GENERAL MEETING OF THE BOARD OF DIRECTORS
OF THE
CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

RESOLUTION NO. 24-044

APPROVING A CONTRACT WITH CDM SMITH, INC. FOR TRAFFIC AND REVENUE ENGINEERING SERVICES

WHEREAS, the Central Texas Regional Mobility Authority (Mobility Authority) has an ongoing need for traffic and revenue engineering services on its existing toll projects and to develop new toll projects; and

WHEREAS, by Resolution No. 24-030, dated June 26, 2024, the Board of Directors awarded a contract to CDM Smith, Inc. (CDM Smith) for traffic and revenue engineering services and authorized the Executive Director to negotiate a contract with CDM Smith; and

WHEREAS, the Executive Director and CDM Smith have negotiated a proposed contract for traffic and revenue engineering services which is attached hereto as Exhibit A and sets forth the scope of services, compensation and other terms; and

WHEREAS, the Executive Director recommends that the Board approve the contract with CDM Smith, Inc. for traffic and revenue engineering services in the form or substantially the same form attached hereto as Exhibit A.

NOW THEREFORE, BE IT RESOLVED that the Board of Directors hereby approves the contract with CDM Smith, Inc. for traffic and revenue engineering services; and

BE IT FURTHER RESOLVED that the Executive Director is hereby authorized to execute the contract with CDM Smith, Inc. on behalf of the Mobility Authority in the form or substantially the same form attached hereto as Exhibit A.

Adopted by the Board of Directors of the Central Texas Regional Mobility Authority on the 28th day of August 2024.

Submitted and reviewed by:

James M. Bass
Executive Director

Approved:

Robert W. Jenkins, Jr.
Chairman, Board of Directors

Exhibit A

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

AGREEMENT FOR

TRAFFIC AND REVENUE ENGINEERING SERVICES

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CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY
AGREEMENT FOR
TRAFFIC AND REVENUE ENGINEERING SERVICES

This Professional Services Agreement (the "Agreement") is made and entered into by and between the Central Texas Regional Mobility Authority (the "Authority" or "CTRMA"), a regional mobility authority and a political subdivision of the State of Texas, and CDM Smith, Inc. (the "Consultant") to be effective as of the [__] day of [_____] (the "Effective Date") with respect to traffic and revenue engineering services to be performed by the Consultant, as an independent contractor, for the Authority.

WITNESSETH:

WHEREAS, pursuant to that certain Request for Qualifications dated May 15, 2024 (the "RFQ"), the Authority sought to identify and obtain the services of qualified engineering firm(s) to provide traffic and revenue engineering services for the Authority; and

WHEREAS, three (3) firms submitted responses setting forth their respective qualifications for the work; and

WHEREAS, on June 26, 2024, the CTRMA Board authorized the Executive Director to negotiate separate contracts for Traffic and Revenue engineering services with each of the three (3) qualified providers; and

WHEREAS, this Agreement has been negotiated and finalized between those parties whereby the services shall be provided by the Consultant to the Authority at a fair and reasonable price;

NOW, THEREFORE, in consideration of payments hereinafter stipulated to be made to the Consultant by the Authority, the parties do hereby agree as follows:

ARTICLE 1
THE SERVICES

The Authority agrees to and hereby retains the Consultant, as an independent contractor, and the Consultant agrees to provide services to the Authority upon the terms and conditions provided in this Agreement. The Authority is the sole and exclusive client of the Consultant for the purposes of this Agreement, and this Agreement is exclusively between the Authority and the Consultant. The scope of services (the "Services"), which is described in detail in Appendix A attached hereto and incorporated herein, shall include, but not be limited to, rate/revenue analysis, traffic modeling, technical assistance, problem resolution assistance, project management duties, and duties imposed on the Traffic Consultant by Authority trust agreements. As directed by the Authority by separate Work Authorization, the Consultant shall perform such Services in relation to all CTRMA turnpike projects and potential projects, which may include, but are not limited to (1) the 183-A Turnpike; (2) 290 East Toll; (3) SH 71 Toll; (4) SH 45 Southwest Toll (5) 183 South Toll; and (6) 183 North Toll; (7) MoPac Express; and (8) MoPac South Toll.

The Consultant, as part of the Services, also shall assist the Authority in achieving the goals established in the Authority's Strategic Plan, as adopted pursuant to Texas Transportation Code § 370.261 and as it may be amended from time to time by the CTRMA Board of Directors. For specific aspects of the Services, to the extent required by any trust agreement, the Consultant shall be expected to operate independently from the Authority and without extensive oversight and direction. The Consultant shall commit the personnel and resources reasonably required to respond promptly and fully to the

responsibilities and tasks assigned by the Authority throughout the term of the Consultant's performance of the Services described in this Agreement.

By written notice or order, Authority may, from time to time, order work suspension and/or make changes in the general scope of this Agreement, including, but not limited to, the services furnished to Authority by Consultant as described in the Scope of Work contained in the Work Authorization. If any such work suspension or change causes an increase or decrease in the price of said Work Authorization, or in the time required for its performance, Consultant shall promptly notify Authority thereof and assert its claim for adjustment within ten (10) calendar days after the change or work suspension is ordered, and an equitable adjustment shall be negotiated.

ARTICLE 2
"TRAFFIC CONSULTANTS" UNDER TRUST AGREEMENTS

Without limiting the provision of Article 1 above, and subject to a Work Authorization and the Work Authorization requirements found in Article 3 herein, the Consultant shall perform the obligations of the "Traffic Consultants" under the Authority's current Master Trust Indenture, as amended, and, as agreed by the Parties, all supplemental, superceding, or additional trust agreements (collectively the "Trust Agreements"). The Authority has covenanted in Section 714 of the current Trust Agreement that, until the bonds issued in accordance with that Trust Agreement and the interest thereon shall have been paid or provision for such payment shall have been made, it will employ the Traffic Consultants for the purpose of performing and carrying out the duties imposed on it by the Trust Agreement. Those duties are summarized in the Scope of Services and provide a general, but not comprehensive, listing of the types of obligations the Consultant will be requested to perform under the Trust Agreements.

ARTICLE 3
COMPENSATION

Authorization for Consultant to perform the Services, compensation for Consultant's work, and other aspects of the mutual obligations concerning Consultant's work and payment therefore are as follows:

a) Notwithstanding any provisions of this Agreement to the contrary, Authority and Consultant mutually agree that Authority's annual cumulative payment obligation (including obligation for Consultant's profit) shall not exceed the amount established for these services in the Authority's annual operating budget.

b) BASIS FOR COMPENSATION. Subject to the terms of a Work Authorization issued pursuant to subsection 3.c. below, the Authority agrees to pay, and the Consultant agrees to accept as full and sufficient compensation and reimbursement for the performance of all Services as set forth in this Agreement, hourly rates for the staff working on the assignment computed as follows:

$$\text{Direct Labor Cost} \times (1.0 + \text{FAR}) \times 1.10$$

where Direct Labor Cost equals salary divided by 2080; FAR equals Consultant's most recent audited overhead rate under 48 C.F.R. Part 31, Federal Acquisition Regulations (FAR 31); and 1.10 reflects a 10 percent (10%) profit. Representative rates computed

through this methodology as of the Effective Date of this Agreement are reflected in Appendix B. Rates will be revised annually to reflect adjustments to the Direct Labor Costs and audited FAR rates; no adjustment shall be made to the specified profit percentage. The first adjustment shall be considered no earlier than one year from the Effective Date of this Agreement. All adjustments shall be agreed to by the parties in writing prior to implementation, and the Authority shall have the right to review and/or audit Consultant's Direct Labor Costs and FAR rates upon written request and as provided in subsection 3.f. hereto. During the term of this Agreement, Consultant shall provide to the Authority, prior to requesting any adjustment to rates, a copy of the report establishing a new FAR rate for the Consultant. The Consultant represents that neither the auditable overhead rate nor the profit percentage used under this Agreement shall exceed the auditable overhead rate or profit percentage utilized by the Consultant in its agreement(s) with, or subcontracts for, traffic and revenue engineering services (or comparable work) for the Texas Department of Transportation, any other regional mobility authority, or any similar transportation authority in the State of Texas.

The payment of the hourly rates and allowed costs shall constitute full payment for all Services, liaisons, products, materials, and equipment required to deliver the Services.

c) COMPENSATION FOR WORK AUTHORIZATIONS. The Services to be performed by the Consultant pursuant to this Agreement shall be assigned by the Executive Director or designee and documented in a manner appropriate for the size and complexity of the specific tasks. Each activity, task, or project shall be performed pursuant to a separate Work Authorization, signed by the Executive Director or designee and the Consultant. Work shall be in accordance with the scope, schedule, and budget set forth in said Work Authorization. The standard form of Work Authorization is attached hereto and incorporated herein as Appendix C, which standard form may be modified during the term of this Agreement upon the reasonable request of the Executive Director or designee and agreement of the Consultant. Upon written directive from the Executive Director or designee (which may occur via electronic mail), the Consultant shall prepare the Work Authorization for the specific task, to be submitted for the Executive Director or designee's approval. No work shall begin on the activity until the Work Authorization is approved and fully executed. The basis for payment on each Work Authorization will be either (i) lump sum or (ii) hourly rate as computed pursuant to subsection 3.b. above, as stipulated in the Work Authorization. In neither case will the maximum amount specified in a Work Authorization be exceeded without prior written approval from the Authority. The costs associated with work performed on any Work Authorization will be tracked and reported to the Authority separately from other work performed by the Consultant. The monthly invoice to the Authority will include a progress summary of the work performed the previous month on each ongoing Work Authorization.

d) EXPENSES. As indicated above, the compensation computed in accordance with subsections 3.b. and 3.c. is anticipated by the Authority and the Consultant to be full and sufficient compensation and reimbursement for the Services. Notwithstanding the foregoing, the Consultant shall be entitled to reimbursement for reasonable out-of-pocket expenses actually incurred by the Consultant that are necessary for the performance of its duties under this Agreement, said expenses being limited to travel costs incurred in conformance with the Authority's Travel Expense Policy set forth in Chapter 3, Subchapter D of the Authority's Policy Code, printing costs, automobile expenses being reimbursed at the federal mileage rates for travel originating from the office of the applicable Consultant employee or subconsultant, application fees, delivery charges, and

other expenses directly approved, in advance, by the Authority. Except for automobile expenses paid at the federal mileage rate and travel paid at state approved rates (if available), all such reimbursement shall be at one-hundred percent (100%) of the actual cost thereof paid by the Consultant to unaffiliated entities; provided, however, that all non-travel related amounts in excess of $1,500 for which the Consultant intends to seek reimbursement pursuant to this subsection 3.d. must be approved in advance and in writing by the Authority, except when such advance approval is impractical due to a bona fide emergency situation. The Authority shall not reimburse the Consultant for travel, lodging, and similar expenses incurred by the Consultant to bring additional staff to its local office or to otherwise reassign personnel to provide basic engineering and technical support of the Consultant's performance of the Services. The Consultant shall take all reasonable steps to acquire all goods and services subject to reimbursement by the Authority under this Agreement on a tax-free basis pursuant to the Authority's tax-exempt status described in subsection 3.i.

e) NON-COMPENSABLE TIME. Time spent by the Consultant's employees or subconsultants to perform Services or functions capable of being carried out by other, subordinate personnel with a lower hourly rate shall be billed at a rate equivalent to that of the applicable qualified subordinate personnel. Time spent by the Consultant's personnel or subconsultants in an administrative or supervisory capacity not related to the performance of the Services shall not be compensable. Time spent on work that is in excess of what would reasonably be considered appropriate for the performance of such Services shall not be compensable. No compensation shall be made for revisions to the Consultant's or subconsultants' Services or deliverables required due in any way to the error, omission, or fault of the Consultant, its employees, agents, subconsultants, or contractors.

f) INVOICES AND RECORDS. The Consultant shall submit one (1) copy of its monthly invoices certifying the fees charged and expenses incurred in providing the Services under this Agreement during the previous month and shall also present a reconciliation of monthly invoices and the Work Authorization (and related estimates) to which the work relates. Each invoice shall be in such detail as is required by the Authority and, if the work is eligible for payment through a financial assistance agreement with the Texas Department of Transportation ("TxDOT"), in such detail as required by TxDOT, including a breakdown of Services provided on a project-by-project basis and/or pursuant to specified Work Authorizations, together with other Services requested by the Authority. Upon request of the Authority, the Consultant shall also submit certified time and expense records and copies of invoices that support the invoiced fees and expense figures. All invoices must be consistent with the rates represented in Appendix B, and direct labor costs for employees performing work for the Authority but not shown on Appendix B must be provided with any invoice reflecting such work. Unless waived in writing by the Executive Director or his designee, no invoice may contain, and the Authority will not be required to pay, any charge which is more than three (3) months old at the time of invoicing. All books and records relating to the Consultant's or subconsultants' time, out-of-pocket expenses, materials, or other services or deliverables invoiced to the Authority under this Agreement shall be made available during the Consultant's normal business hours to the Authority and its representatives for review, copying, and auditing throughout the term of this Agreement and, after completion of the work, for three (3) years, or such period as is required by Texas or Federal law, whichever is longer.

g) EFFECT OF PAYMENTS. No payment by the Authority shall relieve the Consultant of its obligation to deliver timely the Services required under this Agreement. If after

approving or paying for any Service, product or other deliverable, the Authority determines that said Service, product or deliverable does not satisfy the requirements of this Agreement, the Authority may reject same and, if the Consultant fails to correct or cure same within a reasonable period of time and at no additional cost to the Authority, the Consultant shall return any compensation received, therefore. In addition to all other rights provided in this Agreement, the Authority shall have the right to set off any amounts owed by the Consultant pursuant to the terms of this Agreement upon providing the Consultant prior written notice thereof.

h) PLACE OF PAYMENT. Payments owing under this Agreement will be made by the Authority within thirty (30) days after receipt of the monthly invoice therefore, together with suitable supporting information, provided that if the payment is one eligible for reimbursement to the Authority from TxDOT, payment will be made within fifteen (15) business days of receipt by the Authority of the TxDOT payment. In the event the Authority disputes payment, the Authority will pay the undisputed portion when due. Payment shall be forwarded to the address shown for the Consultant: 9430 Research Blvd., Suite 1-200, Austin TX 78759.

i) TAXES. All payments to be made by the Authority to the Consultant pursuant to this Agreement are inclusive of federal, state, or other taxes, if any, however designated, levied, or based. The Authority acknowledges and represents that it is a tax-exempt entity under Sections 151.309, et seq., of the Texas Tax Code. Title to any consumable items purchased by the Consultant in performing this Agreement shall be deemed to have passed to the Authority at the time the Consultant takes possession or earlier, and such consumable items shall immediately be marked, labeled, or physically identified as the property of the Authority, to the extent practicable.

j) AS-NEEDED BASIS. As provided for above, the Authority shall request that the Consultant perform specific Services on an as-needed basis and through the issuance of Work Authorizations. No representation or assurance has been made on behalf of the Authority to the Consultant as to the total compensation to be paid to the Consultant under this Agreement.

k) COMPENSATION OF SUBCONSULTANTS. As noted in the Consultant's response to the RFQ, the Consultant will employ subconsultants providing Services under this Agreement. All subconsultants providing Services under this Agreement shall be subject to, and compensated or reimbursed in accordance with, all requirements of this Article 3, provided that each subconsultant shall utilize its own actual hourly rates (computed using its own multiplier based on actual audited FAR rates or audited overhead rates if FAR rates are not available) provided that no such rates shall exceed the corresponding rates paid by the Consultant for its personnel of comparable grade, category and experience, and further provided that no Subconsultant's FAR rate or audited overhead rate may exceed that of the Consultant without the prior written consent of the Authority. The Consultant agrees to pay its subconsultants for satisfactory performance of their contracts no later than thirty (30) days from its receipt of payment from the Authority. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the Authority. This clause applies to payments to all subconsultants. Consultant is authorized to use those subconsultants identified in Appendix D attached hereto and incorporated herein, being those subconsultants identified in the response of Consultant to the RFQ. Additional subconsultants may only be utilized with the prior written consent of the Executive Director of the Authority.

l) MOST FAVORED CUSTOMER. The Consultant shall voluntarily and promptly disclose to the Authority, and immediately provide the Authority with, the benefits of any discounted hourly fees and rates offered by the Consultant to any public entity customer in the State of Texas for comparable traffic and revenue studies. The Consultant hereby represents to the Authority, as of the effective date of this Agreement and throughout the term thereof, that except as previously disclosed in writing it has and will have no contract or arrangement with any public entity customer in the State of Texas for comparable traffic and revenue studies that provides such customer with fees, or rates that are more favorable than those afforded the Authority under this Agreement. The Consultant shall make available to the Authority for review, copying, and auditing throughout the term of this Agreement and for three (3) years or such period as is required by Texas or Federal law, whichever is longer, after the expiration thereof all such books and records as shall be necessary for the Authority or its representatives to determine compliance with this provision.

ARTICLE 4
TIME OF PERFORMANCE

It is understood and agreed that the initial term of this Agreement is for a period of five (5) years, commencing on the Effective Date, and concluding [_____], subject to the earlier termination of this Agreement pursuant to Articles 5 or 6 below or further extension upon agreement of both parties. The term of this Agreement may be renewed for up to two (2) additional two (2) year periods pursuant to the agreement of the parties and approval of the renewal by the CTRMA Board of Directors. In addition to any termination rights set forth in this Agreement, either party may elect not to extend the term of one or both of the renewal years by providing sixty (60) days written notice to the other prior to the end of the initial term of the first renewal term. Absent such notice or termination pursuant to other provisions of this Agreement, the renewal terms will automatically take effect. If at any time during the contract term the Consultant cannot provide the requested Services within the time required by the Authority or for any other reason, the Authority reserves the unilateral right to procure the Services from any other source it deems capable of providing those Services.

ARTICLE 5
TERMINATION FOR DEFAULT

Time is of the essence with respect to the performance and completion of all the Services to be furnished by the Consultant pursuant to Work Authorizations issued, and which specify an agreed-upon completion or delivery date. Without limiting the foregoing, the Consultant shall furnish all Services in such a manner and at such times as the development schedules of the Projects require so that no delay in the progression of the evaluation, funding, design, or construction of the Projects will be caused by or be in any way attributable to the Consultant. Should the Consultant at any time, in the reasonable opinion of the Authority, not carry out its obligations under this Agreement or not be progressing toward completion of the Services to be rendered hereunder in an expeditious manner, or if the Consultant shall fail in any manner to discharge any other of its obligations under this Agreement, the Authority may, upon providing the Consultant with thirty (30) days prior written notice pursuant to Article 5 hereof and opportunity to cure, terminate this Agreement effective on the date following said 30-day notice and cure period (the "Termination Date"). Such termination shall not constitute a waiver or release by the Authority of any claims for damages, claims for additional costs incurred by the Authority to complete and/or correct the work described in this Agreement, or any other claims or actions arising under this Agreement or available at law or equity which it may have against the Consultant for its failure to perform satisfactorily any obligation

hereunder, nor shall such termination pursuant to this Article 5 or Article 6 below abrogate or in any way affect the indemnification obligations of the Consultant set forth in Article 17 hereof.

If the Authority shall terminate this Agreement as, provided either in this Article 5 or Article 6, no fees of any type, other than fees due and payable pursuant to Article 3 hereof for work performed and acceptable to the Authority, as of the Termination Date or Optional Termination Date, as applicable, shall thereafter be paid to the Consultant, and the Authority shall have a right to set off or otherwise recover any damages incurred by reason of the Consultant's breach hereof, together with the right to set off amounts owed to the Consultant pursuant to the indemnity provisions. In determining the amount of any payments owed to the Consultant, the value of the work performed by the Consultant prior to termination shall be no greater than the value that would result by compensating the Consultant in accordance with Article 3 hereof for all Services performed and expenses reimbursable in accordance with this Agreement.

ARTICLE 6
OPTIONAL TERMINATION

In addition to the process for termination described above, this Agreement may also be terminated as follows:

a) GENERALLY. The Authority has the right to terminate this Agreement at its sole option, at any time with or without cause, by providing thirty (30) days written notice of such intention to terminate pursuant to this subsection 6.a. hereof and by stating in said notice the "Optional Termination Date". Upon such termination, the Authority shall enter into a settlement with the Consultant upon an equitable basis as determined by the Authority, which shall fix the value of the work performed by the Consultant prior to the Optional Termination Date. In determining the value of the work performed, the Authority in all events shall compensate the Consultant for any reasonable costs or expenses attributable to the exercise of the Authority's optional termination, including reasonable costs related to developing a transition plan and providing data as provided for in Article 7, provided, however, that no consideration will be given to anticipated profit which the Consultant might possibly have made on the uncompleted portion of the Services.

b) NO FURTHER RIGHTS, ETC. Termination of this Agreement and payment of an amount in settlement as described in this Article 6 shall extinguish all rights, duties, obligations, and liabilities of the Authority and the Consultant under this Agreement, and this Agreement shall be of no further force and effect, provided, however, such termination shall not act to release the Consultant from liability for any previous default either under this Agreement or under any standard of conduct set by common law or statute. Requirements that survive termination are outlined in Article 35.

c) NO FURTHER COMPENSATION. If the Authority shall terminate this Agreement as provided in this Article 6, no fees of any type, other than fees due and payable as of the Optional Termination Date, shall thereafter be paid to the Consultant, provided that the Authority shall not waive any right to damages incurred by reason of the Consultant's breach thereof. The Consultant shall not receive any compensation for Services performed or expenses incurred by the Consultant after the Optional Termination Date, and any such Services performed, or expenses incurred shall be at the sole risk and expense of the Consultant.

ARTICLE 7
TERMINATION, GENERALLY

The Authority's rights and options to terminate this Agreement, as provided in any provision of this Agreement, shall be in addition to, and not in lieu of, any and all rights, actions, options, and privileges otherwise available under law or equity to the Authority by virtue of this Agreement or otherwise. Failure of the Authority to exercise any of its said rights, actions, options, and privileges to terminate this Agreement as provided in any provision of this Agreement or otherwise shall not be deemed a waiver of any of said rights, actions, options, or privileges or of any rights, actions, options, or privileges otherwise available under law or equity with respect to any continuing or subsequent breaches of this Agreement or of any other standard of conduct set by common law or statute.

Upon request by the Executive Director of the Authority, and subject to Article 13 hereto, The Consultant shall develop a transition plan to be implemented upon termination of this Agreement with the Consultant for any reason or upon the release of any subconsultant so as to ensure a smooth, efficient, and uninterrupted transition to any successor Consultant or subconsultant. The plan shall anticipate the steps necessary to transfer documents, computerized data, plans, work tasks, etc. in possession of or to be provided by the Consultant or its subconsultant(s), as the case may be, and include a schedule of events necessary to complete the transition. The plan should include, but not be limited to, a list of original documents/data being held on behalf of the Authority by the Consultant or its subconsultants; the manner and form in which information is being held; accessibility to the information; the Consultant's records retention policy and/or plan; and strategy to minimize disruption of Services in the event of the release of a subconsultant. A copy of the plan shall be given to the Executive Director for review and approval within thirty (30) days of receipt of the Executive Director's request and shall be updated as necessary to reflect any changes in Consultant activity.

ARTICLE 8
SUSPENSION OR MODIFICATION OF SERVICES; DELAYS AND DAMAGES

In addition to the foregoing rights and options to terminate this Agreement, the Authority may elect to suspend any portion of the Services of the Consultant hereunder, but not terminate this Agreement, by providing the Consultant with prior written notice to that effect. Thereafter, the suspended Services may be reinstated and resumed in full force and effect upon receipt from the Authority of thirty (30) days prior written notice requesting same. Similarly, the Authority may expand, limit, or cancel any portion of the Services previously assigned to the Consultant in accordance with this Agreement. The Consultant shall not be entitled to any damages or other compensation of any form in the event that the Authority exercises its rights to suspend or modify the Services pursuant to this Article 8, provided, however, that any time limits established by the parties in any Work Authorization or otherwise for the completion of specific portions of the Services suspended pursuant to this Article 8 shall be extended to allow for said suspension or modifications thereof. Without limiting the foregoing, the Consultant agrees that no claims for damages or other compensation shall be made by the Consultant for any delays or hindrances occurring during the progress of any portion of the Services specified in this Agreement as a result of any suspension or modification of the Services or otherwise. Such delays or hindrances, if any, shall be provided for by an extension of time for such reasonable periods as the Authority may decide. It is acknowledged, however, that permitting the Consultant to proceed to complete any Services or any part of them after the originally specified date for completion, or after the date to which the time for completion may have been extended, shall in no way operate as a waiver on the part of the Authority or any of its rights herein.

ARTICLE 9
PERSONNEL, EQUIPMENT AND MATERIAL, GENERALLY

Consultant shall provide personnel and equipment as follows:

a) ADEQUATE PERSONNEL, ETC. The Consultant shall furnish and maintain, at its own expense, adequate and sufficient personnel (drawn from its own employees or from approved subconsultants) and equipment, in the reasonable opinion of the Authority, to perform the Services with due and reasonable diligence customary of an engineering firm enjoying a favorable national reputation, and in all events without delays attributable to the Consultant which have a reasonable likelihood of adversely affecting the progress of others involved with one or more of the Projects or the progress of the feasibility evaluation, design or construction of any such Project. All persons, whether employees of the Consultant or of an approved subconsultant, providing the Services shall be fully licensed to the extent required by their professional discipline associations' codes or otherwise by law.

b) REMOVAL OF PERSONNEL. All persons providing the Services, whether employees of the Consultant or of an approved subconsultant, shall have such knowledge and experience as will enable them, in the Consultant's reasonable belief, to perform the duties assigned to them. Any such person who, in the opinion of the Authority, is incompetent or by his/her conduct becomes detrimental to the provision of the Services shall, upon request of the Authority, immediately be removed from the Services. The Consultant shall furnish the Authority with a fully qualified candidate for the removed person within ten (10) days thereafter, provided, however, said candidate shall not begin work under this Agreement unless and until approved by the Authority.

c) CONSULTANT FURNISHES EQUIPMENT, ETC. Except as otherwise specified or agreed to by the Authority, the Consultant shall furnish all equipment, transportation, supplies, and materials required for its Services under this Agreement.

ARTICLE 10
KEY PERSONNEL

The Consultant acknowledges and agrees that the individual(s) identified on Appendix E attached hereto and incorporated herein are key and integral to the satisfactory performance of the Consultant under this Agreement. Throughout the term of this agreement, the Consultant agrees that the identified individual(s), whether employee(s) of the Consultant or of an approved subconsultant, will remain in charge of the performance of the Services and shall devote substantial and sufficient time and attention thereto. The death or disability of any such individual, his/her disassociation from the Consultant or the approved subconsultant, or his/her failure or inability to devote sufficient time and attention to the Services shall require the Consultant promptly to replace said individual with a person suitably qualified and otherwise acceptable to the Authority. In no event shall the Consultant remove, transfer, or reassign any individual identified on Appendix E except as instructed by, or with the prior written consent of, the Authority, which consent shall not be reasonably withheld. The Consultant shall use its best efforts to enhance continuity in the key personnel, subconsultants, and other employees regularly performing the Services. Individuals may be added to Appendix E with the mutual consent of the Consultant and the Authority.

ARTICLE 11
BUSINESS OPPORTUNITY PROGRAM AND POLICY COMPLIANCE

It is the policy of the Authority's Board of Directors that disadvantaged and small business have the maximum practicable opportunity to participate in the awarding of Authority contracts and related subcontracts. To do so the Authority has developed a Business Opportunity Program and Policy ("BOPP"), which is incorporated herein by reference for all purposes. The Authority requires contractors to comply with the BOPP. The Consultant acknowledges that certain Services to be performed under this Agreement are subcontractable and will be subcontracted in accordance with the BOPP and as represented in Consultant's proposal in response to the RFQ. Consultant agrees to submit monthly subcontracting reports as part of its monthly invoices.

ARTICLE 12
PLANNING AND PERFORMANCE REVIEWS; INSPECTIONS

As directed by the Authority, key personnel shall meet with the Authority's Executive Director and/or his designee(s) upon request (a) to assess the Consultant's progress under this Agreement and performance of the Services; and (b) to plan staffing levels to be provided by the Consultant to the Authority for the upcoming calendar year. The Consultant shall permit inspections of its Services and work by the Authority or others, when requested by the Authority. Nothing contained in this Agreement shall prevent the Authority from scheduling such other planning and performance reviews with the Consultant or inspections as the Authority determines necessary.

ARTICLE 13
OWNERSHIP OF REPORTS

Ownership of reports and related materials prepared by Consultant (or any subconsultant) at the direction of the Authority shall be as follows:

a) GENERALLY. All of the documents, reports, plans, surveys, estimates, computer records, discs and tapes, proposals, sketches, diagrams, charts, calculations, correspondence, memoranda, survey notes, opinions, maps, photographs, drawings, data, analyses and other data and materials, and any part thereof, created, compiled or to be compiled by or on behalf of the Consultant solely under this Agreement ("work product"), including all information prepared for or posted on the Authority's website and together with all materials and data furnished to it by the Authority, shall at all times be and remain the property of the Authority and, for a period of three (3) years from completion of the Services or such period as is required by law, whichever is longer, if at any time demand be made by the Authority for any of the above materials, records, and documents, whether after termination of this Agreement or otherwise, such shall be turned over to the Authority without delay. The Authority hereby grants the Consultant a revocable license to retain and utilize the foregoing materials, said license to terminate and expire upon the earlier to occur of (a) the completion of Services described in this Agreement or (b) the termination of this Agreement, at which time the Consultant shall deliver to the Authority all such materials and documents. If the Consultant or a subconsultant desires later to use any of the data generated or obtained by it in connection with the Projects or any other portion of the work product resulting from the Services, it shall secure the prior written approval of the Authority. Notwithstanding anything contained herein to the contrary, the

Consultant shall have the right to retain a copy of the above materials, records, and documents for its archives.

b) SEPARATE ASSIGNMENT. If for any reason the agreement of the Authority and the Consultant set forth in subsection 13.a. above regarding the ownership of work product and other materials is determined to be unenforceable, either in whole or in part, the Consultant hereby assigns and agrees to assign to the Authority all right, title, and interest that Consultant may have or at any time acquire in said work product and other materials which are prepared solely for this Agreement, without royalty, fee or other consideration of any sort, and without regard to whether this Agreement has terminated or remains in force. The Authority hereby acknowledges, however, that all documents and other work product provided by the Consultant to the Authority and resulting from the Services performed under this Agreement are intended by the Consultant solely for the use for which they were originally prepared. Notwithstanding anything contained herein to the contrary, the Consultant shall have no liability for the use by the Authority of any work product generated by the Consultant under this Agreement on any project other than for the specific purpose and Project for which the work product was prepared. Any other reuse of such work product without the prior written consent of the Consultant shall be at the sole risk of the Authority.

c) USE OF CONSULTANT WORK PRODUCT. Except for final versions of reports which are prepared in connection with project financings, the Authority will provide Consultant written advance notice prior to releasing Consultant's work product to any third party. Upon receipt of notice, Consultant will have a reasonable amount of time to review such disclosure and provide the Authority written notice of the completion of review prior to release. The Authority acknowledges that the Consultant's work product will be developed using data that is available at the time of the execution of a given work order and will not constitute any guarantee or other assurance of future events. The Consultant will prepare work product using practices that are standard procedures in the industry.

ARTICLE 14
SUBLETTING

The Consultant shall not sublet, assign, or transfer any part of the work or obligations included in this Agreement without the prior written approval of the Authority, which approval shall not be reasonably withheld. Responsibility for sublet, assigned, or transferred work shall remain with the Consultant.

ARTICLE 15
APPEARANCE AS WITNESS AND ATTENDANCE AT MEETINGS

Consultant shall cooperate with the Authority and requests for attendance at meetings and in various types of proceedings as follows:

a) WITNESS. If requested by the Authority or on its behalf, the Consultant shall prepare such traffic engineering, feasibility, or other exhibits as may be requested for all hearings and trials related to any of the Projects, the Services, or the Authority's activities generally and, further, it shall prepare for and appear at conferences at the offices of legal counsel and shall furnish competent expert engineering witnesses to provide such oral testimony and to introduce such demonstrative evidence as may be needed throughout all trials and hearings with reference to any litigation relating to the Projects, the Services, or the Authority's activities.

b) MEETINGS. At the request of the Authority, the Consultant shall provide appropriate personnel for conferences at its offices or attend meetings and conferences at (a) the various offices of the Authority, (b) at the district headquarters or offices of TxDOT, (c) the offices of the Authority's legal counsel, bond counsel, and/or financial advisors, (d) at the site of any Project, or (e) any reasonably convenient location, including remote attendance. Without limiting the foregoing, the Consultant shall provide personnel for periodic meetings with underwriters, rating agencies, and other parties when requested by the Authority.

c) WORK AUTHORIZATION. In the event that services under this section are not covered by an existing Work Authorization, the Authority will issue a Work Authorization, pursuant to Article 3 hereto, to cover such services.

ARTICLE 16
COMPLIANCE WITH LAWS AND AUTHORITY POLICIES

The Consultant shall comply with all applicable federal, state, and local laws, statutes, ordinances, rules, regulations, codes and with the orders and decrees of any courts or administrative bodies or tribunals in any matter affecting the performance under this Agreement, including, without limitation, workers' compensation laws, antidiscrimination laws, environmental laws, minimum and maximum salary and wage statutes and regulations, health and safety codes, licensing laws and regulations, the Authority's enabling legislation (Chapter 370 of the Texas Transportation Code), and all amendments and modifications to any of the foregoing, if any. The Consultant shall also comply with the Authority's policies and procedures related to operational and administrative matters, such as, but not limited to, security of and access to the Authority information and facilities. When requested the Consultant shall furnish the Authority with satisfactory proof of compliance with said laws, statutes, ordinances, rules, regulations, codes, orders, and decrees above specified.

ARTICLE 17
AUTHORITY INDEMNIFIED

THE CONSULTANT SHALL INDEMNIFY AND SAVE HARMLESS THE AUTHORITY AND ITS OFFICERS, DIRECTORS, EMPLOYEES, AND AGENTS (WHICH, FOR PURPOSES OF THIS AGREEMENT, SHALL INCLUDE THE AUTHORITY'S GENERAL COUNSEL, BOND COUNSEL, AND FINANCIAL ADVISOR (S)), FROM ANY CLAIMS, COSTS OR LIABILITIES OF ANY TYPE OR NATURE AND BY OR TO ANY PERSONS WHOMSOEVER, ARISING FROM THE CONSULTANT'S NEGLIGENT ACTS, ERRORS OR OMISSIONS WITH RESPECT TO THE CONSULTANT'S PERFORMANCE OF THE WORK TO BE ACCOMPLISHED UNDER THIS AGREEMENT, WHETHER SUCH CLAIM OR LIABILITY IS BASED IN CONTRACT, TORT OR STRICT LIABILITY. IN SUCH EVENT, THE CONSULTANT SHALL ALSO INDEMNIFY AND SAVE HARMLESS THE AUTHORITY, ITS OFFICERS, DIRECTORS, EMPLOYEES, AND AGENTS (WHICH, FOR PURPOSES OF THIS AGREEMENT, SHALL INCLUDE THE AUTHORITY'S GENERAL COUNSEL, BOND COUNSEL, AND FINANCIAL ADVISOR (S)) FROM ANY AND ALL EXPENSES, INCLUDING REASONABLE ATTORNEYS' FEES, INCURRED BY THE INDEMNIFIED ENTITY (S) IN LITIGATING OR OTHERWISE RESISTING SAID CLAIMS, COSTS OR LIABILITIES. IN THE EVENT THE AUTHORITY, ITS OFFICERS, DIRECTORS, EMPLOYEES, AND AGENTS (WHICH, FOR PURPOSES OF THIS AGREEMENT, SHALL INCLUDE THE AUTHORITY'S GENERAL COUNSEL, BOND COUNSEL, AND FINANCIAL ADVISOR(S)) IS/ARE FOUND TO BE PARTIALLY AT FAULT, THE CONSULTANT SHALL, NEVERTHELESS, INDEMNIFY THE INDEMNIFIED ENTITY (S) FROM AND AGAINST THE PERCENTAGE OF NEGLIGENCE ATTRIBUTABLE TO THE

CONSULTANT, ITS OFFICERS, DIRECTORS, EMPLOYEES, AGENTS, SUBCONSULTANTS, AND CONTRACTORS OR TO THEIR CONDUCT.

NOTWITHSTANDING THE FOREGOING, THE CONSULTANT SHALL NOT BE RESPONSIBLE FOR (A) CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, OR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE PROJECT UNLESS DEVELOPMENT OR OVERSIGHT OF SUCH MATTERS IS SPECIFICALLY ASSIGNED TO THE CONSULTANT; (B) THE FAILURE OF ANY CONTRACTOR, SUBCONTRACTOR, VENDOR, OR OTHER PROJECT PARTICIPANT, NOT UNDER CONTRACT TO THE CONSULTANT, TO FULFILL CONTRACTUAL RESPONSIBILITIES TO THE AUTHORITY OR TO COMPLY WITH FEDERAL, STATE OR LOCAL LAWS, REGULATIONS AND CODES; OR (C) PROCURING PERMITS, CERTIFICATES AND LICENSES REQUIRED FOR ANY CONSTRUCTION UNLESS SUCH PROCUREMENT RESPONSIBILITIES ARE SPECIFICALLY ASSIGNED TO THE CONSULTANT IN ACCORDANCE WITH THIS AGREEMENT.

ARTICLE 18
CONFLICTS OF INTEREST

The Consultant represents and warrants to the Authority, as of the effective date of this Agreement and throughout the term hereof, that it, its employees and subconsultants (a) have no financial or other beneficial interest in any contractor, engineer, product or service evaluated or recommended by the Consultant, except as expressly disclosed in writing to the Authority, (b) shall discharge their consulting engineering responsibilities under this Agreement professionally, impartially and independently, and after considering all relevant information related thereto, and (c) are under no contractual or other restriction or obligation, the compliance with which is inconsistent with the execution of this Agreement or the performance of their respective obligations hereunder. In the event that a firm (individually or as a member of a consortium) submits a proposal to work for the Authority, Consultant shall comply with the Authority's conflict of interest policies and shall make disclosures as if it were one of the key personnel designated under such policies.

