



PUBLICATIONS, REPORTS, and PRESENTATIONS

January 2004-March 2010

**New York University's Wagner Graduate School of Public Service
Institute for Civil Infrastructure Systems (ICIS)**

Journal Articles and Published Proceedings Papers

- R. Zimmerman, C.E. Restrepo, A. Culpen, W.E. Remington, A. Kling (forthcoming) "Risk Communication for Catastrophic Events: Results from Focus Groups," *Journal of Risk Research*.
- R. Zimmerman (2010) "Transportation Recovery in an Age of Disasters," *Proceedings of the Transportation Research Board 89th Annual Meeting*, Washington, DC: TRB. Paper Number 10-2249.
- J.S. Simonoff, C.E. Restrepo, and R. Zimmerman (2010) "Risk Management of Cost Consequences in Natural Gas Transmission and Distribution Infrastructures," *Journal of Loss Prevention in the Process Industries*, Vol. 23 (2), pp. 269-279. doi:10.1016/j.jlp.2009.10.005.
- C. E. Restrepo, J. S. Simonoff and R. Zimmerman (2009) "Causes, Cost Consequences, and Risk Implications of Accidents in U.S. Hazardous Liquid Pipeline Infrastructure," *International Journal of Critical Infrastructure Protection*, Vols. 1-2, pp. 38-50. doi:10.1016/j.ijcip.2008.09.001.
- M.R. Greenberg, W. Irving, and R. Zimmerman (2009) "Allocating U.S. Department of Homeland Security Funds to States with Explicit Equity, Population and Energy Facility Security Criteria," *Socioeconomic Planning Sciences*, Vol. 43 (4), pp. 229-239.
- R. Zimmerman, C. E. Restrepo, and J. S. Simonoff (2009) "Infrastructure Age, Security and Natural Hazards," *The CIP Report*, Vol. 8 (4), pp. 18, 28, 29.
- R. Zimmerman, C. E. Restrepo, and J. S. Simonoff (forthcoming 2009) "The Age of Infrastructure in a Time of Security and Natural Hazards," *Proceedings of the DHS Aging Infrastructures Workshop*.
- R. Zimmerman and C. E. Restrepo (2009) "Analyzing Cascading Effects within Infrastructure Sectors for Consequence Reduction," *Proceedings of the IEEE International Conference on Technologies for Homeland Security*.
- R. Zimmerman and J.S. Simonoff (2009) "Transportation Density and Opportunities for Expediting Recovery to Promote Security," *Journal of Applied Security Research*, Vol. 4 (1), pp. 48-59.
- V. Bier, N. Haphuriwat, J. Menoyo, R. Zimmerman and A. Culpen (2008) "Optimal resource allocation for defense of targets based on differing measures of attractiveness," *Risk Analysis*, Vol. 28 (3), pp. 763-770.
- R. Zimmerman, C.E. Restrepo, and J. S. Simonoff (2008) "Infrastructure Disruptions and Recovery Rates in Disasters," *ASCE Metropolitan Section Infrastructure Group Technical Seminar "New York City Infrastructure Critical Needs,"* Brooklyn, NY: Polytechnic University of New York, March 24-25, pp. 28-35.

