



2018 IGNITION INTERLOCK INSTALLATIONS: STATE DATA



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EXECUTIVE SUMMARY

- > As of December 2019, 35 states and Washington, D.C. required all alcohol-impaired driving offenders, including first offenders, to install an interlock device. There was a 3.6% decrease in alcohol-impaired driving fatalities in 2018 from 2017 (National Center for Statistics and Analysis 2019).
- > As of March 1st, 2020, data were received from 25 states and Washington, D.C.
- > Three measures were used in this study to measure trends in interlock installations:
 - > **Total Installs Number (TIN):** Total number of *newly* installed interlocks between January 1st through to December 31st in a given year.
 - > **Total Installs Number all (TINall):** Total number of interlocks installed in vehicles at any time between January 1st through to December 31st in a given year, including devices installed prior to January 1st but that were still in the vehicle for any period of time during that year following January 1st.
 - > **Active Installs Number (AIN):** Total number of interlocks in vehicles of active participants on December 31st of a given year.
- > There were 145,202 new ignition interlock devices (TIN) installed in 18 states and Washington, D.C. in 2018. When comparing new interlock installations among the 12 states who provided TIN data for both 2016 and 2018 there was a 20% increase in installations from 65,967 in 2016 to 79,013 in 2018. Since 2014 there has been a 34% increase in TIN according to data available from six states.
- > Based on TINall data, 223,223 installations were reported in 17 states and Washington, D.C. in 2018. When comparing total installations among the 12 states who provided TINall data for both 2016 and 2018 there was a 10% increase from 143,471 in 2016 to 158,283 in 2018. Previous data on TINall collected from manufacturers showed the number of installations nationally was 614,626 in 2016 (Robertson et al., 2018). Applying the 10% growth rate to this number results in an estimated 676,089 total installations nationally in 2018.
- > As of December 31st, 2018, there were 141,480 active installations (AIN) reported in 16 states. When comparing active installations among the 10 states who provided AIN data for both 2016 and 2018 there was a 5% decrease from 110,159 in 2016 to 105,080 in 2018. However, when comparing data from six states that provided this information since 2014, there has been a 10% increase in AIN.
- > Among states where data were obtained, the percent of installations (TIN) per Driving while Intoxicated or Impaired (DWI) arrests in 2018 was 48.41%, per 2018 DWI convictions it was 56.73% and per 2018 incoming DWI cases it was 37.57%. While the indicators for DWI arrests and DWI convictions have consistently increased over time (17.5% and 35.3% in



- > In conclusion, the preponderance of the evidence shows considerable growth in the industry yet confirms a relatively low installation rate among all eligible offenders.

¹ Incoming DWI cases are defined as those added to the court's caseload during the reporting period and include New Filing, Reopened, and Reactivated cases as per the definition of the National Center for State Courts (cf. Methods section).



