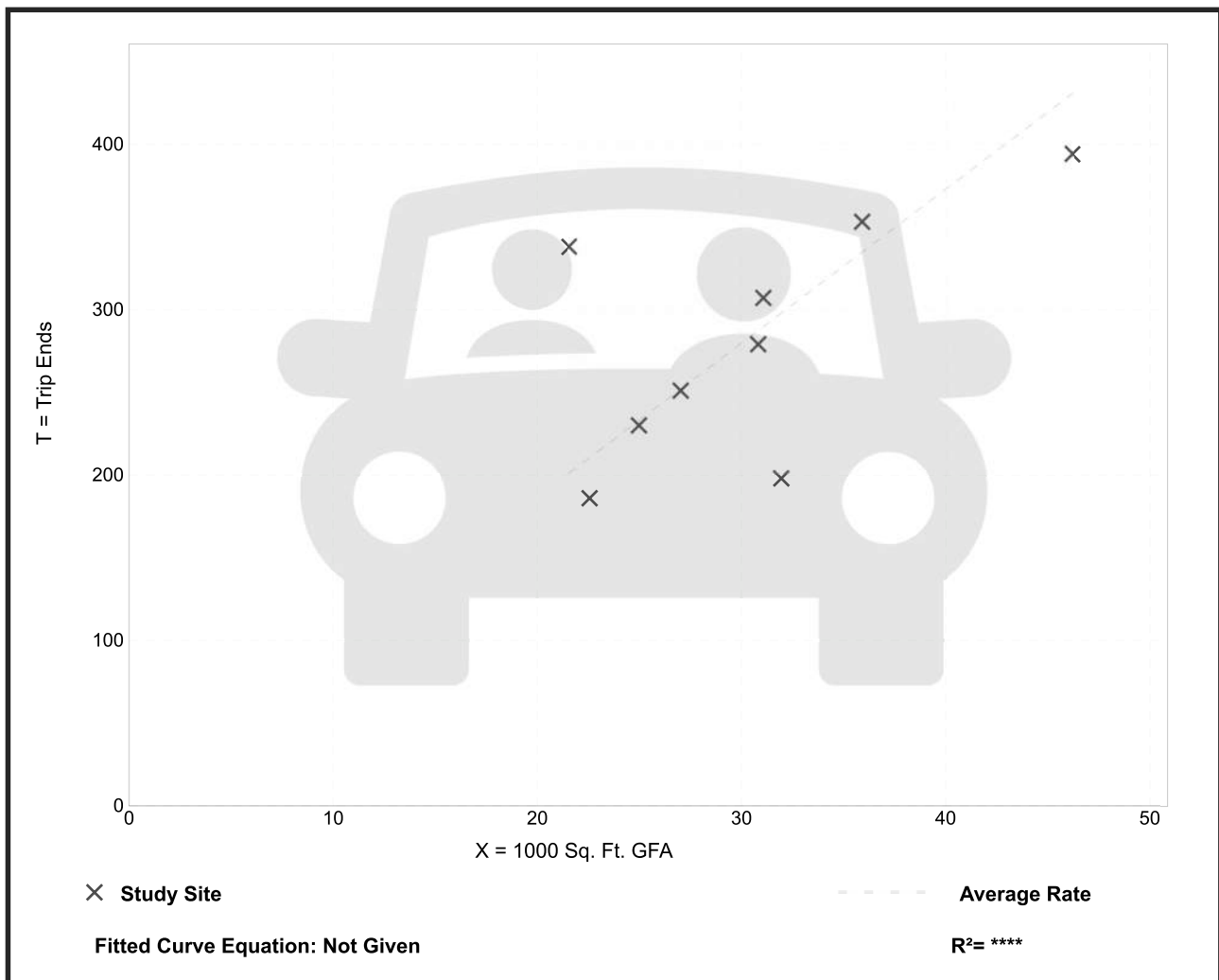
Supermarket (850)

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)

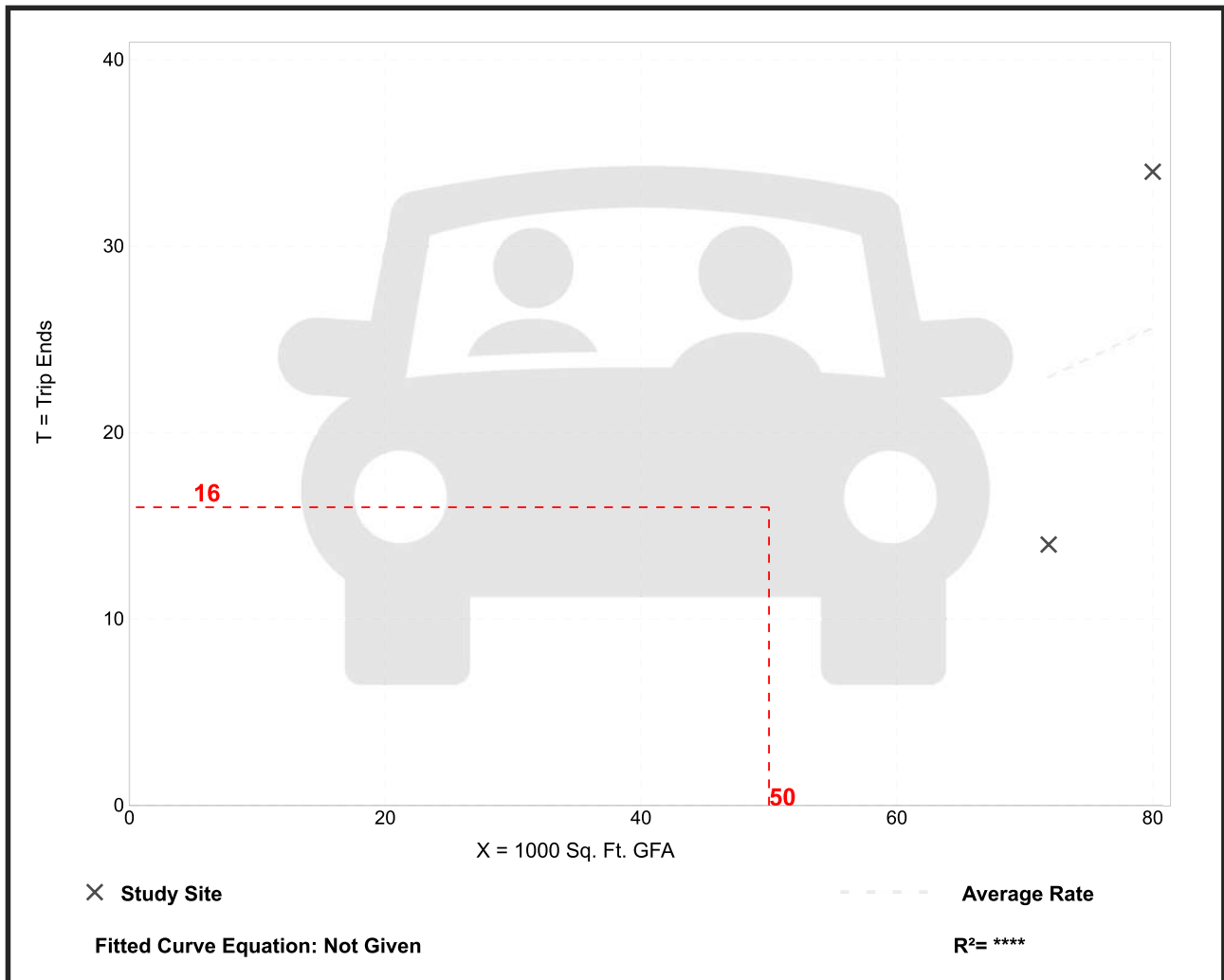
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 76
 Directional Distribution: 90% entering, 10% exiting

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)

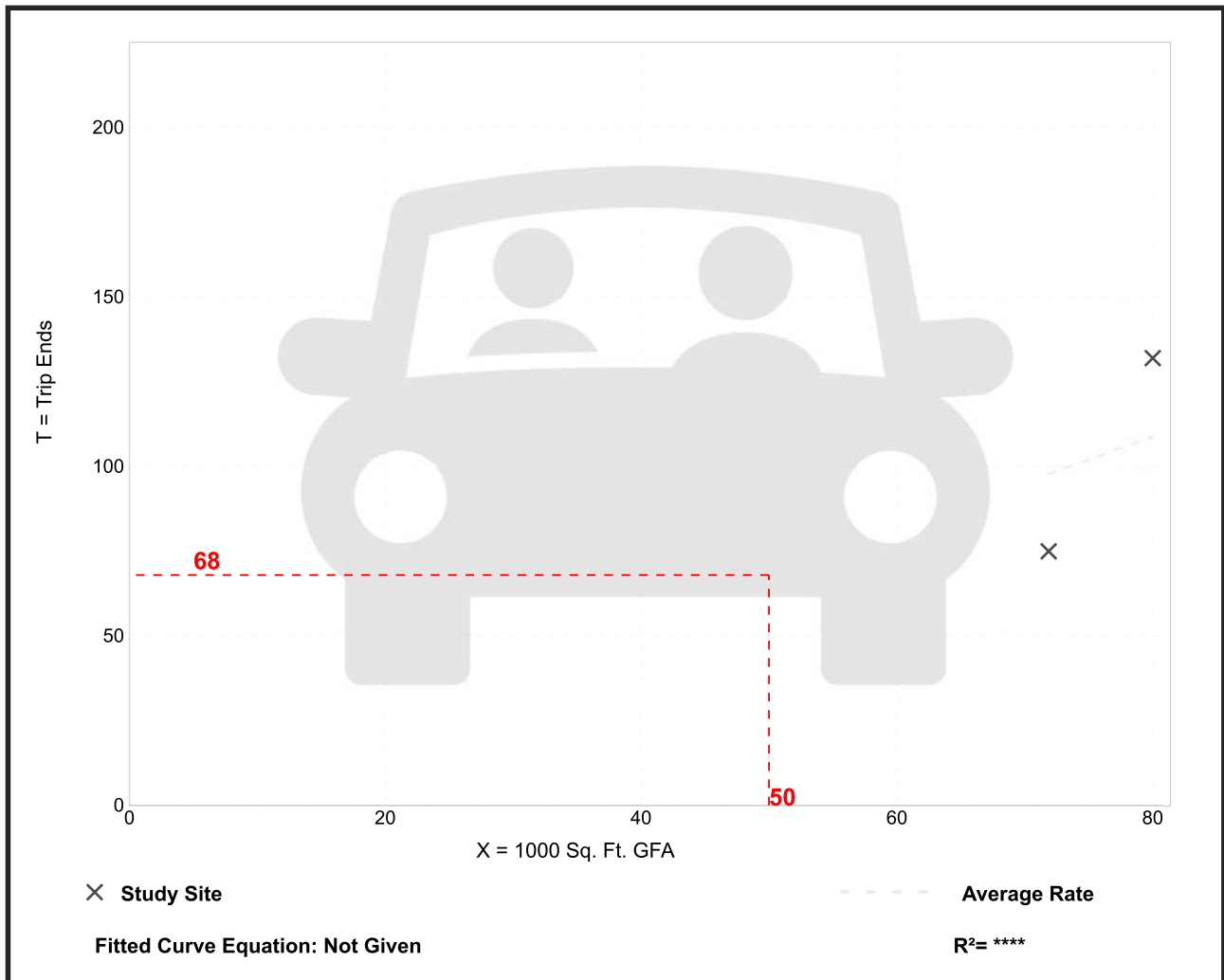
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 76
 Directional Distribution: 49% entering, 51% exiting

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)

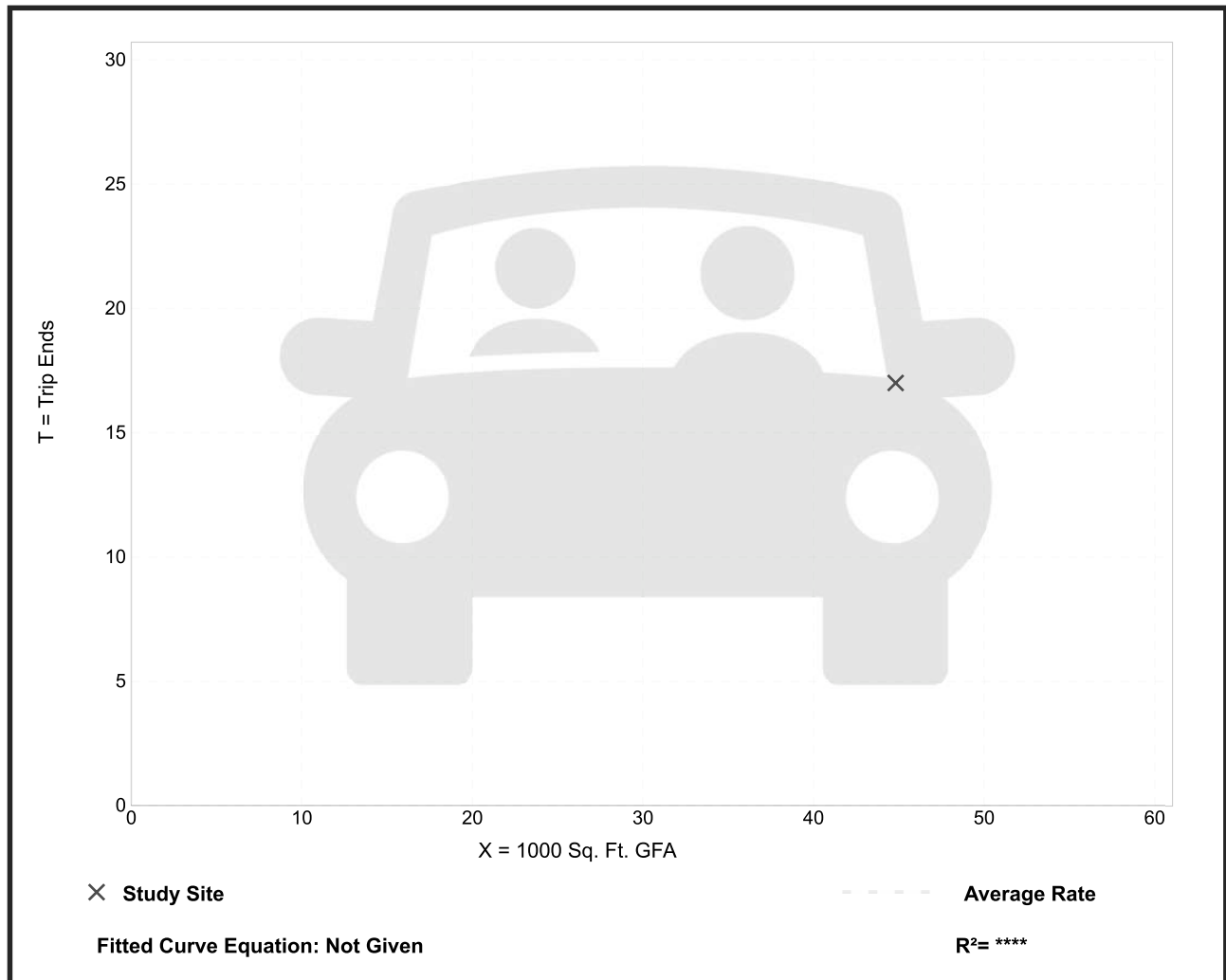
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 45
 Directional Distribution: 59% entering, 41% exiting

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)

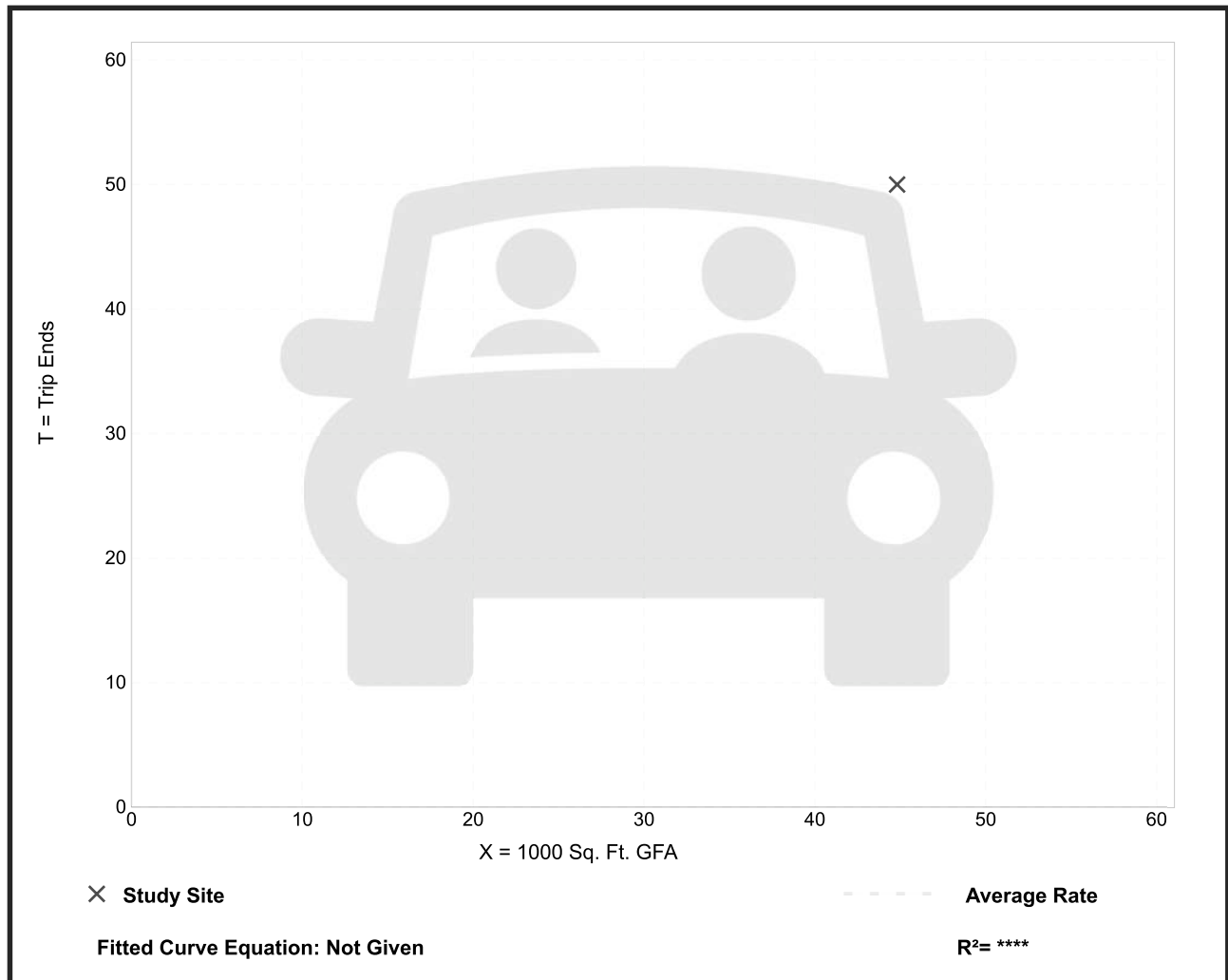
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 45
 Directional Distribution: 42% entering, 58% exiting

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)

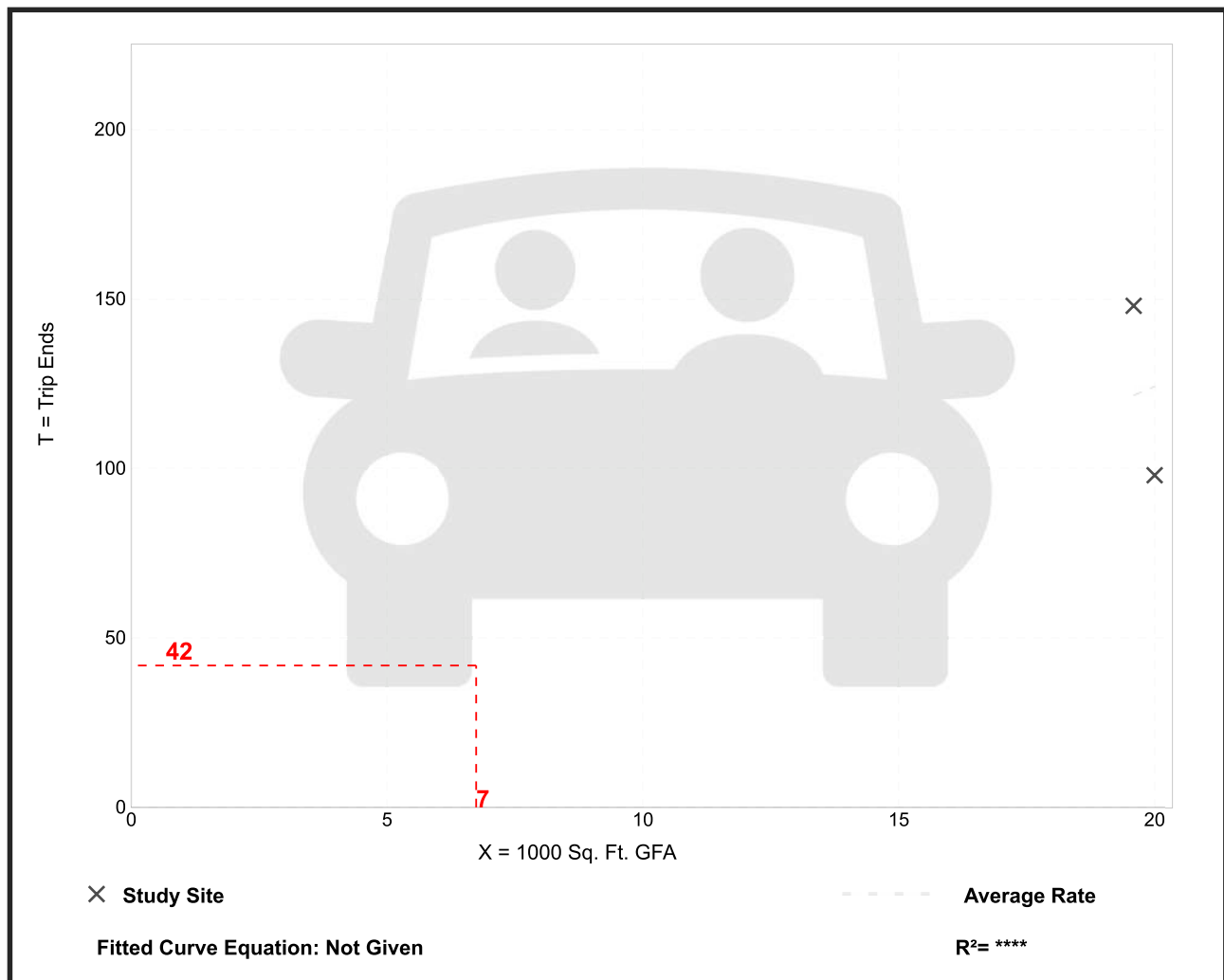
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 2
 Avg. 1000 Sq. Ft. GFA: 20
 Directional Distribution: 46% entering, 54% exiting

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)

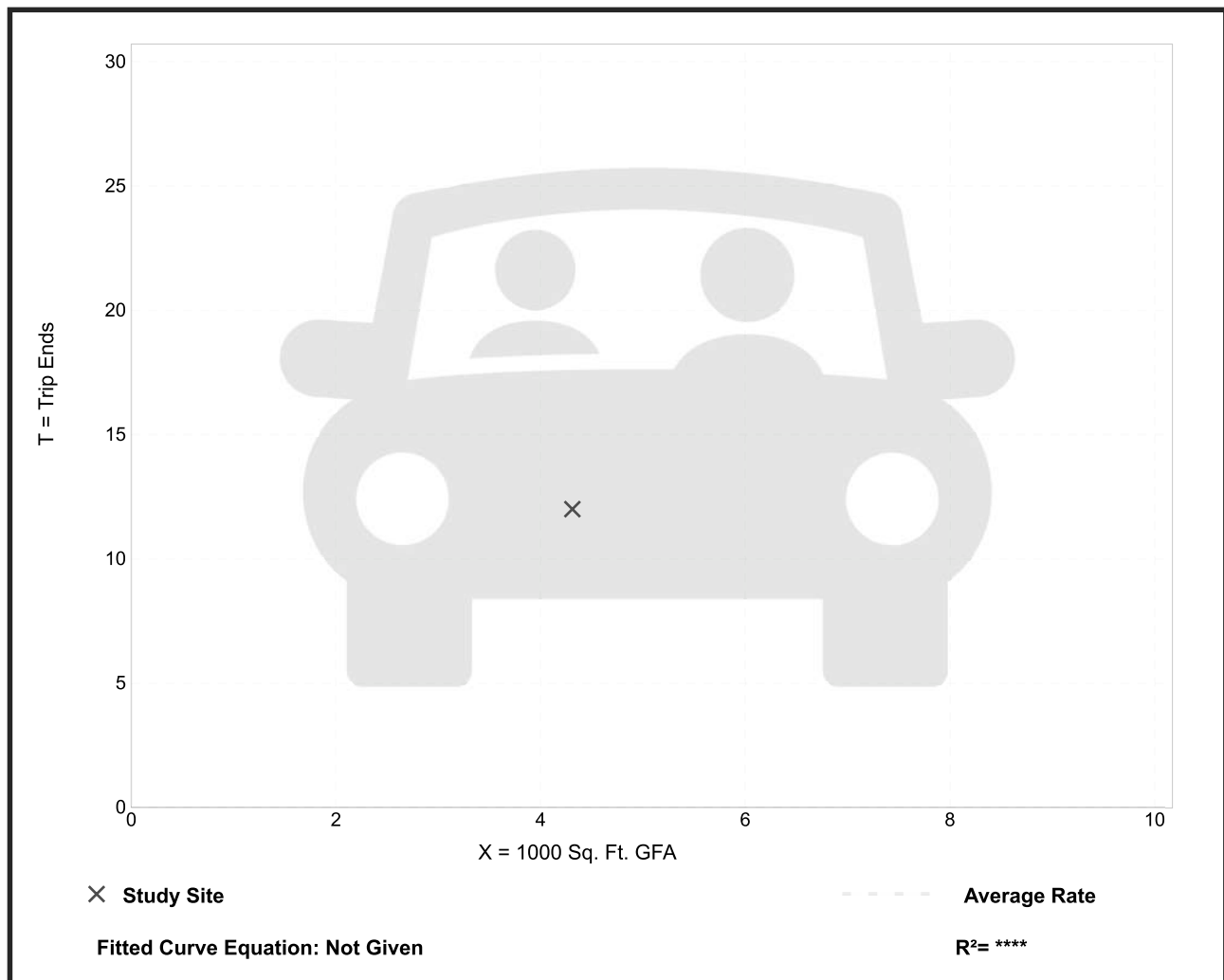
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 4
 Directional Distribution: 75% entering, 25% exiting

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)

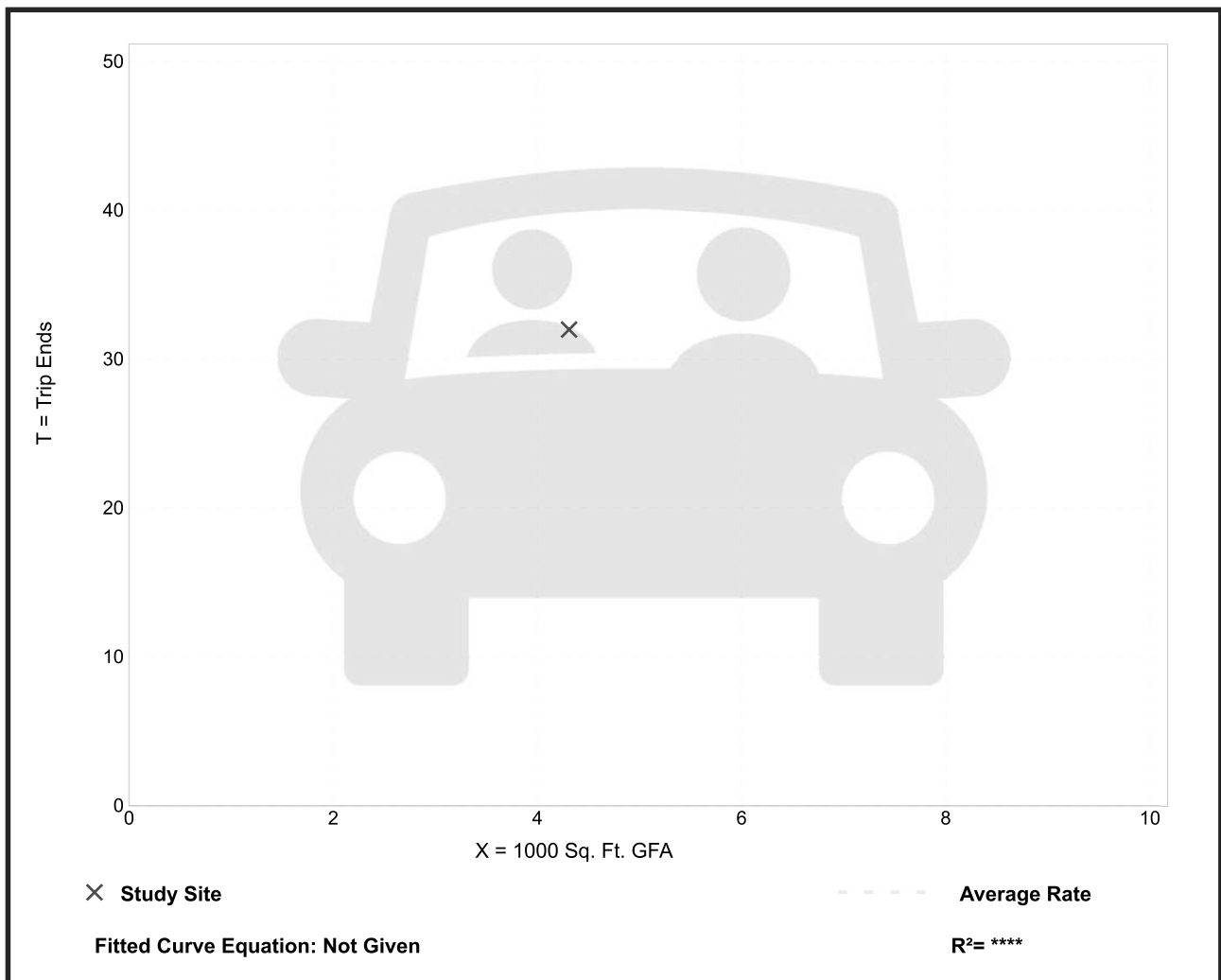
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 4
 Directional Distribution: 44% entering, 56% exiting

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)

