

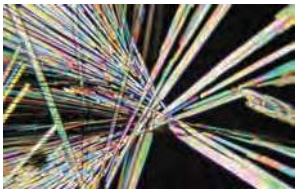


DIVISION OF FORENSIC SCIENCES ANNUAL REPORT 2020

Mission Statement
To promote excellence in analysis, training and service to the community and our organization with integrity and uncompromising quality.

Vision Statement
To search for the truth through science and to lead and shape the advancement of forensic science.





Division of Forensic Sciences Discipline Overview

The Division of Forensic Sciences (DFS) was established as an independent division in 2019, though the Wisconsin State Crime Laboratory (WSCL) was originally established in 1947. DFS employs approximately 180 people including forensic scientists, technicians, evidence specialists, and crime scene response professionals and offers impartial forensic analysis in the following areas of science: toxicology, drug identification, biology/DNA analysis, DNA database, trace evidence analysis, firearms and tool marks analysis, latent print and footwear analysis, ten print comparison, and forensic imaging. DFS crime laboratories—located in Madison, Milwaukee, and Wausau—are the only full-service forensic science laboratory system in Wisconsin. DFS provides scientific testing and analysis of evidence for every community in the state, and staffs on-call Crime Scene Response Units, located at each laboratory, to assist law enforcement at major crime scenes by processing the crime scene and maintaining evidence integrity. Crime scene response staff receive special training to aid in the recognition, documentation, recovery, and preservation of physical evidence.

DFS added services to the Footwear Unit in the Criminalistics Section, where footwear impression evidence can be run against the SoleMate® FPX database, the Wisconsin State Crime Laboratories' footwear standard reference collection, as well as a number of online resources and can yield information about a shoe's possible make(s) and model(s) which may provide the investigator with valuable leads that would otherwise go unknown.

A new scanning electron microscope was purchased for use in the Trace Evidence Unit which replaced an old, outdated piece of equipment.

The DNA Analysis Unit validated and implemented a new DNA mixture analysis software called probabilistic genotyping. The software revolutionized the interpretation of complex mixtures and required extensive training of DNA analysts in DFS.

The firearms examiners were also fully trained in toolmarks, allowing the analysts to address much older toolmark cases, generally related to property crimes.

Services	Madison	Milwaukee	Wausau
AFIS	✓		
Controlled Substances	✓	✓	✓
Crime Scene Response	✓	✓	✓
DNAAnalysis	✓	✓	
DNADatabank	✓		
Firearms and Toolmarks		✓	
Forensic Imaging	✓	✓	✓
Latent Prints and Footwear	✓	✓	✓
Toxicology	✓	✓	✓ (BAC only)
Trace Evidence		✓	

Providing Services During the COVID 19 Pandemic

In 2020, like many industries, the laboratories faced an additional challenge with the COVID-19 pandemic which impacted workflows within the laboratory, and laboratory technology upgrades to accommodate remote work. Keeping crime lab employees safe is a top priority. To maintain adequate social distancing, DFS staggered work shifts in the laboratories and implemented procedures for non-lab work to be done remotely. New security protocols and systems were created to ensure data security during remote work. To maintain consistency with accreditation standards during the COVID 19 pandemic, DFS reviewed and documented modifications to the work protocols that had never before been performed in a remote work environment. This was a substantial undertaking by both DFS and the Bureau of Computing Services. Keeping our employees safe from COVID-19 spread in the workplace also helped ensure DFS did not face additional workflow disruptions from employee absences. DFS staff did a phenomenal job adapting during difficult circumstances in order to continue to provide scientific analysis with uncompromised quality.

Building Capacity to Meet Statewide Needs

DFS faced additional challenges during the pandemic, including a decrease in program revenue needed to fund different aspects of crime lab work. Budget constraints on the Department of Justice as a result of 2017 Act 369 already decreased the spending flexibility of the department, flexibility which previously helped ensure public safety functions weathered downturns in program revenue. DOJ held position vacancies open in offices and divisions across DOJ longer than usual to help balance the budget, including vacancies in DFS.

DOJ's biennial budget request for the 2021-2023 budget includes a request for the authority to hire four additional toxicology positions and updated instrumentation needed in testing trace amounts of highly dangerous, illegal substances. Unfortunately, the opioid epidemic remains a top public health concern in Wisconsin. DFS has seen an uptick in number of toxicology cases, where crimes range from traffic incidents to homicide, sexual assault to bail jumping. The complexity of the drug compounds in these cases has also increased, resulting in slightly longer average turnaround time, 36 days in 2019 to 39 days in 2020. The Forensic Toxicology Unit identifies and quantifies drugs and alcohol in biological samples submitted by law enforcement agencies related to felony investigations.

