

JOINT COMMITTEE ON GOVERNMENT AND FINANCE  
WEST VIRGINIA OFFICE OF THE LEGISLATIVE AUDITOR

# POST AUDIT DIVISION

LEGISLATIVE AUDIT REPORT

## Fleet Management Division - Telematics Pilot Program

Legislative Auditor: Aaron Allred  
Post Audit Division Director: Justin Robinson





GENERALLY ACCEPTED GOVERNMENT  
AUDITING STANDARDS STATEMENT

We conducted this performance audit in accordance with Generally Accepted Government Auditing Standards (**GAGAS**). Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

POST AUDIT DIVISION  
Justin Robinson, Director



# POST AUDIT DIVISION

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## Fleet Management Division - Telematics Pilot Program

January 8, 2023

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## Background

The Legislative Auditor has issued many reports over the past several years examining the management and utilization of state-owned vehicles by state spending units. These reports have been focused on ensuring there is accurate information maintained and available to ensure accountability for the use of those state assets and to account for any personal or commuting use of those assets that would require specific IRS tax treatment as a result. These reports have also discussed the role of the state's Fleet Management Division (FMD) under the Department of Administration and factors that have limited its ability to have a more direct and impactful role in the oversight and management of the statewide fleet.

In an effort to maintain a sufficient but efficient level of state vehicles, W.Va. Code sets forth minimum monthly vehicle usage requirements to justify the size of the state's fleet. This requires a state spending unit to utilize a state-owned vehicle an average minimum monthly mileage of 1,100 miles, exclusive of any commuting miles. Additionally, spending units with vehicles that do not meet the minimum utilization requirement of 1,100 miles per month must request an exemption from FMD. The exemptions are valid through the Fiscal Year and must be renewed annually.

A December 2016 Post Audit Special Report on Statewide Fleet found that there was no single source of information to accurately and fully account for all state-owned vehicles and their use. Subsequently, in February of 2017 a report issued by the Post Audit Division found that prior to September 2016 the FMD did not collect odometer readings, making the FMD fuel service contract vendor the only available source for this data. However, only 37 percent of the state fleet used the FMD contracted fuel vendor as many agencies were exempted from being required to do so. This led to mileage data only being available for approximately 2,800 of the state's 7,529 vehicles at the time. Because it relies upon the driver to input mileage information when refueling, the data from the fuel service vendors was subject to error and inaccuracies making it unreliable in some cases.

In April of 2017, another report found mileage data was available for approximately 50 percent of state vehicles. However, of those vehicles with mileage data available, 42 percent did not meet the monthly minimum utilization requirement. Only 10 of the 1,531 vehicles that did not meet the monthly minimum were granted an exemption. W.Va. Code requires a spending unit utilize a state vehicle a minimum of 1,100 miles per month on average, exclusive of commuting miles, to justify its need, or otherwise requires an exemption from the FMD for continued use of a vehicle not meeting this requirement. It was also found that FMD did not evaluate vehicle utilization data for those vehicles whose mileage was able to be obtained. A November 2017 report found deficiencies in prior reports had not been addressed. The majority of vehicles continued to be underutilized without requesting an exemption, mileage data was incomplete, commuting mileage was included in the State's utilization calculation, and the FMD was attempting to address inconsistent inventory data.

Finally, the Statewide Fleet Commuting report was released in May of 2018, which found commuting was not tracked for the majority of commuters and taxable fringe benefits were not being properly reported. As a result of recommendations made in these prior reports the Legislature now requires that each state-owned vehicle have a vehicle log sheet associated with the vehicle, each spending unit must submit its vehicle records to FMD annually, and the spending unit must report commuting value as wages and salary to the FMD at least annually.



This current audit of the statewide fleet focuses again on the data being reported by the spending units to the FMD to determine compliance with the requirements set forth by the Legislature in response to our 2018 report and to determine additional activities undertaken by the FMD to better account for the use of state-owned vehicles.

### **Issue 1: A Pilot Project for a Telematics System for State Fleet Vehicles Initiated by the Fleet Management Division Produced Positive Results Indicating Potential Benefits to the State Through its Statewide Adoption.**

At the time of audit there were approximately 7,500 one-ton and under state-owned vehicles served by the FMD. Under W.Va. Code §5A-12-3 FMD is responsible for providing or contracting for management services necessary to properly manage the operation, maintenance, and use of state vehicles one ton and under, as well as preapproving and assisting with the purchase of new or replacement vehicles. FMD acts as a repository for vehicle logs and the non-compensatory business purpose a vehicle was assigned to an individual and acts as the point of contact for individual spending units and fleet coordinators. Oversight of the state vehicle fleet is the responsibility of each individual spending unit, not FMD, to ensure compliance with W.Va. Code and Legislative Rule 148-03.

W.Va. Code and the Rule places the responsibility on each individual spending unit to provide oversight of the vehicle usage and take appropriate action when an employee's use of the vehicle is not in accordance with the Rule. In addition to daily oversight, fleet coordinators perform the following functions:

- Assign vehicles to employees who require continuous access to a vehicle to perform their job duties;
- Prepare and maintain a list of all employees who are provided a state vehicle;
- Monitor vehicle use through vehicle logs identifying the driver, destination, purpose, and the mileage associated with each, including commuting; and
- Submit the employee list, vehicle logs, and utilization waivers to FMD annually.

Vehicle logs containing complete and accurate information are critical to ensuring statutory compliance, providing public transparency, and ensuring costs are managed appropriately, by providing data to help determine fleet size, utilization, and need. Additionally, complete and accurate vehicle logs provide accountability the vehicle was utilized for a purpose benefiting the state.

The Legislative Auditor sought to determine how effectively each spending unit was managing its fleet in accordance with W.Va. Code and Legislative Rule, specifically focusing on the impact employees commuting in state vehicles have on the assignment, utilization, and cost of the vehicle fleet. The auditors attempted to analyze the total mileage, commuting mileage, and personal use mileage of each vehicle in the state fleet for Fiscal Year 2019. This was designed to allow for a breakeven cost analysis of state-owned vehicle total operating costs, personal vehicle mileage reimbursement costs, and vehicle rental costs to be performed and to determine a breakeven threshold based on the analysis. This analysis would also allow the state vehicle fleet to be right sized by eliminating those vehicles assigned to employees as an additional form of compensation rather than having a genuine business for a permanent vehicle assignment. However, after the review of hundreds of vehicle logs, it was found the vast majority of the logs were

incomplete or inaccurate, and thus unusable. Subsequently, in an attempt to provide the Legislature with actionable data, a second attempt was made covering Fiscal Year 2021.

To determine if data integrity issues from Fiscal Year 2019 vehicle logs remained in the Fiscal Year 2021 data, a statistically significant random sample was reviewed. This sample review determined the Fiscal Year 2021 data to have the same systemic issues in the vehicle logs as the Fiscal Year 2019 data, rendering them unusable for analysis. This sample contained all vehicle logs for 108 vehicles one ton and under. Only 60 (56%) out of the 108 reviewed had vehicle logs that were complete. The attempt to analyze the 2021 vehicle logs yielded the same outcome as the attempted analysis of the 2019 data. The majority of logs, if provided, were incomplete or inaccurate. Incomplete or inaccurate vehicle logs defeat the purpose of vehicle logs which is to account for every mile of use for a state asset. Without a complete mileage and trip history of the vehicle it is not possible to determine if the vehicle is being used for a defined state business purpose or if the vehicle use is for commuting purposes that may not be necessary.

Utilizing information obtained from the current fuel and maintenance vendor, Holman, as well as information from the spending units, FMD releases the Fiscal Year State Vehicle Fleet Annual Report and the Fiscal Year Utilization Exemption Vehicle Summary Report. While these reports rely upon imperfect information, these reports provide some insights into the state vehicle fleet. Both reports are publicly available on the FMD website. Although imperfect, these reports are an important source of information as they are currently the only way to detail the utilization of vehicles, can allow the identification of vehicle assignments that may no longer be necessary, and ways fleet could be improved to create cost savings for the state. Despite the useful and necessary information FMD is authorized to obtain and communicate through these reports, and its position as the Fleet Management Division, FMD lacks the statutory authority to effectively manage the state vehicle fleet.

Currently, W.Va. Code requires FMD to “act solely as a repository” for the vehicle logs submitted by the spending units, while the Legislative Rule places responsibility on the spending unit to “monitor vehicle use and take appropriate action” when an employee's use of the vehicle is not in accordance with the rule. Additionally, the Legislative Rule allows for exemptions for spending units from the fuel or maintenance program provided by FMD. These exemptions remove the objective independent third-party oversight role that the FMD plays with regard to state-owned vehicles and places total control of oversight for the use of the state-owned vehicle with the spending unit. If a spending unit has an internal culture that views a state vehicle as a perk of employment, or as additional compensation in lieu of salary increases, the likelihood the spending unit will provide sufficient oversight is improbable. It is the Legislative Auditor's opinion that expanding FMD's statutory authority for oversight of the state vehicle fleet and removing exemptions from FMD management programs would be in the best interest of the state and could lead to an overall reduction in the size and annual expense of the state vehicle fleet.

The success of this approach can be found in the Post Audit report released February 7, 2017, where the Legislative Auditor reported the state of Pennsylvania, who has a Fleet Management Division with oversight authority of a fleet larger than West Virginia's was able to eliminate 26 percent of its fleet through various steps it took to improve efficiency. This drastic reduction in fleet size ultimately realized almost \$60 million in savings within the first four years of implementation. Pennsylvania accomplished this by implementing some of the steps below:



- Instituted one comprehensive fleet policy and refreshed the policy on assigned vehicles based on a business need, rather than politics or preference. Specific changes included:
  - a. vehicles could no longer be employed for personal use,
  - b. departments with underutilized vehicles had to turn them in or document their specific use case,
  - c. mandated that employees must chose the most effective form of travel, and
  - d. removed agency exemptions from the policy.

