
(Space above reserved for Recorder of Deeds certification)

Document Recording Cover Sheet

1. **Title of Document:** DEVELOPMENT AGREEMENT
2. **Date of Document:** June 20, 2023
3. **Grantor(s)/Party indexed as Grantor(s):** Mid-Am Development, LLC, a Missouri limited liability company

4. **Grantee(s)/Party indexed as Grantee(s):** City of Columbia, Missouri

5. **Mailing Address of Grantee or Party:** City Clerk, City of Columbia, 701 E Broadway,
Columbia, Missouri 65201

6. **Legal Description:** See Exhibit A

7. **Reference Book and Page(s):** _____

(If there is not sufficient space on this page for the information required, state the page reference where it is contained within the document.)

DEVELOPMENT AGREEMENT

THIS AGREEMENT ("Agreement"), is made and entered into by and between Mid-Am Development, LLC, a Missouri limited liability company ("Developer") and the City of Columbia, Missouri, a municipal corporation of the State of Missouri ("City") and will be effective the date of signature by the Party last executing this Agreement ("Effective Date"). The City and the Developer may hereinafter be collectively referred to as the Parties and individually as a Party.

RECITALS

WHEREAS, Developer is the owner of a tract of land consisting of approximately 24.50 acres, more or less, located in the City of Columbia, generally located at the southeast corner of Providence Road and Veterans United Drive, and legally described on **Exhibit A attached hereto and incorporated herein by this reference** (the "Subject Property"); and

WHEREAS, a preliminary plat for the Subject Property known as the Spring Brook Preliminary Plat was submitted to the City for approval and is attached hereto as **Exhibit B** (the "Preliminary Plat"); and

WHEREAS, Developer desires to develop the Subject Property for a mix of uses, including commercial, office and residential uses. When fully developed, the Subject Property is anticipated to be subdivided and developed into thirteen (13) lots as shown in the Preliminary Plat attached as **Exhibit B**; and

WHEREAS, the parties desire to set forth responsibility for the construction and dedication of certain public improvements associated with development of the Subject Property in this Agreement, it being the intent of this agreement to provide milestones for which the construction and dedication of such public improvements shall occur;

NOW, THEREFORE, in view of the foregoing Recitals and in consideration of the mutual promises, declarations, covenants and agreements of the City and Developer as hereinafter set forth, the Parties hereby agree as follows:

1. **Agreement to Run with the Land.** The provisions of this Agreement will constitute covenants running with the entirety of the Subject Property and each and every part of the Subject Property, and will bind the current Developer and all of such successors and assigns.

2. **Developer's Obligations.**

a) Traffic Impact Study Improvements. Developer will construct the following improvements identified in the January 27, 2023 Traffic Impact Study by CBB Transportation Engineers + Planners, which is attached hereto as **Exhibit C** (the “Traffic Study”).

i. Construct a single-lane roundabout not less than 135 feet in diameter as measured from the outside curb of the roundabout at the intersection of Veterans United Drive and MU Healthcare Drive/Veterans United Middle Drive as depicted in the Traffic Study. The roundabout must be completed by Developer, at Developer’s expense, and accepted by the City prior to: (1) the issuance of a building permit for the fourth lot on the Subject Property; or (2) the issuance of a building permit for any lot on the Subject Property, the development of which would result in 145 total trips or more being generated at peak hour by uses on any lot or combination of lots on the Subject Property, whichever occurs earlier. Concurrent with the submission of an application for a building permit for the first three lots on the Subject Property, Developer shall submit a trip generation assessment for the proposed use. Prior to construction of the roundabout, a building permit may only be issued for a building located on any of the first three lots on the Subject Property if the City Traffic Engineer determines that the total trips generated by the total development on the Subject Property will not exceed 145 at peak hour.

ii. Construct an improvement to restrict the northbound left-turn from Adler Drive to Veterans United Drive. The improvement shall be a raised median unless otherwise approved by the City. The improvement must be completed by Developer, at Developer’s expense, and accepted by the City prior to: (1) the issuance of a building permit for the fourth lot on the Subject Property; or (2) the issuance of a building permit for any lot on the Subject Property, the development of which would result in 145 total trips or more being generated at peak hour by uses on any lot or combination of lots on the Subject Property, whichever occurs earlier. Concurrent with the submission of an application for a building permit for the first three lots on the Subject Property, Developer shall submit a trip generation assessment for the proposed use. Prior to construction of the raised median improvement, a building permit may only be issued for a building located on any of the first three lots on the Subject Property if the City Traffic Engineer determines that the total trips generated by the total development on the Subject Property will not exceed 145 at peak hour.

iii. Construct a separate southbound left-turn lane on Providence Road at Corporate Lake Drive. The improvement shall be completed by Developer prior to the approval of any final plat for Lots 6-11 of the Preliminary Plat of the Subject Property.

iv. Construct a separate northbound left-turn lane on Providence Road at Corporate Lake Drive. The improvement shall be completed by Developer prior to the approval of any final plat for Lots 6-11 of the Preliminary Plat of the Subject Property.

v. Construct a separate northbound right-turn lane on Providence Road at Corporate Lake Drive. The improvement shall be completed by Developer prior to the approval of any final plat for Lots 6-11 of the Preliminary Plat of the Subject Property.

b) Pedestrian Improvements.

i. Veterans United Drive and Providence Road: Developer will design and construct at its sole expense the following pedestrian improvements at the intersection of Veterans United Drive and Providence Road. Construction plans for the pedestrian improvements at the intersection of Veterans United Drive and Providence Road shall be submitted to the City for review and approval concurrently with the submission of any final plat of the Subject Property and shall be constructed concurrently with the installation of any private roadway infrastructure necessary to serve the lots shown on said plat.

A. A pedestrian crossing to allow direct pedestrian movement across Providence Road located south of the intersection of Providence Road and Veterans United Drive. This crossing shall include a refuge island.

B. A pedestrian connection (i.e., an internal sidewalk) from the intersection of Providence Road and Veterans United Drive to Stellar Drive (private). The pedestrian connection shall be generally located either: (1) between lots 3 and 4; (2) across lot 4; or (3) between lots 4 and 5.

ii. Corporate Lake Drive and Providence Road: Developer will design and construct at its sole expense a pedestrian crossing to allow direct pedestrian movement across Providence Road at its intersection with Corporate Lake Drive and such crossing shall include a refuge island. Construction plans for the crossing infrastructure shall be submitted to the City for review and approval. The improvement shall be completed by Developer prior to the approval of any final plat for Lots 7-10 of the Preliminary Plat of the Subject Property.

c) Private Streets. The use of private streets to serve the proposed 13 lots as depicted in the Preliminary Plat of the Subject Property is authorized provided the private streets are located within an irrevocable access easement approved by the city counselor, or designee, and provided the private streets conform to the standards set forth in this

section 2(c). The maintenance and repair of all private streets within the Subject Property shall be the sole responsibility of the Developer.

i. Stellar Drive - Private Street Standards. The installation of Stellar Drive as a private street to serve the Subject Property may be permitted provided such construction:

(A) Is in accordance with the City's Street, Storm Sewer, and Sanitary Sewer Specifications and Standards, as may be amended, or any successor specifications and standards adopted by the City together with any final construction plans approved by the City prior to construction of such facilities;

(B) Uses the roadway profile identified as "Option C" of a Local non-residential street as defined within Appendix A, Section A.1(d)(1)(ii)(C) of the Unified Development Code with the exception that said roadway construction may be within a 50-foot wide irrevocable access easement in lieu of a 66-foot wide platted right of way, 6-foot sidewalk shall be installed adjacent to the back of future curb and gutters, and no 9-foot buffer strip shall be required;

(C) Obtains construction plan approval in the same manner as any public street project;

(D) Provides 3rd party verification of construction compliant with the City's adopted standards for each phase of roadway construction as if the street were being inspected for future public dedication. Inspection reports shall be provided within 90 days following completion of the construction of any private streets. Failure to provide said reports may result in the City withholding the issuance of building permits on any lot within the development.

ii. Flagler Drive. Flagler Drive from Corporate Lake Drive to and through the intersection of Springbrook Drive shall be upgraded from its current improvement to the standards identified in (2)(c)(i)(B) above prior to the issuance of a building permit for Lot 7, 8, 9 or 10.

iii. Adler Drive: If Adler Drive is reconstructed, compliance with the standards set forth in (2)(c)(i)(A)-(D) shall be required.

d) Permits. The Developer shall secure any necessary approvals or permits from the Missouri Highways and Transportation Commission (MHTC) for any work done on property that is part of the State Highway System.

3. **Construction and Bonding of Improvements.** Except as otherwise expressly indicated herein, all public improvements required under the regulations of the City or this Agreement must be constructed in accordance with the City's Street, Storm Sewer, and Sanitary Sewer Specifications and Standards, as may be amended, or any

successor specifications and standards adopted by the City together with any final construction plans approved by the City prior to construction of such facilities. In connection with construction, the Developer shall be required to post bonds or other security as required by the city code. Developer is responsible for obtaining all necessary easements to construct improvements related to Developer's Development of the Subject Property.

4. **Phasing Plan.** If any development of the Subject Property, including final platting, will be phased, then a plan which generally describes the sequence of development of the Subject Property ("Phasing Plan") must be submitted to the Director of Community Development ("Director") concurrently with the first application for a Final Plat on the Subject Property. The Phasing Plan shall become final and binding upon Developer upon approval of the first Final Plat on the Subject Property. Thereafter, development and platting of the Subject Property shall occur in the sequence established in the Phasing Plan, and any amendments thereto. However, nothing contained in this paragraph shall be construed as precluding Developer from filing or developing more than one phase at a time. The Phasing Plan may not be amended except upon written approval of the Director, which shall not be unreasonably withheld, conditioned or delayed.

5. **Recording.** The City shall record this Agreement in the office of the Boone County Recorder of Deeds at the cost and expense of the Developer.

6. **Amendments.** Any amendment to this Agreement must be in writing and must be executed by the City and the Developer, and any future Developer of any part of the Subject Property who would otherwise be obligated to perform any of the requirements imposed upon the Developer by this Agreement. Oral modifications or amendments of this Agreement are of no force or effect.

7. **Remedies.** The parties to this Agreement may, either in law or equity, by suit, action, mandamus or other proceedings in court, seek declaratory relief, enforce and compel specific performance of this Agreement provided that in no event will the City have any liability in damages, costs or any other monetary liability to Developer or any affiliate of Developer, any person claiming through Developer, or to their respective successors, assigns, heirs and personal representatives in respect of any suit, claim, or cause of action arising out of this Agreement or any of the actions or transactions contemplated herein.

8. **Third Party Actions.** Developer will have the right, but not the obligation to assume the costs of defense of any action or proceeding initiated by a third party challenging this Agreement, the zoning or rezoning of the Subject Property, or any other actions or transactions contemplated by this Agreement (including, without limitation, to settle or compromise any claim or action for which Developer has assumed the defense) with counsel of Developer's choosing and the City and Developer agree that so long as no

conflicts of interest exist between them, the same attorney or attorneys may simultaneously represent the City and Developer in any such proceeding. In no event will the City have any liability to Developer for damages or otherwise in the event that all or any part of this Agreement, or the approval of a zoning request or platting request, are declared invalid or unconstitutional in whole or in part by a final (as to which all rights of appeal have been exhausted or expired) judgment of a court of competent jurisdiction, and, in the event Developer elects not to assume such defense and costs, the City will have no obligation to defend or to assume the costs of defense of any such action.

