

Commemorating National Police Week May 13 - 19, 2018



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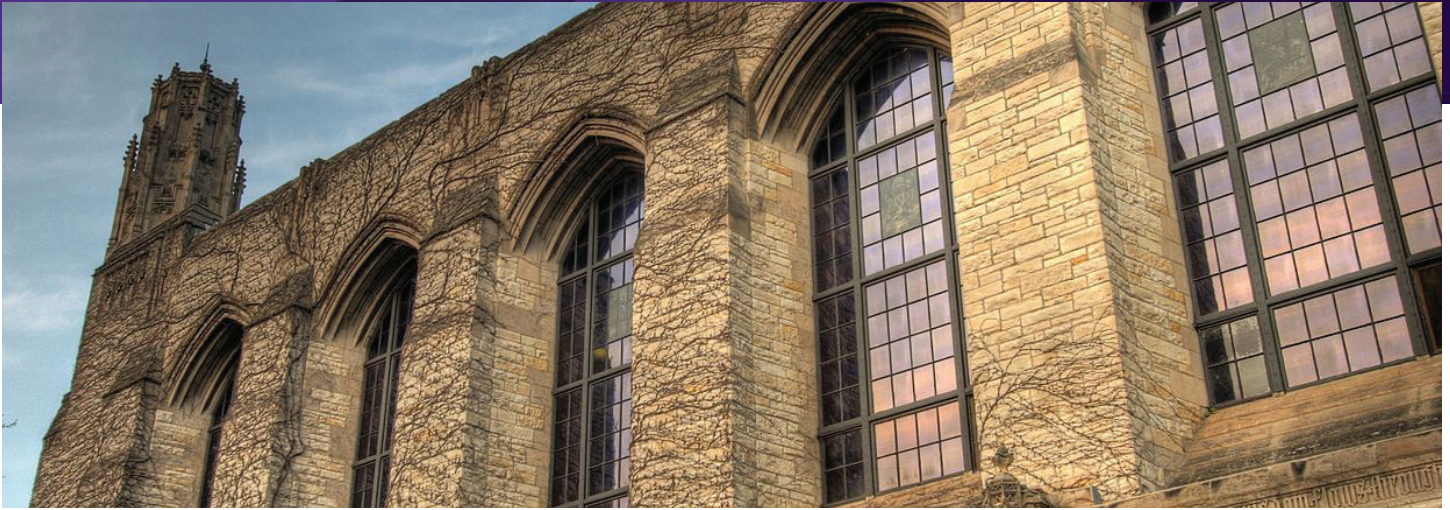
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Letter from the Executive Director

by David Bradford



This issue of *The Key* is dedicated to Mr. Roy Lucke, NUCPS Senior Instructor and program director of Highway and Transportation Programs. Roy has announced his retirement from the Center and Northwestern University, effective July 31, 2018. Roy will have completed 40 years of continuous service here at the Center.

Roy is a graduate of Northwestern University and while attending classes here, began his marital journey when he met his wife, Linda, who was also a student. Linda has recently retired from her position as a librarian in the public school system.

Roy is the official NUCPS historian, and we will miss his stories and insights, not only about NUCPS but NU in general. It is rumored and believed that Roy bleeds purple. Very few people dedicate themselves to their job the way Roy has. Now Roy is taking time for himself and Linda, and I can only imagine the kind of things he is going to get into.

To Roy, I offer the following:

1. Now that you are retiring, you can start taking all of the trips and embark on the travel plans you have been talking about over the years. Travel, relax, enjoy life, and spend all the kids' inheritance. (They will never know. Lol)
2. Never again will you dread Mondays. Every day is the weekend for you now.
3. You get to leave your old boss in the past after retirement, and you start life with your new boss, your wife. (Good luck, my friend!)

Finally, as you begin the journey into this new phase of your life, I thank you for sharing in the journey of NUCPS, the many thousands of students' lives to which you have contributed over the past 40 years as well as your co-workers' lives. We wish you wealth, health, and happiness in retirement. We thank you for your contributions to the Center, NU, and most of all to all of our lives and careers.

Congratulations to you and Linda!

Dave Bradford,
Executive Director

IN REMEMBRANCE — 2018 LINE OF DUTY DEATHS

Trooper Michael J. Anson, New York State Police, Jan. 2
Lieutenant Christopher Robateau, Jersey City (NJ) PD, Jan. 5
Officer Chris Beaudion, Monroe (LA) PD, Jan. 7
Deputy Sheriff Daniel A. McCartney, Pierce County (WA) Sheriff's Dept., Jan. 8
Lieutenant Jeffrey W. Francis, New York City (NY) PD, Jan. 13
Detective Michael R. Doty, York County (SC) Sheriff's Office, Jan. 17
Deputy US Marshal Christopher David Hill, US Marshalls Service, Jan. 18
Deputy Sheriff Heath McDonald Gumm, Adams County (CO) Sheriff's Office, Jan. 24
Police Officer Glenn Anthony Doss, Jr., Detroit (MI) PD, Jan. 28
Deputy Sheriff Micah Lee Flick, El Paso County (CO) Sheriff's Office, Feb. 5
Deputy Sheriff Steven Belanger, Los Angeles County (CA) Sheriff's Dept., Feb. 6
Reserve Officer Jarate Dewayne Condit, Asher (OK) PD, Feb. 6
Police Officer David Charles Sherrard, Richardson (TX) PD, Feb. 7
Police Officer Chase Lee Maddox, Locust Grove (GA) PD, Feb. 9
K9 Officer Eric Joseph Joering, Westerville (OH) Div of Police, Feb. 10
Police Officer Anthony Pasquale Morelli, Westerville (OH) Div of Police, Feb. 10
* Commander Paul R. Bauer, Chicago (IL) PD, Feb. 13
Police Officer Darren Maurice Weathers, Detroit (MI) PD, Feb. 13
Deputy Sheriff Kevin James Stanton, Brevard County (FL) Sheriff's Office, Feb. 17
Police Officer Justin Taylor Billa, Mobile (AL) PD, Feb. 20
Sergeant Mujahid Ramzziddin, Prince George's County (MD) PD, Feb. 21
Sergeant Mark J. Baserman, Pennsylvania Department of Corrections, Feb. 26
Deputy Sheriff Alexis "Thunder" Eagle Locklear, Scotland County (NC) Sheriff's Office, Mar. 1
Deputy Sheriff Jacob M. Pickett, Boone County (IN) Sheriff's Office, Mar. 2
Police Officer Rodney Scott Smith, Hickman (KY) PD, Mar. 2
Police Officer Christopher Ryan Morton, Clinton (MO) PD, Mar. 6
Police Officer Gregory Casillas, Pomona (CA) PD, Mar. 9
Deputy Sheriff David Lee'Sean Manning, Edgecombe County (NC) Sheriff's Office, Mar. 11
Reserve Officer Christopher Michael Lawton, Zachary (LA) PD, Mar. 12
Police Officer Scotty Hamilton, Pikeville (KY) PD, Mar. 13
Deputy Sheriff Ryan Douglas Zirkle, Marin County (CA) Sheriff's Office, Mar. 15
Police Officer Andres Laza-Caraballo, Juncos (PR) Municipal PD, Mar. 21
Special Agent Melissa S. Morrow, FBI, Mar. 22
Trooper First Class Kevin M. Miller, Connecticut State Police, Mar. 29
Police Officer Phillip Lynn Meacham, Hopkinsville (KY) PD, Mar. 29
Corporal Dale Shannon Hallman, Saluda County (SC) Sheriff's Office, Apr. 6
Police Officer Keith O'Neal Earle, Huntsville (AL) PD, Apr. 9
Patrolman Kevin F. Crossley, Whitesboro (NY) PD, Apr. 11
Sergeant Sean McNamee Gannon, Yarmouth (MA) PD, Apr. 12
Sergeant Noel Ramirez, Gilchrist County (FL) Sheriff's Office, Apr. 19
Deputy Sheriff Taylor Lindsey, Gilchrist County (FL) Sheriff's Office, Apr. 19
Detective Sergeant Brian Scott Cuscino, New Castle (PA) PD, Apr. 19
Deputy Sheriff Casey L. Shoemate, Miller County (MO) Sheriff's Office, Apr. 20
* Police Officer Tamby Yagan, Paterson (NJ) PD, Apr. 22
Corporal Eugene Cole, Somerset County (ME) Sheriff's Office, Apr. 25
Police Officer Rogelio Santander, Dallas (TX) PD, Apr. 25

* denotes a NUCPS course or program graduate.

Source: www.odmp.org

NUCPS Community Loses Officers in Line-of-Duty Deaths in 2017 & 2018

AS OF APRIL 24, two NUCPS course graduates have been killed while on duty during the 2018 calendar year. One member of the NUCPS community was lost to an on-duty death in 2017.

On Feb. 13, 2018, Chicago Police Commander Paul Bauer of the 18th District was murdered in a mid-day struggle with a fleeing suspect in the Chicago’s Loop business district. Commander Bauer, a 31-year CPD veteran, was about to enter Chicago City Hall for a meeting with city officials when he heard a radio call about the suspect and happened to spot the man near the James R. Thompson Center, an Illinois state government building across the street. Bauer was shot six times, including twice in the head, in a struggle at the bottom of an exterior stairwell at the Thompson Center. His assailant was a four-time convicted felon wearing body armor. Bauer leaves a wife and a 13-year-old daughter.

Paterson (NJ) Police Officer Tamby Yagan lost his life in an on-duty auto accident on the morning of April 22, in Paterson. The cause of the accident is under investigation. The 41-year-old Yagan had been a member of Paterson’s traffic division for the past 12 years. Prior to joining the Paterson force, he was a volunteer fire firefighter in neighboring Prospect Park, NJ. Officer Yagan leaves behind a 4-year-old son.

