

ROUZBEH GHABCHI, PHD, A.M. ASCE, E.I.T.*Assistant Professor*

Department of Civil and Environmental Engineering
South Dakota State University, Brookings, SD

Contact Information

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Education

- *Degree:* **Doctor of Philosophy**, Civil Engineering, The University of Oklahoma
PhD Dissertation Title: "Laboratory Characterization of Recycled and Warm Mix Asphalt for Enhanced Pavement Applications"
Advisor: Dr. Musharraf Zaman
Study included: Laboratory characterization of asphalt mixes containing reclaimed asphalt pavement (RAP), recycled asphalt shingles (RAS), warm-mix asphalt (WMA), evaluation of fatigue, rutting, low-temperature cracking, and moisture-induced damage characterization of asphalt mixes by applying surface free energy technique.
- *Degree:* **Master of Science**, Civil Engineering, University of Tabriz, Iran
MSc Thesis Title: "Engineering Stiffness Criterion for Prismatic Members used in Structural Frames"
Advisor: Dr. Alaeddin Behravesht
Study included: Modeling of steel frames, semi-rigid joints, developing an approximate method for estimation of moments in frames with rigid joints
- *Degree:* **Bachelor of Science**, Civil Engineering, University of Tabriz, Iran

Teaching Experience

Teaching at South Dakota State University

- *Course:* CEE363-S01 – Highway and Traffic Engineering (Spring 2017) – Enrollment: 45
Role: **Instructor** – *Course Level:* Undergrad.
- *Course:* CEE765-S01 – Pavement Design (Fall 2016) – Enrollment: 13
Role: **Instructor** – *Course Level:* Grad.

Teaching at The University of Oklahoma

- *Course:* PE 2153.001 – Mechanics of Materials (Spring 2015) – Enrollment: 104
Role: **Instructor** – *Course Level:* Under-Grad. (Please see Appendix section for course evaluation).
- *Course:* CEES 5303.910 – Asphalt Materials and Mix Design (Spring 2015) – Enrollment: 6
Role: **Lab. Instructor** and **Class Co-Instructor** with Dr. Dominique Pittinger– *Course Level:* Grad.
- *Course:* PE 2153.002 – Mechanics of Materials (Spring 2014) – Enrollment: 119
Role: **Co-Instructor** with Dr. Musharraf Zaman – *Course Level:* Under-Grad.
- *Course:* CEES 3403.010 – Materials (Spring 2014) – Enrollment: 40
Role: **Guest Lecturer** invited by Dr. Jinsong Pei – *Course Level:* Under-Grad.
- *Course:* CEES 5693: Structural Design of Pavement (Fall 2013) – Enrollment: 5
Role: **Guest Lecturer** invited by Dr. Musharraf Zaman – *Course Level:* Grad.
- *Course:* CEES 2113.002 – Statics and Dynamics (Fall 2013) – Enrollment: 39
Role: **Co-Instructor** with Dr. Kianoosh Hatami – *Course Level:* Under-Grad.

Developed Course at the University of Oklahoma

- *Course:* Transportation and Roadway Safety Module
Role: **Course Developer and Instructor**
Course Attendees: College of the Muscogee Nation Students – October 12, 2015.
Langston University Students – October 8, 2015.
Langston University Transportation Academy (LUTA) – June 10, 2015.
BP Summer Camp K12 Students– June 11-12, 2014.
Course Objectives: The main objective of the transportation and roadway safety module was to provide students with information on, and hands-on experience in transportation safety through fun and experimental learning in a supportive environment. Mechanics and physics were combined with activities involving remotely-controlled model cars to introduce important roadway design concepts, namely individual reaction time, coefficient of friction, braking distance and effect of radius of curvature on maximum speed.

Teaching at Azad University, Iran

- *Courses:* Technical Drawing, Mechanics of Materials, Steel Design, Engineering Geology
Role: **Lecturer** – *Course Level:* Under-Grad. (Fall 2002 – Spring 2006)

Research Experience

- **Assistant Professor**, August 2016 – Present
Department of Civil and Environmental Engineering, South Dakota State University, Brookings, SD
Key activities:
- Research and teaching.
 - Leading the research activities in the area of transportation infrastructures materials.
- **Senior Post-Doctoral Research Fellow**, May 2014 – August 2016
School of Civil Engineering and Environmental Science, University of Oklahoma, Norman, OK
Key activities:
- Receiving research grants from Oklahoma Department of Transportation, Southern Plains Transportation Center, Oklahoma Department of Environmental Quality with research funding in total amount of \$ 1,147,567.
 - Leading the research activities in the area of characterization asphalt mixes and binders and pavement performance for transportation infrastructures applications.
 - Leading the research activities in the area of characterization of asphalt binders exposed to extreme temperatures through multiple stress creep and recovery test and supervising an MSc student working on this research topic.
 - Leading research activities in area of fatigue performance and low-temperature cracking characterization of asphalt mixes containing RAS and RAP.
- **Graduate Research Assistant**, January 2009 – May 2014
School of Civil Engineering and Environmental Science, University of Oklahoma, Norman, OK
Advisor: Dr. Musharraf Zaman
Research Areas:
- Developing method /special provision in close collaboration with Oklahoma Department of Transportation (ODOT) for increasing the use of RAS and RAP in asphalt mixes.
 - Study the fatigue life, rutting, low-temperature cracking and moisture-induced damage potential of WMA and mixes containing RAS and RAP.
 - Study bonding, debonding and stripping mechanisms of asphalt binder and aggregates using Surface Free Energy (SFE) method.
 - Developing ODOT guidelines for use of geosynthetics in pavement applications by studying in-aggregate performance of geogrids as mechanical stabilizer of unbound aggregate bases.
 - Study the effect of permeability of aggregate bases on their stability in laboratory and field to help ODOT use more local aggregates as aggregate base.
 - Study the effect of aggregate shape parameters measured using an Aggregate Imaging System (AIMS) on drainability of aggregate bases.
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Research Grants

