



## Ethan Ray

### RoadSafe LLC

545 E. Rancho Catalina Pl.

Tucson, AZ 85704

207-891-7617

ethan@roadsafellc.com

[www.roadsafellc.com](http://www.roadsafellc.com)

## SUMMARY

*A veteran of the advanced non-destructive testing field, Ethan brings a practical, hands-on approach to roadside safety research. Ethan holds a Bachelor's Degree in Civil Engineering from Worcester Polytechnic Institute.*

## DETAILED BIOGRAPHICAL SKETCH

Ethan Ray is a research engineer with RoadSafe LLC with ten years of practical work experience in the field of civil engineering. Ethan received his undergraduate degree in Civil Engineering from Worcester Polytechnic Institute. While at Worcester Polytechnic Institute, he conducted the following research projects:

- **“Design of an HDPE Crash Cushion.”** in cooperation with Dr. Malcolm Ray and the Laboratorio sulla Sicurezza dei Trasporti at the Politecnico di Milano. Milan, Italy. Fall 2006.
- **“Flooding and Erosion Control in the Informal Settlements of Windhoek, Namibia.”** in cooperation with Dr. Chrysanthe Demetry, Dr. Richard Vaz, the Namibia Housing Action Group and the Polytechnic of Namibia. Windhoek, Namibia. Spring 2006. (awarded Presidents Top Interactive Qualifying Project (IQP) Award, 2007)

He began his career in Engineering as a Non-Destructive Testing inspector at a Pennsylvania inspection company, WavesinSolids. During Ethan's 10 years with WavesinSolids (company name changes to TechKnowServ in 2012) he ascended from field inspector trainee to lead inspector to project manager.

Ethan's engineering and management experience includes frequent contact with new and existing clients to organize and plan jobs, preparing contracts and estimates, collecting and analyzing field data, and preparing project reports. He used his classroom training and extensive field experience to develop innovative solutions to difficult projects.

Ethan joined RoadSafe LLC during the Fall of 2017. His practical, field proven, data collection and analysis skills developed over the last decade are called upon for procedure development, worksheet development, and regulatory guidance research.

## PROFESSIONAL FOCUS

Application of crash-based and encroachment-based models in roadside safety; risk and cost effectiveness analysis of design alternatives; design and evaluation of roadside improvements; and development of roadside design guidance.

## EDUCATION

- BS in Civil Engineering, Worcester Polytechnic Institute, Worcester, Massachusetts (2009).

## COMMITTEE SERVICE

- Transportation Research Board -- Roadside Safety, Committee AFB20 (Friend, 2017 – present).
- Transportation Research Board – Highway Safety Performance, Committee ANB25 (Friend, 2017 – present).

## EXPERIENCE

**2017-Present:** Research Engineer at **RoadSafe LLC, Canton, Maine:** Perform research in the areas of roadside and highway safety, crash modeling, cost-benefit analysis, and risk assessment. Collect and analyze field data. Develop procedures for incorporation in AASHTO publications.

**2007-2017:** Project Manager and Lead Inspector at **WavesinSolids LLC & TechKnowServ Corp., State College, PA:** As Project Manager for the non-destructive testing services branch of WavesinSolids LLC (2007-2012) and TechKnowServ Corp. (2012-2017) Ethan was actively engaged in all steps leading up to and following on-site inspections. Ethan assisted customers in determining the best testing method for their specific applications. He developed technical procedures, work proposals and quotes while also preparing the TKS inspection teams for on-site work. He also performed technical analysis, reported on findings and ensured customer satisfaction through the entire process.

## REFEREED PUBLICATIONS

1. Thomas R. Hay, Subash B. Jayaraman, **Ethan M. Ray**, D. Robert Hay, “**Rail Surface Characterization,**” Materials Evaluation, Volume 66, Issue 11, The American Society for Nondestructive Testing, 2008.

## PUBLICATIONS

### Technical Reports

1. M.H. Ray, C.E. Carrigan and C.A. Plaxico “**Guidelines for Shielding Bridge Piers,**” National Cooperative Highway Research Program Project 12-90 (In Press), National Academy of Sciences, Washington, D.C., expected 2018. (authored Appendix)

2. C.E. Carrigan and M.H. Ray, **“Consideration of Roadside Features in the Highway Safety Manual,”** National Cooperative Highway Research Program Project 17-54 (In Press), National Academy of Sciences, Washington, D.C., expected 2018. (authored Appendix)
3. C.E. Carrigan, M.H. Ray, **E. Ray**, and A.M. Ray, **“Proposed Alternative Procedures for Assessing Compliance with the Washington State Department of Transportation Control Zone Policies,”** Roadsafe LLC, 2017.