The Director for Pennsylvania’s Fleet Management Division, after several years of corrective action stated the implementation of a telematics system at the beginning of their management revision, rather than several years later, would have eliminated a lot of resistance to the changes and “it would have taken a lot of manual mileage input off the drivers and automotive officers. We could also have put in place more proactive measures to improve the driving habits of state drivers and reduced the number of accidents.”

Telematics systems, which are a combination of telecommunications software programs and informatics systems, are becoming more common for the maintenance and management of fleets. By installing a telematics device in a vehicle, it provides access to a multitude of data, such as the location of the vehicle, idle time, speed, and fuel consumption in nearly real time, that would not be able to be gathered any other way. These devices allow for the optimization of fleet vehicles, improve operations, lower maintenance costs, and maintain road safety. The WV Board of Risk and Insurance Management (BRIM) indicated it was aware of several states utilizing a telematics system. Additionally, telematics is utilized across a range of private businesses to right size fleets, reduce costs, and improve safety. An example of private use, PepsiCo., which utilizes telematics for one of the largest private fleets with more than 70,000 sedans, trucks, tractors, and other transportation assets in some 200 countries on six continents. Bob Zimmer, Pepsi’s Senior Manager of Supply Chain Fleet Technology says that the technology has generated impressive savings which includes, millions of dollars in fuel expenses through a 30 percent reduction in idling, as much as a 60 percent reduction in breakdowns through preventative maintenance, fewer accidents, and a crackdown on out-of-route mileage and unauthorized out-of-hours use of the fleet vehicles.

### **The Information Obtained by the Telematics System Pilot Program Provides Insights into Areas for Improvement for the Use of State-Owned Vehicles Including Improved Maintenance with Reduced Cost, Increased Safety Through Vehicle Driving Reports, and Better Insights into the Overall Utilization of the Statewide Fleet for Better Planning and Decision Making.**

FMD realized the benefits a telematics system could provide to the state and began a year-long telematics pilot program utilizing the GeoTab telematic software and hardware in conjunction with the Department of Environmental Protection (DEP) Abandoned Mine Lands Division (AML) that ran from October 29, 2019, until October 31, 2020. The pilot program included installing 50 telematics devices in fleet vehicles: 44 for DEP AML and 6 for rental fleet vehicles. The telematics

system used the same vendor interface, Automotive Resources International (ARI)<sup>1</sup>, currently used by the state for maintenance and fueling. With the telematics system's ability to use the ARI interface, it eliminated the need to train and learn a new system and provided a centralized location for all data regarding each vehicle, which allows for seamless analysis of all possible diagnostics related to any single vehicle. FMD identified six key performance indicators (KPI) to quantifiably measure the outcomes of the telematics pilot project. The six performance indicators identified were: fuel savings, improved maintenance scheduling, vehicle utilization, customizable reporting, a reduction in labor costs, and improved safety and operating efficiency.

According to FMD, instances of idling above 15 minutes for the 50 vehicles in the pilot cost the State approximately \$7,800 in fuel costs. Based on FMD's analysis of this data, the observed idle time equated to an average of approximately 110 hours of idle time per week at a cost of \$2.46, which if multiplied across the entire fleet, could amount to approximately a million dollars in fuel expenses from excess idling per year. According to GeoTab, most fleets utilizing GeoTab are able to reduce idle time by over 50 percent, which could mean approximately \$500,000 in savings from reduced idle time.

A major benefit of telematics found by the FMD is the use of the on-board diagnostic or OBD port located in the vehicle to alert the driver or fleet manager to potential maintenance issues. This allows for more predictive maintenance scheduling and proactive maintenance to avoid potentially larger vehicle maintenance problems with larger costs. In Fiscal Year 2021 the state spent approximately \$2.8 million in maintenance costs for the state fleet, therefore, even a modest reduction in these annual expenses would yield significant benefit.

In addition to cost savings identified in the pilot project through the two KPI's discussed above, FMD indicated the GeoTab system provides a level of detail for vehicle usage that is unobtainable without it. Telematics allowed FMD to pull electronic trip logs in real-time, automating vehicle logs and monthly mileage reports that are required for all vehicles. Additionally, odometer readings from each vehicle were able to be uploaded to the current ARI system in near real-time. Automating the vehicle logs, mileage reports, and odometer reading through telematics would eliminate the unreliable data that is currently submitted by the spending units, while simultaneously reducing the workload for agencies and individual employees. The only way to ensure the effective management of the state vehicle fleet is to make data-based decisions regarding the fleet. Without accurate, reliable data, decisions surrounding right sizing the state vehicle fleet, vehicle utilization, and vehicle assignment will continue to produce suboptimal outcomes for the State.

The telematics system also provides data that when acted upon can lead to increased safety outcomes. These improved safety outcomes are related to recording seatbelt violations, aggressive driving, and speeding infractions. During the pilot, FMD reported there were 4,196 seat belt violations, and 8,051 instances of aggressive driving. Aggressive driving was defined as hard acceleration, hard braking, and harsh cornering.

The Legislative Auditor analyzed the data recorded by the telematics system from October 1, 2019, to October 31, 2020, for 44 DEP vehicles and six FMD vehicles, and found there were 69,640 instances of speeding over the posted speed limit. As a note, instances of speeding are noted once the vehicle is exceeding the posted speed limit of the road the vehicle is traveling on for 20

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<sup>1</sup> ARI was the vendor during the pilot project. ARI has since been purchased by Holman.

seconds or more, and multiple speeding instances can be noted in a single trip or on a single stretch of road. For instance, if the posted speed limit is 70 Miles per Hour (MPH), when a vehicle exceeds this speed limit for 20 seconds or more it is noted as an instance of speeding and the duration of time spent in excess of the speed limit is recorded as part of that single instance. If the vehicle then reduces speed to below the speed limit, and then again exceeds it for a 20 second interval, this will be counted as another separate instance of speeding and the duration of time in excess of the speed limit is again recorded.

Of those 69,640 instances of speeding, 69,510 (99.8%) exceeded the speed limit for 20 seconds or more, with an average distance of 1.53 miles and an average of 6 MPH over the posted speed limit. There were 424 instances where the driver was going 20 MPH or more over the speed limit with an average duration of 2 minutes 48 seconds and 3.24 miles. The Legislative Auditor also found multiple instances of drivers reaching speeds in excess of 90 MPH, some on multiple occasions, with one driver reaching a speed of 102 MPH in a non-emergency state-owned vehicle. A summary of the analysis that is correlated to Division of Motor Vehicles Driver’s License Point System is located in the following table.

<b>Table 1 Instances of Speeding by DMV License Points Categories</b>		
<b>DMV Point Category</b>	<b>Points Assessed</b>	<b>Instances</b>
<b>Speeding 20 MPH and Greater Over Limit</b>	6	424
<b>Speeding 19 - 15 MPH Over Limit</b>	5	1,660
<b>Speeding 14 - 11 MPH Over Limit</b>	3	4,411
<b>Speeding 10 - 6 MPH Over Limit</b>	2	24,461
<b>Speeding 5 MPH and Less Over Limit</b>	2	38,554
<i>Obtained from Legislative Auditor’s analysis of FMD telematics data.</i>		

Based on the speeding violations provided by the telematics data, the Legislative Auditor sought to determine the number of instances where speeding was a contributing factor to accidents involving state vehicles. The Legislative Auditor contacted BRIM to request information concerning the number of state-vehicle accident claims it had paid where speed was a contributing factor, however BRIM informed us that this information was not readily available. While BRIM does maintain record of claims paid, it does not track this type of information separately and would require manual review of those claims to determine this information. BRIM was able to inform the Legislative Auditor that there are 4,205 auto related claims, totaling approximately \$15.3 million, for Fiscal Years 2019, 2020, and 2021. It should be noted that in relation to the subject matter of this report, not all incidents resulting in claims paid by BRIM involving state vehicles are related to speed or other factors that could be mitigated through the use of the telematics system, and this information on the total amount of claims paid is provided for context. During the three Fiscal Years of accident claims data reviewed the average claim cost approximately \$3,600. While we were unable to determine the dollar amount of claims paid by BRIM where speed was a contributing factor in correlating a potential reduction in claims through the use of the telematics system, we are able to provide an estimate based on national data. The National Highway Traffic Safety Administration indicated in 2020 that 10 percent of crashes involving property damage only involve speeding. Based on this 10 percent figure, if speeding did in fact contribute to 10 percent of the state vehicle claims during Fiscal Years 2019-2021, it could have been a contributing factor to approximately \$1.5 million in claims paid by BRIM.

At the midpoint review of the pilot program<sup>2</sup> FMD stated, “overall, GeoTab has provided all the tools and reports necessary to deem this pilot a success regarding the primary goals and objectives that were set forth at the beginning of the pilot.” Also at the midpoint of the pilot, DEP stated that they felt like the telematics system was useful and by eliminating the reporting requirements to an automated system it will “allow the inspectors the time they need to perform their respective jobs vs. having to be a constant administrator of entering information to be tracked.” DEP went even further to state, “Automation of this process also eliminates, human error, fraudulence, and increases the accuracy of the reporting.” DEP stated that overall telematics could be used as a management tool to supervise and have a safer environment, but DEP did note a “decrease in morale” that would have to be overcome and they felt that if it was implemented state-wide rather than only DEP it would be much easier to overcome. Despite these concerns noted by DEP, it continued utilizing the telematics program for the remaining six months of the pilot project for 45 vehicles until October 31, 2020.