- **Project Title: Screening of South Dakota Asphalt Mixes for Moisture Damage using Conventional and Innovative Approaches**
Sponsored by: Mountain-Plains Consortium (MPC)
Total Amount: **\$194,089** (MPC: \$81,350; SDSU: \$112,739)
Roles: **Principal Investigator (PI): R. Ghabchi**
Contract Period: 03/21/2017 – 07/31/2018 (**active**)

- **Project Title: Development of a Guideline for Selection of Tack Coats in South Dakota**
Sponsored by: Mountain-Plains Consortium (MPC)
Roles: **Principal Investigator (PI): R. Ghabchi**
Total Amount: **\$159,790** (MPC: \$75,000; SDSU: 84,790)
Contract Period: 01/01/2017 – 09/30/2018 (**active**)

- **Project Title: A Proof of Concept: Use of Plastic Water Bottles as an Additive in Asphalt Mixes**
Sponsored by: Office of Academic Affairs, Department of Civil and Environmental Engineering, Jerome J. Lohr College of Engineering, South Dakota State University
Role: **Principal Investigator (PI): R. Ghabchi**
Total Amount: **\$9,000**
Contract Period: 11/01/2016 – 07/31/2017 (**active**)

- **Project Title: Development of Special Provision for Mix Design of Foamed-WMA Containing RAP**
Sponsored by: Southern Plains Transportation Center (SPTC)
Roles: **Principal Investigator (PI): R. Ghabchi**; Co-PIs: M. Zaman, M. Barman
Total Amount: **\$79,917**
Contract Period: 5/1/2016 – 4/30/2017 (**active**)

- **Project Title: Development of a SFE Database for Screening of Mixes for Moisture Damage in Oklahoma**
Sponsored by: Southern Plains Transportation Center (SPTC)
Role: **Principal Investigator (PI): R. Ghabchi**; Co-PIs: M. Zaman, R. Bulut, R. Steger
Total Amount: **\$194,043**
Contract Period: 1/1/2016 – 12/31/2017 (**active**)

- **Project Title: Use of Ground Tire Rubber (GTR) In Asphalt Pavements: Literature Review and DOT Survey (Phase I)**
Sponsored by: Oklahoma Department of Environmental Quality (ODEQ)
Role: **Principal Investigator (PI): R. Ghabchi**; Co-PI: M. Zaman
Total Amount: **\$18,496**
Contract Period: 11/15/2015 – 5/31/2016 (**completed**)

- **Project Title: Development of Guidelines for Selection and Evaluation of Tack Coats in Oklahoma**
Sponsored by: Oklahoma Department of Transportation (ODOT)
Roles: **Principal Investigator (PI): R. Ghabchi** (10/1/2015 – 8/26/2016); Co-PI: M. Zaman
Principal Investigator (PI): M. Zaman; **Co-PI: R. Ghabchi** (8/27/2016 – 9/30/2017)
Total Amount: **\$166,319**
Contract Period: 10/1/2015 – 9/30/2017 (**active**)

- **Project Title: Characterization of Asphalt Binders Exposed to Extreme Temperatures through Simple and Effective Test Methods**
Sponsored by: Southern Plains Transportation Center (SPTC)
Role: **Co-Principal Investigator (Co-PI): R. Ghabchi**, Z. Hossain (Arkansas State University); PI: N. Wasiuddin (Louisiana Tech University)
Total Amount: **\$221,108**
Contract Period: 10/1/2014 – 3/31/2017 (**active**)

- **Project Title: Performance of Asphalt Binders Modified with Polyphosphoric Acid (PPA)**
Sponsored by: Southern Plains Transportation Center (SPTC)
Role: **Co-Principal Investigator (Co-PI): R. Ghabchi**; PI: M. Zaman
Total Amount: **\$162,045**
Contract Period: 10/1/2014 – 3/31/2017 (**active**)

- **Project Title: Fatigue Performance of Asphalt Pavements Containing RAS and RAP**
Sponsored by: Oklahoma Department of Transportation (ODOT)
Role: **Co-Principal Investigator (Co-PI): R. Ghabchi**, D. Singh, D. Boeck; PI: M. Zaman
Total Amount: **\$225,275**
Contract Period: 10/1/2012 – 9/30/2014 (**completed**)

Students Advised/In-Progress

PhD Student

- *Buddhika Prasad Rajapaksha* (Spring 2017 – Present)
Dissertation Title: TBD
Role: **PhD Advisor and Committee Chair**
- *Shivani Rani* (Fall 2014 – Present)
Dissertation Title: Performance of Asphalt Binders and Mixes Modified with PPA
Role: **PhD Committee Member**; Committee Chair: Dr. M. Zaman

