

EXHIBIT “A”

E. MEDICAL CENTER DRIVE BRIDGE OVER AMTRAK RAILROAD
REHABILITATION AND WIDENING PROJECT
SCOPE OF SERVICES

GENERAL PROJECT REQUIREMENTS

The LEAD CONSULTANT (DLZ Michigan, Inc.) shall manage all aspects of the project design up to the award of the construction contract(s) for the project. This includes but is not limited to managing all aspects of the project, including the work of all sub-consultants, and project coordination with all affected agencies. The project manager must ensure the timely and cost-effective delivery of the project design, as well as provide oversight and review of all project deliverables. The Project Manager will be responsible for the overall review and coordination of the contract documents to confirm preparation of plans that are detailed, thorough, and accurate and meet all the requirements of the City of Ann Arbor.

The CONSULTANT shall be involved with public/stakeholder awareness and involvement strategies throughout the course of the design of the project, including, but not limited to; public meetings; stakeholder meetings; e-mails; and other information sharing techniques as proposed by the Consultant team. The CONSULTANT must effectively communicate the purpose and the benefits of the project with the public and the stakeholders and assist with all necessary negotiations with affected public and private agencies.

The CONSULTANT shall prepare visual aids and attend the following public meetings to coordinate the design of the project with the following groups:

City departments/state agencies	Up to 12 meetings
Immediately affected property owners (Or approximation 1 meeting/check in per week for the duration of the project) University of Michigan (U of M), Amtrak and the City	Up to 50 meetings/phone conferences
Other public entities (AATA, U of M Logistics, Transportation & Parking)	Up to 12 individual meetings
Planning Commission/City Council	6 progress updates 2 regular meetings

The CONSULTANT shall coordinate all elements of the design with all affected parties, including, but not limited to; FHWA, MDOT, AARR, various City Departments, University of Michigan, private utility companies, other formal and informal committees, and the public in general.

The CONSULTANT shall schedule and chair design progress meetings to be held on a bi-monthly basis with agenda and requested attendees provided to all parties a week or more in advance. This is to include a design kick-off meeting in which all affected parties to the design will be contacted and invited to attend. The CONSULTANT shall prepare and distribute written meeting minutes for all

progress and coordination meetings.

The CONSULTANT shall prepare complete, thorough, and accurate contract documents including plans, specifications, bid forms, etc., to allow the project to be bid either as one project, or up to two projects, depending on the methods and timing of relocating the existing communication lines at the bridge.

The CONSULTANT will track project costs associated with the bridge rehabilitation, widening and utility relocation) in separate categories (or other agreed upon categories) as much as possible in order to facilitate final cost sharing with the U of M.

The CONSULTANT will have several project tasks to coordinate with the University of Michigan (U of M/U of M Medical). To assist the CONSULTANT in completing these tasks, the U of M will have certain responsibilities, including, but not limited to:

- Providing the CONSULTANT with contact information and organizational chart of U of M staff involved with this project (e.g., IT department, engineering, parking, etc.)
- Providing existing information related to utility locations (maps), GIS information, traffic counts, road plans, signal information, and other available information related to E. Medical Center Drive (EMCD), the overall U of M Medical Campus, and the EMCD Bridge
- Timely reviews and decisions on items that impact the operations and facilities of the U of M. The CONSULTANT will provide “user friendly” and understandable exhibits and information to the U of M to assist them in responding quickly and accurately to impacts and questions.

INFORMATION GATHERING

The CONSULTANT shall obtain and review information pertaining to existing public, private and U of M utilities and determine the precise location, both horizontally and vertically, of all existing utilities. Coordinate all aspects of the proposed work with all utility owners. Where critical crossings of utilities are believed to exist, or the elevation(s) of existing utilities may significantly affect the design of the bridge, utilities, roadways, retaining walls, and the like, test holes shall be dug to determine the precise location, both horizontally and vertically of these points.

The CONSULTANT shall arrange for up to ten (10) test holes to be dug, by the respective utility owner or by the CONSULTANT, and shall make arrangements to have the necessary inspection and survey personnel on hand to observe, locate, and verify the results of each excavation. After completion, the test holes shall be backfilled with excavated soil and/or appropriate thickness of granular material and gravel, if located within the roadway, compacted, and patched with bituminous cold patch or quickcrete.

The CONSULTANT shall prepare a complete, detailed, ground survey of the entire construction influence area and the existing bridge (see Project Vicinity and Survey Limits; p. 15). The CONSULTANT shall at a minimum, locate all trees 6 inches diameter or greater and provide the genus and cultivar (if applicable) breakdown; locate all cultural features within the requested survey boundaries; provide a survey with 1 foot contour intervals; locate all “breaklines” and other features as necessary to develop accurate contours; provide detailed spot elevations at all existing sidewalk and sidewalk ramp areas; and, provide all survey work to national map accuracy standards; establish

and define the existing Right-of-Way of Fuller Road, E. Medical Center Drive, and W. Medical Center Drive (as applicable) as well as all intersecting cross-streets that are affected by the project; coordinate with CITY personnel such that the appropriate title work and appraisals can be obtained for the purposes of right-of-way and grading permit acquisition, if necessary; locate all existing property irons and monuments within the survey limits; and, locate existing public, private and University utilities. All survey work shall be performed in accordance with the City of Ann Arbor Public Services Area's Standards and its Geodetic Control Manual.

