Town of Pilot Mountain
Town Hall 124 West Main Street Pilot Mountain, NC 27041
Wednesday, September 18, 2019, 4:15 PM

BOARD OF COMMISSIONERS SPECIAL MEETING AGENDA

Call to Order

Adoption of Agenda

New Business

1. **Police Department Take Home Vehicle Program**
2. Resolution Regarding Acquisition of Conservation Easements

Adjournment

Police Department Take Home Vehicle Program
Background Information:
During the budget process for FY 2020 the Board discussed the possibility of purchasing enough new police vehicles to implement a take home vehicle program. The Board directed staff to remove that item from the budget and to conduct some further research. Staff has done so and will present information and recommendations to the Board.

Staff Recommendation:	Staff recommends that the Board adopt a take home vehicle program as described in the attached memo.

Possible Board of Commissioner Actions

- Approve the take home vehicle program and necessary purchases as presented.
- Make changes to the program and approve.
- Deny approval to the program
- Send back to staff for further review
- Table to a later date
- Take no action

Attachments

- Take Home Vehicle Recommendations Memo
- Take Home Vehicle Policy
- Michigan State Policy Vehicle Testing Information
- Take Home Vehicle Research

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MEMORANDUM

TO:	**Mayor and Board of Commissioners**
FROM:	**Michael Boaz, Town Manager and Darryl Bottoms, Chief of Police**
DATE:	**September 10, 2019**
RE:	**Police Take Home Vehicles and 2019 Vehicle Purchase**

During the budget discussions for FY 2020 the Board discussed the possibility of implementing a take home vehicle policy for the Police Department. At that time, staff told the Board that this would require the purchase of at least 3 new police cars. We proposed at that time to finance these vehicles using the traditional bank financing method. The Board decided during these discussions to remove this capital purchase from the budget and asked staff to develop more information and to explore the possibility of using a lease program like the Enterprise program that the County had recently adopted.

Since that time staff has been working with representatives from Enterprise to get some additional information about their program and to get quotes. We have that information and are ready to present that information to the Board. We have also developed information on leasing the vehicles directly from GM and getting more traditional financing from the bank to make the purchase. We will present our findings below.

Current Situation

Currently the department has five vehicles in regular service. These include a 2004 Crown Vic, 2006 Impala, 2016 and 2017 Ford Interceptor Sedan, and a 2018 Ford Interceptor SUV. The department also has a 1989 Chevy Truck and a 2000 Ford Expedition. These two vehicles are not used on a regular basis. Currently there are three vehicles that are assigned to an individual officer. The 2004 Crown Vic is the K-9 vehicle and it is assigned to Officer Blizzard. The 2006 Impala is assigned to Captain Jackson and the 2018 Interceptor SUV is assigned to Chief Bottoms.

The 2016 and 2017 Interceptor Sedans are assigned to patrol. The 2016 unit is driven by patrol officers Livengood, Wooten, and Montieth. This means that ¾ of the time this vehicle is on the road. The 2017 Interceptor is driven by the Sergeants and is on the road for 12 hours out of every 24. This means that the mileage and maintenance costs on these two vehicles will increase greatly overtime. It also means that the resale value of these vehicles will be lower b/c of the high mileage they will get over there life span with the department.

Vehicle Selection

As a part of this process, Police Department reviewed the types of vehicles it had purchased in the past and what options are available. The PD relied on both its experience with different vehicle types and the report published by the Michigan State Police on their field testing of all available police vehicle models. In the past the department has used both the Dodge Charger and the Ford Interceptor sedan. We did not have a great experience with the Dodge Charger as the costs to maintain this vehicle were high over its life span. This is likely because of the continuous usage of the vehicle and the relatively low speed operation of the vehicle. The Charger has a V8 Hemi engine and is simply not built for low speed, in Town patrol. The department has had a reasonably good experience with the two Interceptor sedans, but the maintenance costs for the 2016

Interceptor are starting to mount. Again, we believe that is based on the car's almost continuous use since it was put into service. Unfortunately, Ford has discontinued this model.

The Department also has a Ford Interceptor SUV in service. It has only been in service for 1 year and so far the experience this unit has been good. Ford has decided to increase the price of the vehicle for 2020 and change the engine to, what most research that we have done, a model that likely will be less reliable.

After viewing the Michigan State Police report, staff decided to get pricing on a Chevy Tahoe as well. The Michigan State Police rated this vehicle highly in its field testing. In addition the vehicle is larger than the Ford model and therefore will increase officer comfort.

Staff has decided that the Chevy Tahoe is probably the best fit for the department at this point in time. The vehicle offers a number of standard safety features, is slightly bigger than the Ford, has a standard 5 year 60,000 mile powertrain warranty, officers similar gas mileage to the Ford SUV, and maintains a higher re-sell value. All of this at a original cost of just $3,000 more than the Ford.

Therefore we will be using the Chevy Tahoe as the vehicle choice in comparing the different financing models below. The cost to outfit and mark each vehicle will be approximately $6.500

Enterprise

The Enterprise program is not a traditional lease as we would all understand it. Essentially, under this model Enterprise would serve as the bank for the Town. The interest rate for this is relatively low at just over 2%. However, there is also a management fee of $720 per year per vehicle. Also, the rate that the Town pays for the vehicle is not based on the full cost of the vehicle, but rather the estimated depreciation of the vehicle over the term of the agreement. So with the Tahoe under the Enterprise option the Town would pay about $31,000 for the $36,000 vehicle, including all fees and interest. At the end of the 5 year term, there would still be roughly $5,000 owed on the vehicle. Enterprise and the Town would jointly sell the vehicle, with the Town keeping the difference between the sales price and the remaining amount owed. However, if the market for these vehicles changes and the vehicle sells for less than anticipated, the Town owes the balance.

Direct Leasing from GM

We also looked at the option of leasing the vehicle directly from GM. Again, this is not a traditional lease but rather a lease purchase agreement. At the end of the lease, the Town would buy the vehicle for $1 from GM Financial. The total annual cost, per vehicle under this option is $33,600. This includes interest of 4.66%. The benefit of this option is that there is no risk at the end of the lease of the Town owing more money. We know that we will have paid the balance and if we choose to sell the vehicles, then any money generated from that sale will be the Towns.

Traditional Bank Financing

Finally, we looked at traditional bank financing for the purchase of these vehicles. We got a rate of 3.85% with an annual payment of $32,847.17.

Take Home Vehicle

Staff also looked at the pros and cons of a take home vehicle program.

The biggest benefit to the Town of such a program is that in the long run it will save money. The cost savings comes from the lowered maintenance costs. We estimate that the 2016 Interceptor and 2017 Interceptor are averaging about 20,000 per year. The maintenance costs for the 2016 Interceptor in FY 2019 were $4,911.95. If you add this to the per year acquisition cost of the vehicle over 5 years, the total cost of ownership per year is $10,911.95. We estimate that the total cost of ownership for each of the Tahoes to be $8431.79, a savings of almost $2500 per year. In addition, we believe that a Tahoe sold after 5 years or 60,000 miles will bring

about $13,500. We anticipate that the 2016 Interceptor will bring about $3,500 when it is sold. In addition the implementation of a take home vehicle program will be a recruiting and retention tool for our PD. We would be the only municipal department in Stokes or Surry County that had such a program. It would boost the morale of our current officers and help us recruit new officers in the future. Having a take home vehicle also limits the time it will take officers to respond to emergencies. They will have all of the equipment that they need with them and can go directly to the scene. Finally, having a policy that has regular replacement of vehicles will insure that officers are driving cars with the newest safety features which could help limit injury in the event of a crash.

There are of course cons to a take home vehicle program. First, some will see the program as the Town paying for gas for the officers to commute to work. Second, there will be additional costs for the insurance on the vehicles as they cost more and there will be more of them. The additional insurance costs will not outweigh the lowered costs of maintenance and the increased re-sell value of the vehicles. The IRS has a specific exemption to the rules regarding the taxability of take home vehicles AND there personal use for sworn, armed police officers. That being said, we believe that the personal use of the vehicle should be limited and have done so in a policy recommendation.