MSc Student

- *Syed Ashik Ali* (Spring 2015 – Fall 2016)
Thesis Title: Rheological Properties of Polymer and RAP Modified Asphalt Binders Using Multiple Stress Creep and Recovery Method
Role: **MSc Committee Member**; Committee Chair: Dr. M. Zaman

BSc Students

- *Duncan Fugitt* (Spring 2013): Superpave® Tests on Asphalt Mixes (Honors Research)
Role: **Supervisor**; Advisor: Dr. M. Zaman
- *Michael Hendrick* (Spring 2013): Superpave® Tests on Asphalt Mixes
Role: **Laboratory Training Supervisor**

Awards and Honors

1. 1st Place Award, Poster Presentation at ODOT – SPTC Transportation Research Day, Oklahoma Department of Transportation, Oklahoma, October 2014.
2. Cleo Cross Scholarship, Received for Spring 2013 (Amount: \$1,000).
3. Rory Victor Scholarship, Received for Academic Year 2012 – 2013 (Amount: \$2,000)
4. Graduate College Robberson Travel Grant, Received for Presenting the Research Paper in 2013 ASCE Airfield and Highway Pavement Conference (Amount: \$500).
5. Outstanding Graduate Research Assistant Award, Received for 2012 – 2013 Academic Year, Graduate Student Senate, The University of Oklahoma.
6. 1st Place Award, Research Poster Competition at Student Research and Performance Day, National Weather Center, The University of Oklahoma, March 2013.
7. McNair's Choice Award, Student Research and Performance Day, National Weather Center, The University of Oklahoma, March 2013.
8. 1st Place Award, Research Poster Competition, ODOT – OkTC Transportation Research Day, Oklahoma Department of Transportation, Oklahoma, October 2013.
9. 2nd Place Award, Research Poster Presentation, ODOT – OkTC Transportation Research Day, Oklahoma Department of Transportation, Oklahoma, October 2012.
10. 1st Place Award, Research Poster Presentation at ODOT – OkTC Transportation Research Day, Oklahoma Department of Transportation, Oklahoma, October 2011.
11. 3rd Place, Research Poster Presentation at ASCE GeoFrontiers 2011, Dallas, Texas, March 2011.
12. Golden Key Honor Society, Since 2013.
13. Gamma Beta Phi National Honor Society, Since 2011.
14. Who's Who in America 2014, 68th Edition.

Professional Activities**Journal Reviewer**

1. *Reviewer*, International Journal of Geomechanics (ASCE)
2. *Reviewer*, Journal of Testing and Evaluation (ASTM)
3. *Reviewer*, Journal of Construction and Building Materials (Elsevier)
4. *Reviewer*, International Journal of Pavement Engineering (Taylor and Francis)
5. *Reviewer*, Journal of Innovative Infrastructure Solutions (Springer)
6. *Reviewer*, Journal of Road Materials and Pavement Design (Taylor and Francis)
7. *Reviewer*, Journal of Advances in Civil Engineering Materials (ASTM)
8. *Reviewer*, Journal of the Transportation Research Board (TRB)

Conference Reviewer

1. 3rd Conference of the Transportation Research Group of India (3rd CTRG), Organized by: Transportation Research Group of India (CTRG), December 17 – 20, 2015, Kolkata, India.
2. Transportation Planning and Implementation Methodologies for Developing Countries (TPMDC 2014) Conference, Organized by: The Transportation Systems Engineering (TSE) group at Indian Institute of Technology, December 10 – 12, 2014, Bombay, India.
3. 2nd Conference of the Transportation Research Group of India (2nd CTRG), Organized by: Transportation Research Group of India (CTRG), December 12 – 15, 2013, Agra, India.

University-Level Service Activities

1. *Member*, Faculty Advisory Council, College of Engineering, South Dakota State University, 2016 – 2017.
2. *Senator*, Graduate Student Senate, The University of Oklahoma, 2011 – 2013.
3. *Advisory Board*, OU Cousin Program, The University of Oklahoma, 2012 – 2013.
4. *Vice President*, Iranian Student Association, The University of Oklahoma, 2010.

Professional Affiliations

1. *Associate Member*, American Society of Civil Engineers (ASCE), Since 2009.
2. *Participating Member*, American Society of Testing and Materials (ASTM), Since 2012.
3. *Member*, Geo-Institute (G-I), Since 2014.
4. *Member*, North American Geosynthetics Society (NAGS), Since 2010.

Professional Certificates

1. *Teaching Certificate*, certified with the highest grade of Pass to Instruct in the Teach Test, Graduate College, The University of Oklahoma, April 2012.
2. *E.I.T.*, Fundamentals of Engineering (F.E.), National Council of Examiners for Engineering and Surveying (NCEES), October 2010.
3. *Level II Asphalt Mix Design Certificate*, Oklahoma Department of Transportation, 2011.
4. *Teaching Training Certificate*, Learning and Teaching Program, The University of Oklahoma, Norman, OK, August 2010.
5. *National Science Foundation Certificate of "Professional Ethics Training- Responsible Conduct of Research (PET-RCR)"*, Norman, OK, October 2010.

List of Publications***PhD Dissertation***

Ghabchi, R., (2014). "Laboratory Characterization of Recycled and Warm Mix Asphalt for Enhanced Pavement Applications," *PhD Dissertation*, The University of Oklahoma, Norman, OK (pp. 265).

