

Traffic Stops & Race in Vermont  
Data Collection and Analysis  
Part One



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Department of Public Safety

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## Executive Summary

Act 193 mandates that law enforcement agencies collect data on roadside stops for the purpose of evaluating racial disparities. The Act dictates agency data collection and any related conversation centers on agency behavior. The Act and the data collected do not focus on or reflect the stories told by Black, Indigenous and People of Color (BIPOC) as related to their contacts with law enforcement agencies. Because of Vermont's rural nature, small populations, and policing strategies, we conclude that traffic stop and race data are not sufficient to inform policy makers and stakeholders. Rigorous qualitative research focused on the experiences of the BIPOC community which detects patterns and trends can distinguish structural issues within the criminal justice system. Agency data should be used as a supplement to that research.

Part 1 of this report covers the data collection process over the past five years. The purpose of Part 2, which is in a separate report, was to test different methods of assessing racial disparities in traffic stops for their applicability for all Vermont law enforcement agencies.

### On Data Quality, Completeness, and Accessibility

In any study, quality data is essential for producing reliable and valid results. It is important to acknowledge that no data set is without limitations. Knowing the limitations of the data is key for understanding which issues analysis of the data can and cannot inform. This is especially important when the analysis has the potential to shape policy decisions. As such, CRG has outlined crucial points concerning the quality of traffic stops and race data analyzed in this report.

1. Researchers worked with law enforcement to facilitate the release of more data elements than required by law. Unfortunately, in one CAD-RMS that covers about half the law enforcement agencies, identifying the specific reason for a stop (such as 5 mph over vs. 20 mph) can only be done by a person manually looking up the stop.
2. The statute requires that roadside stop data shall be collected. The data are then exported into a one line per event (tickets or warnings) that happened at the stop. Therefore, if a 50-year-old White woman was stopped and issued a ticket and a warning, this is entered on two lines. The two CAD-RMS systems handle this duplication differently.
3. Departments do not record search and contraband data consistently. For example, some departments do not record contraband as having been found if it belongs to a passenger.
4. Driving Under the Influence (DUI) is a very common crime in Vermont. The criminal courts routinely process about 4,000 DUI charges a year. However, DUI stops are not reflected in the traffic stop data. Researchers learned that some departments have not filled out the traffic stop ticket/warning paperwork when making an arrest for DUI.

## On Measuring Disparities

In Part 2, we tested three peer reviewed methods for benchmarking the driving population: Commuting Hour populations, Resident Driver populations, and Crash Data benchmarking. All three failed in Vermont because of the state's rural nature. It is not possible for one benchmarking standard to be applied to all law enforcement agencies in the state.

1. We can recommend the “Veil of Darkness” analysis as an effort to examine racial disparities. However, that analysis essentially measures one work shift in a police department. In some departments that may just be a single officer.
2. Post-stop outcome measures may be useful, however, without more information on the stop (such as the violation for which the person was ticketed/arrested) it is of limited value. Further, because so few people are searched or arrested it is hard to draw a conclusion from the data.
3. Stop data will now include information as to how often the same person is stopped by a department. Specifically, the year, make, model, and color of the car and the town/state of residence and the state of the plate will be available. This will help illustrate the stories community members have spoken about in protests, legislative hearings, and news articles – stories of people who feel they are being continuously targeted. For example, using these additional data fields, researchers can identify a 30-year-old Asian female from Montpelier driving a 2008 White Honda CRV who has been stopped four times in one month for various reasons.

## On the Future

1. Listen to people's experiences with the police. In the course of this study, researchers were able to identify data elements that will help tell the story of people who feel discriminated against because of their skin color. People's stories are data, and more nuanced than aggregate quantitative data. Good policy can come from a rigorous analysis of the qualitative data within those stories.
2. Police departments should run monthly reports to identify whether their departments are frequently pulling over the same person. For example, researchers found in the data that often an officer would pull a person over for an equipment violation. A few days later, another officer would pull the person over for the same violation, and so on, for months until the equipment was fixed. A monthly report would help identify these patterns. Additionally, these reports would be helpful for early identification of data quality issues.

The overall recommendation for the data issues is for a thoughtful and coordinated effort by law enforcement, community members, researchers, CAD/RMS experts and the Criminal Justice Training Council to help define data elements and develop protocols for the issues identified above.