There are a number of studies that have been done that outline the costs and benefits of a take home vehicle policy for law enforcement. We have included several of them with this memo. The Center for Public Safety Management, which is associated with the International City/County Management Association, strongly recommends the implementation of a take home vehicle policy. They believe that the cars will last longer, maintenance costs will be less, and officer morale will be improved by such a policy. In addition, we have included the Michigan State Police report on the different police vehicle models.

Recommendations

Staff would recommend the following to the Commissioners:

1. That the Commissioners adopt the attached take home vehicle policy.
2. That the Town acquire 4 Chevy Tahoes and finance those vehicles with Capital Bank.
3. That we use a combination of fund balance and the sales price of two surplus vehicles to fund the upfit cost of the vehicles.

Police Department Take Home Vehicle Program	
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Take Home Cars
An Overview

by Bob Nash, National FOP Research Section
December 14, 1995

In a 1993 Survey by the Bureau of Justice Statistics[1], it was reported that of the 614 police agencies across the United States that responded, 263 (43%) allowed their police officers to drive marked vehicles for commuting purposes. Of those 263 agencies, 111 (42%) also allowed their officers to use the vehicles off-duty for private use. In another report, 90% of state police agencies used take home fleet plans. Clearly, take home car plans have become an employee benefit for many of our members, and more would like to join the ranks of officers who enjoy them. However, like any benefit improvement, one must determine exactly what costs are involved and be ready to justify them. There are a number of significant benefits to both your agency and your members in establishing a take home car program. In this overview we will try to touch on those benefits, as well as on a couple of the negative aspects of a take home car plan. We hope you will have a better overall understanding of the impact of take home car plans should you wish to initiate, or retain, such a plan in your police department.

Comparing Costs

Comparing fleet costs of departments with take home car plans to the costs of departments utilizing traditional fleet programs is a difficult job at best. There are a good number of variables that significantly impact a vehicle's cost per mile. These include such considerations as initial cost, salvage value, fuel costs, and maintenance expenses. Each of these considerations can vary greatly depending on the approach your department takes.

For instance, in a recent comparison done between a state highway patrol agency and a major city police department, the cost per mile for the state cars was determined to be $0.27 per mile versus $0.40 per mile for the city fleet. The Highway Patrol owns their fleet of 3,400 cars. They replace those vehicles every 95,000 miles. Their cars averaged 3,550 miles per month and had a life expectancy of 26 months. They use a pool concept and the cars are run 2 or 3 shifts a day. Before selling their vehicles, the highway patrol agency removes all the police equipment and cleans, details and paints each vehicle at a cost of $550 to $750 per vehicle. Their resale value is then customarily between $6,000 and $7,000. When they are purchased, the highway patrol pays approximately $17,800 for the vehicles, which includes the price of an extended warranty which covers the drive train for up to 100,000 miles.

Highway Patrol Fleet Model

Cost	$17,800
Salvage	(6,500)
Refurbish	650
Net Cost	$11,950
Maintenance & Fuel	$13,300
Total Cost	$25,250
Mileage	9,500
Cost Per Mile	$0.27

[1] "Law Enforcement Management and Administrative Statistics, 1993: Data for Individual State and Local Agencies with 100 or More Officers," U.S. Department of Justice, Office of Justice Programs, Bureau of Justice Statistics, NCJ-148825, ©1995.

The city department leases its fleet from its department of general services. The lease rate includes all the maintenance, repairs (except accident damage), and fuel costs. When the vehicles reach between 60,000 and 80,000 miles, they undergo a major overhaul of drive components (the General Services Department spends approx. $3,450 per vehicle for the overhaul). The vehicles are auctioned off when they reach 120,000 miles. The majority of the cars in the fleet are assigned to officers who use them on duty and for commuting to and from work.

City Model

Avg. Miles Per Month	1,459
Mileage	120,000
Life Expectancy (Months)	82
Monthly Lease Rate	$580
Total Cost	$47,704
Cost Per Mile	$0.40

The analysis noted that among the city's opportunities for saving money were purchasing rather than leasing the cars and looking at selling off their cars sooner. It noted that the city was paying $0.09 per mile (for miles between 80,000 and 120,000) by rebuilding the vehicles. At the same time, it cost highway patrol less than $0.01 per mile to purchase the extended warranty and trade the car off earlier. Consequently, they controlled their maintenance costs and obtained a significantly higher resale value.

Again, the point of the above discussion is to raise awareness of the many issues involved in the costs of police fleets. A take home car program may become much more affordable if other costs related to fleet management can be lowered. Opponents to take home car programs are quick to point out the costs involved in purchasing the additional cars. You must be ready to counter those claims by being informed of all the issues related to fleet costs.

Advantages and Disadvantages

There are other savings to be had by initiating a take home car program. In a study reported in The Police Chief magazine[2], a survey of 416 Tennessee law enforcement officers found that officers assigned vehicles on a take-home basis were involved in fewer accidents than those who used fleet vehicles. One can speculate that these cars were better maintained, that officers were more familiar with their operation and also drove with more care having a "sense of ownership" in the vehicles. The obvious benefits are lower vehicle maintenance costs and lower liability claims.

The Newport News (Virginia) Police Department began phasing take-home police cars into its fleet in 1984 as part of their Community-Oriented Police Patrol. Cars were issued to officers living within the city limits. They determined that the benefits of the program included enhanced visibility and service, improved vehicle care and reduced maintenance costs, and improved officer job satisfaction. The take home car program also serves as an inducement to remain a resident of Newport News.

Another study done in 1986 by the Hampton (Virginia) Police Department further supports the benefits of take home fleet programs. The study showed that both maintenance costs and operating costs were lower for the take home car fleet vehicles than for pooled cars. The maintenance costs for take home cars was $0.16 per mile versus $0.19 per mile for pool vehicles, a 16% savings. Operating costs for 55 take home cars was $0.17 per mile versus $0.20 per mile for the 24 pool vehicles, a 15% savings. Like the Tennessee study, the Hampton Police also found a significant drop in motor vehicle accidents involving take home police vehicles. Although take home cars made up a sizable majority of the police department's fleet, out of the twenty (20) preventable accidents involving police cars, only four (4) were take home cars.

[2] "Police Vehicles," Police Chief, Vol. 50, No. 1, January 1983, pg. 25-27.

Take home cars also add additional police units and protection to a community. The Hampton Police study also found, in 1985, that officers participated in 1,231 service calls, 38 arrests, 21 misdemeanor summonses, and 152 traffic summonses while off-duty. This represented 3,777 off-duty hours of protection provided to citizens and which acted to supplement on-duty personnel.

This extra police presence is also noted and supported by citizens. Hampton Police also surveyed citizens to determine community satisfaction with the take home car plan. In analyzing the responses of 320 citizens surveyed, Hampton Police found that 83.8 percent felt more secure with a patrol car in their neighborhood, 84 percent wanted a car in their neighborhood, and 88 percent felt the program should be continued.

A May 1992 article in Law and Order magazine[3] noted a number of other benefits. The article notes that about 90 percent of all State government law enforcement agencies use this system. Police use the vehicles for commuting and in return are responsible for keeping the vehicles clean and well maintained. The author notes that the advantages to the agency include having effectively two shifts on the road during shift changes, faster response times to emergencies, and simpler routines for call-outs. The article acknowledges that initial start-up costs can be of concern, but that net savings occur due to lower maintenance costs and extended vehicle life. It also notes that the costs of the increase in fleet size begin to be offset by lower maintenance costs by the second year of the policy. In the fourth year, vehicle replacement costs drop significantly because the take home cars accumulate fewer miles, extending their service time.