Despite supporting the telematics system during the midpoint evaluation of the pilot project and indicating the benefits it provided, after one full year of enrollment in the telematics system, DEP withdrew all but six vehicles. These six vehicles are now under Department of Homeland Security Emergency Response Division. The Legislative Auditor inquired as to why DEP withdrew its vehicles from the telematics system and DEP gave the following statement,

“WVDEP Executive Staff decided at the time not to continue with the telematics program and pulled all devices from the vehicles due to the increase in cost, as well as the decrease in employee morale and respect. It was the opinion of the staff that the implementation of telematics was used to track the employees and not just the asset. Those factors were the reason for the not continuing.”

To assess the applicability and practicality of utilizing the telematics trip data, the Legislative Auditor analyzed all vehicle trips for 44 DEP employees that were assigned a vehicle equipped with a GeoTab device from October 1, 2019, to October 31, 2020. These vehicles were assigned to individuals who must typically travel to various locations and appear to have a valid business use for the vehicle. Within this set data the Legislative Auditor identified three drivers assigned a vehicle who were found to have commuted in the state vehicle between 58 percent and 67 percent of the trips taken. The designation of commuting in the vehicle was a trip that began the day at the place of residence and proceeded to initially end at a DEP office location. For some of these trips the DEP office location was where the vehicle remained for the duration of the day, and for some the trip continued to other locations. This analysis is not meant to cast doubt on the necessity of the vehicles assigned to these individuals or any others at DEP, merely to highlight the ability to obtain accurate reliable information regarding the usage of state assets. The Legislative Auditor draws no conclusions regarding the assignment and usage of these vehicles; however, without telematics data the question regarding the need for the over 7,000 state vehicles cannot be asked nor answered.

It is the opinion of the Legislative Auditor that a state vehicle is an asset of the state that should be provided only to employees with a genuine need for a vehicle to perform essential job duties. In general, if an employer assigns a vehicle to an employee, the employer has the right to monitor the vehicle's use and location, because the vehicle is property of the state, and the employer has a legitimate interest in ensuring that it is being used properly and for the benefit of the business.

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<sup>2</sup> See Appendix C for the FMD 6-month midterm evaluation report for the Telematics Pilot Project.

A state vehicle is not a component of a compensation package and should not be treated as such by any spending unit. A state vehicle is no different than any other asset the state provides employees in the course of their employment including cell phones or laptops, all of which require the primary use to be for state government purposes only.

The Legislative Auditor recognizes these decisions cannot be made in a vacuum, and that the benefits of any additional expenditures must outweigh the costs to obtain them. As such, the Legislative Auditor sought to analyze the costs associated with implementing the telematics system in the vehicle fleet. FMD informed the Legislative Auditor that the cost savings to the state would depend on how many systems are installed and the participation from state agencies. Each vehicle included in the telematics system would incur a one-time charge of \$124.18, and a monthly service fee of \$16.00. FMD representatives indicated that the telematics devices could pay for themselves within a year.

## **Conclusion**

The Legislative Auditor agrees with FMD's assessment of the pilot program as a success. It is the opinion of the Legislative Auditor that providing FMD statutory authority for oversight, removing exemptions from FMD, and the implementation of telematics in the state fleet would allow the state to manage its vehicle fleet much like a private business. This change to state operations would reduce costs in the short term, right size the fleet in the long term, provide public transparency, and ensure no one is provided a vehicle as supplementary or additional compensation. The Legislative Auditor believes that with a change in W.Va. Code to grant FMD oversight authority for statewide fleet married with the implementation of a telematics system the State could potentially reduce the approximately \$9 million expended in Fiscal Year 2021 for total vehicle operating expenses<sup>3</sup>, as well as potentially reducing the total size of the fleet as Pennsylvania was able to do after making similar changes.

It is the opinion of the Legislative Auditor that without granting FMD statutory authority for oversight and removing the exemptions from FMD, any changes made requiring telematics or additional reporting requirements that is overseen by the spending units would result in suboptimal outcomes for the state. There has been a long-ingrained culture in many spending units that view vehicle assignments as a perk of employment. To expect these same spending units who may have this ingrained culture to self-govern the oversight of the state vehicle fleet leads to where the state is today: a large number of vehicles, unreliable information on which to base decisions, and oversight assigned to the very fiefdoms that benefit from the asset they are to oversee.

### **Recommendations:**

1. The Legislative Auditor recommends that the Legislature consider amending W.Va. Code §5A-12-3 to grant the Fleet Management Division oversight authority of the state vehicle fleet, with consideration given to excluding law enforcement vehicles should such oversight conflict with any law enforcement activities.
2. The Legislative Auditor recommends that the Legislature consider amending W.Va. Code §5A-12-9(a) to delineate telematics as a required service for state spending units, and if telematics is a required service, amend W.Va. Code §5A-12-6 to remove the requirement to complete vehicle logs in telematics connected vehicles.

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<sup>3</sup> Expenses include maintenance, fueling, fees, and fixed costs.

3. The Legislative Auditor recommends that the Legislature consider amending W.Va. Code §5A-12-9(b) to remove exemptions from FMD.
4. The Legislative Auditor recommends that the Legislature consider amending W.Va. Code §5A-12-9(b) to only allow for exemptions from the provisions of this code section for law enforcement.



## Appendix A

### WEST VIRGINIA LEGISLATIVE AUDITOR'S OFFICE

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Justin Robinson  
Director

**Transmitted by Mike Jones, Audit Manager, Via E-Mail on December 21, 2022**

Executive Director Yoakum,

The Post Audit Division has the attached report concerning the Fleet Management Division's Telematics Pilot Program that we plan on presenting at the January interim meetings currently scheduled for January 8-10, 2023. This report is not reflective of a direct audit of the Fleet Management Division, rather it is meant to inform the members of our committee and the Legislature of the results of the program and some of the things noted within the data gathered. Once a time and date are established for this meeting, we will contact you with that information as members may have questions concerning the report and we would advise a representative from the Fleet Management Division be in attendance to respond to any questions they have. Our report concludes that the telematics pilot program could provide benefit to the state in more effectively and efficiently managing those assets and ensuring the use of state vehicles is in the best economic interest of the state.

Please review the attached report and inform us if you note any inaccuracies or misstated information so that we may make corrections prior to releasing the report. If you would like to meet to discuss this report prior to its release, please contact me to schedule a meeting for a time and date that would occur prior to the interim meeting date. Additionally, if you would like to provide a written response to this report to be included in the report, please provide that to us no later than Noon on January 5, 2023. Feel free to contact me with any questions or concerns.

## Appendix B

### Objective, Scope, & Methodology

The Post Audit Division of the Office of the Legislative Auditor conducted this post audit as authorized by Chapter 4, Article 2, Section 5 of the West Virginia Code, as amended. The post audit was conducted in accordance with the standards applicable to performance audits contained in the 2018 generally accepted government auditing standards (GAGAS) issued by the Government Accountability Office. Those standards require the audit to be planned and performed to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. The Legislative Auditor believes that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The Legislative Auditor's Office reviews the statewide single audit and the DOH financial audit annually with regards to any issues related to the wvOASIS financial system. The Legislative Auditor's Office on a quarterly basis request and reviews any external and internal audits of the wvOASIS financial system. Through its numerous audits, the Legislative Auditor's Office is constantly testing the financial information contained in the wvOASIS financial system. In addition, the Legislative Auditor's Office has sought the professional opinion of the reliability of wvOASIS from the Joint Committee on Government and Finance's Fiscal Officer who, along with her staff, uses the wvOASIS system daily. Based upon these actions, along with the audit tests conducted on the audited agency, it is our professional judgement that information in the wvOASIS system is reliable for auditing purposes under the 2018 Yellow book. However, in no manner should this statement be construed as a statement that 100 percent of the information or calculations in the wvOASIS financial system is accurate.

#### Objectives

1. To determine if state spending units are in compliance with Legislative Rule 148 series 3 and West Virginia Code §5A-12.
2. To determine if there is a cost benefit to the state in utilizing a Telematics system to record driving and maintenance of Fleet vehicles.

#### Scope

The scope of this audit comprised a review of vehicle logs, reported commuting value, required annual data as reported to the Fleet Management Division, exemption waivers, bona-fide business reasons, and the policies and procedures utilized by individual spending units for fiscal years 2019 and 2021. In conjunction with the Telematics Pilot Program data that ran from October 2019 to October 2020 and calendar year 2022 telematics data was reviewed and analyzed.

#### Methodology

Legislative Rule and W.Va. Code were reviewed by the Legislative Auditor to determine the roles of the Fleet Management Division (FMD) and the individual state spending unit, as this set the parameters for analysis and determining compliance.

The Legislative Auditor sought to analyze the total mileage, commuting mileage, and personal use mileage of each vehicle in the state fleet for Fiscal Year 2019. This would have allowed for a breakeven cost analysis of state-owned vehicle total operating costs, personal vehicle mileage reimbursement costs, and vehicle rental costs to be performed and to determine a breakeven threshold based on the analysis. This analysis could have allowed for the state vehicle fleet to be right sized by eliminating unnecessary vehicles. However, review of the vehicle logs and any corresponding documentation, resulted in unusable data. Subsequently, a second attempt at gathering sufficient data by using a statistically significant random sample was reviewed for fiscal year 2021. This sample review possessed the same systemic issues as the fiscal year 2019 data, also rendering them unusable for analysis. Given the systemic issues with the data the Legislative Auditor reviewed and analyzed the FMD's pilot program data in conjunction with the data retrieved from calendar year 2022 for state vehicles using the same telematics as the pilot program. This was to allow for a determination of whether the telematics system would be both cost-efficient and cost-effective in state-wide vehicle fleet implementation and maintenance.