## Traffic Stops and Race Data Collection

### Background

Act 193 amended 20 VSA § 2366, which went into effect June 17, 2014. Section (e)(1) states as follows (in part):

On or before September 1, 2014, every State, local, county, and municipal law enforcement agency shall collect roadside stop data consisting of the following:

- (A) the age, gender, and race of the driver;
- (B) the reason for the stop;
- (C) the type of search conducted, if any;
- (D) the evidence located, if any; and
- (E) the outcome of the stop, including whether:
  - (i) a written warning was issued;
  - (ii) a citation for a civil violation was issued;
  - (iii) a citation or arrest for a misdemeanor or a felony occurred; or
  - (iv) no subsequent action was taken.

20 VSA § 2366 (e)(1).

The statute further states that law enforcement agencies (LEAs) shall work to collect uniform data, adopt uniform storage methods, and ensure that the data can be analyzed. This roadside stop data, reports, and any analysis are to be made public.<sup>1</sup>

In the 2016 legislative session, the House Committee on Judiciary introduced Act 147 as a way to emphasize and require the collection and analysis of traffic stop and race data. Pursuant to 20 VSA § 2366, the Vermont Criminal Justice Training Council (VCJTC) was authorized to select a vendor to collect the traffic stop and race data. VCJTC selected Crime Research Group (CRG), to which the data was submitted, reviewed, and the datasets posted to its website ([www.crgvt.org/tsrd](http://www.crgvt.org/tsrd)). During this process, CRG discovered that there were many issues that negatively impacted the ability of state and local law enforcement agencies to extract the data into a format that could be published and analyzed. CRG also discovered problems with data quality and challenges with the collection of uniform data. CRG, providing services as the Statistical Analysis Center (SAC) for Vermont, through a contract with the Department of Public Safety (DPS), addressed these challenges and analyzed the data from the LEAs willing to participate in the initial analysis.

### Goals and Objectives

CRG proposed the development of a consistent sustainable approach to traffic stop and race data collection and management to support research and policy through five objectives. CRG worked with all law enforcement agencies in Vermont to improve data collection and conducted several

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<sup>1</sup> 20 VSA § 2366(e)(1).

different analyses of traffic stop and race data analysis to determine if one method could be used for all Vermont law enforcement agencies going forward. The objectives for this project were:

Objective 1	Develop Strategies to Enhance Law Enforcement Data Collection for Traffic Stop and Race Data
Objective 2	Work with Law Enforcement Agencies to Facilitate the Extraction of Traffic Stop and Race Data
Objective 3	Assess Law Enforcement Agencies' Data Collection and Quality Needs to Assist in Crime Analysis and Evaluation
Objective 4	Analyze Traffic Stop and Race Data
Objective 5	Disseminate Traffic Stop and Race Data on a public website

### Objective 1: Develop Strategies to Enhance Law Enforcement Data Collection

CRG worked with the LEAs, including municipal police departments, county sheriff's offices, the Vermont State Police, and local constables, to understand Act 147 and identify the data required by the legislation. Several requests were sent to all the agencies as reminders to extract and send their data to CRG. Agencies struggled with this as they did not know how to extract the data or did not have the staff time to learn the data extraction process. Technical assistance was provided regarding extraction and submitting the data.

Vermont LEAs primarily use two computer aided dispatch/records management systems (CAD/RMS) called Spillman (vendor is Motorola) and Valcour (vendor is Crosswind). Approximately half of the LEAs agencies use each system. Three agencies use what is known as "little Spillman." The Constables used different databases. CRG worked with all LEAs to streamline the process.

The first set of data collected in 2016, consisted of 72 data files with tickets and warnings for September 1 through August 30. These data files had mismatched timeframes, inconsistent fields, missing data, and a variety of formats including Excel, CSV, text, pdf, and handwritten submissions. The challenge was to create standardized data fields and to collect the data for the same timeframe using a consistent format.

After receiving the 2015/2016 data for different dates and in a variety of formats, CRG asked the LEAs to send the 2017 data for the calendar year. DPS extracted the traffic stop and race data for the LEAs using Spillman, and Crosswind created a customized report for Valcour agencies and sent instructions to the LEAs using Valcour on how to extract the data. Even so, many Valcour agencies struggled with the extraction and needed assistance. The Valcour agencies used the same standardized excel format and these files were posted separately for each agency on the CRG website.

In 2018, DPS extracted one excel spreadsheet for most LEAs using Spillman. VSP, Essex Police Department, and the Department of Fish and Wildlife asked to be in separate excel spreadsheets. Several LEAs switched from Valcour back to Spillman which resulted in some of the 2018 data existing in both systems which is noted alongside their published data. Valcour agencies submitted their data individually and they were posted in separate excel spreadsheets.