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INTRODUCTION

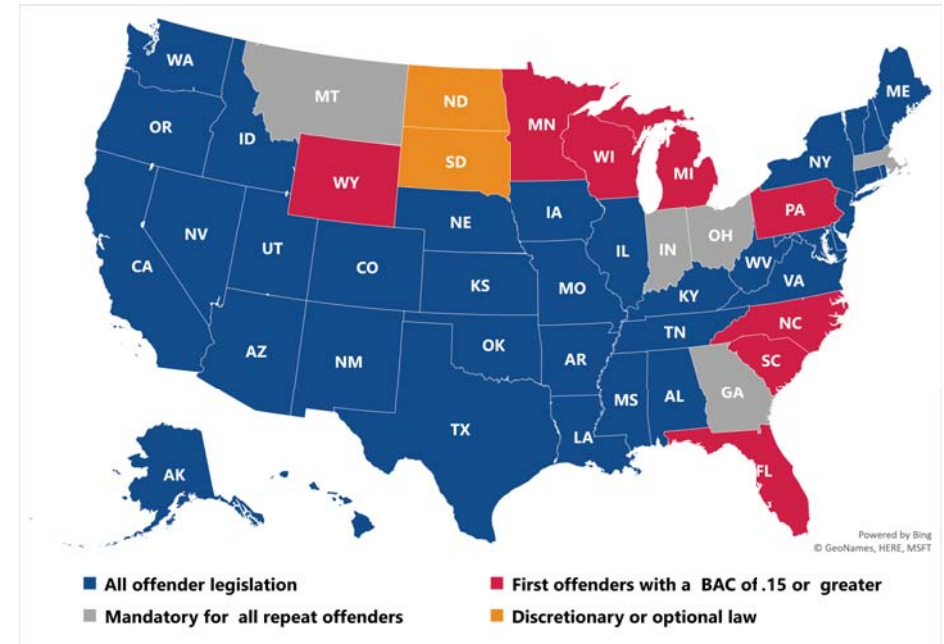
Unprecedented declines in the drinking driving problem occurred during the 1980s. Based on declining trends in the percent of alcohol-related fatalities, progress continued through the 1990s, although the gains were far less impressive (Simpson and Robertson 2001). In the new millennium, data from the Fatality Analysis Reporting System (FARS) revealed alcohol-impaired driving fatalities in crashes involving drivers with a blood alcohol concentration (BAC) of at least .08 (the per se limit in the US) declined by 27% from 13,582 in 2005 to 9,943 in 2014. Since 2014, increases have been noted in this indicator, e.g., in 2015 it increased to 10,265 (NHTSA August 2016). More recently, according to NHTSA, these alcohol-impaired driving fatalities accounted for 28.8% of total motor vehicle crash (MVC) fatalities in 2018, or 10,511 lives lost, which is still higher than 2014. Nevertheless, this corresponds to a 3.6% decrease compared to 2017 when the number of fatalities was 10,908 (NHTSA October 2019). During the same time span vehicle miles traveled (VMT) increased by 0.3% from 2017 to 2018 and the overall fatality rate per 100 million VMT decreased by 3.4 percent from 1.17 in 2017 to 1.13 in 2018.

Alcohol ignition interlock programs are an alcohol-impaired driving countermeasure proven to reduce recidivism among both first and repeat offenders, including those who repeatedly drive after drinking with extremely high BACs and are resistant to changing this behavior. A systematic review of 15 scientific studies conducted by the Centers for Disease Control and Prevention (CDC) revealed that while interlocks were installed, the re-arrest rate of offenders decreased by 67% compared to groups that did not have the device installed (Elder et al. 2011). A study of New Mexico's interlock program showed offenders who participated in the program had a 61% lower recidivism rate while the device was installed and a 39% lower recidivism rate following the removal of the interlock compared to offenders who never had the device installed (Marques et al. 2010). Similar reductions were found by Vanlaar et al. (2017) when evaluating Nova Scotia's interlock program. A meta-analysis of interlock program evaluation studies conducted in 2005 found an average reduction of recidivism of 64% (Willis et al. 2004).

Furthermore, recent evaluations studying the impact of interlocks on crashes have also demonstrated interlock programs embedded in strong legislation can reduce alcohol-related fatalities (Marques et al. 2010; McCart et al. 2013; Kaufman and Wiebe, 2016; Lucas et al. 2016; Vanlaar et al. 2017; McGinty et al. 2017; Teoh et al. 2018). Kaufman and Wiebe (2016) used data from 1999 to 2013 to compare alcohol-involved crash fatalities between 18 states with universal mandatory interlock laws and 32 states without. Results indicated by installing interlocks on all new vehicles, impaired driving fatalities would be reduced by 15%, and an estimated 2,500 lives would be saved annually in the US. However, when given the sanction of a suspended license instead of an interlock, more than half of convicted impaired driving offenders continue to drive and alcohol-related crash rates are reduced by only 5% (Kaufman and Wiebe 2016).

Alcohol-impaired driving offenders, including first offenders, were required to install an interlock device in 35 states and Washington, D.C. as of December 2019 (Figure 1). An additional eight states required interlocks for all first offenders with a BAC of .15 or greater, five states required mandatory interlocks for all repeat offenders, and two states had discretionary or optional laws.