The legislature made a significant investment in the crime labs in the last state budget. However, DOJ did not receive everything requested, seeking 15 positions and receiving 7.4. All those positions are currently filled and fully trained except one, who was promoted in March of 2021 and the position is in the process of being filled again. High training standards are maintained by DFS both as an accreditation requirement and because the scientific analysis provided by DFS is relied on in the criminal justice system. Extensive training is required for most DFS positions taking between 2 months and 2 years depending on the position. DFS will only begin to see the impact of positions hired in 2019 and 2020 in the coming year.

The instrumentation requested in DOJ's budget is called a Liquid chromatography- Tandem Mass Spectrometry (LC/MS/MS) and is able to identify synthetic drugs and drug analogues that are toxic at very low levels, including buprenorphine, fentanyl analogues, benzodiazepines, and synthetic cannabinoids. The state crime lab does not currently have the ability to identify low levels of all of these drugs in biological samples.

Division of Forensic Sciences Metrics

2020	Chemistry Section			Criminalistics Section					DNA Section	
	Controlled Substance	Toxicology	Trace Evidence	AFIS	Crime Scene Response	Firearms and Toolmarks	Forensic Imaging	Latent Prints	DNA Analysis	DNA Databank
Mean TAT	44	39	68	N/A	49	247	56	55	94	37
Median TAT	37	28	27	N/A	36	106	41	35	79	36
Queue	210	345	27	0	9	201	48	119	998	250

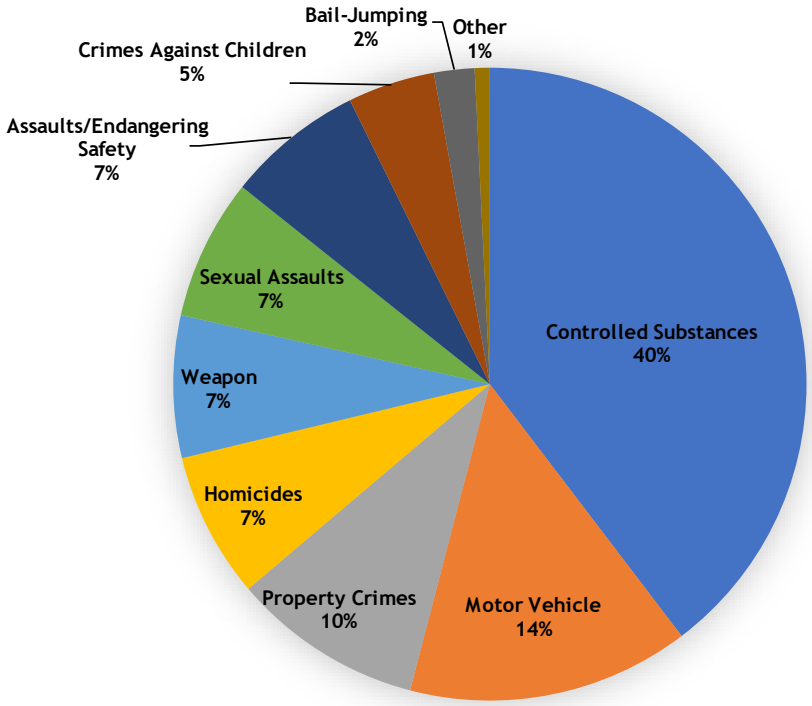
Queue is defined as any case, sample, or record in possession of the DFS greater than 30 days.

The Division of Forensic Sciences will be modifying the way turnaround times (TAT) are reported. In the past, TAT was defined by and reported as the mean (or "average"). Going forward, DFS will be phasing out the mean and replacing it with the median. Employing the median TAT is in accordance with West Virginia University's Project Foresight, an organization that uses business-guided metrics to evaluate forensic science laboratories. Reporting the median TAT will allow DFS to participate in Project Foresight and engage in data collection with other lab systems across the country. This year's 2020 Annual Report will contain both mean and median TAT, and this will continue for several years until reporting the mean is fully phased out. DFS looks forward to the participation in Project Foresight and to continuing to partner with laboratories nationwide.