Take home car plans have their down sides, too. From a political standpoint, they give your chief, city manager, mayor, city council members, state representative and the like a very powerful bargaining chip that many use shamelessly. The threat of abolishing a take home car plan, where one has been in effect, can cause members to lose a good deal of enthusiasm when your organization is involved in a contract fight. A take home plan also can undermine officer camaraderie to a degree. Officers who might have once met after work at the station and gone out socializing no longer meet at the station. Instead, they are driving directly home with their patrol cars. Also, you will have small groups of citizens and politicians who will constantly be harping about this rich benefit that other workers do not enjoy. These are not insurmountable problems by any means and most would agree that the benefits of a take home car program far outweigh such concerns. However, it is important that you be ready to address the benefits to the community when these and other issues arise.

Clearly, take home car plans have a number of very attractive features. It also has some components which cause concern and some, like costs, which are complex. We are attempting to gather some more detailed cost analyses from departments which currently have take home car plans. We are also looking for a good analysis of take home car costs versus pool cars. In the meantime, I hope we have been able to give you a good start in your assessment of take home car plans and whether they make sense for you and your department.

[3] "Take Home Cars: After the First Shock There Are Benefits," Law and Order, Vol. 40, No. 5, (May 1992), pg. 88-91.

The Take Home Car Advantage

Chris Williamson

Conway Police Department

February 5, 2016

Problem Statement

During my nearly 14 years with the Conway Police Department, (CPD), I have seen a number of officers come and go, both good and bad. One of the primary reasons I believe that we lose officers to surrounding agencies is not the necessarily the pay, but the advantage of having a take home vehicle. We lose many officers annually, most of them to Horry County Police. This agency provides all of their officers with take home vehicles. Horry County police starting pay is less than ours and we have had officers take a pay cut to go to this agency. To that end, officers are willing to absorb a reduction in pay, sometimes substantial as in the case of a former CPD Detective, for the advantage of a take home car.

Currently the Conway Police Department consists of 61 officers and civilian staffers that provide 24/7, around the clock protection to nearly 20,000 residents of the city. The Department offers a full array of services, to include crime prevention, criminal investigations, front line patrol, K-9, and accident investigations. The city has grown exponentially in the past 14 years, however, the department has failed to keep pace with the overall growth of the city as a whole. When fully staffed, the department consists of 55 class one officers, however, the department is only maintaining a fleet of approximately 33 vehicles.

The problem with the department's fleet management approach is not a new one. The department has always "hot seated" vehicles. Hot seating is when the vehicle is constantly utilized 24 hours a day, 7 days a week. The supervisor would assign the officer a vehicle at the beginning of shift, requiring the oncoming officer to wait at the station for the on duty officer to complete his shift and transfer his personal equipment before the vehicle was ready for the on-coming officer to begin his tour of duty. To possibly drive a different vehicle each time he/she reported to work increased the likelihood that he/she would be placed in a vehicle that had a different setup, since there was not a policy governing

the type, placement and installation of equipment inside the vehicle. An officer would not be familiar with the vehicle set up and that could lead to issues such as accidents. This was how the vehicle assignments worked when I first came to work at the police department.

Since that time some progress has been made, with officers being assigned to share a vehicle. This is a step forward from the "hot seating" because the vehicles do have downtime between shifts, all be it minimal, and still some of the same issues with assigned shared vehicles arise as with the hot seated vehicles. There are days when an officer(s) still has to wait for the shared vehicle and officer operating it to return to the station before gear can be switched so that the oncoming officer is ready for patrol. There are other issues with the assigned shared vehicle scenario as well. For example when officers have to come in for extra duty assignments, or there is a large scale emergency, like the recent flooding, when more officers than your usual daily shift are called in for duty. In those cases the officer's assigned vehicle may not be available so they end up in someone else's assigned vehicle creating confusion and frustration for the officer. The department has a few "spare" vehicles, but they are rarely available when needed due to their ongoing daily use. Currently there are not even enough vehicles for every detective to have one while they are working without having to locate another officer's vehicle. The citizens of Conway deserve to have a department equipped to handle any situations that may arise and able to respond in a timely manner. A take home car program would help make that prospect a reality.

Contrary to the current belief, there is a cost effective solution for the department to provide every officer with a take home vehicle. All the data shows the benefits of this program. The department has gone from hot seating vehicles to assigned shared vehicles, and the next logical step to move forward is to take home/assigned vehicles. The data indicates that maintenance costs are lower on take home

vehicles, officers take more pride in their vehicles and take better care of them, which leads to less vehicle accidents with their patrol vehicles. The data will also show that take home/assigned vehicles stay on the road longer than shared vehicles, which leads to less down time and increased productivity. I believe that introducing the program at the department will not only bring more recruits applying for positions, but also help in keeping the officers we have and slow down the turnover rate. The data was collected from police departments across the country, from my own department, and from several other local departments that have the program already in place. They all show the undeniable benefits to implementing a take home car program that will far out way the initial startup costs that the department may face with the program, and it does not have to be implemented all at once. The program can be started over a period of years to break up the initial costs of purchasing a large amount of vehicles. Not only would the Conway Police Department and the officers benefit from the implementation of a take home vehicle program, but also the residents of the City of Conway. Benefits include seeing more police vehicles on the roads and parked within the neighborhoods, which creates a high visibility omni-presence and acts as a powerful deterrent of criminal activities.

Data Collection

There have been countless studies done at police departments across the country ranging from the largest of departments to the smallest of departments and all the data points to the same conclusion. Let's begin by examining data, and surveys obtained from the Conway Police Department, and compare them to a few other local South Carolina departments that currently have a take home vehicle program in use. The first step was to solicit input from officers at the department on a take home car program, and as one might imagine the results were very much in favor of implementing the program. A survey was conducted with all class one officers ranging from the Operations Captain to the newest patrol

officer. The goal of the survey was to get an idea from the department as a whole, their feelings about a take home car program, and to get a wide variety of opinions from officers from different command levels within the department. The surveys were emailed to each officer and consisted of the following questions:

1. How would a take home vehicle program impact the work of police services? List 3 positive things and 3 negative things.
2. The following question deals with officer perceptions of the program. Rate the below statements on a scale from 1 to 5:1 being disagree to 5 being strongly agree

   Reduced maintenance costs:

   Decreased response times:

   Increased officer morale:

   Crime Deterrence:

   Employee recruiting success:

   Employee retention:

   Crime Prevention:

   Increased patrol:
3. Do you think a take home vehicle program can help to develop a better attitude towards work? Why?
4. Estimate how much time it takes during a two-week pay period to load/unload a vehicle, wait on a vehicle, or find a vehicle to use.
5. Would you like to see a take home vehicle program implemented? How would this program impact you personally?

We will examine the results of this survey along with data collected from the City Maintenance Facility which is responsible for the maintenance and repairs for all city vehicles, including the police department. We will also examine data I have collected from the Bluffton, North Myrtle Beach, and Georgetown Police Departments, which all have implemented a take home vehicle system. We will also examine some case studies selected from the internet regarding take home vehicle programs from around the country.