Figure 1: Laws mandating alcohol ignition interlock devices (December 2019)²



Despite the prevalence of interlock programs across the country, installation rates of interlocks among eligible offenders vary considerably, and can be as low as approximately 15%. Given the evidence regarding interlocks, it is paramount they are utilized to the fullest by increasing participation rates, and thereby ensuring this effective road safety measure is also an efficacious one. It is therefore essential to monitor installation rates; such is the purpose of this data collection effort.

The Traffic Injury Research Foundation USA, Inc. (TIRF USA) in partnership with the Association of Ignition Interlock Program Administrators (AIIPA), and TIRF Canada collected data on interlock installations in the US in 2018. Previous data collection for installations occurred in 2014, 2015, 2016, and 2017 (Casanova Powell et al. 2016, 2017; Robertson et al. 2018). These data provide a comprehensive picture of interlock installations across the US and are a useful benchmark for state

² Source: MADD (2018). 2018 Report to the Nation. Mothers Against Drunk Driving (madd.org). The 2018 MADD figure was updated with individual state data obtained from the Highway Safety Offices for: California, Florida, Georgia, Indiana, Iowa, Kentucky, Massachusetts, Michigan Minnesota, Montana, New Jersey, North Carolina, North Dakota, Ohio, Pennsylvania, South Carolina, South Dakota, Wisconsin, Wyoming.

ignition interlock program administrators and impaired driving stakeholders to measure interlock usage and growth in interlock programs on an annual basis. This report contains results from the 2018 data collected from state agencies and compares these data to results from previous years.³

METHODS

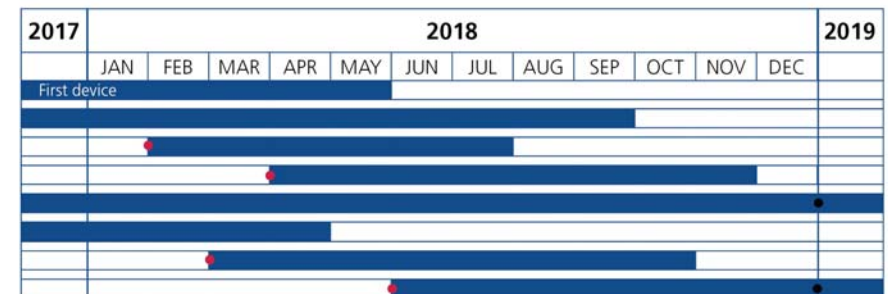
Installation counts

State alcohol ignition interlock program managers in all 50 states and Washington, D.C. were contacted by email in October through December 2019 to request relevant ignition interlock data for 2018. Three measures of installation were requested. Each indicator is useful to measure growth, as well as to gauge workload associated with administering these programs. Specific definitions of these measures were provided as follows:

- > **Total Installs Number (TIN):** Total number of *newly* installed interlocks between January 1st through to December 31st in a given year.
- > **Total Installs Number all (TINall):** Total number of interlocks in a vehicle at any time between January 1st through to December 31st in a given year, including devices that may have been installed prior to January 1st but were still in the vehicle for any period of time during that year following January 1st.
- > **Active Installs Number (AIN):** Total number of interlocks in the vehicle of an active participant on December 31st of a given year.

Figure 2 contains eight separate hypothetical interlock device installations to illustrate these definitions for 2018. In this example, all installs (TINall) in 2018 is equal to eight, whereas new installs (TIN) is four, and installs on December 31st, 2018 (AIN) is two.

Figure 2: Illustration of installation measures



Time Device Installed █

TINall = 8

TIN = 4 ●

AIN Dec 31st, 2019 = 2 ●

First device was installed in 2017 and removed end May 2018

³ Due to the timing of data collection, the 2017 data year is missing. Future versions of this report may include a completed time series, including the missing data year.