- Z. S. Naphtali, C.E. Restrepo, and R. Zimmerman (2008) "Maps Expand Asthma Hazards Awareness: GIS Helps Policy Makers See Where Childhood Asthma, Schools, and Pollution Sources Collide," *HealthyGIS, ESRI*, Winter, pp. 4-5.
<http://www.esri.com/library/newsletters/healthygis/healthygis-winter2008.pdf>
- J.S. Simonoff, C.E. Restrepo, and R. Zimmerman (2007) "Risk Management and Risk Analysis-Based Decision Tools for Attacks on Electric Power," *Risk Analysis*, Vol. 27 (3), pp. 547-570.
- M. Greenberg, N. Mantell, M. Lahr, F. Felder, and R. Zimmerman (2007) "Short and Intermediate Economic Impacts of a Terrorist-Initiated Loss of Electric Power: Case Study of New Jersey," *Energy Policy*, Vol. 35 (1), pp. 722-733.
- R. Zimmerman, C.E. Restrepo, B. Nagorsky, and A.M. Culp (2007) "Vulnerability of the Elderly During Natural Hazard Events," *Proceedings of the Hazards and Disasters Research Meeting*, July 11-12, 2007. Boulder, CO: Natural Hazards Center, pp. 38-40.
http://www.colorado.edu/hazards/workshop/hdrm_proceedings.pdf
- T. Fulmer, I. Portelli, G. L. Foltin, R. Zimmerman, E. Chachkes, L. R. Goldfrank (2007) "Organization- based Incident Management: Developing a Disaster Volunteer Role on a University Campus," *Disaster Management & Response*, July-September, pp. 74-81.
- Z. S. Naphtali, C. E. Restrepo & R. Zimmerman (2007) "Using GIS to Examine Environmental Injustice in the South Bronx. The Case of Waste Transfer Stations," *Connect*, Spring/Summer pp. 23-28. <http://www.nyu.edu/its/pubs/connect/spring07/>
http://www.nyu.edu/its/pubs/connect/spring07/pdfs/naphtali_gis.pdf
- R. Zimmerman and C.E. Restrepo (2006) "The Next Step: Quantifying Infrastructure Interdependencies to Improve Security," *International Journal of Critical Infrastructures*, Vol. 2 (2/3), pp. 215-230.
- C.E. Restrepo, J.S. Simonoff, and R. Zimmerman (2006) "Unraveling Geographic Interdependencies in Electric Power Infrastructure," *Proceedings of the Hawai'i International Conference on System Sciences*, IEEE Computer Society.
- R. Zimmerman (2005) "Mass Transit Infrastructure and Urban Health," *Journal of Urban Health*, Vol. 82 (1), pp. 21-32.
- R. Zimmerman, C.E. Restrepo, N. Dooskin, J. Fraissinet, R. Hartwell, J. Miller and W. Remington (2005) "Diagnostic Tools to Estimate Consequences of Terrorism Attacks Against Critical Infrastructure," *Proceedings, U.S. Department of Homeland Security conference, Working Together: Research and Development Partnerships in Homeland Security*, Boston, MA.
- R. Zimmerman (2004) "Decision-making and the Vulnerability of Critical Infrastructure," *Proceedings of IEEE International Conference on Systems, Man and Cybernetics*, edited by W. Thissen, P. Wieringa, M. Pantic, and M. Ludema, The Hague, The Netherlands: Delft University of Technology.
- C. Restrepo, R. Zimmerman, G. Thurston, J. Clemente, J. Gorczynski, M. Zhong, M. Blaustin, and L.C. Chen (2004) "A Comparison of Ground-Level Air Quality Data with New York State Department of Environmental Conservation Monitoring Stations Data in South Bronx, New York," *Atmospheric Environment*, Vol. 38, pp. 5295-5304.

Book Chapters

- R. Zimmerman (2009) "Making Infrastructure Competitive in a Changing World Through Investment," in *The ANNALS of the American Academy of Political and Social Science*, Vol. 626 Issue 1, edited by S. Wachter and E. L. Birch. Philadelphia, PA: AAPSS, pp. 226-241.
 d.o.i.: 10.1177/0002716209344842.

- R. Zimmerman and C. E. Restrepo (forthcoming) "Urban Transportation," in *Urban Health: A Global Perspective*, edited D. Vlahov, J. Boufford, and C. Pearson. New York: Jossey-Bass, John Wiley and Sons.
- R. Zimmerman (forthcoming 2009) "Understanding the Implications of Critical Infrastructure Interdependencies for Water," in *Wiley Handbook of Science and Technology for Homeland Security*, edited by J. Voeller, accepted for publication.
- R. Zimmerman (2008) "Managing Infrastructure Resiliency, Safety and Security," in *Encyclopedia of Quantitative Risk Assessment and Analysis*, edited by E. Melnick and B. Everitt. Chichester, UK: John Wiley & Sons, Ltd, pp. 1033-1040.
- C.E. Restrepo and R. Zimmerman (2008) "Environmental Justice," in *Encyclopedia of Quantitative Risk Analysis and Assessment*, edited by E. L. Melnick and B. S. Everitt. Chichester, UK: John Wiley & Sons, Ltd, Vol. 2, pp. 808-817.
- J.S. Simonoff, C.E. Restrepo, R. Zimmerman, and Z.S. Naphtali (2007) "Analysis of Electrical Power and Oil and Gas Pipeline Failures," Chapter 27 in *Critical Infrastructure Protection*, edited by E. Goetz and S. Sheno. New York, NY: Springer, pp. 381-394.
- M. R. Greenberg and R. Zimmerman (2008) "Distribution of Federal Anti-Terrorism Funds to States in the United States: A Comparison of Population, Income, and Simple Vulnerability Indicators with Infrastructure Applications," in *Global Terrorism: Issues and Developments*, edited by R. A. Larche. Hauppauge, NY: Nova Science Publishers, Inc., pp. 101-120.
- R. Zimmerman, C.E. Restrepo, J.S. Simonoff, and L. Lave (2007) "Risk and Economic Cost of a Terrorist Attack on the Electric System," Chapter 14 in *The Economic Costs and Consequences of Terrorism*, edited by H.W. Richardson, P. Gordon and J.E. Moore II. Cheltenham, UK: Edward Elgar Publishers, pp. 273-290.
- R. Zimmerman (2006) "Critical Infrastructure and Interdependency," Chapter 34 in *The McGraw-Hill Homeland Security Handbook*, edited by D.G. Kamien. New York, NY: The McGraw-Hill Companies, Inc., pp. 523-545. Reviewed in the *Journal of Homeland Security and Emergency Response* (2006) Vol. 3 (1), pp. 1-3, by W.R. Cumming.
- R. Zimmerman (2005) "Social Implications of Infrastructure Network Interactions," Chapter 4 in *Sustaining Urban Networks: The Social Diffusion of Large Technical Systems*, edited by O. Coutard, R. Hanley, and R. Zimmerman. London, UK: Routledge, pp. 67-85.