ARTICLE 19
INSURANCE

Prior to beginning the Services designated in this Agreement, the Consultant shall obtain and furnish certificates to the Authority for the following minimum amounts of insurance:

a) WORKERS' COMPENSATION INSURANCE. In accordance with the laws of the State of Texas, and employer's liability coverage with a limit of not less than $500,000. A "Waiver of Subrogation" in favor of the Authority shall be provided.

b) COMMERCIAL GENERAL LIABILITY INSURANCE. With limits not less than $1,000,000 for bodily injury, including those resulting in death, and property damage on account of any one occurrence, with an aggregate limit of $1,000,000. A "Waiver of Subrogation" in favor of the Authority shall be provided.

c) BUSINESS AUTOMOBILE LIABILITY INSURANCE. Applying to owned, non-owned, and hired automobiles in an amount not less than $1,000,000 for bodily injury, including death, to any one person, and for property damage on account of any one occurrence. This

policy shall not contain any limitation with respect to a radius of operation for any vehicle covered and shall not exclude from the coverage of the policy any vehicle to be used in connection with the performance of the Consultant's obligations under this Agreement. A "Waiver of Subrogation" in favor of the Authority shall be provided.

d) ARCHITECTS AND/OR ENGINEERS PROFESSIONAL LIABILITY INSURANCE. In the amounts normally carried for its own protection in the practice of providing general consulting services, but in no event less than $3,000,000 per claim and aggregate. Coverage must be continuously maintained for a period of three (3) years beyond the Consultant's completion of the Services.

e) EXCESS UMBRELLA LIABILITY. With minimum limits of $1,000,000 per claim and in the aggregate, annually, as applicable excess of the underlying policies required at a.–d. above. The Umbrella Policy shall contain the provision that it will continue in force as an underlying insurance in the event of exhaustion of underlying aggregate policy limits.

f) GENERAL FOR ALL INSURANCE. The Consultant shall promptly, upon execution of this Agreement, furnish certificates of insurance to the Authority indicating compliance with the above requirements. Certificates shall indicate the name of the insured, the name of the insurance company, the name of the agency/agent, the policy number, the term of coverage, and the limits of coverage.

All policies are to be written through companies (a) registered to do business in the State of Texas; (b) rated: (i), with respect to the companies providing the insurance under subsections 19.a. through d., above, by A. M. Best Company as "A-X" or better (or the equivalent rating by another nationally recognized rating service) and (ii) with respect to the company providing the insurance under subsections 19.d. and e., a rating by A. M. Best Company or similar rating service satisfactory to the Authority and/or its insurance consultant; and (c) otherwise acceptable to the Authority.

All policies are to be written through companies registered to do business in the State of Texas. Such insurance shall be maintained in full force and effect during the life of this Agreement or for a longer term as may be otherwise provided for hereunder. Insurance furnished under subsections 19.b., and c., above, shall name the Authority additional insureds and shall protect the Authority, the Consultant, their officers, employees, directors, agents, and representatives from claims for damages for bodily injury and death and for damages to property arising in any manner from the negligent or willful wrongful acts or failures to act by the Consultant, its officers, employees, directors, agents, and representatives in the performance of the Services rendered under this Agreement. Applicable Certificates shall also indicate that the contractual liability assumed in Article 17, above, is included.

The insurance carrier shall include in each of the insurance policies required under subsections 19.a., b., c., d., and e., the following statement: "This policy will not be canceled or non-renewed during the period of coverage without at least thirty (30) days prior written notice addressed to the Central Texas Regional Mobility Authority, 3300 N Interstate 35 Frontage Rd, Suite 300, Austin, TX 78705, Attention: Executive Director."

ARTICLE 20
COORDINATION OF CONTRACT DOCUMENTS

The Statement of Qualifications for Traffic and Revenue Engineering Services and Appendices thereto, dated June 12th, 2024, submitted by CDM Smith, Inc. to the Authority ("Statement of Qualification") is attached hereto and incorporated herein as Appendix F for all purposes, provided, however, that in the event of any conflict between said Statement of Qualifications and any other provision of, appendices or exhibits to this Agreement, the Statement of Qualifications shall be subordinate and the provision, appendices, or exhibits of this Agreement shall control.

ARTICLE 21
RELATIONSHIP BETWEEN THE PARTIES

Notwithstanding the anticipated collaboration between the parties hereto, or any other circumstances, the relationship between the Authority and the Consultant shall be one of an independent contractor. The Consultant acknowledges and agrees that neither it nor any of its employees, subconsultants, or subcontractors shall be considered an employee of the Authority for any purpose. The Consultant shall have no authority to enter into any contract binding upon the Authority, or to create any obligation on behalf of the Authority. As an independent contractor, neither the Consultant nor its employees shall be entitled to any insurance, pension, or other benefits customarily afforded to employees of the Authority. Under no circumstances shall the Consultant, or its employees, subconsultants, or subcontractors, represent to suppliers, contractors or any other parties that it is employed by the Authority or serves the Authority in any capacity other than as an independent contractor. The Consultant shall clearly inform all suppliers, contractors and others that it has no authority to bind the Authority. Nothing contained in this Agreement shall be deemed or construed to create a partnership or joint venture, to create the relationship of employee-employer or principal-agent, or to otherwise create any liability for the Authority whatsoever with respect to the liabilities, obligations or acts of the Consultant, its employees, subconsultants, or subcontractors, or any other person.

ARTICLE 22
DELIVERY OF NOTICES, ETC.

In each instance under this Agreement in which one party is required or permitted to give notice to the other, such notice shall be deemed given either (a) when delivered by hand; (b) one (1) business day after being deposited with a reputable overnight air courier service; or (c) three (3) business days after being mailed by United States mail, registered or certified mail, return receipt requested, and postage prepaid. Any notices provided under this Agreement must be sent or delivered to:

In the case of the **Consultant**:

CDM Smith, Inc.
9430 Research Blvd.
Suite 1-200
Austin, TX 78759

Attn: Christopher E. Mwalwanda, Vice President

In the case of the **CTRMA**:

Central Texas Regional Mobility Authority
3300 N. IH 35
Suite 300
Austin, TX 78705

Attn: James Bass, Executive Director

Either party hereto may from time to time change its address for notification purposes by giving the other party prior written notice of the new address and the date upon which it will become effective.

ARTICLE 23
REPORTS OF ACCIDENTS, ETC.

Within twenty-four (24) hours after occurrence of any accident or other event which results in, or might result in, injury to the person or property of any third person (including an employee or subconsultant or employee of a subconsultant of the Consultant) which results from or involves any action or failure to act of the Consultant or any employee, subconsultant, employee of a subconsultant, or agent of the Consultant or which arises in any manner from the performance of this Agreement, the Consultant shall send a written report of such accident or other event to the Authority, setting forth a full and concise statement of the facts pertaining thereto. The Consultant also shall immediately send the Authority a copy of any summons, subpoena, notice, or other documents served upon the Consultant, its agents, employees, subconsultants, or representatives, or received by it or them, in connection with any matter before any court arising in any manner from the Consultant's performance of the Services under this Agreement.

ARTICLE 24
AUTHORITY'S ACTS

Anything to be done under this Agreement by the Authority may be done by such persons, corporations, firms, or other entities as the Authority may designate.

ARTICLE 25
LIMITATIONS

Notwithstanding anything herein to the contrary, all covenants and obligations of the Authority under this Agreement shall be deemed to be valid covenants and obligations only to the extent authorized by Chapter 370 of the Texas Transportation Code and permitted by the laws and the Constitution of the State of Texas, and no officer, director, or employee of the Authority shall have any personal obligations or liability thereunder.

The Consultant is obligated to comply with applicable standards of professional care in the performance of the Services. The Consultant makes no other representation or warranty, whether express or implied, and no warranty or guarantee is included or intended in this Agreement or in any "work product" or otherwise.

The Consultant shall be entitled to rely, without requirement of further investigation, on all information supplied to the Consultant by the Authority, together with any other materials, such as prior reports or analyses prepared by or on behalf of or for the benefit of Authority.

Neither Authority nor the Consultant shall in any event be liable for any consequential, incidental, indirect, punitive, exemplary or special damages including, without limitation; loss of profits, business or goodwill of any kind from any causes of action (whether arising in contract, tort or otherwise) unless caused by their willful misconduct, negligent act or omission, or other wrongful conduct. Each party to this Agreement is obligated to take commercially reasonable steps to mitigate any damages that it may incur. Nothing herein shall constitute a waiver of any other defenses that either party may have at law or in equity.

ARTICLE 26
CAPTIONS NOT A PART HEREOF

The captions or subtitles of the several articles, subsections, and divisions of this Agreement are inserted only as a matter of convenience and for reference, and in no way define, limit or describe the scope of this Agreement or the scope or content of any of its articles, subsections, divisions, or other provisions.

ARTICLE 27
CONTROLLING LAW, VENUE

This Agreement shall be governed and construed in accordance with the laws of the State of Texas. The parties hereto acknowledge that venue is proper in Travis County, Texas, for all disputes arising hereunder and waive the right to sue and be sued elsewhere.

ARTICLE 28
COMPLETE AGREEMENT

This Agreement sets forth the complete agreement between the parties with respect to the Services and, except as provided for in Article 20 above, expressly supersedes all other agreements (oral or written) with respect thereto. Any changes in the character, agreement, terms and/or responsibilities of the parties hereto must be enacted through a written amendment. No amendment to this Agreement shall be of any effect unless in writing and executed by the Authority and the Consultant. This Agreement may not be orally canceled, changed, modified or amended, and no cancellation, change, modification or amendment shall be effective or binding, unless in writing and signed by the parties to this Agreement. This provision cannot be waived orally by either party.

ARTICLE 29
TIME OF ESSENCE

As set forth in Article 5, with respect to any specific delivery or performance date or other deadline provided hereunder, time is of the essence in the performance of the provisions of this Agreement. The Consultant acknowledges the importance to the Authority of the project schedule and will perform its obligations under this Agreement with all due and reasonable care and in compliance with that schedule.

ARTICLE 30
SEVERABILITY

If any provision of this Agreement, or the application thereof to any person or circumstance, is rendered or declared illegal for any reason and shall be invalid or unenforceable, the remainder of this

Agreement and the application of such provision to other persons or circumstances shall not be affected thereby but shall be enforced to the greatest extent permitted by applicable law.

ARTICLE 31
AUTHORIZATION

Each party to this Agreement represents to the other that it is fully authorized to enter into this Agreement and to perform its obligations hereunder, and that no waiver, consent, approval, or authorization from any third party is required to be obtained or made in connection with the execution, delivery, or performance of this Agreement.

ARTICLE 32
SUCCESSORS

This Agreement shall be binding upon and inure to the benefit of the Authority, the Consultant, and their respective heirs, executors, administrators, successors, and permitted assigns.

ARTICLE 33
INTERPRETATION

No provision of this Agreement shall be construed against or interpreted to the disadvantage of any party by any court, other governmental or judicial authority, or arbiter by reason of such party having or being deemed to have drafted, prepared, structured, or dictated such provision.

ARTICLE 34
BENEFITS INURED

This Agreement is solely for the benefit of the parties hereto and their permitted successors and assigns. Nothing contained in this Agreement is intended to, nor shall be deemed or construed to, create or confer any rights, remedies, or causes of action in or to any other persons or entities, including the public in general.

ARTICLE 35
SURVIVAL

The parties hereby agree that each of the provisions in the Agreement are important and material and significantly affect the successful conduct of the business of the Authority, as well as its reputation and goodwill. Any breach of the terms of this Agreement, including but not limited to the provisions of Articles 13 and 18, is a material breach of this Agreement, from which the Consultant may be enjoined and for which the Consultant also shall pay to the Authority all damages which arise from said breach. The Consultant understands and acknowledges that the Consultant's responsibilities under Articles 13, 17, 18, and all other obligations of this Agreement related to maintaining records outlined in Article 3 shall continue in full force and effect after the Consultant's contractual relationship with the Authority ends for any reason.

ARTICLE 36
FORCE MAJEURE

Either party shall be excused from performing its obligations under this Agreement during the time and to the extent that it is prevented from performing by an unforeseeable cause beyond its control,

including but not limited to: any incidence of fire, flood; acts of God; commandeering of material, products, plants or facilities by the federal, state or local government; national fuel shortage; or a material act or omission by the other party; when satisfactory evidence of such cause is presented to the other party, and provided further that such nonperformance is unforeseeable, beyond the control and is not due to the fault or negligence of the party not performing.

IN WITNESS WHEREOF, the parties have executed this Agreement effective on the date and year first written above.

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY	CDM SMITH, INC.
By: _____	By: _____
Name: _____	Name: Christopher Mwalwanda _____
Title: _____	Title: Vice President/Client Service Leader ___
Date: _____	Date: 08/16/2024 _____

APPENDIX A

SCOPE OF SERVICES

I. Purpose

The Consultant shall be expected to support the Authority in its communications and interactions with the Authority's accountants, rating agencies, bond insurers and underwriters, governmental entities, and the public in accordance with the highest professional standards.

The Consultant shall provide qualified technical and professional personnel to perform the duties and responsibilities assigned under the terms of this Agreement. The Authority, at its option, may elect to expand, reduce, or delete the extent of each work element described in this Scope of Services document, provided such action does not alter the intent of this Agreement.

The Authority shall request Services on an as-needed basis. There is no guarantee that any or all of the Services described in this Agreement will be assigned during the term of this Agreement. Further, the Consultant is providing these Services on a nonexclusive basis. The Authority, at its option, may elect to have any of the Services set forth herein performed by other consultants or by the Authority's staff.

II. Services

The Consultant shall be responsible for conducting complex traffic modeling and forecasting, including forecasting of revenues for bond-financed toll projects, and rendering opinions and other analyses concerning traffic and revenue projections for current and future projects as required under the trust agreements governing CTRMA's revenue bond financing.

The Scope of Services to be provided by the Consultant may include, but not be limited to, the following:

A. Perform all duties imposed on the Traffic Consultant by the Authority's current Trust Agreement, as amended, and all supplemental, superseding, or additional trust agreements, loan documents (including Transportation Infrastructure Fi-nance and Innovation Act credit assistance), financial assistance agreements, development agreements, and other documents related to project financing, including providing certificates and opinions related to annual reviews, pro-posed changes in toll rate schedules or toll classifications, and periodic bond issuances.

B. Develop traffic and revenue projections for the existing CTRMA projects annually and for proposed new projects as requested.

C. Provide and maintain traffic modeling tools pertinent to the CTRMA's projects and potential projects, working closely with the Capital Metropolitan Planning Organization (CAMPO), TxDOT, and other local planning organizations as necessary, to update economic, demographic and land use data.

D. Perform special studies or reports as requested, including peer review analyses, regarding traffic, toll revenues, mobility, toll collection methods and strategies, managed lane traffic analysis and pricing strategies, and related technology and industry trends.

E. Present reports and findings to the CTRMA Board of Directors, rating agencies and investors, local interested parties, or otherwise upon request.

F. Work at the direction and supervision of the Authority's Executive Director and Chief Financial Officer. The firm will also be required to work cooperatively and collaboratively with other firms serving the authority, including but not limited to the authority's General Engineering Consultant, General Counsel, financial advisors, and Bond Counsel as well as with CTRMA department directors.

G. Develop a process that both (1) provides, in a cost-effective manner, assessments of potential future traffic, revenue, and other information for corridors that may be studied for potential turnpike projects, and (2) provides a base for more detailed traffic modeling in the future as potential projects are selected for further advancement.

H. Prepare evaluations, studies, and opinions as necessary to determine recommended toll rates and periodic toll rate adjustments for the Authority's turnpike projects.

III. Subcontracting

Services assigned to subconsultants must be approved in advance by the Authority. Notwithstanding said approval, all responsibility for subcontracted work shall remain strictly with the Consultant. The subconsultants must be qualified by the Authority to perform all work assigned to them.

In the event services of a subconsultant are authorized, the Consultant shall obtain a schedule of rate, and the Authority shall review and must approve, in its discretion, any rates, including overhead, to be paid to the subconsultant.

The Consultant shall be responsible for submitting monthly reports regarding its subcontracting activity including required BOPP reporting.

APPENDIX B

RATE SCHEDULE

PRIME PROVIDER NAME: **CDM Smith Inc.**

Year 1* Average Hourly Wage Rate		Overhead G & A	Profit	Fully Burdened Hourly Labor Rate
	(A)	(B)	(C)	(Columns A+B+C)
Labor/Staff Classification		154.03%	10%	
Project Principal/Senior Advisor (15+ Yrs)	$142.00	$218.72	$36.07	$396.79
Technical Leader (15+ Yrs)	$70.00	$107.82	$17.78	$195.60
Project Manager (15+ Yrs)	$130.00	$200.24	$33.02	$363.26
Deputy Project Manager (15+Yrs)	$110.00	$169.43	$27.94	$307.38
Engineer III (15+ Yrs)	$90.00	$138.63	$22.86	$251.49
Engineer II (8-14 Yrs)	$70.00	$107.82	$17.78	$195.60
Engineer I (1-7 Yrs)	$55.00	$84.72	$13.97	$153.69
Senior GIS (15+Yrs)	$60.00	$92.42	$15.24	$167.66
GIS Analyst II (9-14 Yrs)	$50.00	$77.02	$12.70	$139.72
GIS Analyst I (0-8 Yrs)	$37.00	$56.99	$9.40	$103.39
Planner/Modeler III (15 + yrs)	$100.00	$154.03	$25.40	$279.43
Planner/Modeler II (9 -15 yrs)	$75.00	$115.52	$19.05	$209.57
Planner/Modeler I (0 - 8 yrs)	$50.00	$77.02	$12.70	$139.72
Senior Toll System Specialist (> 10 yrs)	$115.00	$177.13	$29.21	$321.35
Toll System Specialist (< 10 yrs)	$65.00	$100.12	$16.51	$181.63
Senior Project Controls Specialist (>10 yrs)	$64.00	$98.58	$16.26	$178.84
Project Controls Specialist (1-10 yrs)	$48.00	$73.93	$12.19	$134.13
Senior Project Administrator/Contract Manager (>10 yrs)	$48.00	$73.93	$12.19	$134.13
Project Administrator/Contract Manager (1-10 Yrs)	$40.00	$61.61	$10.16	$111.77
Admin/Clerical (1-5 Yrs)	$32.00	$49.29	$8.13	$89.42

*Year 1 is from January 1, 2024, through December 31, 2024.

Negotiated Offsite Year 1 OH Rate: 154.03%
Negotiated Profit Rate: 10.00%

SUBPROVIDER NAME: C J Hensch and Associates, Inc.

Labor/Staff Classification	Year 1* Average Hourly Wage Rate (A)	Overhead G & A (B) 120.00%	Profit (C) 10.00%	Fully Burdened Hourly Labor Rate (Columns A+B+C)
Support Project Manager (10-20 Yrs)	$89.00	$106.80	$19.58	$215.38
Senior Traffic Technician (15+ Yrs)	$27.50	$33.00	$6.05	$66.55
Traffic Technician (5-15 Yrs)	$22.00	$26.40	$4.84	$53.24
Junior Traffic Technician (0-5 Yrs)	$19.50	$23.40	$4.29	$47.19
Admin/Clerical	$28.00	$33.60	$6.16	$67.76

*Year 1 is from January 1, 2024 through December 31, 2024.

Negotiated Offsite Year 1 OH Rate: 120.00%

Negotiated Profit Rate: 10.00%

Traffic and Traffic Signal Timing Unit Costs		
Services To Be Provided	**Unit**	**Average Rates (1)**
Turning Movement Counts		
2-hour Turning Movement Count, Major Intersection,	per intersection	$ 405.00
2-hour Turning Movement Count, Major Intersection,	per intersection	$ 425.00
2-hour Turning Movement Count, Minor Intersection,	per intersection	$ 230.00
2-hour Turning Movement Count, Minor Intersection,	per intersection	$ 250.00
13-hour Turning Movement Count Major Intersection	per intersection	$ 1,300.00
13-hour Turning Movement Count Minor Intersection	per intersection	$ 840.00
24-Hour Video System Classification Counts - Major	per intersection	$ 1,575.00
24-Hour Video System Classification Counts - Minor	per intersection	$ 1,155.00
Intersection Turning Movement Counts - Minor (additional	per hour	$ 200.00
Intersection Turning Movement Counts - Major (additional	per hour	$ 265.00
Intersection Video	per day	$ 250.00
24-Hour Counts		
24-Hour Automated Tube Counts - Volume	per direction/ per	$ 210.00
24-Hour Automated Tube Counts - Speed or Class	per direction/ per	$ 290.00
24-Hour Volume Mainlane Video/Radar Count	per lane/day	$ 210.00
24-Hour 3 Vehicle Classification Main Lane Count	per lane/day	$ 265.00
24-Hour 13 Vehicle Classification Main Lane Count	per lane/day	$ 370.00
Additional Traffic Control (no lane closures/detour)	day	$ 1,840.00
Additional Traffic Control (lane closures/detour)	day	$ 2,625.00
Speed Surveys		
Curve Speed Survey	per curve	$ 500.00
Spot Speed Survey	per location	$ 210.00
Travel Times		
Travel Time Runs in DMI-Equipped Vehicle	hour	$ 210.00
Travel Time- MAC Address Capture	per hour/unit	$ 95.00
Origin Destination		
72-Hour Bluetooth O/D Main Lane	per unit	$ 1,210.00
72-Hour Bluetooth O/D Arterial	per unit	$ 630.00
(1) Calendar Year 2024 rates, which will be updated to include annual escalation for subsequent years.		

SUBPROVIDER NAME: GRAM Traffic North Texas, Inc.

Labor/Staff Classification	Year 1* Average Hourly Wage Rate (A)	Overhead G & A (B) 160.00%	Profit (C) 10.00%	Fully Burdened Hourly Labor Rate (Columns A+B+C)
Principal	$35.00	$56.00	$9.10	$100.10
Field Supervisor (10+ Yrs)	$35.00	$56.00	$9.10	$100.10
Senior Traffic Technician (15+ Yrs)	$29.00	$46.40	$7.54	$82.94
Traffic Technician (5-15 Yrs)	$25.00	$40.00	$6.50	$71.50
Junior Traffic Technician (0-5 Yrs)	$37.00	$59.20	$9.62	$105.82
Admin/Clerical	$32.00	$51.20	$8.32	$91.52

*Year 1 is from January 1, 2024 through December 31, 2024.

Offsite Year 1 OH Rate: 160.00%

Profit Rate: 10.00%

Traffic and Traffic Signal Timing Unit Costs		
Services To Be Provided	**Unit**	**Average Rates (1)**
Turning Movement Counts		
2-hour Turning Movement Count, Major Intersection, Weekday	per intersection	$ 500.00
2-hour Turning Movement Count, Major Intersection, Weekend	per intersection	$ 545.00
2-hour Turning Movement Count, Minor Intersection, Weekday	per intersection	$ 315.00
2-hour Turning Movement Count, Minor Intersection, Weekend	per intersection	$ 370.00
13-hour Turning Movement Count Major Intersection	per intersection	$ 1,645.00
13-hour Turning Movement Count Minor Intersection	per intersection	$ 1,225.00
24-Hour Video System Classification Counts - Major Intersection	per intersection	$ 2,000.00
24-Hour Video System Classification Counts - Minor Intersection	per intersection	$ 1,575.00
Intersection Turning Movement Counts - Minor (additional turning movement count hours)	per hour	$ 275.00
Intersection Turning Movement Counts - Major (additional turning movement count hours)	per hour	$ 425.00
Intersection Video	per day	$ 525.00
24-Hour Counts		
24-Hour Automated Tube Counts - Volume	per direction/per counter/day	$ 270.00
24-Hour Automated Tube Counts - Speed or Class	per direction/per counter/day	$ 358.00
24-Hour Volume Mainlane Video/Radar Count	per lane/day	$ 530.00
24-Hour 3 Vehicle Classification Main Lane Count	per lane/day	$ 430.00
24-Hour 13 Vehicle Classification Main Lane Count	per lane/day	$ 510.00
Additional Traffic Control (no lane closures/detour)	day	$ 2,375.00
Additional Traffic Control (lane closures/detour)	day	$ 3,325.00
Speed Surveys		
Curve Speed Survey	per curve	$ 510.00
Spot Speed Survey	per location	$ 285.00
Travel Times		
Travel Time Runs in DMI-Equipped Vehicle (Includes labor and mileage on site; processing labor not included)	hour	$ 235.00
Travel Time- MAC Address Capture	per hour/unit	$ 110.00
Origin Destination		
72-Hour Bluetooth O/D Main Lane	per unit	$ 1,700.00
72-Hour Bluetooth O/D Arterial	per unit	$ 1,700.00
(1) Calendar Year 2024 rates, which will be updated to include annual escalation for subsequent years.		

SUBPROVIDER NAME: Baez Consulting, LLC

Labor/Staff Classification	Year 1* Average Hourly Wage Rate (A)	Overhead G & A (B) 169.56%	Profit (C) 10.00%	Fully Burdened Hourly Labor Rate (Columns A+B+C)
Senior Advisor	$128.00	$217.04	$34.50	$379.54
Senior Transportation Modeler	$80.00	$135.65	$21.56	$237.21
Admin/Clerical	$30.00	$50.87	$8.09	$88.95

*Year 1 is from January 1, 2024 through December 31, 2024.

Negotiated Offsite Year 1 OH Rate: 169.56%

Negotiated Profit Rate: 10.00%

SUBPROVIDER NAME: Blue Door Strategy and Research

Labor/Staff Classification	Year 1* Average Hourly Wage Rate (A)	Overhead G & A (B) 120.00%	Profit (C) 10.00%	Fully Burdened Hourly Labor Rate (Columns A+B+C)
Support Manager	$107.50	$129.00	$23.65	$260.15
Engineer Technician - Senior	$103.50	$124.20	$22.77	$250.47
Travel Demand Modeler - Senior	$134.30	$161.16	$29.55	$325.01
Transportation Planner - Senior	$107.50	$129.00	$23.65	$260.15
Administrative/Clerical	$35.00	$42.00	$7.70	$84.70

*Year 1 is from January 1, 2024 through December 31, 2024.

Negotiated Offsite Year 1 OH Rate: 120.00%

Negotiated Profit Rate: 10.00%

SUBPROVIDER NAME: Bomba Consulting, LLC

Labor/Staff Classification	Year 1* Average Hourly Wage Rate (A)	Overhead G & A (B) 140.00%	Profit (C) 10.00%	Fully Burdened Hourly Labor Rate (Columns A+B+C)
Senior Economicst/Demographer	$86.20	$120.68	$20.69	$227.57
Planner	$55.11	$77.15	$13.23	$145.49

*Year 1 is from January 1, 2024 through December 31, 2024.

Negotiated Offsite Year 1 OH Rate: 140.00%
Negotiated Profit Rate: 10.00%

APPENDIX C

WORK AUTHORIZATION

(WORK AUTHORIZATION NO. _____)

This Work Authorization is made as of this _____ day of _____, _____, under the terms and conditions established in the AGREEMENT FOR TRAFFIC AND REVENUE ENGINEERING SERVICES, dated as of _____ ____, _____ (the "Agreement"), between the Central Texas Regional Mobility Authority ("Authority"), represented by the Executive Director or designee, and CDM Smith, Inc. ("Consultant"). This Work Authorization is made for the following purpose, consistent with the services defined in the Agreement:

[Brief description of the Project elements to which this Work Authorization applies]

Section A. – Scope of Services

A.1. Consultant shall perform the following Services:

Refer to attached scope letter.

A.2. The following Services are not included in this Work Authorization but shall be provided as Additional Services if authorized or confirmed in writing by the Executive Director or designee.

A.3. In conjunction with the performance of the foregoing Services, Consultant shall provide the following submittals/deliverables (Documents) to the Executive Director or designee: To be determined.

Section B. – Schedule

Consultant shall perform the Services and deliver the related Documents (if any) according to the following schedule: *To be determined.*

Section C. – Compensation

C.1. In return for the performance of the foregoing obligations, the Authority shall pay to Consultant the amount not to exceed $_____, based on the attached fee estimate. Compensation shall be in accordance with the Agreement.

C.2. Compensation for Additional Services (if any) shall be paid by the Authority to Consultant according to the terms of a future Contract Amendment.

Section D. – Authority's Responsibilities

The Authority shall perform and/or provide the following in a timely manner so as not to delay the Services of the Consultant. Unless otherwise provided in this Work Authorization, the Authority shall bear all costs incident to compliance with the following:

Section E. – Other Provisions

The parties agree to the following provisions with respect to this specific Work Authorization:

Except to the extent expressly modified herein, all terms and conditions of the Agreement shall continue in full force and effect.

CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY

By: _____

Name: _____

Title: _____

Date: _____

CDM SMITH, INC.

By: _____

Name: _____

Title: _____

Date: _____

CDM Smith Employee	Classification	2024 Rate ($/hr.)
Adams, Lauren M	Admin/Clerical (1-5 Yrs)	$33.37
Allaire, Scott A	Project Principal/Senior Advisor (15+ Yrs)	$116.23
Amar, Elizabeth Runey (Liza)	Engineer III (15+ Yrs)	$99.91
Aron, David	Planner/Modeler II (9 -15 yrs)	$60.88
Begert, Daniel	Planner/Modeler I (0 - 8 yrs)	$46.63
Bigos, Evan K	Planner/Modeler II (9 -15 yrs)	$57.60
Bleau, Jennifer	Toll System Specialist (< 10 yrs)	$61.99
Boesch, Tim	Planner/Modeler III (15 + yrs)	$89.82
Cavusoglu, Ozge	Planner/Modeler I (0 - 8 yrs)	$47.27
Chen, Szu-han	Engineer II (8-14 Yrs)	$56.51
Dashpute, Aniket S	Engineer I (1-7 Yrs)	$32.27
Dirks, Abbie C	Engineer I (1-7 Yrs)	$36.78
Dunn, Travis	Project Principal/Senior Advisor (15+ Yrs)	$111.03
Gapta, Arti	Project Principal/Senior Advisor (15+ Yrs)	$115.29
Gardes, Yonnel	Planner/Modeler II (9 -15 yrs)	$76.43
Gautam, Bikash	Technical Leader (15+ Yrs)	$66.38
Grzegorczyk, Tyler	Planner/Modeler II (9 -15 yrs)	$66.94
Hammond, Todd	Senior Toll System Specialist (> 10 yrs)	$83.70
Haque, Khademul	Engineer I (1-7 Yrs)	$48.03
Jadhav, Ajay	GIS Analyst II (9-14 Yrs)	$39.68
Jarmarwala, Yagnesh	Project Principal/Senior Advisor (15+ Yrs)	$116.86
Kalakuntla, Sai	Engineer I (1-7 Yrs)	$45.88
Kamal, Mustafa	Planner/Modeler III (15 + yrs)	$91.78
Khan, Kamran A	Project Principal/Senior Advisor (15+ Yrs)	$142.03
Khoury, Lana	Engineer I (1-7 Yrs)	$47.67
Kudale, Siddhesh R	Engineer I (1-7 Yrs)	$34.50
Kulakowski, Cissy S	Project Principal/Senior Advisor (15+ Yrs)	$104.79
Kulkarni, Aakanksha S	Engineer I (1-7 Yrs)	$37.04
Kwong, Alison N	Project Administrator/Contract Manager (1-10 Yrs)	$36.49
Lam, Chi Ping	Planner/Modeler II (9 -15 yrs)	$67.44
Lin, Laurent	Planner/Modeler I (0 - 8 yrs)	$51.41
Lu, Yandan	Planner/Modeler II (9 -15 yrs)	$68.42
Marfitano, Steven	Planner/Modeler II (9 -15 yrs)	$75.04
Matysek, Abril E	Engineer I (1-7 Yrs)	$46.74
Mokkapati, Naveen	Planner/Modeler II (9 -15 yrs)	$65.86
Mwalwanda, Christopher E	Project Manager (15+ Yrs)	$123.34
Ochoa, Ybette	Engineer III (15+ Yrs)	$83.57
Parks, Meredith R	Project Administrator/Contract Manager (1-10 Yrs)	$37.07
Patel, Parth	Engineer II (8-14 Yrs)	$50.88
Sarikonda, Vishal	Engineer I (1-7 Yrs)	$54.24
Shabaanzaadeh Minaei, Negaar	Engineer I (1-7 Yrs)	$49.38
Singh, Kunal	Engineer I (1-7 Yrs)	$47.37
Sirandas, Sai Ram	Planner/Modeler II (9 -15 yrs)	$81.74
Thomas, Amit	Planner/Modeler III (15 + yrs)	$101.60
Tidwell, David	Planner/Modeler I (0 - 8 yrs)	$54.21
Rima, Tarannum	Planner/Modeler II (9 -15 yrs)	$75.15
Reid, Robert J	Senior GIS (15+Yrs)	$43.74
Vohra, Zunubia Abbasbhai (Zunubia)	Project Controls Specialist (1-10 yrs)	$45.37
Winn, Justin	Engineer III (15+ Yrs)	$93.83
Wang, Xiaoran	Engineer I (1-7 Yrs)	$46.82
Yohannes, Anteneh	Engineer I (1-7 Yrs)	$51.40
Zhao, Yong	Deputy Project Manager (15+Yrs)	$102.25

APPENDIX D

SUBCONSULTANTS

Bomba Consulting, LLC:
Michael Bomba
3300 N. IH-3
Suite 300
Austin, TX 78705
Ph: (512) 636-4879

Bauz Consulting
Gustavo Baez
706 Nocona Dr
Allen, TX 75013
Ph: (214)864-9619

CJ Hensch & Associates, Inc.:
Carlos Sepulveda
11801 Domain Blvd.
Suite 500
Austin, TX 78758
Ph: (512) 340-1108

Gram Traffic North Texas, Inc.
Stephanie Swenson
1120 W Lovers Ln
Arlington, TX 76013
Ph: (817)265-8968

Blue Door Strategy & Research
Johanna Zmud
4503 Kitty Ave.
Austin, TX 78721
Ph: (202)679-3195

APPENDIX E

KEY PERSONNEL

Title	Employee Name
Project Principal	Kamran Khan
Project Manager	Christopher Mwalwanda
Senior Technical Advisor	Cissy Kulakowski, PE, PMP
Senior Technical Advisor	Scott Allaire
Technical Leader	Bikash Gautam
Deputy Project Manager	Yong Zhao, PhD, PE, AICP, PMP
Data Collection/Analytics	Parth Patel
Data Collection/Analytics	Yandan Lu, AICP
Demographic/Economic Analysis	Evan Bigos
Demographic/Economic Analysis	Abril Matysek, PE
Traffic and Revenue	Mustafa Kamal
Traffic and Revenue	Xiaoran Wang
Traffic Engineering/Traffic Operations	Ybette Ochoa, PE
Traffic Engineering/Traffic Operations	Anteneh Yohannes, PE
TIFIA Support/Risk Analysis	John Muñoz
TIFIA Support/Risk Analysis	Naveen Mokkapati, PE
TIFIA Support/Risk Analysis	Laurent Lin
Tolling Technology	Dusty Deitiker
Tolling Technology	Vickie Dewey
Tolling Feasibiliy	Justin Winn, PE
SR/RP Surveys	Dan Begert, AICP
Multimodal Studies	Tim Boesch, AICP
Emerging Technologies	Sai Sirandas

APPENDIX F

CONSULTANT STATEMENT OF QUALIFICATIONS

[Attached]

QUALIFICATIONS

Central Texas Regional Mobility Authority

Traffic and Revenue Engineering Services

JUNE 12, 2024

CDM Smith

Table of Contents

June 12, 2024

Mr. Jose Hernandez
Central Texas Regional Mobility Authority (CTRMA)
3300 N IH 35, Suite 300, Austin, TX 78705

Subject: Traffic and Revenue (T&R) Engineering Services

Dear Mr. Hernandez,

Thank you for the opportunity to submit our response to the RFQ for T&R consulting and traffic engineering services for the CTRMA. As a toll industry leader, CDM Smith is the best team for the job. For more than six decades, CDM Smith has been providing our toll agency clients with reliable information and thoughtful solutions. Our T&R forecasts have **supported more than $150 billion** in critical transportation improvements worldwide. We provide trust indenture services and routine monitoring and traffic engineering services to many public toll agencies across the U.S. **We have worked closely with CTRMA and the region over the past 15 years, supporting several T&R studies within Central Texas with traffic engineering and T&R monitoring services, dynamic pricing evaluation, express lanes operation analysis, and technical assistance, and we look forward to building upon this successful relationship.**

We understand that fulfillment of your mission necessitates the retention of a nationally recognized T&R engineer for traditional and express lane independent T&R studies and certifications supporting toll revenue bond sales, refundings, and refinancings to finance the agency's operations, maintenance, and capital programs. The T&R engineer also plays a critical role in annual budgeting, financial reporting, traffic operations and safety, and certification of all changes in toll rates. We recognize that the T&R engineer role extends well beyond these responsibilities. As one of your current T&R engineers, we bring many of the warranted attributes and we place a high value in serving as CTRMA's trusted advisor—providing a link to the world of express lanes, transportation finance and policy, forecasting, planning, and innovations in technology and operations. In this capacity, we provide independent, objective advice with the benefit of national expertise, while being mindful of the local and regional context—we are locally-based and regionally-focused with a national reach.

As an effective T&R engineer, we quickly respond to the rapidly evolving challenges and opportunities presented to CTRMA. This is achieved through being an effective communication partner and source of reliable information primarily for the Finance Department, while supporting the Project Delivery, Communications/Public Affairs, and Maintenance Departments. We bring to you a team of transportation and tolling professionals located near your headquarters with strong working relationships and credibility within the industry. Our local tolling staff in the Austin region have reliable and relevant expertise, and will continue to offer CTRMA the dependable level of service you have come to trust in supporting your program.

LEADERS IN TRANSPORTATION

CDM Smith is a regionally located, global engineering firm with experts who work together—in teams and in partnership with our clients—to solve transportation challenges. Our breadth of services

BENEFITS OF THE CDM SMITH TEAM TO CTRMA

PROVEN T&R SERVICE
Trusted partners with nationwide successes and lessons learned.

INSTITUTIONAL KNOWLEDGE
More than 15 years of dependable regional support.

FINANCIAL CREDIBILITY
Reliable forecast methodologies that instill confidence.

TRUSTED LEADERSHIP
Proven and direct CTRMA experience.

LOCAL RESOURCES
Dedicated to quality and timely delivery.

DELIVERED INNOVATION
Creative tools and processes for T&R services.

CDM Smith's local, trusted team's deep understanding of the region, technical expertise, national tolling experience, and thought leadership will help ensure successful delivery of CTRMA programs. We will support you to position CTRMA to meet future challenges and achieve your vision.

enables us to take transportation projects from conceptual ideas to constructed reality.