## Appendix C



Allan L. McVey  
CABINET SECRETARY

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Kenny H. Yoakum  
DIRECTOR

7/20/2020

Cabinet Secretary, Allan McVey  
West Virginia Department of Administration  
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### Re: **Telematics 6 Month/Midterm Evaluation**

Dear Secretary McVey,

Accompanying this cover letter is a 6-month report evaluating the one-year telematics pilot program involving 50 state vehicles; 44 with the Department of Environmental Protection (DEP) Abandoned Mine Lands (AML) division and 6 rental motor pool vehicles with the Fleet Management Division.

The goal of the telematics pilot program is to evaluate the features and reports available to better assist agencies with managing their fleet, which includes maximizing utilization, safety, and eliminating analog methods of reporting vehicle data.

The pilot program's total cost to equip the 50 vehicles participating was \$18,008. The one-time equip charges for the Geotab telematics devices range from \$69 to \$218 per vehicle based on the features and services an agency requires. The monthly recurring fee ranges from \$11 to \$18.25 depending on the level of service.

FMD did an early comparison between the operating cost before and after telematics installation and have determined that telematics units are the devices needed to manage the State's vehicles in an efficient and effective manner. Below is a snapshot of operation costs and savings in this 6-month period:

Total For All Telematics Vehicles	Before Telematics	After Telematics	Percent of Increase/ Decrease
Cost Per Mile	\$0.27	\$0.34	24%
Miles Travelled	215,827	249,838	16%
Fuel Cost	\$38,058.37	\$40,217.06	6%
Gallons Purchased	16,498.80	16,900.90	2%
Average Per Gallon Fuel Cost	\$2.31	\$2.38	3%
Cost Per Mile Fuel Only	\$0.18	\$0.16	-9%
Maintenance Repairs	\$10,490.97	\$27,400.48	161%
Operating Cost	\$58,614.08	\$84,032.39	43%

- Due to the limited number of vehicles in the pilot program (50) and removing those vehicles that don't have two years of operations cost history, it leaves the test pool at 41 vehicles. Three vehicles had a major maintenance event that skewed the overall operations cost.

Overall, the state has seen a 9% decrease in fueling cost per mile while traveling more miles and paying more for gasoline.

The Telematics Geotab Six Report shows how telematics can reduce cost by providing data for key performance indicator like:

- Utilization
  - Driving distance and duration
  - Most and least vehicles utilized
  - Idling
  - Geofencing
  - After hours usage
- Preventive Maintenance
  - Engine fault
  - Battery drain
  - Oil life remaining
- Safety
  - Seat belts
  - Speeding
  - Aggressing driving
- Fueling

These findings have led FMD to add telematics as an option for agencies on the specifications for our new vehicle management vendor contract which should be available to the state agencies before the end of the year. FMD will continue to provide the tools and services to allow the agencies to manage their fleets in an efficient and effective manner. Please me know if you have any questions.

Sincerely,

Kenny Yoakum



# West Virginia Fleet Management Division (FMD)

## 6 Month Midterm Evaluation Report for Telematics Pilot Program

July 20, 2020

### **Pilot Program Goals**

1. The pilot program will provide the format to evaluate telematics' devices and features for one year and develop an understanding of the services that can best assist the agencies with maximizing the efficiencies of their state vehicles
2. Review and develop reports that can assist with eliminating current analog methods

As of July 2020, there are 10,546 licensed rolling stock that are state owned or operated. Below is a breakout of the State's inventory:

wvOASIS 1 Ton and Under – 6,877  
wvOASIS Over 1 Ton – 1,956  
wvOASIS Third Party Lease – 71  
wvOASIS Trailers – 1,642  
Draft and Pending Acquisition Documents – 5  
Draft and Pending Disposition Documents – 50



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# Background

Fleet Management Division's (FMD) pilot began on Oct 29, 2019 evaluating 50 devices for the one-year program. The first month of the pilot was used to gather baseline data about the operations and driver habits. The next four-five months were spent focusing on reports and key performance indicators (KPI's) identified in the pilot's success criteria.

By utilizing the State's current maintenance and fueling vendor, Automotive Resources International (ARI), it eliminates interface charges. It also reduces the timeline of learning a new system. Having one centralized place for all maintenance, fueling, vehicle tracking, and diagnostics will better define how driving behavior affects a vehicle's operations cost.

DEP volunteered to pilot 44 of the Geotab telematics devices and FMD installed another 6 devices on our rental vehicles. The pilot program is testing Geotab's Base, Pro, and ProPlus plans. Each plan provides different levels of features. The devices were installed on all the vehicles at DEP's headquarters by October 31, 2019.

The pilot program focuses on several key performance indicators (KPI) to evaluate how the State's fleet is being utilized, in addition to the reports available to best utilize and operate a state vehicle.

## Goals & Objectives

### This report covers a six-month snapshot, from Nov 1st – May 31st

The following categories were identified as the criteria on which the success of a telematics solution would be evaluated.

1. Fuel savings
2. Improved maintenance scheduling
3. Vehicle utilization
4. Improved safety and improved operating efficiency
5. Customizable reporting
6. Reduction in labor cost

## Telematics Capabilities

### Near Real-Time Positioning

Ability to monitor vehicle fleet in real-time on a mapping interface. With the Geotab ProPlus plan, it provides Active Tracking; vehicle locations are refreshed every second for up to 20 moving vehicles on the map providing continuous animated movement. Live server-side driver alerts are also enabled by turning Active Tracking on.

### Vehicle Odometer Reporting

Historical odometer reporting and ending of day (schedule) odometer readings.

- Currently those vehicles that don't use FMD's services report odometers by spreadsheet.

### Input Routine Maintenance

Manage and track scheduled vehicle maintenance (oil changes, car washes, tire purchases/rotations).

- Driver, Agency Fleet Coordinator (AFC), Supervisor, and Management can all view maintenance alerts and schedule events.

### Automatic Crash Notifications

Automatic Crash Notification in the event of air bag deployment or G-Force impact exceeded.

- The alerts can be automatically routed to the AFC in charge of the daily operation of that vehicle.

## Passenger Seat Belt Tracking

Real time notification when the seat belt is unbuckled.

## Priority and Preemption Capability

The telematics solution offers prioritization and preemption for emergency service vehicles. This ensures the fleet management that emergency service vehicles are always connected during an emergency.

## EV Suitability Assessment - Recommended Add-In

Built on the largest dataset of real-world EV performance, the Geotab EVSA provides an accurate view of a fleet's electrification potential. Analyzing a fleet's driving profiles to produce data-driven recommendations, the EVSA helps evaluate the viability of introducing EVs into the fleet. The interactive add-in allows for complete customization to run multiple electrification scenarios in a quick and convenient do-it-yourself tool.

### Create an EV adoption Strategy Add-In

- +Select the right vehicles for starting your EV transition
- +Identify vehicles covering distances that are EV range capable
- +Select vehicles that make the most financial sense

# State of WV Pilot Program Data

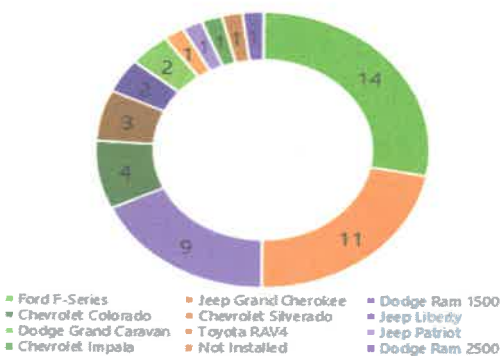
Over the course of this pilot, West Virginia Fleet Management Division evaluated 50 light duty vehicles separated using the wvOASIS hierarchy of department and unit number.

Pilot commenced on Nov 1<sup>st</sup>, 2019 and for the purpose of this report, we are evaluating from that point to May 31<sup>st</sup>, 2020.

## Vehicle Summary

### Device Install

GO Device installation began on Oct 29<sup>th</sup>, 2019 all installs were completed by Oct 31<sup>st</sup>, 2019



# Utilization

Usage Chart	Total Duration	Total Miles
Driving Duration	566 Days 12 Hours & 21 Minutes	495,246.5
Idling Duration	163 Days 6 Hours & 13 Minutes	-
Engine Duration	729 Days 18 Hours & 35 Minutes	-

## Distance Driven

A total of 495,246.5 miles were driven during the pilot.

