1. Letter of Interest:

I am extremely interested and hopeful of being selected to conduct this synthesis study dealing with the implementation of the MEPDG in the US. In my nearly 50 year practicing career, I have dedicated my professional goals to the development, publication and implementation of several pavement design procedures that I have had the distinction and honor to work on. These publications have focused on the use of advanced mechanistic pavement design and rehabilitation procedures for the Asphalt Institute (MS-1 and MS-11); NAPA (IS-117) and NCHRP / AASHTO- (MEPDG PI of the Asphalt pavement portion of Guide).

Without question, my experience over nearly 50 years in the profession, has definitely made me conclude that, while the US far exceeds any other world country in research development and applied technical engineering practice; its efficiency in implementing these advanced findings, especially in the transportation community, is very poor. In my perspective; this needs the immediate attention and focused energy of the community as to how best we, as a nation, can implement significant research / applied technology into practice.

I personally have acknowledged this "implementation" gap in several occasions : TRB Invited Thomas Deen Lecture; AAPT Awards Recognition Dinner for an Honorary Member and even at my Retirement Seminar at Arizona State University. Quite candidly, I have spent the latter part of my career thinking of ways by which the rate of implementation can be grossly enhanced in the Pavement (Transportation) field.

If selected for this synthesis, I can only assure everyone that I will work extremely hard to find a meaningful and practical solution to this issue, It is truly one that I share and feel quite strongly about.

Dr M.W.Witczak
10 August 2012
2. Resume - Matthew W. Witczak, PhD:

**Professional Summary**

Dr. Witczak is an internationally recognized expert in the area of highway and airfield pavements. His expertise includes advanced mechanistic modelling, dynamic materials characterization and design methodologies. He has nearly 50 years of significant, real-world experience in mix design and pavement performance which has actively influenced his practical philosophy towards technical problem solutions. He is an Emeritus Professor at both the University of Maryland and Arizona State University. He retired from academia in May 2011 and now serves as an independent consultant. Dr. Witczak has authored well over 250 technical papers and reports in the area of highway and airfield pavement design, rehabilitation, materials and management systems, including the Transportation Research Board’s design synthesis report dealing with low-volume road design for developing countries.

He co-authored the Principles of Pavement design textbook, which has been the leading textbook for academia and private practice for over 35 years. He has been a major contributor to several internationally-applied pavement design and rehabilitation manuals that have been used throughout the world. Dr Witczak served as the Principal Investigator, overviewing a team of nearly 30 engineers that developed the recently approved AASHTO Interim Pavement Design Guide (ME-PDG) for the United States. He was responsible for all new and rehabilitated pavements having an asphalt surfacing and he, and his team, were responsible for the development of the computer analysis code for new and rehabilitated asphalt pavements that is currently found within the DARWin code.

Additionally, Dr. Witczak was the major contributor to generating the theoretically-based Asphalt Institute Manual MS-1 (Highway Design) and MS-11 (Airfield Design). Dr Witczak (and his supervisor. Mr. J.F.Shook) were awarded the honor of being selected as "One of the Men Who Made Their Mark in the Construction Industry", by the Engineering News Record in 1972. They were awarded this honor for being the first engineers to introduce a mechanistic based design procedure for asphalt pavements in the United States. Dr Witczak also developed for the US Navy a theoretical, full-depth airfield pavement design procedure which was presented in the Tri-Service (USAF, USACE and USN) military airfield design manual. Dr. Witczak also authored the NAPA Publication IS-117, covering the design of HMA overlays placed on fractured PCC slab systems. Dr. Witczak has testified before the US Senate Subcommittee on national transportation issues; and has consulted throughout the world for private consulting companies, foreign countries and multiple US Government entities. Dr Witczak is the recipient of 17 engineering, research and construction awards throughout his career.
Dr. Witczak has served as the Principal Investigator or Major Technical Engineer on a prestigious list of major NCHRP projects (NCHRP 1-28A; NCHRP 9-19; NCHRP 1-37A; NCHRP 1-40D; NCHRP 9-33A; NCHRP 9-22 and NCHRP 9-22A)

.Education
Purdue University  PhD, Civil Engineering, 1969 (Highway/Material Systems, minor in Statistics)
MSCE, Civil Engineering, 1963 (Transportation Engineering)
BSCE, Civil Engineering, 1962

.Memberships
Life Member, Association of Asphalt Paving Technologists (AAPT)
Life Member, American Society of Civil Engineers (ASCE)

.Publications
Professor Witczak has over 250 journal, proceedings and reports over his career. A sample of the most significant publications are shown below and an additional listing of recent publications follows.