Reports

- R. Zimmerman, C. E. Restrepo and Z. Guo, "Feasibility Assessment of Roll-Off Trash Compactor Technology in Reducing Rat Infestations in New York City (Waste Containerization Grant), Draft Final Residential Buildings Report, Draft – For Internal Use Only. Presented to the NYCDOHMH, May 2009.
- R. Zimmerman, C. E. Restrepo and Z. Guo, "Feasibility Assessment of Roll-Off Trash Compactor Technology in Reducing Rat Infestations in New York City (Waste Containerization Grant), Draft Final Schools Report, Draft – For Internal Use Only. Presented to the NYCDOHMH, May 2009.
- C.E. Restrepo and R. Zimmerman, editors, "South Bronx Environmental Health and Policy Study, Public Health and Environmental Policy Analysis: Final Reports for Phases IV, V and VI." New York, NY: NYU, Wagner School, ICIS, 2007-2009.
- A. Kling and R. Zimmerman, "Risk Communication Indicators for Emergency Response." New York, NY: NYU, Wagner School, ICIS, February 2007.

- R. Zimmerman, "Infrastructure Support for Emergency Response: Preliminary Criteria and Indicators for Infrastructure Linkages to Emergency Services." Draft Working Paper for the NYU Center for Catastrophe Preparedness & Response, 27 pp., New York, NY, July 7, 2006.
- R. Zimmerman with J.S. Simonoff and H. Arnett, "Urban Infrastructure Services in a Time of Crisis: Lessons from September 11th." Final Report to the National Science Foundation. New York, NY: NYU, Wagner School, February 2006.
- J.S. Simonoff, C.E. Restrepo, and R. Zimmerman with the assistance of W.E. Remington, "Trends for Oil and Gas Terrorist Attacks," I3P Report No. 2, Hanover, NH: The Institute for Information Infrastructure Protection (I3P), November 2005, 63 pp.
- R. Zimmerman, C. E. Restrepo, N. J. Dooskin, R. V. Hartwell, J. I. Miller and W. E. Remington (NYU-Wagner); J. S. Simonoff (NYU-Stern); L. B. Lave (Carnegie Mellon); R. E. Schuler (Cornell), "Electricity Case: Main Report – Risk, Consequences, and Economic Accounting," Center for Risk and Economic Analysis of Terrorism Events at USC, Los Angeles, CA, May 2005 (Updated June 2005).
- R. Zimmerman (NYU-Wagner), L. B. Lave (Carnegie Mellon), C. E. Restrepo, N. J. Dooskin, R. V. Hartwell, J. I. Miller, and W. E. Remington (NYU-Wagner); J. S. Simonoff (NYU-Stern), R. E. Schuler (Cornell) "Electricity Case: Economic Cost Estimation Factors for Economic Assessment of Terrorist Attacks," Center for Risk and Economic Analysis of Terrorism Events at USC, Los Angeles, CA, May 2005.
- J. S. Simonoff (NYU-Stern); R. Zimmerman, C. E. Restrepo, N. J. Dooskin, R. V. Hartwell, J. I. Miller and W. E. Remington (NYU-Wagner); L. B. Lave (Carnegie Mellon); R. E. Schuler (Cornell) "Electricity Case: Statistical Analysis of Electric Power Outages," Center for Risk and Economic Analysis of Terrorism Events at USC, Los Angeles, CA, May 2005 (Updated July 2005).
- "Institute for Civil Infrastructure Systems, Final Report 1998-2004." New York, NY: NYU, Wagner School, ICIS, 98 pages + appendices.
- R. Zimmerman, C. Restrepo, C. Hirschstein, N. Dooskin, J. Holguín-Veras, and B. Egan, "South Bronx Environmental Health and Policy Study, Public Health and Environmental Policy Analysis: Final Report for Phase II and III," New York, NY: NYU, Wagner School, ICIS, December 2004.
- R. Zimmerman, C. Restrepo, C. Hirschstein, J. Holguín-Veras, J. Lara and D. Klebenov, "South Bronx Environmental Health and Policy Study, Public Health and Environmental Policy Analysis: Final Report for Phase I," New York, NY: NYU, Wagner School, ICIS, 2002. Available online at: <http://www.icisnyu.org/admin/files/PhaseIWagner930.pdf>