Data Analysis

First let's take a look at some studies that have been done across the country on take home vehicle programs that were completed by organizations such as the International Chiefs of Police, Fraternal Order of Police, and International City/County Management Association. One study was conducted that compared a fleet of 30 assigned vehicles to a pool of 34 shared vehicles. The study found that operating costs per mile were 30% lower for assigned rather than shared vehicles. Based on the study, shared vehicles had to be replaced every 20 to 26 months compared to an average of 60 months for a take home/assigned vehicle. They also discovered that on average a shared vehicle averaged $8400 in damage a year when compared to an assigned/take home vehicles which only averaged $1375 per year. The study also looked at the amount down time that officers experienced while waiting to either load/unload vehicles. It found that on an average it took between 28 to 40 minutes per day to check-out, load/unload their shared vehicle. On average the shared car was unavailable 5.6 days a month due to repairs, lost keys, etc. So now the officer would have to find a spare vehicle with average another 25 minutes of non-productive time. All this equals to approximately 13 non-productive days per year per officer. This was a study done at the City of Tacoma police department which in the end concluded that

the take home vehicle program saves the city around 1.4 million per year versus a shared vehicle operation. (International City/County management Association "Police Vehicle Take Home Study" 2008)

A study conducted at the Hampton Virginia Police Department indicated that both maintenance and operating costs were lower with take home vehicles versus shared vehicles. The maintenance cost of take home vehicles averaged $0.16 per mile versus $0.19 per mile on shared vehicles, which is a 16% savings. (International City/County management Association "Police Vehicle Take Home Study" 2008)

Mercury Associates did an extensive study on take home vehicle programs and came up with the same conclusions discussed above. The average replacement for a take home vehicle was every 7 years versus about 3 ½ years for a shared vehicle with, annual maintenance costs averaged $7000 annually for shared vehicles versus $3500 for take home vehicles. The average non-productive time for officers sharing vehicles was 40 minutes a day per officer which is equivalent to 7,300 hours a year for a department the size of the Conway Police Department. This study was done based on a 260 man department and concluded that a take home vehicle program would save the department of that size approximately $21 million over a 20 year period. (Mercury Associates "Are Take Home Vehicle Programs for Police Officers Beneficial" 2013")

Each of these national studies indicates that not only are maintenance and operating costs lower with a take home vehicle program versus a shared vehicle program but there are also many other benefits. There are more police vehicles in neighborhoods, which makes residents feel safer and reduces crime. There is an increased visibility that gives the perception that more police are on the street. Officers will take better care of personal assigned vehicles and morale increases. It also makes it easier for management to hold individual officers accountable for misuse or neglect of the vehicle. There is a quicker response and better preparedness to emergency or critical situations, and officers tend to have

fewer accidents in take home vehicle versus shared vehicles because officers have a "sense of ownership" with that vehicle.

The studies also considered the disadvantages to a take home/assigned vehicle program and concluded that the benefits significantly outweighed the few disadvantages that were found. One of the obvious and most cited disadvantage is the initial startup costs of outfitting every officer with a fully equipped vehicle. We will discuss later ways in which initial start-up costs can be managed so as not to have a significant outlay of capital expenditures all at once. The other main disadvantage and perhaps the greatest to overcome is political. The program could give the city politicians or city manager powerful bargaining chip that many use shamelessly. They would expect a greater presence of police in neighborhoods if every officer is assigned their own vehicle. If the city is willing to make the investment then they would expect a higher return. They could always threaten to discontinue funding the program. It is always a possibility that a small group or minority of politicians, citizens, or both will complain about these benefits that are not being provided for other workers to enjoy. These issues can be overcome by providing independent verifiable, data that demonstrates the undeniable benefits of a take home vehicle program. Now let's look at the data collected from several local departments, along with the Conway Police Department to see if the cost estimates and other benefits provided in the national studies are supported by the local departments selected for the survey.

I met with our City Maintenance Facility Supervisor to obtain maintenance data on our shared patrol vehicles. First I requested the maintenance records on several different vehicles to determine what maintenance costs were associated with each vehicle. I started with a 2010 Chevrolet Impala (P-85). This vehicle is shared between two patrol officers, and occasionally used by other officers when theirs may not be available. A review of the vehicle's maintenance and repair record from the beginning of

2011 to present showed charges totaling $7032.08. This vehicle was taken out of the normal patrol rotation after four (4) years of service and assigned to support personnel due to mileage and overall deterioration of the vehicle. The next vehicle I looked at was also a 2010 Chevrolet Impala (P-86), but assigned to two supervisors. A review of this vehicle's maintenance records from the beginning of 2011 to present, indicated the vehicle has had $8,122.86 in maintenance and repair costs. This vehicle will be taken out of patrol rotation this year. The next vehicle, a 2010 Chevrolet Impala (P-84), is also shared by two (2) supervisors as well. Maintenance records indicated that from 2011 to present $4567.13 has been spent on this vehicle. This vehicle is scheduled to be removed from the normal patrol rotation next year. A 2013 Chevrolet Impala (P-92), which is assigned to (2) two patrol corporals was also selected as part of the study. Since being put in service in March of 2013, it has had $1656.76 in maintenance and repair work, and is still currently in service. I also selected a 2007 Chevrolet Impala (P-79), a take home vehicle that is assigned to the chief. Since 2011 this vehicle has only had $2702.76 of maintenance work and repairs. This is significantly less than the three (3) 2010 models and slightly more than the 2013 model that was selected. These numbers may be a little skewed so let's look at some comparisons from take home patrol vehicles from other local departments.

I contacted the Town of Bluffton, which is a similar size city and department as Conway and has a take home vehicle program. Bluffton offers all of its officers take home vehicles as part of their employment. I spoke with Sergeant Sheldon Epstein, the Departments Fleet Manager regarding the average operational life of their take home vehicles and maintenance costs. Sergeant Epstein informed me that their average patrol vehicle lasts approximately 6-7 years in the normal patrol rotation and then is used another 1-2 years for miscellaneous duties(e.g. use such as transport vehicles or spares). In comparison our vehicles last an average of 4-5 years in the patrol normal rotation, a reduction of 29%-33% in the expected operational life of the vehicle. Sergeant Epstein retrieved the maintenance records

on several of their take home vehicles for me to compare with ours. The first being a 2011 Ford Crown Victoria. The maintenance and repair records indicated that for the date it was put into service to present, was only $2509.33. The second vehicle was also a 2011 Ford Crown Victoria. Maintenance and repair records from the day it was put into service to present was $3,230. A third vehicle, again a 2011 Ford Crown Victoria indicate similar maintenance and repair costs of $2,344.40 from the date it was placed in service to the present. While different vehicle models, al are used for the same purpose and the much lower maintenance costs over the same time period is obvious. When comparing the highest operating cost of our P-86 with $8112 verses Bluffton's 2011 Ford with the highest operating cost of $3,230, a 60% increase operating costs. Sergeant Epstein also indicated on average that 6-7 new vehicle are purchased annually to keep the fleet current. At Conway we purchase about 5-6 vehicles a year, however, our fleet is not up to date and the majority of the vehicles in the fleet would be considered high mileage.

Bluffton was not the only other agency I met with. I also contacted North Myrtle Beach Public Safety who also provide all their officers with take home cars as long as they live within 12 miles of their headquarters. North Myrtle Beach is also a similar sized city in the way of area and number of officers as Conway. If a North Myrtle Beach Officer lives farther than the 12 mile requirement they are not provided with a take home vehicle, but they still have their own assigned vehicle. A review of their maintenance records using the same methodology on three (3) of their patrol vehicles also found similar operating and maintenance cost as in Bluffton. They include 2011 Ford Crown Victorias. Their maintenance and repair numbers for the three vehicles are $3115.42, $2792.25, and $4573.79 respectfully for the same operational period. Once again cost analysis found substantially lower maintenance costs for the take home vehicles versus the shared vehicles. North Myrtle Beach also advised me that their average patrol vehicle lasts 6-7 years.

Finally I obtained information from the Georgetown Police Department. They are also a similar sized department that offers take home cars to their officers. I obtained information from three of their patrol vehicles. They did not have any 2011 vehicles so 2010 Ford Crown Victoria's were used to conduct a comparison of maintenance and repair records for the time the vehicles were put into service until the present. The first vehicle's maintenance and repair records were reviewed for a comparable time period and operational costs were $4269.73. The second vehicle maintenance and repair records indicate similar operation costs of $4249.97, as did vehicle with $3213.75.