Additional Recent Publications


Summary of Core Skills

Academic Experience: Dr. Witczak has served as the PI or Co-PI on over $20 Million dollars of research projects in his career. He has directed over 50 separate research grants, projects and studies since 1973. A few of several projects, are as follows:

NCHRP 1-37A and NCHRP 1-40 A/D
Led Research Team in developing new Mechanistic-Empirical Pavement Design Guide (related to asphalt pavement systems) for eventual adoption by AASHTO. Was primary developer of the 3 Level Hierarchical design system employed in the Design Guide. In the development of the national system; a procedure is in place to allow individual regional state agencies, county and city agencies to develop experimental designs, using local performance information, to re-calibrate the existing models for local conditions.

NCHRP 9-19
Development of SPT (Simple Performance Test) for asphalt HMA. Provisional guidance provided relative to the statistical sampling and testing plans recommended in the test protocols. Plan based upon ANOVA of component variances during the sampling and testing phase.

NCHRP 9-22
Development of Probabilistic Based PRS (Performance Related Specifications for HMA, based upon the distress – performance predictions generated by the ME-PDG (AASHTO) models. The project development contains numerous statistical example implementation methodologies. Some of these are the use of statistical regression techniques to develop rapid, closed form distress prediction models; use of Monte Carlo simulation, Taylor Series and Rosenbleuth’s procedure to determine mean-variance of dependent variables, knowing the variance of multi-independent variables in a closed form solution; adoption of reliability capacity – demand functions, having differing probability distributions to establish Performance Based Pay Factors (Penalty/Bonus) and the development of QA/QC project control charts.

NCHRP 1-28A
Project involved the development of a set of standardized (Harmonized) test protocols used to establish the Mr of both unbound materials (subgrade soils and granular bases/subbases) as well as asphalt mixtures. In the development, a comprehensive ANOVA was developed to establish the variety of component variances, associated with: sample rotation; gage length (LVDT); replicates; aggregate size; sample variance and variation due to in-place construction. The results of this study were then used to establish a specific test protocol procedure (based upon sample numbers, number of rotations, number of replicate tests, face rotation etc..) resulting in the greatest level of accuracy that could be statistically achieved.

Private Industry Experience: Dr. Witczak has been involved with over 200 consulting projects in his career. Some of the organizations are: World Bank; UN; NAS; AAR; NCMA; NAPA; US Navy; USA Corps of Engineers; FAA; FHWA; TAI; Minn DOT; Col DOT; Virginia DOT; Del DOT; Md DOT; TAMS; Wilbur Smith; BTML; WBCM; Woodward-Clyde; Greiner; Conrail; Lyon Associates; Connell, Metcalf and Eddy; ARE; Ertec Corp; BDM Corp; Dutco Pauling; Petro Source; STV/Lyons; Boeing (King Co); Kirkland-Ellis; Marsh-McLennan, UAE Ministry of Transportation; South African Road Federation; Venezuela Ministry of Transportation; Dominican Republic Ministry of Transportation; Norwegian Technical Institute. A small sample of some of the Consulting projects are as follows:
Colorado DOT
Review of Colorado DOT Asphalt Mix design procedure (involved Statistical round robin analysis of HMA properties by Labs and replicates; Development of Precision-Bias results; Repeatability and Reproducibility; Development of Statistical Confidence Interval Curves of Results)

MX Missile
Assist Government (Military) and Private Industry on the Deployment of MX Missile System in the US: Major area of emphasis involved scenario of Mobile 10 Warhead Device traveling on Newly Constructed “Racetrack” road systems.

AMOCO –Cadiz Oil Spill
Led Engineering team to evaluate French road damage claims to the French communal Road Network, caused by cleanup operations by the French Military of oil spill damaged “Black Mousse”. The Amoco Cadiz Oil Spill is still the largest oil spill cleanup operation in the world. Developed expert testimony for AMOCO Oil in U.S. federal legal suit brought by France upon AMOCO Oil (dealing with Road Damage Claims of the law suit)

PANY/NJ
Established first Pavement Management System for all three major airports operated by the PANY/NJ (J. F. Kennedy; LaGuardia and Newark)

Diego Garcia US Military
Provided Key decision to US Military as to whether the new B-52 Runway, constructed on the Island of Diego Garcia, could be used with SAC aircraft after the island was hit by a relatively large scale earthquake. The final decision was made through the use of a Monte-Carlo simulation of the variable (post damaged runway structural evaluation Capacity), relative to the actual structural Demand load of the B-52 aircraft. An affirmative decision was made by the PI to the military. This allowed for the actual deployment of SAC aircraft to the airfield and their subsequent operation in the First Iraq War.