MSc Thesis

Ghabchi, R., (2002). "Determining an Engineering Stiffness Criterion for Prismatic Members used in Structural Frames," *MSc Thesis*, University of Tabriz, Iran (pp. 134).

Journal Papers

- J1. **Ghabchi, R.**, Barman, M., Singh, D., Zaman, M., and Mubarak, M. (2016). "Comparison of Laboratory Performance of Asphalt Mixes Containing Different Proportions of RAS and RAP," *Journal of Construction and Building Materials*, Vol. 124, pp. 343-351.
- J2. **Ghabchi, R.**, Singh, D., Zaman, M., and Hossain, Z. (2016). "Micro-Structural Analysis of Moisture-Induced Damage Potential of Asphalt Mixes Containing RAP," *ASTM Journal of Testing and Evaluation*, Vol. 44, No. 1.
- J3. **Ghabchi, R.**, Singh, D., and Zaman, M. (2015). "Laboratory evaluation of stiffness, low-temperature cracking, rutting, moisture damage, and fatigue performance of WMA mixes," *Journal of Road Materials and Pavement Design*, Vol. 16, No. 2, pp. 334-357.
- J4. **Ghabchi, R.**, Singh, D., Zaman, M., and Hossain, Z., (2015). "Laboratory Characterization of Asphalt Mixes Containing RAP and RAS," *International Journal of Pavement Engineering*, DOI: 10.1080/10298436.2015.1022778 (Available Online), pp. 1-18.
- J5. **Ghabchi, R.**, Singh, D., and Zaman, M. (2014). "Evaluation of Moisture Susceptibility of Asphalt Mixes Containing RAP and Different Types of Aggregates and Asphalt Binders Using the Surface Free Energy Method," *Journal of Construction and Building Materials*, Vol. 73, pp. 479-489.
- J6. **Ghabchi, R.**, Zaman, M., Kazmee H., and Singh, D. (2014). "Effect of Shape Parameters and Gradation on Laboratory Measured Permeability of Aggregate Bases," *ASCE International Journal of Geomechanics*, Vol. 27, No. 9, pp. 04014070-1 – 04014070-11.
- J7. Diab, A., You, Z., **Ghabchi, R.**, and Zaman, M. (2014). "Effect of Regular- and Nano-sized Hydrated Lime on Binder Rheology and Surface Free Energy and Adhesion of Foamed Warm Mix Asphalt" *ASCE Journal of Materials in Civil Engineering*, Vol. 27, No. 9, pp. 1-7.
- J8. **Ghabchi, R.**, Singh, D., Zaman, M., and Tian, Q. (2013). "Mechanistic Evaluation of Effect of WMA-Additives on Wettability and Moisture Susceptibility Properties of Asphalt Mixes," *ASTM Journal of Testing and Evaluation*, Vol. 41, No. 6, pp. 933-942.
- J9. Hatami, K., Mahmood, T., **Ghabchi, R.**, and Zaman, M. (2013). "Influence of In-Isolation Properties of Geogrids on Their Pullout Performance in a Dense Graded Aggregate," Invited Paper. *Indian Geotechnical Journal*, Special Issue on Geosynthetic Engineering, December 2013, Vol. 43, No. 4, pp. 303-320.
- J10. **Ghabchi, R.**, Zaman, M., Khoury, N., Kazmee H., and Solanki, P. (2012). "Effect of Gradation and Source Properties on Stability and Drainability of Aggregate Bases: a Laboratory and Field Study," *International Journal of Pavement Engineering*, Vol. 14, No. 3, pp. 274-290.
- J11. Gupta, A., Zaman, M., Laguros, J., and **Ghabchi, R.** (2011). "Effect of Cement Kiln Dust and Rock Dust as Mineral Fillers on Bulk Specific Gravity of Fine Aggregates," *ASTM Journal of Testing and Evaluation*, Vol. 39, No. 4, pp. 1-9.

- J12. Yalcin, E., Gurocak, Z., **Ghabchi, R.**, and Zaman, M. (2015). "Numerical Analysis for a Realistic Support Design - A Case Study: Komurhan Tunnel (Elazig/Eastern Turkey)," *ASCE International Journal of Geomechanics*, Vol. 16, No. 3, 05015001, pp. 1-14.
- J13. Nazari, M., **Ghabchi, R.**, Zaman, M., and Commuri, S. (2016). "Influence of Tensile Strain at Failure on Flexural Properties of a Cementitiously Stabilized Subgrade Soil," *International Journal of Geomechanics*, [10.1061/\(ASCE\)GM.1943-5622.0000731](https://doi.org/10.1061/(ASCE)GM.1943-5622.0000731), 04016057.
- J14. Arshadi, A., Steger, R., **Ghabchi, R.**, Zaman, M., Hobson, K., and Commuri, S. (2016). "Performance Evaluation of Plant-Produced Warm Mix Asphalts Containing RAP and RAS," *Association of Asphalt Paving Technologists (AAPT) Journal* (Accepted for publication).