In 2019 and most of 2020, CRG worked with the Valcour CAD/RMS vendor, Crosswind, to extract the 2019 traffic stop and race data into one report. This would alleviate each agency having to extract its own data and would provide a standardized, more easily analyzable format. The LEAs using the Spillman CAD/RMS continue to have their data extracted in a minimum number of reports.

During these years, CRG worked with LEAs to improve the traffic stop and race data. Data quality issues were identified as the data was reviewed. LEAs were notified if changes needed to be made regarding the timeframe, fields, and/or missing data and were strongly encouraged to review their data prior to publishing.

## Objective 2: Facilitate the Extraction of the Traffic Stop and Race Data

Vermont LEAs uses two CAD/RMS: Spillman and Valcour. DPS, the manager of Spillman, wrote instructions for extracting traffic stop and race data from the Spillman CAD/RMS and the instructions were distributed to the LEAs using Spillman. Valcour agencies, on the other hand, were able to extract their data using a customizable report. CRG worked with all Vermont LEAs to collect the data required by Act 147 for each traffic stop for 2015/2016. The small agencies that had one to three staff struggled with extracting and reporting their data. At the conclusion of the data extraction process, CRG posted the spreadsheets to its website and distributed the link to DPS and VCJTC. CRG worked with the Vermont State Police to identify specific issues with the data. In 2016, CRG and DPS developed the *Factors Impacting the Validity of the Data*, and posted these on the website to alert anyone using the data of the limitations and issues with the data. It is attached here as Appendix A.

The challenge for 2017 traffic stop and race data was to create standardized data fields, a uniform timeframe, preferably calendar year, and a consistent format.

It was the intention of DPS and CRG at the start of this project that the data extraction be automated in Year 1 using the Vermont Justice Information Sharing System (VJISS). VJISS is a statewide portal used to share justice information between and among authorized users and systems in Vermont. Part of this project was to identify the data needed for robust and long-term analysis of traffic stop and race data, pull it from the CAD/RMSs into the VJISS Analytical Data Store (ADS), then push it out to a publicly accessible website in a format that allowed for data analysis and data visualization. Working with the Valcour and VIBRS Governance Boards, which oversee the process of sharing data with outside agencies, it became apparent for a variety of reasons that uploading the data into the VJISS/ADS was not going to be a solution. CRG then began working with DPS to extract traffic stop and race data for the Spillman agencies into one file; and with Crosswind, the vendor for the agencies using Valcour, to extract traffic stop and race data into a second file.

The statute required that the data be posted on a public website. CRG posted the 2015 – 2018 data on its website. In 2019, CRG started discussions with the VCJTC and the Agency of Digital Services (ADS) about posting the data on the Vermont State website: Vermont.data.gov and the VCJC website. In 2020, both VCJTC and ADS will be pulling the 2018 data over to their websites and posting the 2019 data. Traffic stop and race data will be submitted to VCJC in the future and posted on both websites.



### Objective 3: Assess Law Enforcement Agencies' Data Collection and Quality

From 2016 to 2020, CRG continued to provide technical assistance, contacting the LEAs having gaps in their data and those needing help with data extraction. CRG worked with Spillman and Valcour system users to gain an understanding of the strengths and weaknesses of each CAD/RMS and the fields available to improve traffic stop and race data.

CRG completed several analyses using methods based on the most current research literature in the field and determined that additional fields would be helpful for researchers and citizens choosing to analyze the data. These additional data fields would allow for a more robust and accurate analysis of traffic stop and race data. CRG worked with the legislature and Governance Boards to review and agree upon the additional data fields without having to revise the statute. The Governance Boards signed agreements and the following data fields were added to the extracts:

- Date, time, and location of the stop as a way to determine and eliminate duplicates and needed to conduct the veil of darkness analysis.
- Make, model, and year of vehicle can explain disparities in vehicle equipment stops.
- State of the vehicle plate will allow researchers to remove out of state vehicles from any analysis involving Vermont census data.
- State and town of residence of the driver will allow researchers to remove out of jurisdiction drivers from analysis using Vermont census data. And will allow an analysis to be done on resident drivers only.
- More detailed reason for the stop - the current broad categories of vehicle stops may be obfuscating differences. Knowing if a class of people is routinely pulled over for certain offenses versus others is helpful.

CRG also requested “reason for the arrest” and “type of contraband found.” Representatives from the Valcour and VIBRS (Spillman) Governance Boards reported that these two fields can only be extracted manually in Spillman.