FORESIGHT | John Chambers College of Business and Economics | West Virginia University (wvu.edu)

Evidence and Administrative Support Case Receipt and Overview

Receipted Cases	2016	2017	2018	2019	2020
Madison	4124	5978	4601	3662	2993
Milwaukee	5143	6498	5548	4480	3850
Wausau	3762	3319	2531	2471	2142
Total	**13029**	**15795**	**12680**	**10613**	**8985**



2020 Case Statistics

Each submitted case has the potential to be worked by multiple units and certain units are more heavily impacted by specific case types. For instance, sexual assault cases may require both a DNA Analysis and a Toxicology assignment.

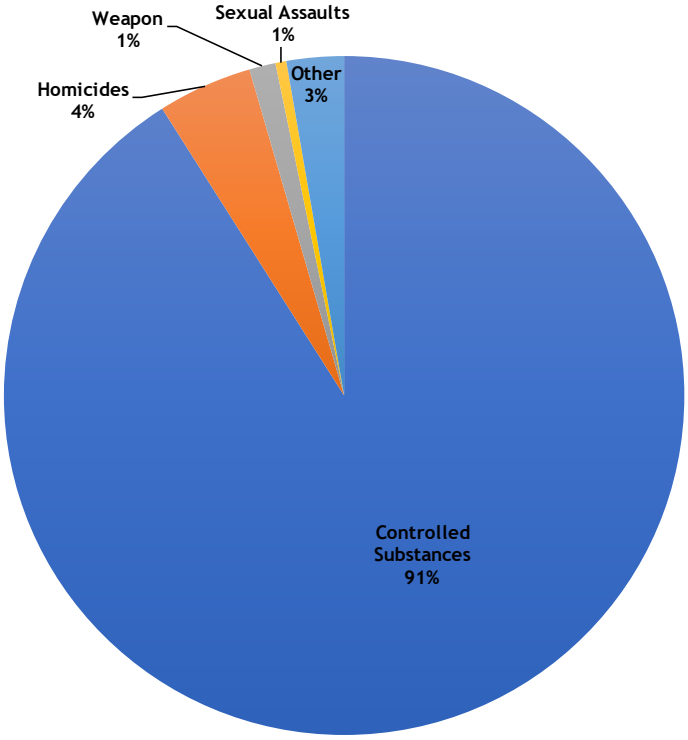
Chemistry Section

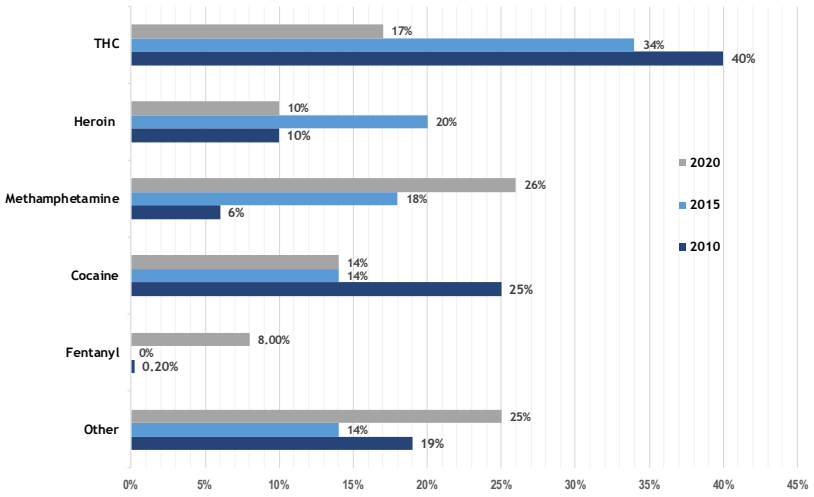
The primary function of the Chemistry Section is to analyze items of evidence in order to determine the presence or absence of a substance. The Chemistry Section consists of three units:

Controlled Substance	Analyze evidence for the presence (or absence) of controlled substances as defined in the Controlled Substance Act, Chapter 961.
Toxicology	Analyze bodily fluids or tissue for alcohol and controlled substances.
Trace Evidence	Analyze broad spectrum of physical evidence and/or substances for identification or comparison purposes.

