IMPAIRED DRIVING TECHNOLOGIES & BENEFITS

DWI System Improvements working group

Addressing impaired driving remains a leading road safety priority. According to the National Highway Traffic Safety Administration (NHTSA), alcohol-impaired driving fatalities involving a driver with a blood alcohol concentration (BAC) of .08 or greater accounted for 28.8% of total motor vehicle crash (MVC) fatalities in 2018, or 10,511 lives lost. This corresponds to a 3.6% decrease compared to 2017 when the number of fatalities was 10,908. While the percent of alcohol-impaired driving fatalities among total driving fatalities remained constant at approximately 29% during 2016, 2017 and 2018, the total vehicle miles traveled (VMT) increased. The VMT coupled with 3.6% fewer alcohol-impaired driving fatalities indicates a decreasing trend of fewer fatalities per VMT (NHTSA October 2019). Nevertheless, the loss of more than 10,000 lives as well as numerous physical injuries remains unacceptable and indicates work must continue to effectively prevent and reduce impaired driving.

A variety of technologies are available both to aid and improve the detection and prosecution of impaired drivers as well as enhance risk-reduction supervision and treatment strategies. The Working Group on DWI Systems Improvements met on September 16-18, 2019 in Orlando, Florida to explore the benefits and implementation issues associated with technologies to reduce impaired driving, including law enforcement cameras, ignition interlocks, and various offender monitoring technologies. This fact sheet contains a brief description of the objectives and functionality of each technology and ways its application can benefit the apprehension, monitoring and treatment of DWI[1] offenders. Important benefits of each technology, as well as some caveats to implementation are highlighted. Other fact sheets in this series contain more detailed information to guide the implementation and use of devices and explore more comprehensively implementation issues and data generated to inform the supervision and treatment of DWI offenders.

What types of technologies are available to law enforcement agencies?

Law enforcement agencies across the country are currently deploying or are considering the acquisition of dashcams, body-worn cameras, and other forms of video evidence to document interactions with the public and support criminal investigations. Recordings by law enforcement and civilians have been used

[1] The abbreviation DWI (driving while impaired or intoxicated) is used throughout this report as a convenient descriptive label and to create consistency, even though some states use other terms such as OWI (operating while impaired or intoxicated) or DUI (driving under the influence), and in some states they refer to different levels of severity of the offense.

in both criminal and civil court cases. Visual and audio technologies can provide evidence of driving performance, field sobriety testing and interactions between an officer and driver. There are several types of cameras available to and used by law enforcement, including:

- **Dashboard cameras.** A dashcam, car DVR, driving recorder, or event data recorder (EDR) is an onboard camera that may automatically activate when officers turn on lights or sirens and then continuously record the view through the front windshield of the patrol vehicle. These cameras are limited to recording what is occurring in front of the vehicle. Nevertheless, this technology can record driver performance behind the wheel or during a field sobriety test.
- **Body cameras.** Body worn video (BWV), body-worn camera (BWC) is a wearable audio, video, or photographic recording system used to capture and document events in which law enforcement officers are involved. They are typically worn on the upper torso on the officer's uniform. They are powered by a battery pack, which ensures recording capability during an entire shift (up to 12 hours). When recording, the cameras capture a wide-angle, full-color view directly in front of an officer's body position. The video can automatically upload via a docking station to a cloud-based or home server storage and management system where it can be accessed for review. The video camera as well as the storage system should be secure and safe from tampering. These cameras have been found to effectively capture actions outside the patrol vehicle, but given their position on the officer's body, do not capture much useful video from the inside of the vehicle. This technology can be helpful in capturing interactions of officers and drivers as well as memorializing field sobriety testing.
- **Flex glass cameras.** Like a body camera's functionality, a small device can be securely attached to sunglasses, a cap, a shirt collar, or a head mount. They may be powered by a pocket-sized battery pack which may ensure recording capability during an entire shift. Alternatively, they may be powered by a rechargeable battery with a range of battery life depending on the chosen camera and battery. When recording, the camera captures a wide-angle, full-color view of objects and persons directly in front of an officer.
- **Smartphones.** Personal cell phones provide video/audio recorded interactions as well as still photos.
- **Security cameras.** Public and private security camera recordings can capture interactions from a fixed location. The quality of the camera has an impact on the usefulness of the images captured.
- **Interrogation rooms.** Many law enforcement departments require all interviews conducted by officers at the station to be recorded. These recordings are limited to interviews conducted in a controlled setting.

