The team proposed for Synthesis Topic 44-06 includes Dr. Leslie Myers McCarthy (PI) and Dr. Jonathan Regehr (Co-PI). The composition of this team is highly effective due to each of the principals’ involvement with implementation of the AASHTO Mechanistic-Empirical Pavement Design Guide (MEPDG) and DARWin-ME software in both the United States and Canada, as well as their combined areas of expertise in traffic, pavement design, construction, and materials. A number of efforts over the past ten years have aimed to help train state and provincial transportation agencies on the technical and general implementation aspects of the MEPDG. The need exists now to establish how the various departments within a transportation agency are approaching organizational efforts for full implementation of the MEPDG process. One proposed approach to this synthesis would be to include targeted surveys by discipline and subsequent phone interviews to clearly identify the ways in which different transportation agencies have found success in the concentrated implementation of a multifaceted process.

The Principal Investigator proposed for the Synthesis Topic 44-06 is Dr. Myers McCarthy who is well-recognized in the pavements field, particularly through her prior position with Federal Highway Administration (FHWA) in the Office of Pavement Technology. She is a member of several pavements-related NCHRP panels and a long-time member of the two pavements-related TRB Standing Committees (AFD60, AFK50) that created this Synthesis Topic. She also served for eight years on the TRB AFD70 Committee on Pavement Rehabilitation. At FHWA headquarters, she was the Program Manager for the multimillion dollar Mobile Asphalt Testing Laboratory program, as well as one of the founding members of the FHWA Pavement Design Guide Implementation Team (DIGIT) in 2002 and worked extensively with the AASHTO Joint Technical Committee on Pavements and the high-profile NCHRP Project 1-37A staff and contractors. As part of that role, she traveled the U.S. providing training to DOT materials, traffic, and pavement engineers on the background and use of the MEPDG design process and software. Her expert knowledge of the MEPDG and DARWin-ME software gave her the opportunity to serve as the PI for NCHRP 20-07 Task 317 Update to AASHTO MEPDG Manual of Practice, completed two months in advance of the 9-month contract period.

Perhaps most importantly, she has experience in successfully writing and presenting NCHRP Synthesis reports. In 2012, she served as the PI for the NCHRP Synthesis Topic 43-04 Practices and Performance Measures for Federally-Funded LPA Projects which achieved a survey response rate of 92% from all 50 states and 41 local agencies. In 2010, she served as the PI for the NCHRP Synthesis Topic 41-02 Effective Delivery of Small-Scale Federal-Aid Projects which achieved a survey response rate of 100% and was published as Synthesis Report 414. As part of the synthesis effort, she interviewed more than 50 individuals from a number of agencies to supplement findings from the survey. In both projects, she effectively worked with the NCHRP Synthesis expert panels to produce comprehensive synthesis reports and submitted all deliverables in advance of their deadlines.

She also has experience in effectively generating and completing national surveys. In 2011, she completed the NCHRP Project 20-07 Task 311 Development of a Warm Mix Asphalt Technology Evaluation Program which included a national survey of DOTs and local agencies on warm-mix asphalt. She achieved a response rate of 88% of DOTs and 100% from local agencies. The high
LPA response rate was a direct result of her ability to “think outside the box” and reach out to both the NACE and APWA transportation leaders. In 2009, she developed and conducted a survey for Transportation Research Board (TRB) Standing Committee AFD60 (Flexible Pavement Design) on sensitivity analysis for flexible pavements using the MEPDG. She had a successful response rate of 95% within three months. The data obtained as part of the survey was presented by Dr. McCarthy at the 2010 TRB Workshop on Flexible Pavement Design and she published an e-Circular (e-C155) in conjunction with Stephen Maher at TRB to capture the findings presented at the 2010 workshop.

