

Macomb County Department of Roads

Request for Project Specific Qualifications

for

CONSULTING ENGINEERING SERVICES: TRAFFIC SIGNAL OPTIMIZATIONS

The Macomb County Department of Roads (MCDR) is soliciting Project Specific Qualification Statements from consultants to perform Professional Engineering Services for the following traffic signal optimization projects:

15 MILE ROAD FROM VICEROY TO HARPER

21 MILE ROAD FROM HAYES TO JEFFERSON

The Selection process will be based on the Brooks Act: Federal Government Selection of Architects and Engineers; Public Law 92-582 92nd Congress, H.R. 12807 October 27, 1972.

Upon successful negotiations with the selected consultant on an individual project scope, schedule and cost, a contract will be prepared and submitted to the Michigan Department of Transportation (MDOT) for approval, then executed. The contract will be MDOT's standard ("Boiler Plate") Preliminary Engineering agreement modified specifically for the work defined in the request. A copy of the agreement may be reviewed at:

http://www.michigan.gov/documents/mdot_subcontract_78647_7.pdf

All work will conform to the Michigan Timing Plan Preparation Guidelines and the Michigan Signal Optimization Guidelines, 5th Edition except as amended herein. Field implementation will be the responsibility of the consultant.

Qualification Statements will only be accepted from firms that have obtained requests directly from the MCDR. The MCDR reserves the right to reject any or all of the Qualification Statements received and re-solicit engineering services at its sole discretion. Project Specific Qualification Statements received after the deadline will not be opened for consideration. The MCDR will not pay for the information solicited, or any costs incurred by consultants submitting Qualification Statements, presentations or interviews.

PRICES OR RATE SCHEDULES WILL NOT BE CONSIDERED IN THIS SELECTION PROCESS. QUALIFICATION STATEMENTS SUBMITTED WITH PRICES OR RATE SCHEDULES WILL BE REJECTED.

Submit questions regarding the preparation of statements via e-mail message to the MCDR Project Engineer: rkudela@rcmcweb.org no later than 11:00 AM Tuesday June 28, 2011. All questions and responses will be distributed via e-mail to all parties who have requested the RPSQ.

Qualification Statements are due 11:00 am, Tuesday, July 5, 2011.

Submit Qualification Statements in *.pdf format via e-mail to the MCDR Director of Roads:

Robert P Hoepfner, PE
Email: BHoepfner@RCMCweb.org
Tel: (586) 463-8671

PROPOSAL EVALUATION:

Scoring will be based on the ability of the QS to demonstrate the following:

15 Mile Road & 21 Mile Road Signal Optimization		Points
1. Staffing - Availability of key staff members, commitments to other projects	10	
2. Staffing - Time allocated to each staff member, level of involvement of experienced staff members	10	
3. Staffing - Plausibility of the project team to complete a quality product within the time allocated	20	
4. Proposal Quality - Organization based on score sheet, ease of scoring	5	
Total Possible		45

Points scored in this evaluation will be added to a possible 100 points earned from the General QS for a total possible 145 points.

Deficiencies in any critical area regardless of overall score can be grounds for rejection of the QS.

PROJECT DELIVERABLES:

- Electronic copies of the *Synchro 7* existing and optimized simulation files.
- Electronic copy of all project documentation.
- Electronic files of all optimized signal configurations and timing plans.
- Electronic files of second-by-second data collected during travel time runs.

MCDR RESPONSIBILITIES:

- Provide existing traffic signal controller configurations for each intersection.
- Provide drawings of existing signal layouts of each intersection.
- Final reviews and comments on proposed timing plans and simulations.

CONSULTANT RESPONSIBILITIES:

- Download optimized controller configuration directly to existing, operating, signal controllers in the field at each intersection.
- Review and adjust configurations for all scheduled time-of-day patterns for seven consecutive calendar days. Review and adjust configurations for up to six contingency patterns as directed by the Project Engineer.
- Upload final, revised configurations directly from existing, operating, signal controllers in the field at each intersection.

PROJECT SCHEDULE:

Traffic counts and travel time measurements will be taken between September 12, 2011 and November 16, 2011. Perform implementation and travel time measurements between April 2, 2012 and May 25, 2012. All work will be completed no later than **June 29, 2012**.

PAYMENT SCHEDULE:

Compensation for this Scope of Services shall be on an **actual cost plus fixed fee** basis.