Controlled Substance

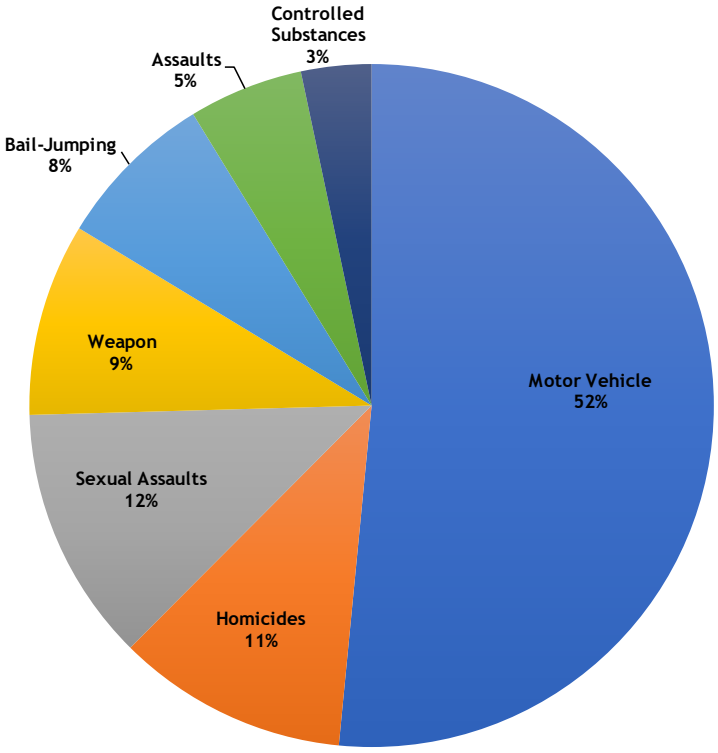
	2018	2019	2020
Case Intake	5283	4861	3813
Case Output	5422	4725	3675
Mean TAT	43	33	44
Median TAT	35	26	37





Controlled Substances saw an increase in the number of illicit tablet cases and complexity of mixtures. The unit also continued to see new designer drugs and analogs. COVID-19 posed challenges in turnaround times and efficiency due to distancing requirements.

Toxicology

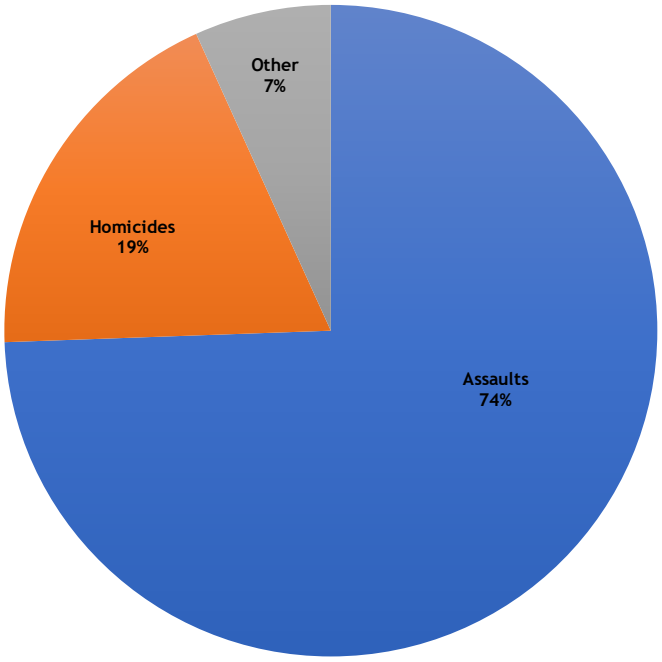


	2018	2019	2020
Case Intake	3897	3609	3972
Case Output	4051	3622	3829
Mean TAT	37	36	39
Median TAT	23	24	28

Toxicology continues to handle increased employee turnover and the training of new analysts. Challenges include keeping up with improvements and new methodology due to short staffing. Evolving case management strategies continues to improve efficiency. This relatively small unit was impacted by vacancies in the later part of 2020 and is now outsourcing cases to the State Laboratory of Hygiene to assist.