At its core, there are two mechanisms driving growth in the interlock industry; first, an increased number of installations, and second, longer periods of installations. The former can grow if more interlocks are installed among eligible offenders or if the definition of eligible offenders is broadened. The latter can grow if installation times are longer, for example as a result of compliance-based removal. The first mechanism is measured by TIN (i.e., new installations in a given year). The second mechanism is measured predominantly by TINall (i.e., all installations in a given year, including those installed in a previous year). It is possible there are fewer new installations in a year but TINall increased due to longer installation periods, or vice versa.

AIN is defined because of its face validity (meaning it is easy to understand given it reports “on this day in this year, this number of devices were installed”). However, on its own it does not capture that interlocks are not just installed but also removed, and serviced over a period of time, which varies. Consequently, AIN may be more volatile from one year to the next; nevertheless, over time, it is expected to reflect trends seen in TIN and TINall.

Installation rates

To place the interlock installation counts in context, and to measure installation rates, other information about legislation and program features was gathered. Rates were calculated by comparing the TIN with Driving while Intoxicated or Impaired (DWI)⁴ arrest and conviction data. Where available, data were examined for trends over time.

Installation rates were calculated by dividing the numerator TIN (number of new interlocks installed in a calendar year) by different denominators and expressed as a percentage.

To calculate denominators, information about the total number of DWI arrests and convictions for the year 2018 was gathered via state annual reports available online through state Highway Safety Offices.

Data were also collected from the National Center for State Courts (NCSC) on both felony and misdemeanor impaired driving cases for the past five years in 27 states.⁵ For the purpose of national reporting, the NCSC requests states report a breakdown of their data by case types. Data are provided by the state court administrator’s office and includes data from trial courts. The NCSC uses the following definitions:

- > **Case:** Generally initiated by a complaint. In two-tiered court systems, proceedings at the second step of a felony case are usually initiated by an information or indictment.

⁴ The abbreviation DWI (driving while intoxicated or impaired) is used throughout this report as a convenient descriptive label, even though some states use other terms such as OUI (operating under the influence) or DUI (driving under the influence), and in some states they refer to different levels of severity of the offense. DWI is used not only to maintain consistency throughout the report but also because it is more descriptive of the offense usually associated with drunk drivers.

⁵ Alaska, Alabama, Arkansas, Arizona, Colorado, Connecticut, Hawaii, Idaho, Iowa, Indiana, Kansas, Kentucky, Louisiana, Massachusetts, Maryland, Maine, Missouri, Minnesota, Mississippi, North Carolina, New Hampshire, New Mexico, Nevada, Pennsylvania, Rhode Island, Utah, Vermont, Washington, Wisconsin



- > **Incoming cases:** Cases added to the court’s caseload during the reporting period and include New Filing, Reopened, and Reactivated cases.
- > **Outgoing cases:** Categories include Entry of Judgment, Reopened Dispositions, and Placed on Inactive Status.

Ultimately, three denominators were used to calculate installation rates: DWI arrests, DWI convictions and incoming DWI cases. Outgoing cases were not considered appropriate to calculate rates in the context of this study.

SurveyGizmo online software (www.surveygizmo.com) was used to capture the data in combination with Microsoft Excel to calculate indicators and create tables and figures.



RESULTS

As of March 1st, 2020, data were received from 25 states⁶ and the District of Columbia. Some states did not possess complete information needed to calculate each of the three indicators (TIN, TINall, AIN) while a few others only provided information related to program features and arrest/conviction data. Of these states, 15 states⁷ also provided some or all of the data requested in 2016.

Number of new, total and active installed interlocks

In terms of all interlocks installed in a vehicle at any time throughout the whole year, including devices that may have been installed in previous years (TINall), the data revealed 223,223 installations within 17 states and Washington, D.C. When comparing total installations among the 12 states who provided TINall data for both 2016 and 2018 there was a 10% increase, from 143,471 in 2016 to 158,283 in 2018.

According to the TIN data provided by 18 states and Washington, D.C., 145,202 new ignition interlock devices were installed in 2018 (Table 1). When comparing new interlock installations among the 12 states who provided TIN data for both 2016 and 2018 there was a 20% increase in installations, from 65,967 in 2016 to 79,013 in 2018.