CONSULTANT PAYMENT:

All invoices/bills for services must be directed to the MCDR and follow the 'then current' MDOT "Professional Engineering Service Reimbursement Guidelines for Bureau of Highways." The latest copy is available on MDOT's Bulletin Board System. This document contains instructions and forms that must be followed and used for invoicing/billing; payment may be delayed or decreased if the instructions are not followed.

Payment to the Consultant for Services rendered shall be "Actual Cost Plus Fixed Fee, Not to Exceed \$160,000.00". All invoices/bills must be submitted within 14 calendar days of the last date of services being performed for that invoice.

Direct expenses will not be paid in excess of that allowed by the Department for its own employees in accordance with the State of Michigan's Standardized Travel Regulations. Supporting documentation must be submitted, with the invoice/bill, for all billable expenses on the Project. The only hours that will be considered allowable charges for this contract are those that are directly attributable to the activities of this Project.

The use of overtime hours is not acceptable unless prior written approval is granted by the MCDR Project Engineer. Reimbursement for overtime hours that are allowed will be limited to time spent on this project in excess of forty hours per person per week. Any variations to this rule should be included in the priced proposal submitted by the Consultant and must have prior written approval by the MCDR Project Engineer.

The fixed fee for profit allowed for this project is 11.0% of the cost of direct labor and overhead.

INSURANCE REGULATIONS:

The consultant shall not commence work until he has obtained and delivered to the MCDR the certificate of insurance required under this paragraph. All insurance carriers must be acceptable to the MCDR, licensed and admitted to do business in the State of Michigan and possess an A.M. Best's rating of not less than 'A-'.

A new certificate of insurance shall be provided to the MCDR each year at the time of policy renewal. Failure of the Vendor to maintain the required insurance shall be grounds for contract cancellation.

1. **Workers' Compensation:** The Vendor shall procure and maintain during the life of this contract, Workers' Compensation Insurance, including employers Liability Coverage, in accordance with all applicable statutes of the State of Michigan.

2. **Commercial General Liability:** The Vendor shall procure and maintain during the life of the blanket purchase order, Commercial General Liability Insurance on an "Occurrence Basis" with limits of liability of less than \$1,000,000 per occurrence and/or aggregate combined single limit, Personal Injury, Bodily Injury, Bodily Injury and Property Damage. Coverage shall include the following extensions:

- a) Contractual Liability;
- b) Products and Completed Operations Liability with limits of liability not less than \$1,000,000;
- c) Independent Contractors Coverage;
- d) Broad Form General Liability Extensions or equivalent;
- e) Deletion of all Explosion, Collapse and Underground (XCU) Exclusions, if applicable.

3. **Motor Vehicle Liability:** The Vendor shall procure and maintain during the life of this contract Motor Vehicle Liability Insurance, including Michigan No-Fault Coverages, with limits of liability of not less than \$500,000 per occurrence combined single limit Bodily Injury and Property Damage. Coverage shall include all owned vehicles, all non-owned vehicles, and all hired vehicles.

4. **Professional Liability:** Errors and Omissions on a "Claims Made Basis" with limits of liability of not less than \$1,000,000.00.

5. **Additional Insured:** Commercial General Liability and Motor Vehicle Liability Insurance, as described above shall include an endorsement stating the following shall be Additional Insured's: "Macomb County Department of Roads, it's elected and appointed officials, employees and volunteers and others working in behalf of the MCDR"

6. **Cancellation Notice:** Workers' Compensation Insurance, Commercial General Liability Insurance and Motor Vehicle Liability Insurance, as described above, shall include an endorsement stating the following: "It is understood and agreed that Thirty (30) days Advance Written Notice of Cancellation, Non-Renewal, Reduction and/or Material Change shall be sent to Macomb County Department of Roads, 117 S. Groesbeck, Mount Clemens, Michigan 48043.

7. If any of the above coverages expire during the term of the contract, the Vendor shall deliver renewal certificates and/or policies to the MCDR at least ten (10) days prior to the expiration date.

AMENDMENTS :

The following are MCDR's amendments to the "*Michigan Timing Plan Preparation Guidelines and the Michigan Signal Optimization Guidelines, 5th Edition*" for the purposes of this project.

All references to "*MDOT Project Manager*" will refer to "*MCDR Project Engineer*."

1.1.2 24-Hour Volume Counts:

Delete the first bulleted item. Replace the second bulleted item with:

"24-Hour counts should be taken on all approaches for each of the seven (7) days of the week."