Total Miles Driven

495,246.49

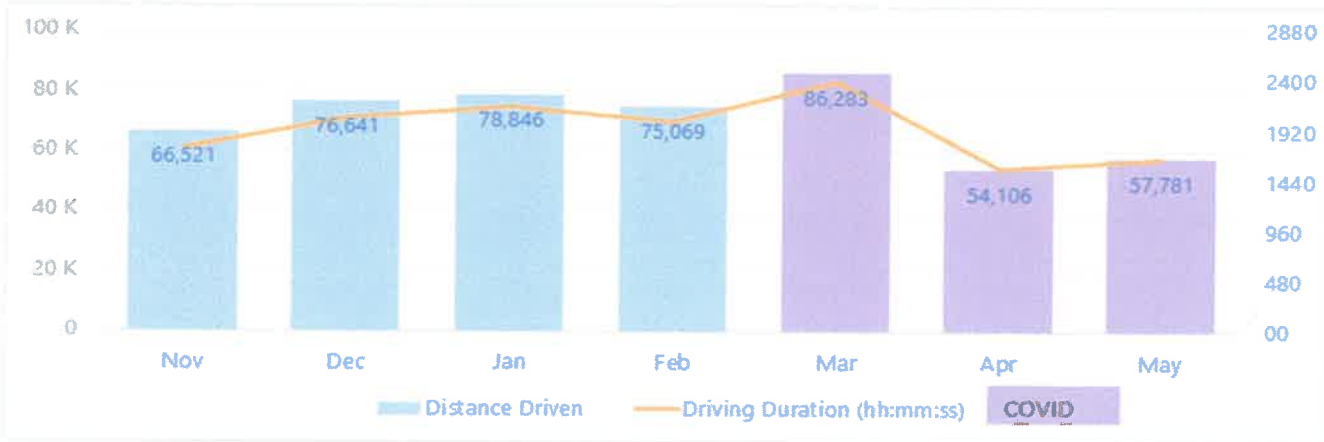
309.62

Avg Weekly Miles

566 Days 12 Hours & 21 Minutes

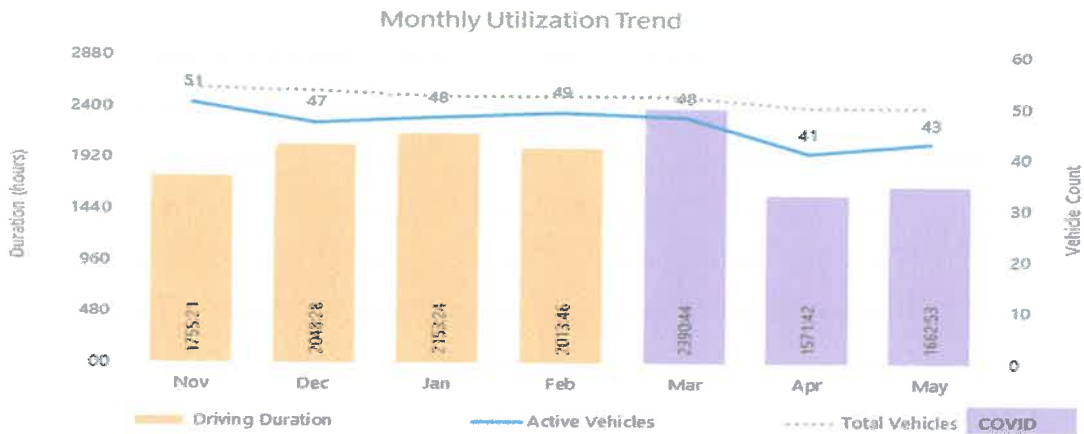
Driving Duration

Month	Distance Driven	Driving Duration (hh:mm:ss)
Nov	66,520.81	1755:21:47
Dec	76,641.21	2048:28:07
Jan	78,846.27	2153:24:53
Feb	75,068.73	2013:46:45
Mar	86,282.72	2390:44:47
Apr	54,105.68	1571:42:31
May	57,781.08	1662:53:04
<b>Grand Total</b>	<b>495,246.49</b>	<b>13596:21:54</b>



## Driving Duration

A total of 566 Days 12 Hours & 21 Minutes of driving duration during the pilot period.



## Top 5 and bottom 5 vehicle utilization

Least Utilized Vehicles								
	Vehicle	Days Driven	Vehicle	Drive Time	Vehicle	Distance	Vehicle	% Utilization
1	717455 -	4	717455 -	06:51:48	717455 -	319.35	733933 -	13.60%
2	598957 -	16	432618 -	19:37:29	432618 -	908.44	432618 -	14.90%
3	432618 -	17	598957 -	25:21:36	598957 -	1534.98	A70967 -	15.27%
4	127784 -	22	127784 -	31:58:07	127784 -	2867.20	E58454 -	19.37%
5	193867 -	32	193867 -	68:57:17	733933 -	3574.09	910290 -	19.73%

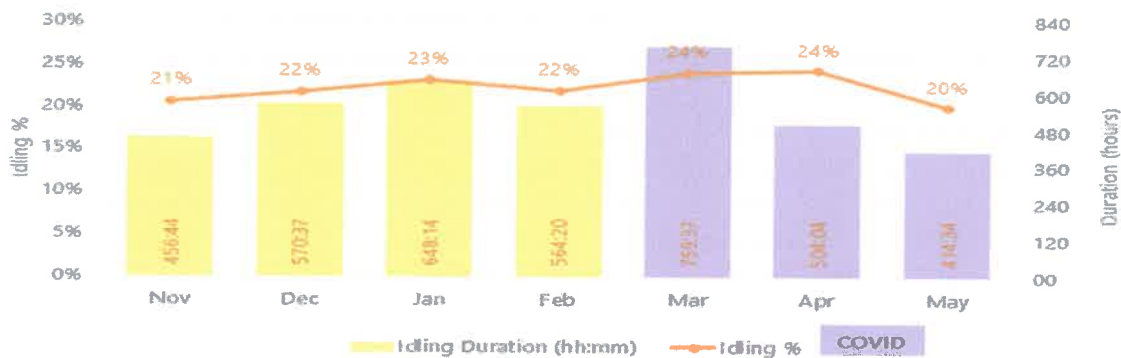
  

Most Utilized Vehicles								
	Vehicle	Days Driven	Vehicle	Drive Time	Vehicle	Distance	Vehicle	% Utilization
1	A70969 -	141	A69012 -	483:25:11	330766 -	18702.50	330766 -	58.55%
2	A70962 -	138	A70968 -	462:47:12	C86230 -	16541.17	C86230 -	54.93%
3	A70966 -	138	307543 -	444:55:27	178682 -	16535.00	178682 -	49.06%
4	A70968 -	136	A70966 -	428:29:47	331021 -	16156.37	307543 -	48.57%
5	A70967 -	131	C86230 -	414:46:17	A69012 -	15114.68	A69012 -	48.08%

## Highest Idle Duration

A total of 166 Days & 14 Minutes of idling duration during the pilot period.

Idle Percentage Trend

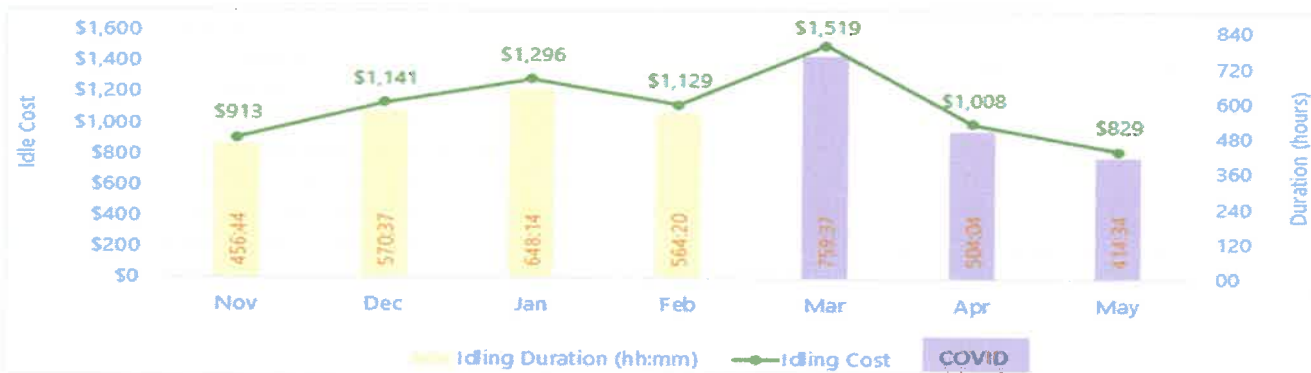
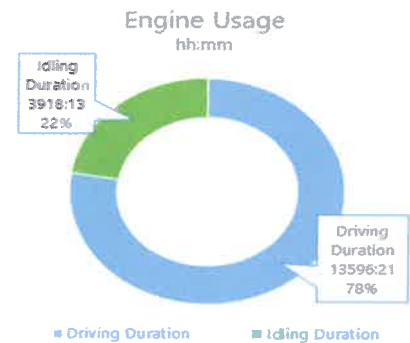


## Idle Cost

A total idling cost for the pilot was \$7,836.45 based on \$2.46 fuel cost per gallon.



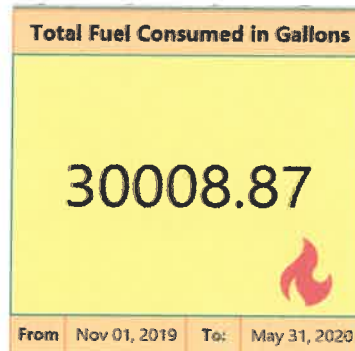
Month	Idling Cost	Idling Duration (hh:mm)
Nov	\$913.48	456:44:25
Dec	\$1,141.25	570:37:36
Jan	\$1,296.48	648:14:28
Feb	\$1,128.69	564:20:50
Mar	\$1,519.26	759:37:39
Apr	\$1,008.14	504:04:20
May	\$829.14	414:34:14
<b>Grand Total</b>	<b>\$7,836.45</b>	<b>3918:13:32</b>





## Fuel Consumption

Total fuel consumption for the pilot was 30,486.63 gallons. Average fuel economy is 15.50 MPG.