Our History: In 1947, Camp Dresser & McKee Inc. was formed to serve clients with high-quality engineering services. With a combined 140 years of engineering excellence, we now provide multidisciplinary consulting, engineering, operations, and construction services with a staff of 6,300 across 125 offices worldwide.

Our Proven Track Record: Since entering the toll industry in the 1950s, we have performed tolling services in 46 states for dozens of transportation clients. As the national leader in T&R forecasting and managed lane projects, we have completed T&R studies for bond issuances representing 60 percent of the industry and supported more than $150 billion in bond issuances.

85+ TOLL DEVOTED STAFF

Our Staff Capabilities: With more than 85 staff devoted almost exclusively to the U.S. toll industry, our tolling capabilities span the gamut of CTRMA's needs. This includes traditional and express lane T&R forecasting, economics and finance, and toll technology and operations planning to develop regional strategies, toll facility planning, and evaluating pricing mechanisms to manage congestion and improve mobility.

PROJECT PLAN, METHODOLOGY, & APPROACH

Most of our services will be provided by our Austin and other Texas-based staff—our local transportation experts encompass transportation finance, toll/express lane forecasting, technology and operations, and traffic engineering. A majority of our staff that assist CTRMA are long-time residents of the area with a deep understanding of transportation issues in Central Texas. Estimation of future travel demand is greatly aided by this knowledge of the local transportation network, economics, land use, and political influences. Our long-term relationships with municipalities and local and regional transportation authorities result in an exceptional understanding of local technical resources and challenges. **Our proposed and local team has supported nearly all the express lanes currently operating in Texas and continues to provide monitoring services for them.** Overall, CDM Smith employs

CDM SMITH HAS SERVED AS CTRMA'S TRUSTED PARTNER FOR MORE THAN 14 YEARS

RESPONSIVE

Whether asked for a traffic impact estimate in just days or a T&R report in months, we produce memos, white papers, and reports with the accuracy and quality that you deserve and expect. This is made possible due to our dedicated local expertise and national industry perspective, allows us to respond quickly and with confidence.

TRUSTWORTHY

We are viewed favorably by toll bond underwriters, rating agencies, and other transportation agencies, meaning that when CTRMA needs a reliable representative, you can trust our independent, expert opinions. Having supported more than half of all U.S. toll revenue bond sales over the last decade, our T&R forecasts continue to be trustworthy in the financial community.

VERSATILE

We provide extensive services outside of the traditional T&R Engineer role, including commercial vehicle usage evaluations, public outreach assistance, and traffic operations analyses. We have a strong track record of fulfilling your specific needs, and we will continue to meet or exceed your expectations for product quality and technical expertise.

INNOVATIVE

We remain at the forefront of technological advances for mobility alternatives and transportation options in the near future. We are part of the national conversation regarding advancements. In addition, we are involved in studying the broader-scale implementation of connected and autonomous vehicles and are building those impacts into our traffic projections and analyses.

ACCURATE

Drawing upon decades of experience in the tolling industry with dozens of agencies, CDM Smith delivers dependable forecasts that build trust with rating agencies and investors. The accuracy of our forecasts provides a strong foundation upon which CTRMA develops budgets and plans for capital programs, which enhances CTRMA's infrastructure and operations.

more than 85 nationally recognized toll industry experts in Texas, Washington, Florida, Illinois, and Connecticut—more toll experts than our competitors combined.

Specific Services—Continuously Delivered

Your RFQ identifies several key areas in which the T&R engineer is expected to support CTRMA. As one of your current T&R engineers, CDM Smith successfully carries out all duties prescribed under the scope of work, while supporting CTRMA's frequent/day-to-day services, periodic/routine services, and long-term/specialized services.

COMMITMENT TO BUSINESS DIVERSITY

We are committed to meeting CTRMA's Disadvantaged Business Enterprise (DBE) commitments. GRAM NTX, Blue Door Strategy and Research, and Baez Consulting are DBE firms on our team. In addition, several key staff on this contract are women- and/or minority-owned businesses.

SUMMARY

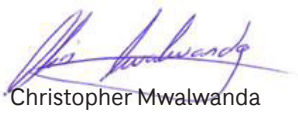
As you review the enclosed response, we encourage you to consider the following differentiators that set CDM Smith apart:

- Local Austin and Texas team with a deep regional understanding and a bench of more than 85 T&R consulting experts dedicated to this unique field.
- Technical excellence and knowledge having supported more than 1,000 tolling studies nationwide, including more than 200 investment grade studies for existing and start-up toll facilities.
- Unparalleled express lane T&R, pricing, and operational analyses support having supported more than half of operating express lane facilities nationwide and nearly all operating express lanes in Texas.
- Financial community credibility having supported approximately 60 percent of all toll revenue bond issues in the U.S. over the last decade.
- A team that supports all the major toll agencies within the state of Texas and has been instrumental in the financing of the majority of toll infrastructure within the state.

CDM Smith has assembled a team of which you will have immediate and unlimited access. These professionals will provide CTRMA with responsive, high-quality advice and services, leveraging lessons learned from previous successes within the region and the state. Our diverse staff, broad scope of service offerings, and teaming partners allow us to adapt quickly as your needs evolve.

We sincerely appreciate the opportunity to submit our qualifications and look forward to assisting CTRMA in continuing to plan and build sustainable transportation infrastructure to help meet anticipated demand, provide economic stability, and benefit future generations. I will serve as the primary contact for this response. Should you have any questions or concerns, please do not hesitate to contact me at mwalwandace@cdmsmith.com or 512.652.5355.

Sincerely,



Christopher Mwalwanda
Vice President
CDM Smith Inc.

Office from which the contract will be managed:

8310-1 N. Capital of Texas Highway, #250, Austin, TX 78731
Phone: 512.346.1100

Statement of Qualifications

SECTION I

The Firm

For 60+ years, CDM Smith has provided consulting engineering services to tolling agencies across the country for planning, design, construction, and operations projects. The depth of our tolling experience – totaling 1,000+ studies – and the successful delivery of comprehensive T&R analyses is unparalleled in the industry.

CDM Smith is an employee-owned corporation providing lasting and integrated solutions in transportation, water, environment, energy, and facilities to public and private clients worldwide. As a full-service consulting, engineering, construction, and operations firm, we deliver exceptional client service, quality results, and value across the entire project life-cycle.

In T&R specifically, we have a strong record of accomplishments spanning more than six decades of toll facility support, totaling more than $150 billion in bond finance.

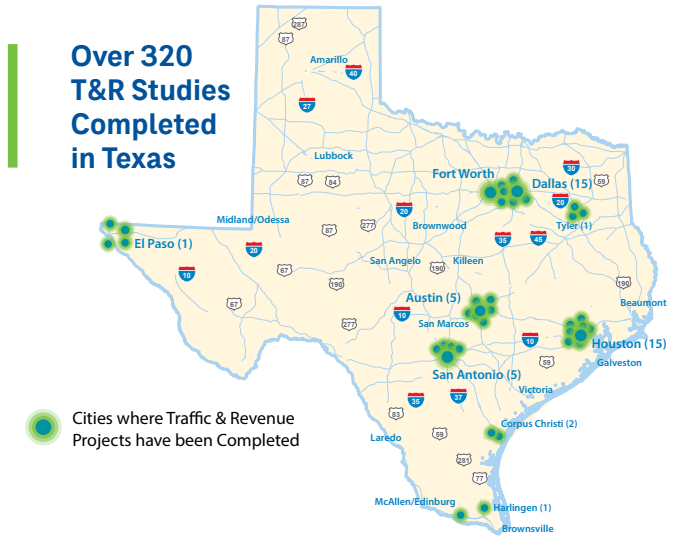
We provide independent forecasts and maintain respect and credibility with rating agencies and the financial community. Our T&R expertise involves a range of services covering economics, travel profiles, detailed travel modeling, behavioral research, and much more.

PROVEN T&R SERVICE

CDM SMITH: 60+ Years of Transportation/Tolling Experience

We are the nation's leading T&R expert, serving the country's largest tolling agencies and supporting multi-million-dollar capital budgets. CDM Smith has worked with 50+ tolling agencies for more than 1,000 T&R activities. Our efforts with these clients inform our national perspective for peer toll systems and the industry. We are working in many states to help address transportation funding challenges—we assist DOTs and tolling agencies in developing statewide strategies and toll facility planning and in evaluating pricing mechanisms to manage congestion and improve mobility. We have staff members who are industry leaders and experts in all modes of transportation. Our proposed team has supported all currently operating express lanes within Texas, many from concept through implementation and monitoring.

Over 320 T&R Studies Completed in Texas



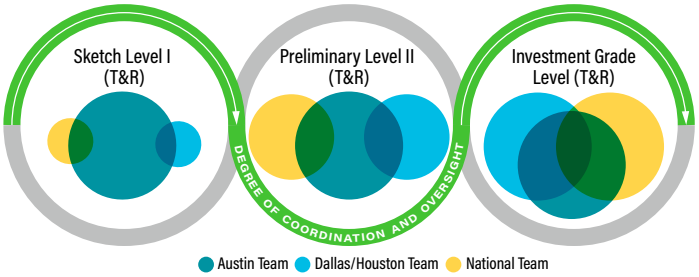
CDM Smith is also considered a leader in toll industry innovations—we supported our clients in pioneering many firsts that include the ETC systems implemented, followed by open road tolling, high-occupancy toll (HOT) lanes, variable pricing, and conversion to cashless toll collections.

In addition, CDM Smith has provided services for the majority of the operational managed lanes in the country. **We have tolling service experience in 46 states, with bonds issued using CDM Smith studies in 25 states. We have evaluated over 320 T&R studies in Texas, with work on a majority of proposed toll road and express lane facilities in Texas.**

A. Capabilities and Resources of Principal Office and Personnel

Our Austin office will serve as the principal office responsible for performing this work. This office consists of over 10 T&R experts and is part of a large nationwide division with more than 85 staff members dedicated to providing specialized services to the toll industry located in Dallas, and Houston in Texas; California/ Washington; Hartford, Connecticut; Lisle, Illinois; and Maitland,

Florida. Our T&R staff deal exclusively in T&R analysis and bring a broad range of experience in the areas of complex travel demand modeling, toll revenue estimation, toll sensitivity analyses, toll rate adjustment analyses, congestion pricing assessments, traffic engineering, economic trending, and data collection and analysis that includes speed and delay, traffic counts, origin/destination, and behavioral stated preference surveys. On investment grade studies, where more detailed coordination to meet the quality and expectations of the financial community is needed, staff from various offices will be involved, while sketch and preliminary level analyses are predominately performed by our Austin office.



This represents the level of coordination anticipated between the regional Texas offices and other various CDM Smith offices and the level of oversight that will be implemented for each project as it moves through the toll feasibility levels.

Kamran Khan, the designated project principal/director has more than 34 years of experience in supporting traditional and express lane financings around the nation and has supported **over $30 billion in T&R bond financing**. He has made numerous presentations to rating agencies, investors roadshows, and to the FHWA's Transportation Infrastructure Finance and Innovation Act program. **Christopher Mwalwanda**, the designated project manager in Austin, has a master's degree in traffic modeling with more than 20 years of experience in traffic engineering, complex travel demand modeling, traffic simulation, report writing, public presentations, and creation of innovative tools for toll traffic demand modeling applications and has supported **over $20 billion in T&R bond financing**. Our deputy project manager **Yong Zhao**, currently serving as PM for the existing CTRMA T&R contract, has a PhD degree in transportation and more than 24 years of experience in leading complex toll road and express lane projects across the nation, supporting **more than $8 billion in toll road financing/refinancing** for both public and private agencies for numerous toll projects including the Manor Expressway (US 290E), MoPac North Express Lanes, NTTA System facilities, HCTRA System facilities, BCTRA SH 288 ML, and I-405 and I-5 express lane facilities in California.

The proposed CDM Smith team has also worked on many projects within the state, including the MoPac North and South Express Lanes, CTTS Peer Review, US 183 Express Lanes, US 290 Peer Review, SH 130 Segments 5 & 6, Trans-Texas Corridor 35, RM 2222 and many more within the Central Texas region, the I-35E Express Lanes, LBJ Express Lanes, North Texas Tollway Authority System, and North Tarrant Expressway (NTE) Segments 1&2W, 3A, 3B, 3C, Midtown Express SH 183, Loop 12) in the Dallas region; Toll 49 initial system and Segment 4 projects in Tyler; and the bulk of all major corridors within the Houston region including the Grand Parkway System and the SH 288 express lanes. **An organizational chart and details of key Texas office personnel is provided in Section II.**

B. Experience Providing Complex Traffic Modeling and Forecasting Tools

The firm is currently involved in a similar capacity as being sought by CTRMA with the following major Texas toll authorities: HCTRA, NTTA, NET RMA, and the Texas Department of Transportation (TxDOT). As traffic consultants to these agencies, CDM Smith has performed a wide variety of traffic and revenue related services that include traffic modeling and annual toll revenue forecasting and monitoring, trust indenture reviews and certification, toll rate structure recommendations, toll covenant safeguards, peer review services for Transportation Infrastructure Finance and Innovation Act (TIFIA) applications, local technical coordination, and overall transportation system monitoring. **The support for more than $150 billion in toll bond finance, including bond issuance for start-up and mature systems, is a testament to CDM Smith's continued success.**

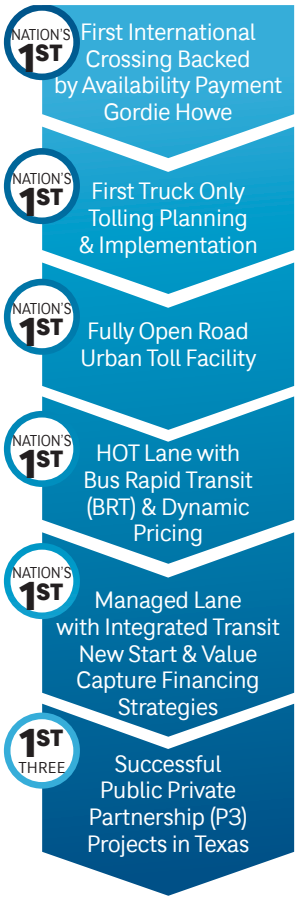
CDM Smith has extensive experience in Texas and other states across the nation in corridor traffic studies, to assist with the environmental assessment and project design support. Our expertise is in modeling

and evaluation of design options for express and general use lane improvements and express lane access, environmental studies of mobile source air toxics, and project and regional environmental justice toll impact assessments.

CDM SMITH BRINGS INNOVATION TO EVERY TASK UNDERTAKEN

The comprehensive CDM Smith tolling experience from planning concepts to final implementation and monitoring nationally, has enabled CDM Smith to develop state-of the-art techniques, tools, and databases necessary to support financing of toll facilities and bring innovation and efficiencies into every aspect of CDM Smith's T&R services.

CDM Smith is committed to continuously advancing the state-of-the-practice to higher levels to better serve the industry as shown by this list of many firsts we have supported.



CDM Smith takes pride in being widely recognized as a leader for confronting an ever-changing environment with innovation. Current corporate leadership continue to blaze new trails, particularly in the areas of next generation tolling applications—from all-electronic toll collection conversions to vehicle-miles-traveled tolling research—CDM Smith remains committed to the toll industry and our clients. We have developed and undertaken many special studies and reports to highlight critical and relevant findings of trends within the toll industry and have presented these in multiple industry forums, including IBTTA, TRB, ARTBA, WTS, and other regional conferences. Our team brings to CTRMA:

- **Comprehensive understanding of regional travel patterns:** The CDM Smith team has undertaken numerous toll studies within the greater Austin region and thus has a solid understanding of the regional demographics, key movements, and distribution of traffic throughout the region, for example our work on MoPac North/South Express Lanes and US 183A.
- **Unmatched understanding of the toll behavioral characteristics:** Our current work pertaining to toll market behavioral assessments for other tolled and express lane facilities nationwide and in the region provides some unique perspectives on the value-of-time/value-of-reliability distributions and factors affecting the traveling markets willingness-to-pay characteristics and state-of-the-art procedures in the collection of these.
- **Unique toll diversion, toll setting, and risk analysis methodologies:** We have pioneered many of the industry standard methodologies being implemented for toll feasibility assessments to bring to CTRMA a state of the practice perspective in the development of the models and tools to assist in effectively informing decision makers. Our toll diversion methodologies are anchored in our observation of many express lane and tolled facilities around the country to lend further credibility to the developed and modeled results. Our dynamic pricing tools assist to improve the operational characteristics and/or to maximize the toll revenue of toll facilities and express lanes projects. Our cutting-edge risk analysis tools, techniques, and processes informed decisions regarding potential new tolling projects using Monte Carlo simulation. Our participation with IBTTA/TRB informs many special reports/white papers discussing all-electronic tolling (AET) conversion waterfall leakage models, impacts related to emerging technology initiatives for interoperability, autonomous /connected vehicles (AV/CV), and scenario planning for other disruptive technologies.
- **New tools for toll express lane operational analysis:** We have worked with every operational model platform and bring specialized approaches to incorporate these into feedback loops with the overall regional travel demand models. Development of VISSIM, CORSIM, and mesoscopic or alternative queue accumulator operational model to capture and refine the weaving and merging frictional characteristics associated with a project

configuration. These specialized tools assist in the evaluation of operational characteristics of express lane projects and elasticities to toll rates and various project configurations.

- **Innovative use of data sources and analytics techniques:** We are constantly exploring new and innovative methods to collect and support our various assessments. This ranges from data sources such and INRIX for speed and delay profiles to StreetLight Data and AirSage data for origin-destination patterns. Our CDM Smith internal stated preference and market research team uses innovative capture techniques to evaluate and identify the key markets and drivers influencing values-of-time and travel characteristics of various user groups such as commuters, recreational travelers, carpoolers, transit riders, and commercial vehicles. We use cutting-edge software platforms to analyze very large datasets and interactive HTML-based dashboard interfaces and use Artificial Intelligence (AI) and machine learning to support monitoring and data processing elements.
- **Exemplary understanding of key influential drivers:** The levels and approaches to evaluating the diverse and different markets as it pertains to commuter traffic versus long-distance through-trip markets is something that the CDM Smith team has undertaken across the country. We have a unique understanding of the key influential factors that must be evaluated and the source databases that must be referenced in supporting the development and correlations to traffic generation. This understanding provides CTRMA with the confidence that the CDM Smith team will bring a defensible and robust assessment.
- **Full service thought leaders and pioneers:** The CDM Smith team provides a full cadre of specialized expertise to support the many needs that may arise in support of the CTRMA's T&R service needs. Our project principal and project manager and key staff members have the unique background and longstanding experience having performed multiple T&R studies within Austin and other metropolitan areas in Texas and the nation. Our team is also skilled in the toll technology implementation process and back office support needed for electronic collection, video billing, pay-by-mail, and other toll payment alternatives.
- **Paradigm Shifts in T&R Modeling:** To address the uncertainty and quantify potential T&R impacts of paradigm shifts in travel behavior resulting from a myriad of influences such as the work from home trends, autonomous vehicle trends and disruptive technologies and routing apps, CDM Smith developed and applied scenario planning models to assist several toll agencies to assist with budgeting, bond refinancings and discussions with rating agencies/financial community.

C. Experience with Trust Indentures

CDM Smith has supported many toll authorities for trust indentures and has developed procedures and dashboard tools to assist with system monitoring. These tools assist in evaluating various factors that may affect CTRMA's traffic and toll revenues. We have extensive experience in providing annual reviews, short- (monthly/quarterly) and long-term forecasts as required by trust indentures for distribution to the bond holders. CDM Smith has issued T&R certificates in support of the financing or refinancing efforts of more than $150 billion in bonds, **$35 billion for tolled facilities within Texas**. As part of an agency's annual budgeting process, the monitoring tools we use support the short-term forecasting of system revenues. They help us understand national, regional, and local transportation

Experience Delivering Scope of Services

The following summarizes and highlights our experience and proofs in delivering the scope of services outlined in the RFQ:

- Traffic Consultant - serving 10+ toll authority clients in Texas/ over 50+ nationwide
- T&R Projections - 200+ projects in Texas/1,000+ nationwide
- Toll Rate Adjustment Support - 50+ in Texas/100+ nationwide
- MPO Models - all major MPO models in Texas/ 30+ nationwide
- Peer Review/Special T&R Studies - 10+ in Texas/30+ nationwide
- Board/Rating Agency Reporting - 100+ in Texas/500+ nationwide
- Executive Director/CFO Coordination - 200+ in Texas/1000+ nationwide
- Future Project Assessments - 50+ in Texas/+400+ nationwide

trends and, more specifically, toll road trends. **Our team brings extensive experience and a deep understanding of how to meet the financial community's expectations, which is invaluable as CTRMA pursues innovative financing delivery mechanisms.** In addition, CDM Smith has supported toll agency clients with TIFIA application process. Appendix table A-1 shows recent representative projects that obtained a TIFIA loan based on CDM Smith T&R estimates. Additional services rendered as part of the trust indenture requirements may include capital improvement plan changes, toll rate policy changes, system connectivity changes, project scope changes or enhancements, and facility widening projects. Our T&R experience ranges from initial screening/conceptual all the way through to investment grade T&R studies - that includes traffic count collection, stated preference surveys, origin-destination surveys, economic land use and socioeconomic tracking, model refinements, T&R estimation, and sensitivity testing and risk analysis. CDM Smith has extensive experience in the use and enhancement of existing planning models to facilitate the evaluation of toll facilities at various levels of feasibility, as illustrated in Appendix table A-2.

> The combination of our experience, knowledge, and innovative analysis methods will assist CTRMA in presenting to investors, implementing new projects, and maintaining existing operations.

D. Experience Providing and Maintaining Traffic Modeling Tools

The firm's Texas toll finance professionals are continually refining or developing new and innovative tools to monitor, forecast and analyze T&R projections for existing and proposed toll road projects. These tools have increased our data processing efficiency and helped summarize origin/destination and stated preference survey databases. Additionally, we have been analyzing the managed lane traffic under dynamic pricing scheme to develop the travel time reliability measure, as well as reveal preferences of managed lane choice behaviors and its comparison to SP survey results. We have also developed mechanisms to streamline the interaction between modeling and simulation software packages as well as complete comprehensive evaluations of historical socioeconomic trends. The CDM Smith team is extremely proficient in advanced technology and complex transportation engineering software programs including Synchro/SimTraffic, CORSIM, VISSIM, VISSUM, TransCAD, and CUBE Voyager.

CDM Smith was involved with the very first express lane system, SR 91 in California, and has performed services on over 50 percent of the nation's express lane systems. Backed by this wealth of experience, we know the kinds of data to be collected, including traffic counts, travel times, economic data, historical growth, etc., as well as how to develop, calibrate, and analyze models to determine the appropriate balance for reduced congestion and revenue potential. CDM Smith's approach to forecasting express lanes usage, toll rates, and revenue is a proven method, with years of experience on real projects. Our express lane approach combines the broader elements of global demand patterns and growth with a more focused corridor model and simulation model that can properly analyze and respond to the unique interactions between the general purpose lanes and the parallel express lanes over a variety of demand levels. We clearly understand the data needed to form a solid foundation from which to calibrate and base our modeling approach on. We also understand the policy trade-offs that can materially affect revenue generation (positively and negatively) for an express lane facility.

> The 4-step travel demand modeling expertise our team brings from working with many regional MPO models across Texas will provide the benefit of first-hand experience as key enhancements as CTRMA continues the development of projects such as the MoPac South Express Lanes project.

As new advancements, such as CV/AV and shared mobility, are implemented on a wider scale, they pose new challenges to transportation planners. In anticipation of emerging trends, CDM Smith is developing scenario planning models to assist transportation agencies to better prepare for uncertainties and make smarter investments for future mobility.

E. Disputes

Summary of all regulatory and legal proceedings

Because of its size and volume of business, over the years CDM Smith Inc. has occasionally been involved in legal proceedings.

There are no past or currently outstanding legal proceedings, judgments, or contingent liabilities that could adversely affect the financial position or ability of CDM Smith to perform its contractual commitments.

Summary of any protest filed by the firm related to procurement of services by any other entity

We are not aware of any protests filed by the firm related to the procurement of services by any other entity.

Any early termination of the firm's work or contract for services by any authority or entity

CDM Smith Inc. does not maintain a centralized record of terminated projects unless those issues lead to litigation or other formal dispute resolution. In May 2024, the Gary Indiana Sanitary District, a long-standing client of CDM Smith Inc., terminated a Master Services Agreement for engineering services for convenience. The District had undergone a substantial change in leadership and the termination was not in any way related to the firm's performance. CDM Smith Inc. continues to provide services to other clients throughout Indiana.

F. Summary of Professional Fees

Every aspect of our operation is designed to provide CTRMA with the greatest value through the highest quality products, the highest level of customer service, and the highest level of responsiveness without any wasted effort or extraneous expenses. Our work authorizations have been and will continue to be based upon actual labor costs multiplied by the firm's audited overhead rate resulting in a loaded labor cost figure. The loaded labor is then multiplied by the agreed upon profit percentage resulting in the total labor fee. We will work closely with CTRMA to develop the scope, schedule, and budget for each new work order that establishes the appropriate level of effort and cost for each new work assignment based on what CTRMA is trying to accomplish and will be subject to final approval by CTRMA before issuance of a formal notice to proceed or before any work commences. We will recommend services and the appropriate level of effort for the proposed assignment and work closely with CTRMA to ensure the fee works within your budgetary constraints under a lump sum for well-defined and scoped requests, cost plus fixed fee for typical complex preliminary or investment grade studies, or specified rates for meeting support and technical services as needed.

A schedule of professional fees will be negotiated and will include an average and a maximum hourly rate for each respective labor classification. Both the average and maximum hourly rates will be subject to annual adjustments accounting for annual salary adjustments. The average hourly rates will be used in the calculation of work authorization fee estimates based upon the anticipated level of effort required for each classification. Staff charged time to a particular project will be invoiced monthly, maintaining the maximum amount agreed upon for each work authorization. Our hourly rate, multiplied by the number of hours worked determines the raw labor cost. The raw labor is then multiplied by the firm's audited overhead rate resulting in a loaded labor cost figure. Direct expenses and outside professionals (subconsultants) costs are then added arriving at the final invoiced amount. CDM Smith typically invoices all active contracts monthly.

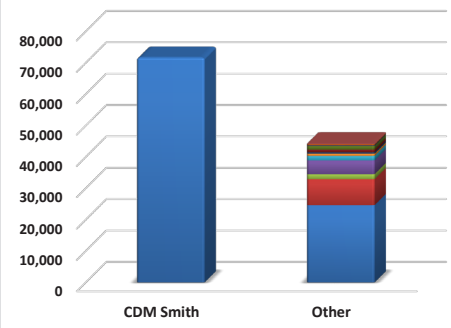
G. Conflicts of Interest

On behalf of our entire team, CDM Smith is not aware of any conflicts or potential conflicts of interest.

FINANCIAL CREDIBILITY

CDM Smith's Record of Over $150B in Bond Issues Outranks the Competition

With the CDM Smith name, CTRMA gains recognition and confidence from the rating agencies and markets, which is often important for bond sales.



Total Value of Revenue/Refunding Bonds Issued, Last 10 years (12/31/2023)

Data Chart Sources: MuniOS, EMMA, Official Statements

CTRMA'S CONFLICT OF INTEREST POLICY

CDM Smith has reviewed and will comply with CTRMA's Conflict of Interest disclosures policy adopted by the CTRMA Board.

SECTION II

Firm Organization, Staffing, and Procedures

For more than 15 years, CDM Smith has diligently partnered with CTRMA's staff, board of directors, and customers. Our key personnel have been working for you for nearly 15 years and are committed to continuing to provide you with industry-leading T&R consulting services.

A. Organizational Chart

The proposed organizational structure for the CTRMA contract with key project management, lead personnel, and anticipated subconsultants is illustrated in the organization chart herein. Austin will be designated as the principal office reporting directly to CTRMA and is where the proposed project and deputy managers reside. Christopher, project manager, will be assisted by Yong Zhao who will serve as deputy project manager and Bikash Gautam and Mustafa Kamal (also residing in Austin), who will serve as technical leaders. Yong, Bikash and Mustafa have extensive experience in managing large and complex toll and express lane projects and bring comprehensive knowledge and expertise regarding T&R services.

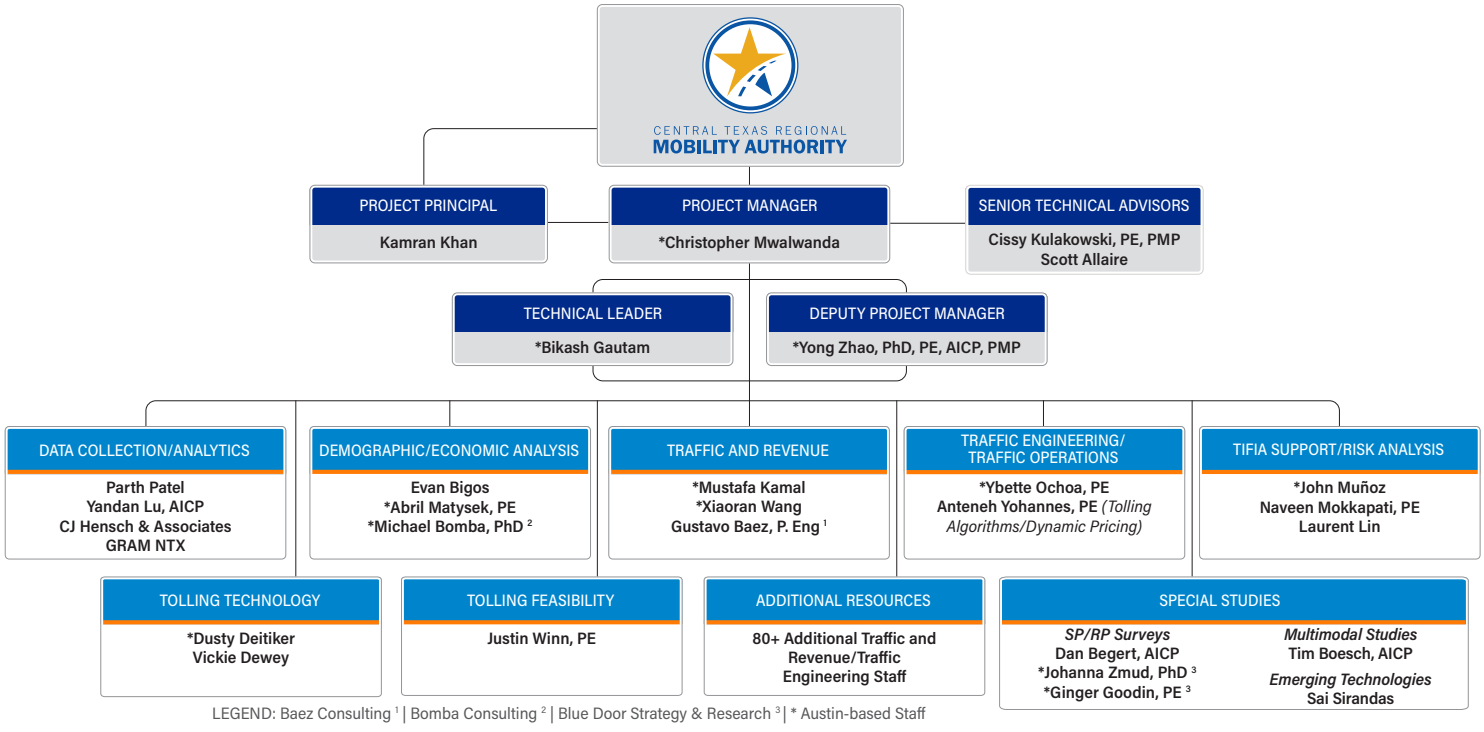
CDM Smith personnel located in our Illinois, California, Florida, Washington, and Connecticut offices will be used as warranted, based upon the scope and the complexity of the individual projects and the schedule requirements of CTRMA. **Christopher Mwalwanda, as a vice president, has full authority to obligate the company contractually and to mobilize and commit resources to assure appropriate staffing levels for all assignments.**

OUR SUBCONSULTANTS WILL LEVERAGE LOCAL AND INSTITUTIONAL KNOWLEDGE TO SUPPORT THIS CONTRACT

We have enlisted the support of the following subconsultants:

BAEZ CONSULTING: 20+ Years of Transportation/Tolling Experience

Baez Consulting, LLC (Baez) specializes in forecasting traffic and toll revenue for transportation projects. Gustavo A. Baez, president, has 21 years of experience in toll feasibility studies, travel demand modeling, congestion pricing, risk analysis, economic growth



LEGEND: Baez Consulting [1] | Bomba Consulting [2] | Blue Door Strategy & Research [3] | * Austin-based Staff

evaluation and traffic simulation. He has participated in more than $20B in bond financing for toll projects in the USA. Gustavo has managed, directed, and evaluated toll projects for public entities such as NTTA, ArDOT, LaDOTD, CTRMA, Alamo RMA, NET RMA, TxDOT's TTA Division, the Hidalgo County RMA, and OTA.

C J HENSCH & ASSOCIATES: 23 Years of Traffic Data Collection Experience

Established in 1995, C J Hensch & Associates is a Houston-based corporation. The firm specializes in traffic data collection and provides engineering studies for governmental agencies, engineering firms, and developers. C J Hensch has well-qualified staff and modern equipment available to conduct multiple data collection efforts simultaneously.

GRAM TRAFFIC NTX: 15 Years of Transportation Data Collection Experience

GRAM NTX provides traffic data collection services for projects that range from small intersection analyses to large-scale, area-wide data collection programs. Specific services provided include video license plate surveys, ATR counts, turning movement counts, parking surveys, radar speed studies, ball-bank studies, and travel time studies.

BOMBA CONSULTING: 25 Years of Demographic/ Economic Analysis Experience

Bomba Consulting prepares transportation planning and economic development studies. The primary focus of the firm is to support T&R studies that assess the feasibility of proposed toll road projects and that fund their construction. Specifically, Bomba Consulting independently reviews and adjusts the socioeconomic data incorporated into travel demand models that predict future traffic and toll revenue on a facility. Recent projects have included supporting a $1.2B debt refinance for TxDOT for the Central Texas Turnpike System (CTTS) and acquiring roughly $500M from federal loans and municipal bonds for the CTRMA construction of the US 183 South project. Bomba Consulting's staff have completed socioeconomic reviews for more than 40 T&R studies.

BLUE DOOR STRATEGY AND RESEARCH: 4 Years of Research Methodology Experience

Blue Door is a portal to the collective knowledge and expertise of senior transportation consultants in transportation modeling, planning, policy, and research. The Blue Door partners have more than 150 years of transportation consulting experience. They deliver consulting services across six key areas of expertise: travel behavior research, travel demand management, policy research, smart mobility markets, support for mobility and delivery technologies, and business strategy. Established in 2022, Blue Door is a certified DBE and HUB.

TRUSTED LEADERSHIP

EXPERIENCE OF KEY PERSONNEL - TRAFFIC AND TOLL REVENUE STUDIES

PROJECT MANAGER: CHRISTOPHER MWALWANDA

Christopher has spent nearly two decades helping public and private clients secure the funds needed to rebuild and maintain their transportation systems, including more than $20 billion in toll project financing. He has served as the project director on all T&R studies performed for CTRMA since 2008.

Christopher is a vice president with 25 years of experience in traffic modeling, revenue forecasting, financial feasibility assessments, traffic simulation, public outreach, presentations to rating agencies, strategic privatization and market valuation support, creation of innovative tools for toll traffic demand modeling applications, and peer reviews. Christopher has been providing T&R services for several agencies, including CTRMA, TxDOT, NTTA, HCTRA and NET RMA. He has directly supported over $20 billion in traditional and express lane/ P3 toll financing for projects such as the greenfield SH 130 Segment 5 and 6 in Austin, SH 99 Grand Parkway, SH 288 Express Lanes in Houston, North Tarrant Express (Segment 1&2W, Segments 3A&3B, and Segment 3C), IH 635 LBJ Express Lanes, IH 35E Express Lanes, Midtown Express (SH 183/SH 114/Loop 12), SH 121, SH 161 in Dallas/Fort Worth, the Gordie Howe International Bridge in Windsor/Detroit, several Oklahoma Turnpike Authority bond issues, and many other multi-billion-dollar mega-projects. Christopher has supported the T&R studies for MoPac North, including the Level 3 T&R Study, and the MoPac South related T&R analyses and traffic analyses for ongoing environmental studies.

DEPUTY PROJECT MANAGER: YONG ZHAO, PHD, PE, AICP, PMP

Yong has more than 24 years of project experience managing preliminary, intermediate, and investment-grade traffic and toll revenue studies, congestion pricing analyses, travel demand forecasting, risk analysis in travel forecasts, traffic engineering and simulation modeling, and transportation surveys.

Yong has developed more than 90 T&R analyses from sketch level to investment grade for both public and private clients. He directly supported more than $8 billion bond sale and concession transfer. He has managed various T&R projects for both traditional toll roads and managed lanes and conducted due diligence reviews for T&R studies in Texas and many other states He was the PM of CTRMA's Manor Expressway (290 Toll) Investment Grade Study and supported the rating agency presentation and bond sale. He also managed the MoPac Express Lane Investment Grade T&R Update Study and tolling algorithm evaluation. Recently, he worked as PM and completed investment grade T&R studies for I-5 and I-405 Express Lane Projects in California. He also finished managed lane T&R studies for I-35E ML, NTE 2E, and MTX in Dallas-Fort Worth area, as well as SH 288 ML in Houston. He managed the DFW managed lane monitoring projects and supported the yearly financial updates.

TECHNICAL LEADER: BIKASH GAUTAM

Bikash has been involved in all CTRMA T&R studies since 2010—he has an intimate knowledge of the background models, assumptions, and T&R trends associated with all the Austin toll roads and supported the MoPac North and MoPac South express lanes projects.

Bikash has more than 21 years of experience in general civil engineering and more than 17 years of experience in the development of travel demand and revenue forecasting models and T&R analysis, including policy developments and technical support for project financing. His areas of interest include toll diversion modeling and financial analysis, urban, intercity, and statewide regional travel demand forecasting, urban and statewide emergency mass evacuation modeling, dynamic and static traffic assignment modeling and analysis. He has been providing technical support and task management support for work with several agencies, including CTRMA, TxDOT, NET RMA, Alamo RMA, MCTRA, and OTA. He served as a deputy PM as well as Project Technical Leader on the CTRMA MoPac North Express Lanes T&R studies and T&R data monitoring, MoPac South corridor traffic forecast development for environmental evaluation, Barton Skyway Ramp Relief project, and several technical support tasks including 183/MoPac Express Lanes toll rate analysis.