The CONSULTANT shall use and coordinate the existing survey data previously obtained in the vicinity of the project site for the Fuller Road/E. Medical Center Drive/Maiden Lane Intersection Study Project (DLZ Project No. 1041-6384-00) with the information obtained for this project.

The CITY shall obtain the needed title work and appraisals required for any proposed project right-of-way, if necessary.

GEOTECHNICAL INVESTIGATION

The CONSULTANT will obtain soil borings at both ends of the existing piers and abutments (eight total). This data will be used to design the extended piers and abutments, either on the east or west side of the existing structure. Even though widening will only take place on one side of the existing bridge, it is prudent to obtain borings in all quadrants so that the information is available in case changes in the design are necessary after this work is completed. In addition, road cores/borings will be obtained in the approaches to determine the existing roadway section and to help design the proposed approaches. Borings for the north abutment will be utilized to design any necessary retaining walls along the portions of the proposed path that are included in this project.

The CONSULTANT's in-house staff will provide the geotechnical services for this project. Office and field reconnaissance of the project site and field boring layout shall be performed by the CONSULTANT. The CONSULTANT will confirm approval of the ROW and Amtrak permits required for this work.

It is assumed that all drilling will take place within the public right-of-way of EMCD, with the exception that the two (2) north pier borings will require work within the railroad right-of-way (ROW). The CONSULTANT will obtain the necessary permits and flagging from Amtrak, and CONSULTANT staff will complete the appropriate training to work in the ROW. This work will be coordinated with survey and SUE activities to keep railroad flagging costs to a minimum. Railroad coordination, obtaining a TPE and railroad flagging hours and costs are included and lumped together with similar efforts needed to complete some of the survey and SUE work.

It is assumed that the CONSULTANT will have full access to the project site. The CONSULTANT has included effort required to obtain a right-of-way permit, a traffic control permit, and a street tree permit (if required) for brush clearing as necessary from the CITY.

It is assumed that the borings drilled for the proposed extended pier foundations will be located within the railroad right of way (ROW). The CONSULTANT will obtain the necessary permits and flagging from Amtrak, and CONSULTANT staff will complete the appropriate training to work in the ROW. This work will be coordinated with survey and SUE activities to keep railroad flagging costs to a minimum.

Underground utilities in the boring areas will be cleared by the CONSULTANT prior to the subsurface exploration. The CONSULTANT will notify Miss Dig a minimum of 3 working days in advance of any underground activities and coordinate with the City with respect to any known private utilities in the project area. The CONSULTANT has included cost for private utility locating services at the proposed boring locations using ground penetrating radar (GPR). However, the CONSULTANT assumes no responsibility for utilities unmarked by state/local/private agencies. If the borings can only be drilled within five feet of utility markings, soft digging (vacuum extraction) shall be required. Costs associated with soft digging are beyond the current scope of services and will be treated as an additional reimbursable expense billed at cost plus 10%. Our SUBCONSULTANT will contact Miss Dig and work with the CITY and U of M to obtain existing maps and other utility information prior to drilling.

It is assumed that all boring locations can be accessed and drilled using one ATV-mounted drill rig under a single field mobilization. The CONSULTANT will provide “cribbing” if needed for drilling the north pier borings due to the existing steep slope. The CONSULTANT will perform minor clearing of brush as needed to access the off-road borings. Any additional work required to prepare the site for drilling are beyond the scope of services for this project.

Significant on-site safety training for the CONSULTANT’s field personnel is beyond the current scope of services. The CITY shall notify the CONSULTANT in writing of any site-specific safety hazards, procedural requirements, and protocols related to this scope of services and project before the CONSULTANT commences field work. During field work, the CONSULTANT reserves the right to stop work in the event that non-CONSULTANT personnel are on site without proper personal protection equipment (PPE) or if other safety concerns are identified.

The CONSULTANT will drill a total of nine (9) borings, advanced to depths of between 30 and 60 feet below ground surface each, using conventional hollow stem augering or rotary wash techniques. These borings/corings shall be as follows:

- **Eight (8) bridge foundation borings:**
 - Eight (8) bridge foundation borings to a planned depth of approximately sixty (60) feet below the existing ground surface.
 - Two (2) borings shall be obtained at each of the existing bridge abutments over the Amtrak Railroad (four total)
 - One (1) boring shall be obtained near each end of the south pier by drilling through the existing bridge deck (two total)
 - One (1) boring will be obtained near each end of the north pier by drilling below the bridge (two total)
- **Road borings/corings:**
 - One (1) roadway boring/coring will be obtained in the roadway approach to a depth of approximately thirty (30) feet.

For borings located within the existing pavement, the pavement (including concrete slope paving) and/or bridge deck will be cored prior to drilling. The borings will be sampled using a standard 2-inch OD, 1.375-inch ID split spoon sampler in general accordance with ASTM D-1586 methods. Standard penetration test (SPT) sampling will be performed at intervals of 5.0 feet or less to the

completion depths of the borings, and representative samples of soil preserved. A maximum of eight (8) relatively undisturbed samples (i.e. Shelby Tube) may be attempted for subsequent laboratory strength and/or consolidation testing. Bedrock coring and/or installation of geotechnical instrumentation is beyond the current scope of services.

Based on the site subsurface conditions encountered, if additional soil boring depths greater than those planned are considered necessary by the CONSULTANT to develop the required recommendations, the CITY will be notified immediately for authorization. No additional soil drilling will be performed without prior authorization.