## Preventive Maintenance Alerts

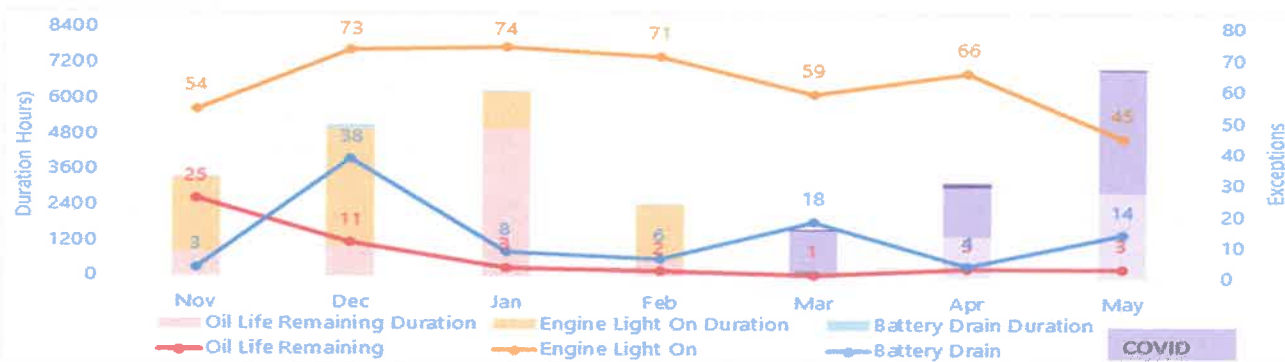
Maintenance-specific reports can be implemented to identify oil and coolant levels or related temperatures. Maintenance reminder rules and automated reporting can also be implemented to track scheduled and recurring maintenance.

*Engine Fault* identifies vehicles being driven with "An Active Fault" light on.

*Battery Drain* identifies vehicles that have a battery voltage below 11 volts.

*Oil Life Remaining < 10%* identifies vehicles that have less than 10% oil and can be a maintenance risk.

Month	Oil Life Remaining	Oil Life Remaining Duration	Engine Light On	Engine Light On Duration	Battery Drain	Battery Drain Duration
Nov	25	805:42:00	54	2541:41:31	3	12:43:12
Dec	11	1015:24:59	73	3989:01:55	38	119:08:00
Jan	3	5016:24:28	74	1261:01:36	8	01:53:26
Feb	2	548:53:29	71	1902:23:08	6	08:47:39
Mar	1	356:24:38	59	1213:18:23	18	12:05:26
Apr	3	1394:06:06	66	1696:41:58	4	122:33:30
May	3	2883:21:47	45	4119:24:30	14	45:20:07
<b>Grand Total</b>	<b>48</b>	<b>12020:17:27</b>	<b>442</b>	<b>16723:33:01</b>	<b>91</b>	<b>322:31:20</b>

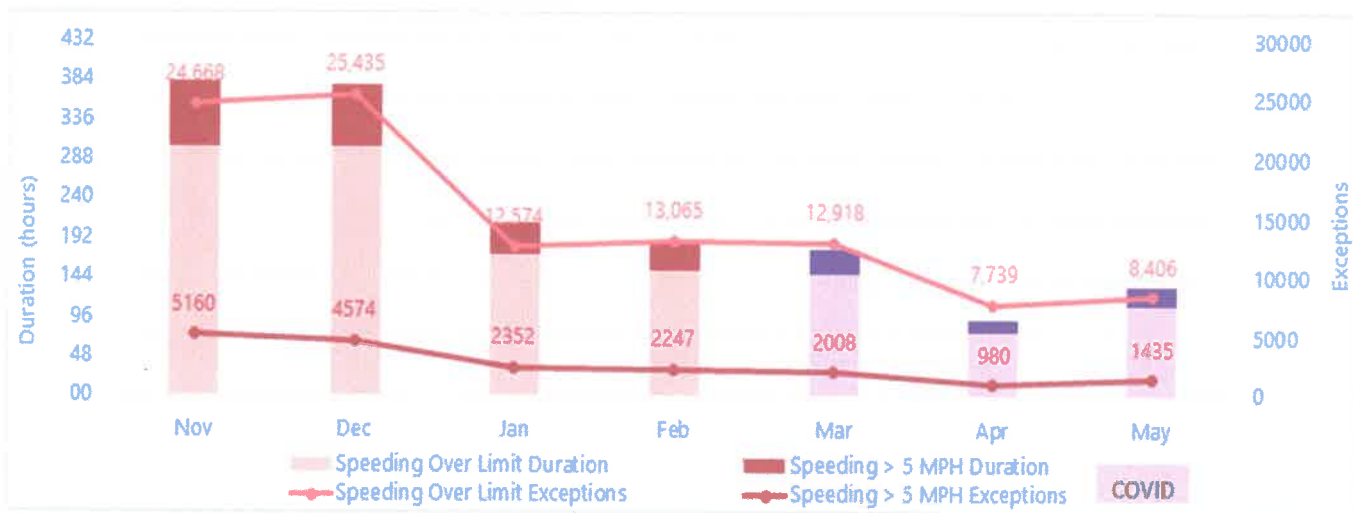


# Safety

## Speeding Violations 0 - 5 MPH

123,561 speeding violations were recorded. The total duration of vehicles speeding is 5 days 0 hours & 33 mins; speeding duration for the pilot was a total distance of 104,602.95 speeding miles. Speeding instances are recorded utilizing various parameter settings. The charts below speak to the specific nature of how these figures are reported.

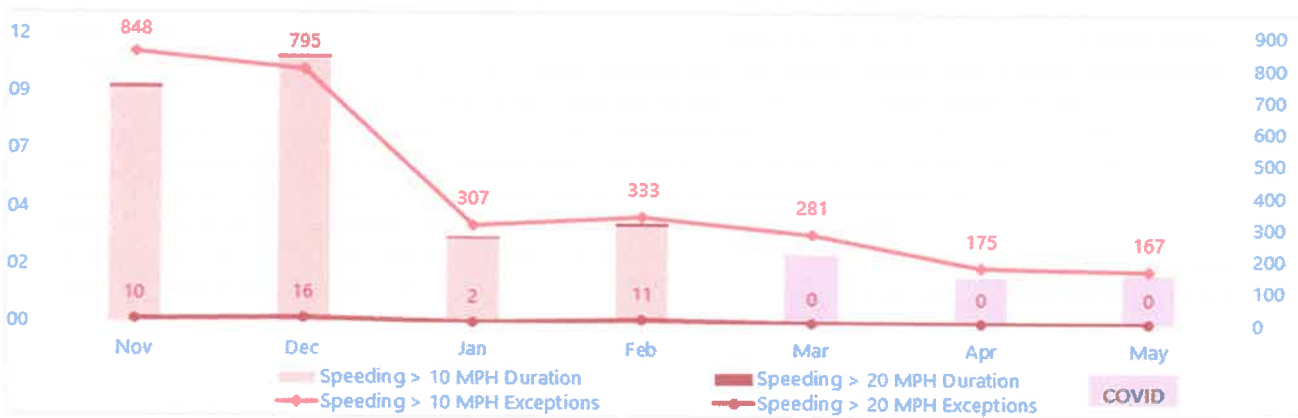
Month	Speeding Over Limit Exceptions	Speeding > 5 MPH Exceptions	Speeding Over Limit Duration	Speeding > 5 MPH Duration
Nov	24668	5160	302:59:53	80:09:30
Dec	25435	4574	302:08:27	75:12:40
Jan	12574	2352	171:39:57	38:58:32
Feb	13065	2247	153:14:06	33:57:10
Mar	12918	2008	148:55:41	29:06:03
Apr	7739	980	78:18:14	13:32:35
May	8406	1435	110:15:14	22:05:33
<b>Grand Total</b>	<b>104805</b>	<b>18756</b>	<b>1267:31:32</b>	<b>293:02:03</b>



## Speeding Violations 10 - 20 MPH

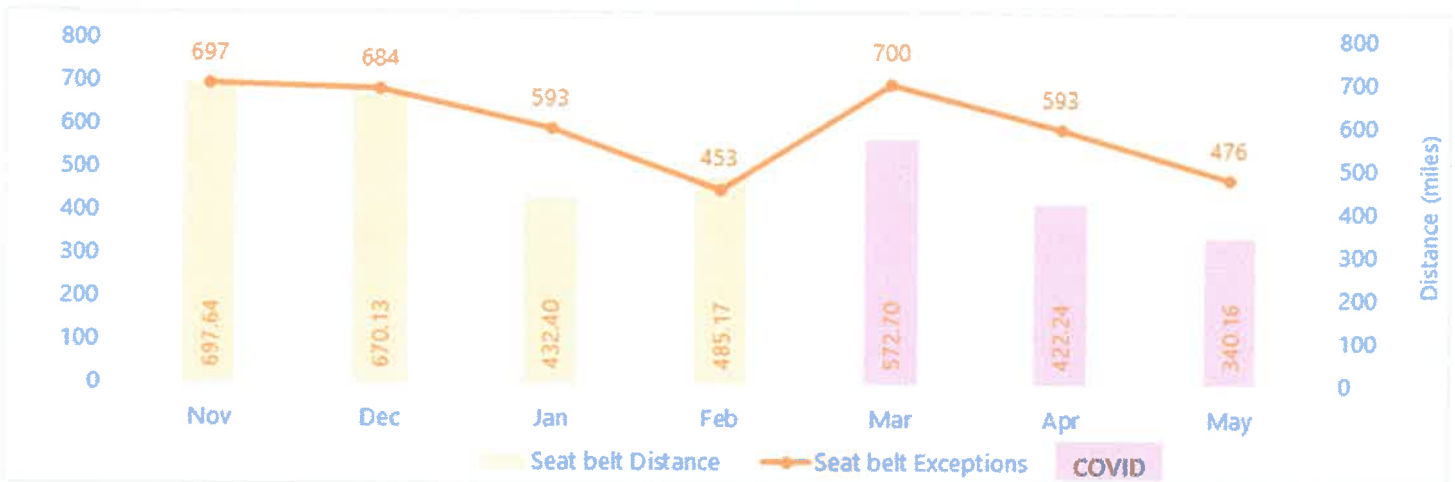
2,945 speeding violations, 1 days 11 hours & 40 mins speeding duration and 2,480.50 speeding miles.

