



**CITY OF NOVI CITY COUNCIL
JUNE 6, 2022**

SUBJECT: Consideration of approval to award engineering design services to AECOM for Phase 1 of the Beck Road Reconstruction project, from 11 Mile Road to the southern limits of the Grand River Avenue intersection, in the amount of \$447,375.84, and to conduct a Traffic Noise Analysis for the proposed Beck Road improvements from 8 Mile Road to Pontiac Trail, in the amount of \$59,844.94.

SUBMITTING DEPARTMENT: Department of Public Works, Engineering Division

EXPENDITURE REQUIRED	\$ 447,375.84 Phase 1 Design (11 Mile to S of Grand River Ave) \$ 59,844.94 Traffic Noise Study (8 Mile to Pontiac Trail)
AMOUNT BUDGETED	\$ 477,030.00 Phase 1 Design (FY 2022-23 Budget) \$ 59,845.00 Traffic Noise Study (FY 2022-23 Budget)
APPROPRIATION REQUIRED	\$ 0
LINE ITEM NUMBER	202-202.00-865.226 Phase 1 Design 202-202.00-816.045 Environmental Assess Beck Rd

BACKGROUND INFORMATION:

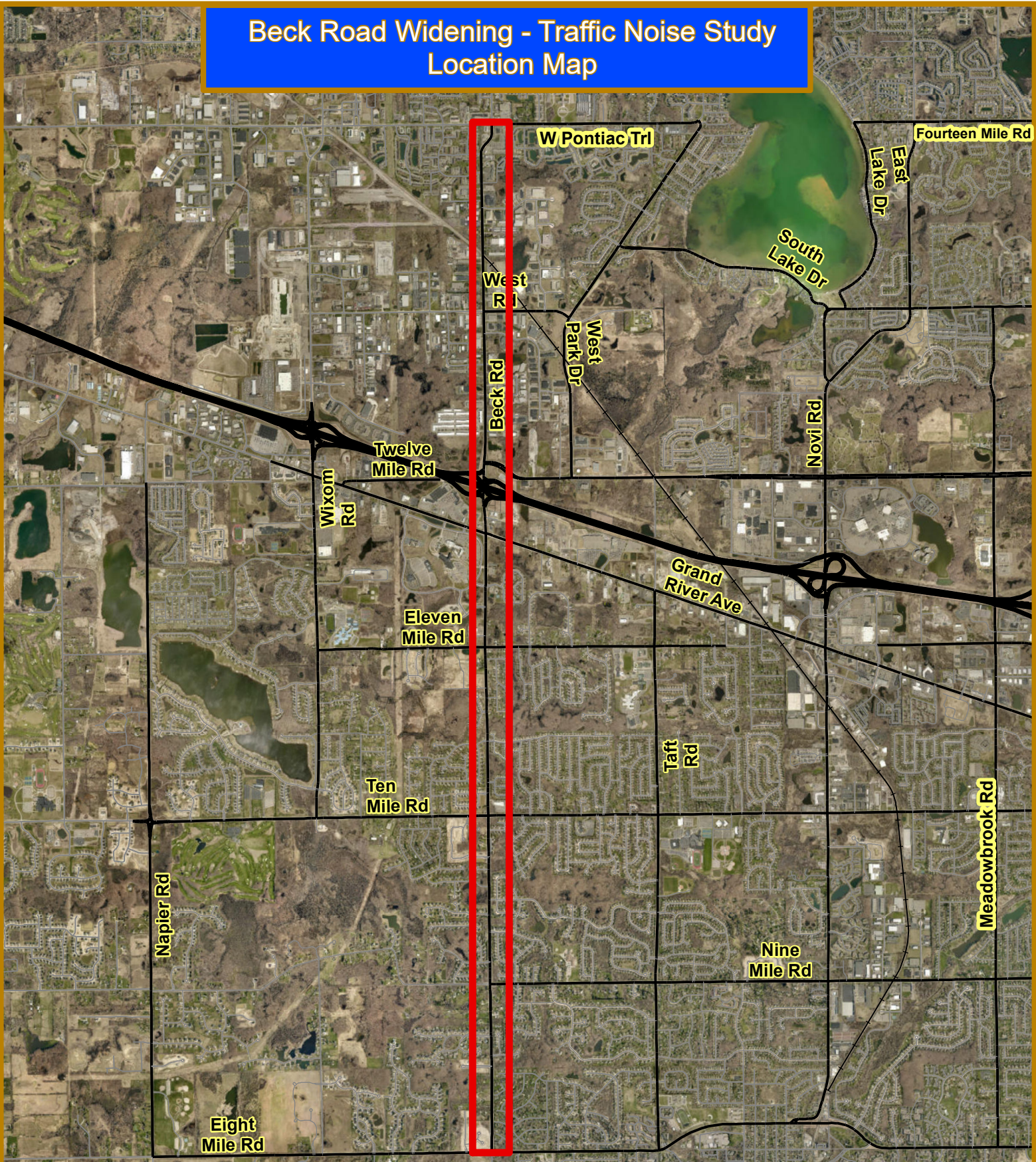
The City has been working with neighboring communities to improve Beck Road from Six Mile Road to Pontiac Trail. The proposed engineering design services would complete the design of one segment of Novi's portion of Beck Road from 11 Mile Road to the southern limits of the Grand River Avenue intersection. Engineering consultant, AECOM, provided a proposal for the design, which includes two different options for the Beck Road and 11 Mile Road intersection: a signalized intersection or a roundabout. Also included in the design proposal is integral concrete curb with storm sewer, completion of sidewalk on both the east and west side of Beck Road, new traffic signals on mast arms at the Providence S. Drive/Central Park Boulevard intersection, an unsignalized crossover in each bound of traffic, and upgraded lighting.