What are the general benefits of law enforcement technologies?

Generally, video recordings (often with audio) can provide the following benefits for both law enforcement and defendants depending on the type of camera.

The use of cameras during police and civilian interactions encourages people to behave better on both sides of the camera.

- **Encourages and documents civil interactions.** Cameras highlight interactions and help establish context during heated situations as well as accentuate the decision-making process of officers. The use of cameras during police and civilian interactions encourages people to behave better on both sides of the camera. Both law enforcement officers and civilians tend to behave better when they know their actions and statements are being recorded. TThe awareness of one's actions being memorialized through a recording can be used to determine culpability at a future date can discourage inappropriate behaviors and communications while encouraging good conduct.
- **Improves community relations.** Another benefit of cameras inspiring more constructive interactions is a reduction in use of force incidences by officers and civilian complaints.

Cameras can promote accountability while reducing agency liability. With a reduction in complaints to investigate, fewer resources can be spent fighting civil actions and more resources may become available for other law enforcement responsibilities. The recordings of traffic stops can aid in the investigation of any public challenge regarding racial profiling. Additionally, videos of appropriate officer behavior can help improve community and media perceptions of law enforcement.

- **Strengthens evidence.** Video recordings provide evidence of driving performance, standardized field sobriety testing results and officer interactions with a driver. Video can be beneficial in reinforcing or reconsidering an arrest decision as well as providing valuable evidence to help determine guilt or innocence and encourage a guilty plea. Cameras incentivize officer compliance with department policies and procedures which can encourage appropriate use of officer discretion regarding the use of warnings and DWI arrests. Recordings can confirm statements and behaviors while resolving disputed testimony. The recorded content can corroborate other evidence and back-up witness statements or written reports. Recordings can also refresh the recollection of arresting officers prior to writing an arrest report or providing court testimony.
- **Expedites dispositions.** Recordings can prevent unnecessary court hearings by encouraging guilty defendants to plead accordingly or by providing prosecutors and defense counsel with clarity about facts resulting in more timely case dispositions. Ultimately, convincing evidence from a recording can increase the efficient use of staff time and court costs.
- **Creates training resources.** Recorded pursuits or interactions help create training materials and opportunities by utilizing actual encounters as an excellent post-incident tool for officer training and DWI offender classes. Reviewing the actions during an event provides learning opportunities which can ensure officers are well-prepared and thoughtful in such situations, thereby improving officer and civilian safety. The use of footage examples to train recruits can lead to more professional conduct throughout the command structure.

What are some of the important policy caveats to implementation?

- **Institute policies to guide usage.** Prior to implementing camera use of any kind, agencies must have comprehensive policies to guiding their use and avoid misuse and inconsistencies in their application. Policies should clearly state reasons for utilizing the chosen camera application or the purpose of the policy. Consultation with experts is essential to assist in the writing of policies considering complex regulations, privacy laws and civil rights issues. It is also important to consult with other agencies using the selected camera to identify best identify best practices and lessons learned.

- **Develop and implement training on policies and procedures.** Training should relate to all aspects of camera functionality and use to ensure appropriate camera operation. Achieving staff buy-in for camera utilization can be a seriou challenge to their implementation. Therefore, distributing policies and training to staff is an essential part of gaining initial buy-in.
- **Clarify when cameras will be used.** Unlike dashboard cameras, which may automatically switch on when officers turn on lights or sirens, body-worn cameras usually require officers to activate recording. Thus, a body-worn camera policy must clearly establish when officers are required to switch their cameras on and off. Since some states prohibit secretly recording individuals, officers may need to notify people when they are recording. As such, the policy should specify how and when this will occur.
- **Establish security requirements.** Clear policies and procedures need to be developed to ensure the security of confidential and/or private data. Policies should indicate who can allow access and who has access to footage and under what circumstances. This will require clear guidance how and when recordings can have redactions to protect the identity of individuals involved.