The Co-Principal Investigator, Dr. Jonathan Regehr, has conducted extensive research in the area of truck traffic information systems as both an engineering consultant and academic. He is a leading expert in Canada on the collection and analysis of truck traffic data for the MEPDG. His initial work in this area occurred as the project manager for the design and implementation of a truck traffic information system as part of the Manitoba Highway Traffic Information System, Manitoba’s traffic monitoring program. In 2010, Dr. Regehr was contracted to produce the truck traffic data inputs to support Manitoba in its adoption of mechanistic-empirical pavement design practices. Through this and subsequent research efforts, Dr. Regehr has assisted Manitoba in becoming one of the leading Canadian jurisdictions in the national effort to implement the MEPDG. Dr. Regehr has shared this expertise at the national and international levels through: (1) active participation at the Transportation Association of Canada, including an invitation to speak about the truck traffic data requirements of DARWin-ME at its upcoming conference; (2) membership on the Expert Panel guiding the ongoing update of the FHWA’s Traffic Monitoring Guide; (3) topical invited presentations at the annual meetings of the TRB and the North American Travel Monitoring Exhibition and Conference (NATMEC); and (4) numerous scholarly publications concerning truck traffic and the MEPDG. Dr. Regehr is an active member of TRB’s committees on Highway Traffic Monitoring (ABJ35) and Truck Size and Weight (AT055), contributing specifically to the area of research concerning truck traffic and its impacts of highway infrastructure. These involvements have helped Dr. Regehr develop a broad network of industry experts on the MEPDG in both Canada and the U.S. Dr. Regehr’s extensive experience conducting literature reviews and jurisdictional surveys, and synthesizing these into best practices, will be an asset for this project.

Both Dr. McCarthy and Dr. Regehr have worked closely with Traffic and Pavement specialists at FHWA Headquarters, along with many other of their counterparts around the United States and Canada, on many issues related to the implementation of MEPDG and DARWin-ME. This combined experience will be important to interfacing with stakeholders and successfully completing this all-encompassing project within the timeframe expected. Drs. McCarthy and Regehr know many of the pavement, materials, and traffic contacts at the state and provincial transportation agencies personally and this will help to guarantee the highest survey response rate possible.

Because of their combined years working with the MEPDG, the proposed research team is intimately familiar with the programs listed in the “Information Sources” section of Topic 44-06 and is confident that through their many federal, state, and provincial contacts, they are one of the very few private sector teams who could provide the optimal product for this project: a synthesis of current practice written in a manner that is accessible and implementable for transportation agencies.

Both Drs. McCarthy and Regehr have taught the MEPDG as part of their academic curricula and have established research records in this specific topic. As a result, they also plan to further disseminate the knowledge of this topic by engaging at least one graduate student, Ms. Maria Guercio, as part of the 12-month effort. This unique opportunity for training future engineers is one beneficial by-product that the Principals can bring to the Synthesis project.
Leslie Myers McCarthy, Ph.D., P.E.
Principal
Myers McCarthy Consulting Engineers, LLC,
Phone: (610) 813-2083       Email: leslie@myersmccarthy.com

A. Professional Preparation
B.S. Civil Engineering Penn State University State College, PA, 1996.
Professional Engineer (PE) License, State of New Jersey and Commonwealth of Pennsylvania

B. Appointments
Principal (2010-Present) Myers McCarthy Consulting Engineers, LLC, Havertown, PA (federal & state WBE status)
Assistant Professor(2009-Present) Villanova University, Dept of Civil & Environmental Engineering, Villanova, PA
Engineering Team Leader (2006-2008) Federal Highway Administration-Florida Division, Tallahassee, FL
Assistant Research Professor (2000-2001) University of Connecticut, Dept of Civil Engineering, Storrs, CT

C. Research Interests: Pavement design, highway materials, infrastructure preservation, and context-sensitive solutions.

D. Professional Activities/Membership
Principal: Myers McCarthy Consulting Engineers, LLC, Havertown, PA; 2010-present
Member: American Society of Civil Engineering since 1994, Association of Asphalt Pavement Technologists, 1998-present
Adviser: Institute of Transportation Engineers, Villanova University Chapter; 2009-present
Advisory Board Member: The Citadel, Military College of South Carolina, Dept. of Civil Engineering; 2006-present
NCHRP Panel Member: Projects1-40, 1-42, 1-48, 9-29, 9-30A, 9-33, 9-38, 9-44, 9-51, 10-81, 10-86, 14-22; as well as many other previous panels between 2002-present.
Associate Editor: ASCE Journal of Transportation Engineering; 2009-present
Executive Consultant: Hill International Inc., Marlton, NJ; 2009-present
Professional Recognition: Walter J. Emmons Award for Best Paper at the Annual AAPT Conference; 1998 & 2005
E. Research Projects