9. **Notices.** All notices between the parties hereto must be in writing and must be sent by certified or registered mail, return receipt requested, by personal delivery against receipt or by overnight courier, will be deemed to have been validly served, given or delivered immediately when delivered against receipt or three (3) business days after deposit in the mail, postage prepaid, or one (1) business day after deposit with an overnight courier, and must be addressed as follows:

If to the City:
City of Columbia
Attn: City Manager
701 E. Broadway
Columbia, MO 65205

If to Developer:

Mid-Am Development
4220 Philips Farm Rd.
Columbia, MO 65201

Each party will have the right to specify that notice is to be addressed to another address by giving to the other party ten (10) days written notice thereof.

10. **Insurance.** Developer must provide, at its sole expense, and maintain during all times in which Developer is constructing public improvements pursuant to this Agreement commercial general liability insurance with a reputable, qualified, and financially sound company licensed to do business in the State of Missouri, and unless otherwise approved by the City, with a rating by Best of not less than "A," that will protect the Developer, the City, and the City's officials, officers, and employees from claims which may arise from operations under this Agreement, whether such operations are by the Developer, its officers, directors, employees and agents, or any subcontractors of Developer. This liability insurance must include, but will not be limited to, protection against claims arising from bodily and personal injury and damage to property, resulting from all Developer operations, products, services or use of automobiles, or construction equipment. The amount of insurance required herein must be in no event less than the individual and combined sovereign immunity limits established by § 537.610 RSMo. for

political subdivisions; provided that nothing herein will be deemed to waive the City's sovereign immunity. An endorsement must be provided which states that the City is named as an additional insured and stating that the policy will not be canceled or materially modified so as to be out of compliance with the requirements of this Section, or not renewed without 30 days advance written notice of such event being given to the City.

11. **Hold Harmless.** Developer at its sole cost and expense, hereby agrees to indemnify, protect, release, defend (with counsel acceptable to the City) and hold harmless the City, its municipal officials, elected officials, boards, commissions, officers, employees, attorneys, and agents from and against any and all causes of action, claims, demands, all contractual damages and losses, economic damages and losses, all other damages and losses, liabilities, fines, charges, penalties, administrative and judicial proceedings and orders, judgments, remedial actions of any kind, and all costs and expenses of any kind, including, without limitation, reasonable attorney's fees and costs of defense arising, directly or indirectly, in whole or in part, from the action or inaction of Developer, its agents, representatives, employees, contractors, subcontractors or any other person for whose acts Developer may be liable, in the activities performed, or failed to be performed, by Developer under this Agreement or in the development of the Subject property, except to the extent arising from or caused by the sole or gross negligence or willful misconduct of the City, its elected officials, officers, employees, agents or contractors. The indemnification, duty to defend and hold harmless obligations set forth in this Section will survive for a period of five (5) years from the date of expiration or termination of this Agreement.

12. **Sovereign Immunity.** Nothing in this Agreement shall constitute or be construed as a waiver of the City's governmental or official immunity or its officers or employees from liability or suit pursuant to Section 537.600 RSMo.

13. **No Third Party Beneficiaries.** There are no third party beneficiaries to this Agreement.

14. **Failure or Delay to Enforce.** No failure to exercise or delay in exercising any right hereunder on the part of any Party to this Agreement shall operate as a waiver thereof, and no single or partial exercise of any right of such Party shall preclude any other or further exercise of such right or the exercise of any other right.

15. **Power of the City.** Notwithstanding anything set forth in this Agreement to the contrary, no provision contained herein shall in any manner diminish or usurp the inherent rights and powers of the City to act in its capacity as a public body. Nothing herein shall relieve Developer from complying with all applicable laws and requirements.

16. **Inspection.** Upon reasonable prior notice, the City may conduct such periodic inspections of the projects herein, including any applicable phase, as may be

generally provided in the applicable law or regulation for inspection thereof in order to confirm compliance with the terms of this Agreement. The Developer shall not deny the City and its officers and employees the right to inspect, upon reasonable prior written request, all engineering plans, construction contracts or other documents pertaining to the construction of the public infrastructure on the Subject Property. Notwithstanding the foregoing, Developer shall not be required to produce documents for inspection if such documents are attorney-client privileged or contain confidential, proprietary information or if production would violate the rights of any third parties.

17. **Governing Law.** This Agreement will be construed according to the laws of the State of Missouri. The Parties will comply with all local, state, and federal laws and regulations relating to the performance of this Agreement.

18. **Venue.** Any action at law, suit in equity, or other judicial proceeding to enforce or construe this Agreement, or regarding its alleged breach, must be instituted only in the Circuit Court of Boone County, Missouri.

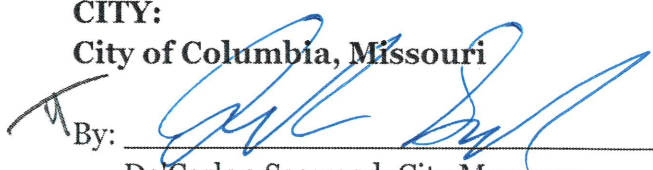
19. **Entire Agreement.** This Agreement contains the entire and complete agreement between the City and the Developer with respect to the requirements imposed upon the Developer for the providing of certain rights-of-way and interests in land, and the construction and installation of certain improvements, all as hereinabove described in the Recitals for this Agreement and the above numbered paragraphs of this Agreement. Parties agree that this Agreement constitutes a lawful contract between the Parties and Developer hereby acknowledges and agrees that this Agreement and provisions of the City's Code of Ordinances applicable to this Agreement constitute lawful exercises of the City's authority and police power.

[Remainder of page intentionally blank. Signature pages follow.]

IN WITNESS WHEREOF, the Parties have executed this Agreement and shall be effective on the last day and year indicated below.

CITY:

City of Columbia, Missouri

By: 

De'Carlton Seewood, City Manager

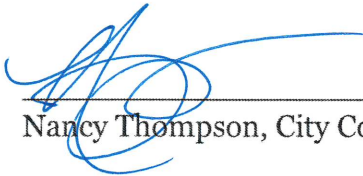
Date: 6-20-23

ATTEST:



Sheela Amin, City Clerk

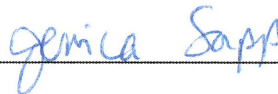
Approved as to form:



Nancy Thompson, City Counselor/rgt

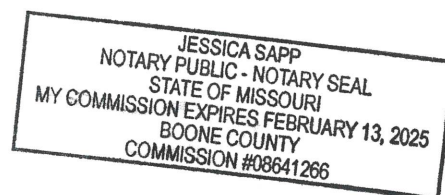
On this 20th day of June, 2023, before me appeared De'Carlton Seewood, to me personally known, who, being by me duly sworn, did say that he is the City Manager of the City of Columbia, Missouri, and that the seal affixed to the foregoing instrument is the corporate seal of the City and that this instrument was signed and sealed on behalf of the City by authority of its City Council and the City Manager acknowledged this instrument to be the free act and deed of the City.

IN TESTIMONY WHEREOF, I have hereunto set by hand and affixed my official seal, at my office in Columbia, Boone County, Missouri, the day and year first above written.



Notary Public

My commission expires: 02/13/25.



DEVELOPER:

Mid-Am Development, LLC, a Missouri
Limited Liability Company

By: _____

Name Printed: _____

JON ODLE

Date 5/9/23

STATE OF MISSOURI)
) SS
COUNTY OF BOONE)

On this 9th day of MAY, 20 23, before me appeared
JON ODLE, to me personally known, who, being by me duly sworn did
say that he or she is MANAGING MEMBER of
MID-AM DEVELOPMENT, LLC and that said instrument was signed on behalf of
said corporation, acknowledged said instrument to be the free act and deed of said
corporation and that he or she executed the same for the purposes therein stated.

IN TESTIMONY WHEREOF, I have hereunto affixed my hand and notarial seal at my
office in the State and County aforesaid, on the day and year hereinabove first written.

Notary Public

My commission expires: 12/19/26



EXHIBIT A
Legal Description Subject Property

A TRACT OF LAND LOCATED IN THE EAST HALF OF SECTION 36, TOWNSHIP 48 NORTH, RANGE 13 WEST, COLUMBIA, BOONE COUNTY, MISSOURI AND BEING PART OF LOT 1A, STATE FARM SUBDIVISION-BLOCK 2 RECORDED IN PLAT BOOK 54, PAGE 82 AND DESCRIBED IN WARRANTY DEED RECORDED IN BOOK 5681, PAGE 185 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF SAID LOT 1A, SAID POINT BEING ON THE SOUTH RIGHT OF WAY LINE FOR VETERANS UNITED DRIVE AND LEAVING SAID SOUTH RIGHT OF WAY LINE AND WITH THE EAST LINE OF SAID LOT 1A THE FOLLOWING COURSES AND DISTANCES, S 34°20'50"E, 316.51 FEET; THENCE 33.17 FEET ALONG A 25.00-FOOT RADIUS TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A CHORD, S 3°39'35"W, 30.79 FEET; THENCE 296.50 FEET ALONG A 909.42-FOOT RADIUS TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, S 32°19'40"W, 295.19 FEET; THENCE S 22°59'20"W, 60.08 FEET; THENCE 323.96 ALONG A 269.06-FOOT RADIUS TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, S 11°30'15"E, 304.74 FEET; THENCE LEAVING SAID EAST LINE, S 47°22'40"W, 176.21 FEET; THENCE 204.10 FEET ALONG A 1000.00-FOOT RADIUS NON-TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A CHORD, S 53°13'30"W, 203.75 FEET; THENCE S 59°04'20"W, 117.58 FEET; THENCE 457.34 FEET ALONG A 460.00-FOOT RADIUS TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, S 30°35'25"W, 438.73 FEET TO THE SOUTH LINE OF SAID LOT 1A, SAID LINE ALSO BEING THE NORTH RIGHT OF WAY LINE FOR CORPORATE LAKE DRIVE; THENCE WITH SAID SOUTH LINE, N 88°09'00"W, 67.36 FEET; THENCE LEAVING SAID SOUTH LINE AND WITH THE WEST LINE OF SAID LOT 1A, SAID WEST LINE ALSO BEING THE EAST RIGHT OF WAY LINE FOR PROVIDENCE ROAD (A.K.A. STATE HIGHWAY 163), THE FOLLOWING COURSES AND DISTANCES, N 1°02'50"E, 63.48 FEET; THENCE N 88°57'10"W, 60.00 FEET; THENCE N 1°02'50"E, 407.24 FEET; THENCE N 0°06'00"W, 500.05 FEET; THENCE N 3°14'20"W, 200.56 FEET; THENCE N 1°02'50"E, 150.00 FEET;

PAGE 1 OF 2

CROCKETT ENGINEERING CONSULTANTS 1000 W. Nifong Blvd. Building 1 Columbia, Missouri 65203 (573) 447-0292 www.crockettengineering.com	CORPORATE NUMBER 2000151304	M-C ZONING DESCRIPTION
	DATE: 3/8/2023	STATE FARM SUBDIVISION - BLOCK 2 LOCATED IN EAST HALF OF S36-T48N-R13W COLUMBIA, BOONE COUNTY, MISSOURI
	PROJECT: 210574	

THENCE TRANSITIONING FROM SAID EAST RIGHT OF WAY LINE TO THE SOUTH RIGHT OF WAY LINE FOR VETERANS UNITED DRIVE THE FOLLOWING COURSES AND DISTANCES, N 35°50'40"E, 71.85 FEET; THENCE S 88°57'10"E, 42.00 FEET; THENCE N 1°02'50"E, 7.69 FEET; THENCE N 89°59'40"E, 178.02 FEET; THENCE 116.31 FEET ALONG A 500.00-FOOT RADIUS TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, N 83°20'00"E, 116.04 FEET; THENCE N 68°20'30"E, 80.00 FEET; THENCE 155.64 FEET ALONG A 538.50-FOOT RADIUS TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, N 63°48'50"E, 155.10 FEET; THENCE N 47°13'30"E, 38.07 FEET; THENCE N 55°31'50"E, 85.11 FEET TO THE POINT OF BEGINNING AND 18.32 ACRES.



