



**Shannon Warchol, E.I.**  
 Research Associate, Highway Systems  
 Institute for Transportation Research and Education  
 North Carolina State University  
 Centennial Campus, Box 8601  
 Raleigh, NC 27695-8601  
 Phone: 919.515.8043 Fax: 919.515.8898  
 Email: sewarcho@ncsu.edu

## EDUCATION

### **North Carolina State University; Raleigh, NC**

M.S. Civil Engineering, May 2015

### **University of Notre Dame; Notre Dame, IN**

B.S. Civil Engineering, Magna Cum Laude, May 2013

Minor: Chinese

## EXPERIENCE

January 2015 - Present

### **Research Associate**

Institute for Transportation Research and Education  
 NC State University; Raleigh, NC

August 2013 – December 2014

### **Graduate Research Assistant**

Institute for Transportation Research and Education  
 NC State University; Raleigh, NC

May 2014 – August 2014

### **Roadway Design Intern**

Kimley-Horn and Associates; Cary, NC

May 2012 – August 2012

### **Quality Control Engineer Intern**

Walsh Construction Group; St. Paul, MN

## PEER REVIEWED PUBLICATIONS

### JOURNAL ARTICLES

Jackson, K.N, O'Brien, S. W., Searcy, S. E., and **S. Warchol**. "Quality Assurance and Quality Control Processes for a Large Scale Bicycle and Pedestrian Volume Data Program." *Transportation Research Record: Journal of the Transportation Research Board of the National Academies*. Paper 17-03067. In Press

Hummer, J.E., Cunningham, C.M., Srinivasan, R., **Warchol, S.**, Edara, P., Claros, B., and C. Sun. "Safety Evaluation of Seven of the Earliest Diverging Diamond Interchanges Installed in the US." *Transportation Research Record: Journal of the Transportation Research Board of the National Academies*. Volume 2583. pp 25-33. Washington, D.C. 2016

**Warchol, S.**, Schroeder, B.J., and C.M. Cunningham. "Impact of Off-Ramp Geometric Treatments at Diverging Diamond Interchanges on Queue Spillback." *Transportation Research Record: Journal of the Transportation Research Board of the National Academies*. Volume 2556. pp 75-85. Washington, D.C. 2016

Kim, S., **Warchol, S.**, Schroeder, B.J., and C.M. Cunningham. "An Innovative Method for Remotely Fine Tuning Offsets along a DDI Corridor." *Transportation Research Record: Journal of the Transportation Research Board of the National Academies*. Volume 2557. pp 33-43. Washington, D.C. 2016

Cunningham, C.M., Schroeder, B.J., **Warchol, S.**, Philips, S., Urbanik, T., and A. Tanaka. “Signal Timing for Diverging Diamond Interchanges: Fundamentals, Concepts, and Recommended Applications.” *Transportation Research Record: Journal of the Transportation Research Board of the National Academies*. Volume 2557. pp 1-10. Washington, D.C. 2016

#### PROCEEDINGS

**Warchol, S.**, Chase, T., and C.M. Cunningham. *DDI Signal Phasing Scheme Evaluation using Microsimulation*. Proceedings of the 96rd Annual Meeting of the Transportation Research Board, Washington, D.C. 2017

**Warchol, S.** *Geometric and Signal Timing Strategies to Improve Corridor Operations in the Vicinity of Diverging Diamond Interchanges*. Proceedings of the 94rd Annual Meeting of the Transportation Research Board, Washington, D.C. 2015

#### REPORTS AND OTHER PUBLICATIONS

Hummer, J.E., Cunningham, C.M., Srinivasan, R., Rao, S., and **S.Warchol**. *Safety Evaluation of Seven of the Earliest Double Crossover Interchanges Installed in the US*. Federal Highway Administration. FHWA DTFH6-10-C-00029. In Press

Hummer, J.E., Cunningham, C.M., Srinivasan, R., Rao, S., and **S. Warchol**. *TECHBRIEF – Field Evaluation of Diverging Diamond Interchanges (Safety)*. Federal Highway Administration. FHWA DTFH61-10-R-00030. In Press.

Cunningham, C.M., **Warchol, S.** and B. Schroeder. *Exploring Corridor Operations in the Vicinity of a Diverging Diamond Interchange (DDI)*. North Carolina Department of Transportation. FHWA/NC 2014-13. June 2016.

Sallade, S., Vaughan, C., Chase, T., **Warchol, S.**, and C.M. Cunningham. *Reducing Aggressive Driving Behavior: Clearly Conveying Enforcement Wave Initiatives to Citizens Using Portable Changeable Message Signs*. North Carolina Governor’s Highway Safety Program. October 2015.

**Warchol O’Brien, S.** *Impact of Right Turn Treatments at Diverging Diamond Interchanges*. Master’s Thesis. North Carolina State University. April 2015.

#### PRESENTATIONS

*Software versus Theory: What Should Undergraduate Engineering Students be Learning?* TransportationCamp. Arlington, VA. January 2017.

*Multimodal Accommodations at DDIs: State of the Practice*. Transportation Research Board Multimodal Traffic Signal Systems Subcommittee AHB25(5). Washington, D.C. January 2017.