The comparisons from each department clearly indicates that the take home vehicles have an overall lower maintenance cost compared to shared vehicles. The cost analysis provided by the Bluffton Police Department indicated total expenditures of $8083.73 for three (3) patrol vehicles during an approximate four year span, North Myrtle Beach's operational costs were $ 10,481.46 for three (3) patrol vehicles for a similar timeframe, and Georgetown Police Department reported cost totaled $11,733.45 for the three (3) patrol vehicles used in the survey. This compares to a total cumulative cost of $19,722.07 in maintenance and operational costs for the three (3) shared patrol vehicles over the same period of time. When averaged the maintenance and repair costs of the three (3) departments with take home vehicles totals $10,099.55, compared to $19,722.07 for shared vehicles. This represents a 51.2% savings over a 4 year period on those three (3) vehicles. A further breakdown of the yearly maintenance cost per vehicle for take home vehicles was approximately $841.63 compared to $1643.51 for shared vehicles. Again translating into a 51.2% savings per vehicle, per year.

Saving money in maintenance costs is not the only benefit of a take home vehicle program. In analyzing the results from the survey that was distributed to the department's officers, it was determined that a take home vehicle program would be beneficial. Of the 22 surveys that were

completed and returned 21 out of 22 or 99% stated that they would like to see the program initiated. Fifteen out of twenty two officers, or 68.18%, reported that it would increase morale and possibly be a factor in remaining with the department. In the survey, 54.5% of the officers indicated that they would take better care of the vehicle, due to having a "sense of ownership" and pride. Also in the survey, 90.9% of officers thought that the program would be a helpful tool in recruiting and retention of employees, meaning less turn-over. In speaking with the Human Resource Director for the City of Conway, she advised that at least one (1) former employee indicated during an exit interview that one of the reasons for leaving was to have a take home car at another agency. Normally an officer will stay with a department approximately 2 years before he/she will be hired by another department. In researching the costs associated with hiring a new, non-certified officer (training, equipping and time) I found it to be approximately obtained $100,000 over a two (2) year period. That equates to $100,000 each time an experienced officer leaves the department. The only negative comments regarding a take home car program I found in my survey was the initial startup costs of providing every officer with a take home vehicle. However, when comparing the numbers in a cost analysis it is clear to see that the initial startup cost will more than offset in the long run by the efficiencies and increased productivity the program will produce.

Implementation Plan

Based on my research, there are two implementation paths for agencies considering moving forward with the take home vehicle program. The first option would be to "bite the bullet" and purchase the number of vehicles necessary to outfit each officer with their own vehicle. As already indicated the Conway Police Department currently maintains a fleet of 33 vehicles. To provide each officer with a take home vehicle, would require the purchasing of approximately 23 additional vehicles, less 2-3 spare

vehicles that would be needed and used when assigned vehicles are out of service for repairs. This approach would be extremely challenging from both a budgetary and political standpoint, due to capital outlay required in a single year's budget.

Option two involves implementing this program is over a period of time, perhaps over 3-5 years. Normally, when the department receives new vehicles, the same amount of old vehicles are taken off the road and sold and/or used for spares. This approach is more achievable and cost effective since the fleet can be increased incrementally without busting the budget and sacrificing other equipment purchases and employee compensation. For example if six (6) new vehicles are purchased in a given year the three (3) worst ones would be dead lined and the remaining three (3) would be kept and issued to the most senior officers. This would be repeated each year until the fleet was expanded sufficiently to eventually issue every officer a take home vehicle. Following this methodology, individual vehicle mileage and associated maintenance costs would decrease, while extending the operational life of the vehicle. Once the fleet numbers are stabilized, then the oldest vehicles would be rotated out of service and replaced by new ones. As in the case of North Myrtle Beach, guidelines and use and distance outside of the city must be factored into the decision making process on who will be assigned a take home vehicle. Regardless, complaints can be expected from the rank-in-file on any decisions, limitations or both that may be included in a take home vehicle policy.

No matter which option is chosen regarding the implementation of a take home vehicle program, the chief will be responsible for presenting the plan to both the City Administrator and City Council for approval. Since this is a budgetary matter and some degree of the costs involved, City Council would have to decide if they wish to commit the funding necessary for the program to be implemented as part of a long term investment in the police department.

Evaluation

Of course the only way to evaluate this program is to implement it and track all the costs that were identified and discussed in the study. It would take time to accurately evaluate all of the associated "hard" costs (e.g. insurance, fuel, tires, maintenance and repairs) over a number years, especially if the approach selected is to expand the fleet by adding a few take home vehicles each year.

Without question, the take home car program would take a significant investment by the City of Conway. However, I feel that the benefits of the program will far outweigh the initial costs of the program. Overall morale would be greatly increased, which leads to having more pride in their department, which in turn leads to more pride in the work that each officer does on a daily basis. A take home car gives officers a sense of ownership, which means they will take better care of their vehicles. This program not only benefits the officers at the department, but it also benefits every citizen of the City of Conway. There will be more marked patrol cars in the neighborhoods and on the streets, which leads to a sense of security and is a crime deterrent. It also means quicker response times, because non-productive "down time" waiting for another officer to return the vehicle and switching your gear out from your personal vehicle to the patrol car. In examining the data and looking at all the positives benefits, while weighing them against the few negatives, it is my opinion that implementing of this program should be seriously considered by City leadership and put into implementation at the earliest available opportunity.

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Police Vehicle Evaluation
Model Year 2019

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and

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2019 Model Year

Police Vehicle Evaluation Program

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PREFACE

The Michigan State Police Vehicle Test Team is pleased to announce the results of the 2019 Model Year Police Vehicle Evaluation. This year we tested twelve patrol vehicles and seven police motorcycles. We appreciate your continued support and encouragement. The vehicles evaluated this year included the following:

POLICE CATEGORY

Chevrolet Tahoe 5.3L RWD
Chevrolet Tahoe 5.3L 4WD
Dodge Charger 3.6L RWD
Dodge Charger 5.7L AWD
Dodge Charger 5.7L RWD
Dodge Durango Pursuit 3.6L
Dodge Durango Pursuit 5.7L
Ford Police Interceptor Utility Hybrid AWD
Ford Police Interceptor Utility 3.0L EcoBoost AWD
Ford Police Interceptor Utility 3.3L AWD
Ford F150 Police Responder 3.5L EcoBoost
Ford Police Responder Hybrid Sedan

MOTORCYCLES

BMW R 1250 RT-P
BMW F 750 GS-P
BMW F 850 GS-P
Harley-Davidson FLHTP
Harley-Davidson FLHP Stage 1
Harley-Davidson FLHTP Stage 2
Yamaha FJR1300AP

GENERAL INFORMATION

All the patrol vehicles were tested with a clean roof (no overhead light or light bar) and without “A” pillar mount spotlights. We believe this is the best way to ensure all the vehicles are tested on an equal basis. Remember that once overhead lights, spotlights, radio antennas, sirens, and other emergency equipment are installed, overall performance may be somewhat lower than we report.

Each vehicle was tested with the tires that are available as original equipment on the production model. Specific tire information for each vehicle is available in the Vehicle Description portion of this report. All vehicles listed in this report were equipped with electronic speed limiters unless otherwise noted, or with the exception of certain motorcycles.

Motorcycles were tested with equipment installed as provided by their respective manufacturer. Harley-Davidson and Yamaha chose to test their bikes with minimal equipment. BMW chose to test their bikes with the majority of the equipment installed.

The manufacturers were allowed to submit a one-half page highlight of their vehicle. These highlights will be included with the vehicle description and photograph. This information is direct from the manufacturer and is not an opinion or endorsement from the Michigan State Police. It is only an attempt to give the consumer the most information about the vehicle.

Chelsea Proving Grounds - Acceleration, Top Speed, & Braking Tests

Acceleration and Top Speed tests were performed at the Chelsea Proving Grounds. This 4.7-mile 140 mph neutral steer banked oval provides ample space to obtain accurate test results in these areas.

The Brake test is also performed at the Chelsea Proving Grounds, utilizing lanes one and two on the straightaway on the eastside of the oval.