DAVID W. BORDEN, PLS-2002000244

3-8-23

DATE

PAGE 2 OF 2

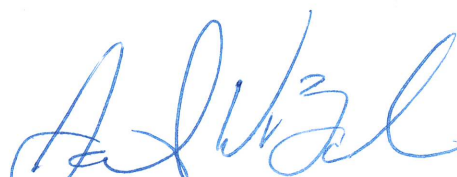
CROCKETT ENGINEERING CONSULTANTS 1000 W. Nifong Blvd. Building 1 Columbia, Missouri 65203 (573) 447-0292 www.crockettengineering.com	CORPORATE NUMBER 2000151304	M-C ZONING DESCRIPTION
	DATE: 3/8/2023 PROJECT: 210574	STATE FARM SUBDIVISION - BLOCK 2 LOCATED IN EAST HALF OF S36-T48N-R13W COLUMBIA, BOONE COUNTY, MISSOURI

A TRACT OF LAND LOCATED IN THE EAST HALF OF SECTION 36, TOWNSHIP 48 NORTH, RANGE 13 WEST, COLUMBIA, BOONE COUNTY, MISSOURI AND BEING PART OF LOT 1A, STATE FARM SUBDIVISION-BLOCK 2 RECORDED IN PLAT BOOK 54, PAGE 82 AND DESCRIBED IN WARRANTY DEED RECORDED IN BOOK 5681, PAGE 185 AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF SAID LOT 1A, SAID POINT BEING ON THE SOUTH RIGHT OF WAY LINE FOR VETERANS UNITED DRIVE AND LEAVING SAID SOUTH RIGHT OF WAY LINE AND WITH THE EAST LINE OF SAID LOT 1A, THE FOLLOWING COURSES AND DISTANCES, S 34°20'50"E, 316.51 FEET; THENCE 33.17 FEET ALONG A 25.00-FOOT RADIUS TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A CHORD, S 3°39'35"W, 30.79 FEET; THENCE 296.50 FEET ALONG A 909.42-FOOT RADIUS TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, S 32°19'40"W, 295.19 FEET; THENCE S 22°59'20"W, 60.08 FEET; THENCE 323.96 FEET ALONG A 269.06-FOOT RADIUS TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, S 11°30'15"E, 304.74 FEET TO THE POINT OF BEGINNING:

THENCE FROM THE POINT OF BEGINNING AND WITH SAID EAST LINE THE FOLLOWING COURSES AND DISTANCES, 7.68 FEET ALONG A 269.06-FOOT RADIUS NON-TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, S 46°48'55"E, 7.68 FEET; THENCE S 47°38'00"E, 33.22 FEET; THENCE S 41°17'50"W, 217.32 FEET; THENCE 185.98 FEET ALONG A 1244.11-FOOT RADIUS NON-TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, S 52°32'10"E, 185.81 FEET; THENCE S 1°51'00"W, 399.80 FEET TO THE SOUTH LINE OF SAID LOT 1A; THENCE LEAVING SAID EAST LINE AND WITH SAID SOUTH LINE, N 88°09'00"W, 606.04 FEET; THENCE LEAVING SAID SOUTH LINE, N 1°51'00"E, 3.50 FEET; THENCE N 88°09'00"W, 32.68 FEET; THENCE 457.34 FEET ALONG A 460.00-FOOT RADIUS NON-TANGENT CURVE TO THE RIGHT, SAID CURVE HAVING A CHORD, N 30°35'25"E, 438.73 FEET; THENCE N 59°04'20"E, 117.58 FEET, THENCE 204.10 FEET ALONG A 1000.00-FOOT RADIUS TANGENT CURVE TO THE LEFT, SAID CURVE HAVING A CHORD, N 53°13'30"E, 203.75 FEET; THENCE N 47°22'40"E, 176.21 FEET TO THE POINT OF BEGINNING AND CONTAINING 6.17 ACRES.

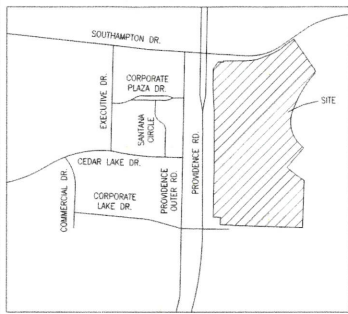



 DAVID W. BORDEN, PLS-2002000244
3-8-23
 DATE

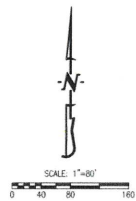
CROCKETT ENGINEERING CONSULTANTS 1000 W. Nifong Blvd. Building 1 Columbia, Missouri 65203 (573) 447-0292 www.crockettengineering.com	CORPORATE NUMBER 2000151304	M-OF ZONING DESCRIPTION
	DATE: 3/8/2023 PROJECT: 210574	

STATE FARM SUBDIVISION - BLOCK 2
 LOCATED IN EAST HALF OF S36-T48N-R13W
 COLUMBIA, BOONE COUNTY, MISSOURI

EXHIBIT B
Spring Brook Preliminary Plat



LOCATION MAP
NOT TO SCALE



BEARINGS ARE REFERENCED TO GRID NORTH, OF THE MISSOURI STATE PLANE COORDINATE SYSTEM (CENTRAL ZONE), OBTAINED FROM GPS OBSERVATION.

DESCRIPTION:

A TRACT OF LAND LOCATED IN THE WEST HALF OF SECTION 36, TOWNSHIP 48 NORTH, RANGE 13 WEST, COLUMBIA BOONE COUNTY, MISSOURI AND BEING ALL LOT 1A OF STATE FARM SUBDIVISION - BLOCK 2, RECORDED IN PLAT BOOK 54, PAGE 82 AND CONTAINING 24.50 ACRES.

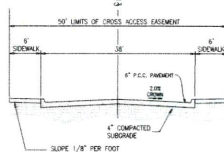
OWNER/DEVELOPER:
MID-AM DEVELOPMENT, L.L.C.
4220 PHILIPS FARM RD
COLUMBIA, MO 65201

NOTES:

- NO PORTION OF THIS TRACT IS LOCATED IN THE 0.2% ANNUAL CHANCE FLOODPLAIN AS SHOWN BY THE FEMA F.I.R.M. PANEL NO. 29019C0229G, DATED APRIL 19, 2017.
- THIS TRACT IS REGULATED BY THE STREAM BUFFER REQUIREMENTS IN SECTION 12A-230, ARTICLE X OF THE CITY OF COLUMBIA CODE OF ORDINANCES AS SHOWN BY THE COLUMBIA USGS QUADRANGLE MAP. THIS TRACT DOES NOT CONTAIN ANY SUCH REGULATED STREAM BUFFER.
- THERE SHALL BE A 10 FOOT UTILITY EASEMENT ALONG THE SIDE OF EACH LOT ADJACENT TO PUBLIC RIGHT-OF-WAY AS WELL AS ADJACENT TO ALL PRIVATE STREETS.
- WATER DISTRIBUTION TO BE DESIGNED BY THE CITY OF COLUMBIA WATER & LIGHT.
- ELECTRIC DISTRIBUTION TO BE DESIGNED BY THE CITY OF COLUMBIA.
- NATURAL GAS DISTRIBUTION TO BE DESIGNED BY AMEREN.
- LOT NUMBERS SHOWN ARE FOR INVENTORY PURPOSES ONLY.
- THE EXISTING ZONING OF THIS TRACT IS M-C (LOTS 1-8, 10-13) & M-OF (LOT 9).
- THIS PLAT CONTAINS 24.50 ACRES.
- THE INTENT FOR THIS DEVELOPMENT IS TO BE DEVELOPED IN MULTIPLE PHASES.
- ALL STORM SEWER AND WATER QUALITY DESIGN SHALL MEET THE CITY OF COLUMBIA STORM WATER MANUAL AND DESIGN REGULATIONS.
- THERE SHALL BE NO DIRECT ACCESS FROM ANY LOT ONTO PROVIDENCE ROAD OR VETERANS UNITED DRIVE.
- THERE SHALL BE 6-FOOT SIDEWALKS CONSTRUCTED ALONG BOTH SIDES OF ALL PRIVATE STREETS WITHIN THE DEVELOPMENT AT THE TIME OF STREET CONSTRUCTION.
- BUILDINGS ON LOTS 4-8 SHALL HAVE THE FRONTS OF THE BUILDINGS FACING PROVIDENCE ROAD.
- THERE SHALL BE A 25-FOOT FRONT YARD SETBACK TO ALL LOTS AND TO BE DETERMINED FROM THE PRIVATE STREET EASEMENT LINE. DERIVED BY THE COLUMBIA CODE OF ORDINANCE SEC-29-4.1.
LOT 1 SHALL FRONT ADLER DRIVE.
LOTS 2 AND 3 SHALL FRONT VETERANS UNITED DRIVE.
LOTS 4-8 SHALL FRONT PROVIDENCE ROAD.
LOT 9 SHALL FRONT FLAGLER DRIVE.
LOTS 10-13 SHALL FRONT STELLAR DRIVE.
- THIS IS THE FIRST REVISION TO THE STATE FARM SUBDIVISION - BLOCK 2 PRELIMINARY PLAT.
- ALL MAINTENANCE OF THE PRIVATE STREETS SHOWN ON THIS PLAT SHALL BE THE RESPONSIBILITY OF THE OWNERS ASSOCIATION OR ABUTTING PROPERTY OWNERS. NO PRIVATE STREETS SHALL BE DEDICATED TO NOR ACCEPTED BY THE CITY UNLESS AUTHORIZED BY CITY COUNCIL.
- RIGHT OF WAY SHALL BE GRANTED AT THE TIME OF CONSTRUCTION OF THE ROUNDABOUT LOCATED ON A PORTION OF LOT 2. THE RIGHT OF WAY SHOWN BY THIS PRELIMINARY PLAT IS APPROXIMATELY 14 ACRES, BUT IS SUBJECT TO CHANGE AT PLATTING.
- FLAGLER DRIVE SHALL CONNECT TO THE EXISTING PAVEMENT EAST OF STELLAR DRIVE AT A 10:1 TAPER.