Supervision of Police Personnel graduate Detective Jason Weiland was killed by gunfire on March 22, 2017, during a standoff with a shooter who had also killed three civilians in a spree that occurred in multiple locations near Wausau, WI. The gunman had barricaded himself into an apartment in Weston, WI, and shot Detective Weiland during an exchange of gunfire with a Marathon County Sheriff’s Office tactical team member and an Everest (WI) Metropolitan Police Department officer. Detective Weiland was a 15-year veteran of the Everest Metropolitan Police Department. His wife and two children survive him. §

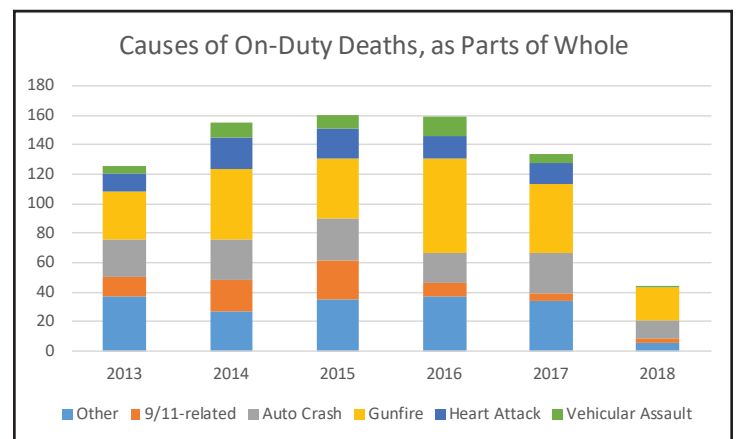
2017 Ends with 2nd Lowest On-Duty Deaths in over 50 Years

IN 2017, the US lost 134 law enforcement professionals in on-duty deaths. Each loss was significant to the profession and a tragedy to the officers’ families, friends, colleagues, and agencies.

Numbers are impersonal, but they are critical to helping the industry work toward further minimizing on-duty deaths. And the industry is doing exactly that: 2017 had the second lowest on-duty losses in more than 50 years, second only to 2013, which totaled 126. With 44 on-duty deaths, as of April 24, 2018, this year has the potential to be as equally low as 2017.

Craig Floyd, president and chief executive of the National Law Enforcement Officers Memorial Fund, told USA Today, “In my 33 years doing this, I’ve never seen this amount of awareness given to officer safety and wellness. That’s definitely been paying off and will continue to help make law enforcement a significantly safer profession.” Floyd credits improvements in de-escalation training and safety equipment for a portion of the decreasing on-duty death rates among officers.

Automobile crashes, consistently a leading cause



Charts: NUCPS | Source: ODMP.org

of on-duty deaths, continue to decline. Floyd points out that the reduction in crash deaths can be attributed to policies that limit vehicle pursuits and speeding as well as the increased promotion of “move-over” laws. §

Sources:

- Hayes, Christal. “Number of Officers killed Hits 2nd-Lowest in more than 50 Years.” USA Today. 2017: Dec. 29.
- Officer Down Memorial Page. <https://www.odmp.org/>

Reaching Out, Lifting Up: Supporting Fellow Officers

TWO CURRENT School of Police Staff & Command classes are rallying behind a fellow officer and the children of an officer killed in an auto accident.

SPSC Legacy Gifts

Each Staff & Command class works on a legacy gift, which is a class project that hones leadership and organizational skills with the purpose of leaving the world a better place. While some classes repaint graffiti-covered bridges, pack food for the needy, or participate in another community-service based project, others use fundraising skills to help individuals or community organizations that have critical financial needs.

SPSC Class #428

The members of SPSC Class #428 have designated Police Detective Krystal Scott as the recipient of its class legacy gift. Scott has served with the Western Illinois University Police Department, in Macomb, IL, since 2009 and is battling stage 4 colon cancer. The single mother of a 12-year-old daughter has been unable to work due to surgeries and chemotherapy.



Scott's situation was brought to the class by #428 member Lt. Lindsay May. So far, Class #428 students have worked with their respective agencies and communities to raise over \$18,000. In addition to a 50/50 raffle that includes autographed Chicago Cubs memorabilia and an AR-15 rifle, #428 also has sponsored a GoFundMe campaign for Scott. All proceeds of Class #428's hard work will be presented to Scott at graduation on May 11.

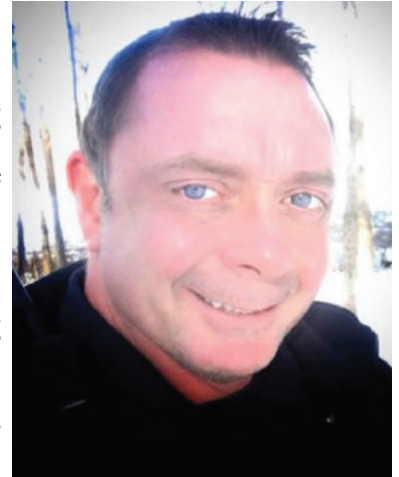
SPSC Class #433

For its legacy gift, SPSC Class #433 has chosen to honor late Bolingbrook (IL) Police Officer Steven

Alexander by contributing to an educational fund for his two daughters, ages 11 and 10. The class goal for the legacy gift is \$40,000.

On Dec. 4, 2017, Alexander, both of his parents, and his brother were tragically killed in a motor vehicle crash shortly after arriving in Ireland for a family funeral. Alexander's daughters only have one living relative remaining on their father's side of the family.

As part of its fundraising efforts, Class #433 is raffling off two AR-15 rifles, a Glock handgun, and a television set on May 17. All proceeds will go to the educational fund.



Alexander was a 17-year veteran of the Bolingbrook Police Department. During his years of service, he was an assistant team leader for the raid and entry containment team and was the lead department instructor for defensive tactics and use of force. §

Some Cancer Mortality Risks Higher for Police Officers

A National Institutes of Health (NIH) paper has concluded that police officers have a higher mortality risk for all cancers and, in particular, for colon, kidney, digestive system, esophagus, male breast, and Hodgkin's disease. Police work has been associated with an increased risk of thyroid, skin, and male breast cancer. The NIH notes that "considering the large number of cancer studies that have been performed among other occupations, such as doctors, nurses, firefighters, and military personnel, the degree to which cancer is understudied among police officers is noteworthy." The paper calls for the "critical need for more research" into understanding the role such biological and social factors as environmental and carcinogen exposures, stress, shift work and other components have on these increased risks.

Sixteen Years Later: The Long Shadow of 9/11 Continues to Claim Officers

“You don’t think the cough you get today will be the cancer you get tomorrow. We lost 23 NYPD officers in the attacks, but many more have died since then of ... September 11-related illnesses.” — Richard Dixon, NYPD Officer & 9/11 First Responder (*Newsweek*)

More than 400 public safety professionals were instantly killed during the morning hours of Sept. 11, 2001. As the years have passed, the total number of fatalities of first responders, other recovery workers, and area residents and employees continues due to the devastating health consequences caused by exposure to the Ground Zero area. Such serious and often fatal conditions as mesothelioma, many types of cancer, asthma, and liver disease continue to appear in recovery workers and survivors.

In the days following 9/11, the Environmental Protection Agency prematurely insisted that the air did not pose a health hazard. However, the thick dust that lingered contained a hazardous blend of particles, including glass, aluminum, and asbestos — an unimaginable amount of asbestos. The north tower alone contained up to 400 tons of asbestos.

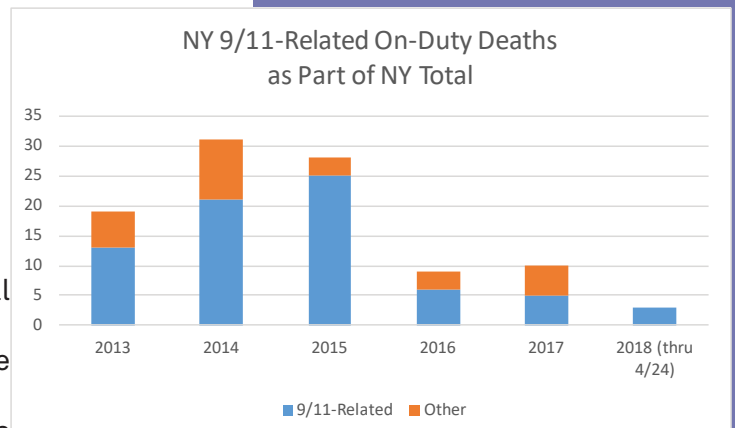
Dr. Michael Crane, the director of the World Trade Center Health Program, which is headquartered at New York’s Mount Sinai Hospital, has noted that the chemical cloud “had all kinds of god-awful things in it. Burning jet fuel. Plastics, metal, fiberglass, asbestos. **It was thick, terrible stuff. A witch’s brew.**”

Among other 9/11 cancers and serious conditions,

potentially fatal asbestos-related conditions like mesothelioma and asbestosis can take 20 years or longer to appear. In an article in the *Los Angeles Times*, Ben Chevat, executive director of 9/11 Health Watch, a nonprofit group, worries that while “people in America know the story of 9/11, what’s really not well known or understood are the challenges facing so many to this day.”

Anyone, including public safety professionals, who was exposed to this toxic dust should pay special attention to their health and seek medical help for any symptoms, from nagging coughs and GERD to watery eyes and stomach pains. According to Mark Farfel, director of the World Trade Center Registry, which tracks the health of more than 71,000 rescue workers and survivors, **“Many people don’t connect the symptoms they have today to September 11.”**

Approximately 60,000 – 70,000 public safety professionals, construction workers, and others from throughout the nation and around the world toiled at Ground Zero for weeks, continually exposed to this toxic cocktail — as were an estimated 300,000 civilians who lived and/or worked



Above: Without breaking down New York’s on-duty losses to account for 9/11-related deaths, the state is consistently one of the top five in line-of-duty deaths. However, in 2013, for example, only 6 of New York’s on-duty deaths were not caused by 9/11-related injury or illness.

within one-and-a-half miles of the Ground Zero site.