Water observations during drilling and water levels in the borings at the completion of drilling will be recorded. Longer term groundwater measurements, including installation of monitoring wells or piezometers, are beyond the current scope of services. Upon completion, the borings will be backfilled with cuttings and bentonite or grout. The surface pavement will be patched using asphalt cold patch or concrete.

In the event non-penetrable objects/layers, environmental conditions/issues, or delays to production are encountered, while the CONSULTANT is mobilized to the site, that are out of the CONSULTANT's control, the additional drill crew time will be billed at the unit rate for "standby time" shown on the Cost Estimate.

The CONSULTANT will remove all tooling from the borehole immediately upon completion of drilling. If the CONSULTANT is directed by the CITY to leave the tooling in the ground and it is lost, becomes unrecoverable, or is damaged, said tooling will be treated as a reimbursable expense.

The possibility of encountering artesian conditions during the drilling of the deep bridge borings is remote. To minimize the potential, the CONSULTANT shall drill with mud rotary drilling techniques for the bridge borings. However, if artesian conditions are encountered that cannot be controlled by simple grouting, a well driller will be contacted by the CONSULTANT to over-drill the hole and set casing to plug the hole, divert the water flow or drill additional borings to relieve the pressure. Additional costs of any such extra measures will be considered outside this scope of services.

During field activities, the CONSULTANT shall mark and survey the boring locations. The actual boring locations shall be included on the site plans. North and East coordinates and the ground surface elevations shall be included on the soil boring logs.

During field operations the CONSULTANT shall provide traffic control in accordance with the current edition of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) that will include signs, cones, and flaggers for drilling work within the existing pavement. In addition, the CONSULTANT shall conduct his field operations such that lane closures will be limited to the hours between 9:00 am and 3:00 pm (Monday-Friday). All field work outside of the existing pavement will be performed Monday through Friday, between the hours of 9:00 am and 3:00 pm. However, the CONSULTANT has assumed that field work located within the existing pavement will be performed on weekends (Saturday and/or Sunday) between the hours of 8:00 am and 5:00 pm.

Work cancellation less than 50 miles from the site within four hours of mobilization will be assessed four hours of standby time. Work beyond 50 miles will be assessed eight hours of standby time.

It is assumed that hazardous material drilling conditions will not be encountered for this project. Environmental sampling, testing, and engineering are excluded from this scope of services.

The CONSULTANT will perform visual classification of all soil samples in accordance with the Unified Soil Classification System. Laboratory testing will include particle-size analyses, plasticity determinations, and moisture content determinations on select samples from each boring. A specific gravity test will be performed with each hydrometer test. The CONSULTANT will perform up to a maximum of four (4) unconfined compressive strength tests and two (2) consolidation tests. The CONSULTANT will perform a maximum of four (4) tests for organic content by loss of ignition on samples visually described as organic, if applicable. The CONSULTANT will prepare formal boring logs using the field logs and the laboratory classifications.

Upon completion of the field exploration and laboratory testing, the CONSULTANT will prepare a written report that will include the findings, conclusions, and recommendations for the proposed improvements. The following will be included in the report:

- Results of the borings and the laboratory testing
- Foundation recommendations for the proposed improvements (widening for the bridge foundations including end walls at the abutments and short retaining wall segment for future bike path between the north pier and north abutment). It is assumed that driven pile foundations will be utilized for support of the abutment widening and either spread foundations or driven piles for the pier widening. Lateral load analysis of deep foundations is beyond the current scope of services; however, soil parameters for use in L-Pile or Group analysis will be provided, if required. Retaining wall analysis for the bike path retaining wall assumes analysis of one retaining wall type only. Soil parameters will also be provided for cofferdam design. All actual foundation designs, cofferdam designs, ground improvement design (if applicable), and evaluation of the existing foundations are beyond the scope of services for this geotechnical investigation.
- Recommendations for approach embankment widening, including results of stability and settlement analysis.
- Geotechnical recommendations for the proposed approach pavement subgrade, including an estimate for design resilient modulus (M_r) using standard correlation data from the laboratory index testing with the MDOT *Mechanistic Empirical Pavement Design User Guide*. Pavement design is beyond the scope of services for this geotechnical investigation.
- Groundwater considerations as they may affect the design or construction of the project. Any actual dewatering programs, designs, and specifications are beyond the scope of services for this geotechnical investigation.
- Other aspects of the soil conditions at the site that may affect the design or construction of the project.

Geotechnical profile sheets are excluded from this scope of services.

The time schedule is anticipated to permit mobilization for geotechnical drilling within three weeks after notice to proceed (NTP), pending permitting (CITY and railroad right-of-way) and railroad flagger coordination. Field activities are anticipated to take one day per boring for drilling; therefore, if only weekend work is permitted for borings located within the existing pavement it is anticipated that drilling will take 2 to 3 weeks. Additional drill rig(s) may be mobilized to expedite the schedule, if warranted; however, the cost to mobilize additional drill rigs/crews is excluded from the cost estimate provided herein. Laboratory testing is anticipated to take one month after the completion of drilling. The geotechnical exploration report will be submitted approximately four weeks after laboratory testing is completed.

MAINTENANCE OF TRAFFIC (MOT), TRAFFIC ANALYSIS, SIGNAL OPERATIONS

The CONSULTANT will use and build upon previous extensive traffic modeling around the project site as part of the Fuller Road/Maiden Lane/EMCD intersection study to build updated VISSIM models, including Synchro and updated information, to model various construction staging and MOT scenarios.

The CONSULTANT will obtain vehicle and pedestrian traffic counts and vehicle turning movements at all key intersections and curb cuts within the project impact area (see Project Area Traffic Count Map, page 16).