Month	Speeding > 10 MPH Exceptions	Speeding > 20 MPH Exceptions	Speeding > 10 MPH Duration	Speeding > 20 MPH Duration
Nov	848	10	09:49:20	00:04:27
Dec	795	16	11:01:46	00:10:12
Jan	307	2	03:29:04	00:01:05
Feb	333	11	04:04:44	00:05:13
Mar	281	0	02:53:14	00:00:00
Apr	175	0	01:57:56	00:00:00
May	167	0	02:03:12	00:00:00
<b>Grand Total</b>	<b>2906</b>	<b>39</b>	<b>35:19:16</b>	<b>00:20:57</b>



## Seat belt Violations

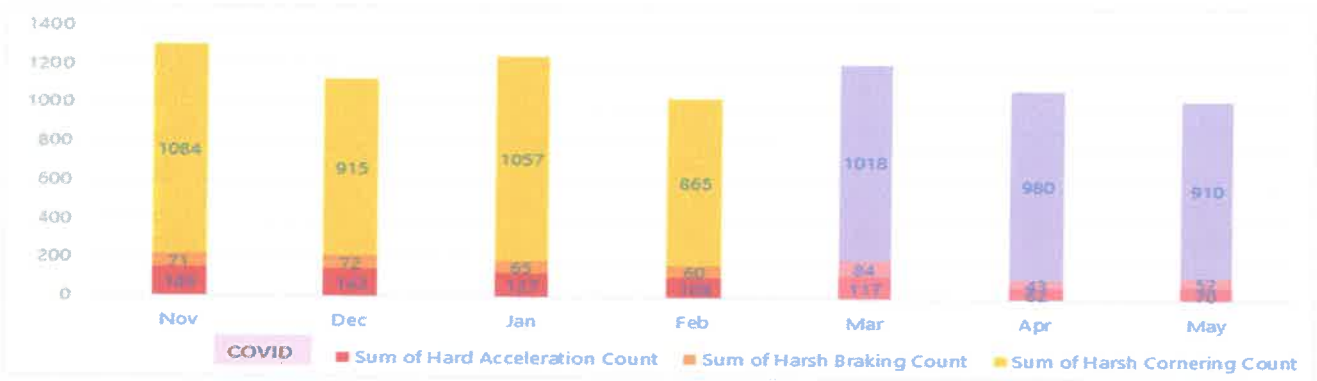
4,196 seat belt violations, 189 hours & 51 mins seat belt unbuckled duration and a total distance of 3,620.45 miles driven with seat belt unbuckled



# Aggressive Driving

## Accident Rule

Total of 8,051 aggressive driving violations consisting of 775 hard acceleration, 447 hard braking and 6,829 harsh cornering exceptions.



# Automatic Crash Notifications - Recommended Add-In

## Possible Accident Rule

This rule will trigger if the accelerometer detects a change of more than 2.6 G (the equivalent to a change in speed greater than 90 km/h or 56 mph in 1 second) in the forward/braking or side-to-side direction. If possible, the device will send detailed forensic information about position, speed, and acceleration of the vehicle. False alarms may occur, knocking the device can trigger the rule. Install the device out of the driver's way.

- Email Notifications enabled for rule.
- Pop up notification enabled for rule.

## Collision Reconstruction Add-In

Geotab's Collision Reconstruction Add-In is an all-in-one solution to viewing, analyzing and interpreting collision data from Geotab tracking devices. It finds and analyzes known collisions for a given time period and displays all relevant information (speed profile, RPM, and accelerometer data) into a single, easy to read document.

**myGEOTAB**

**Accident Reconstruction Document**

**Device Information:**  
Time of Accident: 2016-04-21 02:21:11.957000 UTC

**Point of Impact**

**Map View**  
[Trip History](#)  
 Speed at Accident: 81 Km/h  
[Speed Profile](#)

**RPM Data**  
[RPM Graph](#)

**Accelerometer Data**  
 Accelerometer Forward and Braking: 14.02765  
 Accelerometer Side to Side: -35.30394  
[Accelerometer Graph](#)

# Pilot Program Findings and Realized and Future Potential Savings

For the purpose of this report, FMD used a combination of the exceptions already created in the database and our own measurements to provide a report focused on the areas that are most pertinent to fleet coordinators, which are the following:

- Reducing/monitoring idle time
- Vehicle utilization
- Fleet productivity
- Safety
- Vehicle health

**Reducing vehicle idle time** – Measuring only the instances of vehicle idle time above **15 minutes**, it was observed that from November through May the cost of idling of the 50-vehicle pilot group was **\$7,836.45**. This equates to an average of approximately 110 hours of idle time per week at a cost of **\$2.46**. Multiplied over the entire **6877** vehicle fleet is **\$1,077,763** per year. Reducing idling by (50%) per day, the State can save over **\$500,000** per year in fuel costs and reduce fuel consumption by roughly **220,000** gallons, eliminating nearly **1955** metric tons of greenhouse gas (GHG) emissions.

**Eliminating agency administrative workload** – A key performance indicator was to verify the system’s ability to capture and report engine odometer readings and automatically upload this data into the ARI software. Driver compensation is a large portion of an operating budget, and as a result, inefficient labor can be costly. Reduction of tedious, inaccurate manual data points can be supplanted with electronic real-time engine-based data eliminating the need for manual driver monthly odometer inputs. Manual inputs are often inaccurate, which in turn, increases maintenance costs. Telematics allows FMD to pull electronic trip logs in real-time, automating trip logs and monthly mileage reports that are required for all vehicles.

## **Safety - Reducing costly vehicle collisions**

The average costs of collisions to the employer can be seen below:

- Job-related collision: \$16,500
- Collision resulting in injury: \$74,000
- Collision involving fatality: \$500,000+

Collisions, speeding, and aggressive driving behaviors were found to be a contributing factor in 31% of all fatal crashes. In comparison, seatbelt use was found to decrease the risk of fatality between 45% and 60% (1). In the years of 2006-2010, the average speeding-related casualty in West Virginia was 100 persons a year (2); proper use of telematics can help reduce accidents in combination with statewide safety initiatives. From November 2019 to May 2020, the entire 50 vehicle fleet had a total of 151,273 speeding events of different ranges (>1 MPH - 20 MPH). Besides speeding, we also evaluated the harsh driving conditions of the drivers (acceleration, braking, and cornering), which by themselves can lead to collision events and, when in combination with speeding events, can lead to the above-mentioned fatalities. During this pilot, the total number of these harsh driving events was 8,234, Harsh Cornering being the one with the greatest number of exceptions at 6,974 events at an average speed of approximately 15 MPH.

**Telematics potential savings:** Insurance companies have reported a 45% reduction in accidents and a 50% reduction in accident payout costs with the use of telematics (3). Telematics can monitor seat belt usage while driving. From November to May, the average monthly time of drivers not wearing a seat belt was 35 minutes. In the years 2006-2010 the average fatalities of Unbelted Passenger Vehicle Occupant in West Virginia was 151 (2), which can be reduced by monitoring seat belt infractions in real-time preemptively reinforcing adequate seat belt use.

## **Maintenance: Reducing planned and unplanned repair and maintenance**

Preventive maintenance is a regular part of vehicle ownership, but additional repairs due to aggressive driving and vehicle misuse are an unnecessary cost to a fleet. Market research suggests that excessive maintenance-related costs are



primarily driven by aggressive driving behaviors.

**Telematics potential savings:** non-scheduled events often result in large losses to a company that relies on its fleet assets for day-to-day operations. In fact, a non-scheduled maintenance interruption can result in lost profits of between \$400 to \$700 per day, in addition to the cost of repairs (4).

One of the major benefits of telematics is the use of predictive maintenance by properly detecting issues from the OBD port from the vehicles and alerting the driver or the fleet manager as to avoid higher costs down the road. During this pilot we established different rules to aid in vehicle health (battery drain, engine light on and oil life remaining). Out of these, faults of battery drain and engine light on can be first indicators of a future bigger problem on the vehicle, especially if not taken care of in a timely manner. During this pilot, the total duration of vehicles with these faults was **29,173 hours**, which can be shortened considerably if the AFC is properly notified.

#### **Fuel - Controlling runaway fuel costs**

Inconsistent risky driver behavior leads to increased fuel costs. In fact, the U.S. Department of Energy reports that rapid acceleration and harsh braking can reduce fuel economy by up to 33% for highway driving and 5% on city roads. Idling and speeding can also have a drastic impact on MPG.

**Telematics potential savings:** Market research has shown the effective use of telematics can reduce fuel costs by as much as 14% (5). For every 5 MPH over 50 MPH, a driver can reduce their MPG by approximately 7-14%. In the duration of this pilot, the total speeding events was **126,506** of those **21,701** were speeding events of over 5 MPH which can lead to extra costs.

#### **Roadside Assistance**

Fleet Operations spent \$101,735 on 920 roadside assistance calls in calendar year 2018 and \$99,242 on 888 roadside assistance calls in calendar year 2019.

**Telematics potential savings:** Telematics supplier offers roadside assistance for all light-duty vehicles on battery boost, fuel delivery, towing (up to 25 miles), locksmith service, and more.

#### **Vehicle utilization - 1100 miles per month per vehicle**

**Telematics savings:** Key performance indicators for fleet asset utilization metrics include days driven, drive time, and mileage. FMD and state agencies can easily view these vehicle statistics online, without the need to consult equipment logs or time sheets. Telematics provides a standard set of reports to help assess vehicle utilization so that we always have the right number of vehicles on hand to fulfill agency missions.

During the pilot, the total amount of vehicle driving time was **13,596 hours**, for a total distance of **495,246 miles**. This can be used to create a predictive analysis and determine when the vehicles may start to require more frequent maintenance events based on miles driven.