Awards / Recognitions

AAPT, W.J. Emmons Award (1st Place and Honourable Mention: Best Annual Technical Paper)
TRB F. Burgraff Award (Outstanding Annual Research Paper by Young Engineer)
TRB K.B. Woods Award (Outstanding Annual Paper in Highway Materials)
ASCE Transportation Journal Award (Outstanding Annual Paper in Transportation Journal of ASCE)
National Capital Society of Engineers Award (Outstanding Engineering Contributions in Washington, DC Area)
US Army Commendation Medal: USACE (Outstanding Road/Airfield Construction Related Activities while Serving in U.S. Army)
Engineering News Record (ENR), “Construction Men of the Year”
Maryland Construction Industry, “Hot Mix Industry Recognition Award”
Emeritus Professor (University of Maryland)
Emeritus Professor (Arizona State University)
Emeritus Member , TRB -NAS Committee on Flexible Pavement Design Committee
National Asphalt Paving Association (NAPA) R.D. Kenyon Award (Outstanding Research and Education in the Construction Industry)
Selected as Hall Of Fame Member of the Asphalt Institute (outstanding contributions to the Asphalt Industry)
Recipient of the A, James Clark School of Engineering "Outstanding Commitment award at the University of Maryland"
Selected as International Honorary Member of AAPT (Association of Asphalt Paving Technologists)- (One of 30+ worldwide individuals recognized for world - wide career contributions to asphalt Design, Materials and Construction Community by AAPT in their 75 year history)
Recipient of the Thomas Deen Distinguished Lecture Award at the Annual Meeting of the NAS-Transportation Research Board Meeting (for outstanding contributions in the field of Transportation Engineering)
Recipient of the First Annual Leonard Wood Academic Enhancement Seminar, Purdue University

Employment

Principal Pavement Consultant, AMEC, E&l. 2008 to 2012 (Retired)

Professor, Department of Civil and Environmental Engineering, Ira A. Fulton School of Engineering (Arizona State University) July 1999 to Present

Vice President, Law Engineering (Atlanta, Georgia) 1991 to 1996

President, PCS Consulting Services (College Park, Maryland) 1986 to 1991

Professor and Emeritus Professor, Department of Civil Engineering (University of Maryland) August 1977 to June 1999

Department Chairman, Department of Civil Engineering (University of Maryland) August 1981 to August 1985

Associate Professor, Department of Civil Engineering (University of Maryland) August 1973 to August 1977

President, DAMA Consulting Services (Silver Spring, Maryland) 1975 to 1986

Special Projects and Research Engineer, The Asphalt Institute Headquarters (College Park, Maryland) August 1969 to August 1973

Graduate Research/Teaching Assistant, Department of Civil Engineering (Purdue University) August 1965 to December 1969

Litigation Cases

Amoco Cadiz Oil Spill,
Kirkland - Ellis and Amoco Oil
led expert team assessing the damage sustained to the French road network caused by heavy loaded vehicles removing oil spill damage (Black Mousse) from the beaches to disposal sites in the French interior. Oil spill mobilized French military to assist in clean up operations.
significant pavement network damage analysis studies, legal depositions and legal testimony in U.S. Federal Court (Chicago)
Entire French-Amoco claim was near $1 Billion US dollars.

Paver Block Restraint Edge system Copyright Infringement,
Marsh and McLenaham LLP
Worked as Technical Engineering expert for current patent holder of Edge Restraint system for PCC Paver Blocks; who claimed copyright infringement by competition manufacturing devices by extrusion process.
significant amount of engineering modelling, computational analysis, legal depositions
initial suit claimed was approximately $2 Million US dollars.
Negotiated settlement was obtained immediately prior to trial jury.

Dubai Port Road Failure in United Arab Emirates,
legal expert representing UK construction company (Dutco-Pauling) regarding the rutting
failure of the new Dubai Port Road in UAE.
Road was AC (flexible) construction and contractor was sued for non-compliance to
specifications.
Claim amount was $10 million to $15 million US dollars for damage.
Rigorous pavement material analysis of Hot Mix Asphalt material and legal testimony at trial.
Trial held in Dubai, UAE by European arbitration system.
Case was eventually won by Dutco-Pauling Contractors.

Salwa International Road Failure In Qatar,
Fulbright & Jaworski LLP and Parsons International Limited (PIL).
Litigation by Country of Qatar against PIL on a variety of issues (specifications non-
compliance; design; lack of QA/QC oversight) regarding the construction of the new Salwa
International Highway. This is a new 8 lane facility between Doha, Qatar and Abu Samra
(Saudi Arabia border).
Extremely comprehensive study performed by technical team, overviewed and led by Dr. M.
W. Witczak.
Developed a series of expert reports and executive summary.
Claim approaching $250 million US dollars.
At present; litigation is now in progress in Qatar court system.

Guam USAF Heavy Load Airfield Litigation
WTFH LLP and AMEC E&I .
Litigation by Japanese Contractor against AMEC on a variety of issues (specifications non-
compliance; design; materials) regarding the rehabilitation construction of a Primary B-52
runway, taxiway and Overrun area on the Guam USAF Airfield.

3. Compliance Statement for NCHRP Contract:

If selected to be the Principal Investigator for this NCHRP Synthesis Study; I will comply
with all of the contractual conditions specified by NCHRP to complete the project.

Dr.M.W.Witczak
10 August 2012