The CONSULTANT will review the existing traffic signal locations, phasing, timing, and head locations and include these in the analysis of the MOT. We will work with the stakeholders, especially U of M, to determine MOT scenarios and signal operation changes that will be least impactful to roadway users around the project site. Contract documents that define the required MOT layout and signal changes will be prepared so that the Contractor can accurately and feasibly implement the MOT scheme per the contract documents. However, the details will include enough flexibility so that changes that occur on-the-ground during construction, such as changes in traffic volumes, changes in staging, etc., can also be accommodated.

Maintaining pedestrians and one-lane of vehicle traffic in each direction will also be critical and a requirement of this project. The CONSULTANT will design, at a minimum, one sidewalk on East Medical Center Drive will always be maintained. Pedestrians will be detoured from one side of East Medical Center Drive and/or West Medical Center Drive via existing pedestrian crossings and sidewalk ramps or temporary sidewalks and ramps. The CONSULTANT will evaluate up to three MOT scenarios using existing and updated Synchro models of the study area. We will collect new 24-hour turning movement counts at up to 37 intersections and curb cuts to update existing models (see MOT Model Study Area Intersections, page 17). The preferred MOT scenario will be validated using VISSIM microsimulation software which will allow a more detailed review of non-motorized operations to ensure that pedestrian volumes through the work zone and across the bridge will be sufficiently accommodated during construction. The Synchro models of the three MOT scenarios will include all 37 intersections within the study area. The VISSIM model will be focused on the area immediately surrounding the construction area and include no more than six (6) intersections. Synchro files with recommended traffic signal timings for existing and temporary signals during construction will be provided to the City for use in implementing MOT timings in the field.

The CONSULTANT will develop temporary traffic signal staging plans to accommodate the proposed maintenance of traffic through the signalized intersection of E. Medical Center Drive at Fuller Road as well as the signalized intersection of E. Medical Center Drive at Cancer Center Drive. In addition to the temporary signal staging, it is assumed the bridge widening along the west edge of E. Medical Center Drive which will cause impact to part of the existing signal installation at Fuller Road. Specifically, the widening to a 5-lane cross-section will require the replacement of the southbound mast arm. The CONSULTANT will inspect the current signal installation at Fuller Road, take note of any other potential improvements that can benefit signal operations and present the findings to the CITY. Signal modernization plans will be prepared to address the installation of a new mast arm in the southwest quadrant as well as any additional signal improvements requested by the CITY.

ALTERNATIVE DEVELOPMENT AND EVALUATION

Bridge:

The CONSULTANT will begin early preliminary alternative design analysis after receiving NTP using existing information to prepare concept level structure rehabilitation and MOT staging exhibits. These will be reviewed and discussed with stakeholders and will help to refine survey, geotechnical and SUE activities. Timely preparation, review, discussion, and approval of preliminary design concepts that illustrate the critical items associated with the design and construction of this alternative will allow the project to move forward efficiently and on schedule. Any concept that is considered will have to meet the requirements of the railroad, maintain uninterrupted service of the existing communication lines, and provide for vehicle and pedestrian access across the bridge during construction. All these critical items will be addressed in the alternative design analysis before actual design work is started.

Pathway:

The existing bridge has a 10-foot-wide concrete walkway at the toe of the north abutment slope paving, adjacent to the north pier. The proposed path would tie into each end of this existing walkway and then continue to tie-in points at existing sidewalks or paths. If possible, under the existing bridge, the existing path will be widened to a final width of 14 feet to accommodate the future path connection.

Proposed cross sections adjacent to the EMCD bridge indicate that retaining walls may be required due to the adjacent railroad right of way, steep slopes, and ditches. The CONSULTANT will obtain a proposed soil boring for the extension of the north pier that will provide the needed geotechnical engineering data to assist in the design of nearly any desired type of retaining wall, including sheet piling, reinforced concrete, or modular block. The CONSULTANT'S proposed survey scope includes the topography adjacent to and under the EMCD Bridge to facilitate the design of the pathway and retaining walls (if determined to be required). The CONSULTANT will prepare up to three (3) concept drawings for discussing and determining the desired walls prior to preliminary and final design of the path and retaining walls. The CONSULTANT will include plan and section views, profiles, and pay items for this work in the Contract Documents.

ROADWAY DESIGN

The CONSULTANT shall complete the road design following all applicable design standards and the design details provided in the RFP. The horizontal alignment is anticipated to remain the same while the vertical alignment may change slightly with any bridge vertical clearance improvements that are achievable. The CONSULTANT will complete intersection design work that will be necessary at each intersection adjacent to the bridge to accommodate the additional lane across the bridge, including radii improvements and sidewalk/sidewalk ramp upgrades. Intersection designs will be detailed to show proposed geometric elements with the anticipated bridge widening to the west. The CONSULTANT anticipates the additional travel lane will become a right-turn-only lane onto West Medical Center Drive until future improvements are made on East Medical Center Drive beyond the extent of this project.

The CONSULTANT will determine which side of EMCD Bridge to widen and design changes to the existing traffic signal and pedestrian facilities at the Fuller Road intersection that are required to widen the bridge. The CONSULTANT will use the approved preliminary design concept and begin the process of developing Preliminary Plan documents (drawings, specifications, and cost estimates) for bridge rehabilitation and associated road and path construction. These documents will follow City of Ann Arbor CAD and Specification standards. The development and review of these documents will be part of the bi-weekly meetings, as appropriate, to help maintain the schedule and keep parties apprised of project developments and decisions. The completed Preliminary Plan Documents will be submitted to the City and appropriate stakeholders and reviewed and discussed at a Preliminary Plan Review Meeting. Meeting minutes will be distributed, and comments will be incorporated into the Final Plan Documents.