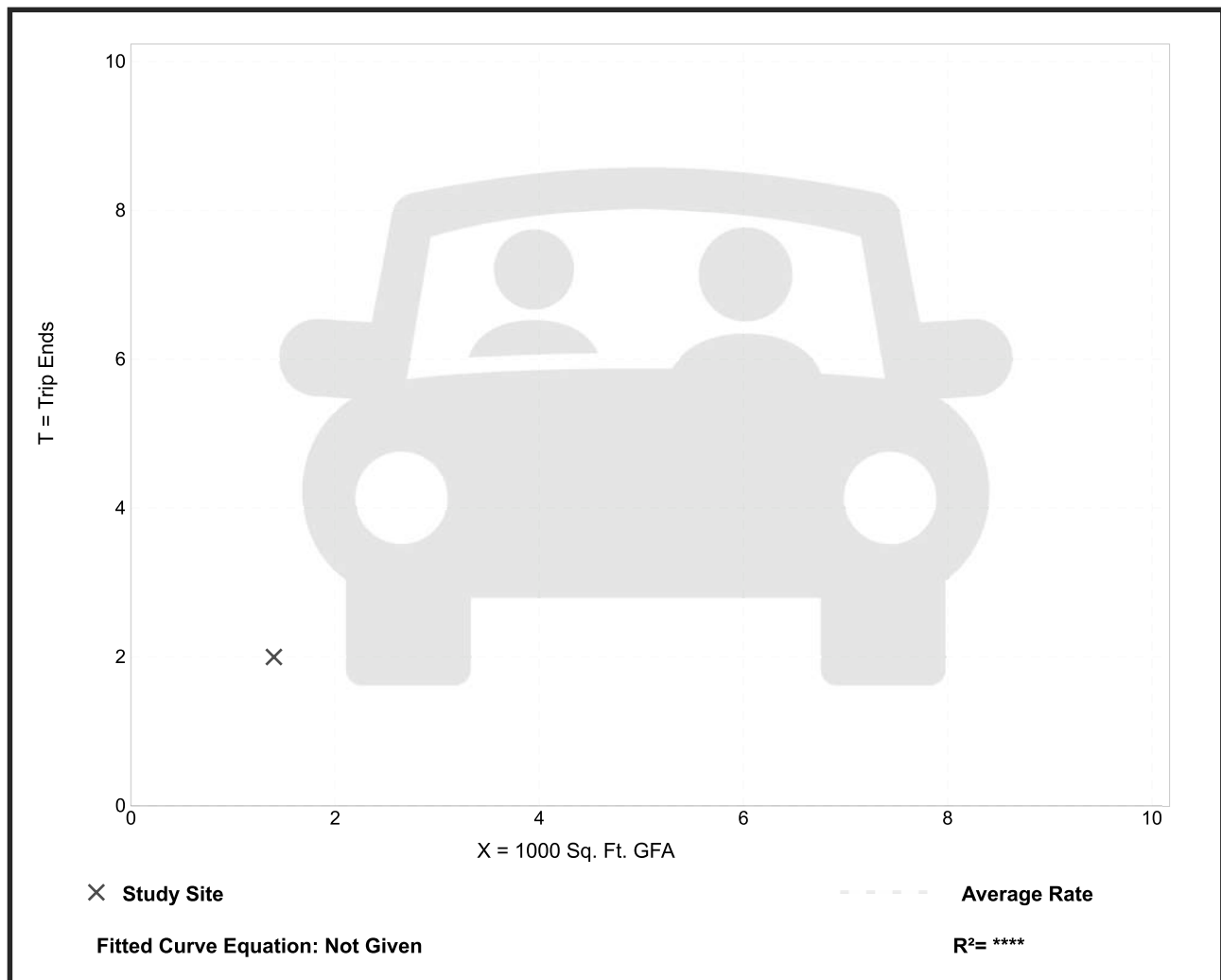
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 1
 Directional Distribution: 50% entering, 50% exiting

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



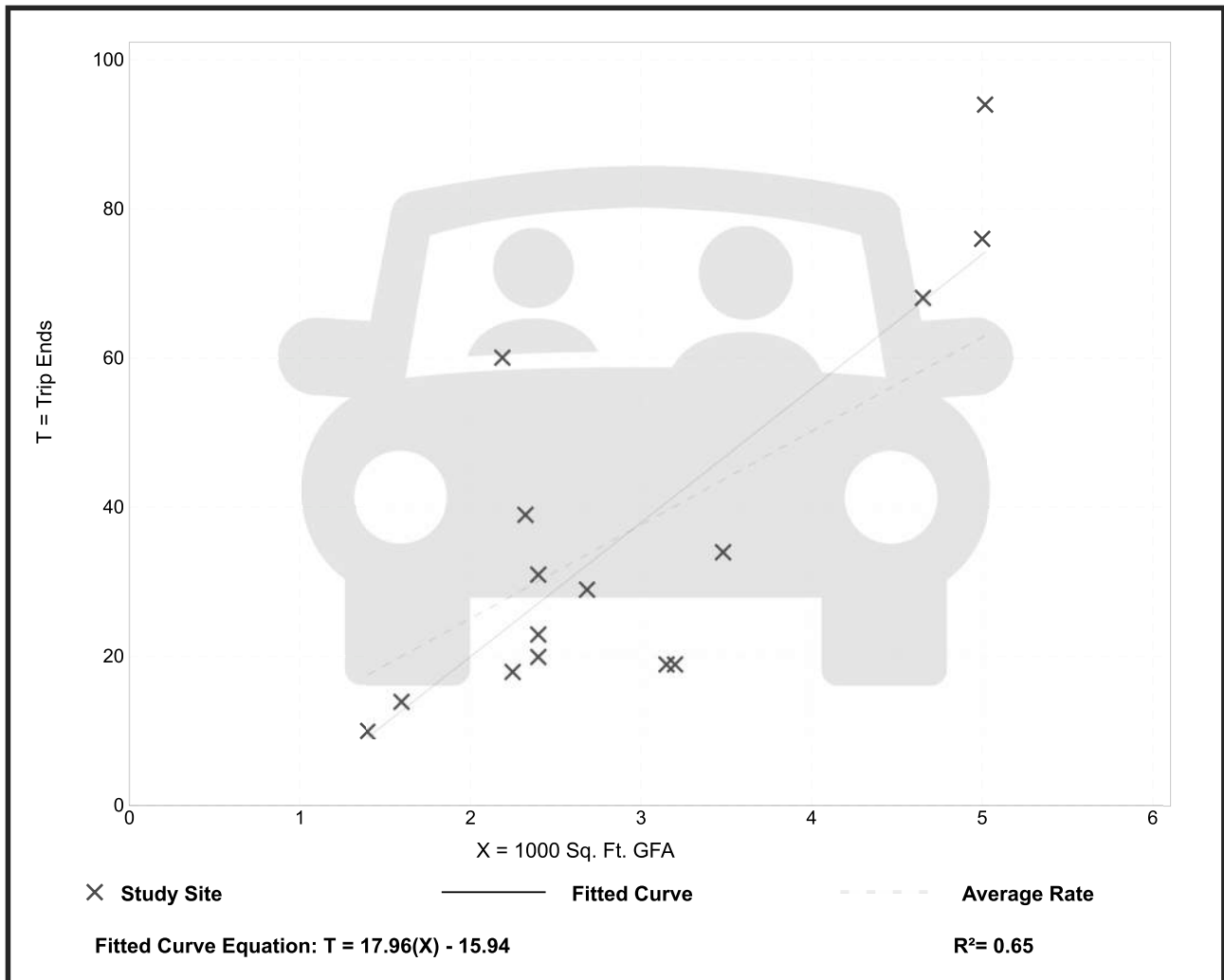
Fast Casual Restaurant (930)

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



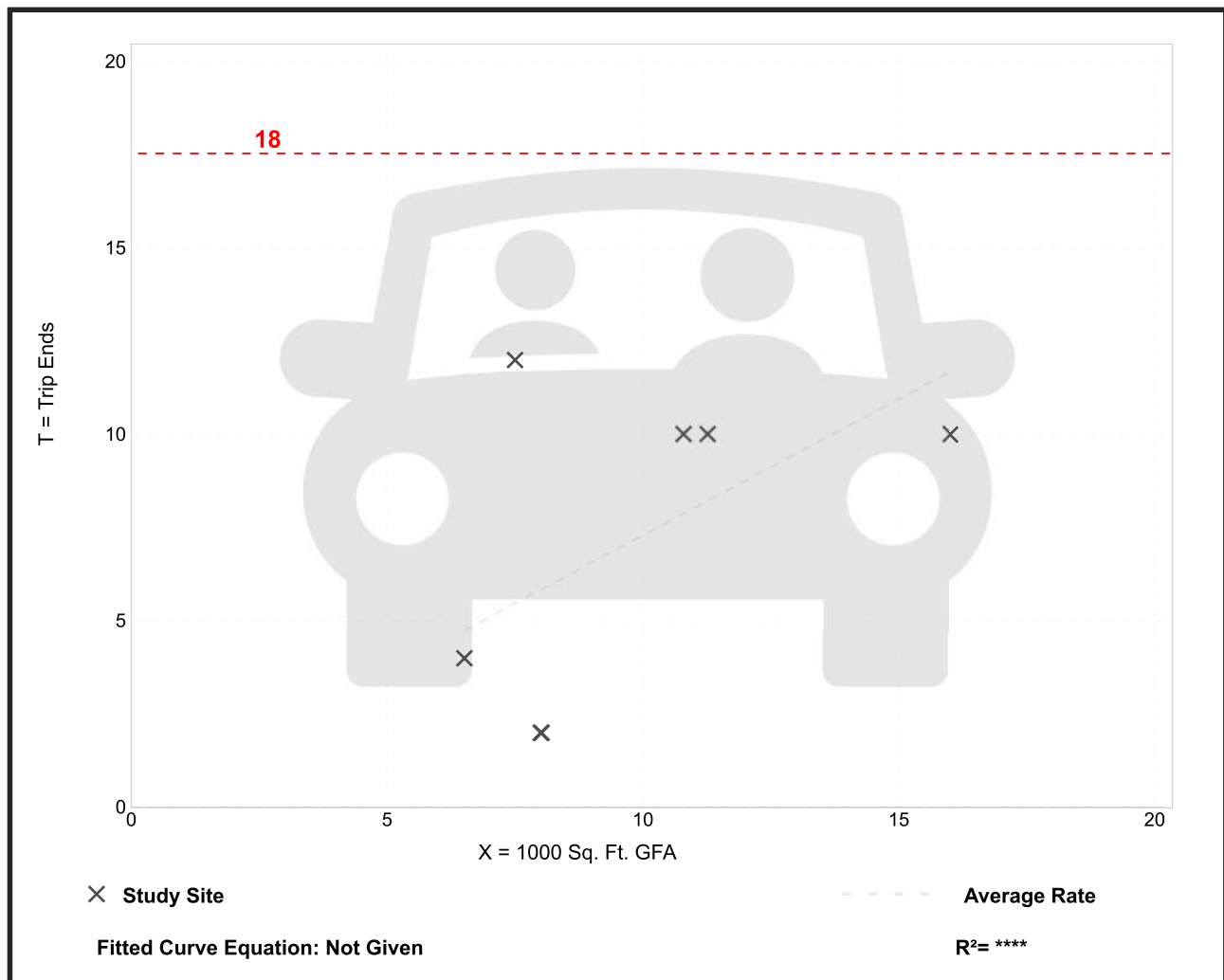
Fine Dining Restaurant (931)

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



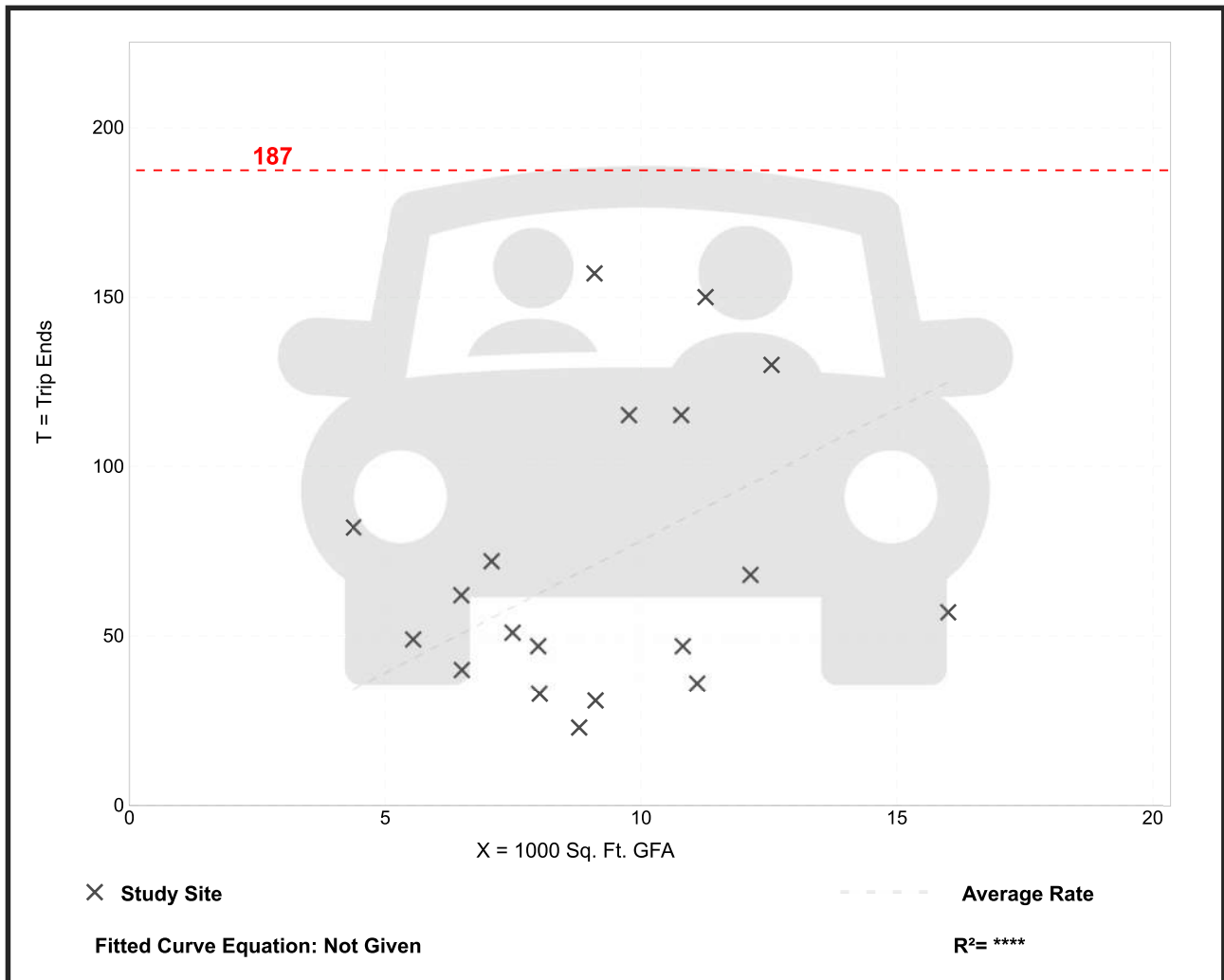
Fine Dining Restaurant (931)

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



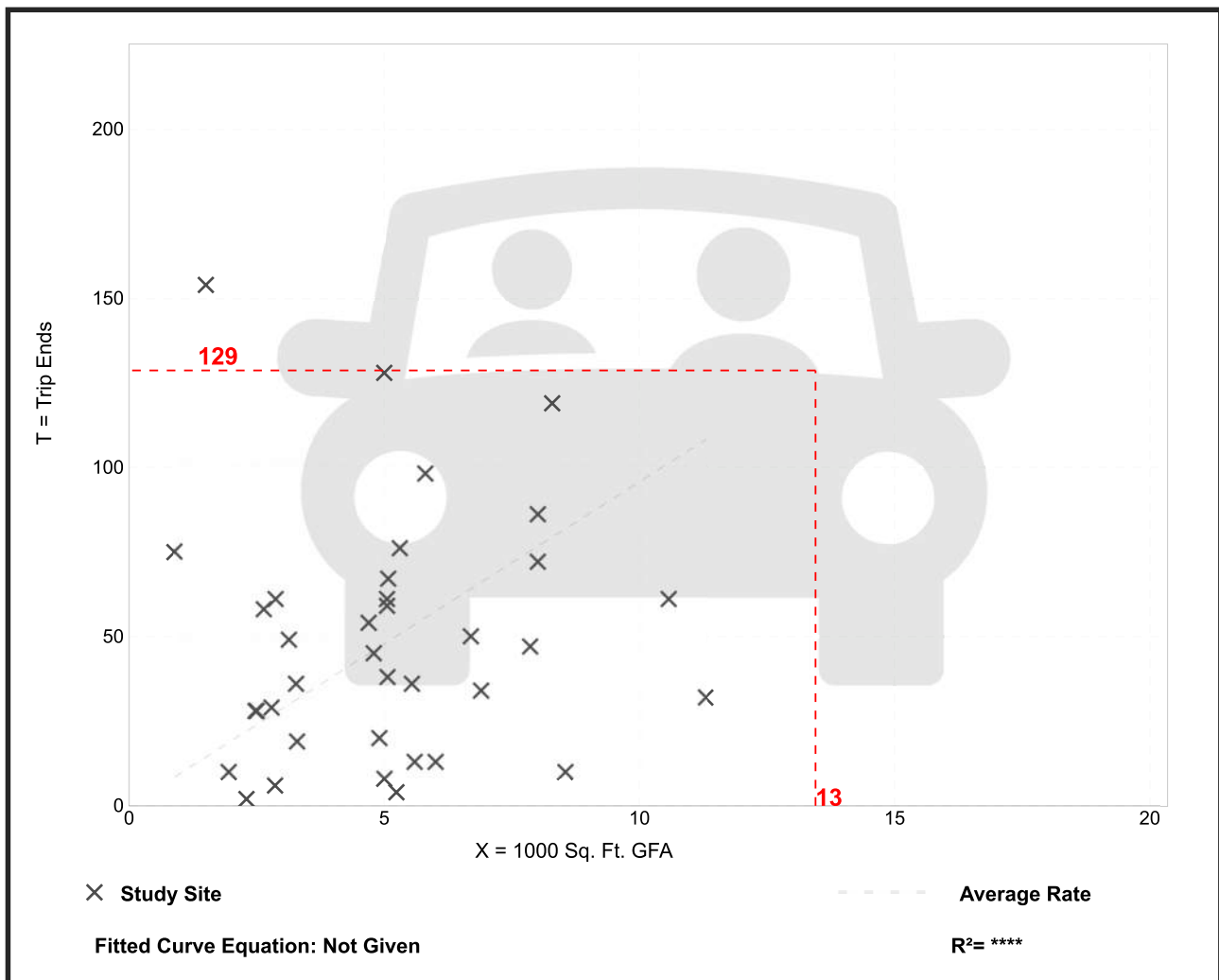
High-Turnover (Sit-Down) Restaurant (932)

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)

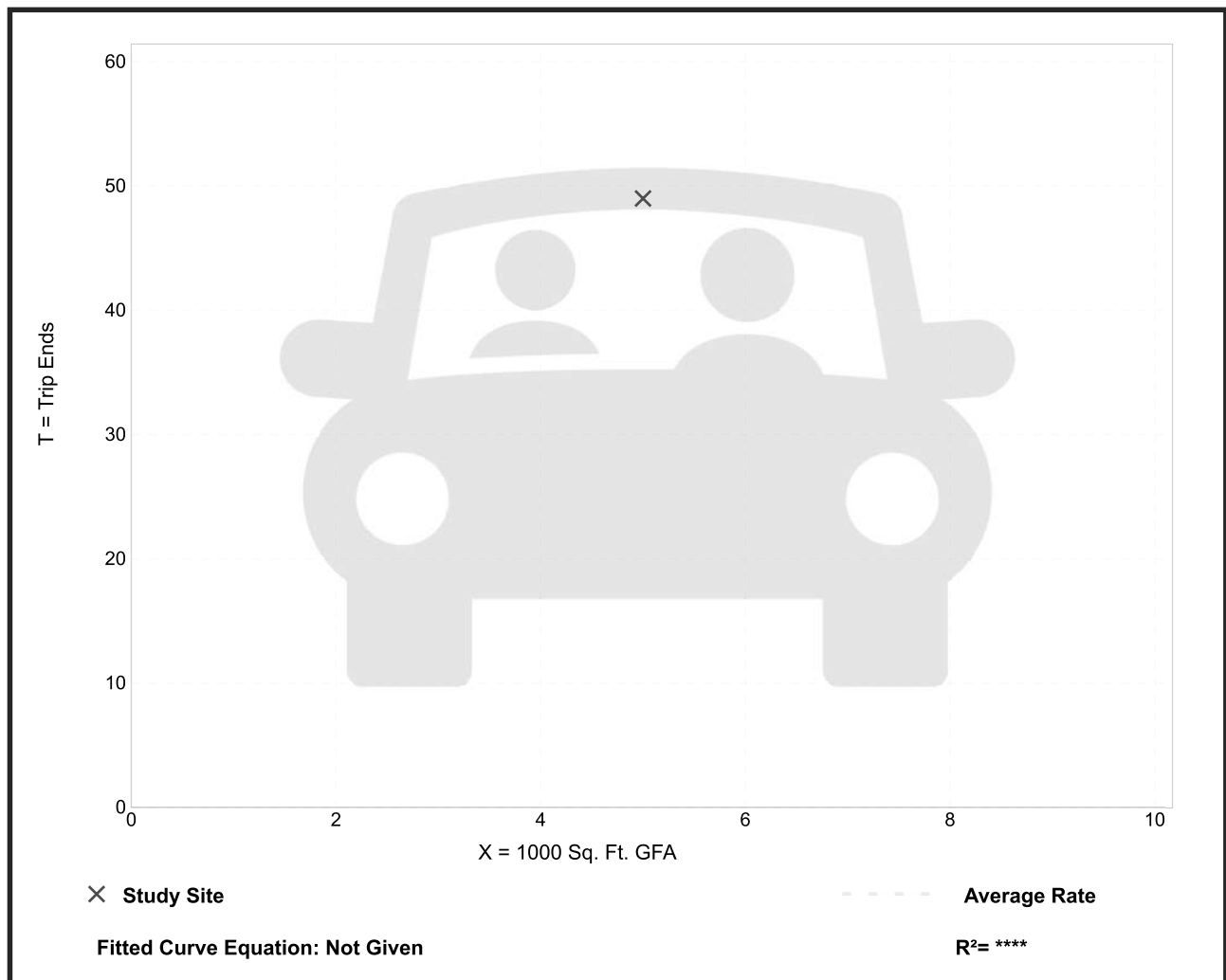
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 5
 Directional Distribution: 63% entering, 37% exiting

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)

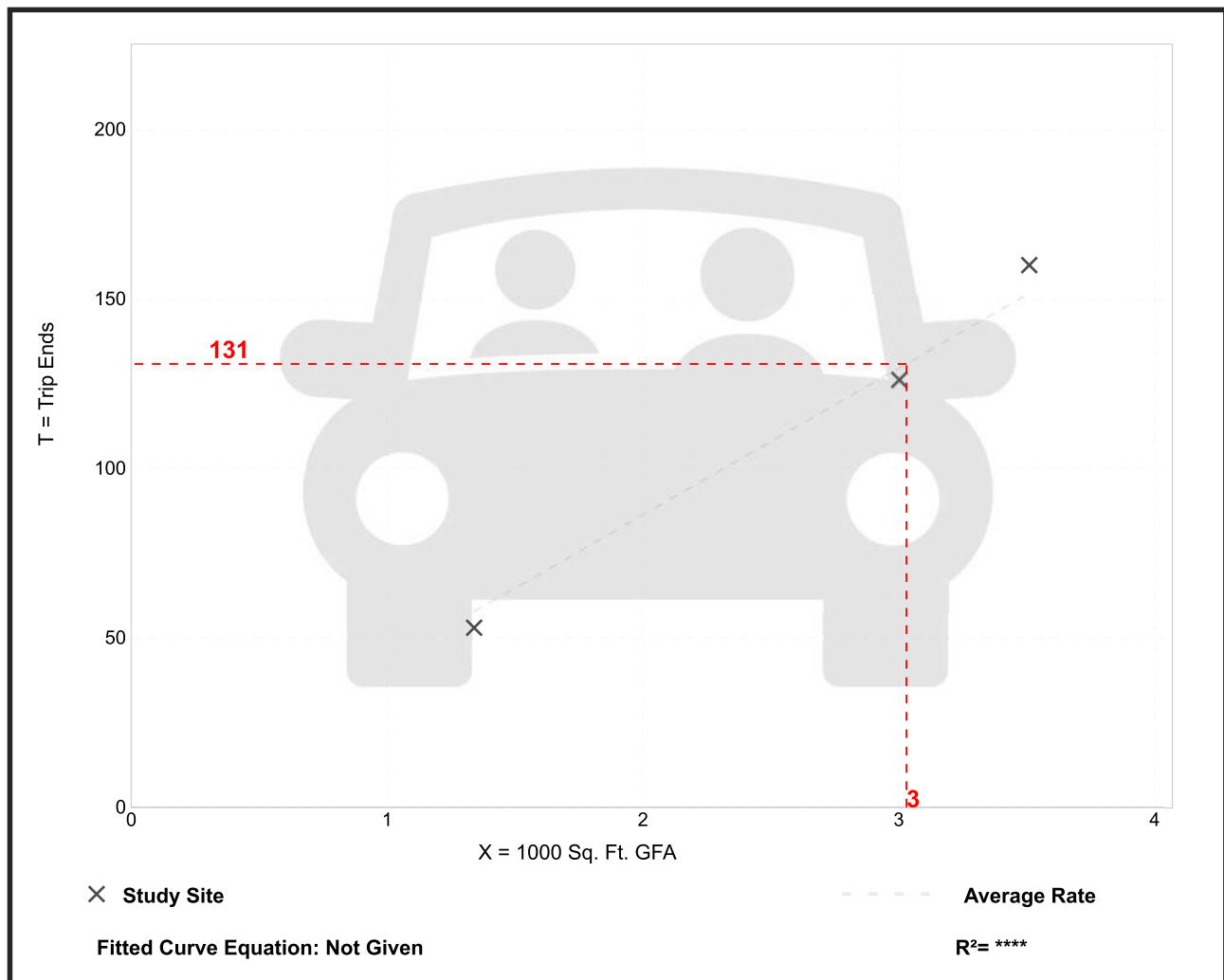
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: General Urban/Suburban
 Number of Studies: 3
 Avg. 1000 Sq. Ft. GFA: 3
 Directional Distribution: 58% entering, 42% exiting

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)

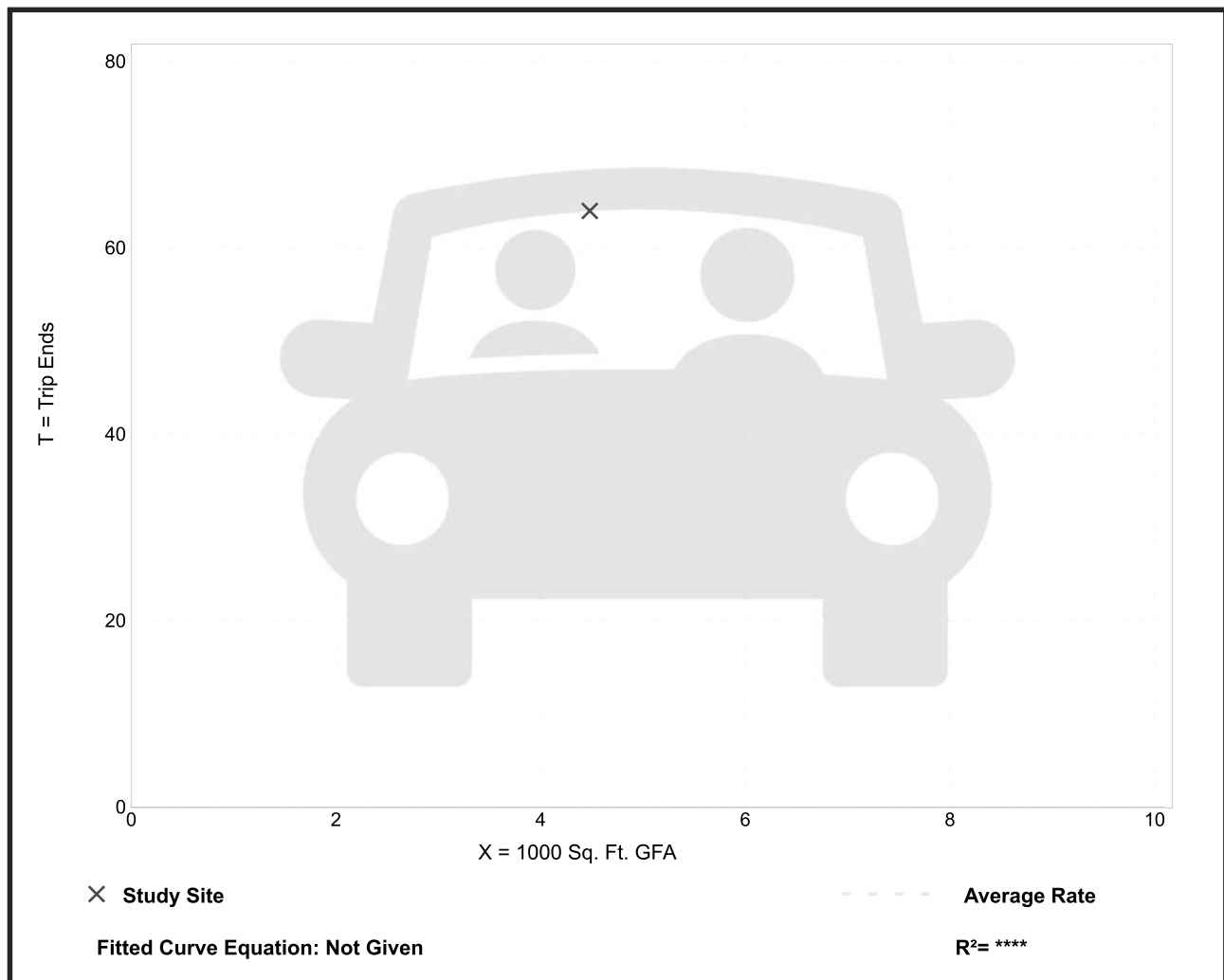
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 1
 Avg. 1000 Sq. Ft. GFA: 4
 Directional Distribution: 51% entering, 49% exiting