Important Medical Resources

The World Trade Center Medical Program is one of the most important medical resources available for anyone exposed to Ground Zero hazards. A federally funded program that was established in 2010, it provides **free medical treatment for a growing list of health conditions that the government has officially linked to 9/11.** In 2015, Congress reauthorized the bill through 2090 to cover the lifespan of all participants. The program is **open to anyone** who can prove that they lived, worked, or volunteered in the World Trade Center area between Sept. 11, 2001, and July

31, 2002. This includes those who were infants and children at the time of the attacks.

By Dec. 31, 2017, the WTC Health Program reported having 69,612 total enrolled responders and volunteers and 14,308 enrolled civilian survivors. It continues to enroll hundreds of new participants each month. While most enrolled responders live in New York State, a total of more than 12,000 enrollees represent every state in the US, with substantial numbers in Florida and Pennsylvania. Those out-of-state enrollees are served by a nationwide provider network. “A lot of people who should enroll in the program don’t, because they think other people need it more than they do,” Crane says. However, the program is funded and **all eligible patients are strongly encouraged to enroll.**

Doctors at the WTC Health Program have linked nearly 70 types of cancer to the 9/11 toxin exposure, from skin cancer and leukemia to lung and bladder. Some of these cancers are rare, aggressive, and hard to treat. As of Dec. 31, 2017, a total of 7,965 enrollees were being treated for at least one type of cancer, and 304 patients had died from at least one type of cancer. Diagnosing multiple types of cancers in one person is not unusual among 9/11 survivors and responders.

In addition to cancer, other approved condition categories covered by the WTC Health Program include: Aerodigestive (e.g., GERD, liver disease, asthma, COPD, etc.); Mental Health (e.g., anxiety disorder, PTSD, depression); and, for first responders only, Musculoskeletal/Traumatic injuries. The federal government does not yet consider autoimmune diseases as 9/11-related conditions, although doctors are advocating for their inclusion. **A list of all eligible conditions is available at www.cdc.gov/wtc/conditions.html.**

The **September 11th Victim Compensation Fund (VCF)**, also federally funded, is a second important resource. Similar to personal injury settlements, VCF provides financial compensation to individuals (or their surviving families) who suffered injuries or died as a result of the 9/11 attacks or debris removal. Providing funding almost continually since 2001, President Obama signed a bill in 2015 that will keep the VCF operating until 2020. As of Dec. 31, 2017, the VCF had received 32,689 claims, made 22,106 total decisions, and of those decisions, found 82% eligible

for compensation.

John Feal, head of the FealGood Foundation, which advocates for first responders, is concerned that public safety professionals and survivors outside of the Northeast United States are not aware of these federal programs. Many responders, construction workers, and volunteers travelled to New York from as far as Oregon, California, Texas, Puerto Rico, Canada, Europe, and the Middle East to work in site cleanup — some for as long as 10 months. “The reality is that more and more people are getting sick and dying,” Feal told the *Los Angeles Times* in 2017.

If you, a colleague, or a family member suffer from a medical condition that may be related to 9/11, you can learn more about available programs at:

The World Trade Center Medical Program
Help Line: (888) 982-4748 | www.cdc.gov/wtc/

September 11th Victim Compensation Fund
(855) 885-1555 | www.vcf.gov §

Sources:

- Center of Disease Control. World Trade Center Health Program. Website. Accessed at <https://www.cdc.gov/wtc/> on 4/24/18.
- Hansen, Matt. “9/11 responders who became ill from toxic exposure now have a monument to their heroism.” *Los Angeles Times*. 2017: Sept. 10.
- Prince, Rosa. “9/11 death toll rises as cancer cases soar among emergency workers.” *The Telegraph*. 2014: July 27. Accessed 3/19/18 at <https://www.telegraph.co.uk/news/worldnews/northamerica/usa/10994227/911-death-toll-rises-as-cancer-cases-soar-among-emergency-workers.html>
- September 11th Victim Compensation Fund. Website. Accessed 4/24/2018 at <https://www.vcf.gov/index.html>.
- Yalkin, Devin. “9/11’s Second Wave: Cancer and Other Diseases Linked to the 2001 Attacks Are Surging.” *Newsweek*. 2016: Sept. 7. Accessed 3/19/18 at <http://www.newsweek.com/2016/09/16/9-11-death-toll-rising-496214.html>.

Roy Lucke, Long-Time NUCPS Employee, Announces His Retirement

Roy Lucke, a nearly 40-year employee of Northwestern University Center for Public Safety announced his upcoming retirement at a recent staff meeting. Lucke, who will retire on July 31, 2018, has been with NUCPS since Nov. 1, 1978.

A Lake County, IL, native, Lucke is a 1970 graduate of Northwestern University, where he met his wife Linda. He was initially a high school math and science teacher before he embarked in his public safety career. The career change was natural, as he was brought up in a family strongly dedicated to public service. Lucke had himself served as a volunteer fire fighter while teaching, which led to a position as a relief dispatcher. Lucke served as a patrol officer in the Lake Forest (IL) Police Department and the Fox Lake (IL) Police Department before joining NUCPS. Through a grant request that he wrote as a Fox Lake officer, he took all of the crash investigation and highway safety courses available at NUCPS (which was then the Traffic Institute). Following his coursework, he was approached about teaching classes on a part-time basis at NUCPS, which he did for a year before joining the NUCPS family full-time.

For the majority of his 40-year tenure, Lucke worked in Research & Development, where he rose from a functionary researcher to program director, a position he held for more than a decade. Recently, his work has been in the traffic engineering and crash investigation program areas. He has been a contributor, editor, and/or reviewer for recent editions of NUCPS' authoritative texts *Traffic Crash Investigation* and *Traffic Crash Reconstruction*. In fact, J. Stannard Baker himself asked Lucke to contribute a chapter to the last edition that Baker himself edited. A frequently published author of juried papers and articles, Lucke received the 2005 Best Paper of the Year award from the Institute of Transportation Engineers for "Use of Automated Wayside Horns for Improving Highway-Rail Grade Crossing Safety."

Lucke has served on two standing committees at the Transportation Research Board of the National Academies of Sciences, Engineering, and Medicine:



the Standing Committee on Alcohol, Other Drugs, and Transportation; and, the Standing Committee on Traffic Law Enforcement, on which he is now an *emeritus* member. In 2013, Lucke was the recipient of the inaugural 2013 Highway Safety Leader Award from the Illinois Traffic Safety Challenge, recognizing a lifetime of achievements in traffic safety.

An active member of his local community, Lucke served as a member of the Libertyville School District Board of Education and on the Fox Lake Planning Commission. He is president of the board of directors for the Libertyville Township Soccer Complex.

Lucke is looking forward to a retirement spent traveling with his wife and spending more time with their two adult children, son Robert and daughter Megan. He hopes to continue his affiliation with NUCPS in an editorial capacity.

Best Wishes from Staff & Instructors

Executive Director David Bradford has dedicated this issue of *The Key* to Lucke (see his letter on page 2).

Shelly Camden, NUCPS Deputy Director, said that

she will “miss the endless source of trivia. He knows more useless details than anyone I know. Countless lunches have been filled with tidbits about everything from presidents, to football, to plaid and world history. I am also going to miss the historical references, not only for NUCPS, but for NU as well. Roy has been here through many changes and transitions. He has seen a lot of different things during his tenure here. I won’t be able to step next door and ask, ‘Do you remember when...?’”

“I wish Roy the best of luck in retirement,” Camden further commented. “Now there will be time for all the fun things that work gets in the way of doing. Enjoy every moment.”

Instructor Adam Hyde emailed

that “the career achievements of Roy are too numerous to count. Roy has always focused on developing highway safety with a goal of making the highways safer for each of us. His decades of leadership will be missed by many.”

Caroline Paulison Andrew, editor of *The Key*, said that she will miss Lucke’s depth of knowledge of all things NUCPS. “In addition to a crash and engineering expert, we’re also losing our unofficial archivist.” Andrew also noted how helpful Lucke has been. “He really helped me settle into my work with *The Key*. I will greatly miss working with him.”

Instructor Jeff Muttart also reflected on Lucke’s willingness to help out a new member of the

NUCPS family. “I would like to thank Roy for making me feel so comfortable. When I first started teaching at Northwestern, I was unfamiliar with the building and the processes involved. Naturally, I was nervous. Roy’s calming influence and friendly demeanor made me very comfortable ever since.”

Instructor Mike DiTallo emailed, “We have worked together since 1994, and time just flies. It has been a privilege working with and for Roy at the Center. You have a heart of gold! I hope you enjoy whatever is next.”

All of the staff and instructors at NUCPS wish Lucke nothing but the best in his retirement. §

**NORTHWESTERN UNIVERSITY
CENTER FOR PUBLIC SAFETY**

**2018
ANNUAL
RECEPTION**

Northwestern University Center for Public Safety is pleased to invite you to our 2018 Annual Reception. Join us from 5:30 through 7:30pm, on Sunday, October 7, at Maggiano's Little Italy, Orlando, and connect with fellow NUCPS course graduates and staff from across the U.S. and from around the globe.

Appetizers, desserts, and beverages will be served as we celebrate another exciting year at NUCPS.

Tickets are limited! Please be sure to RSVP early at nucps.northwestern.edu/orlando to reserve FREE tickets for yourself and guest.

**SUNDAY, OCTOBER 7, 2018
5:30pm - 7:30 pm**


**MAGGIANO'S
LITTLE ITALY**

**9101 International Drive
Orlando, FL 32819
(near the Orange County
Convention Center)**

Northwestern | CENTER FOR PUBLIC SAFETY

The Continued Evolution of Event Data Recorders in Crash Reconstruction

by Michael DiTallo, Shawn Gyorke & Eric Paul



The Event Data Recorder (EDR) continues to be the fastest growing technology for investigating crimes, events, and crashes. This growth is predominantly due to advancements in vehicle technology, expanded vehicle brand coverage, greater vehicle model coverage with each brand, and federal standardization. The term EDR, in its broadest definition, encompasses many devices whose practical uses are far different than their original intent.