Additionally, at the request of the City, AECOM submitted a second proposal for a Traffic Noise Study for the entire Novi project limits, 8 Mile Road to Pontiac Trail. The study will primarily consist of taking noise measurements, modeling, and assessing future noise impacts, evaluating noise mitigation options, and assessing project construction noise. Deliverables include a final technical report and development of a noise analysis presentation for public meetings.

The attached proposals outline the detailed scopes of services. The fee for the traffic noise study will be \$59,844.94. For the Phase 1 proposal, two design fees are listed, one for a signalized intersection, and one for a roundabout at the Beck Road and 11 Mile Road intersection. The design fee for the signalized intersection is \$441,958.87 (6.25% of the estimated construction cost of \$6,547,538.75 plus an additional 0.50% for grant administration) or \$447,375.84 for a roundabout (6.25% of the estimated construction cost of \$6,627,790.15 plus an additional 0.5% for grant administration). Since the difference in fees for the signalized intersection and roundabout is negligible, the design fee being awarded is for the higher amount to cover either option. AECOM's engineering fees are based on the fixed fee schedule established in the Agreement for Professional Engineering Services for Public Projects. Design of this project would begin following award. The start of construction would depend on ease of right-of-way acquisition, funding availability, and coordination with other road projects in the vicinity, potentially starting in 2023 or 2024.

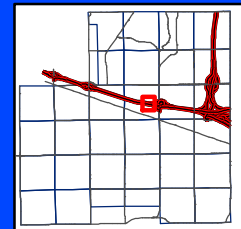
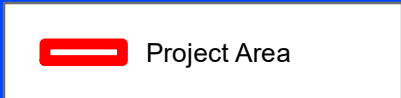
RECOMMENDED ACTION: Approval to award engineering design services to AECOM for Phase 1 of the Beck Road Reconstruction project, from 11 Mile Road to the southern limits of the Grand River Avenue intersection, in the amount of \$447,375.84, and to conduct a Traffic Noise Analysis for the proposed Beck Road improvements from 8 Mile Road to Pontiac Trail, in the amount of \$59,844.94.