We would like to thank Mr. Greg Spicher and Mr. Craig Latta for the assistance we received from the staff at the Chelsea Proving Grounds.

Grattan Raceway - Motorcycle Dynamics Test

Motorcycle Dynamics testing was performed at Grattan Raceway. This two-mile road course provides a taxing environment to test motorcycles in dynamics and continues to produce comprehensive results regarding durability and performance.

We appreciate the support we received from BMW, Harley-Davidson, and Yamaha during testing. This was the twelfth year of police motorcycle testing and we continue to get great feedback on this important component to the testing lineup.

Grattan Raceway - Vehicle Dynamics Test

Vehicle Dynamics testing was performed at Grattan Raceway. This two-mile road course provides a realistic environment to test vehicles in dynamics and continues to produce comprehensive results regarding durability and performance.

We appreciate the support we received from Fiat Chrysler Automobiles (FCA), Ford Motor Company, and General Motors during testing.

EVALUATION INFORMATION

Vehicle Dynamics Testing

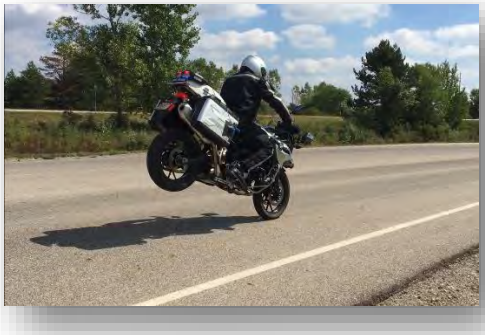
The Chevrolet Tahoe experienced transmission overheating during the vehicle dynamics testing. During the dynamics testing each vehicle is driven a total of 32 timed laps using four separate drivers, each driving an eight-lap series. The temperature on September 17, 2018, ranged from 70° Fahrenheit at 9 a.m. to 88° Fahrenheit at 3:30 p.m. Both the rear wheel drive and four-wheel drive Tahoes experienced partial power/protect mode issues in laps seven or eight on each run for each driver. This partial power mode limited the vehicles speed and caused the final lap times to increase substantially. General Motors (GM) engineers trouble shot the vehicles, and believed the reason was malfunctioning of the thermal bypass valves. These valves determine the flow of transmission fluid through the transmission oil cooler. Both the rear wheel drive and four-wheel drive Tahoes were retested on October 11, 2018, after having the thermal bypass valves replaced. The four-wheel drive Tahoe did not experience partial power during the retest. The rear wheel drive Tahoe experienced partial power on the last lap of the third and fourth runs. The temperature on October 11, 2018, remained 46° Fahrenheit throughout the testing.

The Los Angeles County Sheriff's Department (LASD) performed dynamics testing on both Tahoes on Thursday, October 25, 2018, in 84° Fahrenheit temperatures. The four-wheel drive Tahoe experienced the overheating and partial power mode conditions in the later laps of runs three and four. GM engineers have elected not to retest the vehicles at this time until they have isolated and corrected the root cause of the overheating condition.

After the evaluation on October 25, 2018, the Tahoe four-wheel drive went through redevelopment with product improvements. On January 24, 2019, the Tahoe four-wheel drive was retested and successfully completed all 32 laps of the LASD dynamic course as well as the city pursuit course. Winter conditions at the Grattan Raceway preclude the MSP from any confirmatory testing of the success of the engineering changes. The MSP will accept LASD's testing results as meeting our purchasing requirements.

The GM Engineering team has done extensive developments to resolve this issue. GM has no known incidents of the transmission over temperature issue as a result of insufficient transmission cooling capacity. Recognizing the importance of the testing, GM is continuously working to improve performance in its vehicles to better serve law enforcement needs.

If your vehicle experiences this condition, please contact your GM Fleet Service Representative.



Motorcycle Brake Testing

While performing brake testing on both the BMW F750 GS-P and the BMW F850 GS-P the rear tire lost contact with the roadway on the majority of brake applications. In general, the rear tire lifted 8 to 12 inches causing the rider to modulate braking pressure rather than applying a true panic stop. On several occasions the rider had to release front brake pressure as the rear tire lifted high enough that the motorcycle was no longer stable.

Vehicle Testing History, Pursuit Ratings,

and Purchasing Specifications

The Michigan State Police (MSP) began testing patrol cars in the 1950s. At that time, quotations were requested from manufacturers and only the vehicle with the lowest quotation was tested to see if it met our purchasing requirements. Years later, the quotations received from manufacturers were only four dollars apart. At that point, the MSP decided to test all vehicles in order to select the best vehicle. The equipment used to measure speed and distance has evolved from tape measure to global positioning systems providing more accurate measurements, making the MSP vehicle testing an internationally recognized resource for law enforcement agencies.

The term pursuit rated vehicle has recently been called into question as no one fully understands what this term represents. The term pursuit capable is more appropriate as there is no sanctioning body, or specific performance criteria, to determine if the vehicle meets a specialized designation. Each vehicle has been modified from a civilian vehicle to perform better under the rigors of police use. These vehicles are engineered to repetitively stop in a shorter distance, accelerate faster, and handle better than the base platform. Modifications to engines, cooling systems, transmissions and shifting parameters, brakes, tires, stability control programming, and other changes may all be included as part of the manufacturers police package.

The manufacturers provide upcoming model year vehicles to both the MSP and Los Angeles County Sheriff's Department to be tested for suitability in their respective operations. Historically, successful results at both test sites have validated the manufacturers' engineering efforts in building a car capable of handling the stress associated with police pursuits. Neither the MSP, nor the Los Angeles County Sheriff's Department, has the authority or credentials to award the term pursuit rated to any vehicle.

The MSP has performance criteria attached to its purchasing specifications. The criteria has historically been that a vehicle must accelerate from 0 – 60 mph in 9.0 seconds, 0 – 80 mph in 14.9 seconds, and 0 – 100 mph in 24.6 seconds. The vehicle must reach 110 mph in 4,838 feet and 120 mph in 8,985 feet. The vehicle must maintain an average deceleration rate of 25.79 ft./sec^2 while performing twenty 60 – 0 mph threshold braking stops. The vehicle must also successfully complete all 32 laps of the Grattan Raceway dynamics testing without major component failure. Meeting these criteria does not certify a vehicle as being pursuit rated, rather it justifies a vehicle is capable of performing the job function the MSP requires in a police vehicle. When reading the testing results in this book, it is up to each agency to determine if the vehicle is suitable for the mission of their agency.

We recommend you review the information contained in this report and then apply it to the needs of your agency. This report is not an endorsement of products, but a means of learning what's available for your officers so they can do their job effectively and safely. If anything in this report requires further explanation or clarification, please call or write.

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ACKNOWLEDGEMENTS

We would like to thank the following contributors. We are grateful for their support and encouragement toward our ultimate goal: a safe, successful testing program that benefits the law enforcement community nationwide and beyond.

Colonel Kriste Kibbey Etue, Director, Michigan Department of State Police
Lt. Colonel W. Thomas Sands, Deputy Director, Field Services Bureau
Lt. Colonel Richard T. Arnold, Deputy Director, State Services Bureau
Lt. Colonel Chris Kelenske, Deputy Director, Specialized Services Bureau
Mr. Shawn Sible, Deputy Director, Administrative Services Bureau
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Mr. Greg Spicher, Mr. Craig Latta and personnel from Chelsea Proving Grounds
Mr. Sam Faasen and personnel from Grattan Raceway Park

Photographs by Mr. Ray Holt, Michigan State Police
Vehicle Evaluation book prepared by Ms. Ashly O'Brien, Michigan State Police Precision Driving Unit

The Michigan State Police Precision Driving Unit would like to extend a very special "thank you" to Fiat Chrysler Automobiles, Ford Motor Company, General Motors, BMW Motorrad USA, Harley-Davidson Motorcycles, and Yamaha Motorcycles for their hard work in building and preparing the test cars and motorcycles. We are grateful for your dedication to law enforcement. Law enforcement officers rely on these vehicles to perform a vast array of duties.