The CONSULTANT shall provide geometric designs for the preferred alternative for main line roadways and the intersecting streets in accordance with all AASHTO, City of Ann Arbor, and MDOT Standards.

The CONSULTANT shall prepare pavement marking plans to provide for the safety of motorists and pedestrians.

The CONSULTANT shall review and evaluate existing storm water drainage systems and options for on-site storm water detention and/or water quality improvement. Propose and design improvements, where possible, including using U of M properties located adjacent to the project site. All proposed storm sewers shall be designed to accommodate a 10-year storm.

The CONSULTANT shall identify, define, and prepare all legal descriptions and exhibit drawings for all easements and grading permits that may be required to construct the proposed improvements. This is to include technical assistance, surveying, metes and bounds legal descriptions, and the preparation of the corresponding recordable, exhibit drawings in an 8½" x 11" format, as required and directed by the CITY. The areas where the expected grading permits and easements are necessary will be determined as the design of the project progresses.

The CONSULTANT shall prepare all plans necessary to meet pertinent City of Ann Arbor requirements. For example, these shall include, but not be limited to; Natural Features Protection Plans; Soil Erosion Control Plans; etc. These requirements can be found in Chapter 57 of the City of

Ann Arbor Code of Ordinances. The requirements of the City of Ann Arbor Code of Ordinances shall take precedence over all other MDOT standard practices.

STRUCTURAL DESIGN

The CONSULTANT shall prepare designs and cost estimates for the preferred alternative for the rehabilitation and widening of the EMCD Bridge over Amtrak Railroad. The CONSULTANT shall determine the feasibility of replacing the existing beams instead of rehabilitating them as part of the alternative analysis.

The CONSULTANT anticipates the following construction items at the EMCD Bridge over Amtrak Railroad:

- Removing and replacing the bridge deck
 - Widening the deck by 10 feet, either on the east side or west side
 - Adding beam lines to support the wider deck
 - Placing new sidewalks and bridge railings
- Removing and replacing the pier caps
 - Widening the piers on either the east side or west side
- Removing and replacing portions of the abutments to accommodate the wider superstructure
 - Placing new wingwalls to replace portions of removed abutments/wingwalls
- Removing the existing beams
 - Cleaning and coating the beams offsite
 - Designing beam end or other steel repairs, as needed, for the existing beams (if reused)
 - Or, replacing the existing beams with new beams
 - Reinstalling the rehabilitated (or new) beams on the substructure units

The reinstalled or new beams will be designed to have a minimum vertical clearance over the tracks of 23'-0".

The CONSULTANT shall provide the design of retaining walls, railings, barriers, and guardrails, etc., as detailed in the preferred alternative, to construct the planned improvements.

DESIGN REQUIREMENTS

All improvements shall be designed in accordance with the applicable AASHTO, City of Ann Arbor, MDOT, ADA, Amtrak), and any other relevant standards.

All drawings shall be prepared to City of Ann Arbor Public Services Area Drafting Standards or MDOT Standards as approved by the City of Ann Arbor. All drawings shall be prepared using AutoCAD 2020, or newer, software. The CITY shall be provided with PDF and CAD files in CD ROM/flashdrive of all drawings, specifications, and cost estimates.

In general, the CONSULTANT shall prepare to City of Ann Arbor Standards, plan, and profile sheets, at a horizontal scale of 1"=20' and a vertical scale of 1"=2' for all work. This shall include, but not be limited to, utility and roadway plans. Other plans, such as structure plans, sections, and elevations; traffic control drawings; intersection enlargement plans; typical cross-sections, cross-sections, details, etc. shall be drawn at scales as approved by the CITY to properly complete the work of the project. The following is a brief overview of the major or critical design criteria:

1. Design Speed: The currently proposed improvements will be reviewed and evaluated in relation to the existing values.

E. Medical Center Drive: 30 mph.
2. Design Vehicle: WB-40 (unless otherwise directed)
3. Horizontal Alignment: The proposed horizontal alignment(s) shall follow the current centerline alignment as much as feasible.
4. Vertical Alignment: Minimum longitudinal grade shall be 1.0%. Maximum longitudinal grade shall be 5%. The proposed vertical alignment(s) shall follow the existing grades as much as possible.
5. Typical Cross-Sections: The typical cross-section shall follow those as contained in the FRP. It is expected that the currently proposed cross-sections will be reviewed, evaluated, and adjusted, if needed, to obtain the optimal final design.
6. Drainage: Provide enclosed conduit drainage systems. All drainage systems shall be designed and/or evaluated to handle a 10-year design storm, except as otherwise required by the City of Ann Arbor.
7. Bridge Design Live Load: The Bridge shall be designed for HL-93 Modified and Pedestrian Live Load as specified by AASHTO (LRFD design of the new deck, beams, and pier caps – LFD design and check of all remaining components).
8. General Design Standards: Incorporate the AASHTO Policy on Geometric Design of Highways and Streets; AASHTO Standard Specifications for Highway Bridges, 17th (LFD) and Current (LRFD) Editions; American Railway Engineers Association Standards (current edition); AARR Design Standards; the MDOT Design Guide; MDOT Standard Specifications for Construction (2020); ADA accessibility standards; the City of Ann Arbor Code of Ordinances; and the City of Ann Arbor Public Services Department Standard Specifications (current edition).
9. Roadway Width(s): The number of lanes, intersection configurations, and widths of lanes shall follow those as contained in the RFP.
10. Water Main(s), Sanitary Sewer(s), and Storm Sewer(s): The design of any proposed or relocated facility shall be designed in accordance with the City of Ann Arbor, Public Services Area, Standard Specifications and as directed by the City.
11. Intersection Enlargement Plans: All roadway intersections shall be detailed to include roadway centerline grades, curb grades as measured at the edge of metal,