PROJECT PRINCIPAL: KAMRAN KHAN

Kamran has been providing senior technical oversight to our clients for 34 years and is one of the most experienced and strongest T&R leaders in the industry and our firm.

Kamran is a senior vice president and is currently the National Practice Leader for CDM Smith's national tolling services. He has more than 37 years of professional experience, the last 34 years with CDM Smith, and has an extensive background in toll-related studies. He has made numerous presentations to rating agencies, investors roadshows, and to the FHWA's Transportation Infrastructure Finance and Innovation Act program. Most recently, Kamran has served as senior advisor and project principal for several major toll agencies, including Illinois State Toll Highway Authority, North Texas Tollway, and E-470 Public Highway. In the role of lead senior advisor, Kamran brings not only his many years of experience, but also his national tolling perspective and expertise.

SENIOR TECHNICAL ADVISOR: CISSY KULAKOWSKI

Cissy conducts traffic and revenue studies for toll bridges, toll corridors, express lanes, and regional congestion pricing. Her area of emphasis is in the development and use of modeling techniques for priced facilities, including all aspects of data collection, model calibration/validation, developing stated preference surveys to estimate drivers' value of time, traffic operations analysis in support of assessing willingness to pay, and presenting

these results to clients, stakeholders, ratings agencies, and TIFIA. She specializes in studies of express lanes facilities around the country, beginning with the first, the 91 Express Lanes in Orange County, CA, and most recently in support of San Bernardino County Transportation Authority's successful TIFIA application for their I-10 Express Lanes.

SENIOR TECHNICAL ADVISOR: SCOTT ALLAIRE

Scott specializes in toll revenue studies where his major project experience includes all levels, phases, and components of traffic and toll revenue feasibility studies; including data collection, development and use of toll travel demand modeling techniques, managed lane analysis and forecasting, cashless tolling, economics, sensitivity testing and risk analysis, and presentations to rating agencies and TIFIA in support of project financing.

B. Names and Experience Resumes

Members of the CDM Smith team are available to dedicate their time to CTRMA contract work as required. Detailed resumes of the key task members of the CDM Smith team are shown in the Appendix and the following table highlights the experience of the key Texas-based staff.

Table 1. Additional Key Texas Staff

Parth Patel – Data Collection/Analytics
- Experienced with T&R studies for national toll roads and express lanes, travel demand modeling using TransCAD and CUBE, statistical modeling, transportation planning, and traffic forecasting
- Skilled in TDM development, calibration and validation, network development, data collection, analysis, and development of project reports
- Task leader/data analyst for the Grand Parkway T&R studies in Houston, Texas, and Oklahoma DOT T&R studies

Yandan Lu, PhD, AICP – Data Collection/Analytics
- Specializes in travel demand modeling related to toll studies
- Proficient in toll diversion behavior studies at both planning and mesoscopic simulation level, including T&R estimates, demand calibration, scenario analysis, and queue accumulation analysis

Evan Bigos – Demographic/Economic Analysis
- Economist specializing in analyzing transportation, with responsibilities that include developing and applying economic models, conducting economic and financial feasibilities, and identifying fiscal impacts and funding requirements
- Experienced with various economic modeling software, including IMPLAN and REMI, as well as forecasting and feasibility models

Abril Matysek, PE - Development/Economic Analysis
- Experienced in traffic engineering operations, transportation planning and traffic and toll revenue forecasting
- Extensive knowledge in conducting traffic analysis of freeways, tolled facilities and arterial networks and traffic simulation of large networks

Mustafa Kamal – Traffic & Revenue
- 33 years of experience in the development of traffic and toll revenue forecasts for proposed managed lanes and toll roads
- Involved with travel demand modeling and T&R forecasting for various CTRMA projects for over 14 years
- Developed various levels of T&R forecasts for MoPac North, MoPac South, and US 183 express lanes as well as US 290E toll road; developed T&R forecasts to evaluate financial feasibility of the proposed IH 35 managed lanes, Oak Hill Parkway and SH 45 Southeast toll corridors.

Xiaoran Wang – Traffic & Revenue
- 5 years of experience in traffic data analysis, socioeconomic studies, traffic forecasting, and pricing strategy

Gustavo Baez, P.Eng. (Baez) - Traffic & Revenue
- 20+ years of experience in data analytics and dynamic pricing algorithm development for managed lanes, toll feasibility studies, travel demand modeling, congestion pricing, risk analysis, economic growth evaluation, and traffic simulation
- Developed the dynamic pricing algorithms implemented in I35E, I30, Loop 12, SH 183, and SH 114 managed lanes located in the DFW region
- Has participated in more than $25 billion in bond financing for toll projects in the U.S.
- During his 5-year tenure with the NCTCOG, led several travel demand modeling projects, including the region's first managed lane project

Ybette Ochoa, PE - Traffic Engineering/Traffic Operations
- 13 years of experience in a variety of transportation planning, traffic operations, and ITS projects, including safety assessments, crash reports, speed limit studies, and development of dynamic message sign prototypes for the Illinois Toll Authority
- Proficient in VISSIM, HCS, Synchro, SimTraffic, ArcGIS, AutoCAD

Anteneh Yohannes, PE – Tolling Algorithms/Dynamic Pricing
- Extensive experience as a traffic engineer, transportation planner, and T&R analyst who has contributed transportation engineering and planning knowledge to interchange studies, managed lanes, and toll roads
- Expertise includes data analytics, T&R analysis, micro- and mesoscopic simulation modeling, and travel demand modeling

Table 1. Additional Key Texas Staff

John Muñoz - TIFIA Support/Risk Analysis
- P3 Practice Leader supporting several clients with P3 contracts with construction values totaling $14 billion
- 18+ years of P3 experience leading technical, financial, and legal advisors in the completion of P3 procurements
- Assisted with securing five TIFIA loans for a total of $3.3 billion
- 25 years at TxDOT; led their competitive P3 procurements and development of related credit agreements; successfully developed over $13 billion in P3 and DB projects and procured multiple alternatively delivery projects using various financing mechanisms

Naveen Mokkapati, PE – TIFIA Support/Risk Analysis
- 17 years of experience on projects from sketch level T&R studies to highly detailed investment grade T&R studies used for selling bonds

Laurent Lin – TIFIA Support/Risk Analysis
- Experience includes traffic engineering operations, transportation economics, urban planning, and GIS application

Dusty Deitiker – Tolling Technology
- 25 years of diverse experience including toll technology planning, design, implementation, operations, and maintenance
- Project work spans the planning, design, and implementation of all types of tolling collection systems, including conventional tolling and open road tolling/all electronic tolling; also offers experience with variable pricing models, back-office systems, and violation/video enforcement systems

Vickie Dewey – Tolling Technology
- 25+ years of experience working with some of the nation's most progressive agencies to vision and plan, design, and execute new tolling and pricing systems; develop and implement revenue efficiencies; and prepare and improve our transportation systems for the future
- Expertise includes project and program management, system implementation, all-electronic and open road tolling conversions, procurement support, new technology deployments, risk management, stakeholder coordination, as well as new system testing and integration

Justin Winn – Tolling Feasibility
- Experienced with modern methods of toll collection, including automatic vehicle identification, video tolling, cash toll collection, as well as single point and point-to-point collection
- Currently serves as project manager for CDM Smith's current contract with NTTA, as well as for various ongoing toll studies in Texas and Oklahoma
- Has developed an executive dashboard tool facilitating efficient and ongoing review of key toll system and economic parameters

Dan Begert, AICP – SP/RP Surveys
- 10+ years of analytical experience including survey design and stated preference (SP) choice modeling
- Technical aptitude in spatial analysis with ESRI ArcGIS, travel demand modeling with Citilabs Cube, and traffic flow microsimulation in PTV Vissim

Tim Boesch – Multimodal Studies
- 25+ years of experience supporting a wide range of services including downtown circulation/multimodal, transit corridor planning and preliminary design, parking planning, highway corridor analysis, T&R forecasting, development impact review, and policy development

Sai Sirandas – Emerging Technologies
- 12+ years of experience in transportation data analysis, travel behavior forecasting, and traffic operations
- Has built models that capture the effects of Autonomous Vehicles (AVs) and Connected Autonomous Vehicles (CAVs) on travel behavior and traffic flow and has presented on these topics at national conferences

C. Number of Staff by Location

CDM Smith maintains an entire division of 85+ staff members dedicated to providing specialized services to the toll industry. The staff distribution by geographic location and by specialty is shown in Table 2. These toll industry specialists are supported by many additional planners, engineers, and economists throughout the firm.

Table 2: CDM Smith Staff Specialties and Locations

Austin	
Project Manager Deputy Project Manager Technical Leader T&R, Analytics, Modeling Tasks: 3 Jr. Engineers/Planners 4 Engineers/Planners 3 Sr. Engineers/Planners	Miscellaneous Tasks: 1 Sr. Technical Advisor 2 Toll Technologists 1 Sr. TIFIA Advisor 1 Project Controls Specialist 1 Administrative Professionals
Dallas/Houston	**Satellite (IL,CO, FL, WA, CA, GA, CT)**
3 Sr. Project Managers 1 T&R Discipline Leader 11 Jr. Engineers/Planners 5 Engineers/Planners 1 Sr. Engineer/Planner	Project Principal 8 Sr. Toll Tech. Consultants 4 Jr. Engineers/Planners 4 Engineers/Planners 11 Sr. Engineers/Planners 5 Sr. Toll Technology Consultants 2 Economists

D. Business Opportunity (BOP) and Disadvantaged Business Enterprise (DBE) Participation

COMMITMENT TO DBE PARTICIPATION

We are fully committed to support and comply with CTRMA's proposed 15% DBE goal for this agreement. Our team understands CTRMA's commitment to the development and growth of HUB/DBE

and small businesses through the encouragement of inclusion and opening new opportunities. We have developed a solid business diversity plan designed to, first and foremost, provide CTRMA with superior professional service, and second, support CTRMA's business diversity initiatives of inclusion and building the capacities of HUB/DBE firms. Achieving the program goals is not viewed as merely an obligation, but a true opportunity to expand the capacities of professional firms who desire to serve CTRMA as well as other sophisticated clients in the Central Austin area, across the state of Texas, and to points beyond our state borders. Partnering with small firms, mentoring start-up enterprises, and opening doors ensures a much stronger transportation consulting industry well into the future. We pay long-lasting dividends.

We have a long history of working closely with subcontracting firms that we have proposed to partner in this contract, including Gram NTX (DBE/HUB), Bomba Consulting, and Blue Door Strategy and Research (DBE/HUB). We are excited to add Baez Consulting (DBE/HUB) to the team. We have partnered with Baez Consulting on several other T&R contracts in Texas and have been mentoring this firm as part of NTTA's Relationships and Opportunities Advancing Diversity (ROAD) program.

CONFORMANCE WITH CTRMA'S POLICY ON THE PARTICIPATION OF DBEs/HUBs

CDM Smith will conform with the requirements of CTRMA's Business Opportunity Program and Policy on the participation of HUB/DBE firms and will evaluate opportunities for HUB/DBE participation. CDM Smith is committed to helping CTRMA meet its overall HUB/DBE goals. Previous experience has shown that CDM Smith typically exceeds the HUB/DBE utilization policy guidelines set by public agencies. **Our outreach efforts have yielded the addition of Blue Door Strategy and Research to our team as a DBE.**

Table 3: Commitment to DBE Participation

DBE/HUB Firm	Anticipated Utilization
Baez Consulting	6%
GRAM Traffic North Texas	5%
Blue Door Strategy and Research	5%

SECTION III

Project Development Experience

A, B, C, D, E. Relevant Projects Included in Official Statements

It should be noted that there is considerable uncertainty inherent in forecasting T&R for any toll facility. Our techniques and expertise help to identify the key risk elements associated with global economic issues, changing political climate and regional policies that may influence future outcomes. Table 4 presents a representative listing of the recent projects that have been supported by CDM Smith for successful financing/refinancing and bond issuance.

CDM Smith exceeds your minimum requirements – our team members service the majority of toll agencies within Texas and around the nation. The following projects are detailed with relevant items that represent the scope of work identified as minimum requirements in your RFQ.

INSTITUTIONAL KNOWLEDGE

CENTRAL TEXAS REGIONAL EXPERIENCE

CDM Smith has extensive T&R experience within the Central Texas region including our work for CTRMA, TxDOT, and other regional agencies, as illustrated below. This established history proves that we are the best team to help you with future regional challenges, such as congestion management, operational needs, capacity improvements system expansions, and alternative tolling solutions. The following outlines some key tasks undertaken as part of planning and pre-operational toll traffic impact analyses for the MoPac North/South project express lanes in Austin between 2010 to present.

- Key planning tasks performed included traffic data collection (traffic counts, vehicle classification and origin-destination patterns), traffic analysis support for highway design, policy analysis for the public involvement process, development of

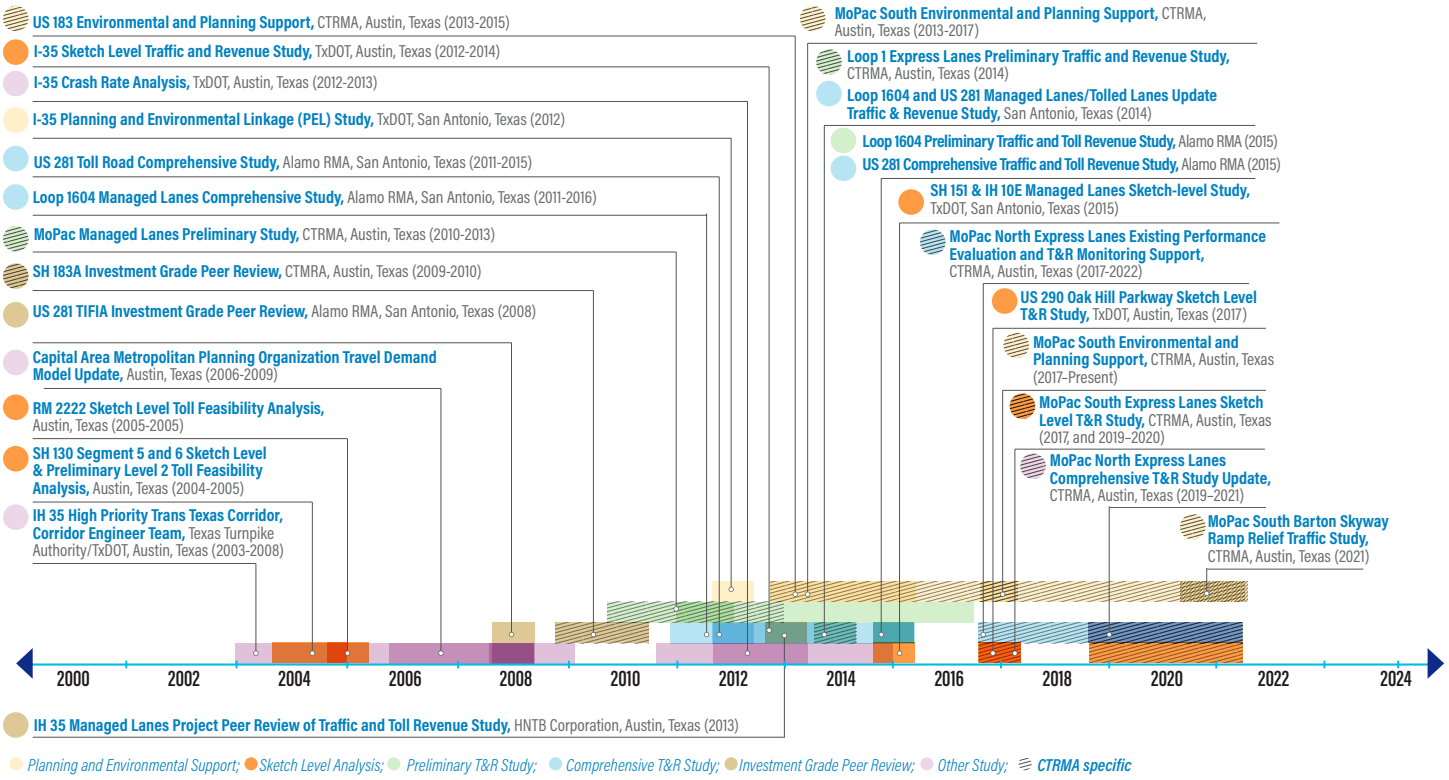
TABLE 4: COMPARISON OF OFFICIAL STATEMENT (OS) ESTIMATES VS ACTUAL OPENING YEAR REVENUE

Project Name / Location / Description	OS Date	First/ Opening Year	First/Opening Year Revenue (000s)		Actual vs Est. Revenues	Client Contact
			OS Estimate	Actual		
"North East Texas Regional Mobility Authority (NET RMA) - Toll 49 Comprehensive T&R Study | Texas. Comprehensive Study with System T&R Report related to then existing Toll 49 (Segment 1, 2, 3A, 3B and 5) and the Segment 4 Project. ***1, A, B, D**	5/24/16	2019	$19,931	$19,006	-4.6%	Glenn H. Green (NET RMA) 1011 Pruitt Place, Tyler TX 75701 | 903.630.9102
North Texas Tollway Authority (NTTA) | Texas. August 2022 T&R Study involved a detailed evaluation of Mobility 2045 - the new metropolitan transportation plan adopted by the North Central Texas Council of Governments (NCTCOG), and incorporated updated travel demand model networks ***2, A, B, C, D**	9/14/22	2023	$1,045,800	$1,130,944	8.1%	Horatio Porter (NTTA) 5900 West Plano Pkwy., #100, Plano, TX 75093 214.224.2247
Grand Parkway Transportation Cooperation | Texas. Grand Parkway System (SH 99) Segments D through I Comprehensive Study (September 2017) and Bringdown Letter (March 2018) prepared to evaluate the T&R potential of Segments D (Harris County), E, F-1, F-2, G, H, I-1. I-2. ***3, A, B, D**	5/23/18	2019	$176,428	$200,599	13.7%	Sara Ulbrich (TxDOT) 125 E. 11th St., Austin, TX 78701 | 512.334.3827
Central Florida Expressway Authority (CFX) - General Traffic and Earnings Consultants Annual Report | Florida. FY 2020 General Traffic and Earnings Consultant's Annual Report: provides 30-year forecasts for seven toll facilities constituting the CFX System ***4, A, B, D**	7/15/21	2021	$476,000	$496,900	4.4%	Lisa Lumbard (CFX) 4974 ORL Tower Road Orlando, FL 32807 407.690.5000
E-470 Public Highway Authority - Bring Down Letter | Colorado. 2018 Bring Down Letter to review and update the 2018 Comprehensive T&R Study titled E-470 T&R Study: New Toll Structure ***A, B, C, D**	2/21/19	2019	$248,626	$249,013	0.2%	Ryan Dole (E-470) 22470 East 6th Parkway Aurora, CO 80018 303.537.3519
Maine Turnpike Authority | Maine. 2021 Bring Down Letter with updated transaction and toll revenue forecast based on 2020 Comprehensive T&R Study ***5, A, B**	12/07/21	2021	$136,593	$138,772	1.6%	John P. Sirois (MTA) 2360 Congress Street Portland, ME 04102 207.482.8128
North Carolina Turnpike Authority (NCTA) - Triangle Expressway System T&R Study Update | North Carolina. Study performed in 2020 as an update to 2019 T&R Study in support of NCTA's financing efforts for the Triangle Expressway and Complete 540 Phase 1 ***6, A, B, C, D**	10/15/20	2021	$40,429	$39,079	-3.3%	David Roy (NCDOT) 1 South Wilmington St. Raleigh, NC 27699-1578 919.707.2729
New Jersey Turnpike Authority (NJTA) - New Jersey Turnpike and Garden State Parkway | New Jersey. Provide traffic and toll revenue forecasts for the New Jersey Turnpike and Garden State Parkway of the NJTA ***7, A, B, D**	11/30/22	2022	$2,113,591	$2,126,027	0.6%	Matt Harding (NJTA) P.O. Box 5042 Woodbridge, NJ 07095 732.750.5300 Ext. 8095
South Jersey Transportation Authority (SJTA) | New Jersey. SJTA 5 year T&R Forecast 2019-2024 (September 2019); 2019 Estimates of Atlantic City Expressway T&R and Certification of 2019 Debt Coverage/Net Revenue Requirements (September 2019); Atlantic City Expressway 2019-2020 T&R Estimates (September 2019) ***8, A, B**	10/10/19	2019	$82,955	$83,474	0.6%	Karen Davis (SJTA) P.O. Box 351 Hammonton, NJ 08037 609.965.6060

(1) T&R study was conducted to include Segment 4 which opened November 2018. For comparison, we considered the 2019 full year of operation for the entire Toll 49 System
(2) Actual revenues from the annual and monthly financial reports available on the NTTA website
(3) Revenues shown also include estimated collected revenues from Pay by Mail transactions
(4) Actual revenues from the Annual Comprehensive Financial Report 2021
(5) Actual revenues from Maine Turnpike Authority's T&R Report
(6) Actual revenues from the Annual Comprehensive Financial Report 2021
(7) Actual revenues from Annual Financial Information and Operating Data: Annual Financial Report 2022
(8) Excluding revenue concessions
(A) Toll rates/periodic adjustments
(B) T&R/mobility/toll collection method reports
(C) Managed lanes
(D) Technology/industry trends

a corridor calibrated travel demand model for performance measures, traffic simulation analysis, conceptual toll T&R forecasts, development of tolling schemes, evaluation of design options for express and general use lane improvements and express lane access, environmental studies of mobile source air toxics, and both project and regional environmental justice toll impact assessments.

- Key tasks during the pre-operational stage included assessment of managed lane policies (minimum toll rates, incentive discounts, opening toll rates), coordination with the toll integrator to review the dynamic toll pricing algorithm, review of alternative technical concepts provided by the contractors, signage considerations (locations, formats and frequency of change), access point and feeder roadway considerations (signal timing



and traffic redistribution), review of in-corridor express bus/transit utilization and toll rate adjustment considerations, and coordination of before and after studies to quantify observed travel pattern changes and project benefits.

Important considerations that enable successful outcomes include the ability to present complex express lane concepts to stakeholders in a simplified way to facilitate consensus building during the concept development phases and to help them understand the impacts that their decisions have on the facility operations. Our team worked with CTRMA and their extended project staff to support a myriad of operational assessments that included support of the environmental process to determine the preferred concept, project concept refinements involving access points and downtown ramp connections, optimization of toll revenue generation, support of financing and pre-operational activities such as determination of toll plaza locations and toll collection concepts.

The toll operation concept developed as part of the MoPac North planning phase warranted the development of dynamic pricing algorithms that carefully consider zonal based pricing and maintenance of reserve capacity on the single lane facility. The team worked closely with the CTRMA staff and the toll integrator to develop toll operational models to emulate the dynamic pricing envisioned for the project. The coordination allowed the development of toll pricing procedures that closely reflected the T&R studies used to secure project financing.

Several changes were made to the original MoPac North project concept including the connection to downtown. This required a reassessment of corridor toll operations and revised connections to feeding facilities. The tools and procedures already developed during the planning phase allowed for a seamless assessment of the impacts and streamlined the concept development evaluation process.

We performed a Level 3 T&R Study on the MoPac North express lanes project to assist with a potential refinancing of the debt. In addition, we performed a traffic forecast analysis to assist the environmental evaluation of the MoPac South express lanes project.

T&R Engineering Consultant, North Texas Tollway Authority (1960s-Present)

CDM Smith has solidified its position as the NTTA's trusted tolling partner with 50+ years of planning and operational analysis support

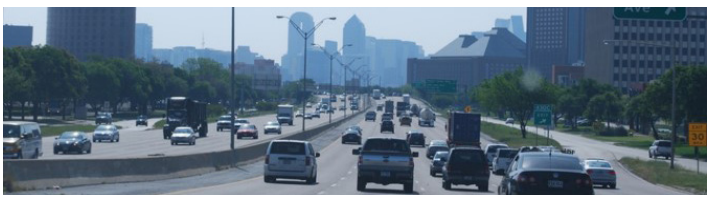
that has grown into a comprehensive partnership, including fulfillment of Trust Agreement requirements; successful financing/refinancing of over $15 billion in toll revenue bonds; investment-grade T&R studies; AET conversion assistance; strategic planning support for toll collection, rate changes, and revenue recovery; annual budgeting-related toll revenue estimation; and development of 140+ centerline miles of operational toll roads, two bridges, and one tunnel.

Bonding: We assisted in the completion of investment-grade studies and bring-down letters for each of NTTA's tolling facilities to secure toll revenue bonds. Our long-range, comprehensive T&R estimates have been used in these bond financings.

T&R Studies: Throughout our history with NTTA, CDM Smith has completed T&R studies for long-term transportation planning, bond financing, and demographic forecasting, including five system refinancings from 2018-2023 totaling approximately $3.8 billion; NTTA System 2017 (supporting the merger of the CTP and PGBT-WE into the NTTA System); Chisholm Trail Parkway (2011); PGBT-EE (2008); and SH 121/Sam Rayburn Tollway (2007).

Comprehensive, Strategic Tolling Initiatives: We have always been dedicated to NTTA's varied needs, supporting more than just T&R studies to ensure the toll roads continue to serve travelers with efficient and safe movement.

Texas Statewide Tolling Program, Texas Department of Transportation (2002-Present)



CDM Smith was retained by TxDOT to support their statewide T&R services that range from conceptual planning to investment grade studies. The support included statewide toll feasibility efforts to provide a broad range of services for projects that range in size from small network improvements to statewide initiatives. The toll feasibility work undertaken as part of this contract included support of several TxDOT Regional Districts that include Dallas, Fort Worth, Tyler, Houston, Corpus Christi, El Paso and Austin. CDM Smith also served as trusted advisors in regards to public private partnership (P3) concessions projects in the Dallas Fort Worth Region related to the North Tarrant Express (Segments 1 and 2W), North Tarrant Express (Segments 3A&3B), IH 635 LBJ Express Lanes, North Tarrant Express (Segment 3C), the SH 121, and SH 161. More recent examples of project financing being support by CDM Smith T&R services within the DFW region includes the IH35E express lanes and the Midtown Express Lanes (SH183, SH 114, and Loop 12).

T&R Advisor, Harris County Toll Road Authority (1980s-Present)

CDM Smith has served as the T&R advisor for HCTRA since its inception in the early 1980s. Over the past 30+ years, the HCTRA system has expanded to almost 83 miles of toll roads and operates three AET systems and a managed lane facility. Our work has extended to all levels of T&R services such as toll model development, calibration, operations analysis, and simulation; risk analysis; and bonding support. Our services for HCTRA have included T&R forecasting and updates; toll rate policy setting and studies; congestion management and value pricing; managed lane evaluations; travel demand modeling; and systems advisory services. Throughout our partnership, CDM Smith has delivered annual T&R estimates and impacts of toll rate changes. To determine future toll rate policy, we analyzed pricing strategies such as toll rate adjustments, advised on the potential mechanics of toll policy modifications, and prepared toll policy documents. Specific T&R work has included Comprehensive Systemwide Investment Grade T&R Studies and the Tomball Tollway T&R Study. We also performed a variety of preliminary studies for the Sam Houston Tollway-Northeast segment, which is now open to traffic as an AET facility.

Appendix

Appendix

Table A-1 Recent TIFIA Applications Supported by CDM Smith

In the last 8 years, CDM Smith has supported 21 agencies/issuers from 11 states for 70 issuances representing more than $26 billion in bonds. The following table highlights the transaction details for some recent studies for which projects were financed using CDM Smith's forecasts including several of our COVID-19 related financings.

Project Name	Agency	Study Type	Project Type	Year Complete	T & R Report	TIFIA	HOT/Managed Lanes/Dynamic Pricing	Stated Preference Surveys	Toll Model Dev/ Calibration/ Ops Analysis/ Simulation	T&R Forecast/ Toll Sensitivity Risk Analysis	Rating Agency Presentations
*SH 288 Express Toll Lanes	Brazoria County, Houston, TX	2,3	N	2017/ 2019	■	■	■	■	■	■	
I-105 Express Lanes	LA County Metropolitan Transportation Authority	3	N	2020	■		■	■	■	■	■
IH 35 Express lanes Comprehensive T&R Study	Texas DOT	1,2,3	N	2016/ 2019	■	■	■	■	■	■	
I-4 Beyond Ultimate, FL	Florida DOT	1, 2	N	2016	■		■	■	■	■	
I-5 North Express Lanes	LA County Metropolitan Transportation Authority	3	N	2016	■		■	■	■	■	
*SH 183/SH 114/Loop 12 Dallas County Express Lanes	Texas DOT	1,2,3	N	2017	■	■	■		■	■	
Tampa Bay Express Lanes	Florida DOT	1,2	N	2017	■	■	■	■	■	■	
I-10/I-15 Express Lanes	SBCTA	2,3	N	2018	■	■	■	■	■	■	■
I-55 Managed Lanes Study (Chicago)	Illinois DOT	2	N	2016	■		■		■	■	
I-395 Managed Lanes Study	Virginia DOT	2	N	2020	■		■		■	■	
MDOT I-495/I-270 Managed Lanes Study	Maryland DOT/MDTA	2,3	N	2020	■		■	■	■	■	
Norfolk Regional HOT Lanes Investment Grade T&R Study	Virginia DOT	2,3	E,N	Ongoing	■		■	■	■	■	■
I-605 Express Lanes	LA County Metropolitan Transportation Authority	2	N	2020	■		■	■	■	■	

* Study Types: 1 = Sketch 2 = Planning 3 = Investment Grade or Equivalent ** Project Types: N = New Facility/Capacity E = Existing Facility

Table A-2

CDM Smith Traffic and Revenue Support Services

Conceptual Feasibility	Data Collection/ Analysis	Local Land-Use Analysis	MPO Model Development Refinements	Traffic and Revenue Analysis	Risk Analysis/ Sensitivity Testing	Special Studies/ Peer Reviews
▪ Conceptual Feasibility Tools ▪ Preliminary Operations Cost Analysis ▪ Financial/ Economic Feasibility	▪ OD/SP/Traffic Counts (Daily/Weekly/ Seasonality Trends) ▪ Market Segmentations (PC/CV/Transit/ Freight) ▪ Behavioral Characteristics and Biases (values of time)	▪ Development Review ▪ Sub-corridor Land Use Assessment	▪ Traffic Impacts/Parking Considerations ▪ Mode Choice and Traffic Simulation Modeling ▪ Accessibility, Configuration and Competing Routes	▪ Traffic and Revenue Certifications ▪ Time of Day Pricing and Toll Schemes ▪ Alternative Pricing Structures and Escalation ▪ Ramp-up Duration and Key Influential Factors	▪ Alternative Delivery Options ▪ Historical Trends and Risk Profiling ▪ Confidence Interval Determination ▪ Market Trends and Elasticities	▪ Value Engineering/ Value for Money Support ▪ TIFIA Application Support ▪ Mobility and Revenue Enhancement Studies ▪ Monitoring/Data Mining

Central Texas Regional Mobility Authority

The CDM Smith team will work closely with all parties and bring its T&R expertise, tools, and experience to meet CTRMA's needs.

Christopher Mwalwanda, P.Eng.

Project Manager

Mr. Mwalwanda is a vice president and serves as a project director/principal on traffic and revenue consultant contracts for toll agencies and departments of transportation (DOTs) around the nation. He has extensive experience in managing toll feasibility analyses and travel demand modeling projects for both private and public agencies. He has served as project manager and supported the financing of over $20 billion in traditional and P3 toll projects in the United States. His areas of specialization include toll diversion modeling and financial analysis; urban, intercity, and statewide regional travel demand forecasting; high speed rail modeling and analysis; new mode modeling and analysis; traveler's behavioral theory; discrete choice models; stated preference and revealed preference survey design and implementation; and software interface development. He has more than 21 years of work experience in the development and calibration of multimodal models, and tolling services. He is also active with the IBTTA at a national level, as a presenter, and was part of several IBTTA Event Planning Committee and Platinum Sponsors Council and with the Transportation Research Board (TRB) as a committee member of the travel demand management (formerly congestion pricing) committee. He routinely leads coordination with rating agencies, underwriters, and investors as part of industry exchanges. This allows CDM Smith to prepare studies in accordance with the needs of the financial community. He works with numerous clients nationally serving as a senior advisor/lead practitioner to the Texas Department of Transportation; Oklahoma Turnpike Authority; E-470 Public Highway Authority; CTIO/CDOT, Colorado; Central Texas Regional Mobility Authority; North Texas Tollway Authority; Harris County Toll Road Authority; Los Angeles Metro; and SANDAG.

Project Director, Loop 1 Express Lanes Preliminary (Level II) Traffic and Revenue Study, Central Texas Regional Mobility Authority, Austin, Texas. Mr. Mwalwanda serves as project director for the evaluation of an 11-mile express lane facility that will extend from Lady Bird Lake in the south to Parmer Lane in the north in Austin, Texas. The preliminary study includes various enhancements to the Capital Area Metropolitan Planning Organization (CAMPO) travel demand model and the coordination of a comprehensive traffic count program to collect traffic counts, stated preference data, origin/destination data and speed and delay information within the corridor. The analysis includes the evaluation of various toll pricing, project phasing and configurations to evaluate the financial feasibility of the corridor taking into consideration various transportation demand management objectives. The models developed as part of this effort also support the environment assessment of the corridor being conducted by TxDOT.

Project Director, US 183A Investment Grade Peer Review, CTRMA, Austin, Texas. Mr. Mwalwanda served as the project director performing a peer review in support of the USDOT TIFIA application by the CTRMA. The review included a study of all key variables likely to affect the investment grade T&R analysis that was performed.

Project Director, Toll 49 Comprehensive (Level 3) Traffic and Toll Revenue Study, NET RMA, Tyler, Texas. Mr. Mwalwanda served as the project director for the comprehensive Level 3 Traffic and Toll Revenue Study to evaluate the feasibility of the

Education

MASc – Transportation Engineering, University of Toronto, Toronto, Canada, 1999

BASc – Civil Engineering, University of Toronto, Toronto, Canada, 1997

corridor. His responsibilities included coordination of several subconsultants that are performed the origin/destination surveys, stated preference surveys, traffic count collection and independent economic reviews, and presentations to the client, stakeholder, and bankers and lenders. He provided quality control and technical oversight for the development of the final report and participated in client discussions and presentations. An early assessment was undertaken to evaluate the feasibility of cash plazas compared to the AET facility options that were ultimately implemented.

Project Director, Grand Parkway SH 99 Segments E, F and G Investment Grade Traffic and Revenue Study, Houston, Texas. Mr. Mwalwanda served as the project director for the implementation of the traffic and revenue study to support design-build financing efforts for the Grand Parkway SH 99 advisor for the Texas Department of Transportation (TxDOT). In this role, he assisted in finalizing the investment grade study and the preparation of presentation to the rating agencies for the successful $2.9B financing of the project. Mr. Mwalwanda provided risk analyses and technical reviews of the procurement documents and reports and continuously interacts with key stakeholders for the project that included: the local planning organization (HGAC), seven county officials, Grand Parkway Association, the local tolling authority (HCTRA) and numerous TxDOT divisions that included: local TxDOT districts, the TxDOT Special Projects Division, TxDOT Special Projects Office Division, the TxDOT Toll Operations Division, the TxDOT Legal Counsel, and the TxDOT Debt Management Division.

Project Manager, I-405 Express Lanes Sepulveda Pass Traffic and Revenue Study, Los Angeles County Metropolitan Transportation Authority. This study will address the first phase of the corridor improvement – dynamically priced tolled express lanes. Demand along the tolled express lane will be managed using an all-electronic tolling system with a dynamic pricing algorithm that will vary tolls based on the level of congestion in the express lanes, travel direction and time of day. Rates will be set to manage demand in the express lanes to ensure minimum operating speeds of 45 miles per hour. The express lanes will be available to passenger vehicles only, and small two-axle trucks. Tolls will be consistent with Metro's current tolling policy and business rules. A total of 15 scenarios, will be studied using a combination of assumptions related to project configuration and different toll policy options (such as discounts for carpools and clean air vehicles, toll rate setting parameters, and maximum tolls).

Principal-in-Charge, I-10 Express Lanes Extension Investment Grade Traffic and Revenue Study, Los Angeles County Metropolitan Transportation Authority. This project is on Metro's 28 by 28 list of short-term priorities and is a Tier 1 project on Metro's ExpressLanes Strategic Plan but lacks specific funding sources. The goal of this study is to identify the potential toll revenue that could be generated by the project to conduct financial analysis of funding capacity and identify and pursue potential sources of funding. The range of scenarios to be tested in this study will address current and future toll policy decisions that will provide a range of possible revenue for the financial analysis. Demand along the tolled express lane will be managed using an all-electronic tolling system with a dynamic pricing algorithm that will vary tolls based on the level of congestion in the express lanes, travel direction and time of day. A total of 15 scenarios, will be studied using a combination of assumptions related to project configuration and different toll policy options (such as discounts for carpools and clean air vehicles, toll rate setting parameters, and maximum tolls).

Yong Zhao, PhD, PE, AICP, PMP

Deputy Project Manager

Dr. Zhao has more than 23 years of project experience managing preliminary, intermediate, and investment-grade traffic and toll revenue studies, congestion pricing analyses, travel demand modelling and forecasting, risk analysis in travel forecasts, traveler's behavioral theory and discrete choice models, traffic engineering and simulation modelling, and transportation surveys. He is active in publishing and presenting peer-reviewed technical papers at various professional conferences. Dr. Zhao has developed more than 80 T&R analyses from sketch level to investment grade for both public and private clients. He directly supported more than $5 billion bond sale or concession transfer. He has managed various T&R projects for traditional toll roads and managed lanes with dynamic pricing and conducted due diligence reviews for T&R studies in Texas, California, Washington, Florida, Virginia, Delaware, Maryland, and Louisiana. Dr. Zhao is the project manager for Mid-Bay Bridge T&R Advisory Service, Tampa Hillsborough Expressway Authority T&R On-call Service, Ohio Turnpike T&R On-call Service, Transportation Corridor Agencies (TCA) T&R On-Call Service, TxDOT T&R Study and Project Risk Workshop On-call Contracts. He also recently led the T&R team and completed Delaware DOT US 301 Toll Discount Program T&R study, Maryland I-270/I-495 Managed Lane P3 Project T&R Study, Dulles Greenway, Dulles Toll Road, and I-66 Express Inside the Beltway T&R Study, and SH 288 Express Toll Lanes T&R Study.