*Diverging Diamond Interchange Signal Timing Techniques*. North Carolina Section of the Institute for Transportation Engineers Signal System User’s Group and ITS Carolinas Joint Meeting. Raleigh, NC. April 2016.

*Dyanmic Bandwidth Optimization for Improved DDI Signal Timing using Vistro and Vissim*. PTV North American User’s Group Meeting. Portland, OR. October 2015.

*Using “Dynamic Bandwidth Assessment Tool” for Optimizing Intersection Offsets*. North Carolina Section of the Institute for Transportation Engineers Signal Systems User’s Group Meeting. Greensboro, NC. May 2015.

*Optimization and Modeling of Corridor Operations in the Vicinity of a DDI Using Vistro & Vissim*. PTV North American User’s Group Meeting. Orlando, FL. October 2014.

*Optimization and Modeling of Corridor Operations in the Vicinity of a DDI Using Cap-X, Vistro, & Vissim.* North Carolina Section of the Institute for Transportation Engineers SimCap User's Group Meeting. Raleigh, NC. September 2014.

*Exploring Corridor Operations in the Vicinity of a DDI – Right Turn Options.* NCSITE Student-led Meeting, Charlotte NC. April 2014.

## **PROJECT EXPERIENCE**

Transportation System Simulation Manual

2016 – 2018, Federal Highway Administration Contract No. DTFH61-16-D-00030

(PI) Warrant Development for Signalization of Superstreet Intersections with Two or Three Approaches

2016 – 2017, North Carolina Department of Transportation No. 2017-11

NCLOS Program Update for the HCM 6<sup>th</sup> Edition

2016 – 2017, North Carolina Department of Transportation No. 2017-19

Developing Guidelines and Documentation of Engineering Studies for Establishing NC Speed Limits

2016 – 2017, North Carolina Department of Transportation Project No. 2017-10

Guidance for Traffic Signals at Diverging Diamond Interchanges and Adjacent Intersections

2014 - 2016, National Academies of Science No. NCHRP 03-113

Effects of Late Lane Merges on Travel Times

2014 – 2016, North Carolina Department of Transportation No. 2015-08

Reducing Aggressive Driving Behavior in the Vicinity of Trucks Using Real-Time Feedback

2014 – 2015, Governor's Highway Safety Project No. 2000003164

Bicycle and Pedestrian Data Collection

2013 – 2017, North Carolina Department of Transportation No. 2014-44

Exploring Corridor Operations in the Vicinity of a Diverging Diamond Interchange

2013 – 2016, North Carolina Department of Transportation No. 2014-13

Field Evaluation of Double Crossover Diamond Interchanges

2013 – 2015, Federal Highway Administration Contract No. DTFH61-10-C-00030

## **TEACHING ACTIVITIES**

Fundamentals of Engineering (FE) Exam Review Course. Topics including: Construction Engineering, Materials Science, Structural Analysis, Reinforced Concrete Design, Steel Design. February 2016 – Present.

North Carolina State University Guest Lecturer

CE 503 – February 1 and 3, 2016

CE 501 – January 28, 2014 and September 30, 2014

## **OTHER ACTIVITIES**

Transportation Research Board: Geometric Design Committee (AFB10) Member, 2015 – Present

Transportation Research Board: Operational Effects of Geometrics Committee (AHB65) Friend

Transportation Research Board: Traffic Signal Systems Committee (AHB25) Friend

NCSITE Signal Systems User's Group Member, 2015 – Present

NCSITE Simulation and Capacity User's Group Member, 2015 - Present

Totino-Grace High School Experiential Engineering Education Mentor, 2013 – Present  
NCSU ITE/ASHE/AREMA Student Chapter President, 2014-2015

## HONORS

### NATIONAL/INTERNATIONAL

Best Simulation Application Paper, *DDI Signal Phasing Scheme Evaluation using Microsimulation*,  
Transportation Research Board Joint Traffic Simulation Subcommittee (AHB45-1), 2017  
North American PTV Vision Traffic User's Group Meeting Best Abstract Award, 2015  
Best Graduate Student Poster Award, Transportation Research Board Geometric Design Committee  
(AFB10), 2015  
Jack E. Leisch National Graduate Fellowship, American Society for Civil Engineers, 2014  
Chi Epsilon, 2012  
Tau Beta Pi, 2012

### LOCAL

Pride of the Wolfpack Award, North Carolina State University, 2016  
Helene M. Overly Graduate Scholarship, WTS NC Triangle Section, 2015  
Graduate Student Scholarship, ASHE Triangle Section, 2014  
Transportation Founders Fund Scholarship, NCSU, 2013  
Walter L. Shilts Award, University of Notre Dame, 2013  
Tau Beta Pi, 2012

## COLLABORATORS

T. Chase; B. Claros; C. Cunningham; P. Edara; J. Hummer; K. Jackson; S. Kim; S. O'Brien; S.  
Philips; S. Rao; B. Schroeder; S. Searcy; R. Srinivasan; C. Sun; A. Tanaka; T. Urbanik; C. Vaughan