- **Coatings and Treatments for Beam Ends**, Pennsylvania Department of Transportation, 2011-2012.
- **Field Validation of QRSS Methodology in HMA Pavements**, National Cooperative Highway Research Program NCHRP Project 9-22A, 2010-2011, $75,000.
- **Recommended Approach for Local Agencies to Satisfy FHWA Sign Inventory Guidance**, internally-funded Villanova University project, 2010-2011.
- **Application of Decorative Concrete Overlays to Vertical Infrastructure**, internally-funded Villanova University project, 2009-2011.
- **Analysis of Pavement Cracking and Road Conditions in Rhode Island**, Rhode Island Department of Transportation, 2001–2002, $24,397, joint with Rowan University.
- **Application of Infrared Thermo graphic Imaging to Identify Factors Inducing Thermal Segregation in Asphalt Concrete**, Connecticut Department of Transportation, 2000-2001, $35,000.

F. Journal Publications (relevant to NCHRP Topic 44-06)

G. Refereed Conference Proceedings (relevant to NCHRP Topic 44-06)


H. Manuals and Training Courses (relevant to NCHRP Topic 44-06)

Myers, L. North East Center for Excellency in Pavement Technology (NECEPT) technology transfer program, 2000-2001.
A. Professional Preparation
Ph.D. Civil Engineering University of Manitoba Winnipeg, MB, 2009
B.Sc. Civil Engineering University of Manitoba Winnipeg, MB, 2003
Professional Engineer, Association of Professional Engineers and Geoscientists of Manitoba

B. Appointments
Principal (2011-present) Montufar Group, Winnipeg, MB
Assistant Professor (2011-present) University of Manitoba, Dept. of Civil Engineering, Winnipeg, MB
Principal (2003-2011) Regehr Consulting, Winnipeg, MB
Sessional Instructor (2010) University of Manitoba, Dept. of Civil Engineering, Winnipeg, MB
Engineering Research Associate (2003-2009) University of Manitoba Transport Information Group, Winnipeg, MB
Traffic Signals Construction Coordinator (2005) City of Winnipeg

C. Research Interests: traffic and highway engineering, traffic information systems, freight transportation systems, trucking, transportation regulation

D. Professional Activities/Membership
Member: Local Arrangements Committee, Canadian Institute of Transportation Engineers (ITE)
2012 conference, 2010-2012
Secretary: Truck Size and Weight Committee, Transportation Research Board (TRB), 2010-present
Member: Highway Traffic Monitoring Committee, TRB, 2010-present
Member: Traffic Monitoring Conferences Task Force, TRB, 2009-2010
Planning Committee Member: Freight Data Research Workshop, 2009 Annual Meeting of TRB
Young Member: Truck Size and Weight Committee, TRB, 2008-2010
Executive Member: Canadian ITE Manitoba Section, 2007-present
Chair: Truck Traffic Monitoring Symposium, Winnipeg, Manitoba, 2007
Chair: Technical Committee, Canadian Multidisciplinary Road Safety Conference (CMRSC) XVI, Winnipeg, Manitoba, 2006
Journal Paper Referee: TRB, American Society of Civil Engineers, 2005-present
Member: Association of Professional Engineers and Geoscientists of the Province of Manitoba
Individual Affiliate Member: Transportation Research Board
Member: Institute of Transportation Engineers
Member: Canadian Society for Civil Engineering
Member: Canadian Transportation Research Forum
E. Research Projects (abbreviated list)


F. Journal Publications


G. Refereed Conference Publications


H. Other Scholarly Contributions (abbreviated list)


Ms. Maria Chiara Guercio is a Ph.D. candidate at Villanova University. She received her B.S. in architectural engineering from Drexel University in 2011 and her M.S. in civil engineering from Villanova University in 2012. She has also been involved in two key NCHRP projects related to asphalt.