LEGEND:

100'	EXISTING WATER CONDUIT	XXXXXX	EXISTING STORM SEWER
100'	EXISTING WATER CONDUIT	XXXXXX	PROPOSED STORM SEWER
CLUB		---	BUILDING LINE
---	EXISTING SANITARY SEWER	---	EXISTING
---	PROPOSED SANITARY SEWER	---	LOT NUMBER
○	UNIMPAVED/PAVEMENT	XX	PROPOSED PAVEMENT
---	PROPOSED WATERLINE	---	EXISTING PAVEMENT
---	PROPOSED LIGHT POLE	---	PROPOSED ROUNDABOUT RIGHT OF WAY
---	PROPOSED FIRE HYDRANT	---	PROPOSED DETENTION
---	WATERWAY	---	
---	EXISTING EASEMENT	---	



NOTE:
TYPICAL CROSS SECTION OF NEW PRIVATE STREET

APPROVED BY THE CITY OF COLUMBIA PLANNING AND ZONING COMMISSION THIS _____ DAY OF _____, 2023.

SHARON GEUX JONES, CHAIRPERSON



4/18/2023
TIMOTHY D. CROCKETT - PE-200400075

EXHIBIT C
Traffic Impact Study (January 27, 2023)

January 27, 2023

Mr. Tim Crockett, P.E.
Crockett Engineering
1000 West Nifong Boulevard, Building 1
Columbia, MO 65203

RE: Traffic Impact Study
Proposed Springbrook Crossing - Providence Road and Southampton Drive
Columbia, Missouri
CBB Job No. 95-22

Dear Mr. Crockett:

As requested, CBB has completed a traffic impact study pertaining to a mixed-use development, known as Springbrook Crossing, in Columbia, Missouri. The location of the site in relation to the surrounding road system is depicted in **Figure 1**.

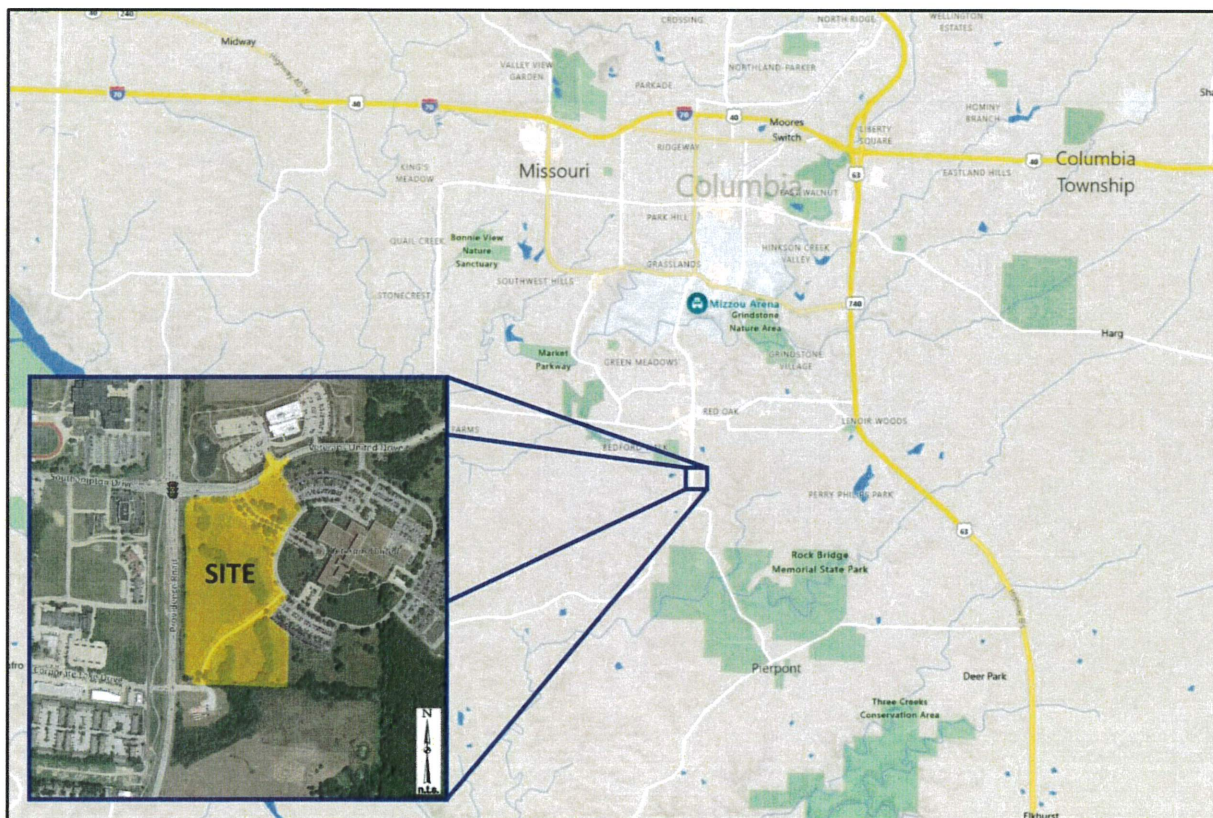


Figure 1: Project Location Map



The proposed development is located in the southeast quadrant of the Providence Road and Veterans United Drive/Southampton Drive intersection, just west of the Veterans United building. Based on the concept plan provided by Crockett Engineering, the proposed development will consist of a mix of commercial uses and a multi-family component. Direct access to the development is proposed via a new private drive off Springbrook Court and Veterans United (VU) Middle Drive that would extend down to the Corporate Lake Drive stub with access to the public street network provided via Springbrook Court and the VU Middle Drive off Veterans United Drive and via Corporate Lake Drive off Providence Road. A schematic of the concept plan provided is shown in **Exhibit 1**.

The purpose of this study was to determine the number of trips that would be generated by the proposed development, evaluate the impact of those trips on operating conditions along the adjacent roadways, and determine the ability of motorists to safely enter and exit the site. Where necessary, roadway improvements and/or traffic control modifications were recommended to mitigate the impact of the development. The focus of this study was the AM and PM peak hours of a typical weekday.

The following intersections were included in the study:

- Providence Road and Southampton Drive/Veterans United Drive;
- Providence Road and Corporate Lake Drive;
- Veterans United Drive and Springbrook Court;
- Veterans United Drive and MU Healthcare Drive/VU Middle Drive;
- Springbrook Court and the proposed internal site roadway; and
- VU Middle Drive and the proposed internal site roadway.

The following analysis scenarios were considered:

- 2022 Existing Conditions; and
- 2022 Build Conditions (Existing plus Site trips)

The following report presents the methodology and findings relative to the 2022 Existing and Build conditions.

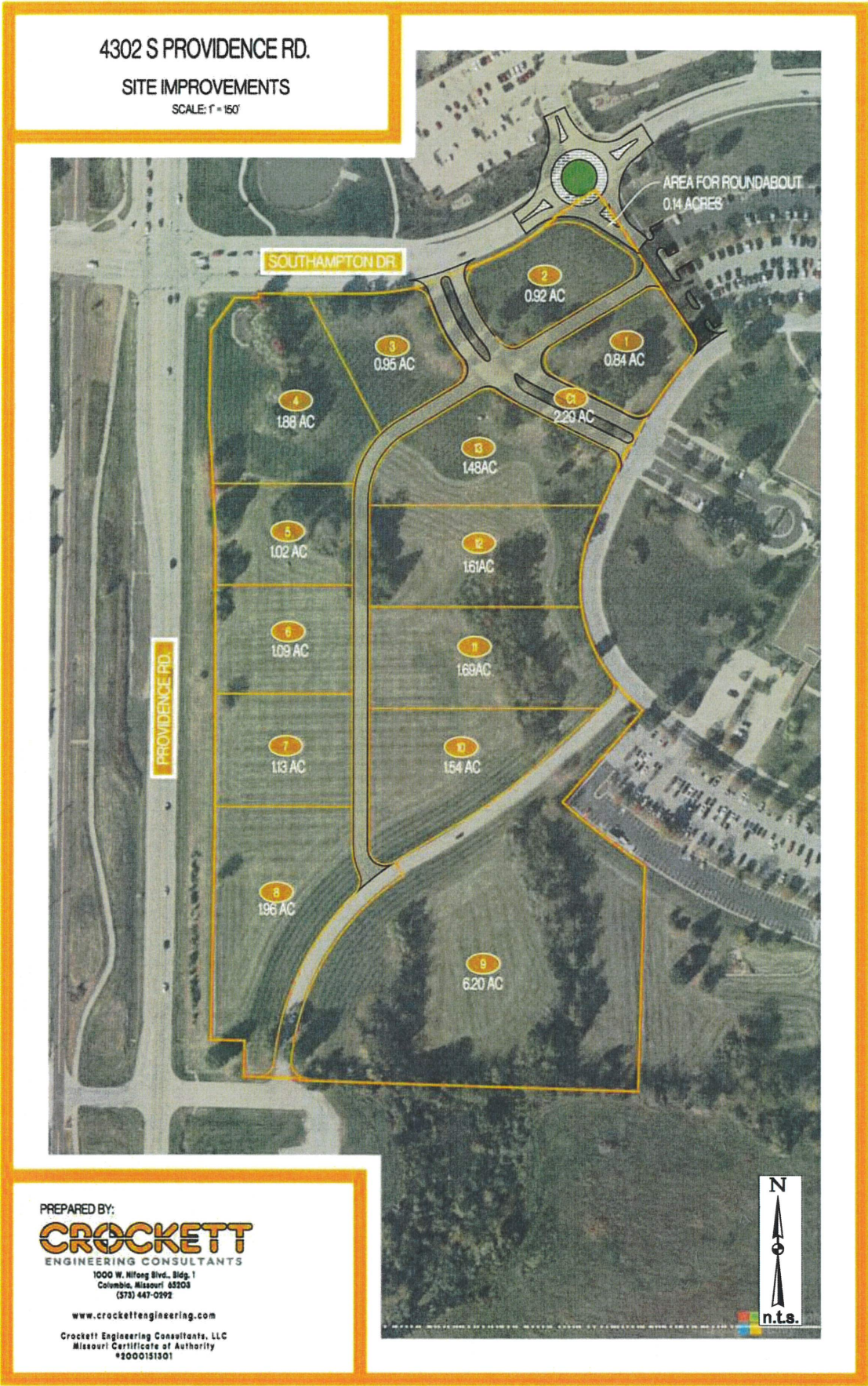


Exhibit 1: Preliminary Site Plan (provided by others)



EXISTING CONDITIONS

Area Roadway System: Providence Road (Missouri Route 163) is a north-south minor arterial owned and maintained by the Missouri Department of Transportation (MoDOT). North of Southampton Drive, Providence Road has four lanes, two in each direction with a center concrete median. Between Southampton Drive and Corporate Lake Drive, Providence Road has three lanes, one northbound and two southbound. Providence Road terminates the second southbound through lane as a separate right turn lane at Corporate Lake Drive and is two lanes south of Corporate Lake Drive. Providence Road has a speed limit of 50 mph throughout the study area. There are paved shoulders on both sides of the road and a multi-use path that runs parallel to Providence Road along the west side of the road.

Southampton Drive/Veterans United Drive is an east-west major collector owned and maintained by the City of Columbia with the road referred to as Southampton Drive west of Providence Road and Veterans United Drive east of Providence Road. Southampton Drive has two lanes, one in each direction, and paved shoulders on both sides of the road. The posted speed limit on Southampton Drive is 30 mph. A full sidewalk is provided on the north side of Southampton, and an intermittent sidewalk is provided to the south.