An examination of the number of active installations (AIN) in a vehicle on December 31st revealed 141,480 devices installed at the end of 2018 within 16 states. When comparing active installations among the 10 states who provided AIN data for both 2016 and 2018 there was a 5% decrease, from 110,159 in 2016 to 105,080 in 2018.

Table 1: State reported installation data

State	TINall			TIN			AIN December 31 st		
	2016	2018	% change	2016	2018	% change	2016	2018	% change
Arkansas	6,214	30,008	383%		5,375		4,317	7,652	77%
California					27,207				
Colorado	72,920	59,753	-18%	24,718	17,493	-29%	57,894	48,867	-16%
Connecticut	6,402			677	10,063	1386%	6,950	7,935	14%
Delaware	598	1,484	148%	598	706	18%		834	
District of Columbia		37			22				

⁶ Arkansas, California, Colorado, Connecticut, Delaware, Florida, Hawaii, Iowa, Kansas, Maine, Minnesota, Missouri, New Jersey, New York, North Dakota, Oregon, Pennsylvania, Tennessee, Utah, Vermont, Virginia, Washington, West Virginia, Wisconsin, Wyoming

⁷ Arkansas, Colorado, Connecticut, Delaware, Iowa, Kansas, Maine, Minnesota, New York, Oregon, Pennsylvania, Vermont, Virginia, West Virginia, Wyoming

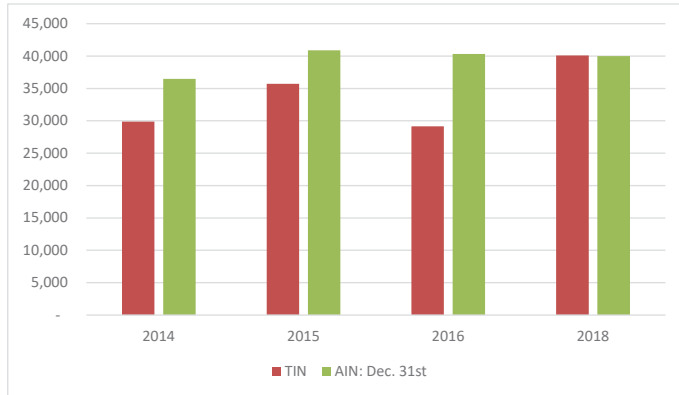


Florida		18,514			12,579			11,846	
Hawaii	1,567			88			1		
Iowa	10,805	7,105	-34%	5,349	6,673	25%	5,695	6,673	17%
Kansas	13,516	9,570	-29%	8,250	8,764	6%	51,205		
Maine	737	2,084	183%	720	726	1%	683	618	-10%
Minnesota	10,035	16,232	62%		8,735		10,025	8,512	-15%
Missouri		23,241			10,419			14,769	
Nebraska	6,193			2,958			3,287		
New York	15,397	14,806	-4%	7,897	6,795	-14%	8,076	7,927	-2%
North Carolina	9,379			11,670			27		
Oregon		10,620		264	7,631	2791%		6,672	
Pennsylvania	6,680	10,145	52%	5,599	8,172	46%	7,283	8,169	12%
South Carolina	1,394			1,300			1,157		
Tennessee		8,590		4,833					
Utah		3,938			1,852			2,275	
Vermont	123	391	218%					4	
Virginia	18,655			9,739	9,351	-4%	7,958	7,394	-7%
West Virginia	5,132	6,123	19%	1,604	2,280	42%	4,256		
Wisconsin	15,274			6,527			8,121		
Wyoming	1,314	582	-56%	552	359	-35%	1,278	1,333	4%
Totals	202,335	223,223	N/A	93,343	145,202	N/A	178,213	141,480	N/A
<i>Totals based on states who reported in both 2016 and 2018</i>									
Totals	143,471	158,283	10%	65,967	79,013	20%	110,159	105,080	-5%

Six states provided data for 2014, 2015, 2016, and 2018 (Figure 3). These six states (Iowa, Minnesota, New York, Pennsylvania, Virginia and Wyoming) were used to compare trends in TIN and AIN (TINall has only been collected since 2016). Since 2014, in these six states there has been a 34% increase in TIN from 29,876 in 2014 to 40,085 in 2018. Further, AIN has increased 10% from 36,469 in 2014 to 40,008 in 2018.