### Objective 4: Analyzing the Traffic Stop and Race Data

CRG has updated this section in a separate report which details the analysis for six jurisdictions. The report can be found here at [www.crgvt.org](http://www.crgvt.org) under reports. This section will briefly review the findings. In summary, there are three generally accepted ways to measure racial disparities: 1) benchmarking stops to an estimated driving population (EDP);<sup>2</sup> 2) Veil of Darkness analysis;<sup>3</sup> and, 3) disparities in post-stop outcomes to determine if Non-White drivers are treated different than White drivers.<sup>4</sup> CRG used all three methods to test their viability for analyzing traffic stop

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<sup>2</sup> <http://ctrp3viz.s3.amazonaws.com/data/April2015ConnecticutRacialProfilingReport.pdf>

<sup>3</sup> Grogger, Jeffrey and Greg Ridgeway, Testing for Racial Profiling in Traffic Stops From Behind a Veil of Darkness. American Statistical Association, 2006. <https://www.rand.org/pubs/reprints/RP1253.html>.

<sup>4</sup> <http://ctrp3viz.s3.amazonaws.com/data/April2015ConnecticutRacialProfilingReport.pdf>



and race data for all LEAs in Vermont and to provide a more holistic approach to understand how the law enforcement agencies interact with the motorists that are stopped.

### *Benchmarking Stops to an Estimated Driving Population (EDP)*

CRG attempted two different analyses to benchmark stops to an estimated driving population. The first was to study the commuting population and the second is to conduct a resident driver analysis.

Commuting Population: Connecticut pioneered the use of a database known as the LEHD Origin-Destination Employer Statistics (LODES). LEHD is an acronym for “Local Employer Household Dynamics.” This is a database of unemployment insurance data supplied by the states. Every employee who pays into the unemployment system is captured, along with work and home addresses. The database also contains the number of jobs by race and other demographics in a jurisdiction. The data come from a variety of sources including census data, but it is also supplemented with social security records and federal tax returns.<sup>5</sup>

The commuting population analysis was completed for three jurisdictions that volunteered and had enough commuters to conduct this analysis. For each, the LODES data was used to identify all those employed in the town but residing in a different location. The numbers of all commuters from the contributing towns were totaled and represent the non-resident portion of the given town’s EDP. This was combined with the town’s resident driving population. The combined non-resident and resident numbers complete the EDP. Because of the geographic diversity of workers, the perils of using county census data as the sole benchmark for all stops becomes clear. Commuting population is not recommended as a method for use in Vermont.

Resident Driver Analysis: The resident driver analysis is useful when analyzing the data from one town or city to compare the difference in the interactions with police between resident drivers and non-resident drivers. There are a few caveats about this analysis to consider. The analysis uses the ACS 2011-2015 5-year survey, which has high margins of error for the non-white populations. It assumes that all residents 15 or older have a learner’s permit or a license, which is likely untrue, but to what extent is unknown. Finally, the census categories for race and ethnicity do not correspond with Vermont’s traffic stop data collection. Latinx is considered an ethnicity in census data and race in traffic data. There are multi-race categories in census data but none in Vermont traffic data. The town/state residence of the driver is needed for this analysis.

### *Veil of Darkness Analysis*

The Veil of Darkness method looks at stops before and after the sun rises or sets on a given day during the inter-twilight of dawn and dusk during Daylight Savings Time and Eastern Standard Time. It assumes that the driving population at 5 p.m. in January is the same population driving at 5 p.m. in June. Therefore, if there is racial bias by a police department, whether explicit or implicit, one would expect more non-white drivers to be stopped during daylight hours (in June), when officers can see into the vehicle than in the dark during January when officers may not be able to perceive the race of the driver. The analysis focuses on the 30 days before and after a time change. This helps eliminate some of the differences that may be observed because of seasonal driving differences.

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<sup>5</sup> [https://lehd.ces.census.gov/doc/QWI\\_101.pdf](https://lehd.ces.census.gov/doc/QWI_101.pdf).

When conducting the regression modeling for the Veil of Darkness it failed to produce relevant factors. However, the Veil of Darkness analysis is useful and can be performed on any jurisdiction. Reviewing the results using only the raw data will give an indication as to whether or not a closer look at a particular LEA might be warranted. However, it should be noted that it is essentially looking at one shift of an LEA, the nighttime commuting hours shift. In some smaller LEAs that might be one officer. The caveat with this method is that it is not a measure of the actions of all officers in a LEA.