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



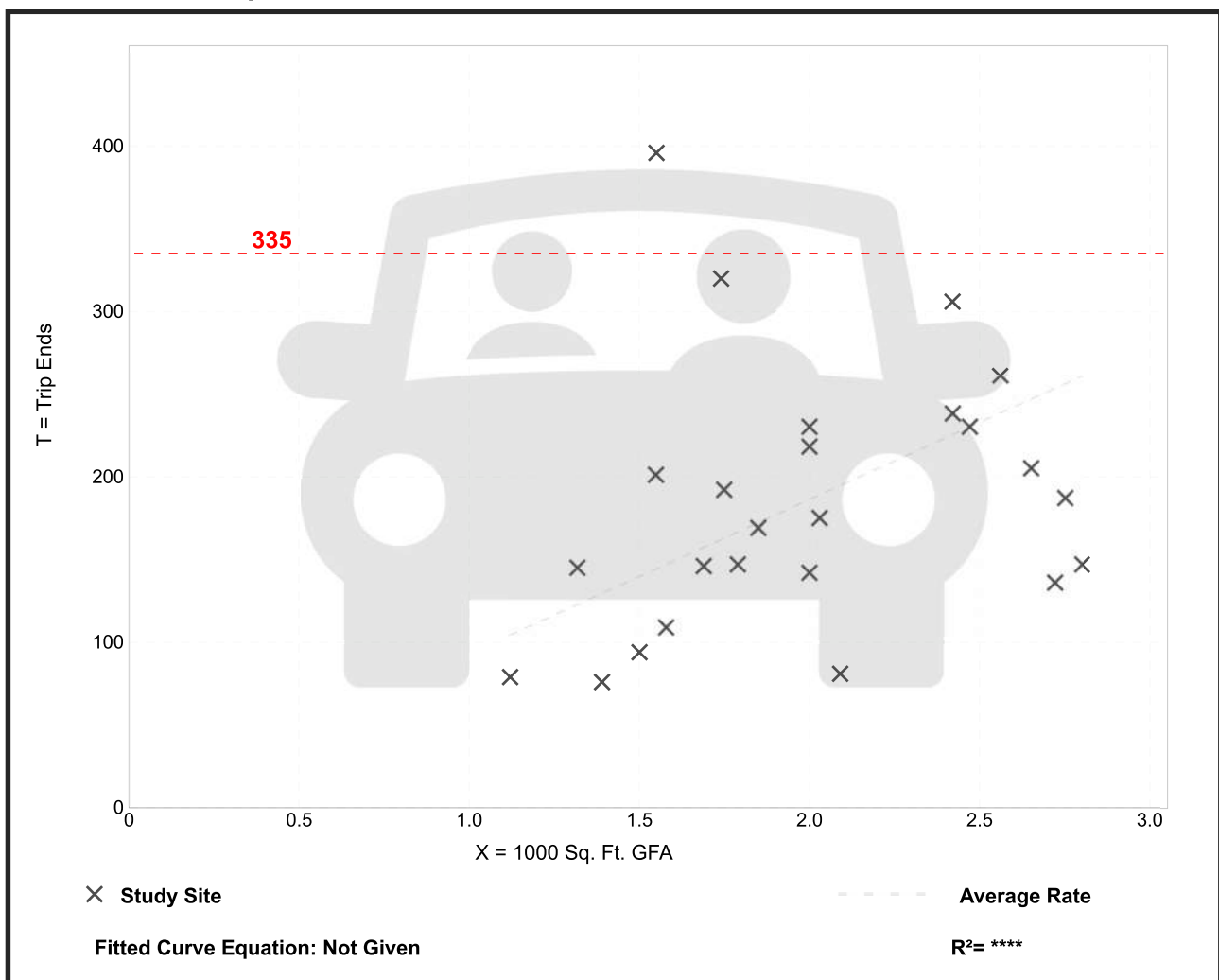
Coffee/Donut Shop without Drive-Through Window (936)

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



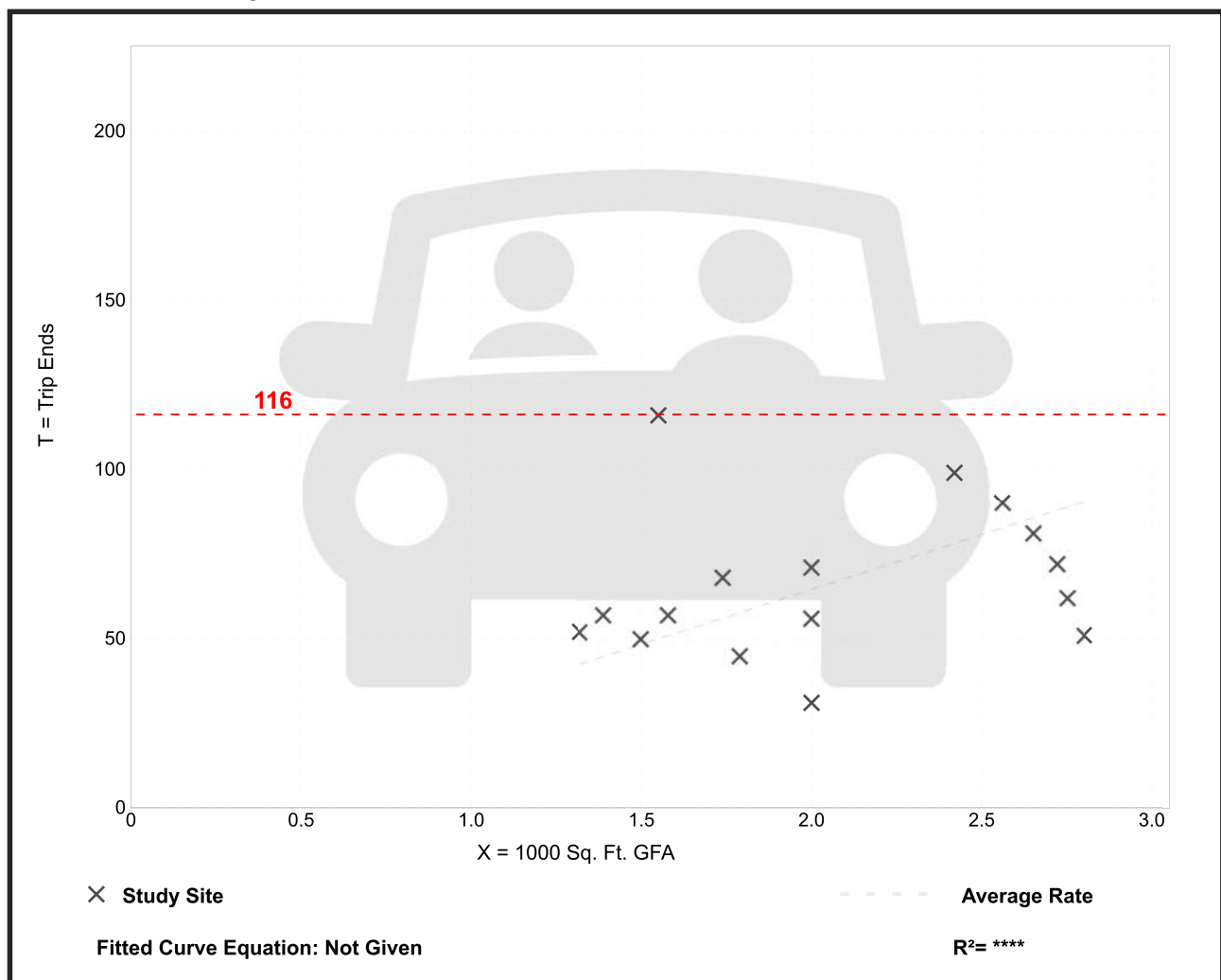
Coffee/Donut Shop without Drive-Through Window (936)

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)

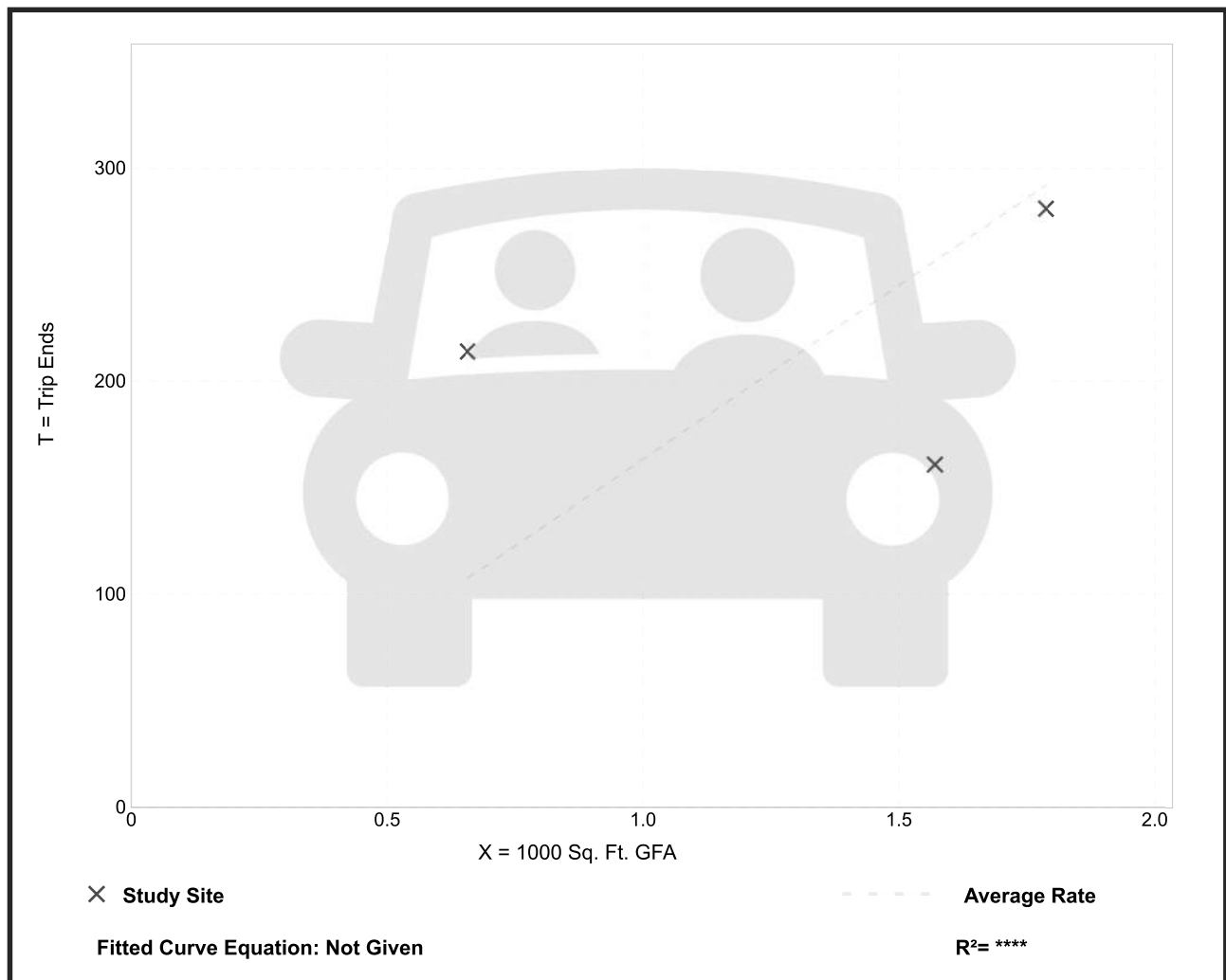
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 7 and 9 a.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 3
 Avg. 1000 Sq. Ft. GFA: 1
 Directional Distribution: 55% entering, 45% exiting

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)

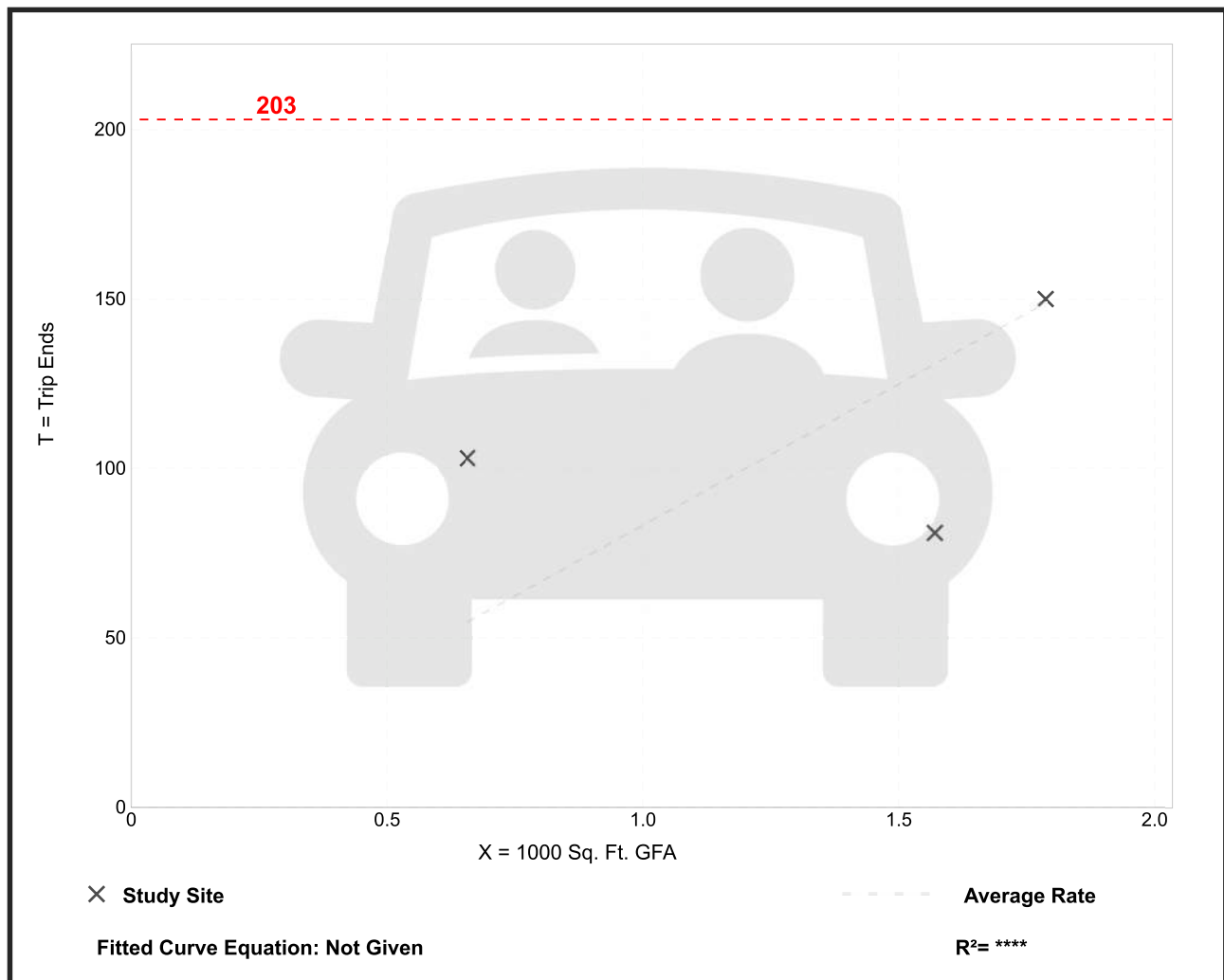
Vehicle Trip Ends vs: 1000 Sq. Ft. GFA
 On a: Weekday,
 Peak Hour of Adjacent Street Traffic,
 One Hour Between 4 and 6 p.m.
 Setting/Location: Dense Multi-Use Urban
 Number of Studies: 3
 Avg. 1000 Sq. Ft. GFA: 1
 Directional Distribution: 53% entering, 47% exiting

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
Additional Considerations	C-246

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				

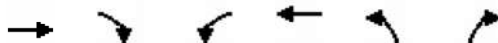
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Lanes, Volumes, Timings

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	

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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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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
 Ø5 (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

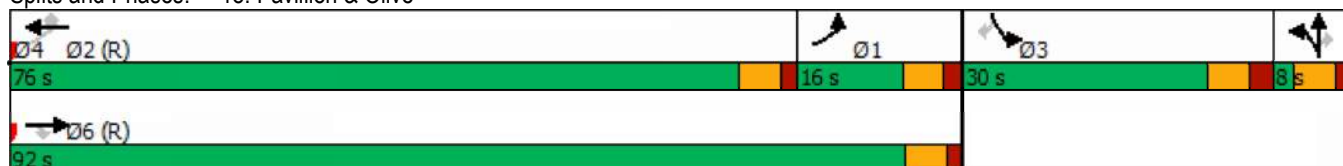
Intersection Capacity Utilization 47.1%

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		

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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			
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	0.66		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



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	EBLn1WBLn1	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	0	-	-	-
HCM Lane LOS	-	A	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				

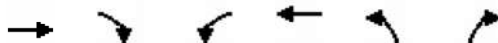
PM 2022 Creve Coeur Existing PM 2022 10:51 am 02/15/2023

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)	87.9	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

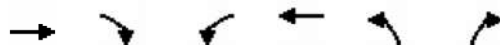
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Synchro 11 Report
Page 4

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

05/18/2023

Splits and Phases: 5: NB Lindbergh & Olive



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

PM 2022 Creve Coeur Existing PM 2022 10:51 am 02/15/2023

Synchro 11 Report
Page 11

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

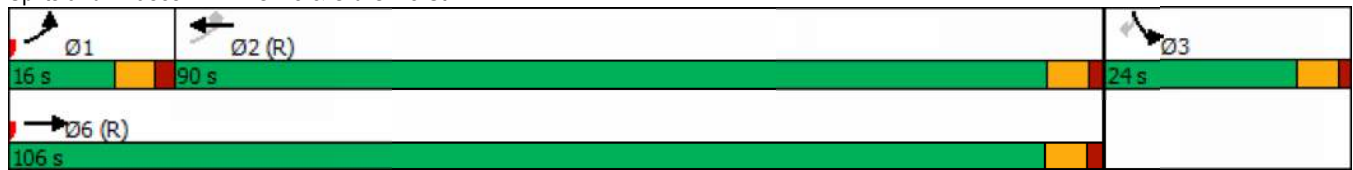
Analysis Period (min) 15

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



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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Synchro 11 Report
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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

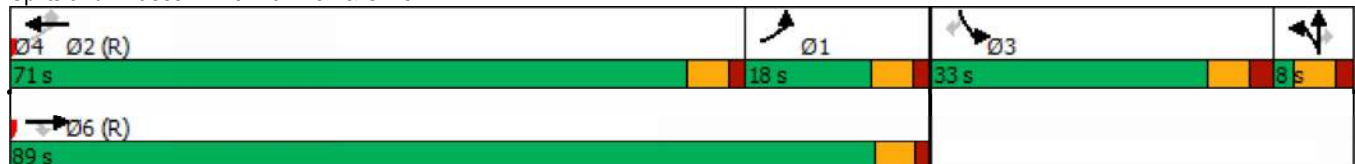
Intersection LOS: A

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

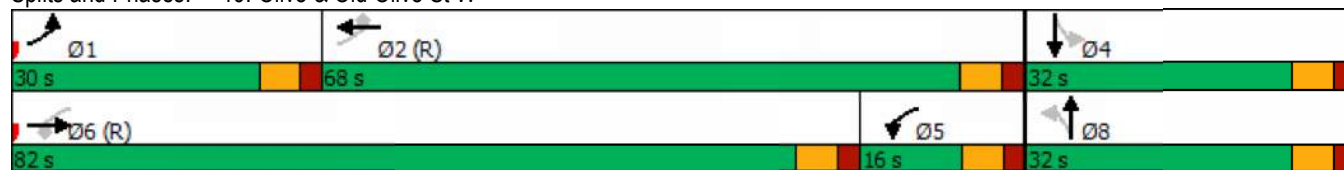
05/18/2023

												
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
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
Stage 1	0	0	-	0	0	-	0	0
Stage 2	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	EBLn1	WBLn1	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]				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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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				

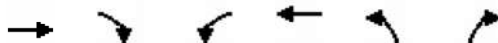
AM 2028 Creve Coeur Existing AM 2028 3:07 pm 02/15/2023

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	

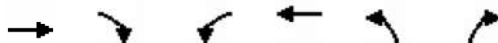
AM 2028 Creve Coeur Existing AM 2028 3:07 pm 02/15/2023

Synchro 11 Report
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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)	101.6	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 Capacity Utilization 61.7%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service B

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

AM 2028 Creve Coeur Existing AM 2028 3:07 pm 02/15/2023

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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

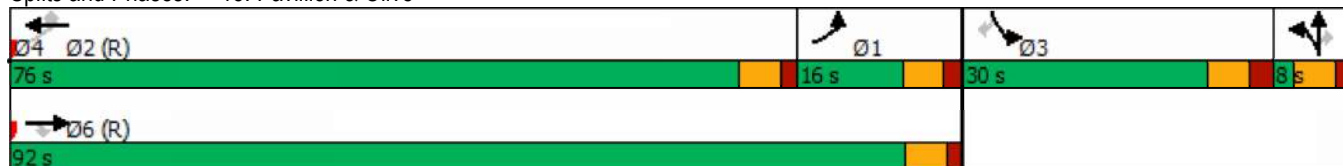
Intersection Capacity Utilization 48.2%

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



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: Spoeede & 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

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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	0.68		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



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	-	-	-	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	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	-	-	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	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 [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				

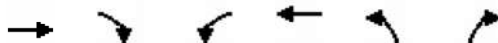
PM 2028 Creve Coeur Existing PM 2028 3:11 pm 02/15/2023

Synchro 11 Report
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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)	87.4	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

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)	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

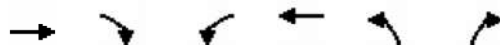
PM 2028 Creve Coeur Existing PM 2028 3:11 pm 02/15/2023

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
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

05/18/2023

Splits and Phases: 5: NB Lindbergh & Olive



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

PM 2028 Creve Coeur Existing PM 2028 3:11 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
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

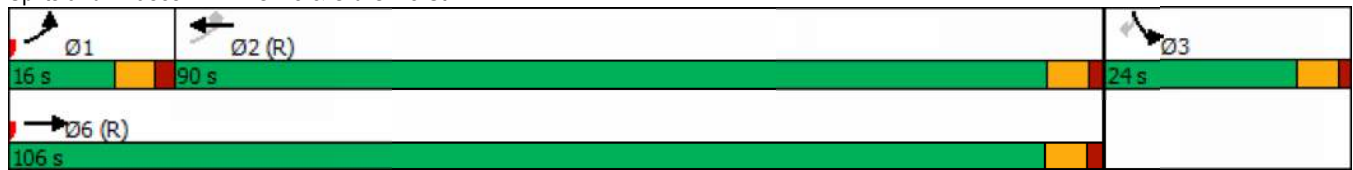
Analysis Period (min) 15

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



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

PM 2028 Creve Coeur Existing PM 2028 3:11 pm 02/15/2023

Synchro 11 Report
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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

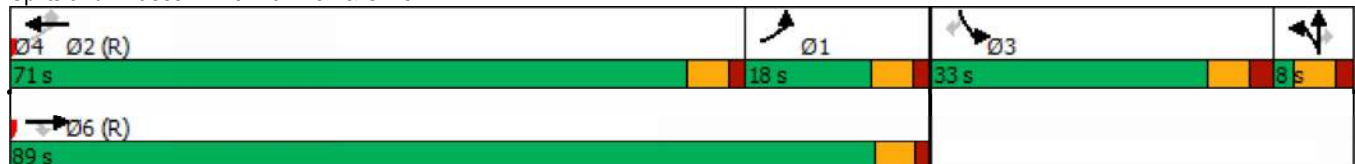
Intersection LOS: A

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		

PM 2028 Creve Coeur Existing PM 2028 3:11 pm 02/15/2023

Synchro 11 Report
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Lanes, Volumes, Timings
19: Olive & Old Olive St W

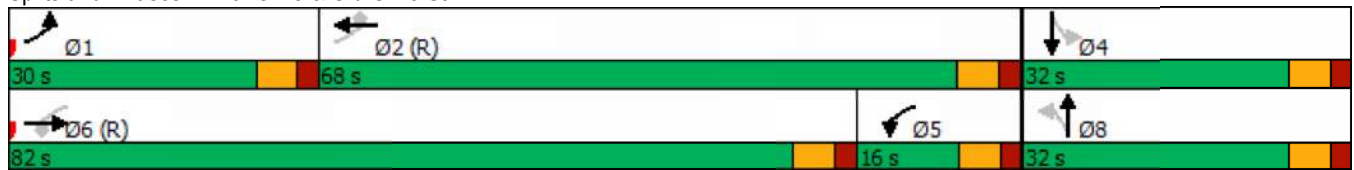
05/18/2023

												
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	

PM 2028 Creve Coeur Existing PM 2028 3:11 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
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]				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				

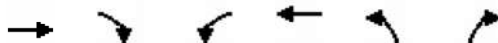
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Lanes, Volumes, Timings

2: SB Lindbergh & Olive

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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

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)	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	

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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	

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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 25 s	 Ø2 (R) 83 s	 Ø3 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

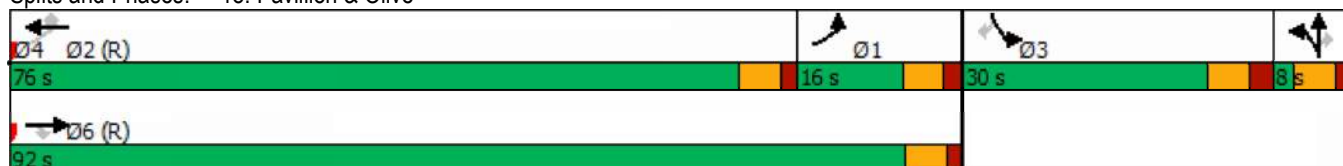
Intersection Capacity Utilization 52.1%

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	

AM 2048 Creve Coeur Existing AM 2048 3:08 pm 02/15/2023

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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												

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings

20: Spoeede & 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

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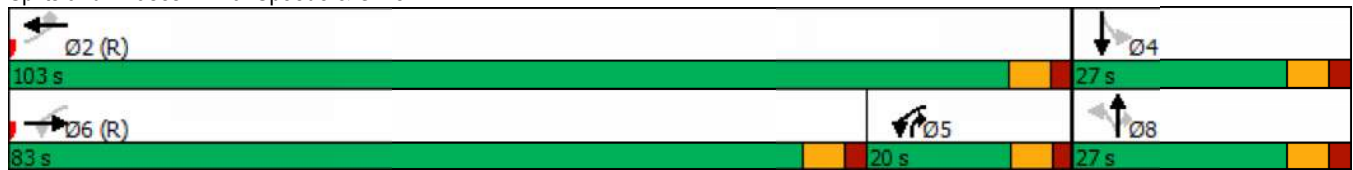
Lanes, Volumes, Timings

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			
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	0.01	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



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				

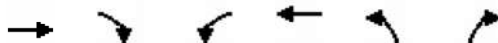
PM 2048 Creve Coeur Existing PM 2048 3:12 pm 02/15/2023

Synchro 11 Report
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)	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)		 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)	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

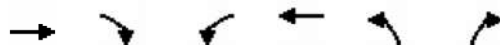
PM 2048 Creve Coeur Existing PM 2048 3:12 pm 02/15/2023

Synchro 11 Report
Page 4

Lanes, Volumes, Timings

5: NB Lindbergh & Olive

05/18/2023



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
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

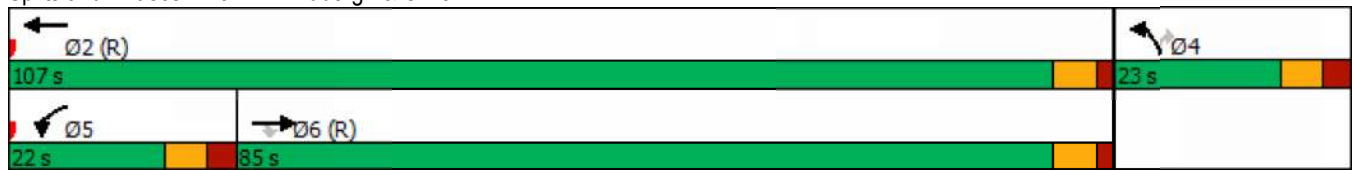
Analysis Period (min) 15

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



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



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



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.												

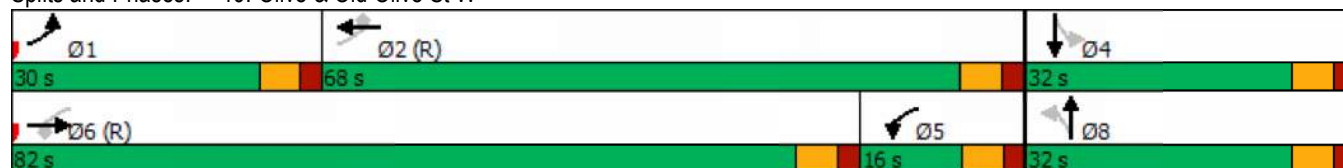
Lanes, Volumes, Timings 19: Olive & Old Olive St W

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	

PM 2048 Creve Coeur Existing PM 2048 3:12 pm 02/15/2023

Synchro 11 Report
Page 19

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	0	-	-	-
HCM Lane LOS	-	A	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] ft				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				

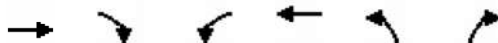
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Synchro 11 Report
Page 1

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



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	

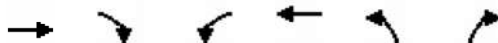
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Synchro 11 Report
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Lanes, Volumes, Timings

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 Capacity Utilization 65.9%

Analysis Period (min) 15

Intersection LOS: B

ICU Level of Service C

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	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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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
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 Capacity Utilization 60.6%
Analysis Period (min) 15
Intersection LOS: A
ICU Level of Service B

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



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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Synchro 11 Report
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Lanes, Volumes, Timings
18: Pavillion & Olive

06/16/2023

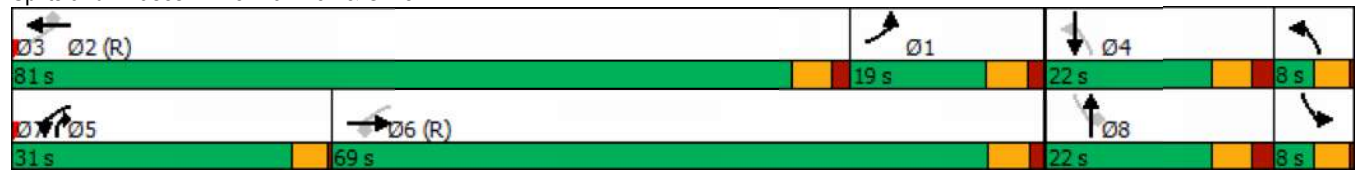
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	5	7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	4.0	10.0	10.0	4.0	7.0	4.0	4.0	7.0	
Minimum Split (s)	12.8	15.5	15.5	8.0	15.6	15.6	8.0	13.0	8.0	8.0	13.0	
Total Split (s)	19.0	69.0	69.0	31.0	81.0	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



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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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		
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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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
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	12.5
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				

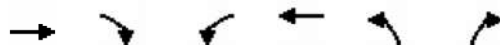
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Synchro 11 Report
Page 1

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

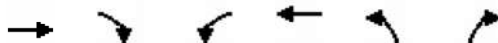
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Synchro 11 Report
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Lanes, Volumes, Timings

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)	96.8	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



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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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
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		8 s	80 s		42 s	42 s		42 s	42 s		42 s	42 s	
														
8 s	80 s		8 s	80 s		42 s	42 s		42 s	42 s		42 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)	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



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

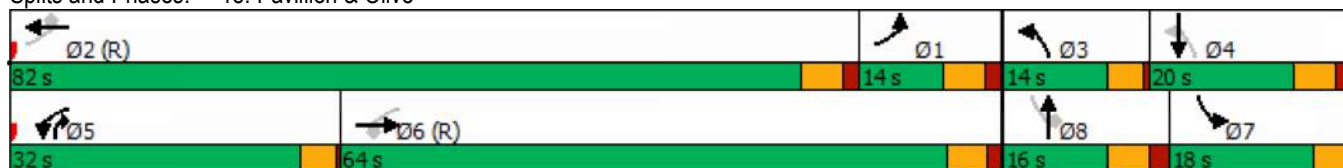
Intersection Capacity Utilization 74.7%

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.												