Journal Papers under Review

- J15. Ali, S. A., **Ghabchi, R.**, Rani, S., and Zaman, M. (2016). "Characterization of Effect of Polymer Modification, Poly-Phosphoric Acid and Aging On Asphalt Binder Using X-Ray Diffraction (XRD)," *Submitted to Journal of Construction and Building Materials*.
- J16. Nazari, M., **Ghabchi, R.**, and Zaman (2017). "Flexural Properties of Chemically-Stabilized Subgrade in Designing Semi-Rigid Pavements." *Submitted to Journal of Road Materials and Pavement Design*.
- J17. Barman, M., **Ghabchi, R.**, Singh, D. V., and Zaman, M. (2017). "Fatigue Performance Characterization of Asphalt Mixes Using Indirect Tension Test." *Submitted to Journal of Construction and Building Materials*.

Refereed Conference Papers

- C1. Nazari, M., **Ghabchi, R.**, Zaman, M., and Commuri, S. (2016). "Influence of Chemical Stabilization on Flexural Fatigue Performance of Subgrade Soil," Accepted for publication and presentation in the proceedings of the *Geotechnical Frontiers 2017*, March 12-15, 2017. Orlando, Florida.
- C2. Ali, S.A., **Ghabchi, R.**, Rani, S., and Zaman, M. (2016). "Evaluation of Moisture-Induced Damage of an Asphalt Binder Modified with a Wax-Based Additive,". Accepted for publication and presentation in the proceedings of the *12th Transportation Planning and Implementation Methodologies for Developing Countries Conference (TPMDC)*, Indian Institute of Technology (IIT) Bombay, December 19-21, 2016, Bombay, India.
- C3. **Ghabchi, R.**, Singh, D. V., and Zaman, M. (2014). "Effects of RAP Binder on Moisture-Induced Damage Potential of Asphalt Mixes with Limestone Aggregates," *Proceedings of 14th IACMAG International Conference, Computer Methods and Recent Advances in Geomechanics*, September 2014, pp. 453 – 458, Kyoto, Japan.
- C4. Barman, M., **Ghabchi, R.**, Singh, D. V., Zaman, M., Commuri, S., and Hobson, K. (2014). "Evaluation of Fatigue Performance of Asphalt Mixes Using Semi-Circular Bend and Four Point Beam Fatigue Test Methods," *Proceedings of 14th IACMAG International Conference*,

Computer Methods and Recent Advances in Geomechanics, September 2014, pp. 459 – 464, Kyoto, Japan.

- C5. **Ghabchi, R.**, Singh, D., Zaman, M., and Tian, Q. (2013) "Application of Asphalt-Aggregates Interfacial Energies to Evaluate Moisture-Induced Damage of Warm Mix Asphalt," *Proceedings of the 2nd Conference of Transportation Research Group of India (CTRG)*, December 12 – 15, 2013. Agra, India.
- C6. **Ghabchi, R.**, Singh, D., Zaman, M., and Tian, Q. (2013). "A Laboratory Study of Warm Mix Asphalt for Moisture Damage Potential Using Surface Free Energy Method," *Proceedings of the 2013 Airfield & Highway Pavement Conference: Sustainable and Efficient Pavements*, Transportation & Development Institute of ASCE, Los Angeles, California, June 9 – 12, 2013, pp. 54 – 63.
- C7. **Ghabchi, R.**, Singh, D., Zaman, M., and Tian, Q. (2012). "Evaluation of Moisture Damage Potential of Advera -Modified Warm Mix Asphalt Using Surface Free Energy Approach," *Proceedings of the 10th International Conference on Transportation Planning & Implementation Methodologies for Developing Countries*, December 12 – 14, 2012, Indian Institute of Technology Bombay Powai, Mumbai 400 076, India.
- C8. **Ghabchi, R.**, Mahmood, T., Hatami, K., and Zaman, M. (2012). "Effect of Geogrid Type on Performance of Reinforced Dense-Graded Aggregate Base." *Proceedings of the 5th Asian Regional Conference on Geosynthetics*, December 13 – 16, 2012, Bangkok, Thailand.
- C9. Mahmood, T., Hatami K., **Ghabchi, R.**, and Zaman, M. (2012). "Laboratory Investigation of Pullout Behavior of Non-extruded Geogrids in a Base Aggregate," *Proceedings of the 91st TRB Annual Meeting*, Paper No.12-4222, January 2012, Transportation Research Board, Washington, DC.
- C10. Mahmood, T., Hatami, K., **Ghabchi, R.**, and Zaman, M. (2012). "Pullout Performance of Geogrids with Different Junction Strength," *Proceedings of the ASCE GeoCongress 2012*, March 25 – 29, 2010. Oakland, CA, pp. 1360 – 1370.
- C11. Hatami, K., Wang Z., Mahmood, T., **Ghabchi, R.**, and Zaman, M. (2011). "In-Aggregate Testing of Unitized and Woven Geogrids for Base Reinforcement Applications," *Proceedings of the ASCE GeoFrontiers 2011: Advances in Geotechnical Engineering*, March 13 – 16, 2011, Dallas, TX, pp. 4635 – 4644.
- C12. Hatami, K., **Ghabchi, R.**, Mahmood, T., and Zaman, M. (2011). "In-Aggregate Performance of Unitized and Woven Geogrids in Open-Graded and Dense-Graded Aggregates," *Proceedings of the 90th TRB Annual Meeting*, Paper No. 11-4078, January 2011, Washington, DC.
- C13. **Ghabchi, R.**, Zaman, M., and Khoury, N. (2011). "Limitations of Field Permeability Test on Different Gradations of a Limestone Aggregate Base," *Proceedings of 13th International Conference of the International Association for Computer Methods and Advances in Geomechanics (IACMAG)*. May 2011. Melbourne, Australia.