TRADITIONAL passenger cars typically are the first to feature technological advancements, followed by commercial vehicles and motorcycles. Though some limited and specific uses of EDR existed in the early 1970s, it wasn't until the early 2000s that the passenger car industry began utilizing EDR technology by way of the Vetronix (now Bosch) Crash Data Retrieval (CDR) Tool, which was developed in conjunction with General Motors. Its initial capability was limited to imaging GM vehicle air bag control modules, known to the industry as Sensing Diagnostic Modules (SDMs). This tool and corresponding data were the first of their kind to be used for investigative work. Following Bosch's 2003 acquisition of Vetronix, the CDR tool coverage increased substantially.

From 1998 to 2001, the National Highway Traffic Safety Administration (NHTSA) sponsored a working group specifically formed for the study of EDRs. In 2004, the NHTSA released a formal Notice of Proposed Rulemaking that declared the NHTSA's intent to standardize EDRs, which was finally released in August 2006. The NHTSA ruling, "49 CFR Part 563," set the minimum standard for EDR data to at least 15 types of crash data, including such

important investigative information as pre-crash speed, engine throttle, brake use, driver safety belt use, and airbag deployment time. Additionally, the NHTSA required that the data: be able to survive a 30-mph barrier crash; be publicly available; and, be measurable with defined precision.

The NHTSA has not required manufacturers to install EDRs in vehicles produced for North America because the voluntary installation rate has continued to only trend upward. In 2006, the NHTSA estimated that by 2010, more than 85% of vehicles would have EDRs installed in them. Its prediction appears to have come true, and recent estimates suggest more than 88% of 2016 and later vehicles are supported by the Bosch CDR Tool (Wikipedia). While the majority of manufacturers choose to use Bosch as their supplier for compliance with the 2006 NHTSA data requirements, other companies, such as Kia, Hyundai, Subaru, Mitsubishi, and Land Rover-Jaguar, have developed tools through alternative suppliers. These additional brands comprised 11% of the 2016 and newer model year vehicles equipped with EDR tools.

The passenger vehicle EDR is not the only module capable of recording data. Several other devices

— such as in-car video, portable GPS, infotainment systems, and vehicle monitoring systems — can provide data to investigators. Likewise, when commercial vehicles are included, the number of EDR devices expands even further.

Today's commercial vehicles also may feature an ECM (Electronic Control Module), video systems, telematics, collision warning-avoidance systems, anti-lock braking system ECUs (Electric Control Units), and ACMs (Airbag Control Modules). The new 2018 federal requirement for ELDs (Electronic Log Devices) will undoubtedly increase the coverage and availability of EDR data available from commercial vehicles. Smaller-size commercial vehicles, such as straight trucks, may not have all the devices mentioned above, but they will be required to have an ELD installed.

Manufacturers of passenger vehicles and commercial vehicles are largely focusing on advanced control technologies. Driver-assist features like Ford's Active Park Assist and collision warning-mitigation-avoidance systems, such as lane-departure warnings, are being installed in passenger and commercial vehicles at a fierce pace. Crash investigation and reconstruction professionals hope that as these systems become more common, their associated data becomes accessible as well.

The current EDR data is uniquely diversified and valuable to crash investigators and reconstructionists and is of increasing importance as empirical evidence in criminal and civil court cases, from vehicular manslaughter to serious personal injury and worker's compensation claims. The personnel within your agencies needs proper training and tools to image and then correctly analyze this data. §

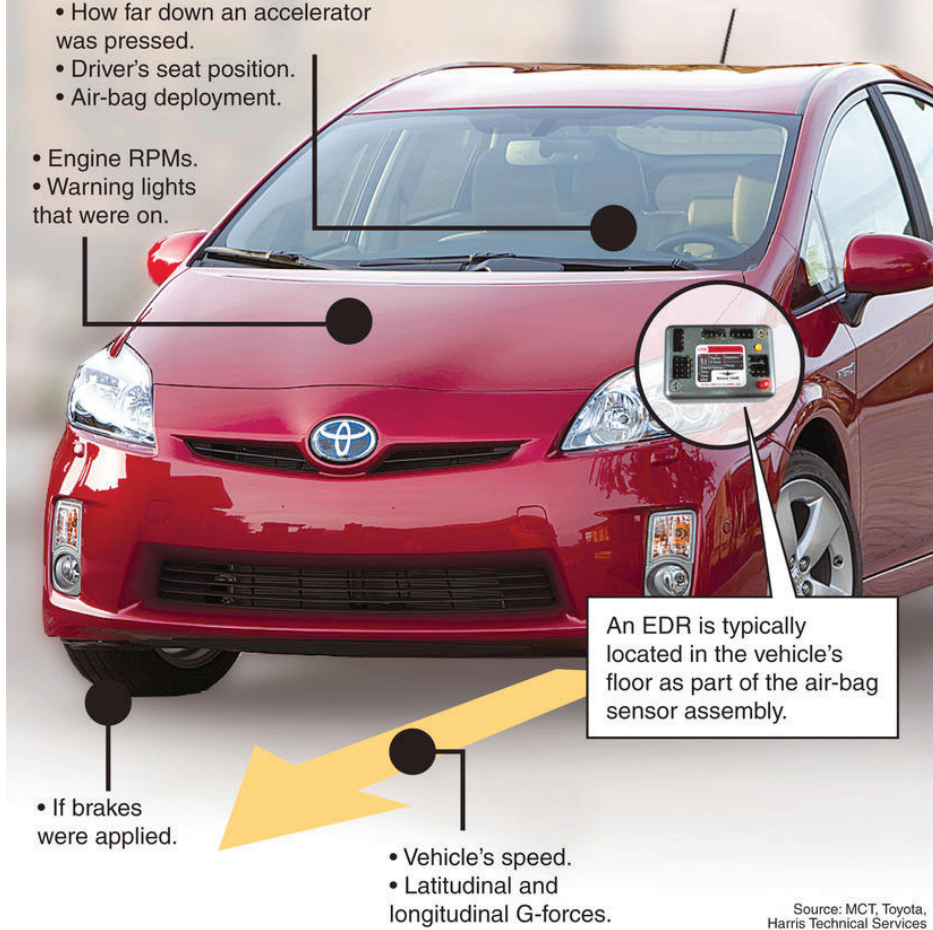
What EDRs can record

Device records a few seconds of data immediately before and after a collision, including:

- If seat belts were buckled.
- How far down an accelerator was pressed.
- Driver's seat position.
- Air-bag deployment.
- Engine RPMs.
- Warning lights that were on.
- If brakes were applied.
- Vehicle's speed.
- Latitudinal and longitudinal G-forces.

About EDRs

- Created to help carmakers improve air-bag technology.



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Killer Roads, Killer Costs: Repairing, Rebuilding & Funding America's Ground Transportation Infrastructure

by Caroline Paulison Andrew

On May 18, 2017, a 42-year-old Grosse Point, MI, woman was nearly killed when a chunk of concrete from I-696 near Warren, MI, flew through her windshield, knocking her unconscious. She veered into the car beside her, causing both cars to crash into the highway barrier. She suffered an injury to her forehead that required facial reconstruction. According to Detroit-area news, the concrete from the road weighed 10 to 12 pounds.

Again in Michigan in May 2017, also on the I-696, a second driver was hit in the head by concrete highway debris that crashed through his windshield. "You know, the police said they thought it was kicked up by a truck and thrown through the windshield. All I remember was the glass flying all over me and the whoosh of the air and feeling that I was going to die," the second driver told Detroit-area news. Both drivers were indeed lucky, considering that an increasingly significant number of deaths each year can be directly linked to deteriorating US roadways.

Infrastructure Funding

On June 29, 1956, President Dwight D. Eisenhower signed the Federal-Aid Highway Act of 1956 into law, setting into motion the construction of 41,000 planned roadway miles that would comprise the all-new Interstate Highway System (IHS), which was allocated a \$25 billion budget. The federal government contributed 90% toward the cost of this original construction, while the states financed 10%. As they do so today, the Act stipulated that states were to own the interstate highways within their respective borders, enforce the traffic laws, and maintain their respective interstate infrastructures.

For young American families in the 1950s and 1960s, the new pristine ribbons of concrete winding their way across the nation became a symbol of the postwar New Frontier and all that was modern and efficient, including brand new homes in rapidly sprawling suburbs, made possible by the new interstate system.

Despite this rosy glow, the Eisenhower administration, working under a Cold War cloud,



expected the new system to offer faster, safer options for travel than the inefficient two-lane rural routes and gravel roads — and to provide “quick evacuation” of target cities “in case of atomic attack.” (History.com) Almost all US Air Force bases had a direct link to the new highways. The engineers who designed the IHS did so with priority placed on future productivity, speed, and efficiency: no at-grade crossings were included in the system’s design; only overpasses and underpasses.

While originally expected to take 12 years to complete, the IHS was not finished until 1993 with the opening of the final stretch of I-105 in Los Angeles — more than 25 years overdue — and extraordinarily over budget, even by government standards. Construction totaled \$425 billion in 2006

dollars (or, roughly \$45 billion in 1955 dollars).

In the mid-1970s, nearly 20 years before that last section of concrete was poured in Los Angeles, some of the original IHS infrastructure were already deteriorating. Unfortunately, the politicians who crafted the Federal-Aid Highway Act of 1956 did not provide a funding plan for future maintenance of these roadways. The states were simply expected to carry the burden, as they historically had done since the Federal-Aid Road Act in 1916, which offered funding for state roads and rural mail routes. **The 1916 Act required that for a state to obtain funding, that state had to possess a highway department that could design, construct, and *maintain* the roads for which it was to receive support.** Repair and maintenance for IHS infrastructure added a cost that states, in a stagflation-plagued 1970s economy, could no longer afford to meet.