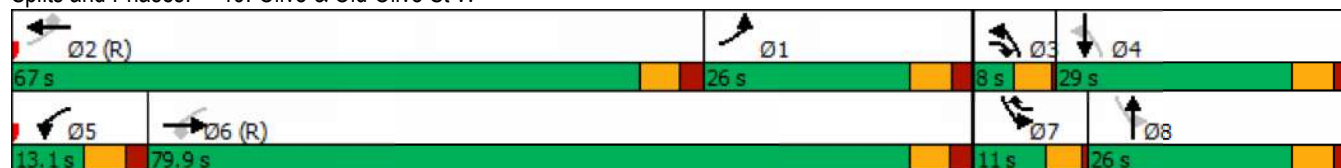
Lanes, Volumes, Timings 19: Olive & Old Olive St W

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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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	0.03	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				

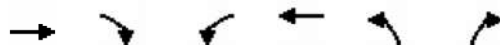
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Synchro 11 Report
Page 1

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



Lanes, Volumes, Timings

5: NB Lindbergh & Olive

06/16/2023

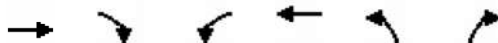
	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↙↘	↑↑	↙↘	↑
Traffic Volume (vph)	1675	176	3	1375	268	230
Future Volume (vph)	1675	176	3	1375	268	230
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	350		0	0
Storage Lanes		1	2		2	1
Taper Length (ft)			80		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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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)	97.0	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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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)	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

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)	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	

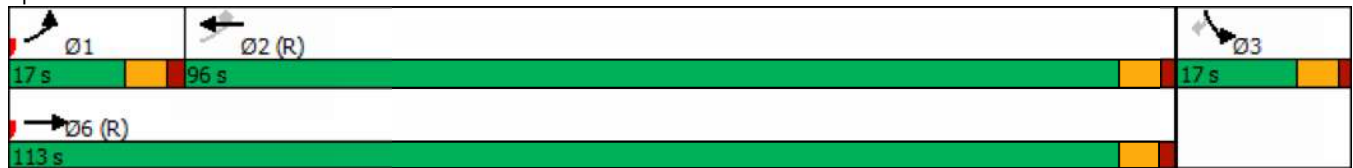
Lanes, Volumes, Timings

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



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

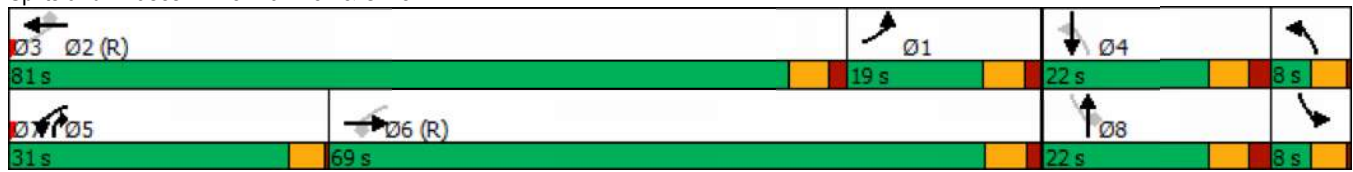
												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Detector Phase	1	6	6	5	2	2	3	8	5	7	4	
Switch Phase												
Minimum Initial (s)	7.0	10.0	10.0	4.0	10.0	10.0	4.0	7.0	4.0	4.0	7.0	
Minimum Split (s)	12.8	15.5	15.5	8.0	15.6	15.6	8.0	13.0	8.0	8.0	13.0	
Total Split (s)	19.0	69.0	69.0	31.0	81.0	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



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

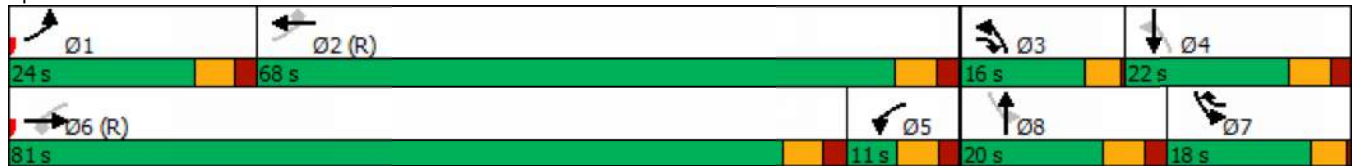
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95th percentile volume exceeds capacity, queue may be longer.

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: Spoeede & 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: Spodee & 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			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	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				

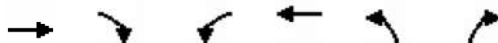
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Synchro 11 Report
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Lanes, Volumes, Timings

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

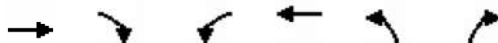
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Synchro 11 Report
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Lanes, Volumes, Timings

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



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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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
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 Signal Delay: 29.5

Intersection LOS: C

Intersection Capacity Utilization 89.4%

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

		
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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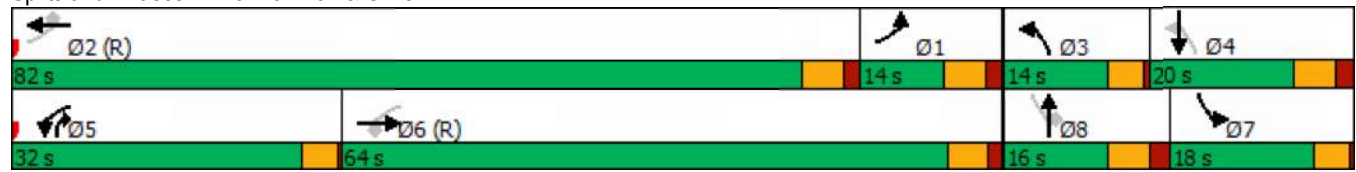
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Lanes, Volumes, Timings
18: Pavillion & Olive

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.												

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)	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	

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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	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												

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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)	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

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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

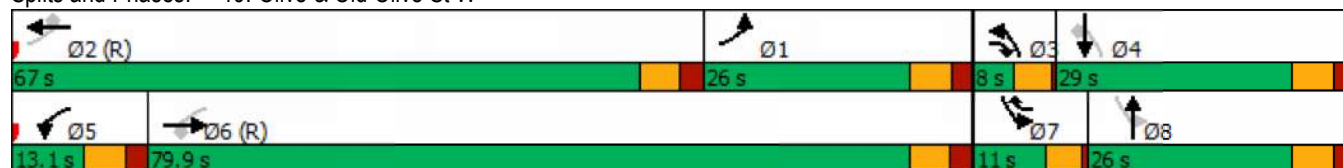
19: Olive & Old Olive St W

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												

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)	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



Lanes, Volumes, Timings
18: Pavillion & Olive

09/13/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1306	146	369	1012	104	118	24	298	56	30	7
Future Volume (vph)	14	1306	146	369	1012	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	0.227			0.060			0.728			0.740		
Satd. Flow (perm)	423	3539	1583	112	3539	1583	1356	1863	1583	1378	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			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	1519	170	388	1065	109	128	26	324	67	36	8
Shared Lane Traffic (%)												
Lane Group Flow (vph)	16	1519	170	388	1065	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

09/13/2023

												
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 Effect 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	0.81	0.19	0.89	0.42	0.09	0.65	0.23	0.63	0.31	0.35	
Control Delay	3.9	17.4	0.8	60.6	6.8	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	17.4	0.8	60.6	6.8	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		15.6			19.8			40.8			53.7	
Approach LOS		B			B			D			D	

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: 21.5

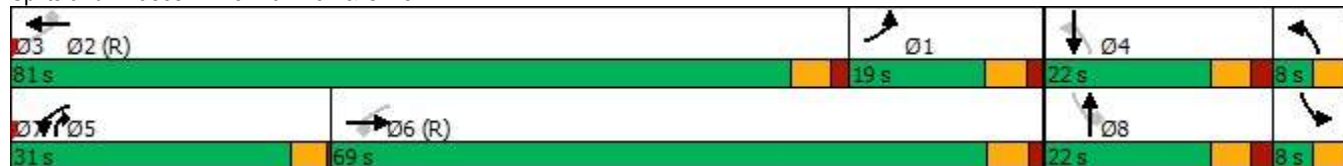
Intersection LOS: C

Intersection Capacity Utilization 82.7%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 18: Pavillion & Olive



Lanes, Volumes, Timings
19: Olive & Old Olive St W

09/13/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	166	1318	78	20	1059	59	62	27	22	126	35	331
Future Volume (vph)	166	1318	78	20	1059	59	62	27	22	126	35	331
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	0.180			0.110			0.734			0.719		
Satd. Flow (perm)	335	3539	1583	205	3539	1583	1143	1453	0	1339	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			79			61		25				338
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)	182	1448	86	21	1103	61	74	32	26	129	36	338
Shared Lane Traffic (%)												
Lane Group Flow (vph)	182	1448	86	21	1103	61	74	58	0	129	36	338
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-additional development 2:32 pm 06/08/2023

Synchro 11 Report
Page 3

Lanes, Volumes, Timings
19: Olive & Old Olive St W

09/13/2023

												
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 Effect Green (s)	81.8	81.2	95.0	84.2	71.3	85.6	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	0.56	0.66	0.07	0.11	0.57	0.06	0.27	0.33		0.39	0.16	0.69
Control Delay	18.4	11.0	0.3	4.6	16.3	3.4	41.2	39.2		44.6	53.1	13.4
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	18.4	11.3	0.3	4.6	16.3	3.4	41.2	39.2		44.6	53.1	13.4
LOS	B	B	A	A	B	A	D	D		D	D	B
Approach Delay		11.5			15.5			40.3			24.2	
Approach LOS		B			B			D			C	

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: 0.69

Intersection Signal Delay: 15.7

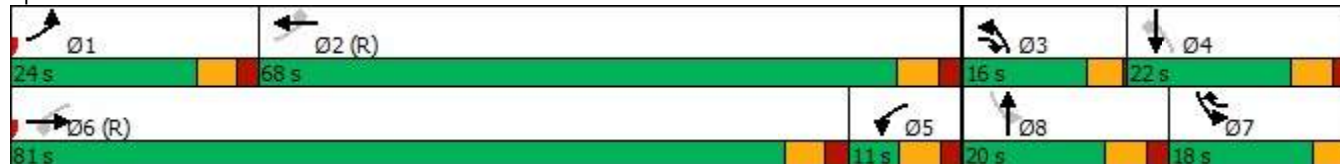
Intersection LOS: B

Intersection Capacity Utilization 71.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings
19: Olive & Old Olive St W

09/13/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	300	1158	72	48	1357	116	67	52	55	95	43	389
Future Volume (vph)	300	1158	72	48	1357	116	67	52	55	95	43	389
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			91		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)	316	1219	76	55	1560	133	71	55	58	103	47	423
Shared Lane Traffic (%)												
Lane Group Flow (vph)	316	1219	76	55	1560	133	71	113	0	103	47	423
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-additional development 2:24 pm 06/08/2023

Synchro 11 Report
Page 1

Lanes, Volumes, Timings

19: Olive & Old Olive St W

09/13/2023

												
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 Effect 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	0.96	0.59	0.07	0.21	0.94	0.15	0.23	0.39		0.35	0.14	0.78
Control Delay	59.7	5.0	0.2	3.8	29.2	2.2	40.8	38.8		42.7	46.7	24.5
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	59.7	5.5	0.2	3.8	29.6	2.2	40.8	38.8		42.7	46.7	24.5
LOS	E	A	A	A	C	A	D	D		D	D	C
Approach Delay		15.9			26.7			39.6			29.6	
Approach LOS		B			C			D			C	

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: 0.96

Intersection Signal Delay: 23.4

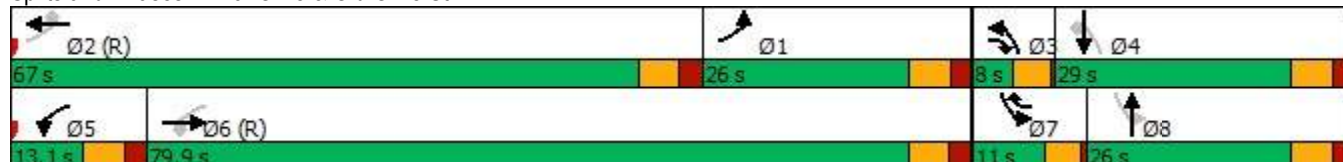
Intersection LOS: C

Intersection Capacity Utilization 81.5%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 19: Olive & Old Olive St W



Lanes, Volumes, Timings
19: Olive & Old Olive St W

09/13/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	186	1447	78	22	1163	64	62	27	24	137	36	364
Future Volume (vph)	186	1447	78	22	1163	64	62	27	24	137	36	364
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	0.141			0.081			0.733			0.717		
Satd. Flow (perm)	263	3539	1583	151	3539	1583	1142	1447	0	1336	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			79			67		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)	204	1590	86	23	1211	67	74	32	29	140	37	371
Shared Lane Traffic (%)												
Lane Group Flow (vph)	204	1590	86	23	1211	67	74	61	0	140	37	371
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 2048 Creve Coeur Build AM 2048-additional development 11:52 am 06/08/2023

Synchro 11 Report
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Lanes, Volumes, Timings
19: Olive & Old Olive St W

09/13/2023

												
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	69.1	83.5	28.0	13.8		28.0	15.9	15.9
Actuated g/C Ratio	0.63	0.62	0.73	0.65	0.53	0.64	0.22	0.11		0.22	0.12	0.12
v/c Ratio	0.66	0.72	0.07	0.15	0.64	0.06	0.27	0.34		0.43	0.16	0.75
Control Delay	30.7	10.9	0.3	5.9	18.9	3.8	41.2	38.1		45.6	53.2	17.5
Queue Delay	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0
Total Delay	30.7	11.4	0.3	5.9	18.9	3.8	41.2	38.1		45.6	53.2	17.5
LOS	C	B	A	A	B	A	D	D		D	D	B
Approach Delay		13.0			17.9			39.8			27.1	
Approach LOS		B			B			D			C	
Queue Length 50th (ft)	43	281	0	2	273	6	49	26		97	28	19
Queue Length 95th (ft)	m127	202	m2	m4	548	m33	85	65		155	64	129
Internal Link Dist (ft)		375			972			131			329	
Turn Bay Length (ft)	75		130	150		210						200
Base Capacity (vph)	381	2210	1200	158	1882	1063	292	178		355	227	497
Starvation Cap Reductn	0	223	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	0.54	0.80	0.07	0.15	0.64	0.06	0.25	0.34		0.39	0.16	0.75

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: 0.75

Intersection Signal Delay: 17.6

Intersection LOS: B

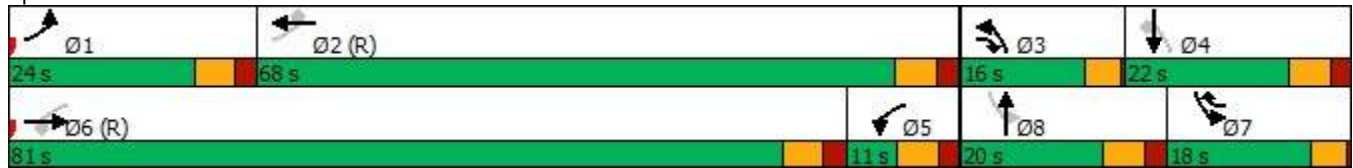
Intersection Capacity Utilization 75.4%

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
19: Olive & Old Olive St W

09/13/2023

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	330	1277	73	54	1499	127	69	56	60	104	46	430
Future Volume (vph)	330	1277	73	54	1499	127	69	56	60	104	46	430
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			91			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)	347	1344	77	62	1723	146	73	59	63	113	50	467
Shared Lane Traffic (%)												
Lane Group Flow (vph)	347	1344	77	62	1723	146	73	122	0	113	50	467
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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Synchro 11 Report
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Lanes, Volumes, Timings
19: Olive & Old Olive St W

09/13/2023

												
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 Effect 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	1.05	0.65	0.07	0.27	1.04	0.16	0.23	0.42		0.39	0.15	0.87
Control Delay	79.6	5.5	0.1	5.0	53.9	2.8	41.0	40.2		43.9	46.8	34.8
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	79.6	6.2	0.1	5.0	59.1	2.8	41.0	40.2		43.9	46.8	34.9
LOS	E	A	A	A	E	A	D	D		D	D	C
Approach Delay		20.4			53.1			40.5			37.5	
Approach LOS		C			D			D			D	
Queue Length 50th (ft)	~268	70	1	6	~805	8	48	66		76	36	135
Queue Length 95th (ft)	m#337	m98	m0	m10	#893	m31	90	130		131	74	#330
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	894	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	1.05	0.79	0.07	0.27	1.06	0.16	0.23	0.42		0.39	0.15	0.87

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: 1.05

Intersection Signal Delay: 37.6

Intersection LOS: D

Intersection Capacity Utilization 87.6%

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

09/13/2023

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
18: Pavillion & Olive

09/13/2023

												
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			0.060			0.728			0.740		
Satd. Flow (perm)	427	3539	1583	112	3539	1583	1356	1863	1583	1378	1812	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			150			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		

AM 2028 Creve Coeur Build AM 2028-Ped Phase 2:32 pm 06/08/2023

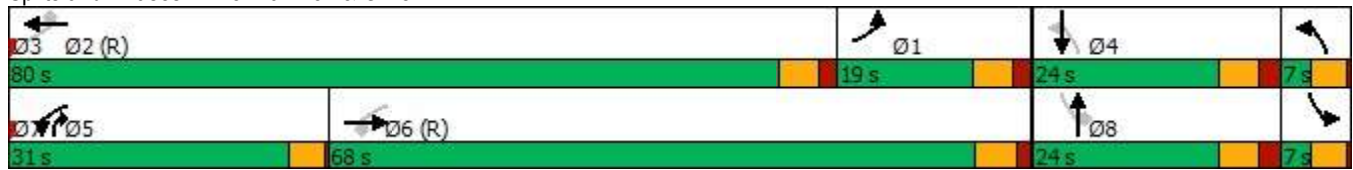
Synchro 11 Report
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Lanes, Volumes, Timings
18: Pavillion & Olive

09/13/2023

												
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	68.0	68.0	31.0	80.0	80.0	7.0	24.0	31.0	7.0	24.0	
Total Split (%)	14.6%	52.3%	52.3%	23.8%	61.5%	61.5%	5.4%	18.5%	23.8%	5.4%	18.5%	
Maximum Green (s)	13.2	62.5	62.5	27.0	74.4	74.4	3.0	18.0	27.0	3.0	18.0	
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)	97.9	68.7	68.7	98.0	92.8	92.8	16.8	7.8	36.7	17.6	8.5	
Actuated g/C Ratio	0.75	0.53	0.53	0.75	0.71	0.71	0.13	0.06	0.28	0.14	0.07	
v/c Ratio	0.04	0.80	0.19	0.88	0.42	0.09	0.64	0.23	0.62	0.31	0.35	
Control Delay	4.1	17.2	0.9	59.5	7.1	2.1	65.3	63.0	28.6	50.5	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	4.1	17.2	0.9	59.5	7.1	2.1	65.3	63.0	28.6	50.5	57.9	
LOS	A	B	A	E	A	A	E	E	C	D	E	
Approach Delay		15.4			19.8			40.3			53.4	
Approach LOS		B			B			D			D	
Queue Length 50th (ft)	2	201	1	277	5	0	99	21	123	50	30	
Queue Length 95th (ft)	m4	284	10	#469	308	20	155	52	201	83	63	
Internal Link Dist (ft)		972			703			320			446	
Turn Bay Length (ft)	190		300	500		210				150		
Base Capacity (vph)	457	1869	906	452	2527	1161	200	257	532	218	256	
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	0.04	0.80	0.19	0.86	0.42	0.09	0.64	0.10	0.61	0.31	0.17	
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: 0.88												
Intersection Signal Delay: 21.4						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.												

Splits and Phases: 18: Pavillion & Olive



Lanes, Volumes, Timings
18: Pavillion & Olive

09/13/2023

												
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	0.104			0.118			0.706			0.747		
Satd. Flow (perm)	194	3539	1583	220	3539	1583	1315	1863	1583	1391	1654	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			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		

PM 2028 Creve Coeur Build PM 2028-Ped Phase 2:24 pm 06/08/2023

Synchro 11 Report
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Lanes, Volumes, Timings

18: Pavillion & Olive

09/13/2023

												
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	10.0	24.0	32.0	10.0	24.0	
Total Split (%)	10.8%	49.2%	49.2%	24.6%	63.1%	63.1%	7.7%	18.5%	24.6%	7.7%	18.5%	
Maximum Green (s)	8.2	58.5	58.5	28.0	76.4	76.4	6.0	18.0	28.0	6.0	18.0	
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 Effect Green (s)	85.6	63.3	63.3	88.0	79.2	79.2	26.0	18.0	43.2	26.0	18.0	
Actuated g/C Ratio	0.66	0.49	0.49	0.68	0.61	0.61	0.20	0.14	0.33	0.20	0.14	
v/c Ratio	0.24	0.70	0.16	0.81	0.68	0.23	0.44	0.06	0.52	0.50	0.28	
Control Delay	9.2	16.5	1.2	39.1	10.7	0.8	48.1	49.5	17.8	49.8	21.0	
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	9.2	16.5	1.2	39.1	10.8	0.8	48.1	49.5	17.8	49.8	21.0	
LOS	A	B	A	D	B	A	D	D	B	D	C	
Approach Delay		14.7			14.4			27.2			39.8	
Approach LOS		B			B			C			D	
Queue Length 50th (ft)	9	121	0	131	377	4	87	12	104	105	15	
Queue Length 95th (ft)	m20	393	13	253	184	0	146	35	170	136	43	
Internal Link Dist (ft)		972			703			320			446	
Turn Bay Length (ft)	190		300	500		210				150		
Base Capacity (vph)	227	1723	844	486	2155	1043	284	257	660	295	278	
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	0.71	0.72	0.23	0.44	0.06	0.48	0.50	0.28	

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: 0.81

Intersection Signal Delay: 17.3

Intersection LOS: B

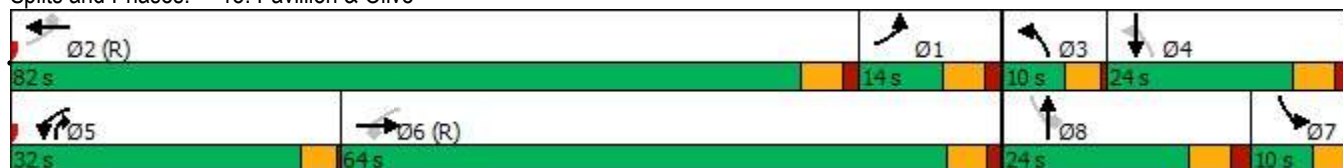
Intersection Capacity Utilization 74.7%

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
18: Pavillion & Olive

09/13/2023

												
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)			135			119			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		

AM 2048 Creve Coeur Build AM 2048-Ped Phase 11:52 am 06/08/2023

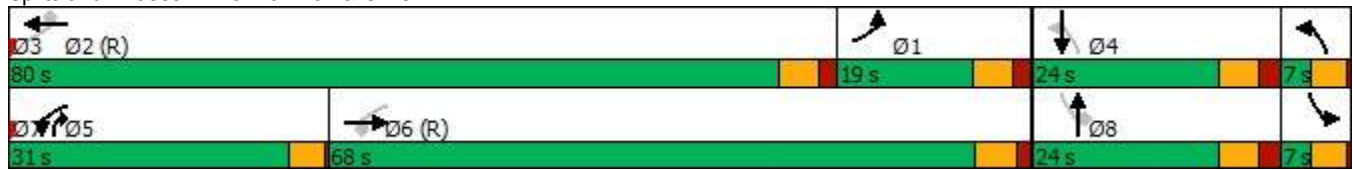
Synchro 11 Report
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Lanes, Volumes, Timings
18: Pavillion & Olive

09/13/2023

												
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	68.0	68.0	31.0	80.0	80.0	7.0	24.0	31.0	7.0	24.0	
Total Split (%)	14.6%	52.3%	52.3%	23.8%	61.5%	61.5%	5.4%	18.5%	23.8%	5.4%	18.5%	
Maximum Green (s)	13.2	62.5	62.5	27.0	74.4	74.4	3.0	18.0	27.0	3.0	18.0	
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)	97.9	68.7	68.7	98.0	92.8	92.8	16.8	7.8	36.7	17.6	8.6	
Actuated g/C Ratio	0.75	0.53	0.53	0.75	0.71	0.71	0.13	0.06	0.28	0.14	0.07	
v/c Ratio	0.05	0.89	0.19	0.88	0.46	0.10	0.64	0.23	0.62	0.33	0.36	
Control Delay	4.8	22.1	1.9	58.3	8.9	3.0	65.3	63.0	28.6	51.2	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	4.8	22.1	1.9	58.3	8.9	3.0	65.3	63.0	28.6	51.2	56.4	
LOS	A	C	A	E	A	A	E	E	C	D	E	
Approach Delay	20.0				19.8				40.3		53.2	
Approach LOS	C				B				D		D	
Queue Length 50th (ft)	2	446	1	259	6	0	99	21	123	54	30	
Queue Length 95th (ft)	m6	#721	m21	#470	360	30	154	52	201	88	64	
Internal Link Dist (ft)	972				703				320		446	
Turn Bay Length (ft)	190		300	500		210				150		
Base Capacity (vph)	416	1869	899	452	2527	1164	200	257	532	218	257	
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	0.89	0.19	0.86	0.46	0.10	0.64	0.10	0.61	0.33	0.18	
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: 23.2						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.												

Splits and Phases: 18: Pavillion & Olive



Lanes, Volumes, Timings
18: Pavillion & Olive

09/13/2023

												
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	0.069			0.071			0.702			0.747		
Satd. Flow (perm)	129	3539	1583	132	3539	1583	1308	1863	1583	1391	1649	0
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			143			195			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		

PM 2048 Creve Coeur Build PM 2048-Ped Phase 11:35 am 06/08/2023

Synchro 11 Report
Page 1

Lanes, Volumes, Timings
18: Pavillion & Olive

09/13/2023

												
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	21.5	21.5	8.0	21.6	21.6	8.0	16.0	8.0	8.0	20.0	
Total Split (s)	14.0	63.0	63.0	32.0	81.0	81.0	11.0	24.0	32.0	11.0	24.0	
Total Split (%)	10.8%	48.5%	48.5%	24.6%	62.3%	62.3%	8.5%	18.5%	24.6%	8.5%	18.5%	
Maximum Green (s)	8.2	57.5	57.5	28.0	75.4	75.4	7.0	18.0	28.0	7.0	18.0	
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	
Walk Time (s)		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	
Pedestrian Calls (#/hr)		0	0		0	0		0			0	
Act Effect Green (s)	84.6	61.0	61.0	87.0	78.2	78.2	27.0	18.0	44.5	27.0	18.0	
Actuated g/C Ratio	0.65	0.47	0.47	0.67	0.60	0.60	0.21	0.14	0.34	0.21	0.14	
v/c Ratio	0.33	0.81	0.16	0.86	0.76	0.26	0.42	0.06	0.51	0.53	0.30	
Control Delay	16.2	22.5	1.6	54.2	12.1	0.9	46.4	49.5	16.9	50.1	20.0	
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	16.2	22.5	1.6	54.2	12.5	0.9	46.4	49.5	16.9	50.1	20.0	
LOS	B	C	A	D	B	A	D	D	B	D	C	
Approach Delay		20.4			17.5			26.1			39.8	
Approach LOS		C			B			C			D	
Queue Length 50th (ft)	12	328	1	188	389	2	86	12	99	117	15	
Queue Length 95th (ft)	m21	544	m12	#349	342	m0	144	35	167	149	44	
Internal Link Dist (ft)		972			703			320			446	
Turn Bay Length (ft)	190		300	500		210				150		
Base Capacity (vph)	187	1659	818	443	2128	1030	296	257	660	309	284	
Starvation Cap Reductn	0	0	0	0	127	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	0.32	0.81	0.16	0.77	0.81	0.26	0.42	0.06	0.48	0.53	0.30	

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: 90

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 20.6

Intersection LOS: C

Intersection Capacity Utilization 78.7%

ICU Level of Service D

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Lanes, Volumes, Timings

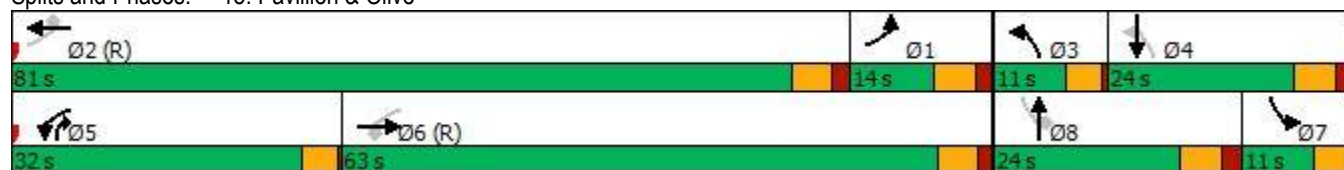
18: Pavillion & Olive

09/13/2023

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Splits and Phases: 18: Pavillion & Olive



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 - Olivia 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 (LCAI), 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, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1444	24
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	1616	27
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)	0.43	0.01

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	1616	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	18.6
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	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

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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	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 (LCAI), 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, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1644	27
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	1840	30
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)	0.48	0.02

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	1840	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	21.1
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), 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 - Olivia 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, CAFCAV	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (Vi), veh/h	1822	248
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	2040	278
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	0.15

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	2040	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	23.5
Level of Service (LOS)	B	Density in Ramp Influence Area (DR), 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, CAF _{CAV}	1.000	-
Final Capacity Adjustment Factor (CAF)	1.000	1.000

Demand and Capacity

Demand Volume (V _i), veh/h	1996	256
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	2234	287
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)	0.59	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	2234	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	25.7
Level of Service (LOS)	C	Density in Ramp Influence Area (D _R), 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



Jason Jaggi <jjaggi@crevecoeurmo.gov>

Olia Village - Revised Plans?