sidewalk and sidewalk ramp grades, any other large miscellaneous paved areas, and other areas as directed by the City. These drawings shall be drawn at scales as approved by the City, but in no case shall they be smaller than 1" = 10'.

These drawings shall take into consideration the effects of "part-width" construction and shall be adequately dimensioned to allow key elevations, or dimensions, to be obtained without calculation.

12. Soil Erosion, Grading, Tree Planting, Natural Features Protection Plans, and other misc. plans: These plans shall be prepared in accordance with the appropriate Chapters of the City of Ann Arbor Code of Ordinances, and as approved by the Project Engineer and/or the appropriate City Departments.
13. Pavement Structural Design: The pavements shall be designed in accordance with the "Guide for Design of Pavement Structures" as published by AASHTO, and the City of Ann Arbor Design Standards. The pavements shall be designed for a service life of 20 years. Design of approach roadways includes concrete bridge approach pavement and asphalt roadway pavements.
14. Contract Specifications: The CONSULTANT shall be responsible for the preparation of a complete set of Contract Documents and required Specifications meeting the satisfaction of the City of Ann Arbor and MDOT.
15. Maintenance of Traffic: The construction of the roadways and bridge associated with this project will be performed under traffic. Provide construction signing plans and detour route(s) that meet all requirements of the Michigan Manual of Uniform Traffic Control Devices (MMUTCD) and the City of Ann Arbor. The traffic control plans shall provide for the efficient, safe, and orderly maintenance of vehicular and pedestrian traffic throughout the project and around the construction staging areas.

A minimum of one lane of vehicular traffic in each direction shall be maintained along the roadways within the limits of construction. Pedestrian traffic along one side of the roadway and bridge shall be maintained at all times. Construction operations must be carefully considered during the preparation of the plans.
16. Right-of-Way Requirements: Legal descriptions, and exhibit drawings shall be in recordable, 8½" x 11" format, as required and directed by the CITY.

UTILITY COORDINATION

Contractor delays or interruption in service resulting from incorrect or missing utility information can be costly in terms of both time and construction dollars. By using the coordination methods described below, the CONSULTANT team will identify potential private/public utility conflicts and coordinate potential utility alterations or relocations to help avoid these interruptions and construction delays.

The CONSULTANT, and our team member T2 UES, anticipates the utility designation to be included with the Subsurface Utility Engineering (SUE) services to consist of below ground water, gas, sewers, telephone/communications, fiber optic, and electric within the vicinity of the proposed project limits as outlined below.

U of M Communication Cabling

The CONSULTANT will coordinate the relocation of the existing U of M owned communication cables in the vicinity of the bridge that are impacted by this project. This may include the installation of new conduits, vaults, and manholes, either as part of the bridge project or as a separate, stand-alone project to be constructed in advance of the bridge project. Some of the actual construction work and materials (e.g., cables, pulling and splicing of cables, etc.) may be completed by U of M or a Contractor retained by U of M. Construction work and materials needed for relocating the existing or installing new cables (e.g., new conduits, handholes, vaults, etc.) will be coordinated and/or installed and provided by the bridge Contractor or other Contractors.

A review of previous information obtained by the CONSULTANT in the project area has already revealed several communication lines carried in one or both bridge sidewalks, in addition to various other buried utilities in the roadway approaches. In addition, buried utilities within the railroad right of way also have the potential to be impacted by the pier widening. Even though the railroad itself has been deeded to MDOT, these fiber links all fall under Norfolk Southern and will require some coordination with them as well. Work related to the SUE investigation will be performed under the direction of a licensed professional engineer and will consist of the following items of work:

SUE INVESTIGATION

- The CONSULTANT will submit a MISS DIG design ticket for the proposed project limits to obtain utility owner maps, drawings, plans, and other available data. After the 21-day design ticket time-period, we will verify that all utility owners have responded and supplied sufficient information about the location of their facilities.
- The CONSULTANT will contact and meet with the appropriate U of M staff to obtain available information related to their facilities in the project area. We will work to thoroughly understand their network, risk tolerance, current and future infrastructure plans, and overall project goals.
- The CONSULTANT will conduct a review of the received maps, drawings, plans, and other data provided by the utility owners through the MISS DIG design ticket and from U of M sources. This information will be evaluated to optimize our efforts in physically confirming and/or locating these utilities in the field.
- Appropriate geophysical prospecting methods will be employed by the CONSULTANT to confirm the horizontal locations (SUE Quality Level B) of subsurface utilities within the project work area. Selection of the appropriate type of geophysical device will depend on