Beck Road Widening - Traffic Noise Study Location Map



Map Author: Runkel
 Date: 5/25/22
 Project: Beck Rd Widening
 Version #: 1.0

MAP INTERPRETATION NOTICE
 Map information depicted is not intended to replace or substitute for any official or primary source. This map was intended to meet National Map Accuracy Standards and use the most recent, accurate sources available to the people of the City of Novi. Boundary measurements and area calculations are approximate and should not be construed as survey measurements performed by a licensed Michigan Surveyor as defined in Michigan Public Act 132 of 1970 as amended. Please contact the City GIS Manager to confirm source and accuracy information related to this map.



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 Department of Public Works
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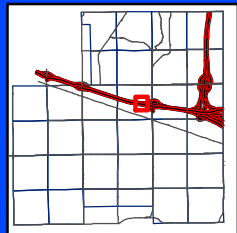
Beck Road Widening - Phase I Location Map



Map Author: Runkel
 Date: 5/25/22
 Project: Beck Rd Widening
 Version #: 1.0

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- Project Area
- Sidewalk Gap Infill

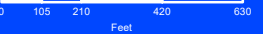




City of Novi

Engineering Division
 Department of Public Works
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1 inch = 501 feet

Beck Road Widening Project, Novi, MI

Traffic Noise Analysis

Submitted by Paul Burge, INCE Bd. Cert., Principal Noise Control Engineer, AECOM, 05/05/2022.

Background and Project Understanding

The City of Novi, MI is planning to widen Beck Road and have requested an appropriate traffic noise analysis. In order to be consistent with Federal Highway Administration (FHWA) and Michigan Department of Transportation (MDOT) policy and guidance, and to be eligible for potential federal funding, the analysis will be done in compliance with MDOT's Highway Noise Analysis and Abatement Handbook (July 2011).

The proposed project would widen Beck Road from 2 to 4 lanes, from Pontiac Trail south to 8 Mile Road (about 6 miles). The area north of the I-96/Beck Road interchange is mostly commercial/industrial except for a multi-family development just south of Pontiac Trail. The area south of I-96 is mostly single-family homes with some multi-family developments. In total there are up to 20 areas where residential areas could be impacted, and where noise abatement would need to be evaluated.

With this understanding, we propose the following Scope of Work.

Scope of Work

Task 1. Review Project Materials and Policy. The AECOM noise team (AECOM) will carefully review available relevant project documents (existing as-built and future roadway design drawings, traffic studies, etc.) and most recent state and local noise policy updates. AECOM will also reach out to local officials to determine any recent or future planned developments in the project area. A data request will be prepared for any additionally required information.

Task 2. Plan and Conduct Site Visit and Noise Measurements. AECOM will plan and execute a site visit to the project area. The site visit is planned to span 3 to 4 days, including travel, and will include verification of local land uses, one long-term (24-hours) and up to six short-term (15-30 minute) noise measurements at representative locations throughout the project area. Short-term noise measurements will include observations regarding contributing noise sources, meteorological conditions, and video-taped or hand-counted existing traffic conditions. The primary purpose of the long-term measurements is to assess the 24-hour noise variation and identify worst-hour noise conditions. The primary purpose of the short-term measurements is to validate the existing condition traffic noise model runs. All sound Level meters used will adhere to current ANSI Type I/Class I standards and will be within 1-year recommended laboratory calibration. Noise measurements will be completed by AECOM noise specialists, and a noise measurement plan will be provided to City staff prior to the site visit for review and approval.

Task 3. Model and Validate Existing Conditions Noise Model. AECOM will develop traffic noise model runs for Common Noise Environments (CNEs), within the project study area using FHWA's Traffic Noise Model version 2.5 (most recent version approved for use by MDOT). The existing condition models will be validated against noise measurements and traffic counts collected during the site visit to confirm that predicted levels are within an acceptable margin of error (typically ± 3 dBA).