Presentations

2010 (through March):

- C.E. Restrepo, J.S. Simonoff, G.D. Thurston, and R. Zimmerman, "Seasonal Ambient Concentrations of Particulate Matter and Asthma Hospitalizations in New York City," 2010 AAAR Air Pollution and Health Specialty Conference, San Diego, CA, March 22-26, 2010.
- "Smart Grid: Challenges and Opportunities," Sallan Foundation, League of Conservation Voters and ICIS (co-hosts), NYU-Wagner, New York, NY, February 3, 2010
- R. Zimmerman "Transportation Protection and Recovery in an Age of Disasters," Transportation Research Board 89th Annual Meeting, Washington, DC, January 12, 2010.
- R. Zimmerman, "Mobility in 2050," Envisioning a Low-Carbon Clean Energy Economy in New York, New York Academy of Sciences, New York, NY, January 5, 2010.

2009:

- R. Zimmerman, C.E. Restrepo and J.S. Simonoff “Solving multiple risks is better than solving one: Risk-based co-benefit assessment for infrastructure investments,” Society for Risk Analysis annual meeting, Baltimore, MD, December 9, 2009.
- J.S. Simonoff, C.E. Restrepo and R. Zimmerman “Cost consequence estimates for natural gas transmission and distribution incidents as a risk management tool,” Society for Risk Analysis annual meeting, Baltimore, MD, December 9, 2009.
- R. Zimmerman, “Infrastructure Dependencies, Interdependencies, and Security: Measuring Anecdotes,” Infrastructure Security Workshop, Rutgers University, New Brunswick, NJ, October 14, 2009.
- R. Zimmerman, “Evacuation and Transportation Planning,” Infrastructure Security Workshop, Rutgers University, New Brunswick, NJ, October 13, 2009.
- R. Zimmerman, “The New Sustainability: Co-benefits of Secure and Green Infrastructures for Cities and Their Regions,” Association of Collegiate Schools of Planning, Washington, DC, October 2, 2009.
- J.S. Simonoff, Restrepo, C., R. Zimmerman, Naphtali, Z, Willis, H., “Resource Allocation and Infrastructure Density Around Vulnerable Sites,” 2009 Joint Statistical Meetings, section on Statisticians in Defense and National Security, August 2-6, 2009.
- R. Zimmerman, Restrepo, C., Simonoff, J., “The Age of Infrastructure in a Time of Security and Natural Hazards,” Aging Infrastructures Workshop, sponsored by the DHS S&T Directorate and Columbia University, New York, NY, July 21, 2009.
- R. Zimmerman Restrepo, C., “Analyzing Cascading Effects within Infrastructure Sectors for Consequence Reduction,” 2009 IEEE International Conference on Technologies for Homeland Security, Waltham, MA, May 11, 2009.
- R. Zimmerman, “Transportation and Climate Change.” Panel on Climate Change: Integrating Transportation, Energy, the Environment, and Health, Transportation & Infrastructure Issues for the Next Decade, Policy Research Institute, Princeton, NJ, March 6, 2009.
- C.E. Restrepo, R. Zimmerman, J.S. Simonoff, and Z.S. Naphtali, “Data Needs and Availability for Infrastructure Incident Analysis Vulnerability Assessment of Critical Infrastructure, With Case Studies on Power Transmission Networks and Dams,” Presentation and discussion paper, Workshop on Vulnerability Assessment of Critical Infrastructure, With Case Studies on Power Transmission Networks and Dams, University of Wisconsin-Madison (UW-Madison), Madison, WI, January 13-14, 2009.

2008:

- R. Zimmerman, J.S. Simonoff, Z.S. Naphtali, C.E. Restrepo, and H. Willis, “Measures of Critical Infrastructure Density around Vulnerable Facilities,” Society for Risk Analysis, Boston, MA, December 9, 2008.
- R. Zimmerman, “Securing Infrastructure Services in the Digital Age,” Panel on Hooked on Technology: The Benefits and Dangers of the Digital Age, The NYU Alumni Association, November 6, 2008.
- R. Zimmerman, presentation for “U.S. Department of Homeland Security,” DHS Modeling & Simulation Workshop,” Suffolk, VA , October 28-30, <http://civic.rutgers.edu/WS-CFP/DHS-Workshop.pdf>
- R. Zimmerman. Invited presentation (and subsequent paper) on “Public Investment in American Cities: Infrastructure, Services and Delivery,” Shape of the American City, a conference co-sponsored by the Penn Institute for Urban Research and the American Academy of Political Science and Social Science, Philadelphia, PA, October 24-25, 2008.