1 message

Monica Moore-Zigo <Monica_Moore-Zigo@gensler.com>

Thu, Sep 14, 2023 at 4:56 PM

To: "jjaggi@crevecoeurmo.gov" <jjaggi@crevecoeurmo.gov>

Cc: Tomislav Zigo <zigot@claycorp.com>, "blmoore@crevecoeurmo.gov" <blmoore@crevecoeurmo.gov>, "hsilverman@crevecoeurmo.gov" <hsilverman@crevecoeurmo.gov>

Hi, Mr. Jaggi-

Thank you for the very thoughtful and professional presentations by the City Planning Division at the last Planning and Zoning Commission meeting.

I am reaching out with a few questions on behalf of the Spoede Woods neighborhood association in regard to the proposed Olia Village development. The Association met last Sunday to discuss our concerns, and we have also been in communication with our neighbors on Spoede Hills, Mission Hills, Ramblewood, and Sunswept. The overall consensus is that, in principle, a well-planned mixed-use neighborhood on the former Monsanto HQ site would be an amazing asset to the neighborhood, providing a significant concentration of amenities within walking distance, creating the type of 24/7 live/work community that is increasingly in demand these days, and supporting the future of the 39 North innovation district.

However, as a number of neighbors raised at the September 5th hearing, we do have significant concerns that there are aspects of the proposed plan that have not been thoroughly considered:

- **Green Buffer.** As you mentioned in your presentation, the current proposal from the developer provides a glaringly insufficient green buffer zone adjacent to the single-family residential streets, especially for Spoede Woods. The Research and Office Park zoning rules currently in force call for a 50' green buffer of undisturbed grading abutting single family parcels, which would allow for preservation of most of the mature trees along the property line and mitigate many of the neighborhoods' concerns about privacy, light pollution, nuisance, etc. Our neighborhoods believe there is no reason for the City to grant a reduction in the required 50' green buffer provision under the proposed Planned Mixed-Use Development, and that, in fact, given the high density of the proposed plan, the required green buffer width should be increased. **Has the City received any plan updates from the development group in regard to the Green Buffer?**
- **Watershed.** Several neighbors have raised significant concerns about stormwater runoff and flooding, especially since many of us have had direct experience with basement sewer backups in our homes during heavy rain events. The Olia Village plan proposes to completely culvertize Dielmann Creek (into which the nearby neighborhoods drain) and the upper part of Monsanto-Sunswept Creek and instead capture stormwater on the development site via an old-school retention pond system. This eliminates the amenity of the stream ecosystem to assist with stormwater management, and works directly counter to many of the efforts that have recently been made in the region to slow down runoff by using natural vegetation. The neighbors have significant concerns about the stormwater impact on adjacent properties. **What is the status of MSD review of this development proposal? Has the Deer Creek Watershed Alliance had an opportunity to review or comment? What is the City's position on preferred stormwater management strategies?**

- **Nature Trail.** While a few have expressed security concerns, the overall consensus we have heard is that thoughtfully landscaped pedestrian byways that connect our neighborhoods to local amenities and parks would be a fantastic asset to the area. The existing walking path that Monsanto constructed (and later Bayer maintained) on their site was in conjunction with acres of protected wildlife habitat <https://www.wildlifehc.org/resources/whc-index/ss-project/?ProgramID=00100> , which is appreciated by all nearby. A new "nature trail" needs to be planned mindfully, in a way where it does not channel a high volume of path traffic past a few people's homes (in Sunswept, for example), and security concerns must be addressed in the design. **Has the development group provided any additional clarity on the design of the "Nature Trail"? Is there a mechanism by which we can bring stakeholders together to create dialogue on a neighborhood path system? And are there still any ongoing conversations with Bayer about creating a pedestrian route over to Stacy Park?**

Our understanding is that the development group was due to submit any updates to their proposal by yesterday, prior to the next hearing on Monday. Are those updated documents available for the public to review?

If you have a moment of time available tomorrow, I would love to get on a quick call to discuss some of our questions. You may be able to provide answers or additional context I can communicate at our next neighborhood meeting on Sunday. If you can let me know your availability I will do my best to make it work on my end.

Thank you!

Monica

Monica Moore-Žigo

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Gensler

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Houston, Texas 77010

USA



[Download the latest trends.](#)



Jason Jaggi <jjaggi@crevecoeurmo.gov>

Development of former Bayer prop.

1 message

Gail Friedman <gbfrie@icloud.com>

To: jjaggi@crevecoeurmo.gov

Mon, Sep 11, 2023 at 2:13 PM

Sent from my iPhone

My name is Gail Friedman at 7 Spoe de woods

And I have lived here 60 plus years I write

To you to voice my thoughts and concerns

About the proposed property development

And the possible problems it could cause

The 25 residents of Spoede Woods.

First a scaled clear drawing of development

With streets, Schnucks, buildings and parking facilities would be very helpful,

Buffer zone and footage proposed would

Be helpful especially along the Original

Fence put in by Monsanto w a double row of 8-10 ft hi evergreens.

They knew what would be a fair and

Acceptable to all Spoeede Woods Residents.

They were always great neighbors.

I hope the developers will take the same

Interest in providing the same kind of

Protection for our lovely neighborhood.

In Creve Coeur the tallest building is

4 stories. 8 stories as you proposed would

Be seen by every resident please reconsider,

traffic could be an issue on Spode Road and

The children who walk to Spode School,

If the ground is reconfigured the water

Runoff could land in many of the lower

Placed yards. I hope that it will be

Possible for the board, the investors and the

Residents to come to a consensus that

Will meet the high standards that Creve

Coeur has always maintained for their

Residents.

Thank you

Thank you
Gail Friedman

Gbfriedman@sbcglobal.net

314-494-9320 mobile

314-432-5254 Home



Jason Jaggi <jjaggi@crevecoeurmo.gov>

Please share with P&Z commission prior to Sept. 18 meeting re: Olia Village

1 message

ELIZABETH DAVID <ed3997@prodigy.net>

Thu, Sep 14, 2023 at 11:27 AM

To: Jason Jaggi <jjaggi@crevecoeurmo.gov>

To: Jason Jaggi, Director of Community Development, City of Creve Coeur and Creve Coeur Planning and Zoning (P&Z) Commissioners

Re: Plans for Olia Village, [10300 Olive Blvd.](#)

From: Elizabeth David, property owner and resident at [9 Ramblewood Lane, Creve Coeur, MO 63141](#)

For relation to the proposed development, my property is one lot removed from the western boundary of the northern section of the proposed Olia Village development. (My neighbors' property at 11 Ramblewood sits between my property and the site.) My property directly abuts the current Schnucks grocery store parking lot at Spoeede and Olive, almost directly to the south of the Olive Blvd/Old Olive traffic light.

I recognize that the proposed development site is a large area of land in Creve Coeur that is ripe for redevelopment. And done correctly, I believe this can be an asset to the community and a valuable source of tax revenue for the city. However, as a nearby resident and property owner, I also have a significant list of concerns that I believe should be considered by P&Z as the project proceeds through the planning phases and during the multiple development phases for the next several years.

I attended the Planning and Zoning meeting on September 5, 2023 and listened to the city planners, the P&Z commissioners, the representative of the developer and the contractors engaged by the city to provide advice to P&Z. Based on review of the documents on the city website, the diagrams and renderings presented at the meeting and the discussion at the meeting, I have itemized my concerns regarding this proposal below.

Loss of trees on the site:

When you stand at the eastern edge of Ramblewood Lane and look east toward this site, the existing office buildings and parking lots are mostly obscured by a large forested area of 60+ year old trees. Even when this site was an active office complex pre-pandemic, you didn't see sun glinting off car windows or hear traffic noise. The trees buffered the surrounding residential properties from light and sound pollution associated with the office/research complex.

The current plans call for extensive removal of these trees. The residents of Ramblewood Lane and other nearby streets, will thus be exposed to a significantly less attractive view of buildings, parking lots, and parking garages. They will be exposed to more light and sound pollution, generated by an active mixed use development with retail, restaurants, entertainment, hotel and residential uses. The activities of this development will expand to many additional hours of the day as compared to a basic 9-to-5 office/research complex that was there previously.

Even if the developer replaces some of these mature trees with new trees as the site is developed, newly planted saplings are not going to provide the same sight and noise buffers, soil and water retention, nor counteract the effects of global warming and carbon emissions. And after the weather conditions the entire country has been exposed to this summer, I believe this should be a significant concern for all developments.

The developer clearly recognizes the value of green space and trees in enhancing residential lifestyle. If you look at the amount of green space planned around the new townhomes the developer hopes to sell, you readily recognize that they have given more consideration to surrounding the townhomes with green space and plenty of trees, as compared to what they plan to retain for buffering of the existing residential area that surround their development. I think the existing residents deserve equal consideration.

The commissioners recognized in the Sept. 5 meeting that the number of trees planned for removal exceeds existing allowances. And I would additionally suggest that the commissioners should consider requiring an even more stringent plan to preserve trees on this site, especially in areas abutting existing residential properties.

Relocation of ramp at the entrance from Old Olive:

At the Sept. 5 meeting, the traffic study discussion included the suggestion that the entrance/exit roadway from the Old Olive intersection onto this site be moved 100 feet to the south. While I understand the desire to provide for additional vehicles to queue at the light to exit the site, this means that a significant amount of additional traffic, and resulting noise, will move 100 feet closer to my bedroom. The traffic noise from Olive Blvd and the Schnucks parking lot and loading dock is already significant. Additional noise abatement/suppression and light blocking from incoming cars needs to be addressed if this change is considered.

Construction noise and traffic during the 5-6 year development of the site:

Use of Spoede Road for construction-related traffic (delivery of equipment and materials) should be severely restricted, if not outright prohibited. All construction-related access to the site should be limited to I-270, Lindbergh and Olive Blvd.

Creve Coeur has existing noise ordinances controlling the days of the week and hours of the day when construction noise is allowed. These must be strictly observed by the developer and/or enforced by the city for the protection of the existing residential properties that will be impacted. Maintaining the quality of life in the surrounding residential neighborhoods should be a paramount concern. Allowances cannot be made for "the project running behind schedule", as seems to happen with all large development projects.

Noise suppression for mechanical systems:

As previously noted, I reside directly behind the existing Schnucks grocery store at Spoede and Olive. And due to the unbuffered rooftop mechanicals, my backyard is never quiet. The rooftop mechanicals run 24 x 7 x 365. and Schnucks had done nothing to block or buffer the noise. Not only is my backyard never quiet, but you can sometimes still hear the rooftop mechanicals and loading dock noise when standing in the middle of the street in front of my house and inside my house.

Given the number of buildings and greater need for mechanical systems to support their use, the developer should be required to provide sound buffering/suppression to protect the surrounding residential properties.

Plans for pedestrian crossing on Olive adjacent to site:

There was discussion during the Sept. 5 meeting regarding the desire to add a pedestrian crossing across Olive Blvd., near Pavillion Drive. While I understand the desire for this, especially if there is a transit stop on westbound Olive anywhere along this development, the commissioners need to understand the impact to Olive Blvd. traffic. At Pavillion Drive, Olive Blvd. has 5 thru-traffic and turn lanes and a median. The amount of time required for pedestrians to traverse this distance (including accounting for ADA-accessibility), is going to impact traffic. In this stretch of Olive Blvd., there are currently traffic lights at the intersections with Spoede, Old Olive, Pavillion Drive, at the west edge of Lindbergh for access to southbound Lindbergh, and at the east edge of Lindbergh for access to northbound Lindbergh. That's five traffic-signal controlled intersections in approximately ½ mile.

Security of the boundaries with surrounding residential area:

Monsanto erected a 4' chain link fence between this property and abutting residential areas. Schnucks erected a 6' brick wall at the back of their property. (When originally built, Schnucks allowed each adjacent residence to elect to have an opening in the wall from their back yard to the parking lot. Only one resident elected to do so.) This effectively blocks non-resident pedestrian access to Ramblewood Lane except via Spoede Lane. Comparable barriers should be required and maintained to provide similar protection to surrounding residential streets.

EV chargers:

This concern may more appropriately belong with planning for the individual phases as the project develops the approximate 1000 housing units (apartments, townhomes) planned for Olia Village. But I urge the commissioners to consider where and how residents will be able to add EV chargers when they do not have private driveways or garages.

Preliminary Subdivision Plat document on city website – Correction for Page 2:

This is a relatively minor error within the context of the numerous pages of documentation and plans associated with this project. However, Page 2 of the Preliminary Plat document incorrectly identifies Ramblewood Lane as a public street. Ramblewood Lane is a private street with the property lines of the 11 lots on the street extending to the center of the pavement and center of the grass in the middle of the cul de sac. The pavement is maintained at the expense of the residents of the street.

As a property owner on this street, I believe that it is imperative that all documents associated with projects under consideration correctly acknowledge the public versus private distinction.

I have provided my contact information below and am available for discussions with anyone who desires further clarification of my concerns. I do plan to remain engaged with P&Z during the future meetings regarding this project and would like to be included in the distribution for additional notices from the city of Creve Coeur and P&Z regarding this project.

Thank you for your time and attention to my concerns.

Elizabeth David

9 Ramblewood Lane, Creve Coeur, MO 63141-7825

ed3997@prodigy.net

314-567-3259 (home)

9/14/23, 11:39 AM

Creve Coeur Mail - Please share with P&Z commission prior to Sept. 18 meeting re: Olia Village

314-540-3473 (cell)



city of CREVE COEUR

300 North New Ballas Road • Creve Coeur, Missouri 63141

(314) 432-6000 • www.crevecoeurmo.gov

APPLICATION TO PLANNING AND ZONING COMMISSION #23-034: SITE DEVELOPMENT PLAN FOR THE CONSTRUCTION OF A NEW 6,504 SQUARE FOOT PLANT GROWTH BUILDING WITHIN THE DONALD DANFORTH PLANT SCIENCE CENTER CAMPUS LOCATED AT 975 N. WARSON ROAD

FOR THE MEETING OF: Monday, September 18, 2023

LOCATION: 975 N. Warson Road, Zoned RO – Research Office District.

REQUEST: Todd Hornburg, on behalf of the Danforth Center, has submitted an application for a site development plan for a new 6,504 square foot plant growth building attached to the main building. The new building will not be visible from Olive Boulevard or N. Warson Road and is internal to the campus and existing buildings. The exterior materials will be brick except for the side facing the existing greenhouses which will be metal to match those structures. In the RO-Research Office District, site development plans require review and approval by the Planning and Zoning Commission. City Council approval is not required.

ADDITIONAL INFORMATION:

Section 405.330 requires site plan review by the Planning and Zoning Commission for all proposed developments in the Research Office zoning district. City Council approval is not required.

Key Issues:

- Does the request further the goals and/or implement the Comprehensive Plan?
- Is the request consistent with the goals of a site development plan?
- Does the request follow the Design Guidelines?

Creve Coeur 2030 Comprehensive Plan References

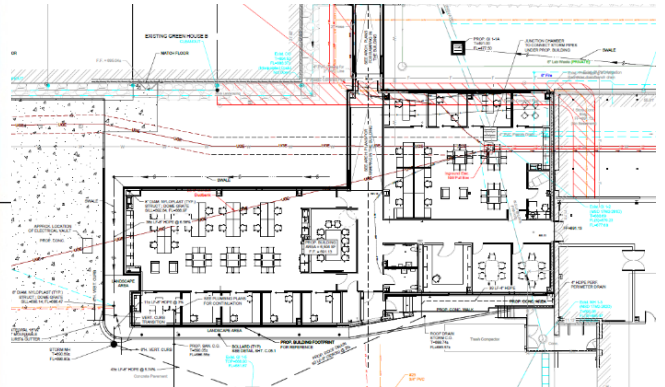
- Mixed-Use Innovative Campus Place Type District

Zoning Code References

- Section 405.330: RO-Research Office District
- Section 405.1080 Site Concept, Site Development and Minor Site Plan Approval

APPLICANT: Todd Hornburg
Donald Danforth Plant Science Center
975 N. Warson Road
Creve Coeur, MO 63132

APPLICANT'S REPRESENTATIVE: Greg Staley
The Clayton Engineering Company, Inc
2268 Welsch Industrial Court
St. Louis, Missouri 63146



REPORT PREPARED BY: Bethany L. Moore, City Planner

DATE: 09/11/2023

ATTACHMENTS: Applicant's Materials received August 18, 2023

BACKGROUND AND PROPOSAL SUMMARY

The Planning and Zoning Commission approved the original Danforth Plant Science Center Site Concept Plan (DPSC) on July 19, 1999. The DPSC opened in 2001. In 2003 the Planning and Zoning Commission approved the amended Site Concept Plan for three buildings, in the northeast corner of the site. In August of 2005, the City Council approved Ordinance Number 3075 to subdivide the 42+ acre parcel into 2 lots, creating the North 8 parcel, referred to as BRDG Park. The Wexford building received approval in 2007. The concept plan was again revised in 2014 for the expansion of the Danforth Building, again in January 2019 for the greenhouse additions and again in May 2019 for the construction of Edge@BRDG.

The applicant is seeking to add a new 6,504 square foot plant growth building attached to the main building for plant growth uses. It will be interior to campus and not visible from any public streets. The exterior materials will be brick in a dark manganese color and metal panels on the side facing the existing greenhouses in order to match them. Native Missouri plants will be added to landscape the south and west sides of the building. Staff does not have any concerns with the proposal. Site Development Plans are required for any development that is adding more than 5,000 square feet per Section 405.1080(B)(2)(c). Site Development Plans require review and approval by the Planning and Zoning Commission and City Council approval is not required. The Site Concept Plan has also been updated with the submitted Site Development Plan drawings to reflect the new addition.

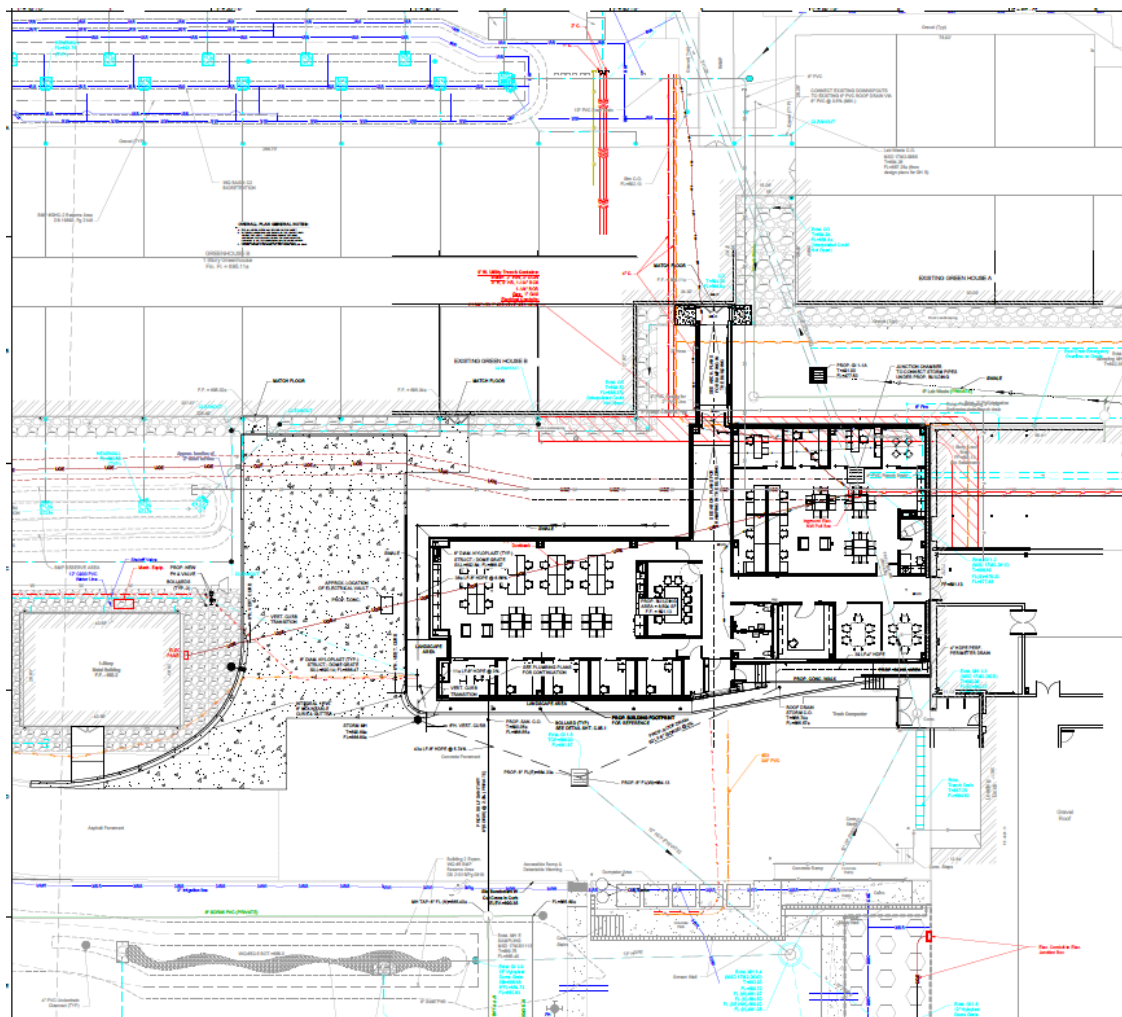


Figure 1: Proposed project area site.



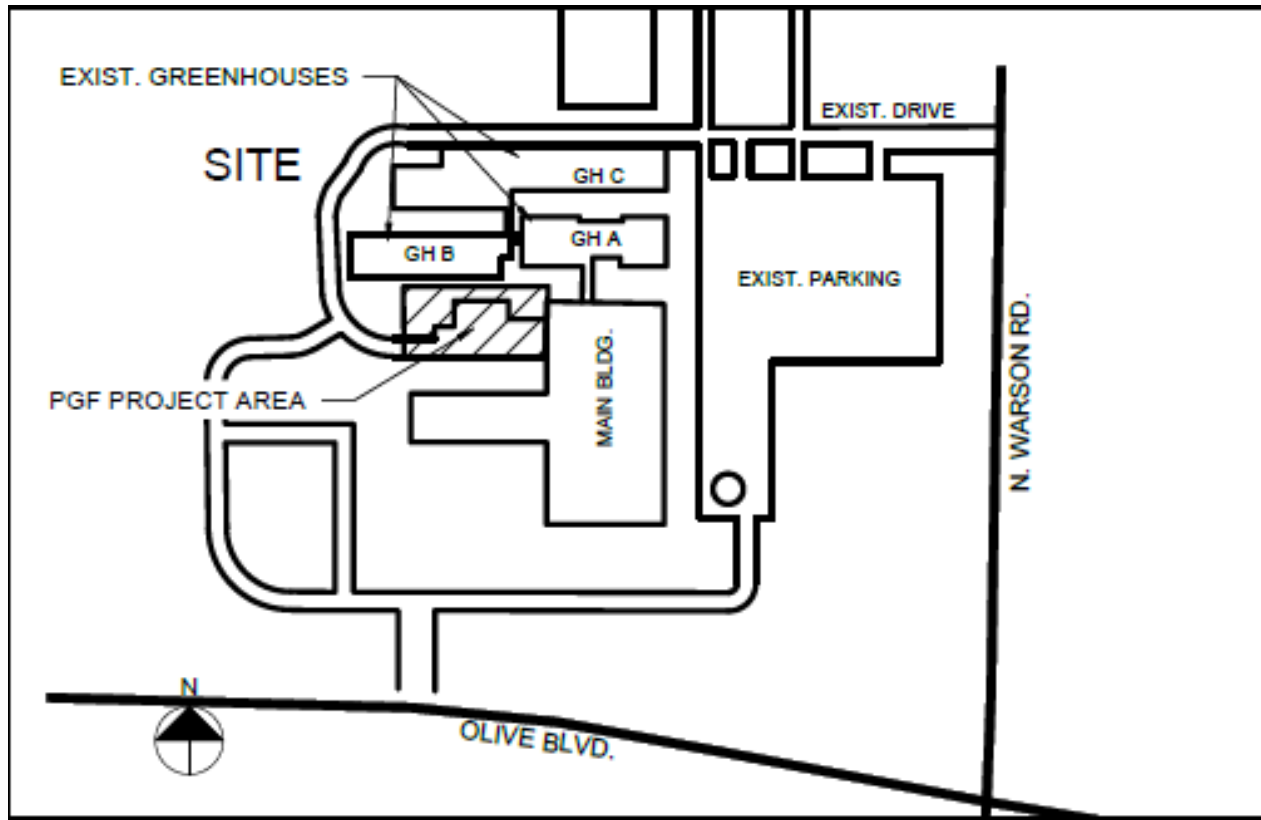


Figure 4: Site Location Map

LAND USE AND ZONING OF SURROUNDING PROPERTIES

The adjacent zoning and land uses are as follows:

DIRECTION	USE	ZONED	SEPARATED BY
North	Single Family Residential	AR-Attached-Single-Family Residential	N/A
South	Bayer West Campus	RO-Research Office	Olive Boulevard
East	Residential	(City of Olivette)	N. Warson Road
West	Missouri American Water Company	GC-General Commercial	N/A

ZONING REGULATIONS

Site concept and site development plan approval by the Planning and Zoning Commission is required for all proposed developments within the "RO" District. The Site Concept Plan has been updated with the submitted Site Development Plan drawings to reflect the new addition. Site development plans are required for any development that is adding more than five thousand (5,000) square feet of new impermeable surface to a site per Section 405.1080. As the building is adding more than 5,000 square feet of new impermeable surface to the site, a site development plan is required.

The proposal includes the construction of the new addition to the existing main building. The new building will sit between Building A and the greenhouses, internal to the campus. The building will not be visible from either public streets, Olive Boulevard or North Warson Road and will be clad in brick and metal panels to match the materials of the surrounding building and greenhouses. Landscaping will also be added around the base.

RECOMMENDATION

Should the Commission find the building addition is acceptable, below are the recommended conditions of approval:

1. The Applicant is required to submit a Building Permit application, as required by Article II of the Building Code. The sign details shall be in substantial conformance with the applicant’s submission as for Application #23-034 received on August 18, 2023.
2. No site development plan or minor site plan approval shall be valid for a period longer than twelve (12) months from the date it is approved, unless within such period a building permit is obtained and substantial construction is commenced. Substantial construction shall be deemed to consist of clearing the site, completion of footings, basement or building slab and inspection of such work. The Planning and Zoning Commission and the City Council, when required, may grant extensions not exceeding twelve (12) months each upon written request of the original applicant prior to the expiration of such period and resubmission of the application if the application as resubmitted is substantially the same as the initially approved application. However, the Commission and the Council, as applicable, have the power in such cases to attach new conditions to their re-approval or to disapprove the reapplication. Where the application for re-approval contains changes which the Zoning Administrator concludes materially alter the initial application, the Zoning Administrator shall initiate a new site development plan review procedure as stated in Section 405.1080 or a new minor site plan review procedure as stated in Section 405.1080.

MOTION

After discussion with the Applicant, if the Planning and Zoning Commission finds that the Application is in conformance with the purposes and regulations of the Zoning Code and all impacts have been addressed, it may vote on a recommendation to the City Council. The following is an example of an appropriate motion for this application:

“I move to recommend approval of the site development plan to construct a new 6,504 square foot addition for The Donald Danforth Plant Science Center Campus at 975 North Warson Road subject to the conditions listed in the Staff Report for the meeting of September 18, 2023”
(Conditions may be added, eliminated, altered, and/or modified).

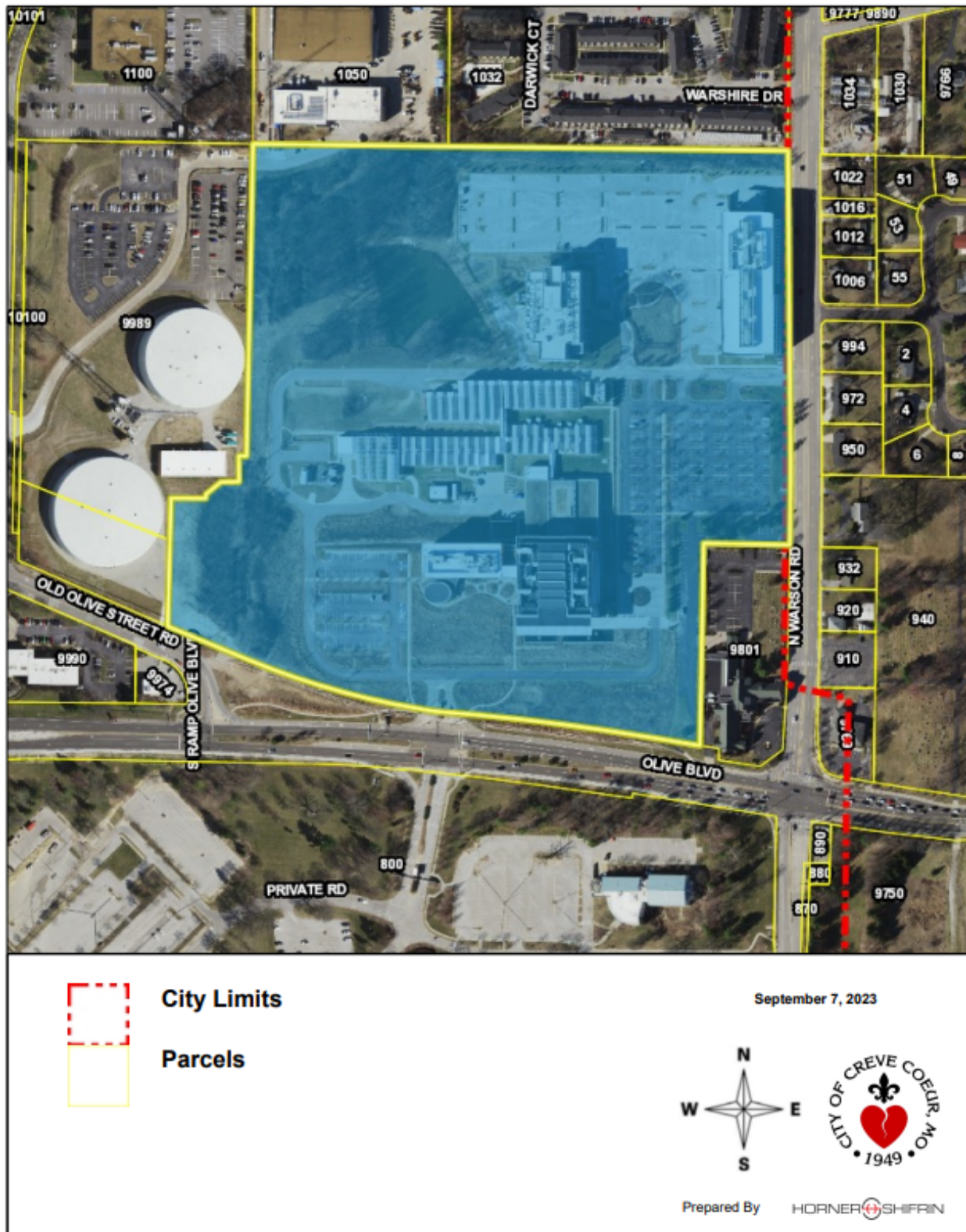
APPENDIX 1: COMPREHENSIVE PLAN

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





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 AGENDA APPLICATION

SITE DEVELOPMENT PLAN

Select Project Type: Site Development Plan ☒ Site Concept Plan ☐ Minor Site Plan ☐

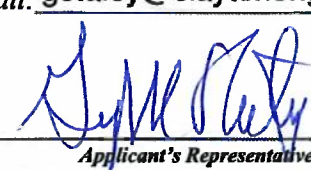
Title of Project: Donald Danforth Plant Science Center-Plant Growth Facility (PGF)

Location of Project: 975 N. Warson Road 63132 Locator # 17M540191

Subject for Agenda: New Plant Growth Facility Building

Applicant:

Architect ☐ Engineer ☐ Contractor ☐ Agent ☐ Owner ☒

Applicant:	Applicant's Representative (if applicable):
<u>Todd Hornburg</u> Name	<u>Greg Staley</u> Name
<u>Danforth Center</u> Company (If Applicable)	<u>The Clayton Engineering Company, Inc.</u> Company (If Applicable)
<u>975 N. Warson Rd.</u> Address	<u>2268 Welsch Industrial Court</u> Address
<u>Creve Coeur, MO 63132</u> Address	<u>St. Louis, MO 63146</u> Address
<u>Telephone # 314-587-1051</u>	<u>Telephone # 636-7515492</u>
<u>Fax #</u>	<u>Fax #</u>
<u>Email: THornburg@danforthcenter.org</u>	<u>Email: gstaley@claytoneng.com</u>
 Applicant's Signature	 Applicant's Representative's Signature

Owner's Acknowledgement (if different from applicant):

Name _____ Company (If Applicable) _____

Address _____

Phone _____ Fax _____ Email _____

Applicant's Signature _____

Description of Request (attach additional sheets as needed)

General Description: _____

We are looking for approval of our Site Development Plan.