- C14. **Ghabchi R.**, Zaman M., Kazmee H., and Khoury, N. (2010). "Drainability of Aggregate Bases in Asphalt Pavements: A Combined Laboratory and Field Study," *Proceedings of the Bangladesh Geotechnical Conference 2010: Natural Hazards and Countermeasures in Geotechnical Engineering*, November 2010, Dhaka, Bangladesh, pp. 109-116.
- C15. Singh, D., **Ghabchi, R.**, Laguros, J. G., and Zaman, M. (2010). "Laboratory Performance Evaluation of Stabilized Sulfate Containing Soil with Lime and Class C Fly Ash," *Proceedings of the ASCE GeoFlorida 2010 Conference, Advances in Analysis, Modelling and Design*. February 20 – 24, 2010. West Palm Beach, FL, pp. 757-766.

Major Technical Reports

- R1. **Ghabchi, R.**, Zaman, M., Arshadi, A. (2016). "Use of Ground Tire Rubber (GTR) In Asphalt Pavements: Literature Review and DOT Survey," Final Report, Submitted to: Oklahoma Department of Environmental Quality, September 2016, The University of Oklahoma, Norman, OK, 2016 (pp. 68).
- R2. **Ghabchi, R.**, Zaman, M., Barman, Singh, D. V., and Boeck, D. (2015). "Fatigue Performance of Asphalt Pavements Containing RAS and RAP," Final Report, Submitted to: Oklahoma Department of Transportation, January 2015, The University of Oklahoma, Norman, OK, 2015 (pp. 119).
- R3. **Ghabchi, R.**, Zaman, M., Bulut, R., Koc, M., and Singh, D. (2013). "WMA Pavements in Oklahoma: Moisture Damage and Performance Issues," Final Report, Submitted to: Oklahoma Transportation Center (OkTC), 2601 Liberty Parkway, Suite 110, Midwest City, Oklahoma 73110, The University of Oklahoma, Norman, OK, 2013 (pp. 159).
- R4. Hossain, Z., Zaman, M., Solanki, P., **Ghabchi, R.**, Singh, D., Adje, D., and Lewis, S. (2013). "Implementation of MEPDG for Asphalt Pavements with RAP," Final Report, Submitted to: Oklahoma Transportation Center (OkTC), 2601 Liberty Parkway, Suite 110, Midwest City, Oklahoma 73110, The University of Oklahoma, Norman, OK, 2013 (pp. 150).
- R5. Hatami, K. Mahmood T., Zaman, M., **Ghabchi R.**, (2012). "Development of ODOT Guidelines for the Use of Geogrids in Aggregate Bases," SPR 2220. Final Report FHWA-OK-12-04. Submitted to Oklahoma Department of Transportation, March 2012, The University of Oklahoma, Norman, OK, 2012 (pp. 192).
- R6. Khoury, N. N., Zaman, M., **Ghabchi, R.**, and Kazmee, H., (2010). "Stability and Permeability of Proposed Aggregate Bases in Oklahoma," SPR 2196. Final Report FHWA-OK009-05. Submitted to Oklahoma Department of Transportation, May 2010, The University of Oklahoma, Norman, OK, 2010 (pp. 241).

Presentations

- P1. **Ghabchi, R.** (2017) "Laboratory Characterization of Asphalt Mixes Containing High Amounts of RAP and RAS." South Dakota LTAP 56th Asphalt Conference, April 5-6, 2017, Pierre, SD (Oral Presentation).
- P2. Rani, S., Ali, S.A., **Ghabchi, R.**, and Zaman, M. (2015). "Superpave® Performance Grading of Oklahoma Asphalt Binder." Student Research and Performance Day, March 6, 2015,