To the east of Providence Road, Veterans United Drive has three lanes, one in each direction with a two way left-turn lane in the center. Sidewalks and shared bike lane arrows are provided along both sides of the road. The posted speed limit on Veterans United Drive is 35 mph.

Corporate Lake Drive is an east-west local road owned and maintained by the City of Columbia. It has two lanes in each direction with no posted speed limit. Corporate Lake Drive has no sidewalks or bike lanes within the study area (east of Providence Road).

The intersection of Providence Road and Southampton Drive/Veterans United Drive is controlled by a traffic signal. The southbound Providence Road approach has two left-turn lanes, one through lane and one channelized separate right-turn lane. The northbound approach has one left turn lane, one through lane and one shared through-right turn lane. The eastbound Southampton Drive approach has two left-turn lanes and one shared through right-turn lane. The westbound Veterans United Drive approach has two left turn lanes, one through lane and one right turn lane. All approaches operate with protected only left-turn phasing. **Figure 2** provides an aerial view of the Providence Road and Southampton Drive/Veterans United Drive intersection.



Figure 2: Aerial View of Providence Road and Southampton Drive/Veterans United Drive

The intersection of Veterans United Drive and Springbrook Court is controlled by a side-street stop with Springbrook Court required to stop. The northbound Springbrook Court approach has one left-turn lane and one right-turn lane. The eastbound Veterans United Drive approach has a separate right-turn lane and a through lane. The westbound approach has a through lane and a two way left turn lane in the center that provides a left turn lane to Springbrook Court. **Figure 3** provides an aerial view of the Veterans United Drive and Springbrook Court intersection.



Figure 3: Aerial View of Veterans United Drive and Springbrook Court

The intersection of Veterans United Drive and MU Healthcare/Veterans United drives is controlled by side-street stop with the MU Healthcare and Veterans United driveways required to stop. The southbound MU Healthcare drive approach has one left-turn lane and one right-turn lane. The northbound Veterans United middle drive has one shared lane. **Figure 4** provides an aerial view of the Veterans United Drive and MU Healthcare/Veterans United drives intersection.

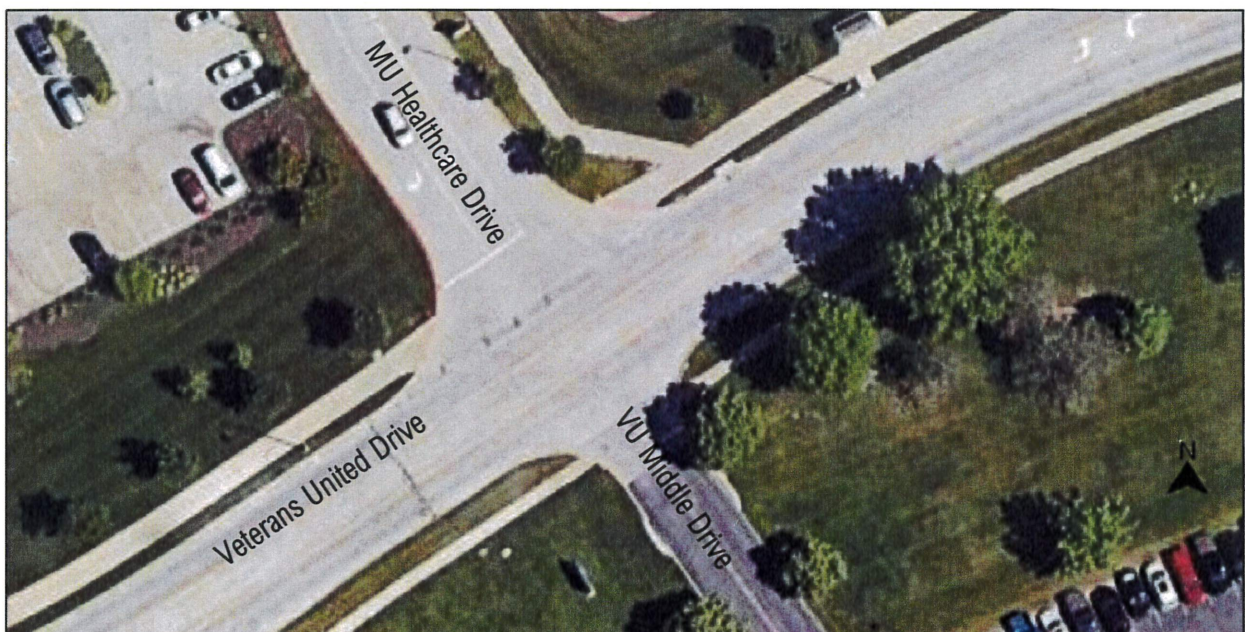


Figure 4: Aerial View of Veterans United Drive and MU Healthcare/ VU Middle Drives



The intersection of Providence Road and Corporate Lake Drive is controlled by side-street stop with Corporate Lake Drive required to stop. The southbound Providence Road approach has one shared left-turn/through lane and one right turn lane. The northbound approach has a single shared lane. Both Corporate Lake Drive approaches have a single shared lane. **Figure 5** provides an aerial view of the Providence Road and Corporate Lake Drive intersection.



Figure 5: Aerial View of Providence Road and Corporate Lake Drive

Existing Traffic Volumes: Video, turning movement traffic counts were conducted at the following intersections during the weekday morning (7:00 - 9:00 a.m.) and weekday afternoon (2:00 - 6:00 p.m.) peak periods on Thursday, October 27, 2022:

- Providence Road and Southampton Drive/Veterans United Drive;
- Providence Road and Corporate Lake Drive; and
- Veterans United Drive and Springbrook Court.

A manual turning movement traffic count was conducted the second week of December at the intersection of Veterans United Drive and MU Healthcare Drive/VU Middle Drive during the AM and PM peak hours.

Based on the traffic data collected, the morning peak hour occurred between 7:45 and 8:45 a.m. and the afternoon peak hour occurred between 4:30 and 5:30 p.m. The existing peak hour volumes are summarized in **Exhibit 2**.



Exhibit 2: Existing Traffic Volumes



Given the proximity to the nearby schools the early afternoon peak period (2:00 - 4:00 p.m.) was also considered. Based on the traffic counts at the Providence Road and Southampton Drive/Veterans United Drive intersection, the total entering volume during the weekday AM peak hour is 2,450 vehicles per hour (vph), the total entering volume during the weekday PM peak hour is 2,805 vph, while the total entering volume during the early afternoon peak hour (3:00 - 4:00 p.m.) is 2,195 vph. The weekday PM peak hour traffic volumes at the primary intersection are approximately 28% higher than the early afternoon traffic volumes, while the weekday AM peak hour traffic volumes are approximately 11% higher than the early afternoon peak hour traffic volumes.

As such, given the traffic characteristics in the area and the anticipated trip generation for the proposed development, the weekday AM and PM peak periods would represent a “worst-case scenario” with regards to the traffic impact. If traffic operations are acceptable during these peak periods, it can be reasoned that conditions would be acceptable throughout the remainder of the day.



PROPOSED SITE

Proposed Land Use: Based on the concept plan provided by Crockett Engineering, the proposed development will consist of a mix of commercial uses including retail, restaurants, and office. For the purposes of this study, it was assumed the proposed development would develop with the following commercial uses:

- Lot 1 - 8,500 SF of general retail;
- Lot 2 - 8,500 SF of general office;
- Lot 3 - 1,800 SF coffee shop;
- Lot 4 - 4,000 SF bank;
- Lot 5 - 3,000 SF fast-food restaurant;
- Lot 6 - 5,000 SF sit-down restaurant (assumed to be close in the AM peak hour);
- Lot 7 - 8,500 SF of general retail;
- Lots 8/10 - 15,00 SF of medical office;
- Lot 9 – 108 apartments;
- Lot 11 – 6,400 SF sit-down restaurant (assumed to be close in the AM peak hour);
- Lot 12 - 12,500 SF of general office and a 2,100 SF fast-food restaurant (assumed to be close in the AM peak hour); and
- Lot 13- 12,500 SF of general retail.

Site Access: As shown on the latest concept plan, direct access to the development is proposed via a new private drive off Springbrook Court and VU Middle Drive that would extend down to the Corporate Lake Drive stub with access to the adjacent roads provided via Springbrook Court and the VU Middle Drive off Veterans United Drive and via Corporate Lake Drive off Providence Road.

It is important to note that the initial site plan only had access to Veterans United Drive via Springbrook Court; however, the left-turn out of the site (northbound Springbrook Court) onto Veterans United Drive was forecasted to operate at failing levels of service due to the heavy east-west traffic volumes along Veterans United Drive. In order to provide acceptable operations alternative traffic control would be needed, such as a traffic signal or roundabout; and with Springbrook Court being less than 500 feet away from the signal at Providence Road, the spacing would not be favorable for either a signal or roundabout. Consequently, the site plan was then revised to also provide internal access to and from the proposed development via a connection to the VU Middle Driveway which provided improved spacing from Providence Road.

Careful consideration should be given to sight distance obstructions when planning future aesthetics enhancements, such as signs, berms, fencing and landscaping, to ensure that these improvements do not obstruct the view of entering and exiting traffic at the intersection of all



drives with the public roadways. It is generally recommended that all improvements higher than 3 ½ feet above the elevation of the nearest pavement edge be held back at least 20 feet from the traveled roadway. Specifically, adequate sight triangles will need to be provided along the divided section of Springbrook Court.

Trip Generation: Traffic forecasts were prepared to estimate the amount of traffic that the proposed Springbrook Crossing development would generate during the peak hours. These forecasts were based upon information provided in the “Trip Generation Manual”, 11th Edition, published by the Institute of Transportation Engineers (ITE). This manual, which is a standard resource for transportation engineers, is based on a compilation of nationwide studies documenting the characteristics of various land uses. Estimates for proposed Springbrook Crossing development were based upon the following land uses:

- Land Use 220 – Multi-Family Housing;
- Land Use 710 – General Office
- Land Use 720 – Medical Office
- Land Use 822 – Strip Retail Plaza (<40,000k)
- Land Use 912 – Drive-In Bank
- Land Use 932 – High-Turnover Sit-Down Restaurant
- Land Use 934 – Fast-Food Restaurant w/Drive-Through
- Land Use 937 – Coffee Shop w/Drive-Through

Based upon the recommended procedures for estimating trip generation outlined in the “Trip Generation Handbook, A Recommended Practice”, published by ITE (March 2001), the regression equation was utilized for:

- Land Use 220 – Multi-Family Housing;
- Land Use 710 – General Office;
- Land Use 720 – Medical Office; and
- Land Use 822 – Strip Retail Plaza (<40,000k).

and the average trip rate was utilized for:

- Land Use 912 – Drive-In Bank;
- Land Use 932 – High-Turnover Sit-Down Restaurant;
- Land Use 934 – Fast-Food Restaurant w/Drive-Through; and
- Land Use 937 – Coffee Shop w/Drive-Through.

The peak hour of adjacent street traffic (one hour between 7 and 9 a.m.) was utilized for the AM peak hour and the peak hour of adjacent street traffic (one hour between 4 and 6 p.m.) was utilized for the PM peak hour trip generation.