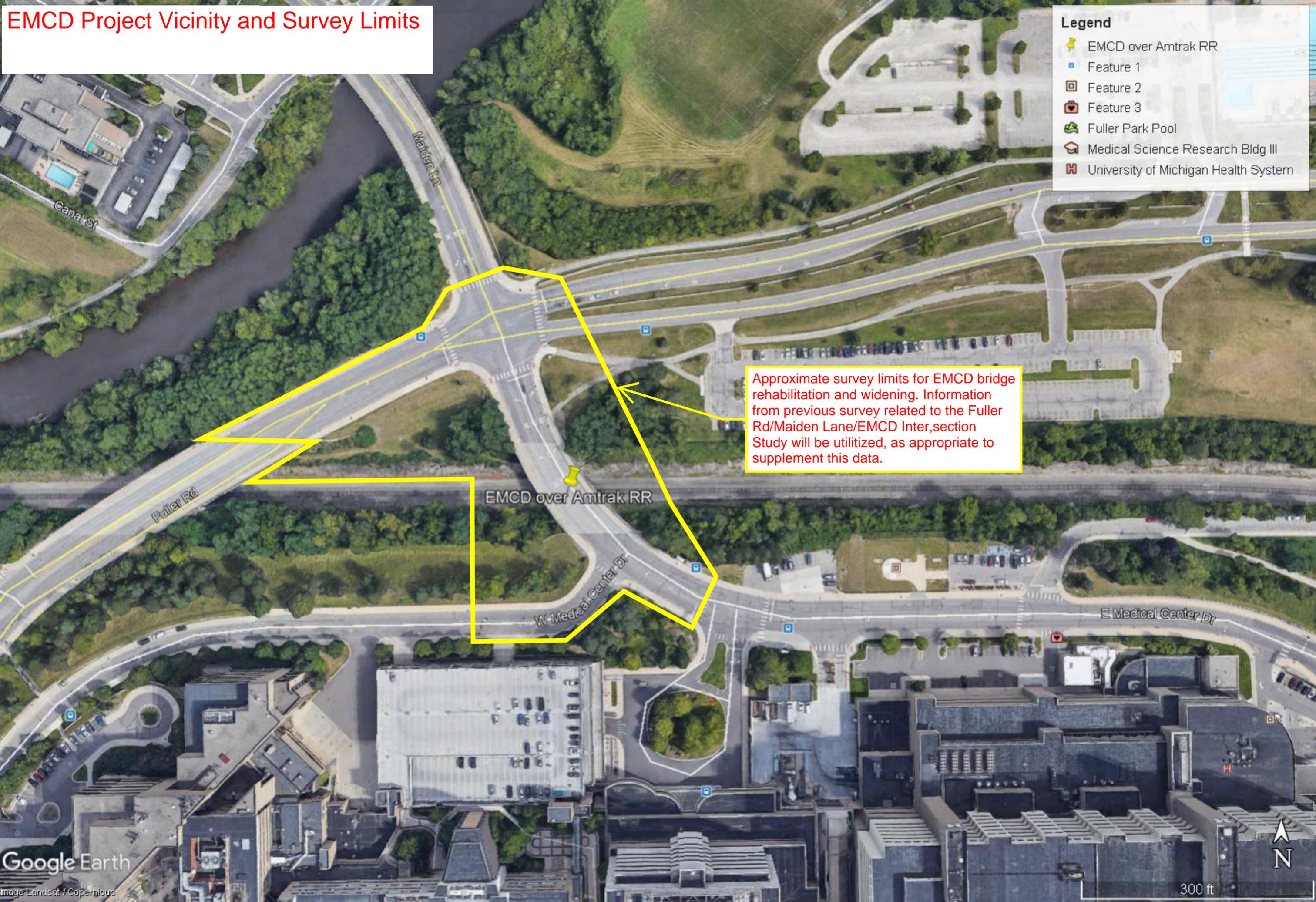
the evaluation of several factors, including: 1) the type of utility being surveyed; 2) its depth below the surface; 3) physical surroundings that may cause extraneous interference to types of equipment; and 4) attentive monitoring of the relative success of equipment and methods as they are being employed. Upon detecting the presence of an underground utility, the location will be designated, marked, and recorded. The utility designating activities will be coordinated with the project surveyor, who will survey the designated utility locations.

- Upon the completion of designating activities and following review of the utility location plans provided by others, the CONSULTANT will hold a team meeting to identify points of potential conflict between existing utilities and proposed construction. Where necessary and as directed by the project team, a return visit to the site will be coordinated to the site to perform a series of up to 10 vacuum excavated test holes to expose the existing utilities and field verify their three-dimensional location (SUE Quality Level A). Upon completion of the field work, the utility location plan will be revised to reflect the additional data.

Prior to the excavation of test holes, the existing paved surfaces (where necessary) will be neatly cored or saw-cut by the CONSULTANT and removed to expose the underlying subgrade. Typical pavement access holes will be approximately 12 to 14 inches in diameter. Vacuum excavation methods using pressurized water and/or air and a suction pump will be used to dislodge and remove the soils. In all cases, care will be taken to locate utilities in a non-destructive manner so as not to damage utility wrappings, coatings, or other protective coverings.

After the utility locations have been adequately documented, the test hole excavations will be backfilled by the CONSULTANT using granular soil materials. At cored locations, the pavement will be permanently restored by patching of the surface pavement.