In the midst of an historic fuel crisis, the Federal Aid Highway Act of 1976 finally offered the states funding options for IHS repair and maintenance and authorized a budget of \$175 million a year for 1978 and 1979. The funding emphasized what became known as the 3Rs (*Resurfacing, Restoring, Rehabilitating*). A fourth R, *Reconstruction*, was added in the Federal-Aid Highway Act of 1981. Further maintenance funding acts were approved in 1982, 1987, 1991, 1998, 2005, and 2012 (MAP-21, a two-year, \$105 billion surface transportation reauthorization). Yet the appropriations were not sufficient for the required repairs.

Productivity & the IHS

“The link between a nation’s infrastructure and its economic competitiveness has always been understood. But today, for the first time, we have data showing how much failing to invest in our surface transportation system can negatively impact job growth and family budgets.”

— Kathy Caldwell, former president of the American Society of Civil Engineers

In the late 1950s, IHS construction accounted for 31% of the US annual increase in productivity; in the 1960s, 25%. According to a study in the *Review of Economics and Statistics*, researchers noted that, at the time, due to easier, faster, and cheaper

transportation, productivity costs fell sharply (24 cents for every 1 dollar invested in the IHS) in 32 of 35 examined industries (*The Economist*). Today, however, the interstates are clogged and crumbling — and hampering productivity.

Deteriorating infrastructure adds \$97 billion a year to the cost of operating commercial and private vehicles and results in shipment and travel delays that total about \$32 billion per year, according to the American Society of Civil Engineers (ASCE). (Halsey) As long as ground infrastructure deterioration continues, companies will be required to divert earned profits to cover the impact of shipment delays and increasing vehicle operating and repair costs. These increased operating costs eat into employee raises and even result in layoffs. “The link between a nation’s infrastructure and its economic competitiveness has always been understood. But today, for the first time, we have data showing how much failing to invest in our surface transportation system can negatively impact job growth and family budgets,” stated former ASCE president Kathy Caldwell, in 2011, in reference to the ASCE report. (Halsey)

Thomas Donohue, former president of the US Chamber of Commerce, has emphasized that investing in infrastructure is “not just transportation for transportation’s sake.” (Halsey) Even though the National Highway System (NHS) is comprised of more than 223,000 miles (about 5% of total U.S. road mileage, including the IHS), these highways account for 55% of total annual vehicle miles and for 83% of annual commercial truck miles. (Chau) More than 50% of US interstate miles are operating at 70% capacity; another 25% are bursting at the seams at 95% capacity.

Washington-based Inrix, a road traffic and driver services application developer, studied the commuting times and expenses in more than 30 cities across the US and calculated that the average commuter currently spends 42 hours stuck in highway traffic per year and loses \$1400 in fuel — although commute time and costs are significantly higher in some of the nation’s worst commuter cities. [See “*Traffic Nightmares*,” p. 17.] By 2035, highway usage is expected to double, leaving commercial and passenger vehicles stranded in traffic for an expected 160 hours per year (Frank). The effect of

lost hours and fuel costs ripple out into US productivity and out of commuter bank accounts.

Killer Roads

Loss of productivity is secondary, though, compared to much graver losses: each year, thousands of deaths and injuries can be directly attributed to the poor conditions of US roads, bridges, and other deteriorating or obsolete infrastructure. According to Anthony R. Foxx, a former US Secretary of Transportation and former mayor of Charlotte, NC,

“There is no question that there are safety impacts and loss of life because we didn’t . . . spend the money to make infrastructure what it should be.” (Nixon)

In 2007, Minneapolis’ I-35 W bridge, where it crossed the Mississippi, collapsed, killing 13 people, injuring 145, and bringing to the spotlight the condition of US bridges. According to ASCE, one in nine bridges are “structurally deficient” but considered safe for use. (Nixon)

Bridge collapses and dam bursts make dramatic headlines in media across the nation, but the deaths and injuries attributed to crumbling roadways are quietly yet significantly building in numbers.

Local newscasts frequently report traffic delays due to concrete pieces that fall from deteriorating overpasses onto highways and roads — and many times onto the cars traveling under them. A simple Google search produces seemingly endless yet brief reports of traffic incidents. In yet another accident on I-696, a Wixom, MI, man’s commute came to a frightening end when, on January 17, 2018, a piece of concrete from I-696 flew up through his windshield and missed his head by inches. Fortunately, the driver was alone in his car at the time. The interior of his vehicle was covered in glass. In Dallas, chunks of concrete falling from an overpass forced the closure of I-35 in October 2017.

Falling concrete almost cost Katherine Dean of Maryland her life as it crushed the hood and windshield of her car as she drove under a Washington, DC, Beltway overpass. At about the same time in Chicago, a two-and-a-half foot wide chunk of



Crumbled concrete flew through this windshiled on I-696, knocking the driver unconscious. | Photo Credit: clickondetroit.com

concrete fell from I-290 in the city’s busy West Loop area, narrowly missing a woman walking to her car in a parking lot located under the expressway.

The Pacific Institute for Research and Evaluation estimates that **the medical costs of highway injuries from poor road conditions was \$11.4 billion in 2013** (Nixon). According to the National Highway Transportation and Safety Administration, of the accidents that can be directly linked to road conditions, 24% can be attributed a variety of such causes as:

- Potholes and uneven pavement
- Significant drop-offs at pavement edges or improper banking of curves
- Missing warning signs
- Faded centerlines and/or lack of reflective markers
- Missing or defective guardrails
- Inadequate lighting
- Obstructed views

Unmaintained highways create dangerous conditions — but failure to warn drivers of these conditions can add to significantly higher risks of serious injuries and fatalities.

Finding & Funding Solutions

“Our nation’s infrastructure cannot be repaired and modernized on leadership and innovation alone. If the United States is serious about achieving an infrastructure system fit for the 21st century, some specific steps must be taken, beginning with increased, long-term, consistent investment. To continue to delay such investment only escalates the costs and risks of an aging infrastructure system — an option the country, the economy, and families can no longer afford.” (ASCE)

As a result of poor roadway conditions and lively online bloggers, a whole pothole subculture has sprung up among civilians that includes: curated collections of photos of massive potholes, how-to instructions for repairing potholes on one’s own, and websites dedicated to pothole news and facts. In Jackson, MS, one man dubbed “Pothole Robin Hood” led a group of citizens in filling 101 potholes before coming under police investigation.

While DIY repair of potholes, highways, and streets is a dangerous and illegal solution, citizen-based attempts at repairs represent the public’s frustration of the prioritization of other federal and state construction projects over surface infrastructure repair projects — in effect, over public safety and quality of life.

In a 2011 landmark report, the ASCE had stated that the US ground infrastructure requires \$1.7 trillion in investment by 2020 and noted that the gap between what should be spent and what is being spent is about \$94 billion per year. (Halsey) One key impediment to raising these funds is the stagnant fixed cost of motor fuel taxes. State and federal motor fuel taxes go to road projects and are paid on a per-gallon basis. As cars get better mileage, they burn less fuel. Therefore, drivers are paying less per mile driven in taxes than in years and decades previously. Ironically, less tax money is available to repair the roads those drivers use.

The US Congressional National Surface Transportation Policy and Revenue Study Commission stated that the annual investment needed by all levels of government to maintain US highways, roads, and bridges is **estimated at \$185**

billion per year for the next 50 years. The report expects repair costs to be **\$2.4 trillion by 2025**, a less conservative estimate than that of the ASCE (which also includes dam renovations in its cost estimates). (Stebbins)

In late 2015, bipartisan legislation resulted in the FAST Act (Fixing America’s Surface Transportation Act), which provides **\$233 billion over five years (2016 through 2020, at \$46 billion per year)** for surface transportation infrastructure investment and planning. Eligible FAST Act projects include highways, safety, public transportation, rail, and research and technology programs. While not near the Commission or ASCE’s recommended funding, FAST offers an accelerated project delivery feature, which is designed “to increase innovation and improve efficiency, effectiveness, and accountability in the planning, environmental review, design, engineering, construction, and financing of transportation projects.” FAST adds new “flexibilities to increase efficiencies” with the Federal Highway Administration (FHWA) website noting that some “common mid-century bridges” will be exempt from certain environmental reviews. Specific emergency reconstruction projects also are eligible for emergency exemptions or expedited procedures. (FHWA)

To best use limited funding, all levels of government should be planning and budgeting with priority placed on those projects that offer the greatest impact on safety, quality of life, and productivity. For instance, 54% of all road fatalities occur on locally owned rural roadways, yet only 19% of the US population is rural. Rural road fatalities consistently remain 2.5 times higher than urban area fatalities, in part because of the distance to the nearest hospital. According to Elaine Chao, the current US Secretary of Transportation, more local agencies are participating in data-driven strategic highway safety planning with funding from FAST. (Chao)

Science & Innovation

While federal dollars are available, states and, to an extent, local entities must be the ultimate source of the majority of funding as well as the conception and implementation of infrastructure improvements. At

the state and local levels, engineers — traffic, transportation, civil — are critical to the innovation and advancements that will rehabilitate the IHS and other roadways.

In her 2017 statement to the US Senate's Committee on Environment and Public Works, Chao noted that through FAST Act, the FHWA “encourages a data-driven, performance-based approach to save lives on all public roads. . . . States develop and implement comprehensive, data-driven Strategic Highway Safety Plans (SHSPs) that establish statewide safety goals, objectives, and key emphasis areas and integrate the four Es of safety: *Engineering, Education, Enforcement, and Emergency medical services.*”

To promote innovation, the Advanced Transportation and Congestion Management Technologies Deployment Program is awarding grants each year through 2020 for eligible model deployment and large-scale implementation of advanced transportation technologies that reduce costs and improve safety, transportation operations, and collection of real-time information.

Northwestern University Center for Public Safety transportation engineering and highway safety experts support and contribute to the increased use of emerging technologies, such as ITS (see “Intelligent Technology-Based Traffic Engineering” in *The Key*, Feb. 2018), to offer up-to-the-minute warnings and alerts to drivers about dangerous and/or deteriorating stretches of roadway and to improve traffic management and safety on all roadways.