Task 4. Model Future Conditions and Assess Noise Impacts. Validated existing condition noise models will be modified to represent future build designs and future traffic volumes. The resulting calculated future loudest hour noise levels will be assessed for noise impacts in accordance with MDOT noise policy. Future noise impact distances (distance to 66 and 71 loudest hour noise levels) will also be determined for any undeveloped areas.

Task 5. Evaluate Noise Mitigation and Design. Where noise impacts are determined to exist, AECOM will evaluate approved types of noise abatement, including noise barriers, for reasonableness and feasibility according to MDOT noise policy. Where noise barriers are determined to be reasonable and feasible, barrier designs will be refined to provide an "optimized" design in which the maximum number of impacted receptor units meet the barrier design goal (7 dBA) at the lowest possible cost. This task will also include coordinating with project engineers on final noise barrier designs.

Task 6. Assess Project Construction Noise. AECOM will utilize the FHWA Roadway Construction Noise Model to estimate construction noise levels at nearby receptor locations. Where construction noise levels approach or exceed local regulations for construction noise, AECOM will provide best practices to minimize construction noise.

Task 7. Draft Noise Analysis Report. AECOM will develop a concise Noise Analysis Report summarizing Tasks 1-6 above, in a format consistent with MDOT Noise Policy, including all required figures, references, appendices, and TNM input/output files.

Task 8. Final Technical Report. AECOM will respond to one round of agency comments on the draft report and incorporate into a final noise analysis report.

Task 9. Public Participation Support. AECOM can assist in developing and presenting a noise analysis presentation for a public meeting based upon the Noise Report analysis, results, and recommendations. Direct participation in any public meetings or other public participation activities is not included in this task, but could be included as a contract modification, if requested.

Assumptions:

1) Adequate existing as-built and future roadway digital design files, as well as topographic data out to 500 feet from right-of-way, and project traffic data for existing and future conditions will be provided by the City for noise modeling and analysis purposes.

2) Noise measurements, as required under Task 2, require appropriate weather conditions (typically moderate temperatures and humidity, low winds [less than 10-15 mph] and dry roadways). Every attempt will be made to schedule the site visit during a period with acceptable weather conditions, but

unexpected and sustained poor weather conditions could cause the site visit to be postponed, extended, or rescheduled.

3) AECOM will depend upon local officials to provide information regarding any recent or future planned and programmed land uses within the project area (typically noise sensitive land uses within 500 feet of project Right-of-way for which a building permit has been issued).

4) Public Participation (Task 9) may be required if noise walls are determined to be reasonable and feasible by MDOT policy, to assess viewpoints of benefitted receptors. If requested AECOM could include preparation of limited traffic noise analysis presentation materials to support a public meeting or other public participation effort. However, this does not include any direct participation in public meetings or any noise barrier balloting or polling process with may be required under MDOT policy. It is assumed that this process would be conducted by City staff, but AECOM is willing to assist, if requested, under a separate scope modification.

5) Draft and Final Reports would be delivered as electronic documents. Large data files, such as sound level data files and TNM modeling files would be maintained on file and provided electronically upon request.

6) Noise barriers that are determined to be reasonable and feasible as defined by MDOT policy will be recommended to be included as part of the project. It is assumed that noise barrier optimization for reasonable and feasible noise barriers, will generally consist of (1) maximizing the number of impacted receptors receiving the noise barrier design goal of 7 dBA, (2) further optimizing wall height by maximizing the calculated value of total cumulative noise reduction at benefitted receptors in decibels divided by estimated barrier cost (dBA/\$\$), and (3) maintaining policy reasonableness and feasibility requirements.