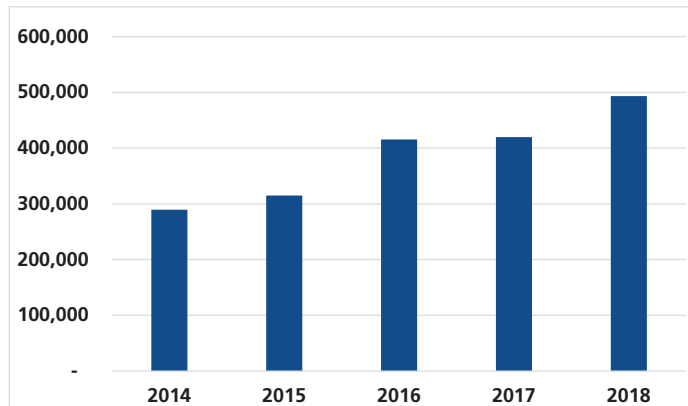
Figure 3: Total new installs (TIN) and active installed (AIN) devices as reported by six states in 2014-2016, 2018



Impaired driving felony and misdemeanors

Data provided by NCSC revealed a steady increase in incoming DWI cases in 27 states from 289,583 in 2014 to 493,454 in 2018 (Figure 4). This represents a 70% increase.

Figure 4: Incoming DWI cases, 2014-2018 (source: National Center for State Courts)



The 2018 NCSC data was consistent with state reported data, as is seen in Figure 5. Specifically, incoming cases are similar to the number of arrests reported by the state. Arizona and Pennsylvania

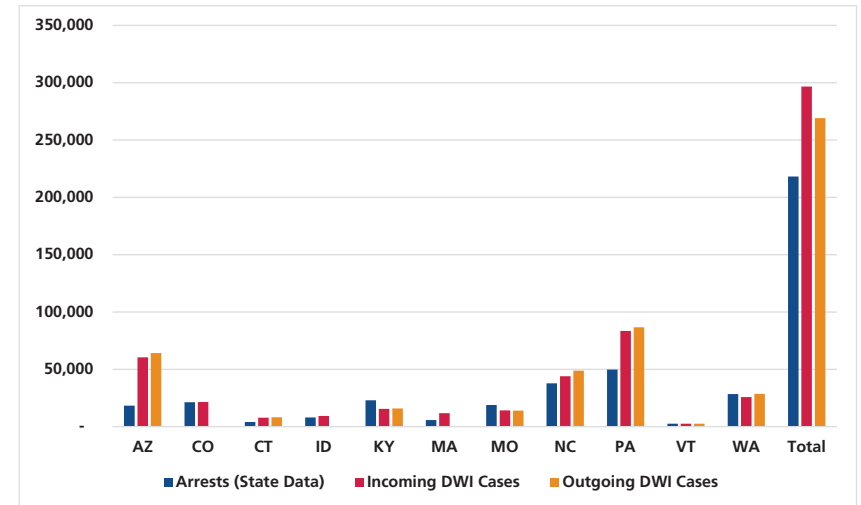


were the outliers, where reported arrests were 70% and 40% lower, respectively, compared to incoming DWI cases.

In Arizona, a possible explanation may be the Administrative Office of the Courts reports information by charge, not offense. For example, prosecutors may file five charges related to one impaired driving offense. Therefore, one arrest could result with multiple charges.

Regarding Pennsylvania, these data may be skewed by Philadelphia's two-tiered court system. After an arrest in Philadelphia, impaired driving cases are opened by a criminal complaint/affidavit. Impaired driving defendants have the right to a full bench/judge-only trial in Municipal Court. After the disposition, defendants can appeal to the Court of Common Pleas where they are given a trial de novo (i.e., an entirely new trial). As a result, one arrest can lead to two different cases with two different dispositions recorded. In sum, one impaired driving arrest in Philadelphia can result in two court cases.