- Graduate College, National Weather Center, The University of Oklahoma, Norman, OK (Poster Presentation).
- P3. Ali, S.A., Rani, S., **Ghabchi, R.**, and Zaman, M. (2015). "Development of Guidelines Toward Adopting the Multiple Stress Creep Recovery (MSCR) Test Method for Extreme Weather Conditions Prevailing in the Southern Plains." ODOT-SPTC Transportation Research Day 2014, October 20, 2015, Moore Norman Technology Center, Oklahoma City, OK (Poster Presentation).
- P4. Ali, S.A., Rani, S., **Ghabchi, R.**, and Zaman, M. (2016). "Characterization of Rheological Properties of Polymer and RAP Modified Asphalt Binders Using Multiple Stress Creep and Recovery Method." Graduate Student Research & Creativity Day, Graduate College, March 4, 2016, National Weather Center, The University of Oklahoma, Norman, OK (Poster Presentation).
- P5. **Ghabchi, R.**, Barman, M., Singh, D., and Zaman, M. (2014). "Fatigue Performance of Asphalt Mixes Containing RAS and RAP," ODOT-SPTC Transportation Research Day 2014, October 2014 (Award Winning Poster Presentation: 1st place).
- P6. **Ghabchi, R.**, Singh, D., Zaman, M., Hossain, Z., and Solanki, P. (2013). "Effects of Using High Amounts of RAP in Asphalt Mixes as a Green Pavement Technology," ODOT-OkTC Transportation Research Day 2013, September 12, 2013. (Award Winning Poster Presentation: 1st place).
- P7. **Ghabchi, R.**, Singh, D., Zaman, M., Koc, M., Bulut, R., Cross, S., and Tian, Q. (2013). "Microstructural Characterization of Moisture-Induced Damage in Warm Mix Asphalt," ODOT-OkTC Transportation Research Day 2013, September 12, 2013 (Poster Presentation).
- P8. Barman, M., **Ghabchi, R.**, Zaman, M., Singh, D., and Commuri, S. (2013). "Evaluation of Fatigue Performance Testing Procedures using Virgin and Reclaimed Asphalt Mixes," ODOT - OkTC Transportation Research Day 2013, September 12, 2013 (Poster Presentation).
- P9. **Ghabchi, R.**, Singh, D., Zaman, M., and Tian, Q. (2013). "A Laboratory Study of Warm Mix Asphalt for Moisture Damage Potential Using Surface Free Energy Method," 2013 Airfield & Highway Pavement Conference: Sustainable and Efficient Pavements, Transportation & Development Institute of ASCE, Los Angeles, California, June 9-12, 2013 (Oral Presentation).
- P10. **Ghabchi, R.**, Singh, D., Zaman, M., Hossain, Z., Solanki, P., and Adje, D. (2013). "Sustainable Transportation: Use of High Amounts of Recycled Asphalt Materials in Green Pavement Technology," Student Research and Performance Day, March 8, 2013, Graduate College, National Weather Center, The University of Oklahoma, Norman, OK (Award Winning Poster Presentation: 1st place, also won the McNair's Choice Award).

- P11. **Ghabchi, R.**, Singh, D., Tian, Q., Koc, M., Bulut, R., Zaman, M., and Cross, S. (2012). "Moisture Susceptibility Evaluation of Warm Mix Asphalt," ODOT-OkTC Transportation Research Day 2012, October 4, 2012 (Award Winning Poster Presentation: 2nd place).
- P12. **Ghabchi, R.**, Singh, D., Adje, D., Autrey, J., Zaman, M., Hossain, Z., Lewis, S., and Solanki, P. (2012). "Effect of High RAP Contents on Mechanistic Properties of HMA," ODOT-OkTC Transportation Research Day 2012, October 4, 2012. (Poster Presentation).
- P13. Zaman M., Hossain Z., **Ghabchi R.**, Singh D., and Lewis S. (2012). "Use of High RAP Contents in Hot Mix Asphalt Pavements," 2012 OkTC and ODOT Workshop. September 18, 2012, Oklahoma Department of Transportation, Oklahoma City, OK (Oral Presentation).
- P14. **Ghabchi, R.**, Singh, D., Tian, Q., and Zaman, M. (2012). "Mechanistic Approach for Evaluation of Moisture Damage Potential of Green Pavement Technologies," ASCE GeoCongress 2012, March 25-29, 2012, Oakland, CA. (Poster Presentation).
- P15. **Ghabchi, R.**, Tian Q., Singh, D., Zaman, M. (2012). "Environmentally Friendly Asphalt Technologies for Pavement Applications: Advantages and Technical Challenges," Student Research and Performance Day, March 2, 2012, Graduate College, National Weather Center, The University of Oklahoma, Norman, OK (Poster Presentation).
- P16. **Ghabchi, R.**, Tian, Q., and Zaman, M. (2011). "Warm Mix Asphalt in Oklahoma Moisture Damage and Performance Issues," Oklahoma Department of Transportation Planning and Research Division Visit, June 22nd, 2011. The University of Oklahoma, School of Civil Engineering and Environmental Science, Norman, OK (Oral Presentation).
- P17. **Ghabchi, R.**, Tian, Q., Singh, D., Zaman, M., Bulut, R., and Cross, S. (2011). "Green Pavement Technology: Warm Mix Asphalt Moisture Susceptibility Evaluation Using Surface Free Energy Approach," ODOT-OkTC Research Day 2011, Oct. 11, 2011, Oklahoma Department of Transportation, Oklahoma City, OK. (Award Winning Poster Presentation: 1st place).
- P18. Mahmood T., **Ghabchi, R.**, Hatami, K., and Zaman, M. (2011). "Influence of Selected Geogrd Properties on their In-Aggregate Performance," GeoFrontiers 2011, March 2011, Dallas, TX. (Award Winning Poster Presentation: 3rd place).
- P19. **Ghabchi, R.**, and Zaman, M. (2010). "Effect of Gradation on Stability and Drainability of Selected Aggregate Bases in Oklahoma: A Field Case Study," 2010 ODOT-OkTC Transportation Research Day. October 14, 2010, Oklahoma Department of Transportation, Oklahoma City, OK. (Oral Presentation).
- P20. Singh, D., **Ghabchi, R.**, Laguros, J.G., and Zaman, M. (2010). "Improvement of Subgrade Soil Properties Using Chemical Stabilization: A Case Study," BGSA Research Symposium. April, 2010. The University of Oklahoma, Norman, OK (Award Winning Poster Presentation).
- P21. Singh, D., **Ghabchi, R.**, Laguros, J.G., and Zaman, M. (2010). "Stabilization of Sulfate Containing Soil for Construction of Pavements," Student Research and Performance Day,

March 26, 2010. Graduate College, National Weather Center, The University of Oklahoma, Norman, OK (Poster Presentation).