Staffing

Paul Burge, INCE Bd. Cert, will serve as the task lead for the noise analysis task. Mr. Burge, a Board Certified Noise Control Engineer, with over 34 years' experience on surface transportation noise and vibration projects across the US and Canada, including over half of the US State Highway Agencies. Mr. Burge has also served as an instructor for the FHWA's National Highway Institute course on Traffic Noise Analysis and has received certified training on the FHWA's Traffic Noise Model. Mr. Burge will be assisted by additional AECOM qualified noise specialists in conducting the noise analysis and report preparation.

Project Schedule

It is assumed that the entire scope of work through Draft Report delivery could be completed with eight weeks of Notice to Proceed and receipt of all required data.

Proposed Cost

The estimated cost for the above scope is approximately \$60,000 as itemized in the table below.

Beck Road Widening, Noise Analysis Costs		Staff Hours						expenses
		Burge	Cowan	Kaiser	Mahoney	Vasquez	Duffy	
Task ID	Description	Task Lead	Review	Detail Check	Noise Spec.	Noise Tech.	GIS/WP	
1	Review Project Materials/Policy	2	0	0	8	0	0	
2	Plan and Conduct Site Visit	4	0	0	40	40	8	\$3,677
3	Model and Validate Existing Cond.	8	0	6	120	0	0	
4	Model Future Build, Assess Impacts	4	0	4	24	0	0	
5	Evaluate/Design Noise Mitigation	16	0	2	80	0	0	
6	Assess Project Construction Noise	3	0	0	4	0	0	
7	Draft Noise Tech Report	24	3	2	40	2	24	
8	Final Noise Tech Report	8	1	0	8	0	2	
9	Public Meeting preparation	4	0	0	16	0	4	\$0
	Total Hours	73	4	14	340	42	38	
	Billing Rate	\$235.59	\$229.32	\$134.88	\$84.81	\$85.74	\$98.08	
	Cost Subtotal	\$17,198.22	\$917.28	\$1,888.26	\$28,836.08	\$3,600.91	\$3,727.19	\$3,677.00
	Total Cost	\$59,844.94						

Expenses for Task 2 includes travel, lodging, and instrumentation charges.



May 24, 2022

Ms. Rebecca Runkel
City of Novi
Field Services Complex
26300 Lee Begole Drive
Novi, MI 48375

**Reference: Proposal for Engineering Services
Beck Road Reconstruction Phase 1**

Dear Ms. Runkel,

AECOM is pleased to submit this proposal for the above referenced project.

The work for Phase 1 of the Beck Road Reconstruction project will span from the southern point of the Beck Rd and 11 Mile Rd intersection and extend to the southern limits of the Grand River Ave intersection. Beck Rd will be reconstructed as a boulevard with two lanes in each direction from 11 Mile Rd to the southern entrance for Providence Hospital. The proposed roadway will be 9" thick concrete with Cp joints (load transfer baskets) at 14' intervals. Other major features of the project include:

- Integral curb concrete with enclosed storm will be provided along with subgrade underdrains
- Completion of sidewalk on both east and west sides of Beck Rd so it is continuous from 11 Mile Rd to Grand River Ave
 - Sidewalk is to be 8' wide on the west side and 6' wide on the east side.
- New traffic signals on mast arms will also be required at the intersection of Beck Rd and Providence S. Drive / Central Park Boulevard due to the widening of the road
- One unsignalized crossover in each bound of traffic with a widened loon to account for large vehicles
- Upgraded lighting throughout the corridor
 - DTE would perform the design and install, but AECOM has provided an estimate for the lighting cost.
- Right of Way acquisition and utility relocation where required

There are two construction options for this project. Either constructing a roundabout at the intersection of 11 Mile Rd and Beck Rd or upgrading the signalized intersection to being on mast arms at each quadrant.

The following tasks will be completed for the project:

Initial Meeting and Scope Verification

The intent of this task is to meet with the City and verify the limits and scope of work for the project. Upon completion of this task, we will move forward with the surveying and preliminary design.