Project Manager, Manor Expressway (US290E) Investment Grade Traffic and Toll Revenue Study, Austin, TX, CTRMA. Dr. Zhao developed the multiple WAs under the master contract with CTRAM with scope, schedule, and budget, managed the detailed breakdown plan with staff and resources. He prepared weekly progress reports, facilitated weekly calls with client and project team. He was also responsible for the QA/QC program of the project and invoice billing to the client. This investment grade analysis and multiple updates includes a comprehensive data collection effort that serves as the calibration set for the proprietary toll diversion model used to estimate overall demand in the region and specifically tolled traffic on the facility. Presented at rating agency and investor meetings, which successfully supported $376M bond sale in 2012.

Project Manager, TxDOT T&R Service On-Call Contract, Austin, Texas, TxDOT. Dr. Zhao served as PM for the T&R contract for on-call services including I-35E monthly monitoring, Phase II construction time of day tolling policy development and support, preliminary T&R analysis for construction phase ramp relocation. The T&R supporting service also include DBRS annual data request, toll facility quarterly, bi-annual, and annual monitoring reports.

Project Manager, NTE GEC Contract T&R Support, Austin, Texas, Pape-Dawson Engineering. Dr. Zhao supported the NTE 1 and 2W monitoring service, responses to the developer, NTEMP's requests of change orders, and follow-up negotiation support. He also supported the NTE 3C construction change order review. He led the team developed level 2 T&R studies for NTE Express Lanes and VISSIM analyses for several NTE segments to evaluate the potential congestion mitigation.

Project Manager, SH 288 Express Toll Lane (Brazoria County) Extension Sketch Level T&R Study, Brazoria, TX, BCTRA. As project manager, Dr. Zhao developed the sketch level

Education

PhD, Civil Engineering, University of Texas at Austin, 2002

MS, Transportation Planning, Tongji University, Shanghai, China, 1996

BS, Road and Traffic Engineering, Tongji University, Shanghai, China, 1993

Registration

Professional Engineer: Texas, 94622

Certifications

American Institute of Certified Planners, 021596

Project Management Professional, 3356951

Honors/Awards

Proximo Deals of 2020 Award

TxDOT Precertification

1.2.1 Systems Planning

1.3.1 Corridor Planning

1.4.1 Land Planning

1.5.1 Feasibility Studies

1.6.1 Major Investment Studies

1.7.1 Travel Demand Modeling

7.1.1 Traffic Engineering Study

7.5.1 ITS

T&R for the proposed extension project for SH 288 Express Lane. The sketch level T&R analysis was based on existing data including toll transaction, traffic counts, and OD data from StreetLight and toll gantries, and INRIX travel time data to build a base case reflecting the current traffic patterns. Several future configuration scenarios were tested and the results was used to advance the project to higher levels of T&R analyses for financial plans.

Project Manager, BCTRA SH 288 Express Lane Toll Consultant Service, Brazoria, TX, BCTRA. For this toll consultant service contract, Dr. Zhao led the team conducting quarterly T&R monitoring service, developing quarterly/semiannually toll escalation recommendations. He also helped the agency to update the toll policy in order to maintain a comparable toll schedule with the SH 288 Express Lane Harris County portion which the private concessionaire operates.

Project Manager, SH 288 Express Toll Lane (Harris County) Comprehensive T&R Study, Houston, TX, Private Client, August 2021-September 2021. As project manager, Dr. Zhao developed the proposal with scope, schedule, and budget, negotiated the contract, managed the detailed breakdown plan with staff and resources, oversaw and coordinated with the subconsultant, Arizona State University on DTA Lite model development. He prepared weekly progress reports, facilitated weekly calls with client, subconsultant, and project team. He was also responsible for the QA/QC program of the project and invoice billing to the client. To validate the choice behaviors of travelers on this managed lane without travel time saving and under the covid impact, the T&R team utilized the StreetLight OD data, toll gantry OD data, INRIX travel time data, and related toll facilities' transaction data to build a base case reflecting the current traffic patterns. Future revenue projections would be used for the client to evaluate their financial strategy.

Project Manager, TxDOT T&R Contract, Austin, Texas, TxDOT. Dr. Zhao served as PM for the T&R contract and developed level 2 T&R studies for LBJ East Express Lanes. He coordinated with the client and prepared the scope, schedule and budget. The T&R Team has been on this recurrent on-call service for TxDOT to support the T&R study needs for more than 15 years. Dr. Zhao lead the team and conducted various levels T&R studies for the agency's plan with more feasible toll projects.

Deputy Project Manager, I-5 Managed Lane Investment Grade T&R Study, Los Angeles, CA, Caltrans. As deputy project manager, Dr. Zhao developed project execution and quality management plan. He oversaw and coordinated with the subconsultants, He led the team and developed a Stated Preference survey to understand the choice behaviors of travelers on this corridor. Screenline traffic counts, travel time data, and vehicle occupancy data were assembled to build a base case reflecting the current traffic patterns. Future revenue projections would be used for the client to apply for TIFIA loan.

Deputy Project Manager, I-405 Express Lanes Investment Grade T&R Study, Los Angeles, CA, LA Metro. As deputy project manager, Dr. Zhao developed and managed the detailed breakdown plan with staff and resources, oversaw and coordinated with the subconsultants, He is responsible for the Project Quality Management program and invoice billing to the client. The team developed a Stated Preference survey to understand the choice behaviors of travelers on this corridor. StreetLight OD data, traffic counts, travel time data, and adjacent toll facilities' transaction data were assembled to build a base case reflecting the current traffic patterns. Future revenue projections would be used for the client to evaluate their financial strategy.

Bikash Gautam

Technical Leader

Mr. Gautam has more than 21 years of experience in general civil engineering and more than 17 years of experience in the development of travel demand, revenue forecasting models and T&R Analysis. He has gained extensive experience while working on several travel demand modeling projects, traffic and toll revenue studies ranging from toll feasibility analysis to investment grade level studies, including policy developments and technical support for project financing. Along with project/task management skills, his technical expertise includes data collection program development, network modeling and calibration, data summary, and report writing for traditional toll road projects, concurrent and reversible managed/express lane projects with variable congestion pricing for different toll collection strategies. His areas of interest include toll diversion modeling and financial analysis, urban, intercity, and statewide regional travel demand forecasting, urban and statewide emergency mass evacuation modeling, dynamic and static traffic assignment modeling and analysis. He has been providing technical support and task management support for work with several agencies, including TxDOT, CTRMA, NET RMA, Alamo RMA, MCTRA, and OTA.

Project Technical Leader/Deputy Project Manager/Planning Analyst, MoPac-North Express Lanes T&R/Performance Monitoring Support, Comprehensive T&R Study and MoPac-South Environmental Support, CTRMA, Austin, Texas. CDM Smith was retained by CTRMA in 2010 through 2013 timeframe to conduct a Level 2 intermediate traffic and toll revenue study for the MoPac-North express lanes corridor in Austin, Texas. The project limits were from W. Parmer Lane to Lake Austin Boulevard with approximately 11.2-miles. The study considered recent traffic and demographic growth trends within the Greater Austin region. In addition, to better understand the traffic characteristics within the region, an origin-destination survey, and a stated preference survey were undertaken as part of the study. As a Planning Analyst and Task Leader, Mr. Gautam developed extensive data collection program, performed traffic and toll revenue analysis and proposed an Intermediate (Level-2) Traffic and Toll Revenue evaluation for the project corridor. Further, a comprehensive traffic and toll revenue study for the existing 11-mile MoPac-North express lane corridor and traffic study with environmental support for the proposed 8-mile MoPac-South express lane corridor were undertaken in 2018 through 2022 timeframe. The existing and proposed MoPac express lane corridor is one/two-lane limited access facility from SH 45 North Toll Road to MoPac Highway and Lake Austin Boulevard to Slaughter Lane.

Project Technical Leader, IH 35E Investment Grade Level Traffic and Toll Revenue Study Update and Technical Support, TxDOT, Dallas, Texas. CDM Smith was retained by TxDOT to conduct a Level-3 T&R study for the proposed IH 35E reversible managed lane project in 2018. This project built upon the investment grade level T&R study update completed in 2010 and several scenario sensitivities conducted through 2016 with a Bringdown Letter update in 2016. Mr. Gautam served as a Project Technical Leader and coordinated with multiple staff in developing the refresh of the previous data collection programs, analyzed the historical as well as current data within the study area. He worked on performing comprehensive traffic and toll revenue study with several ongoing T&R

Education

MS – Civil Engineering, University of Texas at El Paso, 2006

BS – Civil Engineering, Tribhuvan University, Nepal, 2002

Years of Experience

CDM Smith: 17
Total: 21

Training

AutoCAD and AutoLISP, Tribhuvan University

Visual Basic, PENTASOFT Nepal Centre

sensitivities for the IH 35E reversible managed lanes project between FM 2181 and IH 635 in Dallas, Texas. Mr. Gautam is currently supporting TxDOT with several T&R sensitivity assessments related to the corridor configurations and toll pricing strategies.

Project Technical Leader/Deputy Project Manager, Existing NET RMA Toll 49 System T&R Monitoring Support and Proposed Segment 6 Environmental Support, NET RMA, Tyler, Texas. CDM Smith is retained by NET RMA to monitor the T&R trend for the existing Toll 49 System and present the summary to NET RMA staff and board members on a quarterly basis. CDM Smith is also assisting NET RMA and its consultants with the miscellaneous technical support tasks including proposed Segment 6 Environmental Support. Mr. Gautam servers as a Project Technical Leader as well as Deputy Manager on the System T&R monitoring and Segment 6 Environmental Support tasks in which he oversees the tasks' progress and schedule, shares technical expertise, and communicates with client and their consultants on a regular basis.

Project Technical Leader, Texas Statewide Technical Support, TxDOT. CDM Smith is under contract with the TxDOT to provide traffic and toll revenue support as well as miscellaneous technical support. Mr. Gautam serves as a Project Technical Leader as well as Technical Advisor on the ongoing miscellaneous studies including Midtown Express Traffic & Toll Revenue Update in Dallas, Texas; North Tarrant Express Segments 1, 2W and I-35W Segments 3A, 3B and 3C Traffic & Revenue Study Update in Fort Worth, Texas.

Project Technical Leader, Systemwide Comprehensive Traffic and Toll Revenue Study, OTA. CDM Smith was retained by Oklahoma Turnpike Authority (OTA) to conduct a comprehensive traffic and toll revenue study for the existing toll facilities within the Oklahoma state. Mr. Gautam led the project team in developing transactions and toll revenue forecast for multiple toll facilities within the state.

Project Technical Leader/Deputy Project Manager/Task Leader/Lead Analyst, Toll 49 Sketch Level through Comprehensive Traffic and Toll Revenue Study, NET RMA, Tyler, Texas. CDM Smith conducted a comprehensive T&R Level 3 study update for NET RMA in 2010 and submitted a Bring Down Report in 2014 for the proposed Toll 49 toll facility in Smith County, Texas. Further in 2016, another Comprehensive traffic and toll revenue study was undertaken by CDM Smith and assisted NET RMA with successful $181 million revenue bond financing of Segment 4. Recently in 2022, a Comprehensive traffic and toll revenue study was completed to re-benchmark the previous forecasts, in support of possible re-financing. Mr. Gautam contributed to the existing traffic data analysis and updated the transactions and toll revenue forecasts.

Task Leader, Midtown Express Conceptual, Level 2 and Investment Grade T&R Studies, TxDOT, Dallas, Texas. CDM Smith provided procurement support including feasibility/conceptual studies and subsequently for a Level 3 investment grade traffic and toll revenue study for the SH 183, NTE 2E, SH 114 and Loop 12 Managed Lanes projects. This project builds upon the level 2 traffic and toll revenue study update completed in 2014 and in 2010, as well as extensive data collection program in 2008. Mr. Gautam developed the refresh of the previous data collection program, analyzed the historical as well as current data within the study area. He worked on performing investment grade level 3 traffic and toll revenue analysis for the SH 183 managed lanes project between Industrial Boulevard and IH 35E, SH 114 managed lanes between International Parkway and SH 183 and Loop 12 managed lanes between IH 35E and SH 183.

Kamran A. Khan

Project Principal

Mr. Khan is a highly respected hands-on leader. He currently manages CDM Smith's National Tolling Finance and Technology practice, overseeing the performance of more than 85 tolling professionals in CDM Smith's five tolling centers across the US. He has over 36 years of professional experience (33 years with CDM Smith) and an extensive background in toll revenue studies, supporting over $30 billion in project financing. He serves as senior advisor and reviewer for all major traffic and revenue studies within the national practice. Kamran provides policy guidance and advice at the executive level to multiple toll agencies nationally. His reach throughout CDM Smith's client base and the industry provides him with the expertise of current trends, such as dynamic and time-of-day pricing for managed lanes, ETC, and AET. He routinely leads coordination with rating agencies, underwriters, and investors as part of industry exchanges. He works with numerous clients nationally, serving as a senior advisor/lead practitioner to the Illinois Tollway; E-470 Public Highway Authority, Colo.; Miami-Dade Expressway Authority, Florida; North Texas Tollway Authority; Harris County Toll Road Authority; Texas Department of Transportation; and Florida's Turnpike.

Project Principal, E-470 Public Highway Authority, Colorado. Project principal for investment grade study for the toll road. The study included data collection, review of annual transactions by plaza and account activity, independent economic corridor analysis, stated preference surveys, review of long-range needs and review of various pricing options, and toll sensitivity analysis. Extensive use of DRCOG model data sets. Developed scenarios to reflect COVID-19, with presentations to rating agencies and investors. One of the first successful toll road bond transactions in the COVID-19 environment.

Project Principal, North Texas Tollway Authority, Traffic Engineering Retainer Services, TX. Provided technical guidance and review for investment grade studies conducted for the System and new projects/extensions such as PGBT Eastern and Western Extensions and Chisholm Trail Parkway. Comprehensive studies have included detailed data collection, independent socioeconomic forecasts, stated preference surveys, travel demand modeling, development of transaction and revenue forecasts, price elasticity analysis, and sensitivity testing. Extensive use and adaptation of NCTCOG travel demand model. Provided letter updates for financings between comprehensive studies. Participated in rating agency presentations and provided certifications. Work efforts also include a review of T&R forecasts for NTTA budget preparation. Involved in continuous monitoring of T&R performance for NTTA facilities.

Project Principal, Traffic Engineering, Illinois Tollway, Downers Grove, Illinois. Manages services to the Authority, including traffic and revenue studies, traffic operations, ITS, and toll collection systems. Conducted various studies and tasks for the Authority, including providing guidance and recommendations with respect to toll rates, toll sensitivity, and toll collection systems, as well as determining the resulting traffic and revenue impacts; managing preparation of the annual traffic and revenue report by identifying traffic and revenue trend, economic conditions, and construction impacts; conducting interchange feasibility studies; assessing development impacts to the tollway; long range and capital planning to support the $14 billion capital plan.

Education

MS - Transportation Engineering and Planning, University of Southampton, UK, 1989

BS - Civil Engineering, Kingston Polytechnic, UK, 1986

Years of Experience

Total Years: 36
CDM Smith: 33

CDM Smith

Senior Advisor, 95 Express Investment Grade T&R Study, FTE/ FDOT, Florida. The study involved refining the travel demand model from SERPM, using independent socioeconomic forecasts, and integrating output into the ELTOD model developed for the I-95 corridor. The study considered the timing and staging of project improvements and the representation of the proposed tolling policy. Long-term transactions and revenue forecasts were developed.

Task Lead, Michigan Interstate Tolling Feasibility and Priced Managed Lanes Study, Michigan DOT. As part of the HNTB/CDM Smith team**,** leading the traffic and revenue assessment of 28 limited access facilities as potential tolling corridors. The initial phase supported screening candidate corridors by considering various criteria, including project costs, traffic potential, environmental impacts, and high-level financial feasibility. The subsequent phase developed a short list of 10 tolling corridors that were studied in more detail as part of an implementation plan. The CDM Smith team refined the Michigan statewide model by calibrating it to counts and incorporating travel pattern information sourced from GPS and LBS data sets. The model was further enhanced by incorporating tolling algorithms to simulate the impacts of pricing and low-income discount programs. Developed long-range transaction and revenue streams to support financial feasibility assessments for each corridor.

Project Principal, Chicago Mobility and Congestion Pricing Study –lead for an overall study that considers all current mobility options, prevalent travel patterns and trip characteristics, and travel costs for Chicago residents and commuters. A detailed assessment of current transportation fees and taxes will be conducted. The study looks at current equity deficits for vulnerable communities with respect to transportation accessibility within the city. The study will identify areas and corridors of high personal vehicle traffic demand and congestion and will establish a series of key performance metrics to evaluate various travel demand management and pricing policies. Broad stakeholder engagement will be conducted to develop and review potential pricing policies, including cordon pricing, area pricing, and corridor/expressway pricing. Based on screening, preferred alternatives will be taken forward for more detailed evaluations, including the development of a concept of operations.

Project Principal, Interstate Tolling Project Planning and NEPA Services, Indiana Department of Transportation. Leading CDM's Smith project team in assessing the impact of tolling on four interstate corridors. Initial efforts are focused on developing traffic and revenue forecasts and diversion estimates on local routes. The study involves extension data collection, video surveys, and analysis of current travel patterns and trip distributions. In addition, the study team is developing a technical approach to traffic forecasting in support of future NEPA studies.

Project Principal Traffic and Revenue Services Dulles Toll Road, Metropolitan Washington Airports Authority, Virginia. For ongoing traffic and revenue retainer services, including monitoring of traffic and revenue performance, comprehensive traffic and revenue studies in support of project financings for the Silver Line Metrorail Service. Conducted extensive traffic data compilation, including stated preference surveys to measure values of time. Utilized MWCOG model data sets to estimate transit and highway demand and incorporated tolling algorithms to simulate the impact of pricing. Currently updating forecasting to estimate the impact of COVID-19.

Cissy S. Kulakowski, PE, PMP
Senior Technical Advisor

Ms. Kulakowski conducts traffic and revenue studies for toll bridges, toll corridors, express lanes, and regional congestion pricing. Her area of emphasis is in the development and use of modeling techniques for priced facilities, including all aspects of data collection, model calibration/validation, developing stated preference surveys to estimate drivers' value of time, traffic operations analysis in support of assessing willingness to pay, and presenting these results to clients, stakeholders, ratings agencies, and TIFIA. She specializes in studies of express lanes facilities around the country, beginning with the first, the 91 Express Lanes in Orange County, CA, and most recently in support of San Bernardino County Transportation Authority's successful TIFIA application for their I-10 Express Lanes.

Traffic and Revenue Forecasting Lead, Otay Mesa Binational Investment Grade Traffic and Revenue Study, San Diego Association of Governments, California. Serving as the traffic and revenue forecasting lead for an Investment Grade Level Traffic and Revenue Study for the proposed Otay Mesa East-Mesa de Otay II Port of Entry (POE) within the San Diego/Tijuana region and the adjoining SR-11 tolled access road. This comprehensive T&R study and analysis is part of SANDAG's ongoing efforts and is intended to support and secure project financing for the construction of the proposed Otay Mesa East-Mesa de Otay II POE. The Otay Mesa East-Mesa de Otay II POE Project is a joint effort between SANDAG and Caltrans, in collaboration with state and federal partners in the United States (U.S.) and Mexico, to create a new multimodal land POE for the region.

Project Manager, I-10 Express Lanes Extension Investment Grade Traffic and Revenue Study, Los Angeles County Metropolitan Transportation Authority, California. This project is on Metro's 28 by 28 list of short-term priorities, and is a Tier 1 project on Metro's ExpressLanes Strategic Plan, but lacks specific funding sources. The goal of this study is to identify the potential toll revenue that could be generated by the project to conduct financial analysis of funding capacity and identify and pursue potential sources of funding. A total of 15 scenarios will be studied using a combination of assumptions related to project configuration and different toll policy options (such as discounts for carpools and clean air vehicles, toll rate setting parameters, and maximum tolls).

Project Manager, I-10 and I-15 Express Lanes Investment Grade Traffic and Revenue Study, San Bernardino County, California. CDM Smith is conducting an investment-grade traffic and revenue study to assist SANBAG in its efforts to secure bond ratings and a financial commitment from TIFIA to help in financing the first phase of its express lanes system. The I-10 Phase 1 project consists of expansion and conversion of the existing I-10 HOV lane from Los Angeles County to I-15. As part of this work, CDM Smith collected updated traffic count and travel time/speed data in the I-10 and I-15 corridors, collected interchange-to-interchange travel pattern data using Bluetooth recognition, developed an updated regional socioeconomic forecast based on the upcoming 2016 Regional Transportation Plan, updated traffic operational analysis for the corridor, and collected new stated preference surveys. This data will be incorporated into a corridor model that will be used to forecast traffic and toll revenue that will be used to develop a financing plan for the facility.

Education

MS – Transportation Planning and Engineering, NYU Tandon School of Engineering, 1993

BS - Civil Engineering, University of Pennsylvania, 1987

Registration

Professional Engineer: Connecticut, 1993

Certification

Project Management Professional (PMP), 2019

CDM Smith

Project Manager, I-5 North Investment Grade Traffic and Revenue Study, Los Angeles County, California. The final phase of the I-5 North corridor improvement plan is to construct HOV lanes from SR 14 to Parker Road. As part of its assessment to identify potential sources of revenue to advance this project, LA Metro retained CDM Smith to conduct an investment-grade traffic and revenue study for potential HOT lanes for the project. Both the HOV and HOT lane configuration are environmentally cleared. As part of this work, CDM Smith collected current traffic count and travel time/speed data within the study area, collected interchange-to-interchange travel pattern data using Bluetooth recognition, developed an updated regional socioeconomic forecast based on the upcoming 2016 Regional Transportation Plan, conducted traffic operational analysis for the corridor, and collected stated preference surveys from drivers who use I-5. This data will be incorporated into a corridor model that will be used to forecast traffic and toll revenue that will be used to develop a financing plan for the facility.

Project Manager, I-10 and I-15 Express Lanes Preliminary Traffic and Revenue Study, San Bernardino County, California. To help with its decision to consider a tolled express lanes option for its corridor improvement projects, the San Bernardino Associated Governments retained CDM Smith to study the feasibility of adding express lanes to I-10 and I-15 within San Bernardino County. Each 33-mile project, when completed, would add two tolled express lanes in each direction for most of its lengths. As part of this work, CDM Smith used the regional travel demand model to identify regional travel patterns, developed a subarea model around the study corridors, incorporated tolling algorithms into the subarea model, incorporated the results of independent reviews of the regional socioeconomic forecast, developed and used a microsimulation model to assess the future delays, and developed a traffic and revenue forecast to be used in determining the financial feasibility of the projects. CDM Smith also developed toll system capital and operating costs and developed a preliminary concept of operations document for the projects.

Senior Analyst, US 101 Express Lanes Feasibility Analysis, Ventura County, California. CDM Smith conducted a feasibility analysis of potential express lanes on US101 for the Ventura County Transportation Commission. The analysis was performed on a sketch-level basis, and required the development of traffic operations profile based on readily available information. Ms. Kulakowski was responsible for all the traffic and revenue forecasting for this study, which culminated in a preliminary feasibility report.

Senior Analyst, SCAG Express Travel Choices Study, Southern California. As part of a large, multidisciplinary team, CDM Smith was responsible for enhancing the Southern California Association of Governments' model to better reflect the potential impacts of alternative forms of user pricing into the SCAG travel demand model, performing the traffic analysis for these alternatives, and developing inputs to social justice and economic/financial models. As the technical lead for CDM Smith's modeling efforts for this alternative pricing study, Ms. Kulakowski was an integral part of a large, multidisciplinary team. She was directly responsible for integrating alternative user pricing schemes in the travel demand model, developing the traffic analysis for each alternative, and determining inputs to the financial models.

Scott A. Allaire

Senior Technical Advisor

Mr. Allaire is a vice president and a discipline leader of CDM Smith's Transportation, Finance, and Technology (TFT) Group. Mr. Allaire's responsibilities include business development, client interaction, recruitment and hiring of professional staff, mentoring, project management, quality management, and participating in industry conferences. Mr. Allaire specializes in toll revenue studies where his major project experience includes all levels, phases, and components of traffic and toll revenue feasibility studies; including data collection, development and use of toll travel demand modeling techniques, managed lane analysis and forecasting, cashless tolling, economics, sensitivity testing and risk analysis, and presentations to rating agencies and TIFIA in support of project financing.

Project Director, SH 99 Grand Parkway Investment Grade Traffic and Revenue Study, Harris County Toll Road Authority (HCTRA), Houston, Texas. Mr. Allaire served as Project Director for a study of a planned 180-mile third circumferential tollway around Houston, Texas. The study involved significant data collection efforts, analysis of future economic conditions, model development, traffic and revenue forecasting, and sensitivity tests. Mr. Allaire was responsible for review of all project deliverables, particularly the long-term traffic and revenue forecasts for the new facility.

Project Director, SH 288 Managed Lanes Traffic and Revenue Study. For Brazoria County Texas, Mr. Allaire is serving as Project Director for a study of implementing reversible managed lanes along the existing SH 288 Freeway in Brazoria and Harris Counties in Houston, Texas. Various infrastructure alternatives are being considered. Mr. Allaire is tasked with participating in client meetings, review of the technical analysis approach to the study, review of technical submissions and the final report, and final review of traffic and revenue estimates.

Project Manager, U.S. 290 Managed Lanes Preliminary Traffic and Revenue Study, Harris County, Texas. Mr. Allaire was Project Manager for this study in Harris County, Texas. Estimation of traffic and revenue on the proposed facility was performed under different operating scenarios, including an HOV3+ free condition. A micromodel analysis of the corridor was used. Variable toll pricing was used to manage the single-occupancy vehicle demand for the facility to preserve a free-flowing condition for high-occupancy vehicle traffic.

Project Manager, Connecticut Statewide Tolling Planning and Implementation Study, Department of Transportation (DOT), Connecticut. For the Connecticut DOT, Mr. Allaire is serving as Project Manager for a major statewide tolling study to implement tolls on Connecticut Interstates and State Highways. This includes an evaluation of the revenue potential for each corridor, diversion estimates to non-tolled roadways, travel time improvements from tolling, technology needs and costs, institutional and organizational requirements, toll discount analysis, and hosting workshops with the DOT and Legislative Liaisons to gather input and consensus on corridors to toll, toll rates, and policy decisions. The comprehensive study will provide the framework for the DOT to implement tolling, while providing the State Legislature with the necessary information to make decisions regarding potential tolling in the State.

Education

MS – Civil Engineering, University of Connecticut, 1999

BS – Civil Engineering, University of New Hampshire, 1995

Total Years of Experience

Total Years: 23
CDM Smith: 18

Project Director, I-495 and I-270 Express lanes Level 2 and Investment Grade T&R Study, Maryland Department of Transportation/State Highway Association, Maryland, April 2018 – On-going. For the Maryland Department of Transportation, Mr. Allaire is serving as Project Director for a traffic and revenue study for a network of express lanes around Washington D.C on I-495 and I-270. The CDM Smith team is working closely with the MDOT to develop forecasts under various project configurations, tolling policies, and phasing alternatives. Multiple sensitivity tests are also being conducted. CDM Smith participates in progress meetings with the complete project team at MDOT offices or via conference call.

Project Manager, I-64 Norfolk Regional Express Lanes Investment Grade T&R Study, Hampton Roads Transportation Accountability Commission (HRTAC)/Virginia Office of Public-Private Partnerships (VAP3), Norfolk, Virginia. For the Hampton Roads Transportation Accountability Commission (HRTAC) and the Virginia Office of Public-Private Partnerships (VAP3), Mr. Allaire is serving as Project Manager for an investment grade traffic and toll revenue study for a proposed network of express lanes along I-64 in the Hampton Roads region. The project includes more than 40 miles of express toll lanes. Mr. Allaire is responsible for overseeing all technical components of the study, reviewing study findings, forecasts, study coordination, and documentation.

Project Manager, Virginia I-395 Sketch, Level 2, and Investment Grade T&R Studies, Virginia Office of Public-Private Partnerships (VAP3), Virginia. Mr. Allaire served as Project Manager for three different levels of T&R studies of extending the existing I-95 Express Lanes in Virginia northward along I-395. Mr. Allaire was responsible for developing the approach to each level of study, review of all technical findings and reports, and providing revenue projections for a base case and equity case during the investment grade phase of study as a basis to compare against those developed by the concessionaire. Mr. Allaire directly participated in meetings between VAP3 and the concessionaire during negotiations in support of VDOT.

Project Director, Virginia I-95 Fredericksburg Extension Express Lanes Level 2 T&R Study, Virginia Office of Public-Private Partnerships (VAP3), Virginia. Mr. Allaire is serving as Project Director for a Level 2 T&R study of extending the existing I-95 Express Lanes in Virginia southward 10 miles into Fredericksburg Virginia. Mr. Allaire was responsible for developing all work efforts, staffing, review of results and reports, and participating in client meetings to discuss estimates. Revenue projections were produced for a base case and equity case as a basis to compare against those developed by the concessionaire for the project and to support negotiations for VDOT from a T&R view point.

Project Manager, Norfolk Virginia I-64 HOT Lanes Sketch Level T&R Studies, Virginia Department of Transportation, Virginia. Mr. Allaire serving as Project Manager for several Level 1 High-Occupancy (HOT) lanes studies of converting the existing I-64 HOV lanes in Norfolk to HOT lanes. The studies estimated the traffic and toll revenue potential of converting both the reversible and concurrent HOV lanes, and extending the HOT lanes westward across the High-Rise Bridge to I-664 as input into the overall feasibility assessment of the conversion project.

Daniel Begert, AICP

Special Studies: Stated Preference Surveys

Mr. Begert joined CDM Smith in 2013 and is a transportation planner with over ten years analytical experience. In 2023, Mr. Begert assumed the role of lead toll traffic & revenue forecaster for the Illinois Tollway, in addition to continuing in his role as the firm's leader in the transportation survey design and stated preference (SP) choice modeling. Mr. Begert also has technical aptitude in spatial analysis with ESRI ArcGIS, travel demand modeling with Citilabs Cube, and traffic flow microsimulation in PTV Vissim.

Technical Lead, Transportation Survey Design and Analysis, Various Clients. Mr. Begert has led an emerging transportation survey practice since 2016 that has provided origin-destination and SP surveys to multiple toll agency and transportation agency clients in Illinois, Colorado, Washington, D.C., Texas, Virginia, Florida, and California. The practice grew out of an internal R&D project that he began in 2013. Mr. Begert manages the survey through all stages, from initial questionnaire drafting and SP experiment design, through programming and administration of the online survey, to the final analysis and reporting of survey results. As a final product of the surveys, multinomial logit models are used to generate estimates of value of time (VOT) from the SP experiments, which are a key component of regional travel demand models.

Survey Coordinator/Analyst, Mopac Express Lanes Comprehensive Traffic and Revenue Report, Central Texas Regional Mobility Authority, Austin, Texas. Mr. Begert designed a combined origin-destination SP survey for customers of the Texas Loop 1 (MoPac) near downtown Austin. He oversaw online programming and administration of the survey and designed a social media outreach campaign to recruit survey takers. Mr. Begert conducted multinomial logit modeling on segmented survey results to generate VOTs and value of travel time reliability (VOR) estimates for use in the regional travel demand model. Analyzed trip characteristics and sociodemographic data from the survey and summarized the results in a technical memorandum and T&R report chapter.

Survey Coordinator, Veterans Memorial Tollway (I-355) Stated Preference Survey, Illinois State Toll Highway Authority (Illinois Tollway). Mr. Begert designed an SP survey for the Veterans Tollway corridor to develop updated estimates of customer VOTs for the regional Tollway model. The sampling plan, survey instrument, incentive structure, choice alternatives, attribute levels, and orthogonal matrices for the SP survey were initially designed by Mr. Begert as an internal CDM Smith research and development project. Using the data collected, Mr. Begert developed multinomial logit models to estimate VOTs for various market segments, including peak travel times, off-peak travel times, work trips, non-work trips, and commercial vehicle drivers.

Technical Lead/Survey Coordinator, North Texas Tollway Authority (NTTA) 2022 Comprehensive Study, Dallas, Texas. Mr. Begert designed a SP survey of NTTA customers who used the NTTA toll network in the Dallas-Fort Worth Metroplex Region. The purpose of the survey was to estimate travelers' willingness to pay for travel time savings via the existing NTTA toll network. The survey collected data from current users of the network by asking respondents about a recent trip made using one of the five regional NTTA tollways and turnpikes and/or one of the three local toll bridges and tunnels. The estimates of toll

Education

MA - Urban Planning
University of Illinois at Urbana-Champaign, 2011

BA - Environmental Studies, Geology
University of Kansas, 2007

Certifications

American Institute of Certified Planners (AICP), May, 2015

price sensitivity and willingness to use the toll facilities were then incorporated into the travel demand models to support the traffic and revenue estimates for the Comprehensive Study.

Technical Lead/Survey Coordinator, Hampton Roads Express Lanes Summer Weekend Traffic and Revenue Study, HRTAC, Chesapeake, Virginia. Mr. Begert designed a SP survey of summer weekend vacation travelers as a follow-up to a previous survey of weekday travelers conducted by RSG Inc., in 2018. Traffic congestion peaks during summer weekend months in the Virginia Beach area, so the client was curious about the willingness to pay of summer weekend beach-goers compared to typical weekday commuters who travel at all times of the year. Mr. Begert conducted logistic regression models on the survey data and found that summer weekend traveler VOTs were approximately 30 percent higher than weekday VOTs, which had been estimated in the previous study.

Technical Lead/Survey Coordinator, Otay Mesa East Border Crossing Study, SANDAG, San Diego, California. Mr. Begert designed two SP and origin-destination surveys of northbound border crossers at the U.S.-Mexico border near San Diego, CA and Tijuana, Mexico to gather information on willingness to pay for wait time savings at the planned Otay Mesa East tolled border crossing. One survey targeted passenger vehicles and the other targeted commercial shipping/receiving firms and third-party logistics companies in the region. Mr. Begert ran logistic regression models using the SP data from the surveys to generate estimates of VOTs for the people and businesses that regularly use the currently available and overcrowded border crossings.

Technical Lead/Survey Coordinator, US 69 Express Lanes Level 2 Traffic and Revenue Study, Kansas Department of Transportation. Mr. Begert designed the SP and origin-destination survey as part of the planning process for the 69 Express Lanes, a managed lane facility on U.S. 69 in Overland Park, Kansas. Mr. Begert designed the SP experiments and ran the logistic regression models used to generate VOT and VOR estimates for use in the regional travel demand model.

Technical Lead/Survey Coordinator/Analyst, Osceola Parkway Comprehensive Traffic and Revenue Report, Osceola County, Florida. Mr. Begert served as technical lead on the SP and origin-destination survey portion of the project, and additionally acted as an analyst assisting with travel demand model network development and calibration. Mr. Begert collected and analyzed existing and historical traffic data, and assisted in preparing client deliverables, technical memorandums and exhibits for coordination meetings with project partners.

Survey Coordinator/Analyst, I-105 and I-605 Comprehensive Traffic and Revenue Studies, Los Angeles County Metropolitan Transportation Authority (Metro), Los Angeles, California. Mr. Begert designed choice modeling experiments to estimate VOT and VOR of travelers on the 105 and 605 Express Lanes in Los Angeles. Being a managed lane project, the SP survey focused on the differences between single- and high-occupancy vehicle values of travel time. Mr. Begert managed a team of computer programming subconsultants hired to program and the online survey and oversaw survey outreach and administration.

Evan Bigos

Demographic/Economic Analysis

Mr. Bigos is a senior economist specializing in analyzing transportation, with responsibilities that include developing and applying economic and econometric models, conducting economic and financial feasibilities, and identifying fiscal impacts and funding requirements. Mr. Bigos is experienced with various economic modeling software, including IMPLAN and REMI, as well as forecasting and feasibility models. He has analyzed all major transportation modes and for both passenger and freight-related considerations.

Economist, Grand Parkway (Update), Houston, TX. Mr. Bigos conducted an economic impact analysis of the proposed Grand Parkway segments H and I1, located in northeast Houston (Montgomery, Liberty, Harris, and Chambers counties), utilizing REMI PI+ modeling software. Impact included construction and travel-efficiency related considerations.

Economist, I-14 System Existing and Future Conditions, TX. Mr. Bigos compiled, analyzed, and presented the major existing I-14 corridor socioeconomic and freight data, including population, employment, real GRP, industry clustering, freight tons and value by county and by route density.

Economist, Presidio Regional Freight Mobility Plan, Presidio, TX. Mr. Bigos compiled a freight profile for the seven-county Presidio region in west Texas using data from IHS Transearch, and the BTS' TransBorder freight databases and conduced an economic impact of such freight movements and supply chain relationships.

Economist, US 190/IH 10 Feasibility Study, TX. Mr. Bigos evaluated the economic feasibility (through a BCA) and the economic impacts (through a REMI application) of ten corridor alternatives, as well as various individual corridor sections, for the proposed US 190/IH 10 corridor improvement that traverses the width of Texas from El Paso to the Louisiana state line. Economic feasibility was conducted through a consumer surplus-based travel efficiency analysis, and the economic impacts were conducted for both the applicable efficiency benefits and the construction/operating expenditure activities.

Economist, Central Florida Expressway Authority (CFX), FL. Mr. Bigos updated a socioeconomic profile for the seven counties in Central Florida and the State; historical and forecast population, employment, gross regional products, etc. for travel demand modeling and forecasting traffic and revenue.

Economist, I-73 Economic Impacts, SC. Mr. Bigos updated economic impact estimates for I-73 South associated with travel-related benefits such as travel-time, vehicle operating, accident, and emissions cost savings (from 2016 estimates; however, REMI economic modeling was not conducted as per previous studies).

Economist, New Jersey Turnpike. Mr. Bigos utilized econometric modeling (regression analysis) to develop updated mid-term traffic demand growth forecast for the NJ Turnpike and Garden State Parkway, conducted for various corridor groupings for both commercial and passenger vehicles. Also, a quantitative and qualitative assessment of the socioeconomic data for New Jersey was conducted. Equations were updated and revised in 2023.