- P22. Rani, S., Ali, S.A., **Ghabchi, R.**, and Zaman, M. (2015). " Superpave® Performance Grading of Oklahoma Asphalt Binders," Student Research and Performance Student Research and Performance Day, Graduate College, National Weather Center, The University of Oklahoma, Norman, OK, March 6, 2015 (Poster Presentation).
- P23. Rani, S., Ali, S.A., **Ghabchi, R.**, and Zaman, M. (2015). " Effect of Polyphosphoric Acid and Warm Mix Additive on Asphalt Binder's Performance," Annual Meeting of the Society of Environmental Journalists (SEJ), Embassy Suites, Norman, OK, October 7, 2015 (Poster Presentation).
- P24. Rani, S., Ali, S.A., **Ghabchi, R.**, and Zaman, M. (2015). " Performance of Asphalt Binders Modified with Polyphosphoric Acid," Oklahoma Transportation Research Day, Moore Norman Technology Center, OK, October 20, 2015 (Poster Presentation).
- P25. Rani, S., Ali, S.A., **Ghabchi, R.**, and Zaman, M. (2015). " Improved Performance of Asphalt Binders Modified with Polyphosphoric Acid in Oklahoma State." Poster presented at the EGSC Research Poster Fair, 2015, University of Oklahoma, Norman, OK, November 13, 2015 (Poster Presentation).
- P26. Rani, S., Ali, S.A., **Ghabchi, R.**, and Zaman, M. (2016). " Response of Polyphosphoric Acid Modified Asphalt Binders to an Anti-Stripping Agent," Graduate Student Research and Creativity Day, University of Oklahoma, Norman, OK, March 4, 2016 (Poster Presentation).

<i>Delivered Technology Transfer Workshops</i>

- W1. **Ghabchi, R.**, Zaman, Rani, S. (2017). "Effect of WMA and Anti-Stripping Additives on PPA-Modified Binders," Sponsored by: Oklahoma Department of Transportation, Co-Sponsored by: Southern Plains Transportation Center, June 30, 2017 8:30 a.m. – 10:00 a.m. (CDST), Oklahoma Department of Transportation 200 N.E. 21st Street, Oklahoma City Lobby area, 1st Floor, Commission Room.
- W2. **Ghabchi, R.**, Zaman, Rani, S. (2017) "Applicability of MSCR Grading of Polymer- and RAP-Modified Binders," Sponsored by: Oklahoma Department of Transportation, Co-Sponsored by: Southern Plains Transportation Center, June 30, 2017 10:15 a.m. – 11:45 a.m. (CDST), Oklahoma Department of Transportation 200 N.E. 21st Street, Oklahoma City Lobby area, 1st Floor, Commission Room.
- W3. **Ghabchi, R.**, (2015). "Fatigue Characteristics of Asphalt Mixes Containing Recycled Materials," Sponsored by: Oklahoma Department of Transportation, Co-Sponsored by: Southern Plains Transportation Center, May 11, 2015. Online WebEx webinar workshop.
- W4. **Ghabchi, R.**, (2015). "Fatigue Performance of Asphalt Pavements Containing RAS and RAP," Sponsored by: Oklahoma Department of Transportation, Co-Sponsored by: Southern Plains Transportation Center, March 12, 2015 1:00 p.m. – 4:00 p.m. (CDST),

Oklahoma Department of Transportation 200 N.E. 21st Street, Oklahoma City Lobby area,
1st Floor, Commission Room.

Newsletter Articles

- N1. **Ghabchi, R.**, and Wilhelm, C. (2014). "BP Summer Camp Exposes High School Students to Transportation Safety," Southern Plains Transportation Center Newsletter, Fall 2014, pp. 21-22. Available online at:
<http://static1.squarespace.com/static/526c7a98e4b023d8f09390ed/t/562a353fe4b0b1b4cb86f145/1445606719364/SPTC%2BNewsletter%2BFall+2014.pdf>

Press Coverage

- <http://listen.sdpb.org/post/innovation-batten-disease-asphalt-1972-rapid-city-forecast>
- https://cpa.ds.npr.org/sdpb/audio/2017/06/itm_innovation_6_9_17_seg_2.mp3
- <https://www.brookingsregister.com/article/camp-teaches-high-schoolers-about-bridge-road-engineering>
- http://www.yankton.net/community/article_87573bca-4cc2-11e7-9779-0756936086ee.html?mode=story
- <http://www.newswise.com/articles/develop-guidelines-for-asphalt-bonding-agents>
- <http://www.nebraskaagconnection.com/story-state.php?Id=553&yr=2017>
- <https://www.sdstatefoundation.org/news/sdsu-civil-engineering-professor-to-develop-guidelines-for-asphalt-bonding>
- <https://www.sdstatefoundation.org/news/free-summer-camp-teaches-high-schoolers-about-bridge-road-engineering>
- <https://www.sdstate.edu/news/2017/05/free-summer-camp-teaches-high-schoolers-about-bridge-road-engineering>
- <https://www.sdstate.edu/jerome-j-lohr-engineering/engineering-research/research-awards-updates>