Trace Evidence

	2018	2019	2020
Case Intake	126	118	145
Case Output	134	115	133
Mean TAT	71	45	68
Median TAT	58	34	27



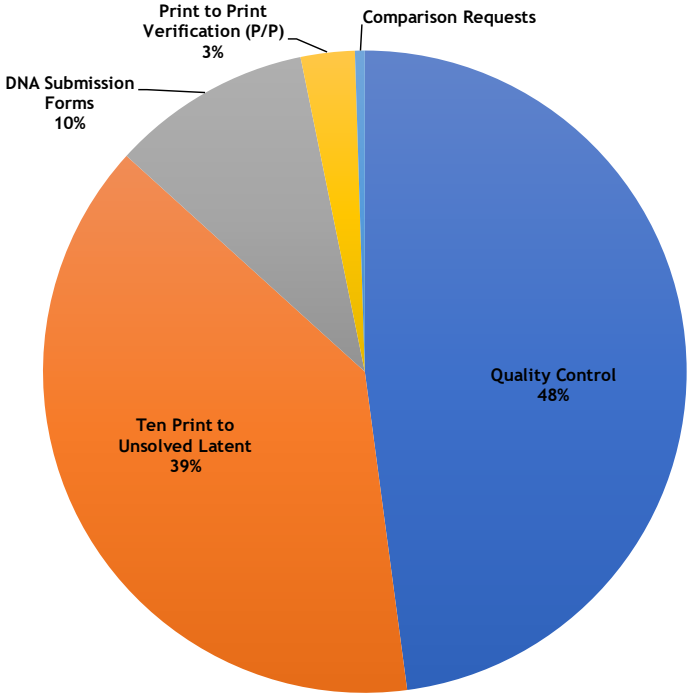
Criminalistics Section

The Criminalistics Section is the most multifaceted section in the laboratory. The Criminalistics Section utilizes scientific principles to complete pattern recognition and interpretation, as well as imaging analysis. The Criminalistics Section consists of five units:

Automated Fingerprint Identification System	Perform comparative analysis of submitted fingerprints to evidence and known standards and maintain the Automated Fingerprint Identification System. In addition, conduct database searches and provide technical and analytical support to state and federal agencies.
Crime Scene Response	Respond to calls from law enforcement agencies for assistance at major crime scenes including homicides, attempted homicides, abductions, officer-involved critical incidents, the recovery of human remains, cold cases, and vehicle processing. Locate, document, and collect evidentiary items.
Firearms and Toolmarks	Analyze firearms for operability, perform comparative analysis on fired bullets and cartridge casings, and maintain the National Integrated Ballistic Information Network. In addition, conduct serial number restorations, distance determinations, and tool mark comparisons.
Forensic Imaging	Perform forensic video, image analysis and enhancement, from various forms of media or image capture devices. Use specialized techniques, high resolution imaging equipment and forensic applications to record and recover information. Provide photographic and video imaging services to all disciplines within the DFS, DOJ, law enforcement agencies and district attorneys throughout the state.
Latent Prints and Footwear	Develop and recover friction ridge (finger) prints and footwear impressions from items of evidence. Compare prints/impressions with known exemplars to establish identity/ exclusion/association and conduct database searches.

Automated Fingerprint Identification System (AFIS)

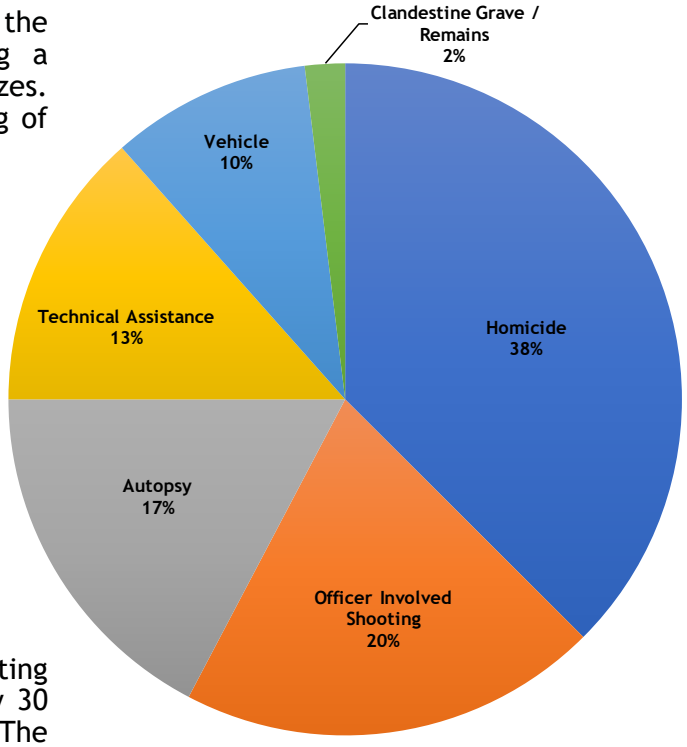
This year saw the implementation of the new AFIS MBIS database. Since July 2020, AFIS has been operating with a ten-print examiner vacancy.