Education

BA - Economics, State University of New York at Buffalo, 2004

MBA - Rollins College, Florida, 2014

Technical Specialties

Economic Impact Analysis

Economic Feasibility

Input-Output Economic Modeling

Econometric Modeling

Financial Analysis

Return on Investment (ROI)

Benefit Cost Analysis (BCA)

Breakeven Analysis

Funding Analysis

Freight Analysis

Market Research

Socioeconomic Profiling/Forecasting

Transportation Policy

Impact Software

Impact Analysis for Planning (IMPLAN)

Policy Insight® (PI+) and TranSight, produced by Regional Economic Models, Inc. (REMI)

BEA's RIMS II

Economist, Maryland Transportation Authority (MDTA), MD. Mr. Bigos updated a socioeconomic profile for Maryland; a historical and forecast compilation of population, employment, gross regional products, etc. for purposes of use in travel demand modeling exercises and forecasting traffic and revenue.

Economist, I-5 Managed Lanes T&R, Orange Co., CA. Mr. Bigos reviewed underlying socioeconomic data developed by a subconsultant, as inputs into the toll travel demand modeling, and reviewed and edited the accompanying documentation.

Economist, I-95 Express T&R, Florida's Turnpike Enterprise (FTE), Miami, FL. Mr. Bigos reviewed underlying socioeconomic data developed by a subconsultant, as inputs into the toll travel demand modeling.

Economist, Pennsylvania Turnpike. Mr. Bigos utilized econometric modeling (regression analysis) to develop updated long-term traffic demand growth forecast for the Turnpike, conducted for various corridor groupings on the mainline, ticket, and barrier facilities for both commercial and passenger vehicles. Also, a quantitative and qualitative assessment of the socioeconomic data for Pennsylvania was conducted. An update in 2022 retained 2018 equations, but revised the underlying explanatory variables (e.g., regional socioeconomics and fuel, etc.). In 2023, the regression modeling was updated with an extended historical timeframe, and modifications to explanatory variables (e.g., inclusion on COVID-19-related indexes, etc.).

Economist, Hood River Bridge T&R, OR. Mr. Bigos reviewed underlying socioeconomic data and documentation developed by a subconsultant, as inputs into the toll travel demand modeling for a new Hood River Bridge.

Economist, Hampton Roads Express Lanes Network (HRELN) T&R, VA. Mr. Bigos reviewed underlying socioeconomic data and documentation developed by a subconsultant, as inputs into the toll travel demand modeling.

Economist, Illinois Tollway, IL. Mr. Bigos conducted a socioeconomic profile for the Chicago area and the Nation, including compiling various short-terms forecasts for real Gross Domestic Product, national unemployment, and inflation.

Economist, Michigan Tolling and Managed Lane Program. Mr. Bigos conducted a socioeconomic profile for the 83 counties, for consideration in identifying future tolling options. A TRANSEARCH-based freight analysis was conducted. And, economic modeling of identified tolling and management lanes options will be conducted.

Economist, Miami-Dade Expressway Authority (MDX), Miami, FL. Mr. Bigos updated a socioeconomic profile for Miami; a historical and forecast compilation of population, employment, gross regional products, etc.

Economist, SANDAG Binational Investment Grade T&R, Otay Mesa, San Diego. Mr. Bigos applied econometric modeling (regression analysis) and other techniques to forecast passenger and commercial vehicle demand across the Otay Mesa and San Ysidro crossings in Southern California. A TRANSEARCH-based freight analysis was also conducted to identify IHS Markit's demand forecasts for cross-border goods movements.

Timothy J. Boesch, AICP, PMP

Special Studies: Multimodal

Tim Boesch brings over 25 years of transportation planning experience in academic, public agency, and private consulting arenas. Over the course of his career, Tim has supported a wide range of services including downtown circulation / multimodal, transit corridor planning and preliminary design, parking planning, highway corridor analysis, traffic and toll revenue forecasting, development impact review, and policy development. He is skilled at providing expert testimony for public agencies, solid analytical analysis for transportation planning, and translating complicated material for stakeholder comprehension.

Project Staff, Loop 1604 and US 281 Tolled/Managed Lanes Level-2 Intermediate T&R Study, Alamo Regional Mobility Authority/TxDOT, San Antonio, Texas. Mr. Boesch was in charge of existing conditions review for multiple corridor tolling study. The work included review of hundreds of traffic counts, traffic class counts, origin-destination surveys, speed and delay studies, and traveler characteristics. Mr. Boesch wrote extensive existing conditions chapter based on data collected. Key staff was involved in review of stated-preference propensity to pay results.

Project Manager, Puget Sound Regional Aviation Study, PSRC (WSP). Mr. Boesch led a team of aviation professionals and urban planners examining the commercial and general aviation facilities, access, and markets in the Puget Sound Region. The team's work included analyzing drive time, multimodal, and freight access to existing airports, general aviation capacity and forecast, developing performance metrics, benchmarking to other state and regional plans, and outlining opportunities/constraints on the regional system.

Project Manager, Route 40 Northgate to Downtown Transit Improvements, Seattle Department of Transportation, Washington. Mr. Boesch is leading a team of transit planning and design professionals to help improve transit speed and reliability as well as multimodal mobility along the third busiest bus route in the greater Seattle Area. The planning stage of the project includes review of existing transit operations, traffic operations, parking, signals and ITS, modeling of no build and future options, development of projects, development of screening criteria, combining projects into scenarios, and working with agency stakeholders to make decisions to move forward. Once the package of projects is selected, he will lead the project into 30% design including channelization, signalization, pavement rehab, and civil design. Mr. Boesch's responsibilities include scope, schedule, and budget; reviewing all documents, communications with SDOT and King County Metro; and assisting with transit technical analysis.

Project Manager, Roosevelt to Downtown High Capacity Transit Study 2014-2016, Seattle Department of Transportation, Washington. Mr. Boesch served as the deputy project manager and key local staff for this high capacity transit study from the Northgate mall area of Seattle to downtown. The city's Transit Master Plan identified this corridor as needing additional service since the region's planned light rail system did not include key neighborhoods along the route as well as the major growth in South Lake Union, including the Amazon headquarters. The project examined existing transit, traffic, and alternative

Education

MS - Transportation, Massachusetts Institute of Technology, 1996

BS - Mechanical Engineering, The Ohio State University, 1991

Certifications

American Institute of Certified Planners (AICP) #024138 (2010)

Project Management Professional (PMP) #2932745 (2020)

Years of Experience

Total Years: 25
CDM Smith: 17

mode conditions, current and expected sociodemographics, and high crash locations. Rapid streetcar vs. bus rapid transit mode choice analysis was developed and executed with BRT being selected. Alternatives were developed for analysis including center and side running full BRT, basic King County Metro RapidRide service, and targeted investments designed to align with project budget. The study will result in a selected corridor alternative, conceptual 10% design, and key documents needed for SDOT to carry the project into final design.

Project Manager, Washington State Bike Facilities and Pedestrian Plan, Washington State Department of Transportation (WSDOT), Bellevue, Washington. Mr. Boesch served as project manager overseeing the development of Washington's statewide pedestrian and bicycle plan. Responsibilities included managing client contacts, quality control, staff coordination, participation in steering committee meetings, and public outreach.

Project Manager, I-10 Mobile Bay Bridge and Bayway T&R On-Call, Alabama Department of Transportation (ALDOT), Mobile, Alabama, 2021 to Present. Mr. Boesch is leading a team of technical experts and modelers in developing sketch level T&R forecasts for varying configurations of the proposed Mobile Bay Bridge and Bayway Project. In addition to fiscal responsibilities, he also accountable for on-time delivery and quality control.

Project Manager, TB Next Toll Study, Florida Turnpike Enterprise, Tampa, Florida. Mr. Boesch led a team of technical experts and analyst staff in developing sketch and planning level T&R studies for an elevated connector to I-275 and express lanes on I-275 and the Howard Frankland Bridge which are currently under construction. Analysis included reviewing and updating prior traffic counts, traffic speeds, land uses, tolling model, new project configuration and tolling points. The project resulted in a 10-year projection of expected toll transactions and revenue along with a report suitable for agency use. Mr. Boesch assisted in data analysis and review, Streetlight data analysis, report development, and meetings with agency and district staff. In addition to fiscal responsibilities, he also accountable for on-time delivery and quality control.

Technical Project Manager, Statewide Tolling Study, INDOT, Indiana. Mr. Boesch led a team of tolling and planning professionals looking at tolling several interstates in Indiana. Work included modifying a statewide model to be reactive to tolling, reviewing metropolitan models for tolling effects during peak periods, analyzing multiple staging scenarios for tolling implementation, and providing presentations to key client staff. Work also included researching existing documentation and best practices on understanding economic and equity impacts of tolling as well as tolling in the context of NEPA and other environmental processes.

Project Manager, SR 520 Investment Grade Traffic and Toll Revenue Update 2016, Washington State Department of Transportation, Washington. Mr. Boesch served as project manager for the update of traffic and toll revenue forecasts for the tolled SR 520 bridge. The project includes analysis of detailed actual tolling experience data, revised economic forecast, and revision of toll travel demand model to update 40+ year forecast reflecting tolling experience to date. The updated forecast is being used for state budgeting, meeting TIFIA loan requirements, monthly and quarterly T&R performance monitoring, and supporting financial feasibility of the project financial structure.

Ken (Dusty) Deitiker

Tolling Technology

With over 25 years of diverse experience, Dusty Deitiker offers a well-rounded background in toll systems implementation and operations. His skills and experience includes program management; project management; toll technology planning, design, implementation, operations, and maintenance; back room operations; systems integration; vendor relations; procurement; customer relations; business development; and client relations. Over his professional career, he has successfully managed or participated in toll systems projects for public and private entities across the U.S., helping to implement, upgrade, and maintain systems in Texas, Washington, New York, Rhode Island, New Hampshire, Illinois, Virginia, and Washington D.C. His aptitude in strategic visioning combined with a strong technical background fosters his ability to see the end goal, making him a positive asset to any team. As a former toll systems program manager for some of the most notable tolling projects in the nation, Mr. Deitiker has served as an advisor to the Rhode Island Department of Transportation, the New Hampshire Bureau of Turnpikes, New York Metropolitan Transportation Authority, the Metropolitan Washington Airports Authority, Illinois Tollway, and several other agencies. His project work spans the planning, design, and implementation of all types of tolling collection systems, including conventional tolling and open road tolling/all electronic tolling. In addition, he offers experience with variable pricing models, back-office systems, and violation/video enforcement systems.

Years of Experience

Total: 26

CDM Smith: < 1 yr.

Toll Technologist, Oregon Department of Transportation General Toll Consultant. CDM Smith is serving as the program manager and general toll consultant to ODOT's Office of Toll System Administration (OTSA). Under this contract, we are providing input, recommendations, in support of the new toll program, and will assist with contract procurement for the roadside and the back-office systems. In addition, we will lead the toll system development and design through the "go-live" process, hypercare (new customer onboarding process), and final acceptance of the toll project systems, and will provide support during the initial years of toll system operations. As a toll technologist for this project, Mr. Deitiker will help lead many of the tasks associated with this effort.

Project Manager, RhodeWorks Toll Facilities Consultant, Rhode Island Department of Transportation. This project will implement a statewide truck tolling program by installing ORT Toll Points, a shape-based classification systems with no embedded roadway sensors, across the state to collect toll revenue from large commercial vehicles that travel across all bridge structures. Acting as RIDOT's representative, Mr. Deitiker oversaw the preliminary civil design plan development, toll system requirements, design-build procurement, local environmental permitting, and completion of several environmental assessments for NEPA approval. In addition, his work included helping RIDOT implement new business rules, establish KPIs, review daily images, commission testing, analyze systems, conduct regular client meetings, and coordinate vendor meetings.

Deputy Project Manager, RITBA Newport/Pell Bridge E-ZPass Implementation, Newport, Rhode Island. As the deputy project manager for this complex project, Mr. Deitiker provided a variety of services. He assisted the Rhode Island Turnpike and Bridge Authority in the procurement of a new back office and lane system provider. This included guiding the development of the new E-ZPass policy and business rules, preparing the bid

package, selecting the vendor, and overseeing the contract. In addition, he ensured that the back office was brought online on time and within compliance of the specifications. In a parallel effort, RITBA implemented a new E-ZPass toll collection system for both cash and all-electronic tolling (AET) at its Newport/Pell Bridge toll plaza. Mr. Deitiker supported the initial needs assessment; evaluated the current toll system, operations, and business rules; developed a requirement and bid document package to procure a new toll system integrator; provided design oversight, factory testing, installation; and guided the final commissioning of the new TCS and E-ZPass system.

Project Manager, New Hampshire DOT, Bureau of Turnpikes On-Call Services, New Hampshire. Mr. Deitiker served as the project manager for two cycles of the statewide on-call toll services contracts. Through these projects, he assisted the NHDOT in overseeing the implementation of the Turnpike's new back-office system. He also assessed the technical and operational security of the toll system to identify potential high-risk issues and provide mitigation recommendations.

Project Manager, Bridges and Tunnels On-Call Toll Services, Metropolitan Transportation Authority and New York Triborough Bridge and Tunnel Authority. As the project manager, Mr. Deitiker managed the delivery of various tasks and services, including the *Henry Hudson Bridge AET Gateless Tolling Pilot Test* and the *Henry Hudson Bridge AET System Implementation*. As part of his role, he oversaw a range of activities, including selecting a toll system provider, conducting final testing, and commissioning the new system.

Project Manager, Bridges and Tunnels Facility Wide AET Conversion, Metropolitan Transportation Authority and New York Triborough Bridge and Tunnel Authority. Mr. Deitiker led the planning, design, and documentation processes in support of this AET conversion. This project was fast tracked by the Governor's office to include a complete conversion from conventional cash collection to AET. Working with the MTA, its toll systems integrator, and back-office provider, the conversion was implemented and in operation within 6 months.

Project Manager, Bridges and Tunnels Central Business District Congestion Pricing, Metropolitan Transportation Authority and New York Triborough Bridge and Tunnel Authority. As the project manager, Mr. Deitiker oversaw the technology assessment and RFP development for the congestion tolling roadside and middleware systems. Due to legislative and government related activities, this project was fast tracked, requiring that the team expeditiously develop a draft and final RFP for both the TCS and supporting infrastructure and review the legislation governing the congestion tolling program. In addition, the team drafted white papers and policy papers to aid in the design, interpretation, and development of the RFP, and ongoing decisions rendered by state designated parties and panels. Mr. Deitiker guided the data gathering activities to identify suggested road-side locations and implementation baseline, middleware, components, and relevant interface requirements of the proposed system, including new back office and third-party interfaces. In addition, he conducted a detailed cost analysis for the conceptual system design tolling components; a detailed analysis of best practices and emerging technologies in both the U.S. and abroad for large scale congestion pricing programs; and assisted in performing detailed risk assessments.

Vickie Dewey

Tolling Technology

With over 25 years of experience, Vickie is passionate about leveraging innovation and technology to advance transportation and rethink revenue systems for long-term sustainability. Based in California, she has worked with some of the nation's most progressive agencies to vision and plan, design, and execute new tolling and pricing systems; develop and implement revenue efficiencies; and prepare and improve our transportation systems for the future. Her expertise includes project and program management, system implementation, all-electronic and open road tolling conversions, procurement support, new technology deployments, risk management, stakeholder coordination, as well as new system testing and integration. Specializing in the next generation of priced systems, Vickie leads complex alternative delivery projects, assists new toll agencies with system development and integration, and facilitates vendor and construction coordination for toll system deployments.

Toll Advisor, I-15 Express Lanes, Utah Department of Transportation, Utah. As part of this express lanes deployment, UDOT sought an innovative approach to reduce occupancy violations, improve operational efficiencies, and increase revenues. Vickie worked closely with agency staff to achieve these goals in several areas. She developed and helped to deploy a smart phone-based pilot to declare and verify vehicle occupancy. Vickie developed business rules, policies, and technical approaches that would help guide upgrades to the existing system and aid the review and evaluation of future potential express lane corridors. In addition, she developed a concept of operations to support new back office and roadside upgrades. She also led the design and development of a new annual interstate performance report for the DOT.

Technical Toll Advisor, Next Generation Managed Lane Network, San Diego Association of Governments, California. As part of the effort to implement its *2021 Regional and Innovative Mobility Plan*, SANDAG partnered with several teams of innovators, entrepreneurs, and mobility experts to deploy innovative connector services. This effort resulted in a plan for a next generation managed lane network with connected and automated vehicle technology to improve the speed and reliability of transit and shared mobility services. Tasks involved a feasibility study, corridor selection, stakeholder outreach, environmental planning and documentation, and preliminary design. Vickie reviewed the possible corridors and provided toll interoperability details for the project planning.

Technical Consultant, Connected and Automated Vehicle Corridor, Michigan Department of Transportation, Michigan. In partnership with Cavnue, MDOT is developing the nation's first connected and automated vehicle corridor in Southeast Michigan. This corridor joins technology and infrastructure to improve safety, congestion, and accessibility for the surrounding community. As part of the project team, Vickie was involved in the early planning and preliminary engineering tasks. She assisted with defining needs to support operations, created the initial design concepts, and helped to identify roles and responsibilities necessary to achieve MDOT goals.

Education

BS, Mechanical Engineering, San Diego State University

Certifications

UCLA Project Management Certificate

Years of Experience

Total Years: 25+
CDM Smith: <1

Technology Researcher and Innovation Coordinator, Traffic Reduction Study, Los Angeles County Metropolitan Transportation Authority (LA Metro), California. LA Metro is exploring options to reduce traffic, including a potential pilot to implement congestion pricing to reduce traffic and reinvest in transportation services. Vickie researched various technology options, developed an implementation and testing plan for a pilot program, and worked on multiple report sections helping to ensure a cohesive and global approach.

Toll Advisor, Highway 427 High-Occupancy Toll (HOT) Lanes, Ontario Ministry of Transportation, Canada. Highway 427 serves as one of two HOT corridors in Canada and is designed to improve traffic flow, maximize highway capacity, and help manage congestion. This 9.6-mile corridor includes electronic tolling in both directions from south of Highway 409 to north of Rutherford Road. Working closely with the Ontario Ministry, Vickie helped to finalize the concept of operations, develop business rules, and write procurement documents, incorporating best practices from the U.S. for the agency's first all-electronic tolling (AET) HOT lane. She also outlined roles and responsibilities for the Ministry and developed risk mitigation strategies.

Innovation Advisor, Open Architecture Tolling, Oregon Department of Transportation, Oregon. This project developed a more comprehensive vision for ODOT's open architecture tolling system that enhances interoperability with other states and provides a variety of solutions and payment options. As part of this project, Vickie developed an open architecture hybrid toll solution that accounts for multiple transportation modes. She provided guidance on tolling technical solutions and the use of emerging technologies to support various payment methods.

Toll Team Leader, I-15 Express Lanes, Riverside County Transportation Commission (RCTC), California. Vickie managed the design of the new express lanes system, focusing on changes to existing RCTC policies and revisions to existing business rules. The program required coordination with multiple local toll agencies and seamless integration with SR-91 Express Lanes program. Vickie led the concept of operations development, procurement coordination, FHWA and Caltrans review coordination, RFP development, proposal scoring, DB and Toll vendor coordination, testing plan development, and toll system design reviews.

Technical Lead, SR 91 Express Lanes, Riverside County Transportation Commission, California. This project extends the 91 Express Lanes from the Riverside County/Orange County Line to I-15, providing the first tolled express lanes in Riverside County. As the technical lead, Vickie served several roles. She provided technical guidance for the development of toll gantry locations; wrote the project description and provided design input for tolling points; provided toll system cost estimates, participated in the value engineering workshop, and served as the technical representative for RCTC to the California Toll Operators Committee Technical Working Group. In addition, she provided oversight for collaboration between the design-build contractor and the toll vendor. She reviewed schedules, scopes of work, and contracts for both civil construction and the toll system, and she facilitated coordination between both contractors during design phase and construction. She also helped to coordinate between Orange County Transportation Authority and RCTC in developing business rules for and designing the extension of the existing facility, which may include a single back office.

Mustafa Kamal
Traffic and Revenue

Mr. Kamal has extensive experience in the development of traffic and toll revenue forecasts for proposed managed-lanes and toll roads. He is also experienced in travel demand modeling for large multimodal projects including regional planning studies, major investment studies, roadway improvements and corridor studies. He is experienced in developing demand forecasts using various software packages such as Cube/Voyager and TransCAD as well as Paramics simulation software.

Project Technical Leader, Modeling Task Leader, Mopac North (Loop 1) Express Lanes Investment-Grade Traffic and Toll Revenue Study, CTRMA, Austin, Texas. CDM Smith conducted this investment-grade traffic and toll revenue study for the Mopac (Loop 1) express lanes in Austin, Texas for CTRMA. The project limits were from W. Parmer Lane to Lake Austin Boulevard with an approximate length of 11.2 miles. Mr. Kamal served as PTL and lead modeler for this study and developed traffic and toll revenue forecasts for the express lanes. These forecasts were based on benchmarked models and behavioral data and included updated value-of-time (VOT) and reliability measures shown to have a significant impact on the demand for the Mopac North express lanes.

Senior Modeler and Project Technical Leader, Mopac South (Loop 1) Traffic Support for Environmental Analyses, CTRMA, Austin, Texas. CDM Smith was retained by CTRMA to provide environmental traffic support for the Mopac South corridor. The project limits for Mopac South are from Cesar Chavez Street to Slaughter Lane (approximately 8 miles). The project included providing traffic data for air quality and noise analyses, Mobile Source Air Toxics (MSAT), Regional Toll Analysis (RTA), Project-Level Toll Analysis (PLTA) and developing measures of effectiveness (MOEs) for five different alternative configurations for the corridor as well as the No-Build alternative. Mr. Kamal is serving as PTL and senior modeler for this project.

Senior Transportation Planner and Modeling Lead, Mopac South (Loop 1) and US 183 North Express Lanes, CTRMA, Austin, Texas. CDM Smith conducted sketch-level traffic and toll revenue studies for various alternative configurations for the Mopac South and US 183 North express lanes in Austin, Texas for CTRMA. The project limits for Mopac South were from Cesar Chavez Street to Slaughter Lane (approximately 8 miles) and from SH 45 North to Mopac (Loop 1) for US 183 North (also approximately 8 miles). These two express lanes corridors will connect to and extend the Mopac express lanes currently under construction in central Austin. Mr. Kamal served as the senior modeler for this project and also developed the conceptual toll feasibility of the proposed express lanes.

Senior Transportation Planner and Modeling Lead, Mopac North (Loop 1) Express Lanes Intermediate Traffic and Toll Revenue Study, CTRMA, Austin, Texas. CDM Smith conducted this intermediate traffic and toll revenue study for the Mopac (Loop 1) express lanes in Austin, Texas for CTRMA. The project limits were from W. Parmer Lane to Lake Austin Boulevard with an approximate length of 11.2 miles. Mr. Kamal served as the senior modeler for this project and also developed the conceptual toll feasibility of the proposed express lanes. The express lanes opened to traffic in the Fall of 2017.

Education

MS - Transportation Engineering, University of Wisconsin, Madison, Wisconsin, 1988

BE - Civil Engineering,

NED University of Engineering and Technology, Karachi, Pakistan, 1987

CDM Smith

SH 45 Southeast Investment-Grade Traffic & Toll Revenue Study, Austin Texas. Mr. Kamal served as senior modeler for this investment-grade traffic and toll revenue study for TxDOT. The SH 45SE toll road located south of Austin connects IH 35 to SH 130, and serves as part of a larger bypass around the IH 35 corridor. Responsible for calibration of the travel demand model used for this study, including the implementation of appropriate value-of-time (VOT) used in the model based on the results of stated preference surveys. The travel demand model used for this study was based on the CAMPO model and utilized specialized toll diversion process inside the traffic assignment routine to forecast toll traffic. An all-electronic toll collection system is used for this project and the model developed forecasts for auto and truck traffic for ETC and Video Tolling customers.

US 290 East Investment-Grade Traffic & Toll Revenue Study Modeling Review, Austin, Texas. Mr. Kamal performed an independent technical review of the traffic and toll revenue forecasts developed for the investment-grade study for the upgrade of the US 290E as a toll road. Performed detailed review of all aspects of the modeling performed for this study including model calibration and assumptions regarding various parameters used to develop traffic and toll revenue forecasts.

MCTRA 249 Tollway Investment-Grade Traffic & Toll Revenue Study, Houston, Texas. CDM Smith conducted this investment-grade traffic and toll revenue study for the Montgomery County Toll Road Authority (MCTRA). The tollway is a three-mile extension of the Tomball Tollway, into Montgomery County, located in northwest Houston. Mr. Kamal served as the senior modeler for this project responsible for developing traffic and toll revenue forecasts for the toll road.

TxDOT SH 249 Toll Road Investment-Grade Traffic & Toll Revenue Study, Houston, Texas. CDM Smith was retained by the Texas Department of Transportation (TxDOT) to conduct an investment-grade traffic and toll revenue study for the proposed extension to the State Highway 249 (SH 249) corridor. The proposed toll road is a further extension of the MCTRA SH 249 Tollway corridor into northwestern Montgomery County. Mr. Kamal served as the senior modeler for this project responsible for developing traffic and toll revenue forecasts for the toll road and providing support for rating agency reviews.

IH 35E Managed Lanes Investment-Grade Traffic and Toll Revenue Study, Dallas, Texas. CDM Smith was retained by TxDOT to conduct an investment-grade traffic and toll revenue study for the IH 35E managed lanes project. The traffic and toll revenue estimates from this study were used to successfully close on a $285 million TIFIA loan for this project in November 2016. Mr. Kamal served as the senior modeler responsible for developing traffic and toll revenue forecasts as well as providing support for rating agency reviews. The managed lanes opened to traffic in Spring 2017.

SH 183 /SH 114/ Loop 12 Managed Lanes Investment-Grade Traffic and Toll Revenue Study, Dallas, Texas. CDM Smith was retained by TxDOT to conduct an investment-grade traffic and toll revenue study for the managed lanes along SH 183, SH 114 and Loop 12 in the vicinity of DFW Airport. Comprehensive data collection for this project included traffic counts, speed and delay data, as well as OD and SP surveys. Mr. Kamal served as the senior modeler. He also participated in meetings and presentations to Fitch rating agency in support of a TIFIA loan application for this project.

Laurent Lin, EIT

TIFIA Support/Risk Analysis

Mr. Lin's academic experience spans a wide array of planning capabilities within the transportation industry, including traffic engineering operations, transportation economics, urban planning, and GIS application. He is familiar with programing languages CamL, Mathematica, Python, and MATLAB. He is also skilled in traffic engineering programs CORSIM, Highway Capacity Software (HCS), and Synchro Studio.

Modeler, Loop 1 - MoPac South Express Lanes, Central Texas Regional Mobility Authority (CTRMA), Austin, Texas. The MoPac South Project involves the application of the NEPA process to develop improvement alternatives for the 8-mile Loop 1 MoPac Expressway corridor in Austin, Texas metropolitan area. I updated the roadway and transit networks of the travel demand model from Capital Area Metropolitan Planning Organization (CAMPO) in TransCAD. Mr. Lin then used the regional four-step model to develop new model runs and to evaluate project impact in documents such as: Regional Toll Analysis (RTA), Mobile Source Air Toxics Analysis (MSAT) and Project Level Toll Analysis (PLTA).

Traffic Engineer, Bee Cave Interchange, CTRMA, Austin, Texas. This project evaluates the impact of the MoPac South Project in Austin, Texas, on forecast traffic volumes using the Bee Cave Road interchange. Mr. Lin developed a CORSIM traffic model to evaluate one of the build option (Option 2C). Then, he analyzed the different outputs to produce performance measures such as queues and level of service.

Modeler, IH 35E Managed Lanes, Dallas, Texas/ SH 249, Texas Department of Transportation (TxDOT), Houston, Texas. These projects are Comprehensive Traffic and Toll Revenue Study. Based on the information about current and future background projects, Mr. Lin updated the base and future networks on Cube.

Analyst, Midtown Express T&R Study, TxDOT, Dallas, Texas. The project is a Comprehensive Traffic and Toll Revenue Study focusing on SH 183/SH 114/Loop 12 Managed Lanes (Midtown Express) in Dallas, Texas. Mr. Lin oversaw gathering information about current and future road projects, so I could update the networks in Cube. He assisted the team in summarizing the data collected using tools such as R and Excel Power Queries. He also, edited and ran the scripts in CUBE to calibrate the models. The outputs were analyzed with tools like select links runs and screenlines. Finally, he participated in producing the Traffic and Revenue numbers and wrote a chapter of the project report.

Modeler, SH 249 MCTRA T&R Study, Houston, Montgomery County Toll Road Authority (MCTRA), Texas. This project is a Comprehensive Traffic and Toll Revenue Study of SH 249, MCTRA portion in Houston, Texas. Based on the information about current and future background projects, he updated the base and future networks on Cube.

Modeler, Hampton Roads Bridge-Tunnel, Virginia Department of Transportation (VDOT), Norfolk, Virginia. This project consists in the addition on a high occupancy tolled tunnel to the existing I-64 bridge-tunnel linking Hampton and Norfolk, Virginia. A queue builder tool was introduced to the models and gave to each segment of the roads (our route and the main competitor), specific parameters that defines their own VDF

Education

ME – Transportation Engineering, Texas A&M University, 2016

ME – Civil Engineering, Ecole Spéciale des Travaux Publics, France, 2015

Registration

Engineer-in-Training: Texas 56725

Computer Skills

Traffic Engineering: Synchro, CORSIM, HCS

Travel Demand Model: Cube, TransCAD

Programming: Python, R, CamL, MATLAB, Visual Basic

Other Software: ArcGIS, AutoCAD

Languages

Fluent: French, English

Conversational: Spanish, Chinese, German

curves (responsible for queues and highlight bottlenecks and spillbacks). Mr. Lin oversaw experimenting this queue builder and the calibrating of the base year model.

Modeler, Gordie Howe International Bridge, Michigan Department of Transportation (MDOT), Detroit, Michigan. This project is an update from a previous study, except that this time, calibration was done by our team and not a sub-contractor. A cross-border project raises numerous challenges such as conversion rate, coordination between agencies and crossing processes at the customs. Mr. Lin was in charge of gathering information about current and future road projects, so he could update the networks on TransCAD. He assisted the team by developing automation tools to help manage the outputs and calibrate the travel demand models.

Planner, Burnet Road Corridor Study, City of Austin, Austin, Texas. Burnet Road is a 5-mile urban corridor in Austin, Texas. The contract includes both design and planning for this project. Mr. Lin was in charge of the planning and traffic sections of the analysis which consist in: a traffic projection memorandum, a safety analysis memorandum, a traffic operations memorandum and a PHB warrant study memorandum.

Planner, Horizon Boulevard Census TAZ Development, TxDOT), El Paso, Texas. Horizon Boulevard is a 10-mile study corridor in El Paso, Texas. Data about current and future roadway, commercial and residential developments were collected in the region. Mr. Lin summarized and updated the socio-demographic data input for the travel demand model. The outputs of the model are then used to develop traffic projections.

Planner, Freight Bottleneck Analysis, South East Texas Regional Planning Commission (SETRPC), Beaumont, Texas. On-call task to identify truck bottlenecks and to measure truck performance in the Beaumont region. A year worth of 15-min speed and volume data were studied using R.

Planner, Census TAZ Development, South East Texas Regional Planning Commission (SETRPC), Beaumont, Texas. Follow-up work from previous studies to develop the model inputs for the regular 5-year cycle of the model for submittal to TxDOT. The models consist of the three counties around Beaumont, Texas (Jefferson, Hardin and Orange counties) and facilitate air quality modeling in this area that used to be non-attainment until recently. The base year 2016 was updated with 2013 travel demand model output, census data and satellite images. The forecast year 2045 includes socio-demographic data such as household numbers, type of employment and income per household.

Planner, Laredo MTP 2045 Update, Laredo Metropolitan Planning Organization, Laredo, Texas. In order to update the Metropolitan Transportation Plan for the year 2045, socio-demographic data including household numbers, type of employment and income per household were forecasted. First, the base year 2013 were updated using census data and satellite images. Then, growths were modeled regarding the information collected from local authorities. Additional intermediate data were evaluated for the years 2018, 2030 and 2040.

Traffic Engineer, Burnet Road Corridor Study, City of Austin, Austin, Texas. Burnet Road is a 5-mile urban corridor in Austin, Texas. I developed the Synchro model to analyze corridor performance and evaluate intersection design alternatives. Based on this study, recommendations on traffic operations and design were suggested to the design team.

Yandan Lu, AICP

Data Collection/Analysis

Dr. Lu specializes in travel demand modeling related to toll studies and actively explores innovative methodologies to improve model quality and enhance understanding of travel behavior under tolling situation. She is proficient in toll diversion behavior study at both planning and mesoscopic simulation level, including T&R estimates, demand calibration, scenario analysis, and queue accumulation analysis. She has a strong background in software programming and masters Python to perform statistical analysis and data post-processing. Besides, Dr. Lu has extensive research on land use and transportation interaction, urban freight planning, machine learning approaches on travel mode choice studies, and agent-based modeling (ABM).

Analyst, MoPac North Express Lanes Comprehensive Traffic and Toll Revenue Study, Texas. CDM Smith conducted a comprehensive T&R analysis for the Loop 1 North Express Lane corridors. Dr. Lu took the challenge to study the queue accumulation pattern on the general-purpose lane. This study is crucial because only when the model accurately evaluates the congestion level on the general-purpose lane, Express Lane demand can be reasonably estimated.

Project Technical Leader, Illinois Tollway ON TO 2050 Model Update, Northeastern Illinois. An Illinois toll diversion model update to align with CMAP's ON TO 2050 travel demand model. Dr. Lu took the role of project technical leader. She implemented multiple innovative methods, such as queue accumulation, travel time reliability, and two-level toll choice behavior, to enhance the model's ability to estimate toll facilities' transactions. Besides taking the lead on developing essential technical components, she facilitated the project manager on scheduling, quality control of technical work, and team communication.

Lead Modeler/Analyst, Comprehensive-Level T&R Study of the Osceola Parkway, Osceola County Government, Osceola County, Florida. Dr. Lu led the modeling efforts to incorporate the latest socioeconomic data, utilize StreetLight data to refine O-D movement, calibrate travel demand, and perform toll scenario analysis and sensitivity analysis.

Lead Modeler/Analyst, Wekiva Parkway T&R Forecasts, Florida's Turnpike Enterprise, Lake and Seminole Counties, Florida). This study aimed to develop a T&R forecast for the Wekiva Parkway project from Fiscal Year 2017 through Fiscal Year 2050. Dr. Lu led the modeling efforts, including calibrating trip table with observed traffic counts, forecasting toll T&R, performing a risk analysis and scenario analysis.

Lead Modeler/Analyst, T&R Study for Dulles Toll Road, Washington DC. CDM Smith undertook a fully updated comprehensive/Investment Grade T&R study for Dulles Toll Road (DTR). Dr. Lu led the T&R modeling efforts, including running the latest MWCOG travel demand model, modeling the toll diversion behavior in this region, calibrating a base-year model, toll scenario analysis, and sensitivity analysis.

Lead Modeler/Architect, Modeling Queue Accumulation in Travel Demand Models, CDM Smith R&D. Dr. Lu developed a comprehensive queue accumulator program in

Education

PhD, Urban Planning and Policy, University of Illinois at Chicago, IL, 2009

MS, Traffic Information Engineering and Control, Northern Jiaotong University, China, 2002

BS, Information Engineering, Northern Jiaotong University, China, 1999

Years of Experience

Total Years: 12
CDM Smith: 6

Certifications

American Institute of Certified Planners (AICP)

Honors/Awards

Dissertation Fellowship Award, Lincoln Institute of Land Policy, 2007 (Nation-wide competition)

George Krambles Scholarship, University of Illinois at Chicago, 2007

Distinguished Graduate Scholar, University of Illinois at Chicago, 2007-2004

Python language and integrating it into Cube Voyager. She also validated the queue accumulator process against empirical speed and queue data.

Ridership Forecasting with STOPS for Transit Project Planning. Dr. Lu attended this 3-day training offered by NTI/FTA and know how to apply STOPS to forecast transit ridership and perform scenario analysis.

Lead Data Analyst, Combining Travel Demand Model with R programming for IL Tollway System-Wide Toll Sensitivity Analysis, Northeastern Illinois. Dr. Lu utilized R Shiny to develop a user interface to exhibit toll sensitivity shown in a travel demand model. With a single interface, users could view T&R toll sensitivity for individual or grouped plazas by facility type, time period, plaza type, etc.

Lead Data Analyst, R programming for Illinois Tollway System-Wide INRIX Speed Data Analysis, Northeastern Illinois. Dr. Lu used R program to analyze INRIX speed data and estimate the travel time reliability revealed by the speed data.

Lead Modeler/Architect, Incorporating Toll Diversion Algorithm in Dynamic Traffic Assignment, CDM Smith R&D. This research effort aimed for a higher quality of T&R forecast for a managed lane with dynamic tolling or traffic rerouting from construction activity. Dr. Lu leads this R&D effort, including developing diversion algorithm in dynamic traffic assignment, scenario analysis, and final report preparation.

Lead Modeler/Analyst, MOT Impact Analysis on Eden Spur: Using Dynamic Traffic Analysis (DTA), Northeastern Illinois. Dr. Lu led the modeling and analysis effort for the Edens Spur lane closure impact study. During the first effort in 2010, Dr. Lu researched and developed a DTA model to study the queue length and travel delay caused by the phasing of a lane closure. Our client Illinois Tollway Authority was very pleased with the estimate since it was close to the observed delay. Tollway requested the same impact analysis in 2017 for its construction plan on the same corridor occurring in 2020.

Lead Modeler/Analyst, SR 826, Palmetto Expressway East-West Corridor from I-75 to I-95 / Golden Glades, Florida. This study evaluated the traffic and toll revenue potential of SR826/Palmetto East-West express lanes in Miami-Dade County for a planning purpose. Dr. Lu tested various modeling strategies and applied the most reasonable solution to reflect travelers' toll diversion behavior. Dr. Lu also performed trip table calibration, T&R forecast, toll sensitivity test, and results analysis.

Lead Modeler/Analyst, Northwest Parkway T&R Study, Colorado. This comprehensive study developed T&R for Northwest Parkway associated with two scenarios with and without the NW Parkway extension and Jefferson Parkway as tolled facilities. Dr. Lu constructed the travel demand model, including toll diversion algorithm design, model calibration, OD survey incorporation, sensitivity analysis, and scenario analysis.