Figure 5: State arrests and DWI case data, 2018



Installation rate of interlocks among eligible population of offenders

An accurate way to measure the efficacy of an interlock program within a state is to estimate the percentage of offenders who installed an interlock among those who were eligible or required to do so.

Dependent upon state legislation, the eligible population of offenders required to install an interlock may be either those offenders arrested for DWI (if an administrative license suspension or revocation requires an interlock) or those convicted of DWI. For the latter, this may be further



dependent upon categories of offenses requiring an interlock. Furthermore, some states may include administrative per se cases. Some offenders may not be deemed eligible because of other driving or non-driving violations; for example, as a result of delinquent child support payments unrelated to DWI.

The percentage of new interlocks installed per DWI arrests and convictions was calculated where possible among states for which both the numerator and denominator were available. Figure 6 shows an increasing percentage of installations per DWI arrests and convictions since 2014.

Figure 6: New interlock installations per DWI arrests and per convictions as a percentage in 2014-2016, 2018

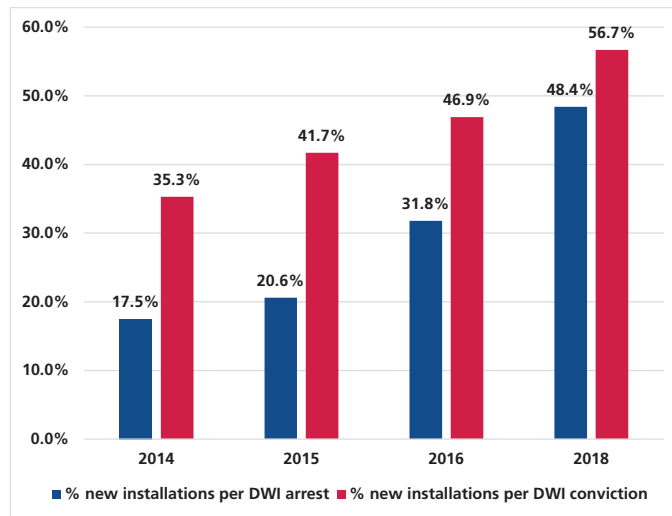


Table 2 presents 2018 percentages of new interlocks installed (TIN) per DWI arrests, per DWI convictions and per incoming DWI cases.

For context, Connecticut, Kansas, and Missouri (where numbers were above 100%) required an interlock for all offenders, including administrative per se cases (failure or refusal of chemical test at arrest). These results over 100% are an overestimate because the correct denominator to accurately calculate the rate was not available (when calculating the national rates, a correction was used for these states).

Ideally there would be a 100% installation rate. However, as presented below (Table 2), the installation rate ranges from 9.78% (%TIN per incoming DWI cases in Pennsylvania) to 89.82% (%TIN per DWI convictions in Colorado).



When combining states with available data, the overall %TIN per DWI arrests was 48.41%, the overall %TIN per DWI convictions was 56.73% and the overall %TIN per incoming DWI cases was 37.57%.

Table 2: 2018 percentage of interlocks installed (TIN) per DWI arrests, per DWI convictions and per incoming DWI cases

State	2018 Arrests	2018 Convictions	2018 Incoming DWI Cases	% convictions per DWI arrests	%TIN per DWI arrests	%TIN per DWI convictions	%TIN per incoming DWI cases
Arkansas	9,569	7,696		80.43%	56.17%	69.84%	
California	123,253				22.07%		
Colorado	21,244	19,476	21,544	91.68%	82.34%	89.82%	81.20%
Connecticut	4,156	2,595	7,832	62.44%	242.13%	387.78%	128.49%
Delaware		1,852				38.12%	
Florida	32,177				39.09%		
Iowa			12,702				52.54%
Kansas		7,271	10,079			120.53%	86.95%
Kentucky	23,024	18,567		80.64%			
Maine	5,811		5,394		12.49%		13.46%
Minnesota			27,974				31.23%
Missouri	18,962	8,007	14,118	42.23%	54.95%	130.12%	73.80%
New York		18,116				37.51%	
Pennsylvania	49,730	25,677	83,522	51.63%	16.43%	31.83%	9.78%
Utah	10,042	7,798		77.65%	18.44%	23.75%	
Virginia	21,308	19,790		92.88%	43.88%	47.25%	
Wyoming		1,556				23.07%	
Totals	319,276	138,401	183,165	N/A	N/A	N/A	N/A
<i>Totals and installation rates based on states without missing data¹</i>							
Totals	158,035	109,606		69.36%	48.41%	56.73%	37.57%