Survey and Base Plans

The intent of this task is to provide topographic survey and base mapping as needed for the proposed design work. A full topographic survey is anticipated to be needed. Base drawings will be created using the survey data, supplemented by aerial photos, and a detailed field review of the site.

AECOM will prepare base plans (30%-40% complete) to identify the major design features. These plans will also be used to further the utility investigation and resolution of potential conflicts. Base plans will include the results of the survey information, utility information from response to our solicitations, and preliminary estimate.



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Utilities

AECOM will obtain existing utility data with a design ticket through the MISS DIG system. In addition, AECOM will distribute the base plan design set to the utility companies that have indicated that they have facilities in the project area. We will incorporate the additional information that utility companies provide to AECOM into the plan set should there be any need.

AECOM will coordinate any required relocation work for all utility companies within the construction limits. At a minimum, it is anticipated that there are a number of utility poles with both electric and communications on them that will be required to be relocated as they will be in conflict with the road widening. AECOM will provide utilities with proposed plans and will work with them to determine acceptable locations for new facilities and provide approvals prior to any relocations.

There is a span of approximately 1150 feet of 16 inch water main and 900 feet of 24 inch water main that are currently outside of the limits of Beck Rd that would fall underneath the roadway after reconstruction. There is currently no plan for the relocation of these facilities, but two gate wells for each of the runs of pipe have been added to the construction estimate in order to isolate the areas which will be covered by the proposed roadway.

Maintenance of Traffic (MOT)

During the design phase of the project, plans will be developed for maintenance of traffic, construction stages, and detours. Regardless of which side of Beck Rd construction is taking place, it is anticipated that MOT will be established such that only one way traffic will be permitted and all going in the same direction. Only one direction will be maintained throughout the duration of the project. It is also anticipated that throughout the duration of the project within the full construction limits, there will only be one lane of traffic maintained. AECOM will coordinate with the City of Novi Fire Department as well as Ascension Providence Hospital to determine the best direction in which to maintain traffic on Beck Rd throughout construction.

Enclosed Storm Sewer

The existing stormwater management system throughout the majority of the project limits along Beck Rd are ditches on both the east and west side of the road. This reconstruction would incorporate an enclosed storm sewer for the entire limits of the project.

The full topographic survey that will be obtained will also assist in designing the enclosed storm sewer system. Part of the design will be a review of the Lyon Drain to determine what, if any, maintenance should be completed within the stream. At a minimum, the existing culvert for the drain will need to be removed and replaced as the proposed roadway is wider than the existing culvert.

For the purpose of the estimate, it was assumed that a new drainage structure would be needed for every 250' of curb. At each structure there would be a sewer crossing and a main trunk line storm sewer would span the entire limits of the reconstruction. The topographic survey provided will help determine if more storm elements will be required and the proper placement of them to handle the increased catchment of the widened roadway.

Intersection Upgrades

The intersection of Beck Rd and Providence S Dr/Central Park Blvd is currently signalized with mast arms at each quadrant. Given the current preliminary estimated footprint, it is anticipated that the mast arms in the northeast and northwest quadrants will not be impacted by the reconstruction and widening. The cabinet is in the northwest quadrant and also appears as though it will not be impacted. Even though a lane will be added for northbound Beck Rd, it will



Ms. Rebecca Runkel
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not be necessary to install a new, longer mast arm to span the lanes as the dedicated right lane to Central Park Blvd will not extend through the intersection. There will also not be a need to add signals to the arm, but they will likely need to be realigned to match up to the new lanes being constructed.

There are two options for the intersection at 11 Mile Rd and Beck Rd. One option is the removal of all current signal elements to be replaced by all new mast arms at each quadrant. The other option is the construction of a roundabout. The signalized option at 11 Mile Rd would also include the reconstruction of westbound 11 Mile Rd far enough back to provide a dedicated right turn lane to northbound Beck Road. Additional traffic survey would be required to be performed should the roundabout option be selected in order to properly design the traffic circle.