Lead Modeler/Analyst, Columbia River Crossing T&R Study, Washington & Oregon. Joined efforts between Oregon and Washington DOTs to provide tolled Interstate 5 bridge between Portland and Vancouver, Washington. Dr. Lu was the lead modeler. Responsibilities include running the four-step model, toll travel demand model calibration, toll sensitivity test, weekend model development. Dr. Lu also develops a Monte-Carlo simulation model to provide insights on mode shift, route diversion, trip suppression, and shift in departure time due to toll on the bridge, using stated preference survey results.

Abril Estefania Matysek, PE

Demographic/Economic Analysis

Ms. Matysek's experience spans a wide array of planning capabilities within the transportation industry, including traffic engineering operations, transportation planning and traffic and toll revenue forecasting. Her technical skills include extensive knowledge in conducting traffic analysis of freeways, tolled facilities and arterial networks and traffic simulation of large networks. Abril is experienced in Vissim (recognized as one of the world's leading traffic planning tools and a simulator of mobility as a service and connected and autonomous vehicles), Synchro, and ArcGIS.

SH 249 Comprehensive Study, Houston, TxDOT, Toll Operations Division. Ms. Matysek provided a variety of transportation planning tasks for this study, which was part of an on-call Traffic & Revenue contract. Such tasks included summarizing traffic count, origin-destination, and speed data for use in the calibration of the base year model. Ms. Matysek also played a key role in the writing of the report for this study.

SH 31 Traffic Analysis and Planning Study, Tyler, TxDOT. Ms. Matysek served as the engineer/analysist for the SH 31 study in Tyler, Texas. Such work included analyzing and summarizing traffic data, developing existing conditions balanced profiles, identifying growth trends from travel demand models and preparing a traffic projections memorandum to then perform an operations analysis for the corridor using Synchro and VISSIM.

Horizon Boulevard (FM 1281) Corridor Master Plan, El Paso, TxDOT. As part of this study, Ms. Matysek assisted with the traffic data collection program, analyzing the traffic count data and developing an existing conditions balanced profile for the corridor to use for modeling purposes, as well as analyzing the need for signalization at major intersections. Ms. Matysek was also part of the public involvement process for this study.

US 67 Corridor Master Plan, West Texas, TxDOT. As part of this study, Ms. Matysek assisted by analyzing existing conditions and preparing traffic projections along the corridor. She also performed an operational analysis along the corridor using Synchro and VISSIM in order to create concepts which would improve any failing intersections. These concepts were included as part of the final US 67 Corridor Master Plan. Ms. Matysek was also part of the public outreach and involvement for this study by helping create maps, presentations, and using her fluency in Spanish to better convey the project goals to the residents of the project area.

Existing Toll 49 System T&R Monitoring Support and Proposed Segment 6 Environmental Support, Tyler, NET RMA. Ms. Matysek assists in summarizing traffic and revenue trends along the existing segments of Toll 49 as part of the T&R monitoring support task. For the Segment 6 environmental support, Ms. Matysek coded six different alignments into future year Cube networks and summarized the outputs, including traffic, speeds, and level-of-service, along each alignment.

IH 35E Managed Lanes Phase II Analysis, Dallas, TxDOT. As part of this study, Ms. Matysek reviewed background projects in the future year Cube networks for Phase II of the

Education

BS – Civil Engineering, Texas A&M University, 2017

Languages

Spanish

Certifications

Texas PE 144680

Software

Microsoft Office, Synchro, VISSIM, CUBE, ArcGIS

IH 35E managed lanes. She also led the writing of two memorandums as part of this study which analyze traffic and revenue forecasts under different tolling scenarios.

Las Americas Bridges Maintenance of Traffic (MOT) Implementation, Puerto Rico, USACE. Ms. Matysek supported the traffic analysis for this study which modeled three interchanges and four signalized intersections in Puerto Rico for existing conditions and seven MOT scenarios in VISSIM for AM and PM peak hours. This study will support the traffic management implementation plan during construction.

Connected Automated Vehicle (CAV) Modeling, Marysville, Ohio DOT. Ms. Matysek assisted in the traffic analysis for this study which included approximately 36 miles along US 33 in Marysville. The analysis involved modeling and analyzing the traffic performance for 10 scenarios with different CAV penetration rates along the study corridor using VISSIM. This study will support ODOT's decision making for long term improvement as CAV technology evolves.

Rockwall and Kaufman County Toll Road Sketch Level Traffic and Revenue Study, Rockwall and Kaufman Counties, NET RMA. As part of this study, Ms. Matysek summarized traffic count and origin-destination data within the study area and reviewed/coded background projects and the proposed corridor in the future year Cube networks. Ms. Matysek also led the development of the report for this study.

US 69 Express Lanes Level-2 Traffic and Revenue Study, Kansas City, KDOT. For the traffic and toll revenue analysis portion of this study, Ms. Matysek created a balanced profile for existing and future years to use as inputs in VISSIM to determine volume-delay function curves to use in the travel demand models. Additionally, Ms. Matysek led the development of the future year build volumes and provided support for the operational analysis of the corridor for existing, future No-Build, and Build conditions using VISSIM modeling software. Ms. Matysek also led the development of the report for this study.

Toll 49 Comprehensive Traffic and Toll Revenue Study, Tyler, NET RMA. As part of this study, Ms. Matysek developed and analyzed the data collection program for traffic count, speed, and origin-destination data to better understand existing travel patterns and for use in the base year model calibration. She also led the development of the report for this study.

SH 87 Regional Feasibility Study, Port Arthur, TxDOT. Ms. Matysek developed balanced volume diagrams for use in the study area intersection analysis. She created and calibrated existing AM and PM peak hour Vissim models of the study area and modeled varying alternatives at the main SH 87/SH 82 intersection for the alternative intersection analysis in effort to reduce congestion.

Naveen Mokkapati, PE

TIFIA Support/Risk Analysis

Mr. Mokkapati began his professional career in 2007 as a transportation analyst and modeler responsible for traffic and revenue research and analysis and financial feasibility studies. He is primarily responsible for conducting analyses for various toll studies for the North Texas Toll Authority (NTTA).

Mr. Mokkapati offers clients a keen ability to view projects from an end-user perspective. During his tenure with CDM Smith, he has developed tools to improve work processes, including a comprehensive monitoring database designed to track various travel characteristics of the NTTA system on a weekly basis. This information enhances the calibration and validation process necessary for traffic and revenue studies.

Mr. Mokkapati's experience includes working with state agencies, tollway authorities, metropolitan planning organizations, and others on projects from sketch level traffic and revenue studies to highly detailed investment grade traffic and revenue studies that are used for selling bonds.

Mr. Mokkapati's academic success provided him a solid foundation for building technical skills. He received a Kimley-Horn graduate scholarship in recognition of this outstanding academic record. During this time, he worked for about two years as a graduate research assistant at the Texas Transportation Institute where he learned about mathematical modeling techniques and as a result, became interested in predicting future travel behavior through understanding existing system conditions.

Project Technical Leader/ Transportation Modeler, NTTA System Comprehensive Traffic and Toll Revenue Study. Mr. Mokkapati led the project to develop traffic and revenue estimates on NTTA System. The major responsibilities include calibration of base year model, reviewing demographic updates done by independent economist, developing traffic and revenue estimates and conducting sensitivity analysis to understand the impacts of various input assumptions.

Transportation Modeler, Kalamazoo Turning Movements. Mr. Mokkapati created a template to estimate turning movements on 50 intersections in Kalamazoo, Michigan for base and future years. The inputs were gathered and summarized from field traffic counts, MDOT historical count database and Kalamazoo travel demand model. The outputs from the turning movement analysis were used in Synchro to evaluate Level of Service at the 50 intersections during peak periods for base and alternative future year scenarios.

Transportation Modeler, Ohio River Bridge Crossing Study. Mr. Mokkapati used KYOVA model to calculate future year traffic forecasts on the proposed Ohio river bridge crossing. The traffic forecasts for existing crossings were also estimated for both build and no-build scenarios. The existing 2017 counts were collected and summarized on the competing routes US 52, WV 527, 106 and I 64. The results include traffic forecasts for two bridge alternatives.

Transportation Modeler, North Carolina Intersection Volumes Forecasting. Mr. Mokkapati used Rocky Mount, NC model to calculate traffic growth rates that were then applied to observed 2017 AADT. Trip diversion rates were also calculated using the model

Education

MS – Civil Engineering, Texas A&M University, 2007

B. Tech – Civil Engineering, Indian Institute of Technology, Madras, 2005

Registration

Professional Engineer: Texas, 2012 (License #107570)

Years of Experience

Total Years: 18
CDM Smith: 16

and applied to existing 2017 AADT. Some modifications to the model were implemented to improve traffic routing in the study area. These modifications are documented in the forecasting report.

Task Manager, Ohio 25k Statewide Model Integration with MPO Models. Mr. Mokkapati integrated Ohio statewide model and six MPO models in CUBE platform. The major responsibilities include: disaggregate the statewide zones into smaller MPO zones and remove and replace statewide network with MPO network. The updated trip table and network are used for running highway assignment.

Analyst, VMT Estimation on NTTA Facilities. Mr. Mokkapati estimated Vehicle Miles traveled (VMT) on the NTTA toll roads (extending about 90 miles) in Dallas-Fort Worth region. The VMT estimates are computed by creating a balanced daily traffic schematic using the transactions data on the toll gantries and traffic counts collected on non-toll ramps.

Analyst, Fort Bend County Toll Road Authority Systemwide Comprehensive Level Traffic &Toll Revenue Study. Mr. Mokkapati assisted in developing traffic and revenue estimates on Fort Bend parkway and West park toll roads. The key tasks involved reviewing the model output from future year travel demand model and estimating traffic and revenue for various alternatives using toll assignment algorithms and conducting risk modeling to understand the high and low estimates for traffic and revenue. Other responsibilities include evaluating toll sensitivity, understanding the impact of various assumptions like revenue recovery, value of time, ramp-up, revenue days, opening date, etc.

Modeler, Chisholm Trail Parkway Investment Grade Study Update, Dallas, Texas. Mr. Mokkapati assisted in reviewing and updating traffic and revenue estimates on Chisholm Trail Parkway. The key changes incorporated in this updated study included adoption of mobility plan 2035, updated independent economic review, and revenue recovery assumptions.

Analyst, Dallas North Tollway Ramp Alternatives, Texas. Mr. Mokkapati evaluated the traffic and revenue impacts of the DNT ramp modifications between PGBT and Parker Road. The responsibilities included forecasting the future year traffic for existing and modified ramp configurations using CDM Smith traffic assignment model, assessing the reasonableness of changes in traffic patterns based on traffic counts, and recommending the revenue effects.

Analyst, President George Bush Turnpike Fourth Lane Revenue Impacts, Texas. Mr. Mokkapati evaluated the traffic and revenue impacts of converting the fourth lane on PGBT to HOV lane under different HOV toll scenarios. Responsibilities included forecasting the future year traffic on the HOV lane and recommending the revenue effects.

Analyst, NTTA System Monitoring, Texas. Mr. Mokkapati closely monitored the NTTA System transactions and revenue to look at the significance of impact of various market dynamics like 2008 credit crunch, $4 gas price, electronic toll collection implementation, addition of new NTTA roadway capacity, among others.

Analyst, All-ETC Paper. Mr. Mokkapati reviewed literature related to state of the practice on the electronic toll collection systems (cashless systems) across the world.

John P. Muñoz

TIFIA Support/Risk Analysis

Mr. Muñoz is a practice leader for Public-Private Partnerships (P3), supporting clients in navigating the complex world of P3 project delivery. Mr. Muñoz has successfully procured five P3 contracts with construction values totaling over $8.2 billion, and four design build contracts with construction values totaling over $5.7 billion. Mr. Muñoz has over 20 years of P3 project delivery experience leading technical, financial and legal advisors in the completion of P3 procurements making him a leading expert in the commercial and technical aspects of P3 project delivery. Mr. Muñoz has over 25 years of state government experience moving up the ranks of the Texas Department of Transportation (TxDOT).

Advisor, Nevada Department of Transportation, Program Management Services. Mr. Muñoz is the Project Task Leader for a $2.1M contract providing assistance with capital programming including prioritizing, funding and developing innovative and traditionally delivered projects. He has worked with NDOT to identify projects in NDOT's overall program for alternative or traditional delivery, setting target dates for letting based on the status of project development and an analysis of the timing and amounts of available funding.

P3 Advisory Services. Mr. Muñoz was the Project Manager for a $1.8M contract leading financial, legal and other technical advisors in the completion of a variety of tasks for NDOT including review of an unsolicited proposal for improvements along the I-80 corridor with a cost of over $400M and completing a comprehensive update to NDOT's P3 procedures manual.

Advisor, Illinois Department of Transportation P3 Advisory Services. Mr. Muñoz is the Project Manager for a $11.1M contract leading financial, legal and other technical advisors in the completion of a variety of tasks for IDOT including development of a P3 procedures manual and performing feasibility analysis for the potential bridge bundling and highway lighting P3 projects.

Advisor, Virginia Office of Public Private Partnerships (VAP3), Transform 66 P3 Project. Mr. Muñoz assisted VAP3 by performing an audit of the best value proposer for the Transform 66 P3 Project. This audit is required under Section 56-560(E) of the Code of Virginia which requires a review and report on the public costs and potential liabilities to which taxpayers would be exposed. The "audit" was completed in December 2016.

Advisor, Pennsylvania Department of Transportation (PennDOT), Rapid Bridge Replacement Project. Mr. Muñoz has successfully assisted PennDOT in the development of commercial and technical procurement documents for an approximately $900 million, 558-bridge replacement project with a 25-year lifecycle maintenance obligation to be delivered using the availability payment P3 delivery method. The procurement has reached commercial close on January 8, 2015 and financial close occurring March 18, 2015.

Advisor, CNG Fueling for Transit Agencies Partnership Project, PennDOT, Pennsylvania. Mr. Muñoz provided assistance in the development of commercial and technical procurement documents for an approximately $126 million, design-build-

Education

BA – Business Administration, University of Texas at Austin, 1986

Certifications

Certified Public Accountant

Certified Internal Auditor

Honors/Awards

2011 Luther DeBerry Award recipient for outstanding contributions to the field of transportation in Texas presented by the Texas Transportation Institute and TxDOT

Years of Experience

34

Years with Firm

9

Office Location

Austin, TX

finance-maintain-operate P3 project. The project reached commercial close on June 20, 2016.

Advisor, Texas Department of Transportation (TxDOT), Programmatic Support. Mr. Muñoz has been extensively involved with the updating of programmatic contract documents, developing guidelines and commercial and technical documents that utilizes lessons learned from previous procurements as well as experiences in other jurisdictions. Mr. Muñoz has also prepared multiple white papers to help supplement training activities for personnel who are implementing P3 and design-build contracts. Mr. Muñoz also worked on the standardization of the cost estimating process across projects through development of an Excel-based model and instruction guide for cost estimators.

Advisor, Southern Gateway Managed Lanes Project, Texas. Mr. Muñoz provided advice to TxDOT on a design-build procurement for a $550 million project. He provided advice on the procurement and technical documents.

Procurement Manager, South Padre Island 2nd Causeway Project, Texas. Mr. Muñoz served as the Procurement Manager for a P3 toll bridge to a resort area in south Texas. Mr. Muñoz led the legal and financial procurement teams in the initial procurement document development of this project. This project is now being developed by the Cameron County Regional Mobility Authority.

Advisor, Alaska Department of Transportation and Public Facilities (ADOT&PF), Knik Arm Crossing Project. Mr. Muñoz provided advice to ADOT&PF on a design-build procurement and obtaining a $350 million TIFIA loan for a $900 million bridge project. He provided advice on the TIFIA loan process, the design-build with long-term capital maintenance procurement process including document development, negotiation and selection.

Deputy Director, Innovative Financing/Debt Management Office, Texas Department of Transportation, Austin, Texas. Mr. Muñoz successfully led the financing legal and technical advisory teams in the delivery of design-build and P3 projects for TxDOT's innovative project delivery program. Under his leadership, Texas successfully developed over $13 billion in P3 and design-build projects and procured multiple alternatively delivery projects using a variety of financing mechanisms. Mr. Muñoz also led a team that secured over $3.3 billion of TIFIA loans for 5 projects and over $1 billion of private activity bonds (PABs) for three projects. As a leader of procurements for innovatively delivered projects, Mr. Muñoz' responsibilities included confirming the availability of federal, state and local funding needed to advance projects; reviewing and approving drafts of documents for commercial reasonableness and consistency with the direction of executive leadership.

I-35E Project. Mr. Muñoz successfully led a team of financial, technical and legal advisors in negotiating terms and conditions for financial and technical documents for the delivery of this design-build project. Mr. Muñoz worked closely with North Central Texas Council of Governments in identifying and determining the viability of alternative funding sources, completing the financial analysis including the development of an approach and project cost and benefit projections and summarizing other qualitative benefits and payback period and for a $20M TIGER grant application to be used for the credit subsidy in support of a TIFIA loan. The $1.4B DB project was completed in May 2017.

Ybette M. Ochoa, PE

Traffic Engineering/Traffic Operations

With broad experience across the U.S., Ms. Ochoa offers over 13 years of professional experience serving in leading roles for complex projects with departments of transportation, toll authorities, and transit agencies. Understanding that today's challenges require data-driven, modern solutions founded on a blend of technical skill and a long-view of technology and mobility options, her work spans a wide variety of transportation planning, traffic operations, and intelligent transportation systems (ITS) projects. Her technical skills include extensive knowledge in database management; conducting signal timing studies; transit mobility planning and operations; airport landside planning, traffic analysis of freeways; tolled facilities and arterial networks; and traffic simulation of large networks. Ybette is proficient in Vissim (recognized as one of the world's leading traffic planning tools and a simulator of mobility as a service and connected and autonomous vehicles), HCS, Synchro, SimTraffic, ArcGIS, and Microsoft Office.

Traffic Engineer, US 183/MoPac Interchange Study, Central Texas Regional Mobility Authority (CTRMA), Austin, TX. This interchange study includes 12 interchanges, located along 3 miles of US 183 and 6 miles on MoPac. Ms. Ochoa developed and calibrated Vissim models for existing conditions and two future scenarios that included different managed lane configurations. Ms. Ochoa also developed a database and excel spreadsheets to automate modeling output post-processing to optimize the process and provide results more efficiently.

Project Technical Lead, Traffic Analysis of Removal of Signal on Route 9, Middletown, CT, Connecticut DOT. Ms. Ochoa is leading the traffic analysis for this study which involves an interchange and six signalized intersections along Route 9 and Main Street. The analysis involves multimodal modeling the existing corridor, 2025 No Build with and without commitments, and three build alternatives for years 2025 and 2045 in Vissim. The build alternatives propose to remove the exiting signals along Route 9 to eliminate the recurrent AM and PM peak period congestion, measuring the operation impact of these improvements on Main Street. This study will support the selection of the preferred build alternative.

Technical Specialist Reviewer, Rehabilitation of Heroes Tunnel, New Haven, CT, Connecticut DOT. Ms. Ochoa is responsible for technical guidance, quality assurance/quality control of the operation and safety analysis. The study includes modeling 26 Vissim models representative of multiple scenarios and design years, to determine the impact of the improvements of the Heroes Tunnel along Route 15 and the Route 15 /Whalley Avenue interchange.

Lead Traffic Engineer, Randall Road at US 20 Planning and Environmental Linkages (PEL) Study, Kane County, IL. Ms. Ochoa is guiding the development of the traffic analysis for existing and future conditions. Ms. Ochoa is responsible for technical guidance, quality assurance/quality control, internal meeting coordination, client presentations, and report writing.

Lead Traffic Engineer, Las Americas Bridges Maintenance of Traffic (MOT) Implementation, Puerto Rico, USACE. Ms. Ochoa led the traffic analysis for this study which modeled three interchanges and four signalized intersections for existing conditions

Education

MS – Civil Engineering
University of Idaho, Moscow, Idaho, 2007

BS – Civil Engineering,
Universidad Nacional San Antonio Abad del Cusco, Perú, 2004

Registration

Professional Engineer:
Texas

Languages

English
Spanish

Honors/Awards

ITE Amy Polk Young Engineer of the Year, 2010

and seven MOT scenarios in Vissim for AM and PM peak hours. This first phase of the study relied on traffic volumes estimates based on historic counts. In the second phase of the study in 2021, all Vissim models were updated with traffic counts collected in October 2021, also additional constructions scenarios and strategies to mitigate construction impact were analyzed in Vissim. This study will support the traffic management implementation plan during construction of the Las Americas Bridges.

Lead Traffic Engineer, US 69 Traffic and Revenue (T&R) Level 2, Kansas DOT, KS. Ms. Ochoa led the development of existing, no build and build microsimulation models of 11 miles of the US69 corridor to support TDM process for T&R Level 2 analysis for the proposed tolled express lanes. The team developed T&R forecasts for the proposed US 69 express lanes that will be used to analyze financial feasibility. Her responsibilities were technical guidance, quality assurance/quality control, and internal meeting coordination.

Lead Traffic Engineer, Connected Automated Vehicle (CAV) Modeling, Marysville, Ohio DOT, OH. Ms. Ochoa led the traffic analysis for this study which included approximately 36 miles along US 33 in Marysville. The analysis involves modeling and analyzing the traffic performance for 10 scenarios with different CAV penetration rates within the study corridor. The project includes the development of a Simulation Model User Guide as a stand-alone document such that another agency could use as guidance to develop and run a CAV simulation project. This study will support ODOT decision making for long term improvement as CAV technology evolves.

Lead Traffic Engineer, I-94 & US 127 Interchange Study, Michigan Department of Transportation, MI. Ms. Ochoa led the traffic analysis of the I-94 & US 127 Interchange to assess the most effective interchange configuration for the traffic operations in year 2045. Analysis involved using Vissim to model and analyze the operations performance under the following scenarios: existing, no build, and five build scenarios in peak periods.

Lead Traffic Engineer, Grand Parkway Traffic Analysis, Texas Department of Transportation, Houston, TX. When fully built, the Grand Parkway will be a 184-mile encircling the greater Houston metropolitan area. As part of the comprehensive traffic study, Ms. Ochoa led the traffic analysis of a 5-mile section of Grand Parkway. The study measured the impact of the proposed alternatives to alleviate the known recurrent congestion along Grand Parkway between I-45 and Kuykendahl Road. She performed the traffic analysis in Vissim; it included modeling existing, 2025 and 2035 no build, and five build scenarios in the evening peak.

ITS Engineer, Connected Vehicle Pilot Study, Illinois State Toll Highway Authority (ISTHA). As ITS Engineer, Ms. Ochoa supported the design, implementation, and evaluation a connected vehicle deployment for the Illinois Tollway. The small-scale deployment has been designed, procured, and is currently being installed on 10 miles of I-90. Task will continue to evaluate performance, oversee integration into TMC, and evaluate potential applications.

ITS Engineer, US 67 Corridor Master Plan, Texas Department of Transportation-El Paso District, Texas. Ms. Ochoa developed the ITS Needs Assessment report and the ITS master plan that included solutions and recommendations such as advanced warning systems (animals, weather conditions, road geometry, and speed), dynamic message signs, accessibility to power and communications utilities, and smart parking system.

Parth Patel, EIT

Data Collection/Analytics

Mr. Patel is a transportation modeler and analyst for CDM Smith. Mr. Patel's experience spans a wide array of transportation planning and traffic engineering capabilities within the transportation industry including urban transportation planning, transportation/land use modeling, traffic engineering operations, characteristics of traffic, public transit planning and operations, applied regression analysis, and GIS application. His experience with CDM Smith includes working on T&R studies for toll road and managed lane projects, travel demand modeling, transportation planning, and traffic forecasting. He offers skills in travel demand model development, calibration and validation, network development, data collection, analysis, and development of project reports.

Transportation Modeler/Analyst, Grand Parkway Projects, Houston, Texas Department of Transportation (TxDOT), Texas. Grand Parkway projects included Grand Parkway System Segments D through I Comprehensive Level T&R study and Grand Parkway Segment B Level 2 T&R Study. As a modeler and analyst, Mr. Patel oversaw the preparation of traffic count data collection program and coordinating with sub consultants regarding the traffic count program. He gathered information about current and future projects to update the networks on CUBE. He reviewed and updated base year network, prepared sub consultant agreements, identified routes to collect speed and delay information and coordinated with other staffs on various tasks. Mr. Patel also led the preparation of T&R estimates and summarizing sensitivity tests.

Transportation Modeler/Analyst, Grand Parkway Project Miscellaneous Analysis, Houston, TxDOT, Texas. Mr. Patel provided technical support on the various requests from TxDOT on the Grand Parkway corridor. He analyzed toll rate escalations and prepared toll rate memorandum to suggest toll rates for the year 2020 on the Grand Parkway corridor. He took a lead on expansion trigger analysis, which included analyzing congestion patterns, prepared balanced profiles to compare Volume/Capacity (V/C) ratios for various alternatives, ran travel demand models, prepared presentation for technical review committee and presented in front of the committee and prepared draft memo summarizing the analysis.

Transportation Modeler/Analyst, Illinois Statewide Travel Demand Model (ILSTDM) Development, Chicago. Mr. Patel was responsible for developing centroid connectors for the internal and halo zones. He worked on to clean up the network geography based on comments received from the prime consultant. He also worked on developing control totals for the socio-economic data in the model by pulling Woods and Pooles, and ACS Data, and calculating growth rates.

Analyst, IH 35E Express Toll Lanes Comprehensive Level T&R Study, Dallas, Texas. This project is to update T&R for IH 35E express lanes. As an analyst, Mr. Patel summarized and reviewed traffic counts which includes analyzing hourly profiles, comparing trends and creating balanced profile to check reasonableness of counts. He conducted travel time runs on project corridor to understand speed variation between general purpose lanes and express lanes and analyzed speed data from INRIX. Mr. Patel

Education

ME – Transportation Engineering, University of Texas at Arlington, 2016

BE – Civil Engineering, Gujarat Technological University, India, 2014

Registrations

Engineer-in-Training: Texas, 2017 (#60941)

Certifications

Autodesk Certified Professional: AutoCAD 2014, (#00351085)

Years of Experience

Total Years:

CDM Smith: 3

Computer Skills

Travel Demand Model: TransCAD, Cube

Traffic Engineering: VISSIM, HCS

Other Software: ArcGIS, SAS, AutoCAD

took a lead to update project report which includes creating tables and figures, coordinating with GIS staff to prepare maps and write up of different sections.

Transportation Modeler/Analyst, I-495 and I-270 Express Toll Lanes Level 2 T&R Study, Maryland. This project included a Level 2 T&R study for a potential tolled build alternative for the I-495 & I-270 P3 program. Mr. Patel performed network coding for the base and future years to update the regional roadway network including coding of the managed lane project configuration into the regional network, reviewing distances, capacities, and speed. He also assisted in sensitivity model runs. As an analyst, Mr. Patel was instrumental in the creation of a set of reliability factors used to simulate drivers' response to uncertainty on the roadway by analyzing variance in travel times, aided in balancing and preparing a traffic count profile, VMT trend analysis, setting up spreadsheet to analyze model output and compare different sensitivity tests, creation of tables for project report and work with GIS support staff to develop graphics for project report.

Transportation Modeler, Ohio Statewide Model, Ohio Department of Transportation, Ohio. This task is to provide support to Ohio Department of Transportation staff to update the statewide travel demand forecasting model network and trip tables to include the MPO specific networks and trip tables. As a modeler, Mr. Patel reviewed work and instructions completed by former staff, completed the integration of the MPO networks into the statewide travel demand model which requires review of MPO network to identify external TAZs, renumbering of nodes and TAZs to align with statewide network, identifying links and TAZs to replace and stitching of the network at the cordons after integration of MPO network. He also created the user guide for integration of the MPO network. As per the client's request, Mr. Patel helped tagging the Annual Average Daily Traffic (AADT) from previous statewide network using TransCAD and Cube.

Analyst, 2017 Lane Closure Guide, Illinois State Toll Highway Authority, Illinois, Chicago. The Illinois Tollway Lane Closure Guide is a 300-plus page reference document used by Tollway maintenance staff and contractors to evaluate when lane closures may be implemented with the least impact to existing traffic. Mr. Patel helped to analyze IL-390 segment which require a large multistep database to process hourly plaza transaction data, hourly mainline traffic volumes and other data sources.

Transportation Modeler/Analyst, System Comprehensive Traffic and Toll Revenue Study, North Texas Tollway Authority (NTTA), Dallas, Texas. This project is a Comprehensive Traffic and Toll Revenue study of NTTA system. As a transportation modeler and planner, Mr. Patel assisted on various tasks of the project. He collected GPS based speed data and analyzed travel time characteristics. Mr. Patel helped review the 2040 Metropolitan Transportation Plan (MTP) and update the future year roadway networks in CUBE regarding the background projects. He helped to identify locations to collect traffic counts and travel time data, analyzed change in demographics, converted trip tables from TransCAD to Cube, Summarized NTTA transaction data to calculate ZipCash recovery rate. He performed travel demand model run and toll sensitivity analysis. He also worked on to update and finalize T&R report.

Analyst, Grand Parkway System Segments D through I Comprehensive T&R Study, Houston, Texas. The project is a comprehensive T&R study of Grand Parkway system segments D through I. Mr. Patel helped update roadway networks in Cube. He summarized transaction data and reviewed line diagrams and report.

Sai Sirandas

Special Studies: Emerging Technologies

Mr. Sirandas has over 12 years of experience in transportation data analysis, travel behavior forecasting, and traffic operations. He specializes in developing and applying macroscopic travel demand models, mesoscopic and dynamic traffic assignment (DTA) models, and microscopic traffic simulation models. Mr. Sirandas has recently joined CDM Smith's Toll and Revenue Regional Team as a modeling and simulation expert to support the traffic and revenue practice and adjacent areas including transportation modeling, revenue analysis, and Road User Charging (RUC). Mr. Sirandas enjoys working on multimodal projects set in complex and challenging environments with elements such as prioritized transit, walking and biking, and ridesharing. Additionally, he has built models that capture the effects of Autonomous Vehicles (AVs) and Connected Autonomous Vehicles (CAVs) on travel behavior and traffic flow. He has presented on these topics at conferences including the TRB Applications Conference, TRB Simulation and Modeling Workshop, ITE Annual and Western District Meetings, and PTV User Group Meetings. Mr. Sirandas is proficient in a range of modeling software including Bentley CUBE, PTV Visum, PTV Vissim, PTV Vistro, Synchro/SimTraffic, and relevant programming interfaces such as Python.

Transportation Analyst, Revenue Alternatives Analysis, Sustainable Transportation Funding Strategies, Nevada DOT. Mr. Sirandas is conducting analysis to support the identification of alternative revenue mechanisms and baseline funding strategies for Nevada DOT. This role is part of a broader effort initiated by Nevada DOT and its partner agencies to establish a stakeholder working group, education and outreach campaign, and a technical study of alternative and sustainable transportation funding strategies.

Transportation Modeler, C-470 Express Lane Toll Revenue Forecasting, Colorado Transportation Investment Office (CTIO), Colorado. Mr. Sirandas is supporting the travel demand modeling and revenue analysis for the Investment Grade Traffic and Revenue Study of the C-470 corridor in Denver, Colorado. He is assisting in the development, calibration, and validation of the CUBE travel demand model, followed by a toll sensitivity analysis and revenue forecasting analysis.

Transportation Modeling Lead, I-80 Design Alternatives Assessment (DAA), San Francisco Bay Area Metropolitan Transportation Commission (MTC), Contra Costa and Alameda Counties, California. Mr. Sirandas led the transportation modeling and traffic analysis work, collaborating with a multidisciplinary team, to identify and evaluate design alternatives for the I-80 corridor in the San Francisco Bay Area. The alternatives spanned nine corridor-wide strategies aiming to reduce overall congestion in the corridor, improve transit and carpool operations, and serve more people in fewer vehicles. He led the development of a Dynamic Traffic Assignment (DTA) model to evaluate strategies such as HOV Lane Access Restrictions, Hours of Operation, and Express Lanes Conversions. Mr. Sirandas leveraged his experience with MTC's Activity-Based Model (Travel Model One) to develop travel demand and mode-shift information for the DAA strategies, and prepared traffic information for the revenue analysis. He also led the technical documentation and coordinated meetings with MTC, Alameda CTC, and CCTA. Following up on the DAA study,

Years of Experience

Total: 12

CDM Smith: 0

Education

MS – Transportation Engineering, The Pennsylvania State University, 2012

BS – Civil Engineering, The Indian Institute of Technology, Kharagpur, 2010

Registration

Professional Engineer (PE): Washington (2015)

License #53244

Software Proficiency

PTV Suite (Visum, Vissim, Vistro)

Bentley CUBE

Python, SQL

Linguistic Languages

English, Hindi, Telugu

Mr. Sirandas successfully led the traffic components of a winning proposal to deliver engineering services for advancing the HOV Lane Access Restrictions alternative through the Caltrans project development and environmental study phases.

Transportation Modeling Lead, State Route 239 Project Approval and Environmental Documentation (PA/ED), Contra Costa and Alameda Counties, California. Mr. Sirandas served as a technical lead on the Project Approval and Environmental Document for the State Route 239 Project in eastern Contra Costa County, eastern Alameda County, and western San Joaquin County. This project will provide a new four-lane highway from State Route 4 at Marsh Creek Road to Interstate 580/205 and will ultimately improve the area's transportation network by providing an alternate route for the heavy commute traffic that currently impacts the community of Byron and improving access to the local airport. Mr. Sirandas led the development and calibration of a large mesoscopic DTA model (using Visum software) that can capture the traffic re-routing effects of the proposed new SR 239 facility across a large subregional area. This model has helped the team develop project alternatives and refine the proposed geometry of the SR 239 project.

Transportation Modeling Lead, Portola Valley Evacuation Study, Portola Valley, California. Mr. Sirandas led the traffic modeling and operations analysis for an Evacuation Traffic Management Plan for the Town of Portola Valley, a small unincorporated town located on the eastern slope of the Santa Cruz Mountains. Mr. Sirandas developed a DTA model in the Visum software platform for the evacuation scenario analysis to identify evacuation route capacities, bottlenecks, and evacuation times. The DTA analysis evaluated various roadway closure and traffic control scenarios. Based on the analysis, roadway network improvements and traffic management strategies were identified.

Transportation Modeler, Transportation Authority of Marin (TAM) Travel Demand Model Update, Marin County, California. Mr. Sirandas served as a technical analyst to help develop an updated and simplified version of Bay Area MTC's Travel Model Two with refined land use, transportation networks, and tour-based trip generation components. The model development focused on simplifying the process for adding traffic analysis zone detail, modifying land use inputs, and quantifying inter-regional travel. The goal of this effort was to make the model easier to use for local applications in Marin County, while maintaining its current complexity.

Transportation Modeling Lead, Autonomous Vehicle (AV) and Connected AV (CAV) Modeling and Simulation, San Francisco, California. Mr. Sirandas served as a technical lead on the company's internal research team to evaluate the potential effects of AV and CAV adoption on travel demand and traffic flow. He developed both macroscopic and microscopic simulation models that incorporated the driving behavior and traffic flow characteristics of AVs and CAVs at various adoption rates, based on research outcomes from the European CoEXist project. Mr. Sirandas formulated guidelines for modeling aspects of AVs and CAVs, including deterministic driving behaviors, Vehicle-to-Vehicle (V2V) communication and Vehicle-to-Infrastructure (V2I) communication, using the Vissim simulation modeling platform. Findings from this research aim to guide future decision makers considering mixed fleet scenarios involving AVs and CAVs. These findings were presented at the 2019 ITE Western District Annual Meeting.

Xiaoran Wang

Traffic and Revenue

With a background in planning and transportation engineering, Ms. Wang spent the last four years in the express lane and tolling industry. She has expertise in traffic data analysis, socio-economic studies, traffic forecasting, and pricing strategy.

Transportation Planner, NTE Level 2 T&R Study, Texas Department of Transportation (TxDOT), Texas. Ms. Wang processed multi-year Streetlight data and observed transaction data in support of traffic model calibration. She studied O-D pattern on NTE corridor and the entire highway system in Dallas- Fort Worth Area. Ms. Wang also involved with socio-economic study, travel demand modeling and report writing for this project.

Transportation Planner, I-35 Traffic & Revenue Study, KDOT, Kansas. Ms. Wang conducted traffic data analysis for I-35 project in Kansas. Tasks including daily trip pattern analysis, seasonality analysis. She created build network using TransCAD which further used for Travel Demand Model.

Transportation Planner, Illinois Tollway Safety Study, Illinois Tollway, Illinois. Ms. Wang conducted descriptive analysis for Illinois Tollway safety study in 2023. The study including identify major crash area, analyze crash data and provide safety suggestions for the client. Ms. Wang created an interactive Power BI dashboard to show crash data on system interchanges and mainlane gantries. Identified the major crash locations and categorized the crashes into different categories.

Transportation Planner, I-5 Traffic & Revenue Study, Caltrans, California. Ms. Wang conducted traffic and toll revenue tasks for I-5 corridor. Including design of tolling plan, future year toll rate setting, VMT analysis, report creation.

Transportation Planner, I-405 Traffic & Revenue Study, LA Metro, California. Ms. Wang conducted data collection and data analysis tasks for I-405 corridor. Used third party data, Streetlight and Replica, to understand trip pattern on I-405 corridor.

Transportation Planner, FM 1314 Access Management Study, TxDOT, Texas. Ms. Wang analyzed Strava mobility data and Replica data, helped the project team understand pedestrian and biking trip characteristics in the region. She identified attraction points along the FM 1314 corridor, which needed further attention on safety and access management study.

Transportation Planner, Grand Parkway SH 99 Investment Grade Traffic & Revenue Study, TxDOT Toll Operations Division, Texas. Ms. Wang performed data analysis of ETC share and leakage on the entire Grand Parkway Segments in support of the Reliance Letter. Evaluated previous forecast versus current performance. She was a key member of writing the 2023 Relance Letter for the client.

Transportation Planner, I-14 Implementation Strategy Study, TxDOT, Texas. TxDOT is looking for traffic study for a potential 1000 miles interstate corridor. Ms. Wang used Replica, a third-party data platform, helped the team understand the existing trip pattern, the flow between counties and the potential traffic hot spot. She created flow map and 3-D map to illustrate the traffic analysis for the study area.