#### **Resources:**

1. NETS, NHTSA & OSHA. (n.d.). Guidelines for Employers to Reduce Motor Vehicle Crashes. Retrieved from [https://www.osha.gov/Publications/motor\\_vehicle\\_guide.pdf](https://www.osha.gov/Publications/motor_vehicle_guide.pdf)
2. Analysis of Fatal Crash Data West Virginia 2006-2010 Retrieved from <https://transportation.wv.gov/DMV/DMVFormSearch/WEST%20VIRGINIA%20DATA%20BOOK.pdf>
3. Taylor, V. (2014, October 13). Attention Fleet Manager: Fleet Safety is Important Too! Driver's Alert. Retrieved from <https://www.driversalert.com/attention-fleet-manager-fleet-safety-is-important-too/>
4. Understanding the true cost of fleet vehicle downtime. (n.d.) Retrieved from <http://fleetanswers.com/content/understanding-true-cost-fleet-vehicle-downtime>
5. Telematics to save fuel costs. (n.d.) Telematics Wire. Retrieved from <http://telematicswire.net/telematics-to-save-fuel-costs/>



# Conclusion

DEP has also provided a summary of after the six months which can be found in the Appendix

Geotab captured the data based on the requirements outlined in the success criteria and pointed out additional findings that were outside of the scope to help identify potential risks within the fleet that would negatively impact the organization.

1. Improve Safety
  - a. Driver Safety Scorecard
  - b. Speeding Violations average over the limit
2. Improve Operating Efficiency
  - a. Reduced fuel consumption
  - b. Reduced engine idle times
3. Asset Tracking
  - a. Instant collision notifications
4. Track Maintenance Reminders
  - a. Scheduled and preventive maintenance.

Overall, Geotab has provided all the tools and reports necessary to deem this pilot a success regarding the primary goals and objectives that were set forth at the beginning of the pilot. FMD has added telematics to the vehicle management vendor contract and will offer the devices to additional DEP vehicles and other state agencies once the new contract is awarded.



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west virginia department of environmental protection

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Office Name  
Office Address  
Phone/fax optional

Austin Caperton, Cabinet Secretary  
dep.wv.gov

## **TELEMATICS - PILOT** **AGENCY PERSPECTIVE AND UTILIZATION**

*In conjunction with the summary by the Fleet Management Division (FMD) the Department of Environmental Protection (DEP) is submitting this conclusion as an agency prospective.*

In 2018 the Fleet Management Division asked the Department of Environmental Protection (DEP) if they would like to volunteer to have vehicles in the telematics pilot program. Given the number of vehicles and the diverse conditions that the DEP utilizes their vehicles, it was a great test of the program. Once the contracts were in place FMD/DEP agreed to install 44 of the telematic units on vehicles from our Abandoned Mine Lands (AML) division. These vehicles are assigned to field inspectors and are used daily to go into a variety of conditions varying from paved roads to completely off grid locations in 4-wheel drive scenarios. The devices were installed in October of 2019 by an outside vendor that traveled to the DEP office to conveniently install. The installation itself was very smooth, however the billing process did see some difficulties due to the vehicles being billed via ARI to DEP but the installation of the telematics being procured by FMD, which FMD and DEP had to work to resolve.

The DEP works diligently to manage and maintain the vehicle fleet of 375 vehicles. Currently DEP uses an internally developed web-based database called Mileage Logger, that allows the users to enter daily commutes, and mileage. Multiple reports can be developed from this system and was developed to eliminate paper tracking and logs, all while being able to be accessed conveniently by a computer, phone, or tablet. During the pilot program the agency wanted to conclude if telematics would help meet the reporting requirements set forth by HB4015. After nearly 9 months of testing the conclusion is still unknown. While there are aspects of telematics that are certain benefits it is not the complete automation of all the reporting requirements for HB4015. The daily mileage log entries, and the commuting reports specifically are not able to be captured at this time. However, in working with FMD they are trying to resolve this, and confident that this will happen. When eliminating the reporting requirements to an automated system this will allow multiple benefits to occur. This will allow the inspectors the time they need to perform their respective jobs vs. having to be a constant administrator of entering information to be tracked. Automation of this process also eliminates, human error, fraudulence, and increases the accuracy of the reporting.

## Pros and Cons:

The pilot program has obvious pros, and cons that have been determined thus far. The cost benefits, and performance of the fleet has already been determined by FMD in their summary, and thus not necessary to duplicate. However, the performance and use of the systems on an agency and managerial level is beneficial deduce.

### Pros:

- Managerial oversight of employee
- Risk analysis
- Performance and goal setting standards
- Safety
  - Hazardous behavior correction
  - Lone worker situation – remote areas
- Ease of system use – in Geotab
- Diagnostics – mechanical diagnosis

### Cons:

- Employee morale – perceived as “big brother” tool, and lack of trust
- Reporting aspects still in development
- Difficulty of system use - in ARI
- Inaccurate data
- Aspects of system not reporting properly

## DEP management perspective:

### *Perspective 1:*

*“Overall, I have found the tool to be helpful in monitoring my staff and their work. I utilized the website, MyGeoTab on a weekly basis. I have framed the Telematics as a safety tool rather than a perceived intrusive tool, tracking their location, actions, and driving. I believe the tool has made them more aware of their driving habits. On several occasions during weekly/bi-weekly performance conversations, they have spoken about issues like hard braking or speeding along their daily routes. Below are my comments regarding the supervisory uses of Telematics.*

- *The MyGeoTab website has easy to use summaries, tables, and graphs for each vehicle. Using Google Maps for location are nice.*
- *Real time and accurate location of personnel. In working in remote locations and mining permits, if an emergency were to occur, known location of the vehicle can be found fast and accurately. Most mining permits have limited or no cell service.*
- *The engine diagnostic tool has helped to verify/find issues not fixed or found by ARI approved maintenance/repair vendors. Example: An ARI repair vendor was saying that a fuel pump was the issue for poor engine performance, but the vehicle was logging many cylinders 1 and 2 misfire codes through Telematics. ARI was informed of the issue and they asked the repair vendor to focus on new spare plugs and wiring of the cylinders. Problem with the engine performance was solved.*
- *Being able to look at vehicle driver’s data and reminding them of potential areas where they need to improve. Example: Speed limit changes abruptly in a city. Telematics showed the vehicle was traveling at an excessive speed through the city. I reminded the driver the speed*

*limit was 35 mph and they were 10 to 15 mph over the posted limit. The issue was corrected and now they are driving the speed limit in this area when review their information.*

- *Drivers are more aware of their location and daily routes are being tracked. The drivers document reasons for the out of the way or different routes taken if questioned by management. Documentation is mainly in their daily planners or through WVDEP Daily Vehicle Mileage Logger. Examples: Going into town to get parts from a hardware store for a repair. Traveling to a mining permit they do not normally work at to pick up fuel for sludge pumps or help co-workers on a project. Lastly, other vehicle accidents/closed roads, changing fastest routes by miles and longer drive times.*
- *Telematics duplicates most of the information entered by vehicle drivers in WVDEP Daily Vehicle Mileage Logger. With a couple of changes to Telematics, it could record the information entered by WVDEP employees. This would be a time saving for the employee providing them with more time performing their job duties."*

## **Perspective 2:**

*"After talking with the other supervisors at the Bridgeport AML office that have the ability to utilize Telematics, I think we all feel that it is mostly unnecessary. There have been incidences where the supervisor has used it to curb issues and behaviors of employees with less than desired integrity levels. For the most part, the employees of our office hold themselves to a professional level. It has been conveyed to them what the capabilities of Telematics are and as supervisors we do not want to be put in a place where we need to constantly manage the site, and they have acted accordingly.*

*One of the other benefits or abilities of Telematics that has been mentioned in the past is the ability to identify the location of an employee's vehicle for safety purposes. Our office and us as supervisors have stressed to our employees to check-in often throughout their workday of their location and activities. They have adhered to this procedure as well making it unnecessary for supervisors to check the Telematics' GPS capabilities.*

*One of the supervisors had mentioned the possibilities of using Telematics for new hires during their probationary period as a tool for what is to be expected of them as a driver and employee. On another note it is hard to make a definitive stance on the pros without knowing the cost that is associated with Telematics. Bottom line is that currently Telematics is under-utilized in our office because the employees we supervise have held themselves to a higher standard making Telematics mostly seen as an unnecessary cost to the state."*

## **Conclusion:**

In conclusion the pilot program of vehicle telematics could potentially be the path forward for fleet vehicles for our agency. We know that there are clear cost savings yet to be determined by a cost benefit analysis if this will offset the overall cost of using telematics. From an agency standpoint it is not clear of the consistent use of telematics as a policy and legislation would need to be in place to set the expectations of the use of telematics. FMD has shown that telematics has the ability to report on driver behavior but the use and management of this system, accountabilities, and enforcement would require an entire staff dedicated solely to the monitoring of the vehicles and driver behavior.

Overall, the supervisor's perspective of the system is positive and can be used as a management tool to supervise and have a safer work environment. However, the negative employee morale is

something that will have to be overcome. If it is a statewide initiative to implement the telematics the employee will not feel so scrutinized.

As a fleet coordinator for the agency I feel that this is a helpful and ultimately necessary tool for the future of managing vehicle fleets. Once clear policy and procedure in place and expectations set this will ultimately provide us with much needed data to help analyze the performance of the fleet. DEP often has workers that are in a lone worker situation and in remote areas, this is an added benefit that will allow us to have a last known location of vehicle in an emergency scenario. Given the above mentioned, and in conjunction with the summary provided by FMD it is concluded that telematics is a tool that DEP will highly consider to have installed on our fleet if it is determined that it is optional to us, and not mandated to be used.

If you have any questions or need further information, please feel free to contact us.

Sincerely,



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Administrative Manager II





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