Rationale

Please describe in detail, on an attached sheet, the reasons why you believe the request should be approved and what steps are being taken to lessen any impacts on surrounding residences and businesses. An explanation of the building and landscape designs (if changes are proposed) should also be included.

This building is an small extension off of the lower level of our A-Building. It is located near our dock area behind our main buildings. It is not visible from any public roads or surrounding residences or businesses. The building will be clad in a manganese brick in all areas that are visible from inside our existing building. The side of the building that faces our greenhouses will be clad in a matching metal panel. Landscaping will be added on the south and west side of the building with Missouri native plantings.

Submittal Checklist

- | | |
|--|--|
| ☒ Rationale | ☒ Building elevations for new construction |
| ☒ Site plan 4 hard copies | ☒ Photographs of existing structures |
| ☒ Access and parking plan-4 hard copies; (may be shown on site plan) | ☒ Materials samples for Commission review |
| ☒ Landscape plan 4 hard copies | ☒ Legal Description in Word format |
| ☒ Floor plan 4 hard copies | ☒ Fees: \$250 (non-refundable) |
| ☒ Electronic copies of all materials | ☒ \$2000 (refundable deposit) |
| | ☐ Other items as requested by staff |

Preferred Public Hearing Date: Monday, _____ September 18 , 2023 .

****Confirm schedule and available meeting dates with Planning Division staff****

Office Use Only

_____ All Sections Complete

_____ All Documents, incl. e-Copies

_____ Fees Paid

Received By: _____

Date: _____

Revised: 7/22

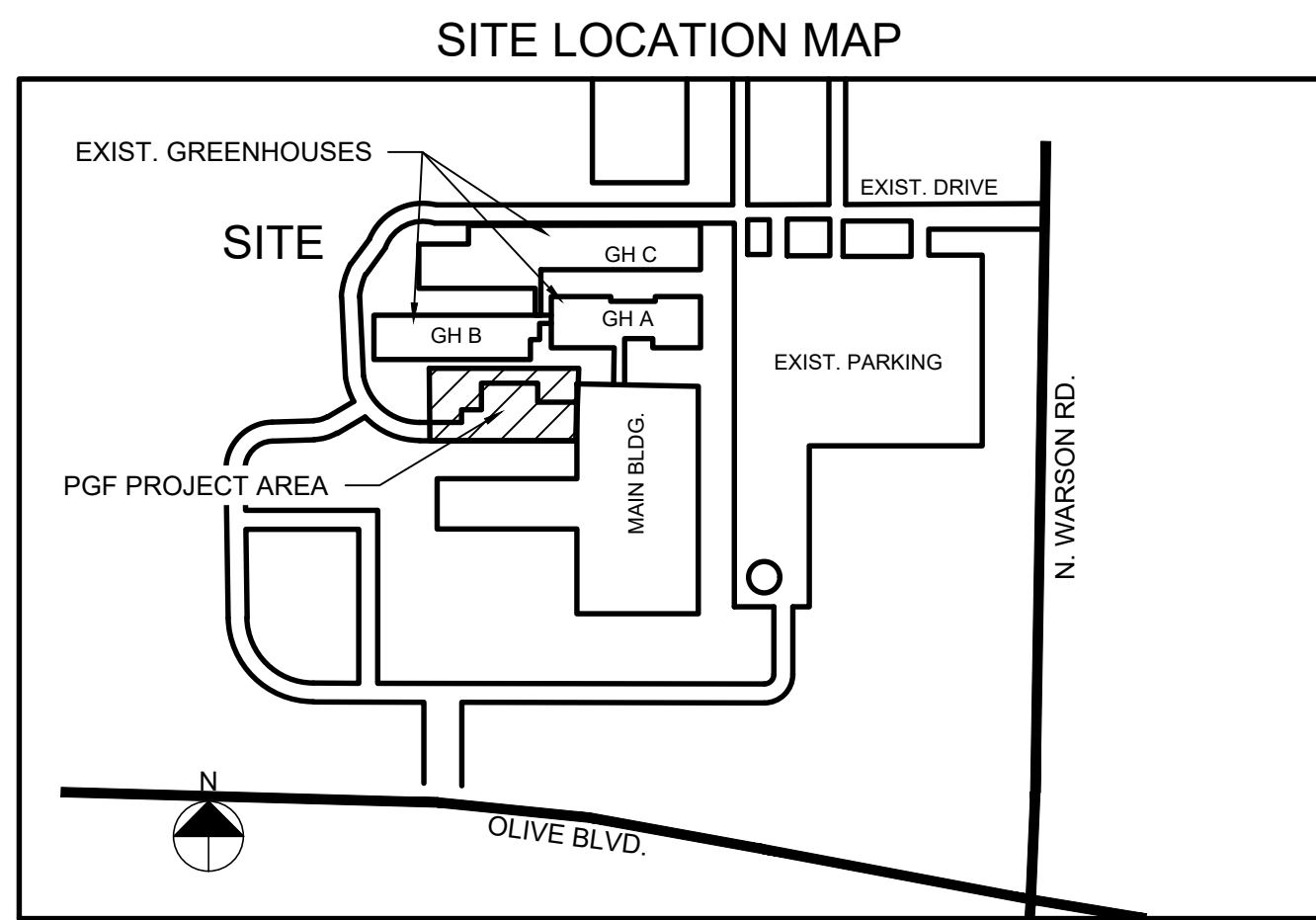
DONALD DANFORTH PLANT SCIENCE CENTER

SITE DEVELOPMENT PLAN

PLANT GROWTH FACILITY (PGF)

AGENCY CONTACTS:

Donald Danforth Plant Science Center (DDPSC)																									
				Exist. DDPSC Phase 1	Exist. DDPSC GH B	Exist. BRDG Bldg 1	Exist. DDPSC GH C ¹	Exist. DDPSC Expansn	Exist. DDPSC GHC Addn	Exist. DDPSC GH B Exp	Exist. EDGE @ BRDG	Prop. DDPSC PGF Bldg	Future DDPSC GH D	Future DDPSC GH E	Future BRDG Bldg 2	Future BRDG Bldg 3									
Zoning Regulations																									
Site Area																									
	Minimum Lot Area	5 Ac.	217,800	sf																					
	Total Site Area	40.305 Ac.	1,755,686	sf																					
Building Height (feet above MSI)	Grade elevation, finish floor elevation (Maximum height 6 stories or 90')				691.0	695.0	705.0	697.25	691.0	697.25	695.0	711.0	691.13	696.25	696.25	706.5	706.5								
	Basement		---		---	---	691.0	682.0	691.0	---	682.0	---	---	681.0	681.0	692.5	692.5								
	Headhouse		---		---	---	691.0	---	---	---	---	---	---	---	---	---	---								
	Level 1		711.0		---	705.0	---	711.0	---	695.0	711.0	691.13	696.25	696.25	706.5	706.5									
	Level 2		726.5		---	722.3	---	726.5	---	---	727.0	---	---	---	723.8	723.8									
	Level 3		742.0		---	737.0	---	742.0	---	---	741.5	---	---	---	738.5	738.5									
	Level 4		---		---	751.7	---	---	---	---	756.0	---	---	---	753.2	753.2									
	Penthouse		757.5		---	766.3	---	---	---	---	---	---	---	---	768.8	768.8									
	Height		774.0		715.0	778.3	719.24	769.2	719.24	721.0	772.5	708.13	722.25	722.25	782.9	782.9									
Building Footprint Areas (sf)	Main Building				34,080	---	25,700	---	22,265	---	---	40,820	6,829	---	---	21,600	25,700								
	Bridge (betw wings)				---	---	---	---	---	---	---	---	---	---	---	---	---								
	Headhouse (exposed)				23,580	---	---	---	1,743	---	---	---	---	---	---	---	---								
	Greenhouse				12,630	15,345	---	20,122	---	6,682	12,207	---	---	19,030	22,010	---	---								
	Ancillary Buildings																								
	Link (to Greenhouse)				660	543	---	580	---	---	---	---	---	1,080	525	---	---								
	Cooling Tower				815	---	265	---	---	---	---	---	---	---	---	300	300								
	Emergency Generator				450	---	160	160	462	---	200	---	---	200	200	200	200								
	Hazardous Waste Storage Facility ²				2,880	---	---	1,159	---	---	---	---	---	---	---	---	---								
	Grounds Maintenance				567	---	---	---	---	---	---	---	---	---	---	---	---								
Total Building Footprint Areas				75,662	15,888	26,125	23,764	22,727	6,682	12,407	40,820	6,829	20,310	22,735	22,100	26,200									
Building Floor Areas (sf)	Main Building ³				129,955	---	118,669	---	75,860	---	---	163,576	6,504	---	---	86,400	105,700								
	Bridge (betw wings)				---	---	---	---	---	---	---	---	---	---	---	---	---								
	Headhouse (exposed)				23,580	---	---	---	1,743	---	---	---	---	---	---	---	---								
	Greenhouse ⁴				12,630	15,345	---	36,915	---	6,682	22,250	---	---	38,060	44,020	---	---								
	Ancillary Buildings																								
	Link (to Greenhouse)				660	543	---	580	---	---	---	---	---	1,080	525	---	---								
	Hazardous Waste Storage Facility ²				2,880	---	---	1,159	---	---	---	---	---	---	---	---	---								
	Grounds Maintenance				567	---	---	---	---	---	---	---	---	---	---	---	---								
	Total Gross Building Floor Areas				170,272	15,888	118,669	40,397	75,860	6,682	22,250	163,576	6,504	39,140	44,545	86,400	105,700								
	Total Net Building Floor Areas ^{3,8}				91,660	0	79,382	0	42,925	0	0	131,716	6,504	0	0	64,800	79,275								
Building Efficiency				71%	---	67%	---	57%	---	0	80.5%	---	---	---	75%	75%									
Site Coverage (sf)	Maximum Site Coverage				60%	1,053,411	sf																		
	Building Footprints				75,662	15,888	26,125	23,764	22,727	6,682	12,407	40,894	6,829	20,310	22,735	22,100	26,200								
	Parking Garage Footprint				---	---	---	---	---	---	---	---	---	---	---	---	24,754								
	Church Parking Lot				---	28,124	---	---	---	---	---	---	---	---	---	---	---								
	Parking, Roads, Service				153,087	68,617	117,434	-2,063	81,410	---	3,354	173,165	(1,742)	25,328	(2,582)	50,816	7,169								
	Added Parking S. of Danforth Entrance Drive				---	---	---	---	---	---	---	---	---	---	---	1,751	---								
	Site Coverage Area				228,749	112,629	143,559	21,701	104,137	6,682	15,761	214,059	5,087	45,638	20,153	74,667	58,123								
	Cumulative Site Coverage Area				228,749	341,378	484,937	506,638	610,775	617,457	633,218	847,277	852,364	678,856	699,009	773,676	831,799								
	Cumulative Site Coverage Ratio				13%	19%	28%	29%	35%	35%	36%	48%	49%	39%	40%	44%	47%								
Floor Area Ratio (FAR)	Maximum FAR				0.5	877,843	sf																		
	Gross Floor Area (sf)				129,955	na	118,669	na	75,860	na	na	na	6,504	na	na	86,400	105,700								
	Cumulative Gross Floor Area				129,955	na	248,624	na	324,484	na	na	na	330,988	na	na	410,884	516,584								
	Cumulative FAR				0.07	na	0.14	na	0.18	na	na	na	0.19	na	na	0.23	0.29								
Parking Requirements	Laboratory: 1 space per 400 sf of floor area ⁸																								
	Auditorium: 1 space per 4 seats																								
	Parking Spaces Provided																								
	Regular (9'x19')		223	0	214	0	98	0	0	0	0	40	0	0	30	-180									
	Reserved / Visitor		18	0	28	0	14	0	0	0	0	0*	0	0	0	-20									
	Accessible		7	0	9	0	5	0	0	0	0	0*	0	0	0	-2									
	Parking Garage		---	---	---	---	---	---	---	---	---	---	---	---	---	390									
	St. Paul's Church Parking Agreement ⁵												---	0	0	0	---	0	0	0	---				
	Added Parking S. of Danforth Entrance Drive												---	0	0	0	---	0	0	0	---				
	Phantom Parking ⁶												---	0	0	0	---	0	0	0	20				
BRDG Park Phantom Parking ⁷												---	0	0	0	---	0	0	0	---					
Total Parking Provided				248	0	251	0	208	0	0	0	40	0	0	30	208									
Cumulative Total Parking Provided				248	248	499	499	707	707	707	707	747	707	707	737	945									
Parking Required	Parking Required		1 sp /	400 sf	229	0	199	0	108	0	0	330	19	0	0	162	199								
	Auditorium		1 sp /	4 seats	---	---	---	---	29	---	---	---	---	---	---	---	---								
	Cumulative Parking Required				229	229	428	428	565	565	895	584	565	565	727	926									
	Difference				19	19	71	71	142	142	142	-188	163	142	142	10	19								
	Cumulative Parking Ratio Provided				1 space / X sf	370	na	343	na	303	303	na	na	295	na	na	378	na							
					2.71	2.92	na	3.30	3.30	na	na	3.49	na	na	2.64	na									
Loading Space Requirements	Gross Building Square Footage												129,955	na	118,669	na	75,860	na	na	na	6,504	na	na	86,400	105,700
	1 sp / first 40k to 100k sf + 1 sp / each add'l 100k												2	na	2	na	1	na	na	na	na	na	na	1	2
	Loading Spaces Provided												3	0	2	1	0	0	1	1	0**	0	0	2	2
Footnotes:																									
1 - Includes GH C greenhouse expansion & phenotyping headhouse expansion.																									
2 - Existing Hazardous Waste Storage Building removed & replaced with a Material Containment Building under DDPSC GH C project.																									
3 - The actual square footage is used for the existing buildings.																									
4 - Includes GH C Basement.																									
5 - Per three agreements between DDPSC & St. Paul's Church, they share 75 parking spaces. Recorded agreements are: Original DB 12247/Pg 577; First Amendment DB 17288/Pg 4466; & Second Amendment DB 18563/Pg 4172.																									
6 - "Reserved" spaces not built & an area reserved for parking should there be a need to add these spaces for function.																									
7 - 0* There are accessible parking spaces near the entry to the existing main building.																									
8 - Parking calculations are based on net floor area of one space per 400 square feet for laboratory. Net floor area is defined as the total interior floor area of a building excluding stairwells, lobbies, common corridors and other non-leasable circulation areas, elevator shafts, parking structures and space occupied by mechanical equipment. Support spaces include the greenhouses, links, atriums, mechanical rooms, and headhouses.																									
9 - Parking, Roads and Service Areas associated with existing BRDG Building 1 are included in the proposed Edge @ BRDG Calculations.																									
10 - As part of the proposed Edge @ BRDG Project 242 spaces associated with overall campus are removed, and 432 spaces are added (711-242)=469; (469+431)=900																									
11 - Site Area assumes removal of pavement within footprint of future building and includes the future parking garage as pavement.																									
12 - 0** Loading Space Requirements for PGF: The existing loading docks that will be utilized.																									
13 - Information provided for EDGE @ BRDG was taken from submittal package by Stock & Associates per SCP-1 dated 4/19/2019.																									



ABBREVIATIONS		Call Before You DIG	
	NF	Now or Formerly	
	OHE	Overhead Electric	
	OIP	Old Iron Pipe	Dial 811 or TOLL FREE 1-800-344-7483 toll-free
	PB	Pipe	
	PC	Plat Book	MISSOURI ONE-CALL SYSTEM INC.
	PIV	Post Indicator Valve	
	PL	Property Line	
	PP	Polypropylene Pipe	
	PVC	Polyvinyl Chloride Pipe	
	Pwt	Pavement	
	R	Radios	Underground facilities, structures & utilities have been plotted for available surveys, records & information, and therefore, do not necessarily reflect the actual location, nonexistence, size, type, number, or location of these facilities, structures, & utilities.
	RCP	Reinforced Concrete Pipe	
	R/W	Right-of-Way	The Contractor shall be responsible for verifying the actual location of all underground facilities, structures, & utilities, either shown or not shown on these plans. Use the underground facility structures, & utilities shall be located in the field prior to a grading, excavation or construction of improvements. The provisions shall in no way absolve any party from complying with the Underground Facility Safety and Damage Prevention Act.
	Sig	Signal	
	TH	Test Hole Location	
	TBR	To Be Removed	
	TB	To Be Back	The original signed and sealed of this drawing is on file at the office of The Clayton Engineering Company. Any modifications to this drawing shall reflect the Clayton Engineering Company, The Engineer and/or Surveyor whose seal appears hereon from any liability for errors, omissions, and/or modifications. The signed and sealed original is the official document and shall take precedence over any digital version.
	TBCE	To Be Replaced	
	TC	Top of Curb	
	TCI	Top of Cast Iron	
	TJ	Telephone Junction Box	
	TM	Telephone Manhole	
	TS	Transformer	
Tran or Trans	Tr	Transformer	
	TP	Top of Pole	
	TWK	Top of Walk	
	Tpt	Typical	
	UG	Underground Electric	
	UGFO	Underground Fiber Optic	
	UGT	Underground Telephone	
	UP	Use in Place	
	UP	Utility Pole	
	VCP	Vertical Cast Pipe	
	WM	Water Meter	
	W/MH	Water Manhole	
	WV	Water Valve	
	32L31075	MSD Survey Identification	

CITY OF CREVE COEUR NOTES

1. All signs shall conform to the City of Creve Coeur sign ordinance requirements. Sign locations and sizes cannot be approved with the Site Improvement Plans; a separate application must be made to the Department of Community Development.
2. All utilities shall be placed underground.
3. No monument signs or their proposed locations can be approved with these documents. A separate Sign Application must be submitted to the Department of Community Development for review and approval.
4. Safety notice to Contractor: In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.
5. All private sewers are under MSD and the City of Creve Coeur's inspection. The sewer contractor must notify both agencies for inspections.
6. The contractor shall verify manhole locations under the direction of a licensed land surveyor or registered engineer. The Contractor will be required to remove and replace any sewer reach under an as-built grade which is flatter than the design grade by more than 0.15%. Sewers with grades greater than the design slope may be left in place, provided no other sewer grade is reduced by this variance in the as-built grade.
7. MSD and the City of Creve Coeur's Construction Inspector also reserve the right to require the Contractor to remove and replace any sewer (at any time prior to final inspection approval) if the as-built grade is flatter than the design grade by more than 0.15% as shown on the above paragraph.
8. The Sewer Contractor shall be responsible for any costs associated with the field verification of the sewer grade, or removal and replacement of the sewer pipe or associated appurtenances.
9. The contractor shall be responsible for the razing and removal of structures, including foundations, related utilities, paving, underground facilities and any other existing improvements.
10. Contractor is to remove and dispose of, off site, all debris, rubbish and other materials resulting from demolition operations.
11. The contractor will be held solely responsible and shall take all precautions necessary to avoid damage to adjacent properties during all phases of the demolition.
12. Burning on site will be allowed if approved by EPA, St. Louis County, City of Creve Coeur, and the Danforth Center.
13. Disposal of material on-site will only be allowed as directed by the owner and geotechnical engineer and approved by the City of Creve Coeur Public Works Department.
14. The General Contractor must be on file with the Missouri One Call System 1-800-344-7483.
15. The Site Improvement Plans approved by the City of Creve Coeur does not allow the removal or construction of any sanitary or storm sewer lines without the prior approval or consent of MSD.
16. The contractor shall restore offsets construction areas to an equal or better condition than existed prior to the commencement of work.
17. All filled places under proposed storm and sanitary sewer lines and/or paved areas shall be compacted to 90% maximum density as determined by the modified AASHTO T-180 compaction test test or 95% of maximum density as determined by the Standard Proctor Test AASHTO T-99. A sealed copy of all test results shall be submitted to the City of Creve Coeur for review and approval.
18. All excavations, grading, or filling shall have a finished grade not to exceed a 3:1 slope (33 percent). Steeper grades may be approved by the Designated Official if the excavation is through rock or the excavation or the fill is adequately protected (a designed head wall or toe wall may be required). Retaining walls that exceed a height of four (4) feet shall require the construction of safety guards as identified in the appropriate section(s) of the adopted IBCA Manual and shall be approved by the City Building Department. Penetration and placement of all material shall be in accordance with appropriate section(s) of the adopted IBCC Codes.
19. Provisions shall be made to accommodate the increased runoff caused by changed soil and surface conditions during the after grading. Unvegetated open areas shall be designed to prevent erosion of mud and soil. The contractor shall be responsible for the design and construction of the erosion control.
20. 5 ft/s shall be established in permanent vegetation by use of commercial erosion control blankets or lined with rock riprap or concrete or other suitable materials as approved by the Designated Official. Detention basins, diversions, or other appropriate structures shall be constructed to prevent velocities above 5 ft/s.
21. All filled places in proposed roads shall be compacted from the bottom of the fill up to 90% maximum density as determined by the modified AASHTO T-180 compaction test or 95% of maximum density as determined by the Standard Proctor Test AASHTO T-99. A soil's engineer shall verify all tests concurrent with grading and backfilling operations. A sealed copy of the result reports shall be give to the City of Creve Coeur Construction Inspector.
22. All proposed roads must be free of mud or mud residue or any other material that may be detrimental to the road surface or the surrounding area.
23. Sediment and erosion control plans for sites that exceed 20,000 square feet of grading shall provide for sediment or debris basins, silt traps or filters, staked straw bales or other approved measures to remove sediment from run-off waters. The design to be approved by the Designated Official. Temporary siltation control measures (structural) shall be maintained until vegetative control is established on the site. The City of Creve Coeur's Construction Inspector shall be notified to require the Contractor to replace or add additional siltation control.
24. Where natural vegetation is removed during grading, vegetation shall be reestablished in such a density as to prevent erosion. Permanent type grasses shall be established as soon as possible or during the next seeding period after grading has been completed.
25. During seeding operations, the contractor shall be required to provide permanent seed shall be established at sufficient density to provide erosion control on the site. Between permanent grass seeding periods, temporary cover shall be provided according to the Designated City Official's recommendation.
26. All finished grades (areas not to be disturbed by future improvement) in excess of 20 percent slopes (5:1) shall be mulched and tacked at the rate of 100 lbs/1000 sq. ft. of area.
27. The adjoining ground to development sites (lots) shall be provided with protection from accelerated and increased surface water, silt from erosion, and any other consequences or erosion. Run-off water from developed areas (parking lots, paved sites and buildings) above the area to be developed shall be directed to existing or proposed detention basins and/or underground outfall systems. Sufficiently anchored straw bales may be temporarily substituted with the approval of the Designated City Official.
28. Per section 26-62 of the City Zoning Ordinance, the Site Improvement Plans, approved by the City of Creve Coeur, shall include a **Formal Landscape and Irrigation Plan**, approved by the Department of Community Development. A detailed Landscape and Irrigation Plan indicates proposed new planting and the location of existing landscape material including trees, plant material and planting methods for all such landscape material in accordance with accepted landscape architectural procedures and standards. Also, location of the irrigation landscape system, including the water source, pipe, location of water tap, stop valve and box, meter, meter box and meter yoke (per Missouri American Water Company), sprinklers, piping, control valves, nozzles, controller, backflow preventer, backflow prevention assembly, and other equipment shall be shown. The plan shall be subject to the acceptance by the City of Creve Coeur, and the Landscape and Irrigation System are in place and accepted by the Department of Community Development.

AGENCY CONTACTS

DONALD DANFORTH PLANT SCIENCE
CENTER
975 North Warson Road
Creve Coeur, Missouri 63132
Phone: (314) 587-1051
Fax: (314) 587-1151
Contact: Mr. Todd Hornburg

CITY OF CREVE COEUR
300 North New Ballas Road
Creve Coeur, Missouri 63141
Phone: (314) 442-2067
Fax: (314) 872-2505

CREVE COEUR FIRE PROTECTION DISTRICT
11221 Olive Boulevard
St. Louis, Missouri 63141-7652
Phone: (314) 432-5570
Fax: (314) 432-2367
Contact: Fire Marshal Art Qestereich

SPIRE
4118 Shrewsbury Avenue
St. Louis, Missouri 63119
Phone: (314) 342-0680
Fax: (314) 768-7744
Contact: Chris Proctor

AMERICAN WATER COMPANY
727 Craig Road
Creve Coeur, Missouri 63141
Phone: (314) 996-2465
Fax: (314) 569-3972
Contact: Gina Myers

AMEREN MISSOURI
P.O. Box 66149, Mail Code 657
St. Louis, Missouri 63166
Phone: (314) 344-6504
Fax: (314) 344-9847
Contact: Randy Hunt

AT&T
402 North Third Street
St. Charles, Missouri 63301
Phone: (636) 949-4228
Fax: (636)
Contact: Tom Merkle

MSD (METROPOLITAN ST. LOUIS
SEWER DISTRICT)
2350 Market Street
St. Louis, Missouri 63103
Phone: (314) 768-6200
Fax: (314) 768-6342

CHARTER COMMUNICATIONS
941 Charter Commons Drive
Town & Country, Missouri 63011
Phone: (636) 207-7044
Fax: (636) 207-7871

GENERAL DEVELOPMENT NOTES:

1. PROJECT NAME: DONALD DANDFORTH PLANT SCIENCE CENTER - PLANT GROWTH FACILITY
2. SITE ADDRESS: 975 NORTH WARSON ROAD 69132
3. ST. LOUIS COUNTY LOCATOR NO. 17M540191
4. OWNER: DONALD DANDFORTH PLANT SCIENCE CENTER
5. PROPERTY AREA: 40.305 Ac.
6. CURRENT ZONING: RO - RESEARCH & OFFICE PARK DISTRICT
7. PROPOSED USE: RESEARCH LABORATORY
8. WATERSHED: RIVER DES PERES / MISSISSIPPI RIVER
9. FLOOD DISTRICT: GREVE COEUR
10. SCHOOL DISTRICT: LADUE
11. ELECTRIC SERVICE: AMEREN MO
12. GAS SERVICE: SPIRIT
13. WATER SERVICE: AMERICAN WATER COMPANY
14. STORM / SANITARY SERVICE: ST. LOUIS
15. METROPOLITAN SEWER DISTRICT (MSD)
16. TELEPHONE SERVICE: AT&T
17. STORMWATER DETENTION CAPACITY PROVIDED BY THE EXISTING LAKE/DETENTION BASIN, LAST EXCEEDED PREVIOUS MSD P-26102-00, WILL BE EXCEEDED BY THIS AND CONCURRENT BRD PARK PROJECT. THE EXISTING DETENTION BASIN SHALL BE MODIFIED BY THIS PROJECT TO MEET PREVIOUS EXISTING STORMWATER DETENTION CAPACITY, AS DETERMINED BY PREVIOUS MSD P-26102-00.
18. ALL SEWERS TO MEET THE REQUIREMENTS OF MSD.