- C. Rosenzweig and R. Zimmerman, "Integrating Transportation, Population and Hazards Data for Risk Avoidance During Emergencies," NYC Dept. of Health and Mental Hygiene/Office of Emergency Management, New York, NY, July 15, 2008.
- R. Zimmerman, C.E. Restrepo, J.S. Simonoff, Z.S. Naphtali, A. M. Culpen, "Hazards, Infrastructure Incidents and Social Equity in Urban Areas," Association of Collegiate Schools of Planning (ACSP)/Association of European Schools of Planning (AESOP) World Planning Congress, Chicago, IL, July 8, 2008.
- R. Zimmerman, C.E. Restrepo and J.S. Simonoff, Paper presentation for "Security: Advancing a Framework for Enquiries (SAFE)," Istanbul, Turkey. Sponsored by the European Science Foundation and NATO. Workshop 4: Management of Security: Successes and Failures, May 21-23, 2008.
- C. E. Restrepo, Z. S. Naphtali and R. Zimmerman, "Using GIS to evaluate the distribution, concentration and level of risk posed by dams in the United States," the Association of American Geographers' (AAG) Annual Meeting, Boston, MA, April 15-19, 2008.
- R. Zimmerman, C. E. Restrepo, and J. S. Simonoff, Infrastructure Disruptions and Recovery Rates in Disasters, ASCE Metropolitan Section Infrastructure Group Technical Seminar "New York City Infrastructure Critical Needs," Polytechnic University, Brooklyn, NY, March 24, 2008.
- R. Zimmerman, C. E. Restrepo, and J. S. Simonoff, Regression modeling and prediction of causes and consequences of oil & gas pipeline accidents and electric power outages, Second Annual Homeland Defense and Security Education Summit, University of Maryland University College, College Park, MD, March 19, 2008.
- R. Zimmerman, An Educational Initiative Combining Security and Global Climate Change (GCC) Needs for Critical Infrastructure Protection, Second Annual Homeland Defense and Security Education Summit, University of Maryland University College, College Park, MD, March 18, 2008.
- A. Culpen, Graduate Research Assistant (with others), Student Poster and Presentation. Infrastructure Needs of Vulnerable Populations in Catastrophes, New York University, Wagner School, U.S. Department of Homeland Security, University Network Summit and Student Day, Washington, DC, March 18, 2008.
- C. E. Restrepo, R. Zimmerman, and J. S. Simonoff, "Risk Communication in Support of Energy, Transportation and Water Services," 2008 Risk Symposium, Santa Fe, NM, March 11, 2008.
- R. Zimmerman, "New Paradigms to Simultaneously Achieve Environmental Sustainability and Security for Infrastructure," Public Entity Risk Institute (PERI) Web Symposium, "Infrastructure Risk and Renewal: The Clash of Blue and Green, January 14-18, 2008. www.riskinstitute.org/PERI/SYMPOSIUM.
- R. Zimmerman and C.E. Restrepo, "Research Directions for Analytical Tools to Portray and Monitor Infrastructure Vulnerability for Resource Allocation," Panel on Securing Critical Infrastructures in New York State: Directions for Research and Application, Conference on Protecting New York from Terrorism and Disaster: Taking Stock, Setting Directions, Looking Forward, Protect New York Society, Levin Institute of SUNY, New York, NY, January 11, 2008. <http://protectnewyork.org/images/PNY-DraftProgram-1-4-08.pdf>
- R. Zimmerman and J.S. Simonoff, "Transportation Density and Opportunities for Expediting Recovery to Promote Security," Panel on Transportation Security in New York, Conference on Protecting New York from Terrorism and Disaster: Taking Stock, Setting Directions, Looking Forward, Protect New York Society, Levin Institute of SUNY, New York, NY, January 10, 2008. <http://protectnewyork.org/images/PNY-DraftProgram-1-4-08.pdf>

2007:

- C.E. Restrepo, J.S. Simonoff and R. Zimmerman “Risk and Vulnerability Measures for Infrastructure Asset Protection: Bridges and Dams,” Society for Risk Analysis Annual Meeting, San Antonio, TX, December 20, 2007.
- R. Zimmerman with C.E. Restrepo and J.S. Simonoff, “Infrastructure Impacts of Global Climate Change,” Global Climate Change and Greenhouse Gases. Market Incentives, Risks, and Lessons. Interactive Seminar. Sponsored by the Society for Risk Analysis (SRA) NY Metro Chapter and Columbia Students for Environmental Action; co-Sponsored by The Louis Berger Group Inc., New York, NY, November 15, 2007.
- R. Zimmerman, “Status of Recovery in New York Since the World Trade Center Attacks,” Invited presentation at the Disasters Roundtable Workshop, Recovering from Disaster, National Academies, Washington, DC, October 17, 2007.
- R. Zimmerman, C. Restrepo, Z. S. Naphtali and J.S. Simonoff, “Impact of Infrastructure Trends & Issues on Public Transportation for a Sustainable Future,” Invited presentation for the session on APTA’s Visioning Initiative: Public Transportation’s Role in a Sustainable, Physical & Natural Environment, American Public Transportation Association Annual Meeting, Charlotte, NC, October 9, 2007.
- R. Zimmerman, C.E. Restrepo, Z.S. Naphtali, J.S. Simonoff, “Analyzing Infrastructure Vulnerabilities to Multiple Hazards” Symposium on Emerging Developments in Multi-Hazard Engineering, Co-sponsored by the Architectural Engineering Institute of ASCE (AEI) and the Multidisciplinary Center for Earthquake Engineering Research (MCEER, U. of Buffalo) and sponsored by the Steel Institute of New York. McGraw Hill Conference Center, New York, NY, September 18, 2007.
- R. Zimmerman, C.E. Restrepo, B. Nagorsky, and A.M. Culpén “Vulnerability of the Elderly During Natural Hazard Events,” University of Colorado (Boulder), Hazards and Disasters Researchers Meeting; Vulnerable Populations in Disaster: Preparedness, Response, and Recovery Session, Boulder, CO, July 12, 2007.
<http://www.colorado.edu/hazards/workshop/list%20of%20presenters.pdf>
- C.E. Restrepo and R. Zimmerman, “Spatial and Temporal Distribution of Heat Related Incidents in the United States, Consequence Measures, Vulnerable Populations and Risk Management, 1980-2005,” University of Colorado (Boulder), Natural Hazards Center 32nd Annual Natural Hazards Research and Applications Workshop, Informational Research Abstract R07-30. Boulder, CO, July 9-11, 2007. <http://www.colorado.edu/hazards/workshop/R07.pdf>
- B. Nagorsky and A. Culpén, “Special Vulnerabilities of Elderly in Disasters from Infrastructure Failures,” Poster presentation, U.S. DHS 2007 Homeland Security S&T Stakeholders Conference, Washington, DC, May 23, 2007.
- S. Clark and A. Culpén, “Security Resource Allocation Using Infrastructure Condition as Potential Terrorist Targets,” Poster presentation, U.S. DHS 2007 Homeland Security S&T Stakeholders Conference, Washington, DC, May 23, 2007.
- A. Culpén, N. Haphuriwat, and J. Menoyo, “Resource Allocation Based on Valuations of Infrastructure Targets,” Poster presentation, U.S. DHS 2007 Homeland Security S&T Stakeholders Conference, Washington, DC, May 23, 2007.
- R. Zimmerman, Z.S. Naphtali, and C.E. Restrepo, “Spatial concentration of critical infrastructure systems and resource allocation for national security grants,” Association of American Geographers Annual Meeting, San Francisco, CA, April 19, 2007.
- C.E. Restrepo, J.S. Simonoff, R. Zimmerman, and Z.S. Naphtali, “Spatial Distribution of Electricity and Oil and Gas Pipeline Failures,” First Annual International Federation for

- Information Processing (IFIP) Working Group (WG) 11.10 International Conference on Critical Infrastructure Protection, Dartmouth College, Hanover, NH, March 21, 2007.
- C.E. Restrepo, J.S. Simonoff, and R. Zimmerman, "Vulnerabilities in the Oil and Gas Industry," First Annual International Federation for Information Processing (IFIP) Working Group (WG) 11.10 International Conference on Critical Infrastructure Protection, Dartmouth College, Hanover, NH, March 20, 2007.
- R. Zimmerman, "University Research in Transportation Security Planning," Presentation for the panel, Adapting Transportation Planning to Homeland Security, Transportation Research Board Annual Conference, Washington, DC, January 22, 2007.