It should be noted that not all of these trips would represent *new* traffic on the adjacent roadways. Nationwide studies have found that a large percentage of convenience-oriented trips, such as banks, restaurants, and retail plazas, would already be present on the adjacent roads and would be attracted to the development on their way to or from home, work or another destination (i.e., pass-by trips). The actual percentage of traffic attributable to pass-by depends upon the nature of the use, the time of day and the traffic volume on the adjacent street. The statistical information provided in the ITE Trip Generation Appendices *Pass-By Data and Rate Tables/2021*, was utilized to estimate pass-by percentages for the proposed commercial uses.

ITE resources suggest that coffee shops support pass-by percentages as high as 90% during the AM peak hour and 95% during the PM peak hour, but this study will conservatively apply a pass-by rate of 75% for the AM and PM peak hours.

The pass-by percentages applied are summarized in **Table 1**.

Table 1: Pass-by Trip Assumptions

Land Use	Pass-By Trip Assumptions	
	Weekday AM Peak Hour	Weekday PM Peak Hour
Strip Retail Plaza (<40k)		40%
Drive-In Bank	29%	35%
High-Turnover Sit-Down Restaurant		43%
Fast-Food Restaurant	50%	55%
Coffee Shop	75%	75%

The resulting trip generation estimate, including both new trips and pass-by trips, for the proposed Springbrook Crossing development are summarized in **Table 2**. As shown in the table, the proposed Springbrook Crossing development is estimated to generate 350 new trips during the weekday AM peak hour and 475 new trips during the weekday PM peak hour with another 190 and 290 pass-by trips respectively during the AM and PM peak hours.



Table 2: Trip Generation Estimate – Springbrook Crossing

Land Use	Size	Weekday AM Peak Hour			Weekday PM Peak Hour		
		In	Out	Total	In	Out	Total
Multi-Family	108 units	15	45	60	40	25	65
General Office	21,000 ft ²	40	5	45	10	40	50
Medical Office	15,000 ft ²	35	10	45	15	40	55
Strip Retail Plaza	29,500 ft ²	35	25	60	85	85	170
Bank	4,000 ft ²	20	20	40	40	40	80
Sit-Down Restaurant	11,400 ft ²				65	40	105
Fast-Food Restaurant	5,100 ft ²	70	65	135	90	80	170
Coffee Shop	1,800 ft ²	80	75	155	35	35	70
Total Trips		295	245	540	380	385	765
Pass-by Trips		95	95	190	145	145	290
New Trips		200	150	350	235	240	475

Trips Rounded to Nearest 5 vph

Trip Distribution: The site-generated trips for the proposed Springbrook Crossing development were then assigned into and out of the site based upon an estimated directional distribution. Based upon the existing travel patterns and the surrounding area and roadway network, it is anticipated that the distribution of new site-generated trips would be as summarized in **Table 3**.

Table 3: Trip Distribution Assumptions

DIRECTION OF TRAVEL	COMMERCIAL USES	RESIDENTIAL USES
To/from the north on Providence Road	30%	70%
To/from the south on Providence Road	20%	5%
To/from the west on Southampton Drive	30%	10%
To/from the east on Veterans United Drive	20%	15%

It should be noted that the pass-by trips were assigned in accordance with the adjacent street traffic along Providence Road and Veterans United Drive.

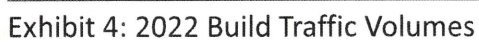


The resulting assignment of site-generated trips for the weekday AM and PM peak hours is summarized in **Exhibit 3**.

2022 Build Traffic Volumes: The proposed site-generated trips (Exhibit 3) were added to the 2022 Existing Traffic Volumes (Exhibit 2) to determine the total volumes in the forecasted scenario. The forecasted, or 2022 Build, traffic volumes for the AM and PM peak hours are shown in **Exhibit 4**.



Exhibit 3: Site-Generated Trips





2022 TRAFFIC ANALYSES

Study Procedures: The 2022 operating conditions were analyzed using SYNCHRO 11, a macro-level analytical traffic flow model. SYNCHRO is based on study procedures outlined in the *Highway Capacity Manual*, published by the Transportation Research Board. This manual, which is used universally by traffic engineers to measure roadway capacity, establishes six levels of traffic service: Level A ("Free Flow"), to Level F ("Fully Saturated"). Levels of service (LOS) are measures of traffic flow, which consider such factors as speed, delay, traffic interruptions, safety, driver comfort, and convenience. Level C, which is normally used for highway design, represents a roadway with volumes ranging from 70% to 80% of its capacity. However, Level D is often considered acceptable for peak period conditions in urban and suburban areas.

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

Level of service is directly related to control delay. At signalized intersections, the level of service criteria differ from that at unsignalized intersections primarily because varying transportation facilities create different driver expectations. The expectation is that a signalized intersection is designed to carry higher traffic volumes, and consequently may experience greater delay than an unsignalized intersection. **Table 4** summarizes the thresholds used in the analysis for signalized and unsignalized intersections.

Table 4: Level of Service Thresholds

LEVEL OF SERVICE (LOS)	CONTROL DELAY PER VEHICLE (SEC/VEH)	
	SIGNALIZED INTERSECTIONS	UNSIGNALIZED INTERSECTIONS
A	≤ 10	0-10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50



Auxiliary Left-Turn Lane Warrants: The need for a southbound left-turn lane on Providence Road at Corporate Lake Drive was evaluated using the *Left-Turn Guidelines for Two-lane Roadway* nomograph which is based on criteria using MoDOT's Access Management Guidelines (AMG). The MoDOT criteria provides guidelines for separate left-turn lanes on the through roadway by comparing the total advancing volume (which includes all turning traffic) to the total opposing volume (which includes opposing through and right-turn movements) during the design hour with respect to the number of mainline left-turns. Then, the percentage of left-turns is determined by dividing the number of left-turns by the total advancing volume. If the point lies to the right of the percentage line, then a left-turn lane should be considered. If the point is to the left of the line, then a left-turn lane is not necessary. Since, the posted speed on Providence Road is 50 mph, the 55-mph nomograph was used.

Figure 6, graphically illustrates the southbound left-turn evaluation along Providence Road at Corporate Lake Drive assuming the 2022 Build traffic volumes during the weekday AM and PM peak hours. As can be seen in Figure 6, a separate southbound left-turn lane is warranted on Providence Road at Corporate Lake Drive.

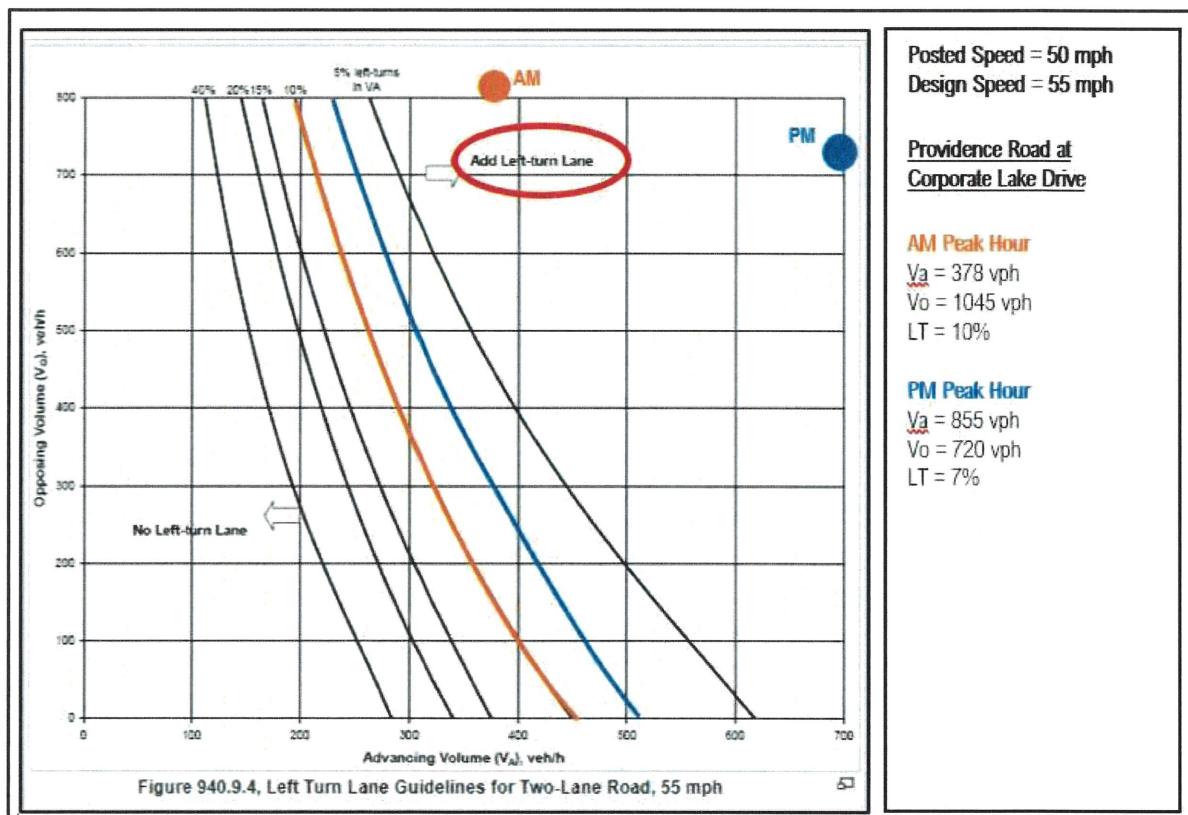


Figure 6: Southbound Providence Road Left-Turn Warrant at Corporate Lake Drive – 2022 Build

Auxiliary Right-Turn Lane Warrants: The need for a northbound right-turn lane on Providence Road at Corporate Lake Drive was evaluated using the *Right-Turn Guidelines for Two-Lane Roadway* nomograph which is based on criteria from MoDOT's AMG criteria. The MoDOT AMG



provides guidelines for separate right-turn lanes on the through roadway by comparing the total advancing volume (which includes all turning traffic) to the number of mainline right-turns. The operating speed (posted speed limit) of the major roadway is used to determine if a right-turn lane is warranted. If the point lies to the right of the operating speed line, then a right-turn lane should be considered. If the plotted point is to the left of the line, then a left-turn lane is not necessary. Providence Road has a posted speed of 50 mph, so the 55-mph graph line was used.

Figure 7 graphically illustrates the northbound right-turn evaluation at Corporate Lake Drive assuming the 2022 Build traffic volumes during the weekday AM and PM peak hours. As can be seen in Figure 7, a separate northbound right-turn lane on Providence Road is warranted at Corporate Lake Drive.