¹ Calculation of total %TIN per DWI arrests, %TIN per DWI convictions and %TIN per incoming DWI cases capped the TIN value at the number of DWI arrests, convictions and incoming cases in case TIN values were higher than arrests, convictions or incoming cases (effectively reducing the % for Connecticut, Kansas and Missouri to 100%).



CONCLUSIONS

Alcohol ignition interlock programs are essential to decrease the number of alcohol-impaired drivers, crashes, and fatalities. Their value as an alcohol-impaired driving countermeasure is evident in light of the strong body of evidence showing they not only reduce recidivism but can lead to a reduction in alcohol-related fatalities when the use of the device is embedded in strong legislation. But to be efficacious, market penetration is crucial, and all offenders required to install a device must actually install a device. As such, the purpose of this annual data collection is to monitor installations and installation rates, and to report these findings to help strengthen interlock programs.

The state data shows significant growth in the use of interlocks:

- > There was a 20% increase in TIN according to data from 12 states (from 65,967 interlocks in 2016 to 79,013 interlocks in 2018);
- > There was a 10% increase in TINall according to data from 12 states (from 143,471 interlocks in 2016 to 158,283 interlocks in 2018).
- > Among six states that provided TIN data from 2014 to 2018, there was a 34% increase (from 29,876 interlocks in 2014 to 40,085 interlocks in 2018).

TINall in this report is based on data collected from a limited number of states. As such, if data from all jurisdictions installing interlocks were available, then TINall would be considerably higher. Assuming the 10% growth rate between 2016 and 2018 in these 12 states is representative of growth nationally, it is estimated national installations would increase from 614,626 in 2016 (Robertson et al., 2018) to 676,089 in 2018.

While both TIN and TINall show considerable growth, AIN suggests the opposite with a decrease of 5% between 2016 and 2018. However, caution is warranted given that AIN is more volatile. Since AIN is a snapshot of one day (the number of installed devices on December 31st), it is subject to all the dynamics/market forces/mechanisms that can cause volatility. Conversely, indicators examining a year of data, notably TIN and TINall, are expected to be more stable because they represent a longer period of time. While year-to-year volatility is possible, over time, AIN is expected to follow trends in TIN and TINall. This is confirmed when comparing AIN results over a longer period of time, revealing a 10% increase between 2014 and 2018.

One hypothetical example of a market force causing this sudden drop in AIN of 5% is the de-certification of one device or vendor resulting in a large number of removals. This could cause a temporary decrease in the number of actively installed devices that would bias the overall count if installations were counted on a day after deinstallation with one vendor and before reinstallation with another. Other mechanisms could play a similar role; their compounded impact on AIN may be even more pronounced because of year-over-year changes in holiday service hours on December 31st.

Regardless of the observed increases in TIN, TINall and AIN since 2014, there remains a large contingent of eligible offenders on the road who are required to install an interlock but have not



done so. This is demonstrated through the arrest and conviction data which shows the 2018 TIN per 2018 DWI arrests was 48.41%, per 2018 DWI convictions was 56.73% and per 2018 incoming DWI cases was 37.57%. While the indicators for DWI arrests and convictions have consistently increased over time (the corresponding percentages were 17.5% and 35.3% in 2014; no historical data were available for incoming DWI cases) ultimately, they are not nearly close to 100%.

In conclusion, the preponderance of the evidence shows considerable growth in the industry yet confirms a relatively low installation rate among all eligible offenders.



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