Since its founding in 1936, innovation and support of the four Es have always been a key component of NUCPS programs. In addition to ITS and core traffic engineering courses, NUCPS offers traffic engineers the opportunity to study such specialty topics as highway railroad grade crossing, identification and treatment of high-hazard locations, intersection design and channelization, and traffic impact, among other practices that are critical to understanding infrastructure deficiencies and developing solutions.

Conclusion

As initiatives to improve the IHS and other ground infrastructures continue, most concur that a mix of federal, state, and local funding must be combined

with private-sector incentives to advance innovative solutions and to finance even basic resurfacing and future maintenance. The CREATE program in Chicago (Chicago Region Environmental and Transportation Efficiency Program), which is focused on reducing freight and passenger rail congestion and delays, is one of the first of these types of solutions. CREATE partners the City of Chicago with the US DOT, Metra, Amtrak, private freight railroads, and the State of Illinois.

As an article from the Brookings Institute Metropolitan Infrastructure initiative series notes, “It is clear that projects are becoming more complex. There is not one-size-fits-all form of financing for them. . . . The level of private engagement will depend on market and business opportunities. In many respects, America’s ability to realize its competitive potential depends on making smart infrastructure choices. These must respond to economic, demographic, fiscal, and environmental changes if they are to help people, places, and firms thrive and prosper.” (Puentes) §

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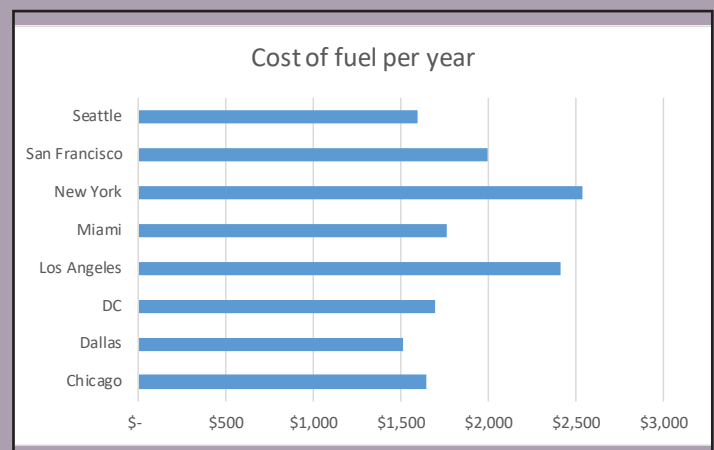
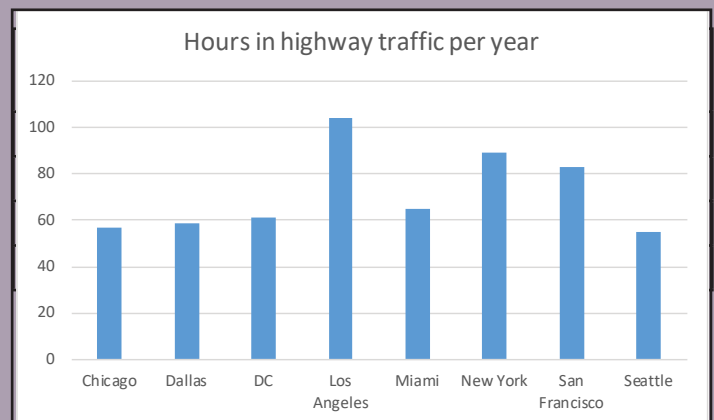
Further Reading

Interested in learning more? Check out these books from your public library:

- Lewis, Tom. *Divided Highways: Building the Interstate Highways, Transforming American Life*.
- McNichol, Dan. *The Roads that Built America: The Incredible Story of the US Interstate System*.
- Petroski, Henry. *The Road Taken: The History and Future of America's Infrastructure*.
- Swift, Earl. *The Big Roads: The Untold Story of the Engineers, Visionaries, and Trailblazers Who Created the American Superhighways*.



US DRIVERS spend a total of about 8 billion hours stuck in traffic each year, contributing to aggressive driving, distracted driving, and road rage. Washington-based Inrix, a road traffic and driver services application developer and data company, studied the cost of commutes, both in time and fuel expenses, in more than 30 US cities. The average US commuter currently spends 42 hours stuck in highway traffic per year, but highway commute time and costs are significantly higher in some of the nation's worst commuter cities. (Frank)





Police Motorcycle Liability & Risk Reduction

by Victor Beecher & Caroline Paulison Andrew

National Police Week and Law Enforcement Memorial Day commemorations kick off a long season of parades and outdoor ceremonies. Among the public, one of the favorite features of these events is the impressive formations of police motorcycle units. While popular with the public, most law enforcement professionals understand that the role of the motorcycle officer goes far beyond the pomp of parades and ceremonies and includes significant risk and liability.

No professional law enforcement officer, from motorcycle operator through supervisors and executives, deny that motorcycle units are dangerous assignments — but their advantages make them indispensable. Cost-efficient to operate, highly maneuverable, and quick to accelerate, motorcycles are preferred tools for traffic enforcement in congested urban areas, on highways, and in rural areas as well as in community policing. Many of the officers who staff the motor units feel that their careers are callings, not jobs.

Risks & Liabilities

In an article in the *Los Angeles Times*, LAPD Officer Connor Maclvor discussed fracturing his leg in a 2004 accident. He recalled his decision making process that led up to the fracture:

“I thought, ‘Should I lay the bike down?’ Then I thought, ‘Is my wife still going to love me if I crash?’ Then I thought about my kids. And right before impact, I decided to jump.”

Maclvor was lucky to literally walk away from the accident with only a leg fracture. “They say there are two types of motor officers,” Los Angeles Police Lt. Geoff Taylor once told the *Los Angeles Times*, “those who go down and those who are going to go down.”

Despite their officers’ dedication and the obvious advantages of motor units, the heightened liabilities and costs associated with motor units leave agencies continually seeking to manage motor unit risk, both for their officers’ safety and for the financial bottom line.

In 2016, motorcycle deaths accounted for 13% of all vehicular death crash deaths. Police motorcycle units are less visible than patrol cars. Crashes often result from other drivers turning in front of the motorcycle officer. According to the U.S. Department of Transportation, 82% of motorcycle fatalities involve crashes with other moving vehicles. Thankfully, the number of police motorcycle fatalities is falling, down from an annual average of 12 during the period of 2000–09 to 8 deaths per year during 2010–15.

However, because the officer is only protected by the equipment on his or her body, **injuries sustained in police motorcycle accidents can be severe and life changing.** Despite the use of high-quality

helmets, head trauma and accompanying **traumatic brain injuries** may permanently change an officer's life. Other career-ending injuries that may occur on a motorcycle include permanent nerve damage, loss of limb, and paralysis.

Because of these significant personal health and safety risks for motorcycle officers, motor units are sources of significant financial liability and must be well managed to reduce risk. Proactive measures are required to either prevent or minimize costs related to such potential liabilities as:

- Workers' compensation claims
- Civil claims brought by severely injured officers assigned to motor units without training or with training from untrained instructors
- Civil claims resulting from police involved at-fault crashes
- Loss of staff and police capacity due to injured officers
- Replacing & repairing equipment and safety gear

Risk Management

Whether a motorcycle unit is small, large, new to the force, or a longtime part of an agency or department, certain factors are critical in operating and managing a unit with minimized risk and reduced liability. For instance, motor unit personnel should already possess extensive field experience as a patrol officer, which helps police motorcyclists make optimal decisions and remain safety oriented. At the core of risk management, two factors are key: instruction and training of professional motorcycle officers; and, certification of instructors.

QUALITY OF OPERATOR TRAINING

The quality of police motorcycle operator training is absolutely critical to motor unit risk management. Investing in high-quality, professional police motorcycle operator training is essential. While debate may occur about the best bike for the job or the best helmet, all police motorcyclists will agree that the operation, riding, and maneuvering of a police bike requires professional training — tactical and street riding techniques differ greatly from

maneuvers performed on a civilian bike.

Operator training courses should help officers develop muscle memory to best conduct maneuvers in stressful situations, understand both their personal capability and that of their bike, and develop confidence in their riding ability. For more than two decades, Northwestern's Police Motorcycle Operator Training program has offered what is now considered the gold-standard for police motorcyclist training. The 80-hour, two-week course combines classroom instruction with in-the-saddle riding instruction that covers:

- Defensive riding techniques
- Evasive maneuvers
- Vehicle stops and tactical techniques
- Low-speed maneuverability
- High-speed braking
- Counter steering
- Curve negotiation

Officers who complete rigorous training programs are more likely to make optimal decisions at critical moments, reducing risk to themselves and the public. High-quality training programs also help departments reduce costs in other aspects, including:

- Increasing longevity of motorcycles;
- Reducing frequency and severity of cosmetic damage;
- Reducing frequency of severe damage; and,
- Fewer significant mechanical breakdowns due to operator vigilance to mechanical performance.

QUALITY OF INSTRUCTOR TRAINING

Agencies with large motor units often "self-certify" motorcycle operators using the most experienced riders on the unit as trainers. Though they are free to do so, the reality is that many great riders cannot teach. Those who can teach, if not trained, may have no idea what their motorcycle is capable of doing or when it is approaching its limit. Though civilian riding is fun, teaching police officers to ride like civilians can get them killed.

Outdated instruction — for example, those who gained their certification 15 years ago and have

not participated in recertification — is another critical issue. If public school teachers, who teach every day, are required to participate in continuing education to learn and become better, many would argue police motorcycle instructors should do so as well. Police chiefs should check to see if they have trainers teaching officers from their own agencies (and others) who never were certified to teach or who have allowed their certification to lapse sometime before anti-lock brakes were invented.

Risk managers beware.

For these units, Northwestern offers its internationally respected Police Motorcycle Instructor Training course, which prepares instructor candidates to teach the 80-hour Northwestern Police Motorcycle Operator Training Program™ at their own agencies. The three-week course includes one week dedicated to familiarizing instructor trainees with how to organize a course, how to instruct basic exercises, and the understanding of adult education principles and methods of instruction. Instructor trainees must pass a skills test to continue into weeks two and three, which feature hands-on experience teaching exercises and working with real students.