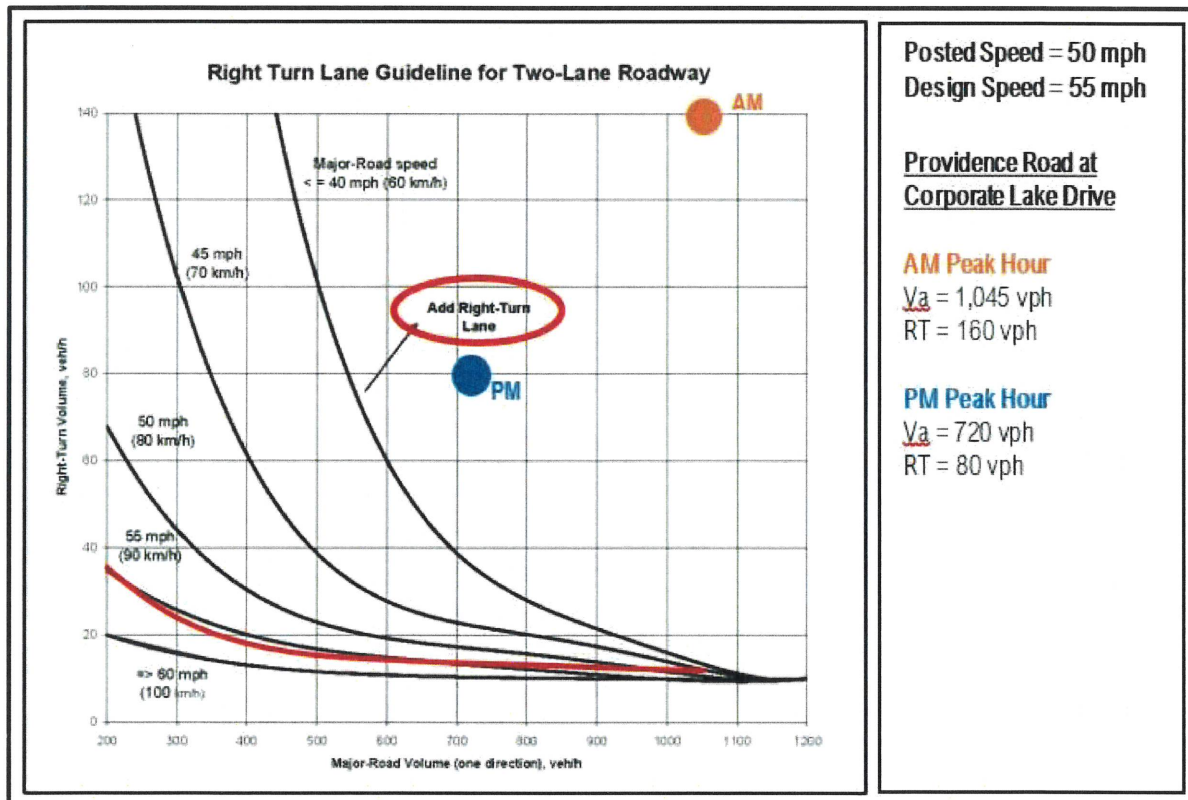


Figure 7: Northbound Providence Road Right-Turn Warrant at Corporate Lake Drive – 2022 Build

2022 Operating Conditions: The study intersections were evaluated using the methodologies described previously. **Table 5** summarizes the results of this analysis, which reflects the 2022 Existing and Build operating conditions and average delay at the study intersections during the weekday AM and PM peak hours. The existing lanes and traffic control for the study intersections were assumed for the existing intersections plus the warranted left- and right-turn lanes on Providence Road at Corporate Lake Drive were assumed in the Build condition. Table 5 assumes that the intersection of Veterans United Drive at MU Healthcare/VU Middle Drive remains the existing side-street stop control.



Table 5: 2022 Capacity Analysis Summary

INTERSECTION / APPROACH	WEEKDAY AM PEAK HOUR		WEEKDAY PM PEAK HOUR	
	2022 EXISTING	2022 BUILD	2022 EXISTING	2022 BUILD
Providence Road and Southampton Drive/Veterans United Drive (Signalized)				
Eastbound Southampton Drive Approach	E (60.2) 95 th Q: 385' T	E (67.6) 95 th Q: 475' T	E (56.0) 95 th Q: 220' T	E (61.7) 95 th Q: 340' T
Westbound Veterans United Drive Approach	D (40.7) 95 th Q: 165' T	D (38.0) 95 th Q: 195' T	D (41.5) 95 th Q: 275' T	D (43.4) 95 th Q: 380' T
Northbound Providence Road Approach	D (43.2) 95 th Q: 360' T	D (46.7) 95 th Q: 375' T	C (28.4) 95 th Q: 255' T	C (34.2) 95 th Q: 280' T
Southbound Providence Road Approach	D (38.9) 95 th Q: 285' T	D (44.0) 95 th Q: 290' T	D (41.5) 95 th Q: 785' T	D (44.9) 95 th Q: 765' T
Overall	D (45.4)	D (49.2)	D (40.5)	D (44.7)
Providence Road and Corporate Lake Drive (Side-Street STOP)				
Eastbound Corporate Lake Drive Approach	E (46.2)	F (83) 95 th Q: 65'	E (46.2)	F (286) 95 th Q: 210'
Westbound Corporate Lake Drive Approach	C (22.8)	D (33.6) 95 th Q: 35' L	C (22.8) 95 th Q: 40' L	F (>400) 95 th Q: 300' L
Northbound Providence Road Approach	A (1.0)	A (<1.0)	A (1.0)	A (1.1)
Southbound Providence Road Approach	A (<1.0)	A (1.0)	A (<1.0)	A (<1.0)
Veterans United Drive and Springbrook Court (Side-Street STOP – ¾ access)				
Eastbound Veterans United Drive Approach	Free Flow	Free Flow	Free Flow	Free Flow
Westbound Veterans United Drive Left-Turn	A (9.6)	B (10.6)	A (8.1)	A (8.8)
Northbound Springbrook Court Approach	C (17.7) 95 th Q: <25' L	B (13.2) 95 th Q: <25'	C (23.7) 95 th Q: 35' L	B (11.2) 95 th Q: <25'
Veterans United Drive and MU Healthcare/VU Middle Drive (Side-Street STOP)				
Eastbound Veterans United Drive Approach	A (1.2)	A (1.1)	A (<1.0)	A (<1.0)
Westbound Veterans United Drive Approach	A (<1.0)	A (<1.0)	A (<1.0)	A (<1.0)
Northbound VU Middle Drive Approach	C (17.9) 95 th Q: <25'	F (94) 95 th Q: 145' L	E (36.2) 95 th Q: 40'	F (>400) 95 th Q: 760' L
Southbound MU Healthcare Drive Approach	B (11.4) 95 th Q: <25'	B (12.3) 95 th Q: <25'	C (16.8) 95 th Q: <25'	C (18.6) 95 th Q: <25'

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

As shown in the table, the signalized intersection of Providence Road and Southampton Drive currently operates at overall acceptable levels of service (LOS D or better) during both peak periods and would continue to operate at overall acceptable levels of service for the 2022 Build condition.



As mentioned previously, the initial site plan only had access to Veterans United Drive via Springbrook Court; however, the left-turn out of the site onto Veterans United Drive was forecasted to operate at failing levels of service with long delays and queues. In order to provide acceptable operations at Springbrook Court, a traffic signal or roundabout would be needed; and with Springbrook Court being less than 500 feet away from the signal at Providence Road, the spacing would not be favorable for either a signal or roundabout. Consequently, the site plan was revised to also provide access to the development via a connection to the VU Middle Driveway which has better spacing from Providence Road. In turn, the lefts out of Springbrook Court would be restricted.

As shown in the table under side-street stop control, the northbound left turns exiting the VU Middle Drive onto Veterans United Drive are forecasted to operate at LOS F with unacceptable delays and queues, particularly in the PM peak hour. Thus, a single-lane roundabout was considered to accommodate the full build-out of the proposed development.

The roundabout intersection was analyzed using the SIDRA Intersection 8 software, which is the most widely recognized tool available for evaluating roundabouts. This software package calculates vehicular delay times and operational LOS that are consistent with methods supported by the HCM, volume to capacity ratios (v/c) and 95th percentile queue estimates. The roundabout analysis was performed using Sidra Intersection. **Table 6** summarizes the results of the 2022 Build operating conditions at the intersection of Veterans United Drive and MU Healthcare/VU Middle Drive under roundabout control.

Table 6: 2022 Build Capacity Analysis Summary – Roundabout Control

Intersection / Approach	Weekday AM Peak Hour	Weekday PM Peak Hour
Veterans United Drive and MU Healthcare/VU Middle Drive		
Eastbound Veterans United Drive Approach	A (8.4) 95 th Q: 110'	A (6.2) 95 th Q: 55'
Westbound Veterans United Drive Approach	A (6.7) 95 th Q: 45'	C (15.8) 95 th Q: 245'
Northbound VU Middle Drive Approach	A (7.3) 95 th Q: <25'	A (9.9) 95 th Q: 65'
Southbound MU Healthcare Drive Approach	A (4.8) 95 th Q: <25'	B (10.2) 95 th Q: <25'
Overall	A (7.6)	B (11.2)

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

As shown, under roundabout control the intersection of Veterans United Drive and MU Healthcare/VU Middle Drive is forecasted to operate at overall favorable levels of service (LOS B or better) during both the AM and PM peak periods with all approaches also operating at LOS C or better.



As shown in Table 5 under the existing side-street stop control, the eastbound and westbound left turns on Corporate Lake Drive at Providence Road are forecasted to operate at LOS F with long delays and queues, particularly during the PM peak hour. In order to provide improved operations for the side-street approaches, a traffic signal or roundabout would be needed. Since the Providence Road corridor is already a higher-volume signalized corridor, a roundabout would not be the preferred option at this location.

Based on discussions with the City and MoDOT, it is our understanding a new traffic signal at Corporate Lake Drive is not desired given the substandard spacing, with half mile spacing preferred. There is approximately 1,400 feet to the signal to north at Southampton Drive and approximately 1,150 feet to the signal to south at Highway 163.

It is our further understanding, the long-range roadway plan shows a connection from Corporate Lake Drive to the future extension of Gans Road which would give patrons of the Springbrook Crossing development access to the next signal to the south at Highway 163 to facilitate a left-turn movement. For motorists on the west side of Providence Road that want to make a left-turn on Providence Road they could utilize the existing street network (Outer Road/) to access the signal at Southampton Drive to the north.

However, if the proposed Springbrook Crossing development was to reach full build-out prior to the connection to Gans Road/Highway 163, patrons of the Springbrook Crossing development desiring to turn left onto Providence Road via Corporate Lake Drive would need an alternative means to access Providence Road. Prior to the connection to Gans Road being made, patrons could use the internal development roadways to access the proposed roundabout on Veterans United Drive to get to the signal at Providence Road and Southampton Drive/ Veterans United Drive.

To test the ability of the proposed roundabout and the Providence Road and Southampton Drive/ Veterans United Drive signal to accommodate this additional traffic, the intersections were reevaluated assuming all westbound left-turn trips on Corporate Lake Drive at Providence Road (25 in the AM peak and 100 in the PM peak) are rerouted through the site to the proposed roundabout on Veterans United Drive to use the existing traffic signal at Providence Road.

Table 7 summarizes the results of this alternative analysis.