Education

Master of Engineering – Transportation Engineer, University of California, Berkeley, 2019

Bachelor of Engineering – General Layout and Transportation Engineering, Xi'an University of Architecture and Technology, China, 2018

Registration

Engineer in Training (Texas)

Certifications

Google Data Analyst Certificate, 2023

Software Languages

R programming

SQL

Lead Traffic and Revenue Analyst, I-77 Express Lane, Ferrovial, Charlotte, North Carolina. Ms. Wang conducted analysis to deeply understand trip patterns and customer characteristics. She updated bid-time forecast based on current performance, new policy, socio-economic changes, and network improvements. Her work demonstrated the increasing value of I-77 express lane, which helped the client make a larger investment in I-77 express lanes in 2020 and 2022.

Analyst, Texpress Lanes, LBJ&NTE Mobility Partners, Dallas, Texas. Ms. Wang analyzed the performances of LBJ and NTE express lane. She monitored construction impact in the area. The analysis helped the company identify risks and opportunities.

Analyst, Highway 407, 407 ETR, Toronto, Canada. Ms. Wang performed traffic and revenue forecast for highway 407 during the COVID-19 pandemic. Due to the high uncertainties, she developed sensitivity models to test different toll scenarios and economic scenarios. The analysis helped the board decide short-term tolling strategy.

Researcher, National Manage Lane Sentiment Study, Texas A&M University and Cintra, Austin, Texas. Ms. Wang conducted a survey, interview people in four different cities (Log Angeles, Miami, Washington DC and Dallas) to understand how Manage Lane is performing in the US. This study was presented at the 2021 Transportation Research Board annual meeting. Ms. Wang helped researchers and operators identify the challenge to quantify Manage Lane performances today. The team then proposed solutions for the Manage Lane Committee to measure performances of those projects with an open and systematical approach.

Justin R. Winn, PE, PMP

Tolling Feasibility

Mr. Winn is experienced with all modern methods of toll collection, including automatic vehicle identification, video tolling, cash toll collection, as well as single point and point-to-point collection. He has been involved in the generation of traffic and revenue estimates to be used as a basis for financing toll projects, both by private entities and public agencies. He currently serves as a project manager for various ongoing toll studies, offering clients experience with modern methods of toll collection, as well as traffic and revenue estimation for financing public and private-funded toll projects. He has developed toll feasibility analyses for a variety of proposed toll facilities in Texas, Oklahoma, Louisiana, Iowa and Ohio.

Project Manager, North Texas Tollway Authority Traffic Engineer Services. Mr. Winn is serving as project manager for on-call traffic and revenue support services including system monitoring, long-term traffic and revenue forecasts and short-term forecasts for budgeting purposes.

Project Manager, Oklahoma Turnpike Authority Traffic Engineer Services. Mr. Winn serves as project manager for on-call traffic and revenue support services including system monitoring, long-term traffic and revenue forecasts and short-term forecasts for budgeting purposes.

Project Manager, Harris County Toll Road Authority Traffic Engineer Services. Mr. Winn serves as project manager for on-call traffic and revenue support services including system monitoring, long-term traffic and revenue forecasts and short-term forecasts for budgeting purposes.

Project Manager, North East Texas Regional Mobility Authority Traffic Engineer Services. Mr. Winn serves as project manager for on-call traffic and revenue support services including system monitoring, long-term traffic and revenue forecasts and short-term forecasts for budgeting purposes.

Project Manager, I-49 South Traffic and Revenue Study, Louisiana. Mr. Winn served as project manager for the development of preliminary traffic and revenue forecasts for the proposed I-49 South toll highway between Lafayette and New Orleans, Louisiana.

Project Manager, East Texas Hourglass, Tyler/Longview Area, Texas. Mr. Winn served as project manager for ongoing traffic and revenue evaluation of the proposed East Texas Hourglass toll project connecting the Tyler and Longview metropolitan areas.

Project Manager, Ohio Toll Corridor Feasibility Assessment. Mr. Winn served as project manager for assessment of toll feasibility as a funding option for new projects in Ohio. Tasks included a review of standard practices and current experience around the country, development of a screening methodology for evaluating potential projects and completion of sketch level traffic and revenue forecasts for certain corridors.

Project Manager, Southern Dallas County Infrastructure Analysis, Texas. Mr. Winn developed assessment of existing and needed transportation infrastructure for the southern Dallas County area, including the cities of Dallas, Ferris, Hutchins, Lancaster and Wilmer.

Education

BS - Civil Engineering, Texas A&M University, 2003

MS - Civil Engineering, Texas A&M University, 2005

Registration

Professional Engineer: Texas, 2011 (#108964)

Project Management Professional, 2019

Years of Experience

Total Years: 20
CDM Smith: 17

TxDOT Precertification's

1.3.1 Subarea/ Corridor Planning

1.4.1 Land Planning/ Engineering

1.5.1 Feasibility Studies

1.6.1 Major Investment Studies

7.1.1 Traffic Engineering Studies

CDM Smith

Project Manager, SH 360 Sketch Level Traffic and Revenue Analysis, Texas. Mr. Winn monitored daily tasks and successfully kept the project on schedule and on budget, conducted quality assurance reviews, and developed a draft report for this sketch level traffic and revenue analysis in the Dallas/Fort Worth metropolitan area.

Project Manager, SH 170 Schematic Traffic and Sketch Level Traffic and Revenue Analysis, Texas. As the project manager, Mr. Winn monitored daily tasks and successfully kept the project on schedule and on budget, conducted quality assurance reviews, and developed a draft report.

Project Manager, Chisholm Trail Parkway Investment Grade Traffic and Revenue Study, Texas. As the project manager, Mr. Winn monitored daily tasks and successfully kept the project on schedule and on budget, conducted quality assurance reviews, and developed a draft report.

Project Manager, President George Bush Turnpike – Western Extension Investment Grade Traffic and Revenue Study, Texas. As the project manager, Mr. Winn monitored daily tasks and successfully kept the project on schedule and on budget, conducted quality assurance reviews, and developed a draft report.

Transportation Analyst, I-74 Corridor Improvement Study, Iowa. Mr. Winn assisted in the development of traffic and revenue forecasts for a proposed I-74 corridor improvement in the Quad Cities area of Iowa.

Project Manager, Southwest Parkway Investment Grade Traffic and Revenue Study, Texas. As the project manager, Mr. Winn monitored daily tasks and successfully kept the project on schedule and on budget, conducted quality assurance reviews, and developed a draft report.

Project Manager, SH 161 Investment Grade Traffic and Revenue Study, Texas. As the project manager, Mr. Winn monitored daily tasks, developed and monitored the budget, and developed the draft report.

Project Manager, North Texas Tollway Authority System Monitoring, Texas. As the project manager, Mr. Winn monitored daily tasks and successfully kept project on schedule and on budget, conducted quality control, and developed the draft report.

Transportation Analyst, North Texas Tollway Authority System Investment Grade Study, Dallas, Texas. This comprehensive NTTA System study was performed to estimate the traffic and revenue by taking into account impacts of key assumption changes such as toll rate increases, the economic recession, and the background regional mobility plan. As a transportation analyst, Mr. Winn assisted in developing a draft report.

Project Manager, Southwest Parkway-Chisholm Trail Parkway – Investment Grade Traffic and Toll Revenue Study, Tarrant and Johnson Counties, Texas. Mr. Winn served as project manager responsible for the evaluation of future traffic and toll revenue on the proposed Southwest Parkway-Chisholm Trail Parkway.

Project Manager, North Texas Tollway Authority System Monitoring, Texas. Mr. Winn served as project manager and chief modeler responsible for the ongoing monitoring of traffic and toll revenue on all NTTA System facilities. This project includes system reconnaissance, quarterly revenue estimate updates, and the production of a weekly NTTA dashboard.

Anteneh Yohannes, PE

Traffic Engineering/Traffic Operations

Mr. Yohannes is a transportation planning engineer with extensive experience as a traffic engineer, transportation planner, and traffic and revenue (T&R) analyst. He has contributed transportation engineering and planning knowledge to corridor and interchange studies, long-range transportation planning, managed lanes, and toll roads. His expertise includes data analytics, T&R analysis, micro- and mesoscopic simulation modeling, and travel demand modeling using TransCAD, TransModeler, CUBE, VISSIM, Synchro, and HCS, software.

Traffic and Revenue Analyst, MoPac North Level 3 T&R Study, Central Texas Regional Mobility Authority, Austin, Texas. Mr. Yohannes served as a T&R and data analyst. He monitored and analyzed traffic and revenue data for the MoPac North express lanes. He also assisted with the travel demand modeling effort to forecast long-term T&R projections and prepared technical figures and reports for client submittals and presentations.

Traffic and Revenue Analyst, I-405 Express Lanes Investment Grade T&R Study, Los Angeles, CA, LA Metro. Mr. Yohannes served as a Traffic and Revenue Analyst responsible for leading the data collection and analysis task for calibrating the I-405 Traffic and Revenue model. He also assisted in the development of a Stated Preference survey by which to understand the choice behaviors of travelers on this corridor. He assembled StreetLight OD data, traffic counts, travel time data, and adjacent toll facilities transactions to build a base case reflecting the existing traffic patterns. Mr. Yohannes also assisted in the future traffic and revenue forecasting.

Traffic Engineer, I-26 at I-95 Interchange Project, South Carolina Department of Transportation (SCDOT), Orangeburg, South Carolina. Mr. Yohannes served as a Traffic engineer in the development of TransModeler simulation models to provide current and future scenarios in order to make recommendations for roadway and interchange improvements that would support SCDOT's efforts to add capacity and improve safety.

Traffic Engineer, Route 9 Middletown Project, Connecticut Department of Transportation, Middletown, Connecticut. Mr. Yohannes provided technical support and reviewed VISSIM and Synchro scenario models.

Traffic and Revenue Engineer, Public-Private-Partnership (P3) project, Cintra US, Dallas, Texas. Mr. Yohannes served as Senior Traffic and Revenue Analyst for the T&R department of three major express lane projects in Dallas, TX – LBJ Express, North Tarrant Express, and North Tarrant Express 35W. He led the projects strategic pricing, traffic studies and modeling, preparing annual T&R budget, and long-term revenue projections.

Transportation Planner, Capital Area Metropolitan Planning Organization (CAMPO). Mr. Yohannes supported the development of CAMPO's long-range regional transportation plan. His responsibilities included working with consultants to develop CAMPO's regional travel demand and socioeconomic models.

Education

MS – Civil Engineering, University of Memphis, Memphis, Tennessee, 2014

BS – Construction Technology and Management, Addis Ababa University, Addis Ababa, Ethiopia, 2008

Registration

Professional Engineer: Texas, 146939

Gustavo A. Baez, P.Eng.

Baez Consulting, LLC

Traffic and Revenue

Gustavo A. Baez has extensive has 28 years of experience in dynamic pricing algorithm development, data analytics, toll feasibility studies, travel demand modeling, congestion pricing, risk analysis, and economic growth evaluation. He has participated in more than $25B in bond financing for toll projects in the USA. Gustavo has managed, directed, and evaluated toll projects for public entities such as NTTA, ArDOT, LaDOTD, CTRMA, Alamo RMA, NET RMA, TxDOT's TTA Division, the Hidalgo County RMA, SRTA, and OTA.

Baez Consulting, LLC, President, 2007 – Present

Responsible and project director for data analytics, traffic forecast, travel demand modeling, traffic simulation, transportation planning, traffic and revenue auditing, and dynamic traffic data analytics for several projects such as:

Traffic Forecasting Framework Project, Transportation Planning and Programming Division, Texas Department of Transportation, Austin, Texas. September 2021; End Date: October 2023
Mr. Baez supported developing a new framework, process and procedures to do traffic forecast within TxDOT to optimize the time frame to generate traffic forecast for project approval and construction. He researched the exiting SOPs influencing traffic forecast, the MOU between TxDOT and FHWA, the TIP and SIP process, and provided recommendations to incorporate them within the new traffic forecast framework.

I-35E, I-30, Midtown Express, and DFW Connector Managed Lanes Monitoring, Texas Department of Transportation, Dallas, Texas. January 2016; End Date: Ongoing
Gustavo is serving as a senior project manager evaluating and monitoring the I-35E, I-30, Dallas Fort Worth Connector (DFWC) and Midtown Expressway managed lanes corridors. The evaluation is based on databases from the LoneStar Data System, and second-by-second transactions from each gantry. He is analyzing the daily traffic data and performing traffic trend analysis for four managed lane facilities consisting of 34 gantries. The analysis included not only evaluating the traffic trend of the managed lanes but also the traffic trend of the general-purpose lanes for each managed lane corridor. Associated activities implemented to improve the operation of the managed facilities include: modified traffic operation information to optimize throughput or toll revenue incorporated into the dynamic pricing algorithm; customized decision-making tables to instruct managed lane operators to minimize speed reduction in the managed lanes; created computer programs in statistical packages and Excel to be able to summarize millions of transaction records produced by the managed lanes and general purpose lanes; developed a process to select the most optimum aggregation period in the dynamic pricing algorithm to optimize revenue considering the operation characteristics of the corridor such as peak-hour factor; truck percentage variations and managed lanes geometric configurations; selected the most appropriate AVI locations to summarize speed along the managed lane corridors; selected the most appropriate LoneStar general purpose lanes operation system locations to compare speed of the managed lanes with the general purpose lanes; created a data analytics system which allow to respond efficiently

Education

M.Eng. - Civil Engineering, University of Toronto, Canada, 1993

B. Eng. - Civil Engineering, Universidad Technologica de Panama, Panama, 1982

Registration

Professional Engineer: Ontario, Canada, #90219940

Expertise

Data Analytics

Travel Demand Modeling

Transportation Planning

Traffic Simulation

Feasibility Studies

Managed Lanes Analysis

Dynamic Traffic Algorithms and Predictive Models

Traffic and Revenue Forecast

Congestion Pricing

to questions from decision makers about the performance of the managed lanes; and created a monthly summary report for each of the managed lanes corridors.

North Texas Tollway Authority System (NTTAS), North Texas Tollway Authority, Dallas, Texas, January 2001; End Date: Ongoing
Gustavo is supporting the evaluation of the daily traffic for the North Texas Tollway Authority System composed of nine operating toll facilities and one hundred and three toll gantries. He analyzed historical toll traffic data and performed traffic trend analyses on the performance and operation of the nine toll facilities. He has used several statistical techniques such as time-series trend algorithms, box-plot techniques, and coefficient of variation process to optimize the operation and revenue collection of the toll facilities. These statistical techniques have been used to forecast short-term revenue; correlate special events with revenue leakage; evaluate revenue risks and estimate expected forecast error.

Oklahoma Turnpike System, Oklahoma Turnpike Authority (OTA), August 2006-Present.
Mr. Baez has monitored and evaluated data analytics for the OTA System since 2006. The Oklahoma Turnpike System consists of eleven urban and inter-urban turnpikes: the Turner Turnpike, the Will Rogers Turnpike, the H.E. Bailey Turnpike, the Indian Nation Turnpike, the Muskogee Turnpike, the Cimarron Turnpike, the Chickasaw Turnpike, the Cherokee Turnpike, the John Kilpatrick Turnpike, the Creek Turnpike, and Kickapoo Turnpike. More than fifty percent of toll revenue collected by the OTAS depends on the number of commercial vehicles using the inter-urban turnpikes. The commercial vehicles traffic is correlated to the national and international trade (Mexico-USA-Canada). Using data analytics techniques, Baez Consulting has developed predictive tools to correlate macro-economic attributes and traffic in the OTAS.

North Texas Tollway Authority System (NTTAS) Origin and Destination (OD) Data Collection, North Texas Tollway Authority, Dallas, Texas, 2019.
Mr. Baez coordinated the collection of OD data for one hundred locations in the vicinity of the NTTAS using the state-of-the practice data sources from StreetLight and data analytics algorithms to summarize the information. The OD data was used to validate the travel demand model to update the NTTAS traffic and toll revenue trends.

Wilbur Smith Associates (WSA), Vice-President, 2000 – 2007

In charge and responsible for all WSA traffic and toll revenue projects in Texas and Oklahoma. Managed the traffic and revenue contracts for NTTA, TxDOT, Oklahoma Turnpike and private concessionaries. Evaluated the feasibility of many toll projects in Texas and Oklahoma. Major highlights are:

North Central Texas Council of Governments (NCTCOG), Principal Transportation Planner, 1994-2000

Responsible for travel demand modeling for major investment studies, mobility plans, geographic information system (GIS) modeling applications, and travel demand model development. He supported the TxDOT District creating traffic forecast and turning movements for several projects in the Dallas Fort Worth region.

Michael S. Bomba, Ph.D.

Demographic/Economic Analysis

Professional Experience

- Bomba Consulting, LLC. Managing Member. 2013-Present.
- Research Professor, Department of Logistics & Operations Management, G. Brint Ryan College of Business, University of North Texas, 2016-Present
- Research Scientist and Associate Director, Center for Economic Development and Research, University of North Texas, 2013-2016
- Research Associate and Adjunct Professor, Center for Economic Development and Research, University of North Texas, 2008-2013
- Alliance Transportation Group, Inc., Senior Associate, 2007-2013
- Bomba & Associates, Inc., Principal, 2004-2007
- Research Associate, Center for Transportation Research, University of Texas at Austin, 2003-2005
- Independent Consultant, 1998-2004
- Applied Economics Consulting Group, Inc., Data Analyst, 1999-2000
- Hicks & Company, Environmental Planner. 1994-1998

Education

- Ph.D., University of Texas at Austin, Public Policy
- M.S., University of Texas at Austin, Community and Regional Planning
- B.A., University of Texas at Austin, Economics and Government

Additional Courses

- Training on GTAP computable general equilibrium model, Purdue University, 2017

BACKGROUND AND EXPERIENCE

Dr. Michael S. Bomba has more than 25 years of professional experience, which has been a blend of practice and research. During his career, he has led or contributed to approximately 165 professional projects and research studies in the areas of regional transportation planning, applied demography, freight transportation, economic development, socioeconomic impacts analysis, and environmental planning.

A significant component of Dr. Bomba's practitioner work has been to assess the reasonableness of metropolitan planning organization's (MPO's) socioeconomic data at the zonal level for various traffic & revenue and toll road planning studies, adjusting the data as necessary. In a support role to the project engineers, he has worked on more than 50 toll road studies over the past 25 years. To date, these inputs have been used to successfully sell or obtain approximately $9.0 billion of municipal bonds and federal loans (e.g., TIFIA, etc.) for green field projects, major facility upgrades, or to refinance existing municipal bonds. These efforts have included participation in presentations to rating agencies (Moody's, S&P, and Fitch) in New York City and presentations to major institutional investors (e.g., BlackRock, PIMCO, Vanguard, etc.) in New York City, Philadelphia, and Boston. The tolled projects financed and constructed using Dr. Bomba's socioeconomic forecasts have been in the Austin, Texas region and include SH 130 (Segments 1 through 4); SH 45 North, Loop 1, US 183-A, US 290 East, US 183 South, SH 45 Southeast, and the US 183 North Managed Lanes (currently under construction).

Select Demographic Updates for Traffic & Revenue Studies

- 2023 Brazoria Expressway Extension Traffic & Revenue Study. 2023. Brazoria County (Texas) Toll Road Authority.
- 2023 Central Texas Regional Mobility Authority Demographic Update. 2023. Central Texas Regional Mobility Authority.
- 2022 Central Texas Turnpike Project Update. 2021-2022. Texas Department of Transportation.
- Calcasieu Parish I-10 Bridge Study. 2022-2023. Louisiana Department of Transportation (under contract with a consortium led by Acciona).
- 2020 Central Texas Regional Mobility Authority Demographic Update. 2019-2020. Central Texas Regional Mobility Authority.
- Loop 1 North/Loop 1 South Managed Lanes. 2018-2019. Central Texas Regional Mobility Authority.
- Cibolo Parkway Project Investment Grade Study. 2017-2019. Cibolo Turnpike LP.
- U.S. 183 North Managed Lanes Investment Grade Study. 2018. Central Texas Regional Mobility Authority.
- 2017 Central Texas Turnpike Project Update (Level II study). 2017. Texas Department of Transportation.
- US 290 Direct Connectors Investment Grade Study. 2016. Central Texas Regional Mobility Authority.

Michael S. Bomba, Ph.D.

Bomba Consulting, LLC

Professional Organizations

- North American Competitiveness Working Group, University of California at San Diego, 2023-Present.
- North American Strategy for Competitiveness (NASCO). Board Member, 2018-Present.
- Transportation Research Forum. 2023-Present.
- Transportation Research Board – National Research Council, National Academies of Science, Engineering & Medicine – 1999-Present

  Committee Memberships:

  - International Trade and Transportation – AT020 (Immediate Past Chair — 6 years)
  - Freight Systems Group Executive Committee – AT000 (Member - 6 years)
  - Agricultural and Food Transportation - AT030 (Past Member — 3 years)
  - Intermodal Freight Terminal Design and Operations – AT050 (Past Member and Secretary – 11 years)
  - Ports and Channels – AW010 (Past Member – 9 years)
  - North American Working Group, George W. Bush Institute. Member. 2016-2023.
- American Planning Association – American Institute of Certified Planners (AICP) #24082, 2009-2013

Select Demographic Updates for Traffic & Revenue Studies (continued)

- LBJ East Managed Lanes Study. 2016. Texas Department of Transportation.
- 2016 CTRMA Bond Refinance. 2016. Central Texas Regional Mobility Authority.
- US 183 South Investment Grade Traffic and Revenue Study. 2014. Central Texas Regional Mobility Authority.
- Second South Padre Island Bridge Level 2 Traffic and Revenue Study. 2014. Texas Department of Transportation.
- Loop 1604 Corridor (Bexar County) Level 2 Traffic and Revenue Study. 2014. Texas Department of Transportation.
- 2014 US 281 Toll Road Investment Grade Study. 2014. Bexar County.
- 2014 Central Texas Turnpike Project Update (Bond refinance study). 2014. Texas Department of Transportation.
- Southern Gateway Level 2 Traffic and Revenue Study. 2013-2014. Texas Department of Transportation.
- Regional Demographic Update for the North Texas Tollway Authority's Service Area. 2013. North Texas Tollway Authority.
- US 183-A Toll Road Investment Grade Study Update. 2013. Central Texas Regional Mobility Authority.
- SH 288 Level 2 Traffic and Revenue Study. 2012. Texas Turnpike Authority.
- Loop 1604/US 281 Toll Road Investment Grade Study. 2012. Alamo Regional Mobility Authority.
- 2012 Central Texas Turnpike Project Update (Bond refinance study). 2012. Texas Turnpike Authority.
- SR 125 Toll Road Evaluation Study (Border traffic study). 2011. San Diego Association of Governments.
- 2010 US 301 Toll Road Investment Grade Study Update. 2010. Delaware Department of Transportation.
- 2010 Central Texas Turnpike Project Update (Bond refinance study). 2010. Texas Turnpike Authority.
- SH 130 Truck Toll Study. 2010 (Toll rate adjustment study). Texas Turnpike Authority. Project Manager.
- US 290E Toll Road Investment Grade Study Update. 2010. Central Texas Regional Mobility Authority.
- US 183-A Toll Road Extension Investment Grade Study Update. 2009. Central Texas Regional Mobility Authority.
- 2008 Central Texas Turnpike Project (CTTP) – SH 130, Loop 1, SH 45 – 2012 Review (Bond refinance study). 2008. Central Texas Regional Mobility Authority.
- US 290E Toll Road Investment Grade Study Update. 2008. Central Texas Regional Mobility Authority.
- US 301 Toll Road Investment Grade Study. 2008. Delaware Department of Transportation.

JOHANNA ZMUD, PHD

Stated Preference Surveys

Dr. Zmud is a survey research expert and travel behavior analyst. She has been at the forefront of applying survey science to the gathering of data on current and future travel behavior and in understanding trends, such as transportation mode choice. Starting in 1987, and for the next 23 years, she was a co-founder of NuStats, which became the largest producer of data on urban travel. In early 2000, she co-founded, GeoStats, which developed technology solutions for measuring personal and vehicle movements. In 2010, Johanna joined the RAND Corporation, where she served as Director of RAND's Transportation, Space, and Technology program. In 2014, she joined the leadership team of the Texas A&M Transportation Institute (TTI), where she directed the multimodal planning division covering the transit mobility, modeling and forecasting, and transportation planning program. After a year as a Consulting Principal at Research Systems Group (RSG), a survey, analytics, and modeling firm, she founded Blue Door with partners. She has written or edited 50 books or book length reports (including two books on transport survey methods) and over 30 peer-reviewed articles.

EXPERTISE

- Survey Research
- Qualitative Research
- Policy Analysis
- Statistical Analysis

EDUCATION

- PhD, Sociology of Technology, University of Southern California (USC)
- MA, Communication Management & Policy, USC
- MS, Educational Statistics, University of Maryland
- BS, German, East Carolina University

HONORS

- 2022 Senior Fellow, Institute for Transportation Studies, UC-Berkeley
- 2022 Outstanding Industry Contributor, Zephyr Foundation
- 2016 National Associate, National Research Council, National Academies of Science, Engineering, and Medicine

AFFILIATIONS

- Transportation Research Board (TRB) - Committees:
  - State/National Data and Information Systems
  - Effects of Information and Communication Technologies on Travel Choices
- International Association of Travel Behavior Researchers
- World Conference on Transport Research

PROJECT HIGHLIGHTS

Current Studies

Measuring Transportation Insecurity within Study to Estimate Transportation Cost Burden. Role: Task Lead. This task to define and measure 'transportation insecurity' aligns with U.S. DOT policy priorities and initiatives, such as Justice40, the equity goals of the U.S. DOT Strategic Plan, and the 'expanding access' focus area of the U.S. DOT Equity Action Plan.

FHWA Complete Trip ITS4US (Under-Served). Role: Evaluation Co-Lead. Under subcontract to ICF, Is the performance measures evaluation co-lead for a pilot deployment in Buffalo, New York. which seeks to integrate innovative technologies to improve mobility and accessibility for underserved populations.

NCHRP 19-22: Equity Impacts of Transportation Revenue Mechanisms and Changing Trends. Role: Subcontractor to Texas A&M Transportation Institute. This National Cooperative Highway Research Program (NCHRP) project develops a toolkit for state departments of transportation about equity impacts resulting from alternative revenue structures and includes strategies to mitigate inequities.

Past Experience

Impacts of Transformational Technologies on Underserved Populations. Role: PI. This Transit Cooperative Research Program study's primary focus is on improving mobility, accessibility, and inclusivity for traditionally underserved populations. by identifying barriers for certain populations

(e.g., persons with impairments, low-income, non-English speakers) to use new mobility services and to determine policy and planning solutions to overcome specific barriers. (2021)

Florida Department of Transportation. Travel Surveys for Model Update. Role: Senior Advisor**.** Johanna provided senior guidance for a Visitor Travel Survey and a Workplace Travel Survey to collect data to be used for a travel demand model update while at RSG. (2022)

Mobility Mode Choice Quantitative Analysis. Role: Senior Advisor. RSG conducted travel behavior and mode choice research to provide an evidence-based understanding of the characteristics of travel demand in San Francisco County for a self-driving taxi pilot. (2022)

Next Generation National Household Travel Survey (NHTS). Role: Senior Advisor. Under subcontract to IPSOS, the firm designing and implementing the NextGen NHTS, Dr. Zmud served as a senior advisor on methodology and data uses. FHWA launched the NextGen NHTS to establish a more continuous travel monitoring program with national and local data products. (2020)

Texas CAV Task Force 2020 Annual Report. Connected and Automated Vehicle (CAV) Data Issues and Opportunities. Role: PI. Dr. Zmud authored a White Paper that addressed CV and AV data privacy, security, and cybersecurity challenges. The paper also examined CV and AV data use, general, and ownership concepts. The paper closed with the opportunities and challenges for data sharing and data exchange. (2021)

NCHRP 20-102(9): Updating Regional Transportation Planning and Modeling Tools to Address Impacts of Connected and Automated Vehicles (CAVs). Role: PI. Sponsored by NCHRP, this research resulted in detailed information and guidelines for state DOTs and MPOs to help update their modeling and forecasting tools to address expected impacts of CAVs on transportation supply, road capacity, and travel demand components. (2018)

NCHRP 20-83(6). Impact of Socio-Demographics on Travel Demand. Role: PI. This research examined how socio-demographic factors may affect travel demand over the next 30 to 50 years and identified strategies and actions that can be used by policymakers in state and local transportation and planning agencies to plan and prepare for alternative future scenarios. (2014).

Regional Household Travel Behavior Surveys. Role: PI**.** As president of NuStats**,** from 1993-2010, Johanna led the design and execution of over 30 large-scale household travel surveys for states and regional governments.

SELECTED PUBLICATIONS

Mansfield, T., J. Ehrlich, J. Zmud, and M. Lee. "Built Environment Influences on Active Travel in the Twin Cities Region: Evidence from a Smartphone-Based Household Travel Survey. To be published, TRR.

Gick, B., and J. Zmud. (2021). *Connected and Automated Vehicle Terminology*. White Paper prepared for the Texas CAV Task Force. 2020 Annual Report. College Station: Texas A&M Transportation Institute.

Kim, W., Kelley-Baker, T., Sener, I., Zmud, J., Graham, M. & Kolek, S. (2019). *Users' Understanding of Automated Vehicles and Perception to Improve Traffic Safety –Results from a National Survey* (Research Brief). Washington, D.C.: AAA Foundation for Traffic Safety.

Zmud, J., I., Sener, B. Lenz, and V. Kolarova. (2018) "Not so Autonomous Vehicles: A Path to Consumers Changing World." In *Road Vehicle Automation 6*. Meyer and Beiker, Eds. Switzerland: Springer.

Zmud, J, F. Dias, P. Lavieri, C. Bhat, R. Pendyala, Y. Shiftan, M. Outwater, and B. Lenz. (2018). "Research to Examine Behavioral Responses to Automated Vehicles." In *Road Vehicle Automation 5*. Meyer and Beiker, eds. Switzerland: Springer.

Zmud, J. *Changing Consumer Preferences and Mobility Behaviors in the Context of a Modal Revolution. (2018)* White Paper prepared for the FHWA Emerging Trends Symposium.

Zmud, J., L. Green, T. Kuhnimhof, S. LeVine, J. Polak, and P. Phleps. (2017) *Still Going…and Going: The Emerging Travel Patterns of Older Adults*. Institute for Mobility Research (IFMO) of the BMW Group. Munich, Germany.

GINGER GOODIN, PE

Stated Prefernece Surveys

Ginger Goodin is a research professional with over 35 years of experience in transportation engineering and public policy. After more than a decade in public works and transportation at the City of Austin, she worked in various capacities at the Texas A&M Transportation Institute (TTI) based in Austin, leading large-scale research projects for federal, state, and local sponsors and strategic initiatives for the Institute. She served five years as the Director of the Transportation Policy Research Center at TTI, working directly with the Texas Legislature to provide data-driven transportation insights in support of policy development. She is an experienced executive with a demonstrated history of working across diverse stakeholders in the transportation industry and applying innovation to practice. She has expertise in mobility, policy, innovation, and technology with background in infrastructure investment, road pricing, and policy implications of technology applications for moving people and goods.

EXPERTISE

- Transportation Policy
- Emerging Transportation Technologies
- Managed Lanes Planning and Operations
- Stakeholder Engagement

EDUCATION AND CERTIFICATIONS

- Master of Engineering, Civil Engineering, Texas A&M University
- BS, Civil Engineering, Texas A&M University
- Registered Professional Engineer, Texas #64560

EMPLOYMENT HISTORY

Blue Door Strategy and Research – Founding Partner (2022-present)

Center for Transportation Research, University of Texas at Austin (2024-present, part-time)

- Senior Advisor for Policy and Strategy

Texas A&M University College of Engineering (2024-present)

- Visiting Lecturer, Graduate Course in Transportation Policy

Texas A&M Transportation Institute

- Assistant Agency Director for State Affairs (2018-2022)
- Director, Policy Research Center (2013–2018)
- Division Head, Austin Planning Division (2011–2013)
- Senior Research Engineer / Research Engineer / Associate Research Engineer (1996–2018)

City of Austin, Department of Public Works and Transportation

- Area Engineer – Construction Inspection (1995-1996)
- Operations Engineer – Street and Bridge Division (1990-1995)

- Contracts and Design Engineer – Design and Consulting Services (1988-1990)
- Traffic Engineering Associate, Urban Transportation (1985-1988)

PROJECT HIGHLIGHTS

Technology Corridor Strategy, Central Texas Regional Mobility Authority. Ms. Goodin led the development of a strategic, needs-based process by which rapidly emerging innovations can be incorporated in corridor projects, particularly those of regional significance involving local partners. The project involved working closely with CTRMA's partners – City of Austin, TxDOT, Capital Metro, Travis and Williamson Counties – to priorities needs, identify applications, and determine collaboration mechanisms.

Mobility Investment Priorities (Rider 42), Texas Department of Transportation (TxDOT) and Texas Legislature. Ms. Goodin served as TTI's lead researcher and facilitator for the Austin region under a program established by the Texas Legislature in 2011 to address the state's most congested corridors. In this capacity she facilitated a working group on behalf of Sen. Kirk Watson, the region's state senator. The group was comprised of TxDOT and local agency executives for the purpose of prioritizing $31 million in state bond funding for engineering and feasibility studies, and to identify strategies for traffic and demand management on six area corridors. In support of regional policy development, she co-led a team of researchers that built a state-of-the-art multi-resolution model of the Austin roadway network to test alterative congestion reduction projects for IH 35.

IBTTA Road Safety Campaign: Industry Highlights and Best Practices. Ms. Goodin served as Blue Door's project manager for an independent review of best practices among some of the tolling industry's leading agencies in safety performance. Using an industry survey and case study approach, the report presents the "safe system" framework that has produced results internationally, highlights current practices, documents safety strategies that have achieved measurable results among leading toll operators, and presents findings and opportunities for IBTTA to lead the tolling industry toward fewer deaths and injuries on its facilities.

AFFILIATIONS

Transportation Research Board (TRB) Committees:

- Economics and Finance, (2024-present), Co-Chair, Strategic Planning Task Force
- Managed Lanes (2004-2013), Past Chair
- Vehicle-Highway Automation (2013-2016)
- EU-US Transportation Research Symposium on Automation (2014)

HONORS

- Texas A&M University System Regents Fellow, 2017
- TTI/Trinity Charley V. Wootan Career Achievement for Research Award, 2013.
- Woman of the Year, Heart of Texas Chapter, Women's Transportation Seminar (WTS), 2011.
- Leadership Texas, Class of 2010

COMMUNITY SERVICE

- City of Cedar Park Bond Advisory Task Force (2021)
- City of Cedar Park Mobility Master Plan Advisory Committee, Chair (2023)
- City of Cedar Park Community Development Board (Type B), (2018-present), Immediate Past President

APPENDIX C
HISTORICALLY UNDERUTILIZED BUSINESS (HUB) /
DISADVANTAGED BUSINESS ENTERPRISE (DBE) CERTIFICATION

HUB/DBE REQUIREMENTS

The goals for participation by HUB/DBEs has been established by the Mobility Authority for future projects to be assigned:

Project	**Professional Services HUB or DBE Goal**
Project to be assigned	15%

DBE Certification

By signing the SOQ, the Proposer certifies that the above HUB/DBE goal will be met in the Agreement by obtaining commitments equal to or exceeding the HUB/DBE percentage or that the Proposer will provide a good faith effort to substantiate the attempt to meet the goal.

Christopher Mwalwanda
Name

Vice President
Title

CDM Smith Inc.
Company

June 10, 2024
Date

APPENDIX E
CONFLICT OF INTEREST DISCLOSURE STATEMENT

This Disclosure Statement identifies potential conflicts of interest that may exist because of a previous (within the last 12 months) or current business relationship (a "business relationship") between:

(1) the undersigned Respondent (including each individual, firm, or other business entity that is a member of a Respondent team) to the proposal for a contract to provide general engineering consultant (GEC) services, and

(2) a person or firm listed on "Key Personnel and Firms" of the Mobility Authority, available at the Mobility Authority website (https://www.mobilityauthority.com/about/policy-disclaimers/keyfirms)

Section I of this Disclosure Statement Form describes a business relationship which could result in a conflict of interest. Section II of this Disclosure Statement Form describes the undersigned's proposed management plan for dealing with any potential conflict of interest identified by Section I of this form. Additional pages may be attached to this form if needed to complete Sections I and II.

This Disclosure Statement is submitted to comply with the Central Texas Regional Mobility Authority's Conflict of Interest Policy for Consultants. The undersigned acknowledges that approval of the proposed management plan is within the sole discretion of the Central Texas Regional Mobility Authority.

SECTION I. Description of Potential Conflicts of Interest.

For each business relationship state: (A) the Respondent (and if the Respondent is a team, the name of any individual, firm, or business entity that is a part of Respondent's team) and the person or firm listed as "Key Personnel and Firms" of the Mobility Authority with whom there is a business relationship; and (B) the nature of that business relationship; its current status; and the date of termination or expected termination of the business relationship.

SECTION II. Management Plan for Dealing with Potential Conflicts of Interest.

For each potential conflict of interest listed in Section I, please propose a management plan to address any potential conflict of interest.

SIGNED: _____ DATE: June 10, 2024

NAME AND TITLE: Christopher Mwalwanda, Vice President

REPRESENTING: CDM Smith Inc.

APPROVED BY THE CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY:

SIGNED: _____ DATE: _____

NAME AND TITLE: _____

DISCLOSURE STATEMENT FORM

This Disclosure Statement outlines potential conflicts of interest as a result of a previous or current business relationship between the undersigned individual (and/or firm the firm for which the individual works) and an individual or firm submitting a proposal or otherwise under consideration for a contract associated with CDM Smith Inc.

Section I of this Disclosure Statement Form describes the potential conflicts of interest. Section II of this Disclosure Statement Form describes the proposer's management plan for dealing with the potential conflicts of interest as described in Section I of this form. This Disclosure Statement is being submitted in compliance with the Central Texas Regional Mobility Authority's Conflict of Interest Policy for Consultant's. The undersigned acknowledges that approval of the proposed management plan in within sole discretion of the Central Texas Regional Mobility Authority.

SECTION I. Description of Potential Conflicts of Interests.

N/A

SECTION II. Management Plan for Dealing with Potential Conflicts of Interest.

N/A

SIGNED: _____ DATE: June 10, 2024

NAME AND TITLE: Christopher Mwalwanda, Vice President

REPRESENTING: CDM Smith Inc.

APPROVED BY THE CENTRAL TEXAS REGIONAL MOBILITY AUTHORITY:

SIGNED: _____ DATE: _____

NAME AND TITLE: _____


CDM
Smith