As a note, if the roundabout option is selected for the 11 Mile Rd intersection in Phase 1, AECOM recommends placing roundabouts at the major intersections that are currently signalized for future phases of Beck Rd extending south to 8 Mile Rd, the southernmost point of the currently planned reconstruction.

Noise Study

AECOM will also perform a noise study for this project. Please see the separate document outlining the scope of work, process, schedule, and itemized cost estimate, which is not included in the calculated design fee. The noise study would span the entire limits of the proposed widening project from 8 Mile Road to Pontiac Trail and would only have to be completed one time, not prior to each phase of the project.

Preliminary Plans

Incorporating the information obtained from the above tasks, we will prepare the preliminary plan set (90%) in accordance with City and MDOT requirements. This submittal will include items such as the typical cross sections, materials/quantities and details. After review by the City, the preliminary plans will be forwarded to MDOT Local Agency Programs and scheduling of a Grade Inspection Meeting requested. The preliminary plan submittal will also include required Special Provisions and an estimate of cost. An EGLE Permit will be prepared and submitted at this stage of work, if required. Plans and, if needed, a permit application will be forwarded to the Road Commission for Oakland County. Items required by MDOT, including a SHPO review submittal and programming forms will also be prepared and submitted.

Right of Way and Legal Descriptions

The right of way/easement descriptions will be developed based upon the proposed design and submitted concurrently with the Preliminary Plans. AECOM will assist City of Novi Engineering staff in completing the ROW and easement acquisition needed for the project. AECOM will obtain the needed title commitments/appraisals. The cost of title commitments and appraisals is assumed to be paid or reimbursed by the City and this cost is not included in our fee.

The estimated cost of ROW Acquisition for the signalized intersection is \$722,965.69 while the estimated ROW Acquisition for the roundabout option is \$746,237.44.

Final Plans and Proposal

Incorporating comments from the City and MDOT, AECOM will develop the final plans submittal, including the plan set, Project Manual, and cost estimate. AECOM will submit the final package to MDOT for advertising and will also respond to any inquiries received from MDOT during the advertising phase.



Ms. Rebecca Runkel
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Advertising and Award

We will respond to any final comments received from the City and submit the Advertisement for Bids to the City for publication. Contract Documents will be made available to bidders by AECOM. AECOM will respond to bidder inquiries during the advertising period and prepare addenda as required. Following the bid opening AECOM will submit the Bid Tabulation and a letter with recommendations regarding contract award

Construction

AECOM will provide full time inspection, contract administration, and staking as required for the project. This will be completed through a separate authorization.

Schedule

The schedule for plan development, bid advertisement, contract award, and construction will be coordinated with the City of Novi at a later date.

Estimated Cost of Construction and Design Fees

Signalized Intersection at 11 Mile Rd

The preliminary estimated const of construction for the project is \$6,547,538.75

The base design fee using the Engineering Fee Chart for Roadway Reconstruction is 6.25% of construction cost and 0.5% for Grant Program Administration. The base fee includes up to five legal descriptions. If any additional legal descriptions are required, they will be performed at a cost of \$670 each.

Design Fee = \$6,547,538.75 x 6.75% = **\$ 441,958.87**

Estimated Cost of Construction and Design Fees

Roundabout at 11 Mile Rd

The preliminary estimated const of construction for the project is \$6,627,790.15

The base design fee using the Engineering Fee Chart for Roadway Reconstruction is 6.25% of construction cost and 0.5% for Grant Program Administration. The base fee includes up to five legal descriptions. If any additional legal descriptions are required, they will be performed at a cost of \$670 each.

Design Fee = \$6,627,790.15 x 6.75% = **\$ 447,375.84**

We understand that fees for construction phase services will be determined after a construction contract is awarded. Please contact me if you have any questions or wish to discuss this submittal.

Sincerely,

AECOM Great Lakes, Inc.

Sean Kelsch, PE
Vice-President