Add the following: "*Upload 24-Hour Volume Count Data to the TCDS data module as provided by Midwestern Software Solutions, LLC.*"

1.1.3 Turning-Movement Counts:

Replace the bulleted list with:

- Weekday AM Peak Hour
- Weekday PM Peak Hour
- Weekday off-Peak Hour

Add the following:

"Determine peak hours from 24-Hour Volume Counts.

The Turning-Movement Counts should represent the demand. Therefore, vehicles should be counted as they enter the turn lane."

"Upload Turning-Movement Data to the TMC data module as provided by Midwestern Software Solutions, LLC."

1.1.4 Pedestrian Counts:

Replace the first sentence with: "*Include pedestrian counts as part of intersection turning movement counts.*"

Add the following: "*Upload Travel Pedestrian Count Data to the PCDS data module as provided by Midwestern Software Solutions, LLC.*"

1.2 Travel Time Data

Replace the last sentence with: "*Perform five runs in each direction for each of the following five time periods: AM peak, PM peak, daytime off-peak, nighttime off-peak and one weekend off-peak. Perform five runs in each direction for up to six contingency patterns as directed by the Project Engineer.*"

1.3 Intersection Geometry and Equipment

Not Used. The consultant will not be responsible for providing this service.

1.4 Heavy Vehicle Volume

Replace both paragraphs with: "*Count the heavy vehicles at each intersection for all movements on all approaches during the peak periods. Do not use MDOT's ADT Map.*"

1.7 Crash Data

Not Used. The consultant will not be responsible for providing this service.

1.8.1 Signal Warrant File Naming Convention

Replace all text with:

A signal warrant analysis should be conducted at each study intersection where applicable. Each signal warrant analysis spreadsheet should adhere to a standard naming convention unless otherwise discussed in advance with the MCDR Project Engineer. The following is the standard file naming convention:

Location # - "Signal Warrant" – Month-Day-Year.xls

Example: The 15 Mile Road corridor at Golden is being inventoried. The location number in this case is 855. The date should also be included.

File Name = 855-Signal Warrant - Month-Day-Year.xls

1.9 Signal Warrant Analysis

Provide this service only at the following intersections:

15 Mile: at Golden and Lipke.

21 Mile: at Tilch.

2.0 Network Set-Up

Add the following: "Use *Synchro (Version 7)* software."

2.1 File Structure and Naming Convention:

Replace the standard file naming convention with:

"Zone # - Condition – Time Period.sy7."

2.2.2 Link Speed

Replace the paragraph with the following:

"The MCDR has completed speed surveys on the 15 Mile Road and 21 Mile Road corridors. 85th percentile link speeds for corridors within the scope of this project will be provided to the consultant."

2.3 Intersection Numbering:

Node Number = MCDR Location Number. XXX0

Boulevard intersections:

Northwest-most Node = Node XXX1

Northeast-most Node = Node XXX2

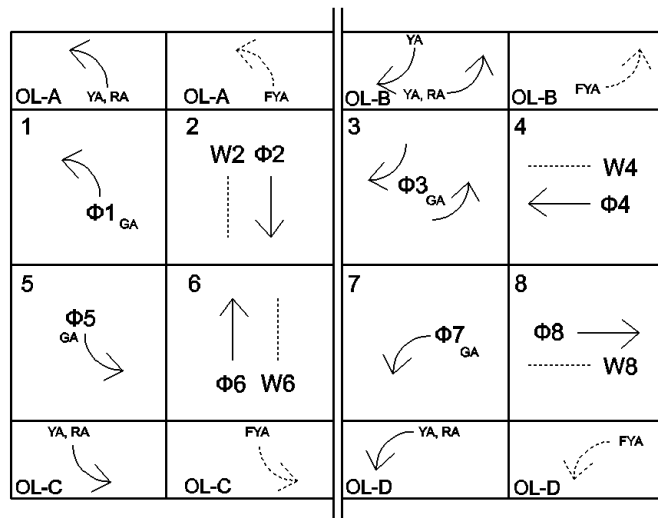
Southeast-most Node = Node XXX3

Southwest-most Node = Node XXX4

2.4 Standard Actuated Signal Phasing Set-Up

Use the following ring and barrier structure convention for actuated controllers:

OL: Overlap
 GA: Green Arrow
 RA: Red Arrow
 YA: Yellow Arrow
 FYA: Flashing YA
 Φ: Phase
 W: Walk



2.5 Boulevard Phasing Set-Up

Use the same convention as in “Standard Actuated Signal Phasing Set-Up.”