Finally, thank you to all in the United States and Canada who represent law enforcement and purchasing agencies for your constant encouragement and support. We are proud to make a contribution to the law enforcement community.

Michigan State Police Vehicle Test Team:

Team Photo

Back Row: Ret. Sgt. David "Doc" Halliday, Lt. Mike McCarthy Tpr. Jeremy Cupp, Tpr. Jeff Mercer, Sgt. Rob Schwalm,

Front Row: Sgt. Jeffrey Yonker, Sgt. Nicholas Darlington, Sgt. Andy Douville, Sgt. Patrick Agema, Tpr. Lisa Kanyuh, Tpr. Jonathon Tibaudo, Ms. Jackie Fitzsimmons

Not Pictured: Ms. Ashly O'Brien

TEST EQUIPMENT

The following test equipment is utilized during the Acceleration, Top Speed, Braking, and Vehicle Dynamics portions of the evaluation program.

Racelogic USA 27240 Haggerty Rd Suite E17 Farmington Hills, MI 48331	• VBox 3i Data Collection System
Schuberth Helmets Stegelitzer Straße 12 39126 Magdeburg Deutschland	• Motorcycle Helmet – C3 Pro
AMB i.t. US-INC 1631 Phoenix Blvd. Suite 11 College Park, GA 30349	• Orbits 5.2 Extended Loop Decoder • AMB TranX260 Transponders
Alpinestars USA 2780 W. 237th Street Torrance, CA 90505-5270	• Alpinestars Protective Riding Apparel
Stilo Helmets USA 9A Electronics Ave. Danvers, MA 01923	• Test Driver Helmet – WRC DES Composite
Motorola Solutions 1303 East Algonquin Road Schaumburg, IL 60196	• Mag One BPR 40 Two-Way Radios

TEST VEHICLE DESCRIPTIONS AND PHOTOGRAPHS

2019 Chevrolet Tahoe
5.3L RWD

MAKE & MODEL	2019 Chevrolet Tahoe RWD
SALES CODE	CC15706
POWERTRAIN INFORMATION	
CUBIC INCHES	325
LITERS	5.3
DRIVE SYSTEM	Rear Wheel Drive
HORSEPOWER	355 HP
TORQUE	383 ft./lbs.
ALTERNATOR	170 AMP
BATTERY	720 Primary 730 Auxiliary CCA
TRANSMISSION	6-Speed Automatic
AXLE RATIO	3.08 Rear- Wheel Drive with Heavy-Duty Locking Rear Differential
TURNING RADIUS	39 ft.
TIRE SIZE, LOAD & SPEED RATING	Goodyear P265/60R17 All Season, 108 Load Rating, “V” Speed Rating
GROUND CLEARANCE, MINIMUM	8.5 inches
BRAKE SYSTEM	Heavy Duty 4-Wheel Anti-lock front & rear disc with Vacuum boost
FUEL CAPACITY	26 Gallons/98 Liters
GENERAL MEASUREMENTS	
WHEELBASE	116 inches
LENGTH	204 inches
CURB WEIGHT	5,224 lbs.
HEIGHT	72.4 inches
INTERIOR VOLUME	
FRONT	63.8 cu. ft.
REAR	56.9 cu. ft.
COMBINED	120.7 cu. ft.
TRUNK	112.1 cu. ft. (Max. Cargo)
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1,588 lbs. with 40/40 front seats (no center seat)
EPA MILEAGE EST. (MPG)	
CITY	15
HIGHWAY	22
COMBINED	18

MANUFACTURER VEHICLE HIGHLIGHTS

The Tahoe PPV is a full-size, body-on-frame, pursuit-rated cruiser. It provides excellent officer comfort, visibility, cargo capacity, up-fit capability, and true utility.

Tahoe interior showcases office-like ergonomics, innovative technologies, and a host of safety features to keep officers safe and connected behind the wheel. Standard are a Rear Vision Camera with 8” Display and Rear Park Assist backup sensors. An 8-inch Chevrolet Infotainment radio with Bluetooth1 cell phone connectivity and steering wheel mounted controls are also standard.

Optional Enhanced Driver Alert Package that includes Forward Collision Alert, Low Speed Forward Automatic Braking, Lane Keep Assist with Lane Departure Warning, and exclusive GM Safety Alert Seat is available.
The Tahoe PPV offers full pursuit capability with tremendous power, speed, braking, and agility. The 5.3L EcoTec3 V8 under the hood features direct injection, variable valve timing, and Active Fuel Management. It produces 355 horsepower and 383 lb.-ft of torque all while yielding better gas mileage than the engine it replaced (up to 22 highway mpg). Also, standard is an auxiliary battery to handle the electrical draw of emergency equipment, and a tow package capable of up to 4,000 lbs. of tow capacity2.

Whether it’s high-speed emergency vehicle operations, city patrol, HAZMAT, K-9 unit, medical first responder, or tactical operations, the 2019 Tahoe PPV reaffirms that the SUV is thriving and ready for duty.

1 Go to myChevrolet.com/learnAbout/bluetooth to find out which phones are compatible with the vehicle.
2 Before you buy a vehicle or use it for trailering, carefully review the Trailering section of the Owner’s Manual. The weight of passengers, cargo and options or accessories may reduce the amount you can tow.

2019 Chevrolet Tahoe
5.3L 4WD

MAKE & MODEL	2019 Chevrolet Tahoe 5.3L 4WD
SALES CODE	CK15706
POWERTRAIN INFORMATION	
CUBIC INCHES	325
LITERS	5.3
DRIVE SYSTEM	Four Wheel Drive
HORSEPOWER	355 HP
TORQUE	383 ft./lbs.
ALTERNATOR	170 AMP
BATTERY	720 Primary 730 Auxiliary CCA
TRANSMISSION	6-Speed Automatic
AXLE RATIO	3.08 Driver-Selectable 4-Wheel Drive with HD Locking Rear Differential
TURNING RADIUS	39 ft.
TIRE SIZE, LOAD & SPEED RATING	Goodyear P265/60R17 All Season, 108 Load Rating, “V” Speed Rating
GROUND CLEARANCE, MINIMUM	8.5 inches
BRAKE SYSTEM	Heavy Duty 4-Wheel Anti-lock front & rear disc with Vacuum boost
FUEL CAPACITY	26 Gallons/98 Liters
GENERAL MEASUREMENTS	
WHEELBASE	116 inches
LENGTH	204 inches
CURB WEIGHT	5,442 lbs.
HEIGHT	72.4 inches
INTERIOR VOLUME	
FRONT	68.3 cu. ft.
REAR	56.9 cu. ft.
COMBINED	120.7 cu. ft.
TRUNK	112.1 cu. ft. (Max. Cargo)
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1,628 lbs. with 40/40 front seats (no center seat)
EPA MILEAGE EST. (MPG)	
CITY	14
HIGHWAY	21
COMBINED	16

MANUFACTURER VEHICLE HIGHLIGHTS

The Tahoe PPV is a full-size, body-on-frame, pursuit-rated cruiser. It provides excellent officer comfort, visibility, cargo capacity, up-fit capability, and true utility.

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Whether it’s high-speed emergency vehicle operations, city patrol, HAZMAT, K-9 unit, medical first responder, or tactical operations, the 2019 Tahoe PPV reaffirms that the SUV is thriving and ready for duty.