- **Create requirements for identifying relevant footage and retention criteria.** Policies should help determine if footage is either relevant or irrelevant and how footage is differentiated and handled. This also requires a policy on how officers indicate relevant footage and whether officers can view recordings prior to completing an incident report or any other time. The minimum length of time footage is maintained should be indicated.
- **Review and update policies and procedures.** It is important to seek officer feedback about policies and procedures to build and maintain trust essential for ongoing buy-in.

What types of technologies are available to prevent impaired driving, monitor alcohol use and/or supervise offender compliance with court conditions?

Several types of technologies are available to monitor alcohol consumption among impaired drivers using breath testing, transdermal alcohol monitoring, biomarker testing, and GPS tracking devices. Some devices are designed to prevent a vehicle from being driven by an alcohol-impaired driver whereas others determine current or recent alcohol use and may be combined with other types of functionality such as location monitoring. These technologies are primarily used to supervise DWI offenders pre- or post-conviction, or as part of court-ordered treatment. More information about different technological options for monitoring and supervising impaired drivers is provided below.

What technologies prevent an impaired driver from operating a vehicle?

- **Alcohol ignition interlock devices (IID).** This is the only technology designed solely to prevent a vehicle from being driven by an alcohol-impaired driver. These devices have been commercially available for more than 40 years and are used primarily to incapacitate impaired driving suspects and offenders (i.e., prevent them from driving under the influence of alcohol).

  An IID is an alcohol breath testing device connected to the starter of a vehicle to prevent it from being driven by someone who has been drinking. This device interrupts the flow of power to the starter until the driver successfully passes a breath test by blowing into a mouthpiece attached to the device.

  IIDs primarily use fuel cell sensors involving an electrochemical process where any amount of alcohol in the breath sample reacts with a catalytic electrode. The IID measures the electrical current to determine BAC. The more alcohol in the sample, the higher the BAC level. Many IIDs also have a camera attachment to identify the person providing the breath sample.

  Multiple research studies have shown IIDs are a proven and effective tool to prevent impaired driving, reduce repeat offenses, and reduce alcohol-related crashes (Willis et al. 2005; Kanable 2010; Elder et al. 2011; Fielder et al. 2013; McCartt et al. 2013; Voas et al. 2013; Beck et al. 2015; McGinty et al. 2017; Vanlaar et al. 2016; Kaufman and Wiebe 2016). Laws mandating interlock devices for all DWI offenses (i.e., first, high-BAC or repeat offenses) are most effective in reducing alcohol-impaired drivers in fatal crashes (Teoh et al. 2018).

What are the benefits of IIDs?

- **Prevents alcohol-impaired driving.** IIDs have been shown to prevent alcohol-impaired driving and, thus, prevent alcohol-impaired crashes. Several evaluations of IIDs reveal significant reductions in re-offending; especially while the IID is installed. Reductions remain, albeit smaller, after the device is removed. Since research has shown many suspended or revoked drivers continue to drive, IID usage can help reduce unlicensed driving by persons suspended or revoked for DWI. Additionally, IID service centers record the mileage of the IID installed vehicle. This record of miles driven when compared to the driver's daily activities is a good indicator of whether restricted drivers are driving the IID equipped vehicle or driving a vehicle illegally without an IID.
- **Allows offenders to drive legally.** Ignition interlock devices permit DWI offenders to either maintain or regain their legal driving status.

This ability to continue driving may be crucial to retain employment and support their families, as well as manage family-related and court-ordered responsibilities requiring driving to and from certain locations.