ISTNER ARCHITECTS

ARCHITECTS | DESIGNERS | PLANNERS | LANDSCAPE ARCHITECTS

621 NORTH SKINKER | ST. LOUIS, MISSOURI 63130
TEL 314 725 2927 | FAX 314 725 2928
CHRISTNERARCHITECTS.COM
CERTIFICATE OF AUTHORITY - 000842

OWNER:
DONALD DANFORTH PLANT SCIENCE CENTER
975 N WARSON ROAD, ST. LOUIS, MO 63132
314-587-1051

STRUCTURAL:
IMEG CORP.
15 SUNNEN DRIVE, SUITE 104, ST. LOUIS, MO 63143
314-645-1132
CERTIFICATE OF AUTHORITY
MECHANICAL PLUMBING

IMEG CORP.
15 SUNNEN DRIVE, SUITE 104, ST. LOUIS, MO 63141
314-645-1132
CERTIFICATE OF AUTHORITY

CIVIL:
THE CLAYTON ENGINEERING COMPANY, INC.
2268 WELSCH INDUSTRIAL CT, ST. LOUIS, MO 6314
314-692-8888
MO CERT. OF AUTHORITY-PROF. ENGINEERING
#000067 & PROF. SURVEYING #000014

LIFE SAFETY:
CCI
2043 WOODLAND PKWY, #300, ST. LOUIS, MO 6314
314-991-2633
CERTIFICATE OF AUTHORITY

REVISION SCHEDULE

NO	DATE	REVISIONS
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PROPERTY DESCRIPTION

**ADJUSTED SUBDIVISION OF THE THIRD AMENDMENT TO THE BIO RESEARCH & DEVELOPMENT
GROWTH PARK AT THE DANFORTH CENTER CONDOMINIUM**

A TRACT OF LAND BEING PART OF THE ORIGINAL SUBDIVISION OF THE THIRD AMENDMENT TO THE BIO RESEARCH & DEVELOPMENT GROWTH PARK AT THE DANFORTH CENTER CONDOMINIUM, RECORDED IN PLAT BOOK 367 PAGES 323-325 OF THE ST. LOUIS COUNTY RECORDER'S OFFICE, AND BEING SITUATED IN THE NORTHEAST QUARTER OF SECTION ONE, TOWNSHIP 45 NORTH, RANGE 5 EAST, ST. LOUIS COUNTY, MISSOURI AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE NORTHERN LINE OF SAID SECTION ONE, AT THE NORTHEAST CORNER OF A TRACT OF LAND NOW OR FORMERLY CONVEYED TO ST. LOUIS COUNTY WATER COMPANY, BY INSTRUMENT RECORDED IN DEED BOOK 744, PAGE 599 OF THE ST. LOUIS COUNTY RECORDER'S OFFICE, SAID POINT IS ALSO THE NORTHWEST CORNER OF THE THIRD AMENDMENT TO THE BIO RESEARCH & DEVELOPMENT GROWTH PARK AT THE DANFORTH CENTER CONDOMINIUM, RECORDED IN PLAT BOOK

[illegible]

ALONG SAID EAST LINE, A DISTANCE OF 308.86 FEET TO A POINT; THENCE DEPARTING SAID EAST LINE, SOUTH 88 DEGREES 31 MINUTES 49 SECONDS EAST, A DISTANCE OF 83.54 FEET TO A POINT; THENCE NORTH 00 DEGREES 28 MINUTES 11 SECONDS EAST, A DISTANCE OF 9.42 FEET TO A POINT; THENCE NORTH 51 DEGREES 03 MINUTES 37 SECONDS EAST, A DISTANCE OF 46.91 FEET TO A POINT; THENCE NORTH 89 DEGREES 05 MINUTES 44 SECONDS EAST, A DISTANCE OF 43.48 FEET TO A POINT; THENCE NORTH 00 DEGREES 34 MINUTES 16 SECONDS WEST, A DISTANCE OF 61.63 FEET TO A POINT ON THE WEST LINE OF SAID TRACT, BEING THE CORNER OF SAID ST. LOUIS COUNTY WATER COMPANY BY INSTRUMENT RECORDED IN DEED BOOK 744, PAGE 599 OF SAID COUNTY RECORDS; THENCE SOUTH 88 DEGREES 40 MINUTES 31 SECONDS EAST, A DISTANCE OF 18.89 FEET TO AN OLD STONE; THENCE NORTH 01 DEGREE 19 MINUTES 29 SECONDS EAST, A DISTANCE OF 745.67 FEET TO THE POINT OF BEGINNING, CONTAINING 1,748.419 SQUARE FEET OR 40.138 ACRES,

CIVIL SITE DEVELOPMENT PLAN SHEET INDEX

SDP-1	COVER SHEET
SDP-2	EXISTING CONDITIONS EXHIBIT - OVERALL
SDP-3	PROPOSED SITE / UTILITY PLAN - PROJECT AREA

MSD Ref. No.:23MSD-00273
MSD Base Map :17M
Zip Code : 63132

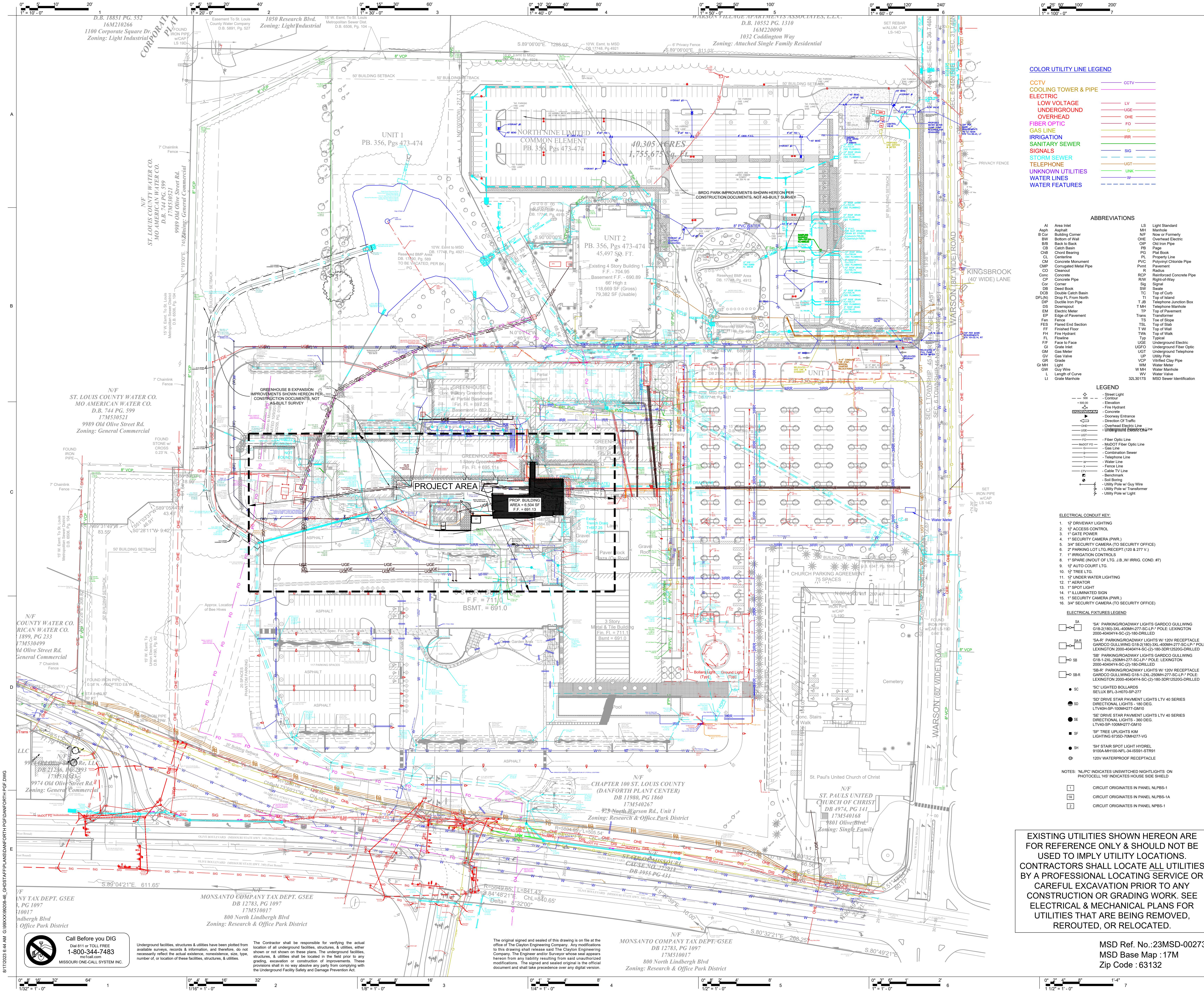
CEC PROJECT NO: 99208.48 SHEET NO

PROJECT NO: 22039

DATE: AUGUST 15, 2023

SDP-1

FOR CONSTRUCTION



- COLOR UTILITY LINE LEGEND**
- CCTV
 - COOLING TOWER & PIPE
 - ELECTRIC
 - LOW VOLTAGE
 - UNDERGROUND
 - OVERHEAD
 - FIBER OPTIC
 - GAS LINE
 - IRRIGATION
 - SANITARY SEWER
 - STORM SEWER
 - TELEPHONE
 - UNKNOWN UTILITIES
 - WATER LINES
 - WATER FEATURES

- ABBREVIATIONS**
- | | | | |
|-------|--------------------|-------|--------------------------|
| AI | Area Inlet | LS | Light Standard |
| Asph | Asphalt | MH | Manhole |
| B Cor | Building Corner | NF | Now or Formerly |
| BW | Bottom of Wall | OHE | Overhead Electric |
| BB | Back to Back | Old | Old Iron Pipe |
| CB | Catch Basin | PL | Page |
| CHB | Chord Bearing | PL | Plat Book |
| CL | Centerline | PL | Property Line |
| CM | Concrete Monument | PVC | Polyvinyl Chloride Pipe |
| CMP | Concrete Monument | P | Pavement |
| CO | Cleanout | R | Radius |
| Conc | Concrete | RCR | Reinforced Concrete Pipe |
| CP | Concrete Pipe | R/W | Right-of-Way |
| Cor | Corner | SG | Signal |
| CS | Cast Block | SW | Swale |
| DCB | Double Catch Basin | TS | Top of Curb |
| DL(N) | Drop FL From North | TI | Top of Island |
| DIP | Drill Hole Pipe | TJ | Telephone Junction Box |
| DS | Downspout | TMH | Telephone Manhole |
| EM | Electric Meter | TP | Top of Pavement |
| EP | Edge of Pavement | Trans | Transformer |
| F | Face | TS | Top of Slope |
| FES | Flared End Section | TS | Top of Slab |
| FF | Finished Floor | TW | Top of Wall |
| FF | Fire Hydrant | Typ | Typical |
| FL | Flowline | UGE | Underground Electric |
| FF | Face to Face | UGF | Underground Fiber Optic |
| GI | Grate Inlet | UGP | Underground Telephone |
| GM | Gas Meter | UP | Utility Pole |
| GV | Gas Valve | VCP | Vitrified Clay Pipe |
| GR | Grade | VM | Water Meter |
| GMH | Gas Meter | WM | Water Manhole |
| GW | Guy Wire | WV | Water Valve |
| L | Length of Curve | WV | Water Valve |
| LI | Light | WV | Water Valve |
| LI | Light | WV | Water Valve |

- LEGEND**
- Street Light
 - Contour
 - Fire Hydrant
 - Downspout
 - Direction of Traffic
 - Overhead Electric Line
 - Underground Electric Line
 - Fiber Optic Line
 - McDOT Fiber Optic Line
 - Gas Line
 - Combination Sewer
 - Telephone Line
 - Water Line
 - Fence Line
 - Cable TV Line
 - Soil Boring
 - Utility Pole w/ Guy Wire
 - Utility Pole w/ Transformer
 - Utility Pole w/ Light

- ELECTRICAL CONDUIT KEY**
- 1" DRIVEWAY LIGHTING
 - 1" ACCESS CONTROL
 - 1" GATE POWER
 - 1" SECURITY CAMERA (PWR.)
 - 3/4" SECURITY CAMERA (TO SECURITY OFFICE)
 - 2" PARKING LOT LTO RECEIPT (120 & 277 V)
 - 1" IRRIGATION CONTROLS
 - 1" SPARE (INOUT OF LTO J.B. W/ IRRIG. CONTROL #7)
 - 1" AUTO COURT LTO
 - 12" TREE LTO
 - 12" UNDER WATER LIGHTING
 - 12" AERATOR
 - 1" SPOT LIGHT
 - 1" ILLUMINATED SIGN
 - 1" SECURITY CAMERA (PWR.)
 - 3/4" SECURITY CAMERA (TO SECURITY OFFICE)

- ELECTRICAL FIXTURES LEGEND**
- SA' PARKING/ROADWAY LIGHTS GARDCO GULLING G18-2180-3XL-400MH-277-SC-PL* POLE: LEXINGTON 2000-400V-SC-2-180-DRILL
 - SAR' PARKING/ROADWAY LIGHTS W/ 120V RECEPTACLE GARDCO GULLING G18-2180-3XL-400MH-277-SC-PL* POLE: LEXINGTON 2000-400V-SC-2-180-DRILL
 - SB' PARKING/ROADWAY LIGHTS GARDCO GULLING G18-12XL-250MH-277-SC-PL* POLE: LEXINGTON 2000-400V-SC-2-180-DRILL
 - SB-R' PARKING/ROADWAY LIGHTS W/ 120V RECEPTACLE GARDCO GULLING G18-12XL-250MH-277-SC-PL* POLE: LEXINGTON 2000-400V-SC-2-180-DRILL
 - SC' LIGHTED BOLLARDS SELUX BFL-3-H070-SP-277
 - SD' DRIVE STAR PAVEMENT LIGHTS LTV 40 SERIES DIRECTIONAL LIGHTS - 180 DEG LTV40-SP-100M-277-GR10
 - SE' DRIVE STAR PAVEMENT LIGHTS LTV 40 SERIES DIRECTIONAL LIGHTS - 360 DEG LTV40-SP-100M-277-GR10
 - SF' TREE UPLIGHTS KIM LIGHTING 673SD-70MH-277-VG
 - SH' STAR SPOT LIGHT HYDREL 9100A-MH100-NFL-34-SS91-STR1
 - 120V WATERPROOF RECEPTACLE

- NOTES:**
- NLPIC INDICATES UNSWITCHED NIGHTLIGHTS ON PHOTOCELL. 'HS' INDICATES HOUSE SIDE SHIELD
 - CIRCUIT ORIGINATES IN PANEL NLPBS-1
 - CIRCUIT ORIGINATES IN PANEL NLPBS-1A
 - CIRCUIT ORIGINATES IN PANEL NLPBS-1

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MSD Ref. No.: 23MSD-00273
MSD Base Map: 17M
Zip Code: 63132

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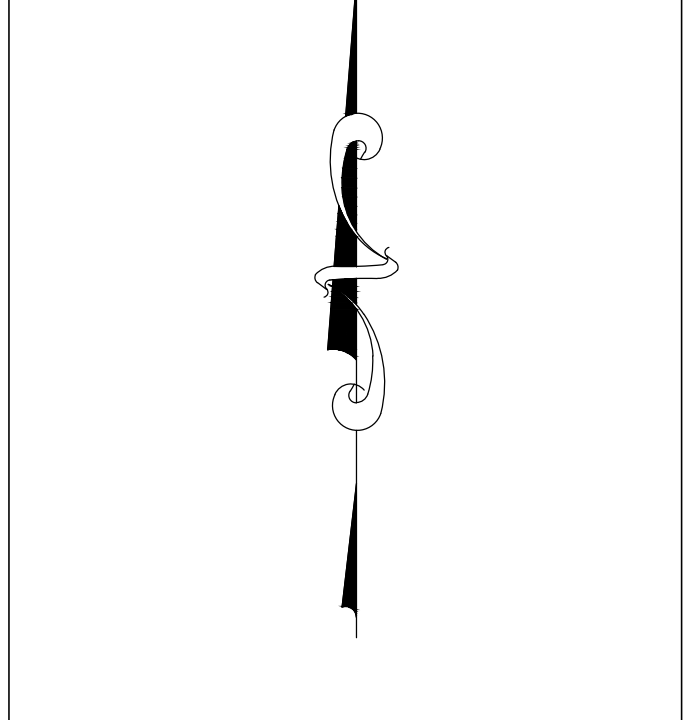
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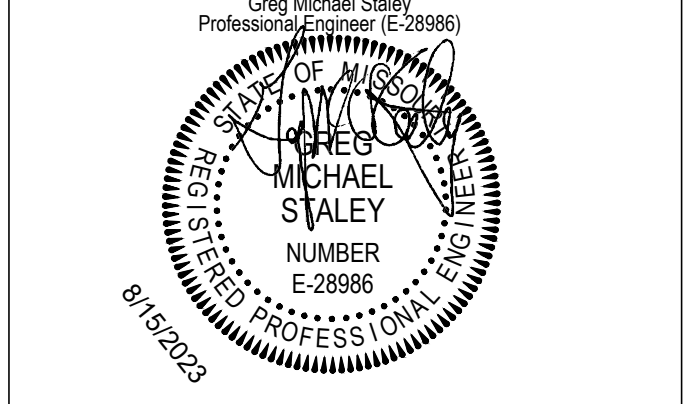
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Scale 1" = 60'
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REVISION SCHEDULE		
NO	DATE	REVISIONS
1	7/14/2023	PERMIT SET



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DANFORTH PGF ADDITION

EXISTING CONDITIONS EXHIBIT - OVERALL

CEC PROJECT NO: 99208.48
PROJECT NO: 22039
DATE: AUGUST 15, 2023

SHEET NO
SDP-2

FOR CONSTRUCTION

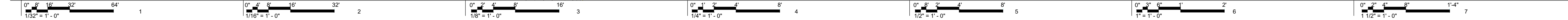
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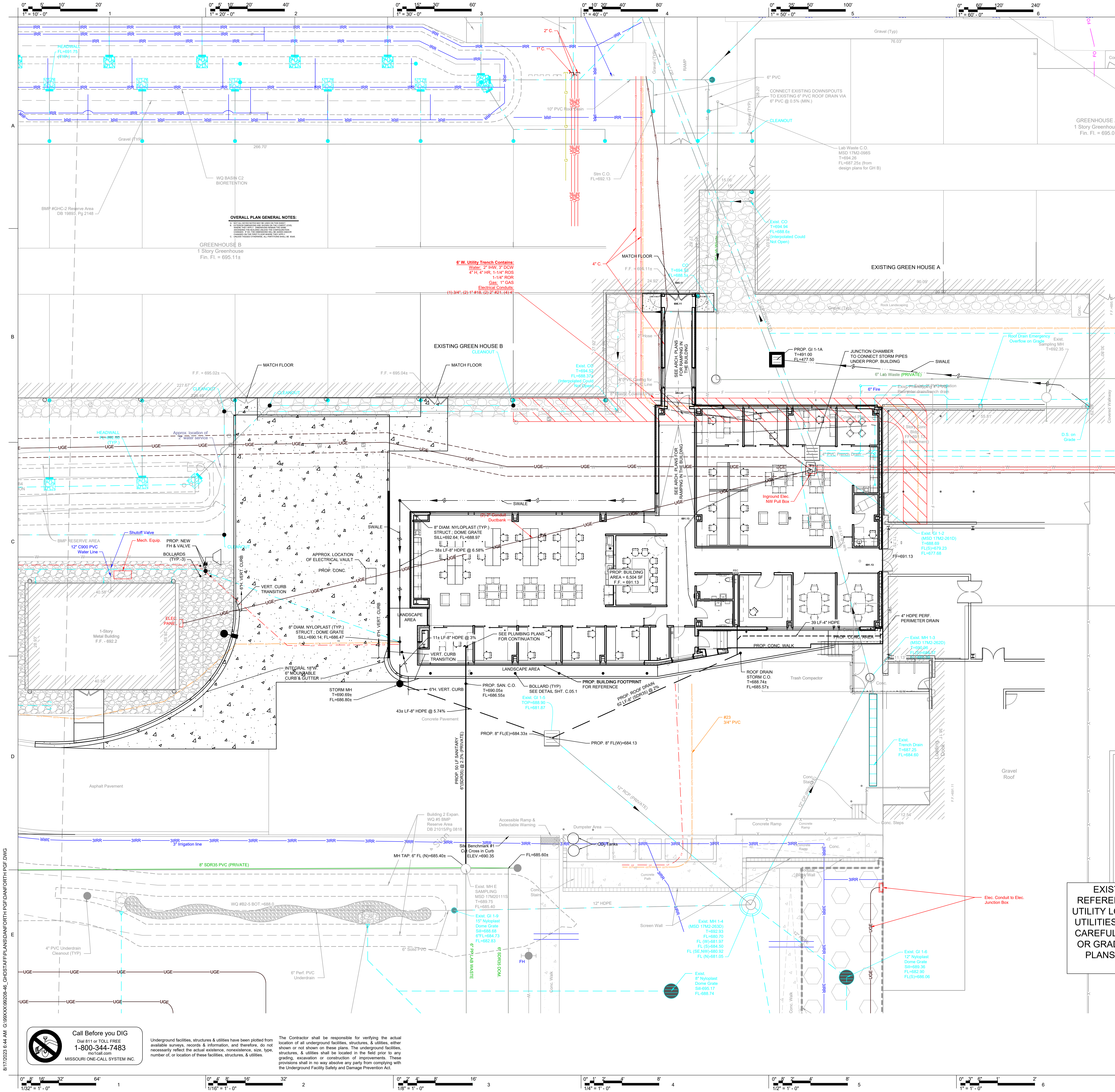
Underground facilities, structures & utilities have been plotted from available surveys, records & information, and therefore, do not necessarily reflect the actual existence, nonexistence, size, type, number of, or location of these facilities, structures, & utilities.

The Contractor shall be responsible for verifying the actual location of all underground facilities, structures, & utilities, either shown or not shown on these plans. The Contractor shall be responsible for any liability resulting from said unauthorized modifications. The signed and sealed original is the official document and shall take precedence over any digital version.

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MONSANTO COMPANY TAX DEPT. GSEE
DB 12783, PG 1097
17M510017
800 North Lindbergh Blvd
Zoning: Research & Office Park District





COLOR UTILITY LINE LEGEND

CCTV	---	CCTV
COOLING TOWER & PIPE	---	
ELECTRIC	---	
LOW VOLTAGE	---	
UNDERGROUND	---	
OVERHEAD	---	
FIBER OPTIC	---	
GAS LINE	---	
IRRIGATION	---	
SANITARY SEWER	---	
SIGNALS	---	
STORM SEWER	---	
TELEPHONE	---	
UNKNOWN UTILITIES	---	
WATER LINES	---	
WATER FEATURES	---	

SHOWN & SEALED SHOP DRAWINGS SHALL BE SUBMITTED TO THE CIVIL ENGINEER ON THESE PLANS FOR REVIEW. THE CONTRACTOR SHALL FORWARD THE APPROVED SHOP DRAWINGS TO MSD FOR THEIR APPROVAL PRIOR TO CONSTRUCTION OF SEWERS. MSD CONTACT: BRIAN DUNN AT 314-335-2072.

- MSD NOTES:
- STANDARD CONSTRUCTION: All storm and sanitary sewer structures and appurtenances to be dedicated to MSD, to be private under MSD inspection (PUMI), or private shall conform to the Metropolitan St. Louis Sewer District, Standard Construction Specifications for Sewers and Drainage Facilities, 2009. That will include standard details shown therein, and shall include all subsequent changes made thereto.
 - SHOP DRAWING REVIEW NOTE: Shop drawings shall be submitted to the civil engineer on these plans for review. The civil engineer shall forward approved shop drawings to MSD for their approval prior to construction of the BMPs. MSD contact Brian Dunn at 314-335-2072.
 - FILL OR REMOVE ABANDONED SEWERS (PIPE TBA / TBR): Abandoned sewers shall be removed or completely filled with grout. MSD permits are required prior to the abandonment or removal of existing sewers. To receive MSD permits the project must have MSD plan approval. Notify MSD 48 hours prior to sewer abandonment and/or removal.
 - LIMITS OF DISTURBANCE: The Contractor shall stay within the limits of disturbance as shown on the plans & minimize disturbance within the work area wherever possible.
 - REMOVE, REPLACE, OR REHABILITATE STRUCTURE (TBR&R): The removal and replacement, or rehabilitation of the existing structure(s) will be determined by the MSD field inspector. If the structure is determined to remain in place, then the top shall be adjusted to grade, if needed.
 - PARTIAL REMOVAL OR CONVERSION OF A STRUCTURE: The partial removal, replacement, and conversion of the existing structure(s) will be determined by the MSD field inspector. If the structure is determined to remain in place, and the top section can be converted as proposed, and still meet MSD standards then convert and adjust to grade. Otherwise the entire structure will be removed and replaced with a new structure.
 - CONSTRUCTION SITE RUNOFF (if applicable): To prevent sediment from clogging the existing BMP, construction site runoff shall not flow into BMP areas. All stormwater flow to BMP areas shall be diverted, plugged, or disconnected until the construction site is stable and the MSD dedication inspector provides approval to place the BMP on-line.
 - PROTECT PROPOSED BMPs (if applicable): Contractor shall protect existing BMPs to remain from debris, silt, etc. from getting onto or into the BMP. Pictures shall be submitted to the site civil engineer of record before construction begins & after completed. If debris, silt, etc. has increased over existing pictures, then contractor shall be responsible for removing the debris, silt, etc. or replacing the BMP(s) at their expense. POWER WASHING IS NOT ALLOWED.

- GENERAL SITE UTILITY PLAN NOTES:
- Sanitary is required to be separated from the storm sewers.
 - Coordinate conduits & locations for telephone, data, cable with electrical site plans & appropriate utilities.
 - Utility contractors to review proposed utility crossings at gravity sewers to determine depth of non-gravity utilities.
 - STORM SEWERS CROSSING OVER SANITARY SEWERS: When a storm pipe crosses over a sanitary sewer & the vertical clearance is <2 FT., the sanitary sewer must be encased in concrete through the crossing & for 10 LF each side of the crossing.
 - STORM & SANITARY SEWER LOCATION IN CONJUNCTION WITH WATER SERVICE: Storm & sanitary sewers shall be at least 10 FT horizontally from any existing or proposed water main. On crossings, a min. vertical clearance of 18 in. shall be provided between the outside of the pipes.
 - See landscape architect plans for ground cover & plantings.
 - See mechanical, electrical, & plumbing plans for locations & details of these utilities.
 - Existing utility lids, etc. at the surface shall be adjusted to finished grade per utility requirements.

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MSD Base Map :17M
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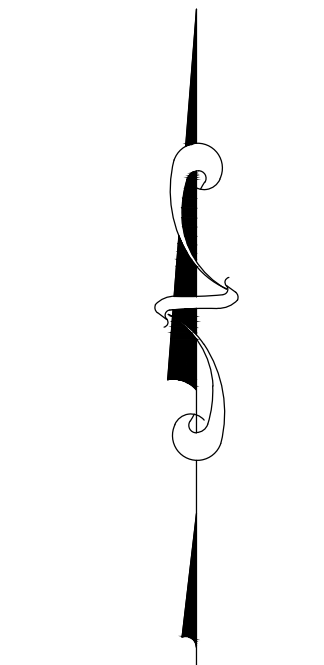
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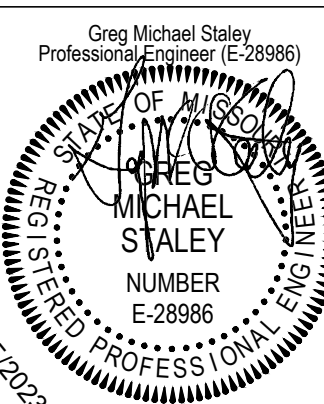
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REVISION SCHEDULE

NO	DATE	REVISIONS
1	7/14/2023	PERMIT SET



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DANFORTH PGF
ADDITION

PROPOSED SITE / UTILITY
PLAN - PROJECT AREA

CEC PROJECT NO: 99208.48 SHEET NO
PROJECT NO: 22039

DATE: AUGUST 15, 2023

SDP-3

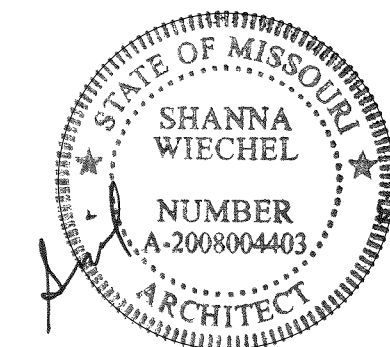
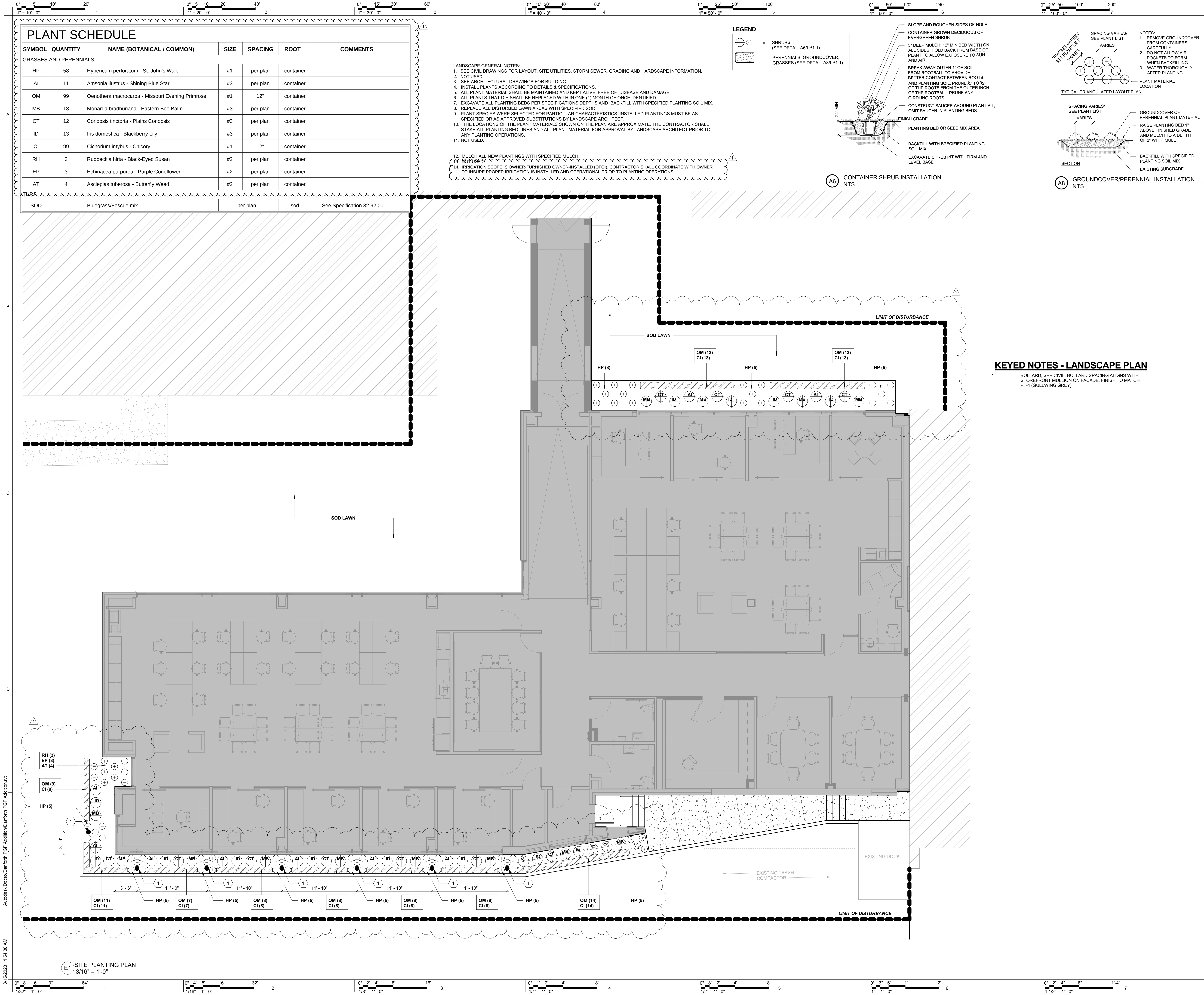
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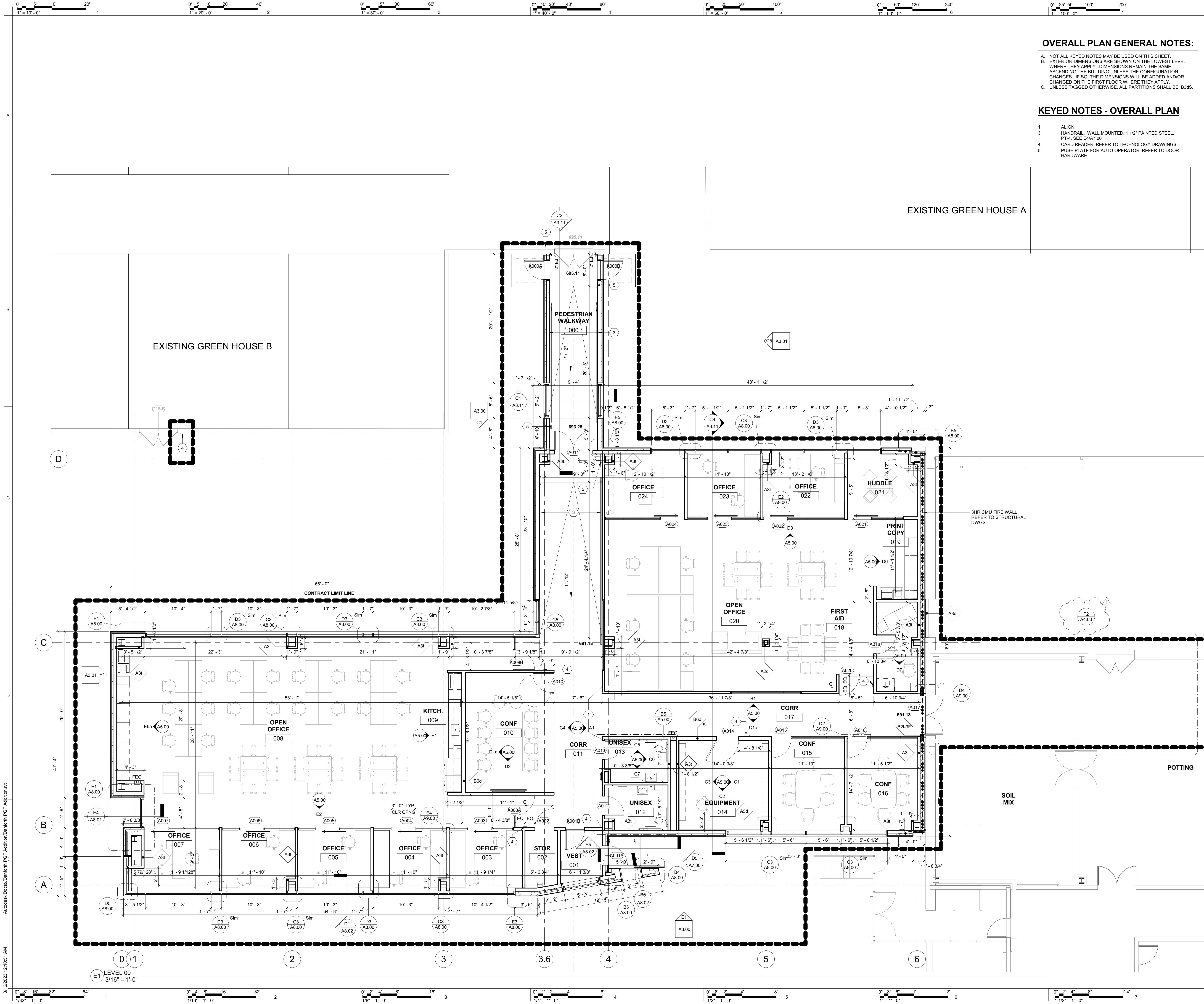
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OVERALL PLAN GENERAL NOTES:

- A. NOT ALL KEYED NOTES MAY BE USED ON THIS SHEET.
B. EXTERIOR DIMENSIONS ARE SHOWN ON THE LOWEST LEVEL WHERE THEY APPLY. DIMENSIONS REMAIN THE SAME ASCENDING THE BUILDING UNLESS THE CONFIGURATION CHANGES. IF SO, THE DIMENSIONS WILL BE ADDED AND/OR CHANGED ON THE FIRST FLOOR WHERE THEY APPLY.
C. UNLESS TAGGED OTHERWISE, ALL PARTITIONS SHALL BE B3dS.

KEYED NOTES - OVERALL PLAN

- 1 ALIGN
3 HANDRAIL, WALL MOUNTED, 1 1/2" PAINTED STEEL, PT-4, SEE E4/A7.00
4 CARD READER, REFER TO TECHNOLOGY DRAWINGS
5 PUSH PLATE FOR AUTO-OPERATOR, REFER TO DOOR HARDWARE

EXISTING GREEN HOUSE A

EXISTING GREEN HOUSE B

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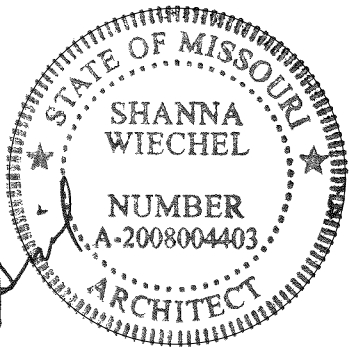
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1	08/15/2023	ADDENDUM 1



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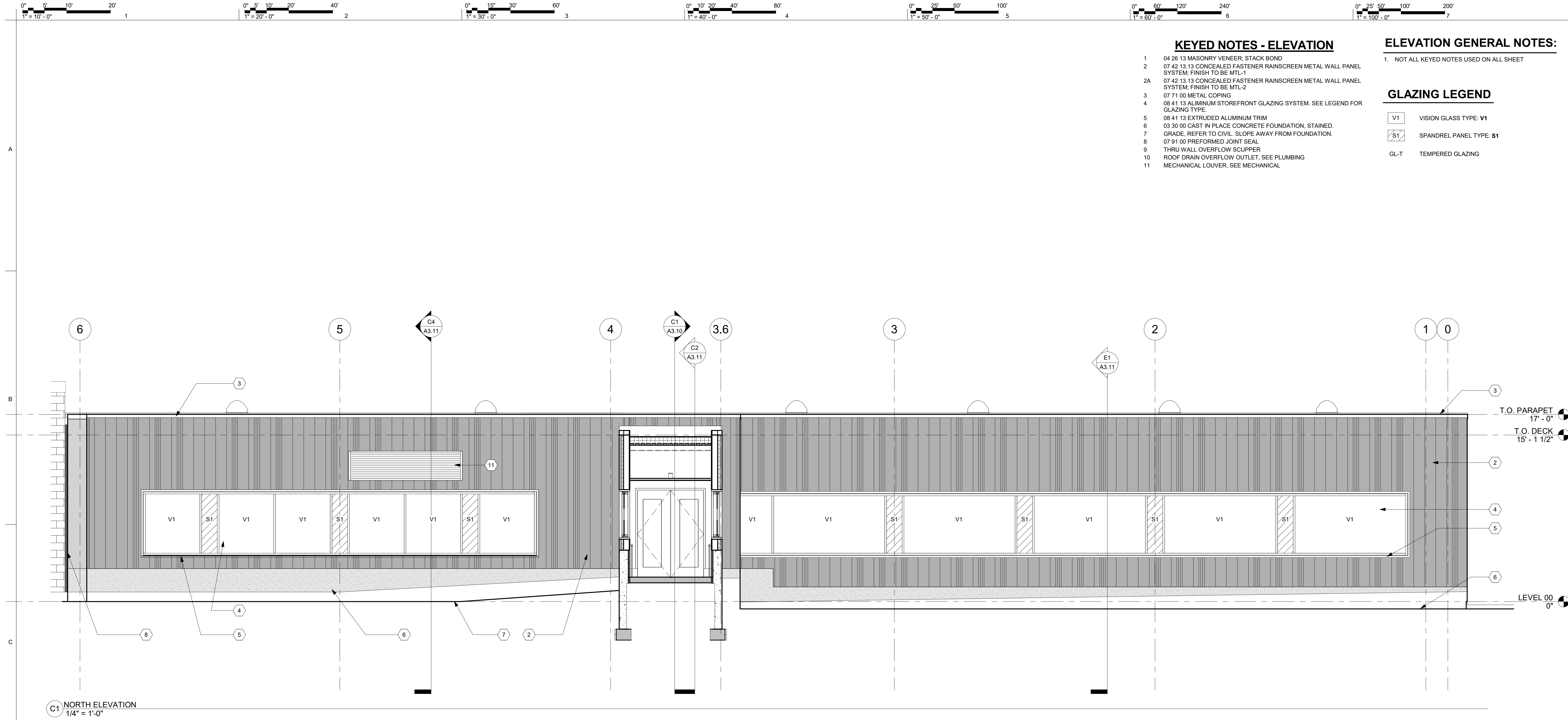
OVERALL FLOOR PLAN

SHEET NO
PROJECT NO: 22039
DATE: 14 JULY, 2023
A2.00

FOR CONSTRUCTION

Autodesk Docs\Danforth PGF Addition\Danforth PGF Addition.rvt

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KEYED NOTES - ELEVATION

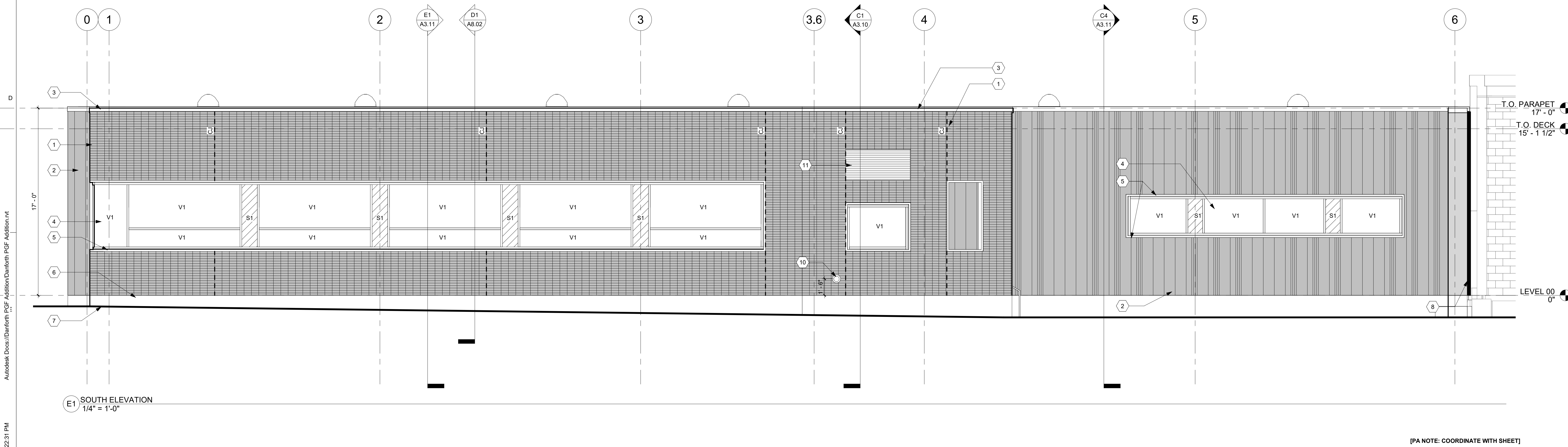
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- 07 42 13 13 CONCEALED FASTENER RAINSCREEN METAL WALL PANEL SYSTEM, FINISH TO BE MTL-1
- 07 42 13 13 CONCEALED FASTENER RAINSCREEN METAL WALL PANEL SYSTEM, FINISH TO BE MTL-2
- 07 71 00 METAL COPING
- 08 41 13 ALUMINUM STOREFRONT GLAZING SYSTEM. SEE LEGEND FOR GLAZING TYPE.
- 08 41 13 EXTRUDED ALUMINUM TRIM
- 03 30 00 CAST IN PLACE CONCRETE FOUNDATION, STAINED.
- GRADE, REFER TO CIVIL. SLOPE AWAY FROM FOUNDATION.
- 07 91 00 PREFORMED JOINT SEAL
- THRU WALL OVERFLOW SCUPPER
- ROOF DRAIN OVERFLOW OUTLET, SEE PLUMBING
- MECHANICAL LOUVER, SEE MECHANICAL

ELEVATION GENERAL NOTES:

- NOT ALL KEYED NOTES USED ON ALL SHEET

GLAZING LEGEND

- V1 VISION GLASS TYPE: V1
- S1 SPANDREL PANEL TYPE: S1
- GL-T TEMPERED GLAZING



KEYED NOTES - ELEVATION

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- V1 VISION GLASS TYPE: V1
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- GL-T TEMPERED GLAZING

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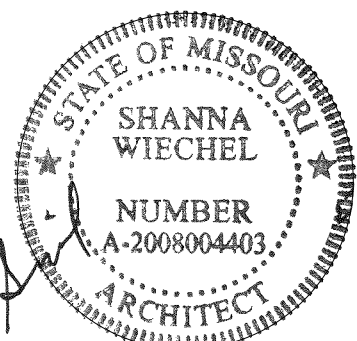
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ADDITION

EXTERIOR ELEVATIONS

SHEET NO
PROJECT NO: 22039
DATE: 14 JULY, 2023
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[PA NOTE: COORDINATE WITH SHEET]



KEYED NOTES - ELEVATION

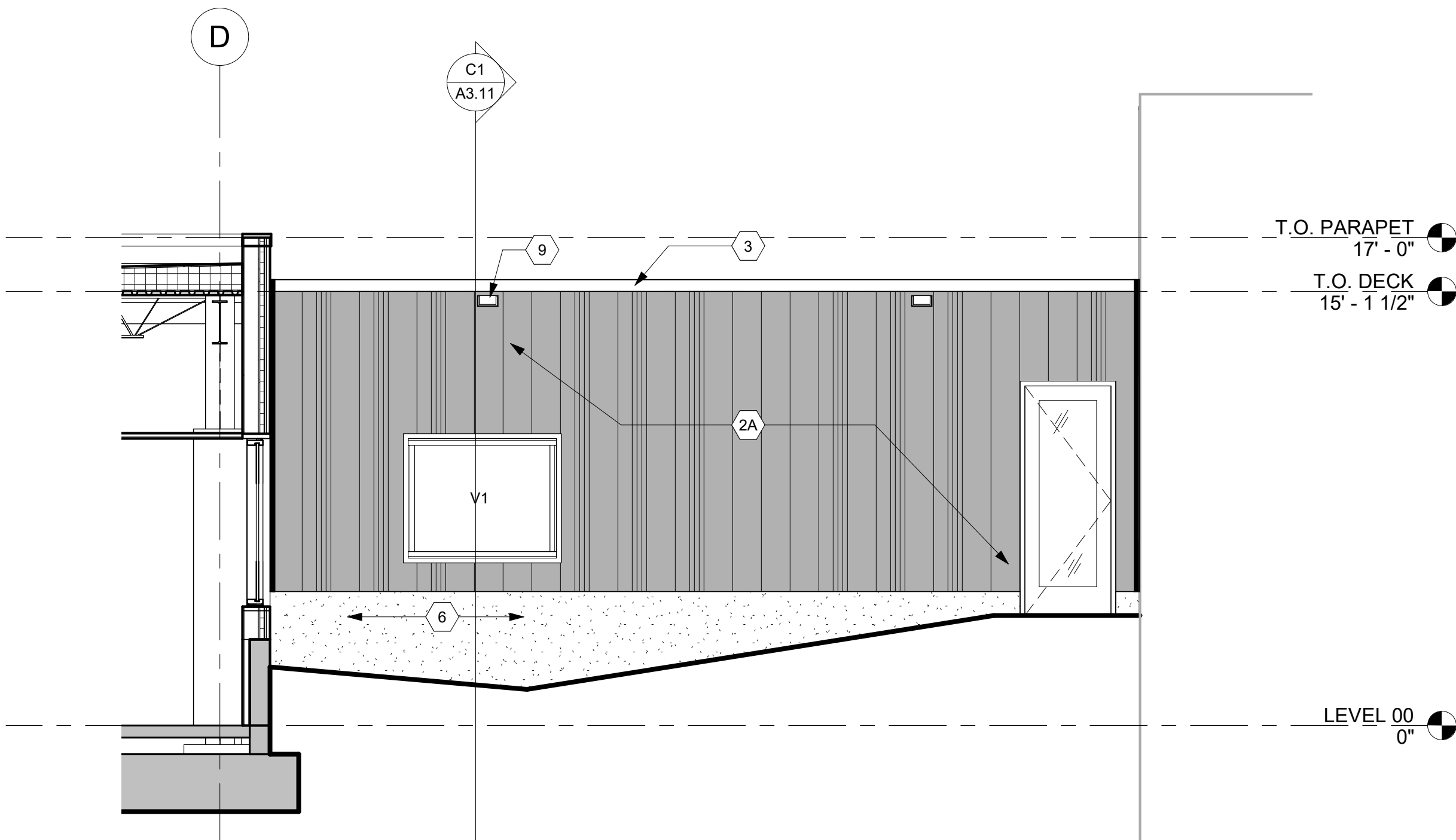
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ELEVATION GENERAL NOTES:

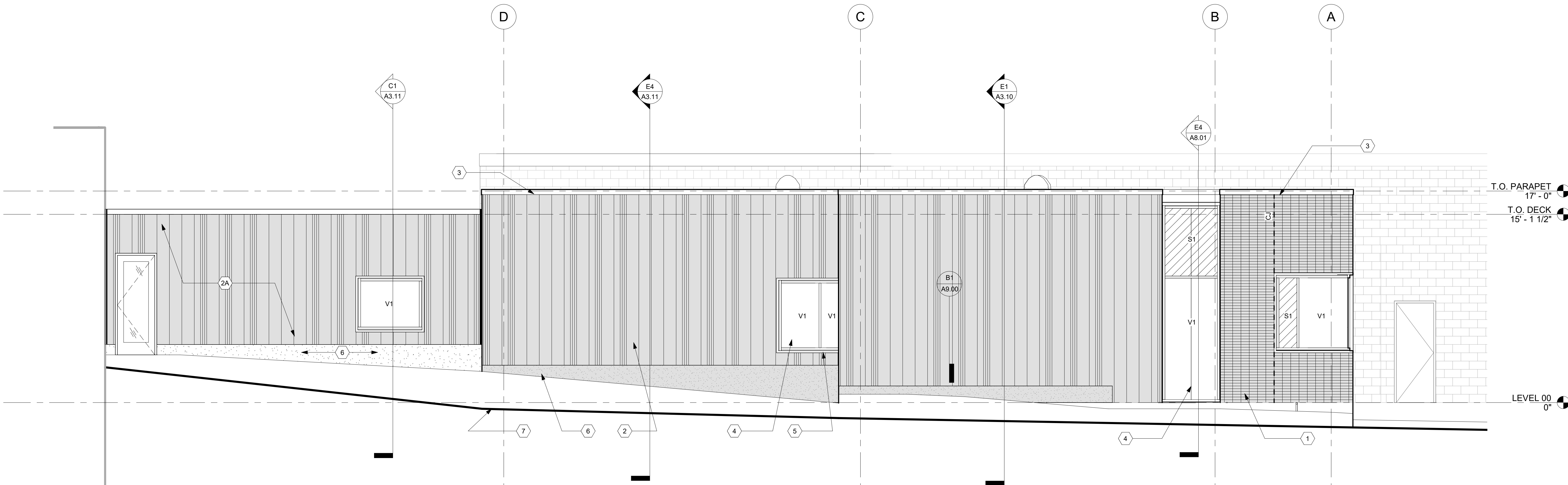
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- V1 VISION GLASS TYPE: V1
S1 SPANDREL PANEL TYPE: S1
GL-T TEMPERED GLAZING



C5 EAST ELEVATION
1/4" = 1'-0"



E1 WEST ELEVATION
1/4" = 1'-0"

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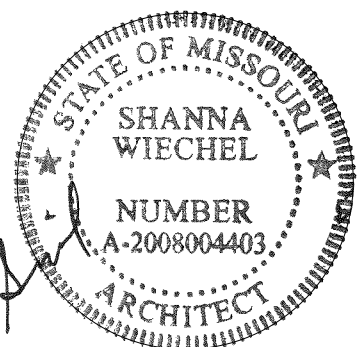
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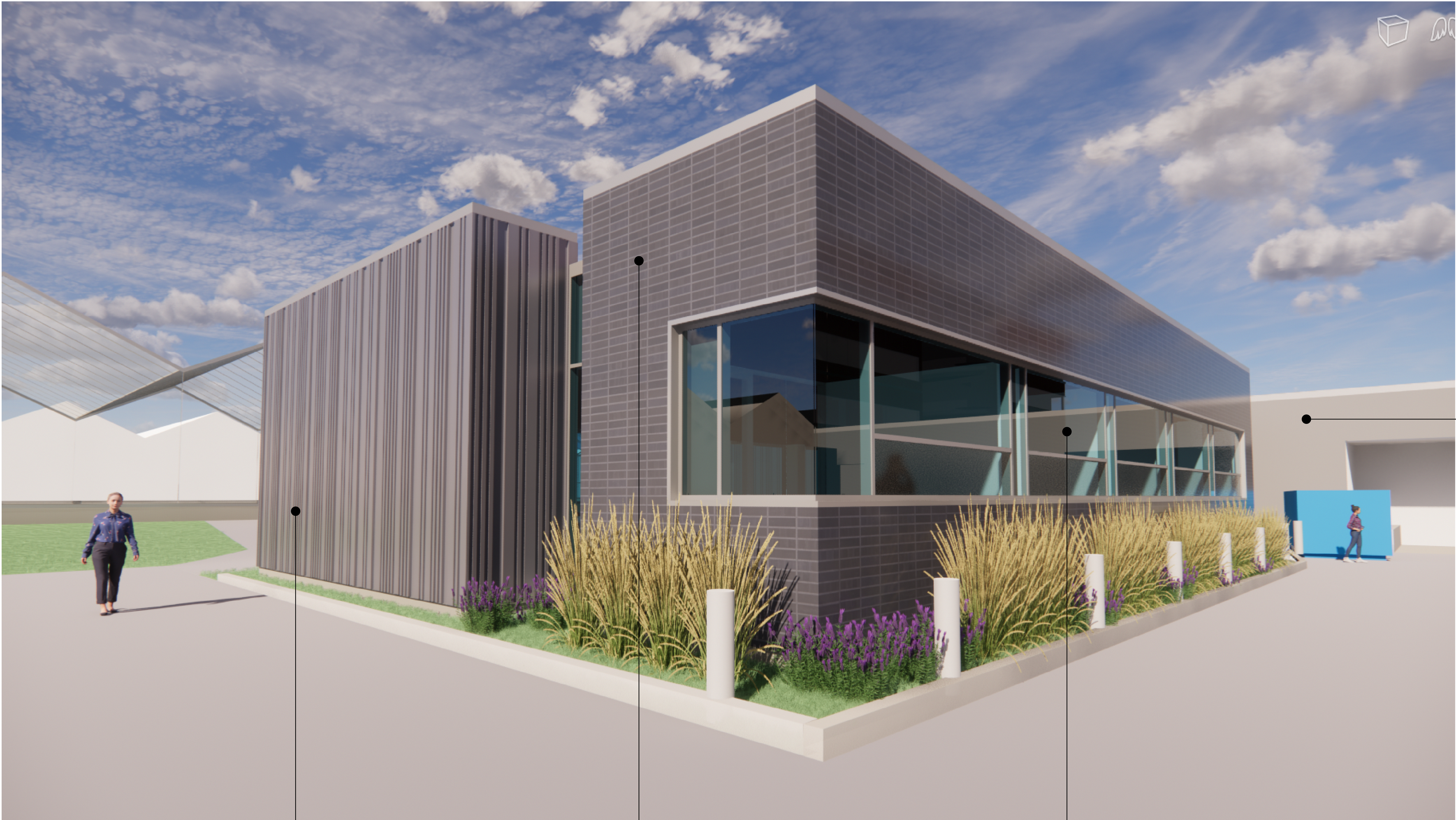
EXTERIOR ELEVATIONS

SHEET NO
PROJECT NO: 22039
DATE: 14 JULY, 2023
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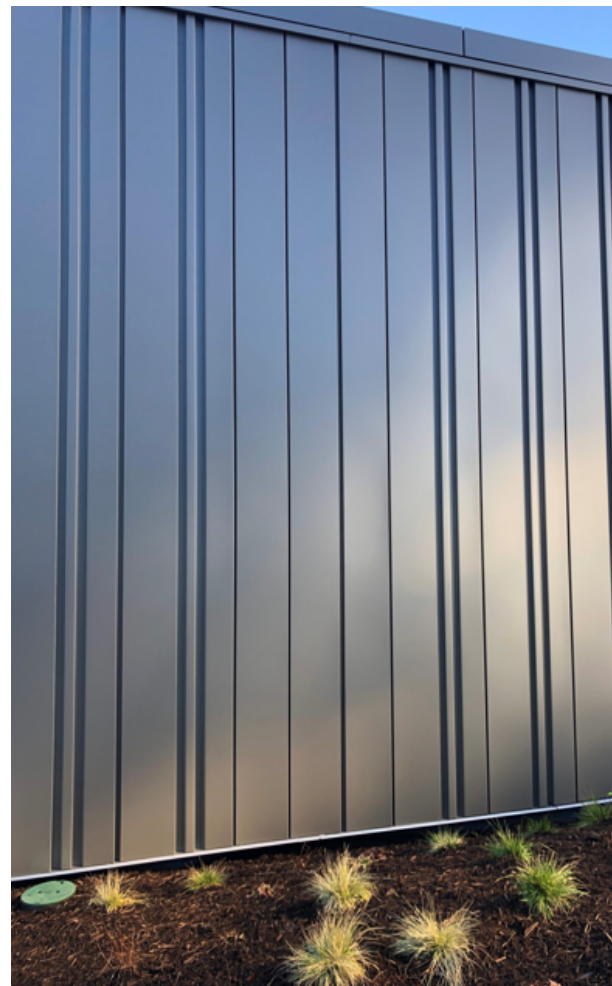




METAL PANEL:

Basis-of-Design Product: Subject to compliance with requirements, provide **Morin - A** **Kingspan Group Company**, Matrix Wall Series models MX-2.0, 6.0, and 7.0 (as indicated on the Drawings) or a comparable, Architect-approved product.
Aluminum Sheet: Coil-coated sheet, ASTM B 209, alloy as standard with manufacturer, with temper as required to suit forming operations and structural performance required.
a. Thickness: 20-gauge.
b. Surface: Smooth, flat finish.
c. Exterior Finish: Three-coat fluoropolymer.
d. Color: Manufacturer's standard Premium Color range in a Metallic finish
1) MTL-1: Medium Gray (refer to exterior elevations in drawing set)
2) MTL-2: Bright Silver (refer to exterior elevations in drawing set)
Panel Coverage: 12 inches.
Panel Height: 1.5 inches.

RECENT INSTALL IN ST. LOUIS COUNTY:



FACE BRICK:

Clay Face Brick: As indicated, facing brick complying with ASTM C 216 or hollow brick complying with ASTM C 652, Class H40V (void areas between 25 and 40 percent of gross cross-sectional area), Grade MW or Grade SW, Type FBX.
1. Face Brick Types (all modular size):
a. B1: Sioux City Modular Ebonite Smooth.

SAMPLE:



RECENT INSTALL IN ST. LOUIS COUNTY:



INSULATED GLASS UNIT:

Glass Type (IGU: "V1")
1. Basis-of-Design Product: Guardian SNR-50
2. Overall Unit Thickness: 1 inch.
3. Outdoor Life:
a. Tempered float glass.
b. Minimum Thickness of glass lite: 1/4-inch.
c. Low-E Coating: Pyrolytic on second surface.
4. Interspace Content: Air.
5. Indoor Life:
a. Heat-strengthened clear float glass.
b. Minimum Thickness of glass lite: 1/4-inch
Performance Data:
a. VLT: 48%
b. R Out: 26%
c. Winter Nighttime U-Value: 1.370 W/m2K
d. Summer Daytime U-Value: 1.215 W/m2K
e. SC: 0.28
f. SHGC: 0.25

RECENT INSTALL IN ST. LOUIS CITY:



EXISTING MATERIAL CONTEXT:

**STACK BOND, GROUND FACE CMU WITH
CLEAR ANODIZED ALUMINUM METAL TRIMS**



CHRISTNER ARCHITECTS

ARCHITECTS | DESIGNERS | PLANNERS | LANDSCAPE ARCHITECTS

621 NORTH SKINNER | ST. LOUIS, MISSOURI 63130
TEL 314 725 2927 | FAX 314 725 2928
CHRISTNERARCHITECTS.COM
CERTIFICATE OF AUTHORITY - 000842

OWNER:
DONALD DANFORTH PLANT SCIENCE CENTER
975 N WARSON ROAD, ST. LOUIS, MO 63132
314-887-1081

STRUCTURAL:
WEG CORP
15 SUNNEN DRIVE, SUITE 104, ST. LOUIS, MO 63143
314-645-1132
CERTIFICATE OF AUTHORITY - E2017008530

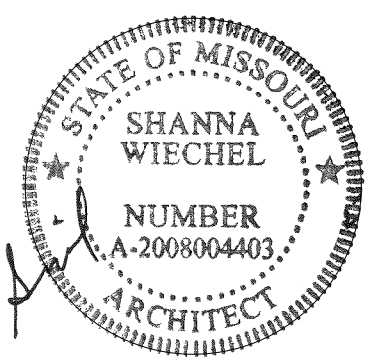
MECH / ELEC / PLUMB / FIRE:
WEG CORP
15 SUNNEN DRIVE, SUITE 104, ST. LOUIS, MO 63143
314-645-1132
CERTIFICATE OF AUTHORITY - E2017008530

CIVIL:
THE CLAYTON ENGINEERING COMPANY
2268 WELSCH INDUSTRIAL CT, ST. LOUIS, MO 63146
314-692-8888
CERTIFICATE OF AUTHORITY

LIFE SAFETY:
CCI
2043 WOODLAND PKWY, #300, ST. LOUIS, MO 63146
314-991-2633
CERTIFICATE OF AUTHORITY

REVISION SCHEDULE

NO	DATE	REVISIONS
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**DANFORTH PGF
ADDITION**

EXTERIOR MATERIALS

SHEET NO
PROJECT **202039**
DATE: 14 JULY, 2023 **A3.02**

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