	2018	2019	2020
Quality Control	131412	137344	73358
Ten Print to Unsolved Latent	117987	107146	59469
DNA Submission Forms	30843	26973	15419
Print to Print Verification (P/P)	3913	4837	4153
Comparison Requests	1127	1003	755

Crime Scene Response

The Crime Scene Response teams respond to many of the most complex crimes scenes in the state, providing a valuable service to law enforcement agencies of all sizes. The turnaround times in this unit refers to the finalizing of reports following the on-scene work.



	2018	2019	2020
Responses	122	106	104
Mean TAT	33	37	49
Median TAT	16	24	36

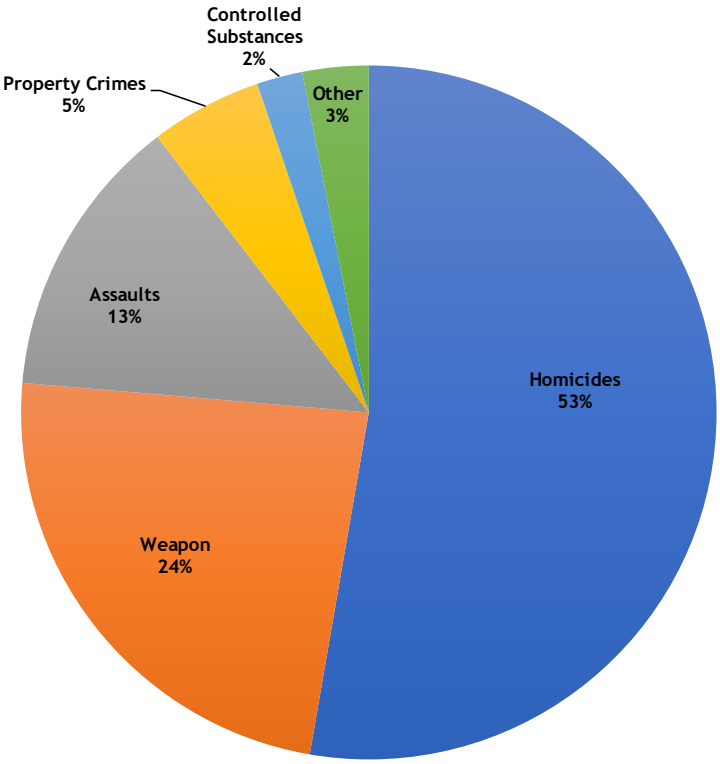
The DFS staffs an Office of Crime Scene Response consisting of five full-time individuals in addition to approximately 30 individuals from various units throughout the laboratory. The units in each crime lab assist law enforcement at major crime scenes by processing the crime scene and maintaining evidence integrity. Crime scene response staff receive special training to aid in the recognition, documentation, recovery, and preservation of physical evidence.

Firearms and Toolmarks

Firearms and Toolmarks Unit has been challenged by one unfilled vacancy. The unit was also challenged by the need to train several staff in toolmark analysis in the last two quarters of 2020, which was a success despite the challenges faced by COVID-19.

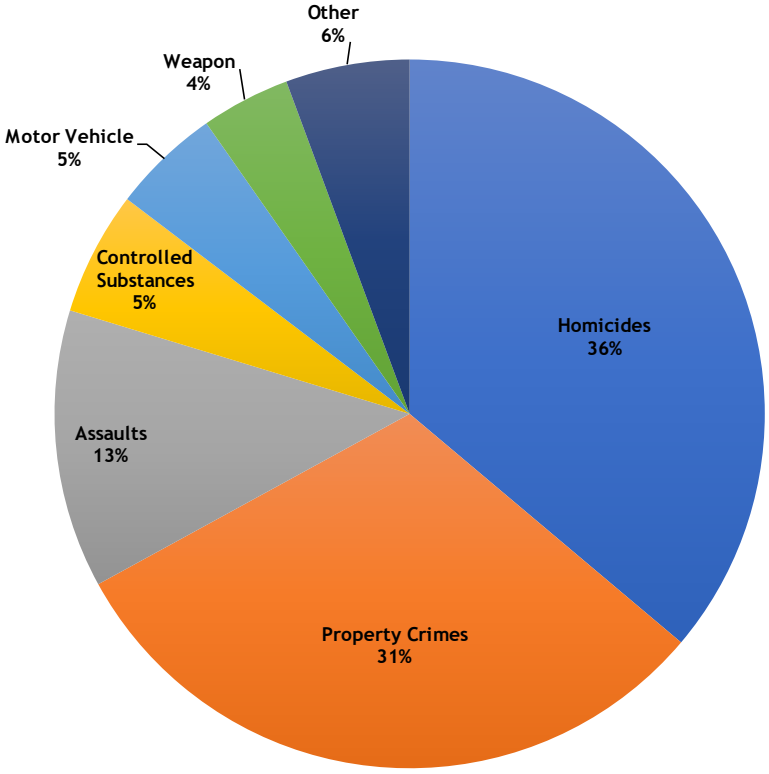
Firearms	2018	2019	2020
Case Intake	446	428	451
Case Output	419	577	403
Mean TAT	209	258	247
Median TAT	87	51	106