- **Helps predict future impaired driving.** Studies show IIDs can help reliably predict future repeat DWI offense risk based on recorded breath tests logged into the device (Zador et al. 2011; Marques and Voas 2012; Assailly and Cestac 2014; Voas et al. 2016). DWI offenders with more failed BAC tests in early morning hours were shown to have a higher chance of repeat DWI offenses in the future, even after the IID was removed. Such information is critical to inform the restoration of driving privileges.
- **Creates a record of alcohol use.** The IID provides a record of failed and successful BAC tests. This is valuable information for court professionals and substance abuse treatment providers. The ability to support good decisions (no alcohol use) and confront continued destructive behavior (alcohol consumption or attempts to drive after consuming alcohol) can assist the treatment regimen. Additionally, a record of BAC results gives treatment providers objective information to discuss alcohol use with offenders as well as overcome denial of a substance abuse problem and move them towards readiness to change.
- **Furnishes aggregate outcome data.** IID service centers also provide important aggregate data to demonstrate the effectiveness of interlock programs with and across jurisdictions. Aggregate data can be used to create a better overall understanding of impaired driving behaviors while considering locations of use (e.g., urban vs. rural) and demographics of drivers (e.g., sex, age, income).

What are caveats to IID program implementation?

- **Appropriating adequate resources.** The enactment of ignition interlock state laws often lacks the necessary accompanying appropriations to put into operation a well-resourced, comprehensive, and effective implementation strategy. Executing and maintaining a successful interlock program statewide is predicated on adequate administrative and technical support. This requires a designated authority to coordinate agencies and staff to bring together the necessary stakeholders and resources to implement a coordinated plan. This includes:
  - Developing policies and procedures to guide each entity involved in the operation of the program.
  - Establishing a bid and selection process for IID vendors which is customized to the jurisdictional needs.
  - Hiring people with the technical expertise to certify and audit IID service centers.
  - Creating a database to track overall operations.
  - Developing and implementing training curricula for the different stakeholders (e.g., law enforcement, prosecutors, defense counsel, judges, DMV, probation officers).

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- **Ensuring installation and use.** A common pitfall to the ongoing successful implementation of an interlock program has been the inability to ensure the ordered IID is installed by offenders and they are compliant with the order to only drive an IID installed vehicle. Without good monitoring offenders may choose to drive illegally without an IID because they believe they will not be detected.

What technologies help determine recent or past alcohol use?

- **Transdermal continuous alcohol monitoring.** The ankle bracelet device measures (usually every 30 minutes) the concentration of alcohol present in the insensible perspiration constantly excreted through the skin. Alcohol can be detected in the level of ethanol vapor present in the offender's perspiration after drinking events. At least once a day, the data from the bracelet is downloaded on to a base station in the offender's home or workplace. It is sent to the monitoring agency via wireless, landline or ethernet communication. Defined alerts such as transdermal alcohol concentrations (TACs) are then transmitted to the monitoring authority.
- **EtG testing.** The biomarker Ethyl Glucuronide is a metabolite produced from drinking alcohol and is used to detect alcohol levels in urine. A

positive EtG test usually confirms a person was exposed to ethanol within the previous one to five days, depending on how much alcohol was consumed. EtG tests are extremely sensitive and detect low levels of alcohol consumption. The amounts of EtG could be due to heavy drinking within three days of the test, light drinking in the past 24 hours, or recent intense exposure to products containing alcohol. The EtG urine test is useful for determining abstinence and used to confirm or estimate suspected drinking events.

What technologies determine real-time alcohol use?

- **Breath testing devices.** These devices are designed to estimate Blood Alcohol Concentration (BAC) from a breath sample. Most devices use one of three technologies to detect BAC: a semiconductor oxide sensor, a fuel cell sensor, or an infrared spectrometer. Some devices have wireless connectivity, facial recognition, tamper detection and real-time reporting to a designated agency. There are many devices on the market, and some are desktop or home-based units and others are portable.

  The devices may be a component of or used in combination with tracking or monitoring technology such as radio frequency, smartphones, and GPS. Tracking and monitoring technologies can provide valuable information to a supervising agency as to the location and activities of DWI offenders while holding them accountable to a pre-arranged schedule.

- **Radio frequency (RF) monitoring with breath testing capabilities.** This is a wireless communication technology consisting of at least two components: an ankle bracelet and a monitoring base station and each component is capable of detecting the presence or absence of the other. The RF tag in the bracelet transmits a signal to the monitoring base. The technology primarily provides alerts when offenders are not near the base at scheduled intervals. The base station may include a breath testing device and video camera. Information is transmitted to a monitoring agency indicating when the person wearing the unit is near the base station including breath alcohol results.