3.2.1 Walk Intervals:

Replace all text with the following:

“For locations with pedestrian signals, the pedestrian walk interval should generally be 5.0 seconds or greater. Walk intervals less than 5.0 seconds will be considered if the pedestrian time requirements exceed the vehicular time requirements for that particular movement, and if low pedestrian demand exists. The walk interval shall be no less than 4.0 seconds.”

3.2.3 Minimum Green Intervals:

Replace all text with the following:

“Use 3.0 seconds for all minimum green intervals.”

3.2.4 Minimum Split Calculations:

Replace all references to “MDOT” with “MCDR.”

3.3 Actuated Signal Settings:

For controller settings, replace the first two bulleted items with:

- Vehicle Extension = 0.0 seconds
- Minimum Gap = 0.0 seconds

To allow Synchro to more closely model video detection coverage, use the settings shown in the Michigan Signal Optimization Guidelines.

4.3 Phasing

Replace all text with the following:

“Use any phasing sequence which provides for the best optimization regardless of existing phasing. Phasing sequence may change by time of day. Optimize the phasing sequence for each timing plan.”

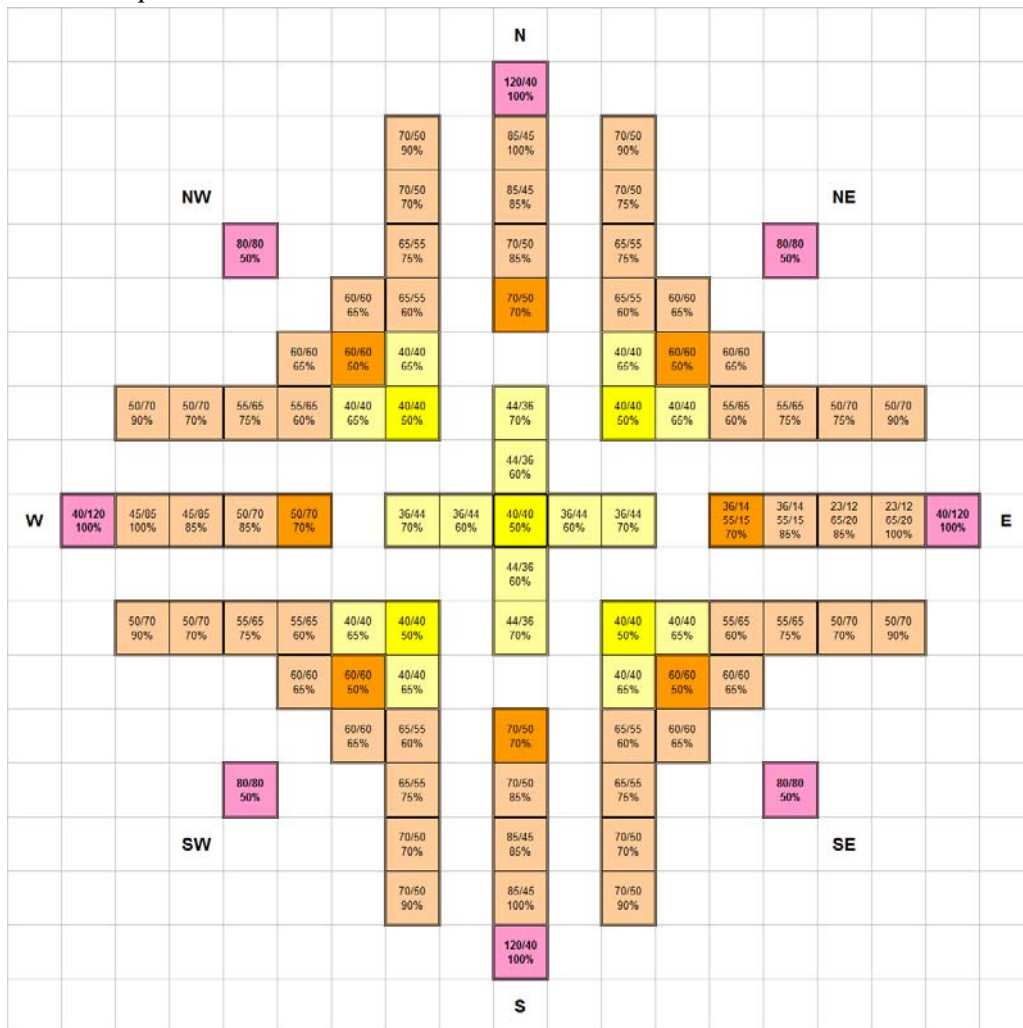
4.5 Optimization Techniques

Replace all text with the following:

“The optimization functions in Synchro do not typically provide timings consistent with MCDR preferences. Manually adjust the timings based on the following general guidelines:

Develop 89 patterns in accordance with the console plan chart shown below. The patterns include AM peak, PM peak, and Off peak optimized plans, as well as 86 supplementary plans based off of the optimized plans for incident management and preplanned events. These will include patterns with 80 second, 120 second and 160 second cycle lengths. A description of these patterns is described below and a more in-depth explanation will be given at the project kick-off meeting.

The chart below consists of two portions: the directional contingency patterns (for Northbound, Southbound, Eastbound and Westbound), and the daily, bi-directional patterns (AM peak, PM peak and Off peak). Contingency patterns will consist of directional plans intended for high volume, non-routine, traffic events such as evacuation routes or freeway closures. The bi-directional patterns will be used for average, daily traffic. Small changes in traffic flow can be accommodated through the use of the various offsets. Small changes in traffic capacity can be accommodated through the use of the various splits.



Time-Space/Platoon Progression Diagram Generator:

Once the timing plans are optimized in Synchro, export the timing plan using the Universal Traffic Data Format and import it into TS/PP. Optimize the phase sequencing including “lead/lag left” and offsets in T-S/PP and convert back to Synchro for fine tuning. Maximization of the progression band will be the primary focus of the signal optimization.”

4.6 Measures of Effectiveness

Not Used. The consultant will not be responsible for providing this service.

4.7 Time-of-Day Schedules

Replace the first bulleted item after the first paragraphs with the following:

“Schedule the signals to operate under five timing plans: AM peak period, PM peak period, daytime off-peak, nighttime off-peak and an additional weekend or off-peak timing plan. The weekend timing plan may consist of a combination of any of the other timing plans.”

Replace all text in the third, fourth and fifth paragraphs with the following:

“Review periods of flash operation based on the 24-Hour Volume Counts (1.1.2).

Develop three flash schedules: weekday, Saturday and Sunday. Average each of the five weekday counts to develop the weekday flash schedule. Review Saturday and Sunday counts to develop separate flash schedules for each day.

Schedule the signal to flash during periods of two or more consecutive hours when the volume drops to less than basic minimum hourly traffic volume (footnote a) in either of the following tables.”

Condition A—Minimum Vehicular Volume									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1.....	1.....	500	400	350	280	150	120	105	84
2 or more...	1.....	600	480	420	336	150	120	105	84
2 or more...	2 or more ...	600	480	420	336	200	160	140	112
1.....	2 or more	500	400	350	280	200	160	140	112

Condition B—Interruption of Continuous Traffic									
Number of lanes for moving traffic on each approach		Vehicles per hour on major street (total of both approaches)				Vehicles per hour on higher-volume minor-street approach (one direction only)			
Major Street	Minor Street	100% ^a	80% ^b	70% ^c	56% ^d	100% ^a	80% ^b	70% ^c	56% ^d
1.....	1.....	750	600	525	420	75	60	53	42
2 or more...	1.....	900	720	630	504	75	60	53	42
2 or more...	2 or more ...	900	720	630	504	100	80	70	56
1.....	2 or more	750	600	525	420	100	80	70	56

^a Basic minimum hourly volume.

^b Used for combination of Conditions A and B after adequate trial of other remedial measures.

^c May be used when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

^d May be used for combination of Conditions A and B after adequate trial of other remedial measures when the major-street speed exceeds 70 km/h or exceeds 40 mph or in an isolated community with a population of less than 10,000.

5.0 Microsimulation

Add the following: “Use *SimTraffic (Version 7)* software.”

5.3 Measures of Effectiveness

Replace the second sentence with the following: “*The following MOE’s should be reviewed during the analysis process.*”

6.0 TIMING PERMITS AND REPORTS

Not Used. The consultant will not be responsible for providing timing permits or a project report.

The consultant will download the optimized configurations of all signals to be optimized. The consultant will be required to edit the configurations using the D4 software in accordance with the approved Synchro timing plans. The consultant will provide MCDR with a final revised configuration file for each signal.