In the NCHRP Project 20-07 Task 317 Update of “Mechanistic-Empirical Pavement Design Guide Manual of Practice” Ms. Guercio served as Consultant Engineer researching issues bugs and technical errors related to the MEPDG software and reported by users. She identified technical errors and items reported unclear by MEPDG users from several resources including the Transport Research International Documentation (TRID), the Transportation Research Board (TRB) proceedings, the FHWA MEPDG Community of Practice website, the ARA Mantis Bug Tracker website, Federal Highway Administration (FHWA) and state department of transportation (DOT) internal reports, journal publications and conference proceedings. Ms. Guercio performed approximately forty DARWin-ME analyses to determine if the reported issues were still present in the software. She conducted verification analyses of both flexible and rigid pavements in AASHTO DARWin-ME software. Ms. Guercio also reviewed the published “Manual of Practice” to identified calibration factors and equations currently used in the DARWin-ME software that needed to be updated in the “Manual of Practice”. She also conducted a comprehensive literature review to identify technical publications or research reports that highlight DOT implementation of the MEPDG. The findings from the literature review were summarized to showcase implementation strategies pursued by various state transportation agencies in a number of topics related to the DARWin-ME.

Ms. Guercio provided recommendations of future technical changes based on the findings from this project and proposed changes necessary to establish a close correlation to AASHTOWare DARWin-ME.

In the NCHRP Project 9-22B Comparing HMA Dynamic Modulus Measured by Axial Compression and IDT Methods she served as Graduate Research Engineer, under the supervision of the Principal Investigator Dr. Leslie Myers McCarthy, conducting MEPDG analyses to determine predicted distresses of selected pavement sections and comparing results from different laboratory testing and specimen type configurations. In order to gather necessary data used as input in the MEPDG software, Ms. Guercio coordinated with the participating DOTs (Maine, Delaware, and Rhode Island) and collected state specific threshold criteria, traffic data, and pavements characterization for six unique pavement structures. The mixture types analyzed include WMA-SMA + 10% RAP, HMA Hi-RAP, SMA + 30% RAP, DGA HMA + 15% RAP, HMA + 10% RAP, and DGA HMA. Based on the availability of data, MEPDG analyses were performed with Level 1, Level 2, and Level 3 inputs. Ms. Guercio collected dynamic modulus (|E*|) and binder data (G* and delta) for the selected mixtures obtained from laboratory testing of three different specimen configurations (plant-produced/QC laboratory-compacted from uniaxial compression; plant-produced/laboratory-compacted from IDT; plant-produced/field-compacted) to perform MEPDG analyses with Level 1 HMA inputs. For this project a total of eighty six MEPDG analyses were performed including a sensitivity analysis and a “lot by lot” analysis of WMA-SMA and HMA Hi-RAP project mixtures based on |E*| data measured from each specimen type and test configuration. Ms. Guercio’s master’s thesis is based on this project, specifically evaluating the impact of HMA input levels to the AASHTO MEPDG when asphalt mixtures are produced with RAP or WMA.
Mr. Jon Williams  
Senior Program Officer  
National Cooperative Highway Research Program (NCHRP) Synthesis Program  
Transportation Research Board  
500 Fifth Street, NW  
Washington, DC  20001

Re: Statement of Contract Terms Compliance, NCHRP Synthesis 20-05, Topic 44-06

Dear Mr. Williams:

Myers McCarthyr Consulting Engineers, LLC, has read the terms of the 2012 NCHRP Synthesis Projects contract and confirms that it can comply with the terms of the contract for NCHRP 20-05, Topic 44-06 Implementation of Mechanistic Empirical Pavement Design Guide (MEPDG) and DArWin-ME Software.

Please contact me if you require any additional information.

Sincerely,

Leslie Myers McCarthyr, Ph.D., P.E.
Principal