Because training techniques change and motorcycles evolve, re-certification is also critical for on-staff instructors.

Police agencies with instructors certified to teach highly successful, courtroom-tested programs from such renown programs as Northwestern University can have confidence that their officers, their agency, and their community are well prepared and protected. §

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NUCPS Updates Police Motorcycle Instructor Recertification Requirements

Earlier this year, Northwestern Center for Public Safety announced that it has changed its Police Motorcycle Instructor Recertification™ requirements. These changes have been made for the safety and benefit of the motorcycle operators who participate in training that is led by Northwestern-certified instructors.

Effective March 1, 2018, certified Northwestern instructors must successfully complete a Northwestern Police Motorcycle Instructor Recertification™ class once every three years. Instructors who have not successfully completed this course within the previous three years no longer possess valid instructor certification. Individuals holding expired instructor certifications or who have not successfully completed the Northwestern Police Motorcycle Instructor™ course are not considered qualified to teach the Northwestern Police Motorcycle Operator Training™ program and may not use the Northwestern curriculum, training materials, or riding exercises.

The Recertification course is a one-day course taught in across the US that reflects the latest teaching techniques, ABS braking, street-riding techniques, and law enforcement tactical techniques, as well as a test of riding and teaching ability. Upon successful completion, participants receive a new instructor certificate plus the most recent edition of the *Northwestern Center for Public Safety Motorcycle Instructor Manual*.



FEATURED STAFF STUDY:

Implementation of a Citizen Police Foundation for Building Community Relationships, Influencing Agency Priorities, and Improving Departmental Transparency

by Lt. Scott Robertson, Snohomish County (WA) Sheriff's Office
Submitted Oct. 25, 2017, SPSC Class #422, Burien, WA

Problem

The Snohomish County Sheriff's Office has an elected Sheriff and provides law enforcement services to the unincorporated areas of Snohomish County, WA. It provides law enforcement services to an area covering over 2,090 square miles (Annex A) and with a population of about 330,000 people (Annex B). The Sheriff's Office has over 736 employees, including 275 sworn law enforcement deputies (Annex C).

The Snohomish County Sheriff's Office holds at least one citizens academy each year. The academy is broken down into sections and runs for 12 consecutive weeks (Annex D). Approximately 75 attendees are in each class. Each attendee lives in Snohomish County and is individually chosen to represent a diverse cross section of the county (Annex E). At the conclusion of the academy, attendees are awarded a completion certificate and are considered graduates.

Despite intimate knowledge of the internal workings of the Sheriff's Office, graduates are not given the opportunity to help develop goals and priorities, positively influence other community members, or aid in organizational transparency (Annex D).

In order to implement a community-based policing plan that includes the development of goals and priorities that are in line with the community's needs, positively influence community members, aid in the transparency of the organization to other community members, build community trust, drive political agendas, and make communities safer, the Sheriff's Office must organize a citizen-based police foundation.

Failure to implement a citizen-based police foundation would impact the overall effectiveness of the Sheriff's Office to partner with the community, decrease our ability to develop goals and priorities based on community inputs and concerns, decrease overall transparency and public trust, reduce our ability to push forward needed political agendas, and ultimately reduce our ability to keep communities safe.

Assumptions

- Community engagement is important to the Snohomish County Sheriff's Office.
- Citizen academy graduates want to be involved in our organization.
- Direct input from citizen academy graduates will build trust and transparency.
- Citizen academy graduates will improve the Snohomish County Sheriff's Office overall effectiveness.
- Citizen academy graduates can help drive department goals and priorities and, thus, make our communities safer.

Facts

- The mission of the Snohomish County Sheriff's Office is to provide safe communities through dedicated and professional service (Annex F).
- The vision of the Sheriff's Office states that it is our promise that Snohomish County will have a Sheriff's Office that is community-minded, progressive, and professional (Annex F).
- The Sheriff's Office has over 736 employees with 275 sworn deputies (Annex C).
- The Snohomish County Sheriff's Office serves approximately 330,000 citizens and covers approximately 2,090 square miles (Annex A and B).
- Community engagement is a major goal of the Sheriff's Office (Annex G).
- The Snohomish County Sheriff's Office conducts at least one citizen's academy each year.
- Citizen academy graduates are willing to participate in a police foundation (Annex H).

Discussion

Background

For the past several years, the Snohomish County Sheriff’s Office has run at least one citizen’s academy every year. The citizen’s academy attendees must be Snohomish County residents and are selected to represent a diverse cross-section of the communities that the Sheriff’s Office serves (Annex E). The citizen’s academies are limited to about 75 participants.

Currently, the Snohomish County Sheriff’s Office does not utilize citizen academy participants in any manner after graduation. However, the Sheriff’s Office maintains a database for graduate information.

In 2015, the Sheriff’s Office launched a voter initiative (Proposition 1) to increase manpower by implementing a one-tenth of one percent tax on sales. Although widely believed that the proposition would pass, it failed by several hundred votes (Annex I). The organization believes that marketing was an issue and that the Sheriff’s Office missed the mark by not soliciting the marketing direction from citizens.

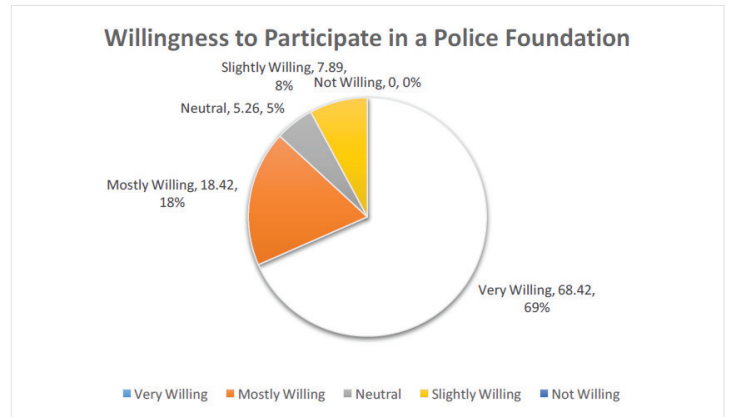
Recently, Snohomish County Sheriff Ty Trenary has discussed an option to utilize the citizen academy graduates in a Sheriff Police Foundation (or citizens advisory board) to help drive departmental goals and priorities, increase the department’s overall effectiveness, and help drive political agendas.

Citizens Academy Graduate Survey

In September, 2017, a survey was sent to recent Snohomish County Sheriff’s Office Citizens Academy graduates. The graduates were asked questions about the citizens academy and participating in a Snohomish County Police Foundation. From the data received, 68.42% of those responding to the survey stated that they would be very willing to participate in a Sheriff’s Police Foundation (Annex H).

Community Partnership and Police Foundations – A Best Practice

The benefits of establishing a police foundation through community-oriented policing are vast and



Annex H.

well documented in many publications, including the *Presidential Task Force on 21st Century Policing* and the U.S. Department of Justice Office of Community Oriented Policing Services study, *Building Trust Between the Police and the Citizens They Serve: An Internal Affairs Promising Practices Guide for Local Law Enforcement*.

Community-oriented policing is a philosophy that promotes and supports organizational strategies to address the causes, and reduce the fear of, crime and social disorder through problem-solving tactics and community/police partnerships. This philosophy requires that citizens and police collaborate to proactively increase public safety within the community (Fisher-Stewart, 2007).

In today’s climate of increased scrutiny of law enforcement, citizens in many jurisdictions are clamoring to have greater visibility in their police or sheriff’s departments and are demanding more robust community policing efforts. One way to achieve both goals is to create a police foundation (or, citizens’ advisory board), which is distinctly different from a citizens’ review board (Wyllie, 2016).

Benefits of Developing a Police Foundation

Unlike a citizens’ review board, a *police foundation* is a group of people who meet regularly with the sheriff to offer advice and opinions on a wide range of issues and to exchange ideas. Members of the police foundation and the department make joint public appearances. A police foundation can provide insight into blind spots — the activities and attitudes in the jurisdiction that are beneath the surface and invis-



Provo PD's Citizen Advisory Board began meeting in 2015. | Photo Credit: [Provo PD.](#)

ble (Wyllie, 2016). The police foundation is a success when it has become an integral part of the department.

During a seminar session at the 2016 International Association of Chiefs of Police (IACP) conference in San Diego, Chief John King of the Provo City (UT) Police Department stated that the overarching purpose of a police foundation is to achieve transparency, increase credibility, gain support, obtain outside opinions, and receive direct feedback (Wyllie, 2016). Chief King stated that the citizens advisory board in Provo was not a formal city organization; and therefore, not subject to the rules which can mire down public meetings. Provo's citizens' advisory board is structured such that it is a relaxed environment, which encourages dialogue and not an hour of formal drudgery (Wyllie, 2016).

During the same IACP seminar, a citizen from the Provo Citizens' Advisory Board, Dr. Dianne McAdams-Jones, spoke about the process and perceived benefits of a citizens' advisory board. Dr. McAdams-Jones stated the following:

“You can educate the public. There are a lot of things that I did not know before joining the Citizens' Advisory Board. It helps me to understand law, I understand how police approach things . . . I can fact-check rumors and that's extremely important. And, once I'm educated, I can educate the people around me.” (Wyllie, 2016)

Another benefit of organizing a police foundation is the availability of perspectives which are completely different from that of law enforcement professionals. One example provided at the IACP seminar was a college professor serving on Provo's citizens' advisory board. Through citizens' advisory board meetings, the professor has introduced classroom concepts of unstructured learning (or, creative learning) to solve problems with a scenario-based training approach at the department (Wyllie, 2016).

Other studies indicate that when the Sheriff, or police executive, engages in dialog with members of the community regarding their perception of how the organization is adhering to established standards, both the department and community gain a better understanding of the community's perception and can make changes that have a positive impact on that perception (Office of Community Oriented Policing Services, 2009).