- **Global Positioning System (GPS) tracking with breath testing capabilities.** This technology consists of a navigation device in an ankle bracelet attached to or in a smartphone carried by offenders. GPS tracks the device's movements and determines its location. When a DWI offender is assigned a GPS tracking device, law enforcement or corrections officials place a permanent bracelet on his/her ankle. This makes it possible to track the person 24 hours a day, seven days a week. For instance, if a DWI offender goes to a bar or liquor store, the monitoring agency can notify the supervising authority, or it will show up on a report from the monitoring center. If breath testing is a component of or used in conjunction with tracking technology, offenders could be contacted by the supervising authority and asked to provide a breath sample.

- **Kiosk monitor reporting with breath testing capabilities.** This technology is a computer or an ATM-like machine to which individuals under community supervision can report as an alternative or supplement to traditional face-to-face meetings with a probation officer. Kiosks are often located in probation offices, courthouses, or police departments. A kiosk with a breath tester typically uses biometric fingerprint authentication to verify the identity of the individual. It captures video as it administers the breath test, and automatically uploads the test results to the offender's file. Operating without any direct supervision, the kiosk can test up to 40 individuals per hour, 24 hours a day, seven days a week. Additionally, the kiosk system usually prompts the person to answer several questions typically asked by a Probation Officer (PO) during a face-to-face visit.

What are the benefits of alcohol monitoring technologies?

The general benefits of alcohol monitoring technologies and specific benefits of individual technologies are described below.

- **Improves public safety.** Knowing alcohol consumption is being monitored can be a deterrent from drinking. Individuals who abstain from alcohol are unlikely to drive impaired and less likely to be crash-involved. These technologies can identify offenders who drink and are more likely to be non-compliant with other court-ordered conditions. Technologies providing a record of recent alcohol use can assist in determining the ongoing risk level for recidivism and/or alcohol use relapse offenders pose. They also can guide determination of the necessary level of supervision and appropriate substance abuse interventions and referral of considerations.

- **Supports evidence-based programming**. These alcohol monitoring technologies provide varying degrees of information to a supervising authority about an individual's alcohol use. All the technologies provide unique data related to jurisdictional outcome measures. This valuable data is an indication of drinking patterns (some technologies are more detailed or comprehensive than others). This data supports evidence-based court-ordered supervision and treatment and can guide discussions between offenders and their probation officers and/or treatment providers. The different intensity and intrusiveness of each of the technologies facilitates the use of enhanced options for graduated sanctions and incentives. Thus, compliance can be incentivized and lead to a reduction in restrictions whereas non-compliance can lead to a step-up in graduated sanctions.

What are the benefits of individual monitoring technologies?

- **Transdermal technology.** The technology eliminates the need for practitioners to perform a test to determine alcohol use. Information collected is generally accurate and a more effective means of continuously monitoring alcohol consumption events and amounts than other technologies (e.g., periodic breath tests or urinalysis).
- **EtG testing.** If court-ordered conditions require a zero tolerance for alcohol consumption, these types of tests can be extremely helpful because they can detect alcohol consumption up to four days after someone drinks.
- **Breath testing (stand-alone).** Breath tests can be performed virtually anywhere utilizing a hand-held unit. Results are well accepted by the courts.
- **Radio frequency (RF) monitoring with breath testing capabilities.** RF monitoring can avert criminal justice costs by reducing the use of incarceration. The technology is effective in helping enforce an offender's approved schedule away from home. Units with breathalyzers can be programmed to require a random breath test.
- **GPS monitoring with breath testing capabilities.** This technology tracks offenders' movements in real time. In addition to imposing home curfews like RF, GPS is useful for enforcing more complicated supervision orders such as exclusion zones (e.g., drinking establishments or schools). Units with breathalyzers can be programmed to require a random breath test.
- **Kiosk reporting with breath testing capabilities.** These devices help community supervision officers to better manage large caseloads of low-risk clients and redirect some of their time and attention to supervising higher-risk clients with greater needs. This technology also creates easier access for offenders to comply with testing.

What are caveats to implementation?