Toolmarks	2018	2019	2020
Case Intake	25	14	23
Case Output	0	48	20
Mean TAT	0	235	1164
Median TAT	0	233	1226



Forensic Imaging

In addition to the work submitted to the Forensic Imaging Unit, the Imaging Specialists have been assigned the task of training Crime Scene Response (CSR) Photographers. This task has been challenging in the virtual work environment.



Imaging	2018	2019	2020
Case Intake	62	52	86
Case Output	59	52	77
Mean TAT	62	69	56
Median TAT	25	47	41

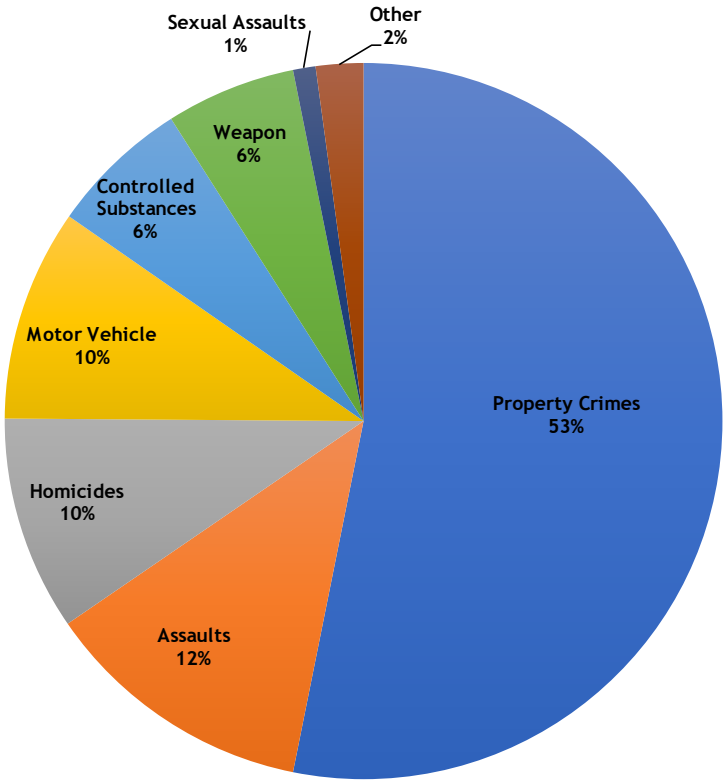
Work Orders	2018	2019	2020
Case Intake	698	611	502
Case Output	671	630	490
Mean TAT	32	40	32
Median TAT	22	28	23

Latent Prints and Footwear

The Latent Print and Footwear Unit moved to 100% verification of work which contributed to higher quality and an increased workload. The unit continues to train new staff and operate with unfilled vacancies.

Latent Print	2018	2019	2020
Case Intake	1304	1003	941
Case Output	1706	1274	870
Mean TAT	224	124	55
Median TAT	139	46	35

Footwear	2018	2019	2020
Case Intake	19	28	21
Case Output	26	32	18
Mean TAT	263	195	140
Median TAT	134	136	140