**Table 7: 2022 Build Capacity Analysis Summary – Alternate Scenario
(No Westbound left-turns from Corporate Lake Drive to Southbound Providence)**

Intersection / Approach	Weekday AM Peak Hour	Weekday PM Peak Hour
Providence Road and Southampton Drive/Veterans United Drive (Signalized)		
Eastbound Southampton Drive Approach	E (68.4) 95 th Q: 475' T	E (62.6) 95 th Q: 340' T
Westbound Veterans United Drive Approach	D (39.5) 95 th Q: 195' T	D (47.5) 95 th Q: 380' T
Northbound Providence Road Approach	D (46.9) 95 th Q: 375' T	C (34.8) 95 th Q: 280' T
Southbound Providence Road Approach	D (44.3) 95 th Q: 290' T	D (46.7) 95 th Q: 765' T
Overall	D (49.7)	D (46.8)
Veterans United Drive and MU Healthcare/VU Middle Drive (Roundabout)		
Eastbound Veterans United Drive Approach	A (8.4) 95 th Q: 110'	A (6.2) 95 th Q: 55'
Westbound Veterans United Drive Approach	A (7.0) 95 th Q: 45'	C (22.0) 95 th Q: 310'
Northbound VU Middle Drive Approach	A (7.8) 95 th Q: 25'	B (12.9) 95 th Q: 120'
Southbound MU Healthcare Drive Approach	A (5.0) 95 th Q: <25'	B (11.8) 95 th Q: <25'
Overall	A (7.8)	B (14.5)

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

As shown in Table 7, the proposed roundabout at the intersection of Veterans United Drive and MU Healthcare/VU Middle Drive is forecasted to operate at overall favorable levels of service (LOS B or better) during both the AM and PM peak in a worst-case scenario of all left-turn traffic at Corporate Lake Drive diverting to the roundabout. Additionally, the signalized intersection of Providence Road and Southampton Drive is also forecasted to operate at overall acceptable levels of service in a worst-case scenario of all westbound left-turn traffic removed from Corporate Lake Drive and re-routing through the roundabout and then making a left-turn at the signal onto Providence Road.



Sensitivity Analysis: While ultimately a roundabout is recommended at the Veterans United Drive and MU Healthcare/VU Middle Drive intersection to accommodate the full build-out of the Springbrook Crossing development, the existing roadway network and traffic control could accommodate some development before the roundabout would be needed.

Since the PM peak hour is the critical hour, the PM peak hour will control when the intersection needs to be converted to a roundabout. Considering the existing northbound left-turn volume on Springbrook Court at Veterans United Drive is 70 vph during the PM peak hour, an additional 35 left turns can be accommodated before the northbound left-turn movement fails (i.e., delay over 50 seconds). Considering the full build-out of the site resulted in 185 lefts from the site onto Veterans United Drive, 35 lefts would represent about 19 percent of the total site trips. As shown in Table 2, the full build-out of the site is expected to generate approximately 765 trips in the PM peak hour so 19 percent of the total site would be about 145 trips. So for example, the assumed bank on Lot 4 is estimated to generate 80 trips in the PM peak hour which would be under the 145 trip “threshold” and could therefore be accommodated without the proposed roundabout.



SUMMARY

CBB completed the preceding study to address the traffic impacts associated with the proposed a mixed-use development, known as Springbrook Crossing, located in the southeast quadrant of the Providence Road and Veterans United Drive/Southampton Drive intersection in Columbia, Missouri.

In summary, the following findings and improvements should be considered in conjunction with the proposed development:

- The proposed Springbrook Crossing development is estimated to generate 350 new trips during the weekday AM peak hour and 475 new trips during the weekday PM peak hour with another 190 and 290 pass-by trips respectively during the AM and PM peak hours.
- Direct access to the development is proposed via a new private drive off Springbrook Court and VU Middle Drive that would extend down to the Corporate Lake Drive stub with access to the adjacent roads provided via Springbrook Court and the VU Middle Drive off Veterans United Drive and via Corporate Lake Drive off Providence Road.
- Based on MoDOT's Access Management Guidelines, a separate southbound left-turn lane is warranted on Providence Road at Corporate Lake Drive.
- Based on MoDOT's Access Management Guidelines, a separate northbound right-turn lane is warranted on Providence Road at Corporate Lake Drive.
- The signalized intersection of Providence Road and Southampton Drive currently operates at acceptable levels of service during both peak periods and would continue to operate at overall acceptable levels of service for the 2022 Build conditions.
- The initial site plan only had access to Veterans United Drive via Springbrook Court. The site plan was revised to also provide access to the development via a connection to the VU Middle Driveway which has better spacing from Providence Road. In turn, the lefts out of Springbrook Court (northbound left-turns) would be restricted.
- It is recommended the intersection of Veterans United Drive and MU Healthcare/VU Middle Drive be controlled by a new single-lane roundabout. Under roundabout control the intersection is forecasted to operate at overall favorable levels of service during both the AM and PM peak periods.
 - A basic sensitivity analysis indicates a "trip threshold" of approximately 145 total trips could be used to determine the amount of development that could occur before the northbound left-turn from Springbrook Court to Veterans United Drive degrades to failing levels. Development that generates more than 145 trips may require the northbound left-turn from Springbrook Court to be restricted and the construction of the roundabout at Veterans United Drive and MU Healthcare/VU Middle Drive.



- The eastbound and westbound left turns on Corporate Lake Drive at Providence Road are forecasted to operate at LOS F with long delays and queues, particularly in the PM peak hour.
 - Based on discussions with the City and MoDOT, it is our understanding a new traffic signal at Corporate Lake Drive is not desired given the substandard spacing. It is our further understanding, the long-range roadway plan shows a connection from Corporate Lake Drive to the future extension of Gans Road (east of Providence Road) which would give patrons of the Springbrook Crossing development access to the signal at Providence Road and Highway 163 to facilitate a westbound left-turn there instead of at Corporate Lake Drive.
- However, if the proposed Springbrook Crossing development was to reach full build-out prior to the connection to Gans Road/Highway 163, patrons of the Springbrook Crossing development desiring to turn left onto Providence Road via Corporate Lake Drive would need an alternative means to access Providence Road. Prior to the connection to Gans Road being made, patrons could use the internal development roadways to access the proposed roundabout on Veterans United Drive to get to the existing signal at Providence Road and Southampton Drive/ Veterans United Drive.
 - The proposed roundabout at the intersection of Veterans United Drive and MU Healthcare/VU Middle Drive is forecasted to operate at overall favorable levels of service during both the AM and PM peak in a worst-case scenario of all left-turn traffic at Corporate Lake Drive diverting to the roundabout.
 - The signalized intersection of Providence Road and Southampton Drive is also forecasted to operate at overall acceptable levels of service in a worst-case scenario of westbound left-turn traffic removed from Corporate Lake Drive and re-routing through the roundabout and then making a left-turn at the signal onto Providence Road.
- Careful consideration should be given to sight distance obstructions when planning future aesthetics enhancements, such as signs, berms, fencing and landscaping, to ensure that these improvements do not obstruct the view of entering and exiting traffic at the intersection of all drives with the public roadways. It is generally recommended that all improvements higher than 3 ½ feet above the elevation of the nearest pavement edge be held back at least 20 feet from the traveled roadway.

We trust that this traffic impact study adequately describes the forecasted traffic conditions that should be expected as a result of the proposed Springbrook Crossing development in Columbia, Missouri. If additional information is desired, please feel free to contact me at 314-449-9572 or swhite@cbbtraffic.com.

Sincerely,

Shawn Lerai White, P.E., PTOE
Associate - Senior Traffic Engineer

MOVEMENT SUMMARY

Site: 101 [Springbrook Crossing AM]

Build New Site Plan
AM Peak Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: NB VU Middle Drive												
3	L2	133	2.0	0.193	7.3	LOS A	0.8	20.2	0.61	0.61	0.61	23.6
8	T1	1	2.0	0.193	7.3	LOS A	0.8	20.2	0.61	0.61	0.61	13.4
18	R2	1	2.0	0.193	7.3	LOS A	0.8	20.2	0.61	0.61	0.61	27.1
Approach		136	2.0	0.193	7.3	LOS A	0.8	20.2	0.61	0.61	0.61	23.5
East: WB Southampton Drive												
1	L2	22	2.0	0.333	6.7	LOS A	1.8	45.3	0.47	0.34	0.47	29.1
6	T1	306	2.0	0.333	6.7	LOS A	1.8	45.3	0.47	0.34	0.47	32.4
16	R2	28	2.0	0.333	6.7	LOS A	1.8	45.3	0.47	0.34	0.47	29.0
Approach		356	2.0	0.333	6.7	LOS A	1.8	45.3	0.47	0.34	0.47	32.0
North: SB MU Healthcare Drive												
7	L2	6	2.0	0.054	4.8	LOS A	0.2	5.5	0.50	0.40	0.50	33.3
4	T1	1	2.0	0.054	4.8	LOS A	0.2	5.5	0.50	0.40	0.50	21.3
14	R2	39	2.0	0.054	4.8	LOS A	0.2	5.5	0.50	0.40	0.50	26.4
Approach		46	2.0	0.054	4.8	LOS A	0.2	5.5	0.50	0.40	0.50	27.5
West: EB Southampton Drive												
5	L2	94	2.0	0.525	8.4	LOS A	4.3	109.1	0.22	0.07	0.22	18.0
2	T1	528	2.0	0.525	8.4	LOS A	4.3	109.1	0.22	0.07	0.22	31.3
12	R2	67	2.0	0.525	8.4	LOS A	4.3	109.1	0.22	0.07	0.22	24.3
Approach		689	2.0	0.525	8.4	LOS A	4.3	109.1	0.22	0.07	0.22	29.4
All Vehicles		1226	2.0	0.525	7.6	LOS A	4.3	109.1	0.34	0.22	0.34	29.6

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [Springbrook Crossing PM]

Build New Site Plan
PM Peak Hour
Site Category: (None)
Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance ft	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed mph
South: NB VU Middle Drive												
3	L2	339	2.0	0.432	9.9	LOS A	2.6	64.8	0.67	0.71	0.80	22.1
8	T1	1	2.0	0.432	9.9	LOS A	2.6	64.8	0.67	0.71	0.80	12.5
18	R2	11	2.0	0.432	9.9	LOS A	2.6	64.8	0.67	0.71	0.80	25.9
Approach		351	2.0	0.432	9.9	LOS A	2.6	64.8	0.67	0.71	0.80	22.2
East: WB Southampton Drive												
1	L2	20	2.0	0.696	15.8	LOS C	9.7	245.2	0.82	1.03	1.44	24.6
6	T1	611	2.0	0.696	15.8	LOS C	9.7	245.2	0.82	1.03	1.44	27.7
16	R2	11	2.0	0.696	15.8	LOS C	9.7	245.2	0.82	1.03	1.44	24.1
Approach		642	2.0	0.696	15.8	LOS C	9.7	245.2	0.82	1.03	1.44	27.6
North: SB MU Healthcare Drive												
7	L2	28	2.0	0.205	10.2	LOS B	0.8	19.8	0.69	0.69	0.69	28.6
4	T1	1	2.0	0.205	10.2	LOS B	0.8	19.8	0.69	0.69	0.69	16.4
14	R2	72	2.0	0.205	10.2	LOS B	0.8	19.8	0.69	0.69	0.69	21.5
Approach		101	2.0	0.205	10.2	LOS B	0.8	19.8	0.69	0.69	0.69	23.9
West: EB Southampton Drive												
5	L2	28	2.0	0.363	6.2	LOS A	2.2	56.9	0.22	0.09	0.22	19.2
2	T1	433	2.0	0.363	6.2	LOS A	2.2	56.9	0.22	0.09	0.22	32.9
12	R2	6	2.0	0.363	6.2	LOS A	2.2	56.9	0.22	0.09	0.22	26.2
Approach		467	2.0	0.363	6.2	LOS A	2.2	56.9	0.22	0.09	0.22	32.2
All Vehicles		1561	2.0	0.696	11.2	LOS B	9.7	245.2	0.60	0.65	0.88	27.8

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: Same as Sign Control.

Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.

LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).

Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).

Roundabout Capacity Model: US HCM 6.

HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.

Gap-Acceptance Capacity: Traditional M1.

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.