### Objective 5: Website for the Dissemination of Traffic Stops and Race Data

CRG provided public access to the annual traffic stop and race data, which included the ability to download the datasets for analysis. CRG posted the original data sets from all LEAs on the CRG website ([www.crgvt.org/tsrd](http://www.crgvt.org/tsrd)) for 2015/16, 2017, and 2018. The data and data collection process has improved over time switching to calendar year in 2017 and standardizing the format for Valcour and Spillman agencies. CRG worked with Crosswind, the Valcour vendor, in 2019 and for 2019 and 2020 one traffic stop and race data file will be extracted for all agencies using Valcour, similar to the process DPS has been using for the Spillman agencies since 2017. As with the Spillman agencies, there were a few Valcour agencies that had reviewed and cleaned their data and preferred to have it posted separately. The 2019 traffic stop and race data from all law enforcement agencies was published in 2020 on the VCJTC website and also on the State of Vermont Agency of Digital Services public website: [Vermont.data.gov](http://Vermont.data.gov). The 2018 data was moved to these websites as well.

Late in 2019, DPS released its Public Safety Modernization Strategy. One of the benefits in the plan is to realize administrative cost savings over time. This will be, in part, brought about by consolidating some support functions including information technology systems and sharing technology. The plan is to use one CAD/RMS for law enforcement agencies which would alleviate the struggle that the LEAs currently have to provide traffic stop and race data, improve data quality, standardize the data, increase access to the data for the public and researchers, and allow for more robust analyses of the data. The plan is for this to be realized in the summer of 2021.

### Conclusion

CRG standardized the timeframe for collection of traffic stop and race data and facilitated a process for extracting the data from the two CAD/RMS being used by Vermont LEAs. The data has improved over time and will continue to improve as challenges with the data are identified, solutions are found, and the movement to one CAD/RMS is implemented.

The purpose of the analyses was to test different methods of assessing racial disparities in traffic stops for their applicability for Vermont LEAs. The commuting hour analysis pioneered by Connecticut fails when applied to Vermont agencies because of the geographic diversity of the workforce. Resident driver analysis is useful for understanding how residents of a town may be treated different than non-residents. It should be included in future analysis of the individual LEAs. The Veil of Darkness analysis is the easiest to perform consistently over time and could be used as the primary analysis going forward. For the year 2016, this analysis did not find evidence of disparities. It is important to acknowledge that statistical tests check for disparities

for which there may be many reasons including racial bias. The fact that there are disparities is not proof of racial bias.

“It is important to understand that a key component of external procedural justice—the practice of fair and impartial policing—is built on understanding and acknowledging human biases, both explicit and implicit. These principles form the foundation of fair and impartial policing. This is not a short term fix but a long range vision.”<sup>6</sup> In alignment with the national movement on transparency and accountability, the State of Vermont is embracing this move toward recognizing implicit bias and exploring the issues of race in the criminal justice system. The passing of Act 147 is an example of this. Although it is important to ensure that the anecdotal evidence is supported by quality data and valid analysis, it is equally important, and possibly more important, when the stories of people effected by these actions are not represented in the data, to conduct a rigorous qualitative analysis using the stories of affected people to delve deeper into these issues.

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<sup>6</sup> 21<sup>st</sup> Century Policing Report

## Appendix A

### Factors affecting the validity of the traffic stop and race data (for 2015/2016):

Number of people stopped vs number of tickets: The traffic stop counts in the data as submitted by departments are for tickets, not people. A police officer may give out more than one ticket per stop which can be miscalculated as number of people stopped. State law requires that data associated with an officer's interactions with a vehicle operator be collected at all roadside stops.

Non-discretionary stops: Tickets and warnings issued as the result of crashes, marijuana tickets, under-age drinking tickets, and externally generated stops may be included in the data sets as if they were discretionary (e.g., a crash may have been coded as a moving violation).

Numbers too small for analysis: In many of the spreadsheets, the numbers of stops for operators of color are too small for valid analysis of the data.

Non-standardization of data entry and coding: Data entry and coding in the law enforcement data collection systems have not been standardized, and officer training on data entry has not been available. Therefore, some percentage of the data may be inaccurate.

Timeframe: Not all data was extracted for the same timeframe.

Missing data: Data was frequently missing from tickets (e.g., race was not coded), or more than one box was checked in a category. Tickets or warnings issued to a company (i.e., commercial motor vehicle stops) were missing data, including age and gender of the driver.

Non-audited data: Data include tickets improperly coded by police officers and have not been checked for accuracy.

Data missing from some police departments: Some police departments were unable to extract the data from their records management systems, so that data is not available.

Driving Under the Influence (DUI): In 2019, there was a realization because of the low numbers for DUI in the traffic stop and race data that when an arrest for DUI was made it was likely that a ticket was not issued. When reviewing one barracks data, 96 DUIs were discovered that weren't in traffic stop data.

Analysts should be cautious when comparing results from different jurisdictions because of the lack of data, missing data, differing timeframes for data extractions, differences in coding, etc.