- **Selecting an appropriate technology.** Jurisdictions need to determine which technology is the best fit for their desired objectives and outcomes. This requires stakeholders to come to a consensus about which technology to use under what circumstances with a clearly defined purpose.
- **Developing policies and providing training.** The implementation of any impaired driving technology requires the development of appropriate policies and training. Policies cannot be developed in a vacuum and should involve relevant stakeholders. Training development must consider who is to be trained and what training is required. Stakeholder training needs to be included.

The implementation of any impaired driving technology requires the development of appropriate policies and training.

- **Securing the necessary appropriations.** A realistic budget to implement any technology must be developed. Items to consider include but are not limited to the cost of training, technology procurement and maintenance, additional staffing costs, and service contracts.
- **Ensuring technology maintenance.** All technologies require ongoing maintenance to ensure it is in proper working order. Any breath testing technology requires regular instrument calibration to ensure accuracy of results over time.
- **Providing the necessary human resources.** Each technology is a tool and not a stand-alone strategy. All technologies require human resources to monitor and respond to the results/data generated by the technology. Furthermore, technology administered to or deployed with

high-risk offenders will require a greater level of monitoring and faster responses to non-compliance to avoid liability.

Impaired driving technologies require human resources to monitor and respond to the results/data generated by the technology.

About the Working Group

The Working Group on DWI System Improvements is a prestigious coalition of senior leaders of organizations representing frontline professionals in all segments of the criminal DWI system (law enforcement, prosecution, judiciary, supervision, and treatment). During its 15-year tenure, this distinguished consortium has shaped the focus on and development of drunk driving initiatives in the United States with its unique perspective on knowledge transfer of critical research findings, as well as the translation of legislation, policies, and programs into operational practices. The efforts of the Working Group have served to identify critical system needs, to make needed educational materials available, to articulate the complex issues associated with program and policy implementation embedded within broader systems, and to give voice to the concerns of practitioners in the DWI system and identify achievable solutions. Since 2004, the Working Group has met annually to produce much-needed educational primers, policy documents and guides for justice professionals to help strengthen the efficiency and effectiveness of the DWI system for dealing with persistent impaired driving offenders. These documents can be accessed at www.dwiwg.tirf.ca.

- 2004 – Working Group on DWI System Improvements: Proceedings of the Inaugural Meeting
- 2006 – A Criminal Justice Perspective on Ignition Interlocks
  10 Steps to a Strategic Review of the DWI System: A Guidebook for Policymakers
- 2007 – Screening, Assessment, and Treatment: A Primer for Criminal Justice Practitioners
  Improving Communication and Cooperation
- 2008 – Impaired Driving Priorities: A Criminal Justice Perspective
- 2009 – Impaired Driving Data: A Key to Solving the Problem
  Funding Impaired Driving Initiatives
  Understanding Drunk Driving
- 2010 – Effective Strategies to Reduce Drunk Driving
- 2011 – Performance Measures in the DWI System
- 2012 – Impaired Driving in Rural Jurisdictions: Problems and Solutions
- 2013 – DWI Dashboard Report: A Tool to Monitor Impaired Driving Progress
- 2014 – DWI Dashboard Strategic Guide: Addressing Gaps in the DWI System
- 2015 – Post-Conviction Services for DWI Offenders: Building Community Partnerships
- 2017 – The Persistent DWI Offender Policy & Practice Considerations
- 2017 – Navigating the DWI System Perspectives of Public Defenders
- 2017 – Key Questions that Help Motivate DWI Probationers
- 2018 – Impaired Driving & Road Safety Campaigns
- 2018 – Preventing Alcohol-Impaired Driving What the Public Needs to Know
- 2019 – Impaired Driving Technologies to Guide Supervision & Treatment
- 2019 – Impaired Driving Technologies & Critical Implementation Issues
- 2019 – Impaired Driving Technologies & Benefits

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Traffic Injury Research Foundation

The mission of the Traffic Injury Research Foundation (TIRF) is to reduce traffic-related deaths and injuries. TIRF is a national, independent, charitable road safety research institute. Since its inception in 1964, TIRF has become internationally recognized for its accomplishments in a wide range of subject areas related to identifying the causes of road crashes and developing programs and policies to address them effectively.

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