The *President's Task Force of 21st Century Policing* recommends that law enforcement agencies should collaborate with community members to develop policies and strategies in communities and neighborhoods disproportionately affected by crime for deploying resources that aim to reduce crime by improving relationships, greater community engagement, and cooperation (Office of Community Oriented Policing, *Final Report*, 2015).

Positive Outcomes: Police Community Partnerships

Police-community partnerships serve a wide variety of purposes, most falling into either the category of

enhancing communications or that of responding to problem situations. Enabling those partnerships can lead to:

- Understanding community concerns and identify problems.
- Educating citizens and teaching crime prevention techniques.
- Building community support.
- Information sharing.

(Wells, 2009)

Citizen Advisory Boards in Contemporary Practice: A Practical Approach in Policing holds that a police foundation can be a critical component to establish an open culture between a public agency and the community. The article warns that a foundation cannot be politically motivated and should be culturally diverse and genuinely represent the community (Reece, 2015).

According to the *President's Task Force on 21st Century Policing*, joint community and police dialogues regarding procedural justice has led to beneficial results in that communities are often more willing to assist law enforcement when agencies need help during investigations. When critical incidents occur, those law enforcement agencies already have key allies who can help with information messaging and mitigating challenges (Office of Community Oriented Policing, *Interim Report Part 2*, 2015).

The public's understanding of why and how law enforcement conducts itself is key to building trust. It is unrealistic to expect law enforcement to develop the best solutions and strategies without the valuable ideas that individuals and community leaders may well provide. The keys for developing public trust are transparency through open, honest, timely communications; and engaging the community in outreach programs, like police foundations, to build effective relationships. These outreach programs lead to cooperation and positive relationships and, ultimately, to a higher quality of life and peaceful communities (Mahoney, 2017).

Possible Solutions

The Snohomish County Sheriff's Office has three options to consider regarding the formation of a Police Foundation, which are outlined below:

Option I

Continue to run yearly citizen's academy without the formation of a Police Foundation (Status Quo).

Pros:

- The citizen academy is well organized and will need no further alterations.
- No new policies or documentation is required.
- No additional cost.
- No additional time needed for selection process/meetings.

Cons:

- No direct involvement with processes from citizen academy graduates.
- Continued one-way communication during citizen academy classes in reference to procedural justice, building trust and relationships, and enhanced transparency.
- No method for improved messaging.
- No method for identifying and mitigating challenges in our communities (less-safe communities).

Costs: None



Option II

Continue to run a yearly citizen's academy without the formation of a Police Foundation, while adopting a yearly post-graduation survey involving community topics.

Pros:

- The citizen academy is well organized and will need no further alterations.
- Most surveys are free or are of little expense.
- Receive yearly information from academy graduates about a wide range of topics.
- Information and statistics from the surveys can be documented and compared with historical data.
- Academy graduates might feel that they have a voice in the direction of our organization (building relationships and procedural justice).

Cons:

- New policies and or documentation is required.
- More time is needed to develop and process survey (minimal).
- Continued one-way communication during citizen academy classes in reference to procedural justice, building trust and relationships, and enhanced transparency.
- Only a once-a-year method for improved messaging.
- Only a once-a-year method for identifying and mitigating challenges (only marginally safer communities than Option I).
- No free flow of information and ideas.
- Only a once-a-year ability to get feedback about direction, intelligence, processes, etc.

Costs: Minimal



Option III

Continue to run a yearly citizen’s academy while adopting a post-graduation survey; and, with the formation and adoption of a police foundation.

Pros:

- The citizen academy is well organized and will need no further alterations.
- The Police Foundation can be staffed with academy graduates that are from Snohomish County, have a working knowledge of our organization, and can be selected to represent a diverse cross-section of our community.
- A Police Foundation can aid in external and internal procedural justice, building trust and relationships, and enhanced transparency.
- Receive up-to-date information from community members about a wide range of topics to both identify and mitigate perceived challenges in our communities.
- Information and statistics from surveys can be documented and compared with historical data.
- A Police Foundation can increase all communication and can enhance political efforts.
- A Police Foundation will make our communities safer.

Cons:

- New policies and documentation are required.
- More time is needed to develop and process surveys (minimal).
- More time is needed for staff to attend Police Foundation meetings.
- Some challenges, presented by Police Foundation members, might not be able to be resolved due to RCW, case law, or common procedures and/or conflict-of-interest.
- Some Foundation members might have unattainable expectations.
- The Police Foundation would expect transparency (are we willing).

Costs:

- If held to command-level staffing, the majority of costs would be time.
- Other costs may include food and beverage.
- Paper products for documentation.
- Meeting location rental cost.

Conclusion

The Snohomish County Sheriff’s Office runs an annual citizen’s academy. As of this study, the Snohomish County Sheriff’s Office has not taken advantage of the academy graduates to enhance our community-oriented policing efforts. From examined literature and current trends in policing, failure to implement a citizen-based Police Foundation would impact the overall effectiveness of the Snohomish County Sheriff’s Office ability to partner with the community, decrease our ability to develop our goals and priorities based on community inputs and concerns, decrease overall transparency and public trust, reduce our ability to push forward needed political agendas, and ultimately reduce our ability to keep our communities safe.

This study has presented three possible solutions to increase the participation of graduates of the Snohomish County Sheriff’s Office Citizens Academy. Option I, keeping the status quo, does not change our processes and only provides one-way communication (from us to them). This option does not enhance our ability to change our organization to meet the community’s needs and keeps business as usual. Option II, adding a yearly survey, gets information

flowing in a limited capacity. The information can be documented and compared to historical data to make changes or adopt policies and procedures. It limits our ability to develop relationships, build trust and transparency, and receive real time data about our communities.

Option III, recommended, establishes a Police Foundation with citizen's academy graduates. This option will allow our agency to receive input on real time concerns from members of our community. These members, if selected appropriately, will represent a diverse cross-section of Snohomish County. This option will aid in building trust, enhance transparency, and increase perceived external procedural justice within our communities. It will increase all communications and can enhance political efforts. Most importantly, it will make our communities safer.

Recommendation

The implementation of a Police Foundation will dramatically help to support our mission and goals. A Police Foundation will provide real time concerns and mitigate challenges. It will build trust, enhance transparency, improve perceived external procedural justice, enhance political efforts, and make our communities safer. It is recommended that the Department implement Option III, a

Police Foundation staffed by citizen's academy graduates. A proposed implementation schedule is outlined in Annex J. §

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(To view annexes cited in this study, please visit *The Key* at nucps.northwestern.edu.)



POWDERS IN FINGERPRINT DEVELOPMENT: A REVIEW

by Don Ostermeyer

SINCE the on-set of carbon-based fingerprint powders in the late 1800s, powder products have continued to develop and improve in sensitivity. Magnetic powders have added greatly to the sensitivity range in friction ridge development. These powders afford far more control in the building or developing of latent fingerprints.

Development is often limited to such conventional processing materials as black carbon-based powders, primarily due to cost and lack of training. However, innovative research and design have produced far more sensitive and superior powders. Many of these new powders have evolved through discussions with forensic technicians who have been faced with difficult or challenging substrates. Topics of these conversations have included such surfaces as guns, ammunition, steering wheels, and other vehicle interiors. Additionally, forensic technicians have confronted troublesome situations with various porous surfaces, such as paper. This begs the question, **How many latent prints are missed or never developed?**

Latent print powders have evolved into four categories:

- Conventional;
- Specialty;
- Fluorescing; and,
- Magnetic Versions.

Experienced technicians have confronted numerous surfaces and substrates through the years. Difficulties with certain surfaces and substrates resulted in the development of specialty powders. For instance, vehicle interiors, especially steering wheels, are made of pebble plastics, leather, or vinyl. While conventional powders may work, specialty powders assist in development on these surfaces. These specialty powders include Dash-it™, Jolt™, V.I.P. (Vehicle Interior Powder)™, and other reduced powders.

Weapons, including firearms and their magazines and ammunition, are also often problematic due to their types of surfaces, pitting, and lubricants. Specialty powders that help in this type processing include:

FORENSIC SCIENCE & CRIME SCENE INVESTIGATION

- Ultra Red X2™
- Ultra Red X3™
- Ultra Blue 2™
- Other reduced powders

Human skin development has been researched for many years. While many processes have been considered, including the application of Super Glue Fumes, reduced powders have provided consistent results in both direct applications and in various transfer techniques. The following powders provide exceptional development on human skin and on transfer lift surfaces:

- Ultra Blue 2™
- Skin Print Black™
- Ultra Red X2™
- Ultra Red X3™
- Other reduced powders formulas

Paper processing has always remained a dilemma. Tools of choice often involve *ninhydrin*. While usable results may occur, they are mostly sporadic and minimal. Equal or superior results will often result from reducing magnetic powders. Paper Plus™ or

other reduced powder formulas provide excellent development on paper and cardboard surfaces and may be used in conjunction with many of the Amino Acid reactive chemistry.

New methods and techniques continue to develop in answer to the many *What if's* that arise in latent fingerprint development. Many of these questions are confronted in NUCPS' Crime Scene Technology 3 Advanced Techniques Lab classes. Some of these problems are solved by simply reduced pre-existing powders or the development of new approaches in powders and chemicals. The science continues to excel, adding thousands of times more sensitivity to the realm of latent fingerprint development in the field and laboratory. §



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- Aug. 27 - Nov. 9. Ft. Worth, TX.
- Sept. 10 - Nov. 16. Edwardsville, IL.
- Sept. 10 - Nov. 16. Burien, WA.
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- **Crash Investigation 1 Online:** Self-Paced. Spring 2018.
- **Crash Investigation 2 Online:** Self-Paced. Spring 2018.
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Thank you to this issue's contributors.

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We welcome new authors! If you would like to contribute an article to *The Key* — or wish to see an article on a specific topic — please contact the editor, Caroline Paulison Andrew, at nucps-alumni@northwestern.edu.

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