2006:

- Symposium for CREATE organized and chaired by R. Zimmerman with four paper presentations, "Decision Analysis for Risk Management of Catastrophic Events," Society for Risk Analysis (SRA) Annual Meeting, Baltimore, MD, December 4-6, 2006.
- L.B. Lave, A.Z. Rose, C.E. Restrepo, J.S. Simonoff, R. Zimmerman, and M.R. Greenberg, "Approaches to Integrated Risk and Economic Analysis for Electric Power Disruption," SRA Annual Meeting, Baltimore, MD, December 4-6, 2006.
- J.S. Simonoff, C.E. Restrepo, and R. Zimmerman, "Measures of Risks of Failure of Oil and Gas Facilities for Energy Risk Management," SRA Annual Meeting, Baltimore, MD, December 4-6, 2006.
- R. Zimmerman, "Connectivity and Consistency of Environmental Decision Tools for Community Planning," Association of Collegiate Schools of Planning (ACSP) 2006 Annual Conference, Fort Worth, TX, November 9-12, 2006.
- R. Zimmerman, Invited Panelist for Panel on "The New York City Region and the University," Terrorism and the University Conference, John Jay College, New York, NY, November 10-11, 2006.
- R. Zimmerman, C.E. Restrepo, J.S. Simonoff, and Z.S. Naphtali, "Modeling Spatial Concentration of Transportation Systems to Assess Vulnerability to Natural Hazard and Terrorist Threats," INFORMS, Pittsburgh, PA, November 5-8, 2006.
- C.E. Restrepo, Invited Presenter, "Infrastructure: How Firm is the Foundation," Symposium 300 Million Americans, National Press Club, Population Resource Center, Washington DC, October 5, 2006. <http://www.300millionusa.org>
- A. Culpin, B. Nagorsky, W.E. Remington, and R. Zimmerman, ICIS poster and handouts "Evacuation of the Elderly in Disasters," Rudin Center for Transportation Policy and Management (and ICIS participation) Good to Go: Transit Options for Older Adults, New York, NY, September 26, 2006.
- R. Zimmerman, "World Trade Center Evacuation and Communication and Transportation," World Trade Center Evacuation Study Scientific Meeting, Translating Research into Practice, Columbia University Mailman School of Public Health, New York, NY, September 15, 2006. [Focused on a statistical analysis of the role that infrastructure systems played in enabling survivors to reach initial and ultimate destinations after the attacks.]
- R. Zimmerman and C.E. Restrepo, "Planning Tools to Protect Border Area Infrastructure," 2006 World Planning Schools Congress, Mexico City, Mexico, July 11-16, 2006.
- R. Zimmerman and C.E. Restrepo, "Information Technology (IT) and Critical Infrastructure Interdependencies for Emergency Response," Third International Conference on Information Systems for Crisis Response and Management (ISCRAM) 2006, New Jersey Institute of Technology, Newark, NJ, May 16, 2006.

- R. Zimmerman, "Sustainability and Security," American Planning Association 2006 National Planning Conference, Local Strategies to Achieve Sustainability, San Antonio, TX, April 23, 2006.
- R. Zimmerman, "Hurricane Katrina: Societal Impacts of Civil & Environmental Infrastructure in New Orleans," New York University-Wagner Graduate School of Public Service, New York, NY, April 18, 2006.
- C.E. Restrepo, J.S. Simonoff and R. Zimmerman, "Analyzing Vulnerabilities in the Oil and Gas Sector from Incident Data," Los Alamos National Laboratories Risk Symposium 2006 - Risk Analysis for Homeland Security and Defense: Theory and Application, Santa Fe, NM, March 21, 2006.
- R. Zimmerman, "NYC Electricity: Achieving Security and Sustainability," panel presentation for Energy System Research & Innovation: New York City Electricity-Past, Present, Future, Co-sponsored by the NY Academy of Sciences Environmental Sciences Section, Metropolitan Engineering Society's Council (MESOC), and the Association of Energy Engineers NY Chapter (NY-AEE), New York, NY, February 21, 2006.
- C.E. Restrepo, J.S. Simonoff, and R. Zimmerman, "Unraveling Geographic Interdependencies in Electric Power Infrastructure," Hawaii International Conference on System Sciences, Kauai, HI, January 4, 2006.

2005:

- R. Zimmerman, C.E. Restrepo, J.S. Simonoff and L.B. Lave, "Estimating Risks and Consequences of Catastrophic Energy and Electricity Outages," Society for Risk Analysis Annual Meeting, Orlando, FL, December 7, 2005.
- R. Zimmerman, "Global Climate Change Impacts on Coastal Infrastructure Services," U.S. Climate Change Science Program Workshop: Climate Science in Support of Decisionmaking, Washington, DC, November 14, 2005.
- Å.J. Holmgren "A European perspective on protecting critical infrastructure from catastrophe: Planning for the Protection of Critical Infrastructures Against Attacks: Policy and Risk Assessment," NYU-Wagner, New York, NY, September 28, 2005.
- R. Zimmerman, C.E. Restrepo, J.S. Simonoff and L.B. Lave, "Risk and Economic Costs of a Terrorist Attack on the Electric System," Second CREATE Economics Symposium: Economic Costs & Consequences of a Terrorist Attack, University of Southern California, Los Angeles, CA, August 19, 2005.
- R. Zimmerman, "Robust Transportation and Future Threats: from Terrorism to Climate Change," U.S. DOT, FHWA Advanced Research Forum, Boston, MA, July 13, 2005.
- R. Zimmerman, C.E. Restrepo, R.E. Schuler, L.B. Lave, J.S. Simonoff; N.J. Dooskin, J. Fraissinet, R.V. Hartwell, J.I. Miller and W.E. Remington "Estimating Consequences of Terrorism Attacks Against Critical Infrastructure: Electric Power Case," Institute for Information Infrastructure Protection (I3P), Dartmouth College Consortium Meeting, NYU, New York, NY, June 16, 2005.
- R. Zimmerman, C.E. Restrepo, N.J. Dooskin, J. Fraissinet, R.V. Hartwell, J.I. Miller and W.E. Remington "Diagnostic Tools to Estimate Consequences of Terrorism Attacks Against Critical Infrastructure," Proceedings, U.S. Department of Homeland Security conference, Working Together: Research and Development Partnerships in Homeland Security, Boston, MA, April 27, 2005.
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Beyond September 11th (NHRAIC, PERI, ICIS, U. Colorado Boulder, 2003)

Digital Infrastructures (R. Zimmerman and T. Horan, Routledge, 2004)

Sustaining Urban Networks (O. Coutard, R.E. Hanley and R. Zimmerman, eds., Routledge, 2005)

EXAMPLES OF SELECTED RESEARCH AREAS AND THEMES

- Statistical models to estimate economic and social costs and consequences of the impact of natural hazards, accidents, and environmental conditions on urban infrastructure and policy implications for service planning and design
- Resiliency and vulnerability of urban energy, transportation and water services in light of interdependencies among these sectors
- The potential role of cyber attacks and other information technology impacts on the resilience of public services
- Mathematical approaches to estimate critical infrastructure system recovery after a terrorist attack or natural hazard
- Methods of communicating risks to people during catastrophic events to improve emergency management response and reduce adverse impacts
- Social justice dimensions of exposures to natural hazards
- Anticipated impacts of climate change on urban public service resiliency and availability

RECENT AND CURRENT PROJECTS

Center for Interdisciplinary Studies in Security and Privacy, (CRISSP) led by NYU-Poly
ASPIRE: An SFS Program for Research and Education, funded by NSF

Workshops on Interdisciplinary Studies in Information Security and Privacy

Mobile Source Air Toxics (MSATs) Mitigation Measures, led by the Rudin Center, NYSDOT

Waste Containerization, funded by the Fund for Public Health in New York for the NYC

Department of Health and Mental Hygiene

South Bronx Environmental Health and Policy Study, funded by the U.S. EPA

Center for Risk and Economic Analysis of Terrorism Events (CREATE) at USC funded by U.S.

DHS. NYU Risk Management projects include: Using Infrastructure Density for Resource

Allocation Policy; Determinants of Spatial Infrastructure Concentration as Inputs to Resource

Allocation; Infrastructure Asset Security; Resource Allocation Based on Critical

Infrastructure; Risk, Consequences & Economic Analyses for Terrorist Attacks on Electricity

Public Infrastructure Support for Protective Emergency Services, funded by the NYU Center for

Catastrophe Preparedness and Response from U.S. DHS

Risk Communication task of the Large Scale Emergency Readiness (LaSER) Project: A Public

Health Perspective, funded by the NYU Center for Catastrophe Preparedness and Response

from U.S. Department of Homeland Security

Supervisory Control and Data Acquisition (SCADA) Systems and Critical Infrastructures, I3P

Urban Infrastructure Services in a Time of Crisis: Lessons from September 11th, funded by NSF

Initial ICIS Workshops, funded by NSF

2nd Annual Conference on Infrastructure Priorities: Advancing Innovation – Educating

Infrastructure Professionals to Make a Difference

Learning from Urban Disasters: NSF Response and Opportunities for Future Research

1st Annual Conference on Infrastructure Priorities: National Infrastructure Research Agenda

Bringing Information Technology to Infrastructure

International Research Seminar: Social Sustainability of Technological Networks

National Forum on Advanced GIS Applications and Database Needs for Civil Infrastructure

Systems

Workshop on Civil Infrastructure Systems (CIS) Education

Coordinated Renewal of Civil Infrastructure Systems for Sustainable Human Environments

CONSORTIUM AFFILIATIONS

- Center for Interdisciplinary Studies in Security and Privacy (CRISSP), NYU-Poly
- The Institute for Information Infrastructure Protection (I3P) at Dartmouth College
- Center for Risk and Economic Analysis of Terrorism Events (CREATE) based at USC

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