## **INVITED PRESENTATIONS**

1. **E. Ray**, C.E. Carrigan, and M.H. Ray **“Procedures for Consideration of Roadside Features using Crash-based Methods,”** 2018 Data Gathering Session of the TRB AFB20 Committee Meeting, 97<sup>th</sup> Annual Meeting, Washington, D.C., January 7-11, 2018.
2. C.E. Carrigan, **E. Ray**, and M.H. Ray **“Consideration of Roadside Features in the Highway Safety Manual”** TRB ANB 25 Committee Workshop, 97<sup>th</sup> Annual Meeting, Washington, D.C., January 7-11, 2018.

## **SPONSORED RESEARCH PROJECTS**

1. **“Development of Safety Performance Based Guidelines for the Roadside Design Guide,”** National Cooperative Highway Research Program (NCHRP) Project 15-65, National Academy of Sciences, \$300,000
2. **“Recommended Guidelines for the Selection and Placement of Test Levels 2 through 5 Median Barriers,”** National Cooperative Highway Research Program (NCHRP) Project 22-31, National Academy of Sciences, \$300,000.
3. **“Guidelines for Shielding Bridge Piers,”** National Cooperative Highway Research Program (NCHRP) Project 12-90, National Academy of Sciences, \$450,000, 2018.
4. **“Consideration of Roadside Features in the Highway Safety Manual,”** National Cooperative Highway Research Program (NCHRP) Project 17-54, National Academy of Sciences, \$1,140,000, 2018.

## **NON-DESTRUCTIVE TESTING PROJECTS**

Ethan participated in numerous non-destructive testing projects through his employment at WavesInSolids/TechKnowServ. The projects were funded by both government and industry clients. A representative sample of his experience is provided here.

1. Project Manager: Chemical bulk storage tank inspections as part of the New York State Department of Environmental Conservation 5-year inspection requirements. Developed custom testing protocols, accepted by the NYS DEC, for non-entry inspections where tank entry was typically required. Global Foundries. Ongoing contract 2016 – 2020.
2. Project Manager: Wooden utility pole inspection and treatment. Inspection included visual testing, sounding and below grade resistograph relative density measurements while treatment included external and internal fumigation for maintenance of the system. Bryant University. Smithfield, RI. August 2017.
3. Project Manager: Cable inspection of various amusement rides at Six Flags New Jersey using visual inspection and magnetic flux leakage inspection. Six Flags Great Adventure. Jackson, NJ. March – August 2017.
4. Project Manager: Rotor Spider non-destructive testing using visual inspection, phased array ultrasonic, and magnetic particle testing at the Fort Randall Dam. US Army Corps of Engineers. Pickstown, SD. June 2017.
5. Project Manager & Inspector: Shear wave ultrasonic testing of full penetration welds on the Jonesville Dam tainter gates using rope access (SPRAT). US Army Corps of Engineers. Jonesville, LA. April 2017.
6. Project Manager & Lead On-Site Inspector: Top Thrill Dragster bolt torque inspection and weld magnetic particle inspection using rope access (SPRAT). Cedar Point Amusement Park. Sandusky, OH. 2015 – 2017.
7. Project Manager & Inspector: Contact method ultrasonic inspection of girder bearing pins on the Garrison Dam Outlet Works Service Bridge. US Army Corps of Engineers. Pick City, ND. September 2016.
8. Project Manager & Lead On-Site Inspector: Compressed gas tube trailer rebuild, neck thread inspection and DOT recertification using acoustic emission testing. Praxair Mexico. Ciudad del Carmen, Campeche, Mexico. July 2016.
9. Project Manager & Lead On-Site Inspector: Compressed gas tube trailer DOT rectification using acoustic emission testing. West Air Gas. National City, CA. July 2016.

10. Project Manager: Compressed gas tube trailer DOT rectification using acoustic emission testing. Limetree Bay Terminals. St. Croix. March 2016.
11. Lead Inspector: Pipeline inspection at various PEMEX refineries and remote pumping stations using guided wave ultrasonic testing. PEMEX. Various locations in Mexico. 2013 – 2015.
12. Project Manager & Lead On-Site Inspector: Phased array ultrasonic inspection of eye bar link pins and tie-down pins on the 6<sup>th</sup>, 7<sup>th</sup>, and 9<sup>th</sup> Street Bridges. Allegheny County Department of Public Works. Pittsburgh, PA. August 2015
13. Project Manager & Inspector: Phased array ultrasonic inspection of eye bar link pins on the Norfolk Southern SR-361.66 Bridge using rope access (SPRAT). Norfolk Southern Railroad. Letchworth State Park, NY. October 2013.
14. Lead Inspector: AREMA inspection of thermite field welds using geometric measurements, ultrasonic testing, magnetic particle testing, and hardness testing. Cuyahoga Valley Scenic Railroad. Akron, OH. May 2012.