EMCD Project Vicinity and Survey Limits

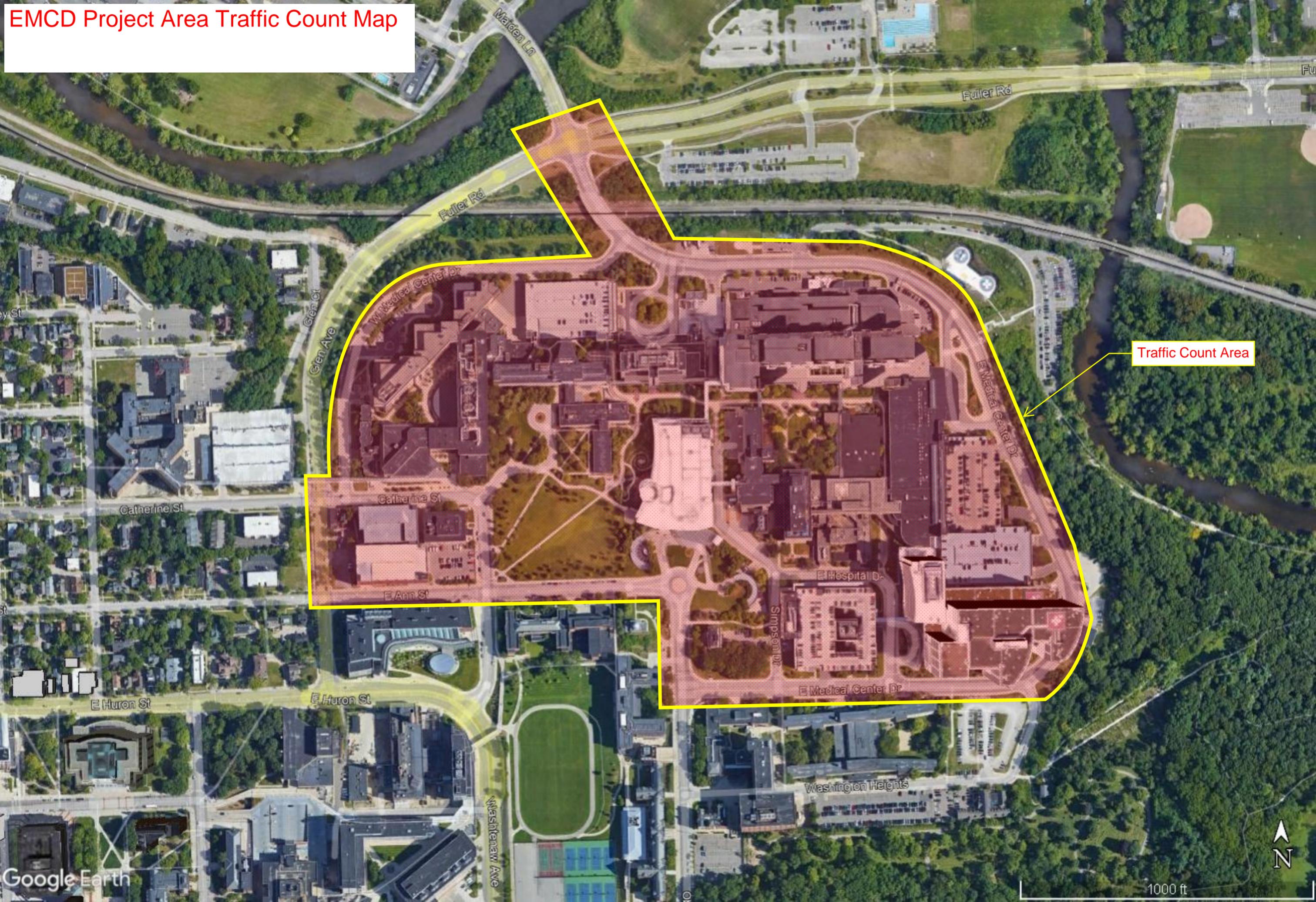


- Legend**
- EMCD over Amtrak RR
 - Feature 1
 - Feature 2
 - Feature 3
 - Fuller Park Pool
 - Medical Science Research Bldg III
 - University of Michigan Health System

Approximate survey limits for EMCD bridge rehabilitation and widening. Information from previous survey related to the Fuller Rd/Maiden Lane/EMCD Inter,section Study will be utilized, as appropriate to supplement this data.



EMCD Project Area Traffic Count Map



Traffic Count Area



EMCD Bridge Rehabilitation

MOT Model Study Area Intersections

1. Ann and Zina Pitcher
2. EMCD and Cancer Center
3. EMCD and E Hospital Dr
4. EMCD and Nichols
5. EMCD and Observatory
6. EMCD and P2 Garage
7. EMCD and P2 Exit / Surface Parking Exit
8. EMCD and P3 Entrance
9. EMCD and P3 Exit
10. EMCD and Psychiatric Hospital
11. EMCD and Simpson
12. EMCD and Staff Parking Garage
13. EMCD and Taubman Center 1
14. EMCD and Taubman Center 2
15. EMCD and Washington Hts
16. EMCD and WMCD
17. Fuller and Fuller Park Pool
18. Fuller and Medical Center Parking
19. Fuller and Glen
20. Fuller and Bonisteel
21. Fuller and Main
22. Fuller and Maiden Ln and EMCD
23. Geddes and Observatory
24. Geddes and Washtenaw
25. Glen and Ann
26. Glen and Catherine
27. Glen and Huron
28. Huron/Washtenaw and Zina Pitcher
29. Maiden and Broadway
30. EMCD and Mott Loading Dock
31. Observatory and Ann
32. Washtenaw and Observatory
33. WMCD and Blue Permit Parking
34. WMCD and Catherine
35. WMCD and Gold Permit Parking
36. WMCD and Med Research Loading
37. WMCD and Med Science Research