DNA Section

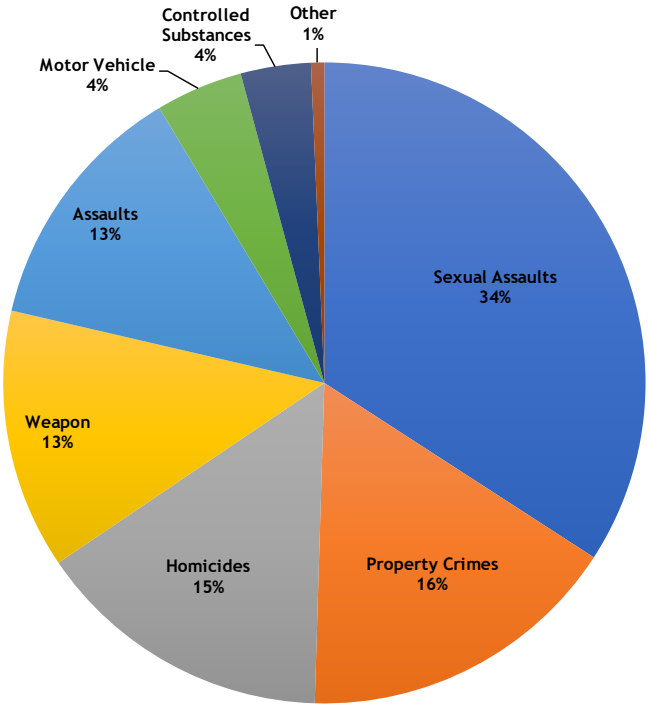
The primary function of the DNA Section is to analyze and compare biological material from evidence and/or individuals required by Wisconsin State Law to provide a reference DNA sample. At the DFS, the DNA Section consists of two units: DNA Analysis and DNA Databank.

DNA Analysis	Examine evidence for the presence of biological material. Develop, analyze, and interpret DNA profiles utilizing scientific techniques. Compare DNA profiles with known standards to establish identity/exclusion/association and conduct database searches.
DNA Databank	Receive, verify acceptability, develop, analyze and maintain a repository of reference DNA samples in the Combined DNA Index System (CODIS).

DNA Analysis

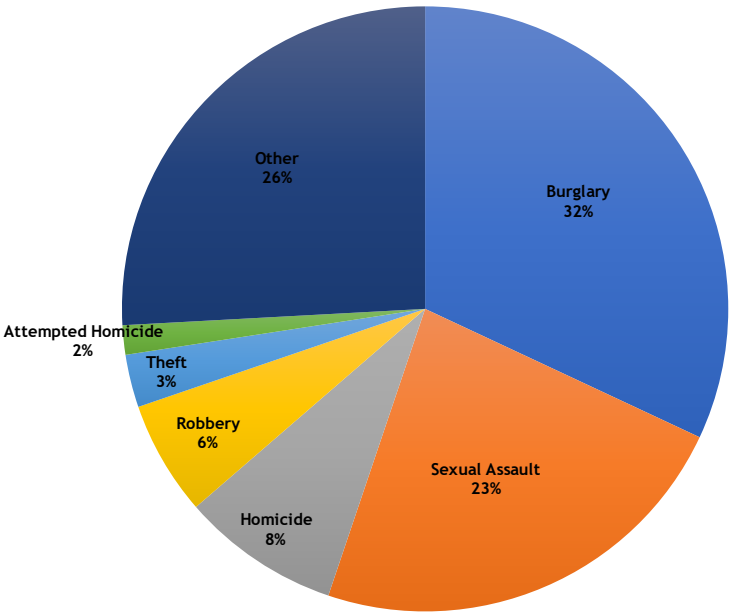
The DNA Analysis unit worked in 2020 to get staff trained and competency tested in probabilistic genotyping, a new interpretation tool that assists the DNA Analyst in resolving previously uninterpretable profiles which can happen when a DNA sample is very small or includes a mixture of multiple individuals' DNA. Even with the impact of COVID-19, the unit was able to successfully train a majority of the staff, perform casework in a remote environment, and evaluate new technologies to help increase efficiencies within the unit.

	2018	2019	2020
Case Intake	8626	4400	3820
Case Output	5664	4960	3144
Mean TAT	80	97	94
Median TAT	50	65	79



DNA Databank

The DNA Databank unit was heavily impacted by COVID-19. For the first time in two years, even though the receipt of reference DNA samples decreased, the number of samples in the queue greater than 30 days old increased from 0 to 250 and the turnaround time increased from 29 days to 39 days. Despite the challenges presented in 2020, the unit assisted law enforcement with 639 investigative leads (over 30% were to high priority crimes), five familial searches, including one success, and four repeat familial searches.



	2018	2019	2020
Sample Intake	29900	26808	15223
CODIS Uploads	27610	24882	13788
Leads Reported	1409	956	639
Mean TAT	29	29	37
Median TAT	24	28	36