1 Go to myChevrolet.com/learnAbout/bluetooth to find out which phones are compatible with the vehicle.
2 Before you buy a vehicle or use it for trailering, carefully review the Trailering section of the Owner’s Manual. The weight of passengers, cargo and options or accessories may reduce the amount you can tow

2019 Dodge Charger
3.6L RWD

MAKE & MODEL	2019 Dodge Charger 3.6L RWD
SALES CODE	27A, Z1B
POWERTRAIN INFORMATION	
CUBIC INCHES	220
LITERS	3.6
DRIVE SYSTEM	Rear Wheel Drive
HORSEPOWER	292 HP
TORQUE	260 ft./lbs.
ALTERNATOR	220 AMP
BATTERY	800 CCA
TRANSMISSION	5 Speed Electronic Automatic
AXLE RATIO	2.62
TURNING RADIUS	37.7 ft.
TIRE SIZE, LOAD & SPEED RATING	P225/60/R18, 103V, Goodyear Eagle RSA
GROUND CLEARANCE, MINIMUM	5.1 inches
BRAKE SYSTEM	Power, Dual Piston Front/Single Piston Rear, 4 Channel Anti-Lock
FUEL CAPACITY	18.5 Gallons/70.03 Liters
GENERAL MEASUREMENTS	
WHEELBASE	120.2 inches
LENGTH	198.4 inches
CURB WEIGHT	4,019 lbs.
HEIGHT	58.4 inches
INTERIOR VOLUME	
FRONT	55.6 cu. ft.
REAR	49.2 cu. ft.
COMBINED	104.7 cu. ft.
TRUNK	16.5 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1390 lbs.
EPA MILEAGE EST. (MPG)	
CITY	18
HIGHWAY	26
COMBINED	20

MANUFACTURER VEHICLE HIGHLIGHTS

The 2019 Dodge Charger Pursuit comes with FCA's exclusive, no-cost Officer Protection Package, which includes the Fleet Safety Group. This package is designed to provide officers with rear vision and enhanced officer safety when parked and working inside their vehicle. When activated, the rear-facing camera and sensors detect movement behind the vehicle. When motion is detected, images automatically appear on the vehicle's Uconnect touchscreen - and any or all of the following can be programmed to occur: alert chimes sound, reverse lights and tail lamps flash, windows roll up and all doors lock.

The available Uconnect 12.1-inch display integrates law enforcement systems and innovative technology to improve safety and occupant space.

New for 2019:

- Greater range of screen brightness settings to better accommodate individual officer preferences
- Usable area on Uconnect 12.1-inch touchscreen has been increased to 97 percent (from 87 percent)
- New USB connectivity increases tracking and input speed for keyboard and mouse

The 2019 Dodge Charger Pursuit features a Pentastar® V6 engine with Decel Fuel Shut-Off feature that provides a unique balance of pursuit-rated performance and V6 efficiency, including Flex-Fuel capability.

Pursuit package upgrades include performance-tuned suspension, load-leveling shocks and heavy-duty brakes. Additional officer-focused upgrades include specially developed seats to accommodate belt-mounted gear, a steering wheel with auxiliary buttons for controlling police equipment and an I/P-mounted gear shifter that frees up the center console for police-specific controls.

2019 Dodge Charger
5.7L RWD

MAKE & MODEL	2019 Dodge Charger 5.7L RWD
SALES CODE	29A, 5ZV
POWERTRAIN INFORMATION	
CUBIC INCHES	345
LITERS	5.7
DRIVE SYSTEM	Rear Wheel Drive
HORSEPOWER	370 HP
TORQUE	395 ft./lbs.
ALTERNATOR	220 AMP
BATTERY	800 CCA
TRANSMISSION	5 Speed Electronic Automatic
AXLE RATIO	2.62
TURNING RADIUS	37.7 ft.
TIRE SIZE, LOAD & SPEED RATING	P245/55/R18, 103V, Goodyear Eagle RSA
GROUND CLEARANCE, MINIMUM	5.1 inches
BRAKE SYSTEM	Power, Dual Piston Front/Single Piston Rear, 4 Channel Anti-Lock
FUEL CAPACITY	18.5 Gallons/70.03 Liters
GENERAL MEASUREMENTS	
WHEELBASE	120.2 inches
LENGTH	198.4 inches
CURB WEIGHT	4,325 lbs.
HEIGHT	58.4 inches
INTERIOR VOLUME	
FRONT	55.6 cu. ft.
REAR	49.2 cu. ft.
COMBINED	104.7 cu. ft.
TRUNK	16.5 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1200 lbs.
EPA MILEAGE EST. (MPG)	
CITY	16
HIGHWAY	25
COMBINED	18

MANUFACTURER VEHICLE HIGHLIGHTS

The 2019 Dodge Charger Pursuit comes with FCA's exclusive, no-cost Officer Protection Package, which includes the Fleet Safety Group. This package is designed to provide officers with rear vision and enhanced officer safety when parked and working inside their vehicle. When activated, the rear-facing camera and sensors detect movement behind the vehicle. When motion is detected, images automatically appear on the vehicle's Uconnect touchscreen - and any or all of the following can be programmed to occur: alert chimes sound, reverse lights and tail lamps flash, windows roll up and all doors lock.

The available Uconnect 12.1-inch display integrates law enforcement systems and innovative technology to improve safety and occupant space.

New for 2019:

- Greater range of screen brightness settings to better accommodate individual officer preferences
- Usable area on Uconnect 12.1-inch touchscreen has been increased to 97 percent (from 87 percent)
- New USB connectivity increases tracking and input speed for keyboard and mouse

Power under the hood comes from the legendary 5.7L HEMI® V8 engine. Its Variable Valve Timing (VVT) increases power output without sacrificing fuel economy through continuous adjusting of the camshaft timing.

Pursuit package upgrades include performance-tuned suspension, load-leveling shocks, heavy-duty brakes and two-mode police-specific Electronic Stability Control (ESC). Additional officer-focused upgrades include specially developed seats to accommodate belt-mounted gear, a steering wheel with auxiliary buttons for controlling police equipment and an I/P-mounted gear shifter that frees up the center console for police-specific controls.

2019 Dodge Charger
5.7L AWD

MAKE & MODEL	2019 Dodge Charger 5.7L AWD
SALES CODE	29A, 590
POWERTRAIN INFORMATION	
CUBIC INCHES	345
LITERS	5.7
DRIVE SYSTEM	All Wheel Drive
HORSEPOWER	370 HP
TORQUE	395 ft./lbs.
ALTERNATOR	220 AMP
BATTERY	800 CCA
TRANSMISSION	5 Speed Electronic Automatic
AXLE RATIO	3.08
TURNING RADIUS	38.7 ft.
TIRE SIZE, LOAD & SPEED RATING	P245/55/R18, 103V, Goodyear Eagle RSA
GROUND CLEARANCE, MINIMUM	5.1 inches
BRAKE SYSTEM	Power, Dual Piston Front/Single Piston Rear, 4 Channel Anti-Lock
FUEL CAPACITY	18.5 Gallons/70.03 Liters
GENERAL MEASUREMENTS	
WHEELBASE	120.2 inches
LENGTH	198.4 inches
CURB WEIGHT	4,520 lbs.
HEIGHT	58.4 inches
INTERIOR VOLUME	
FRONT	55.6 cu. ft.
REAR	49.2 cu. ft.
COMBINED	104.7 cu. ft.
TRUNK	16.5 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1000 lbs.
EPA MILEAGE EST. (MPG)	
CITY	15
HIGHWAY	23
COMBINED	18

MANUFACTURER VEHICLE HIGHLIGHTS

The 2019 Dodge Charger Pursuit comes with FCA's exclusive, no-cost Officer Protection Package, which includes the Fleet Safety Group. This package is designed to provide officers with rear vision and enhanced officer safety when parked and working inside their vehicle. When activated, the rear-facing camera and sensors detect movement behind the vehicle. When motion is detected, images automatically appear on the vehicle's Uconnect touchscreen - and any or all of the following can be programmed to occur: alert chimes sound, reverse lights and tail lamps flash, windows roll up and all doors lock.

The available Uconnect 12.1-inch display integrates law enforcement systems and innovative technology to improve safety and occupant space.

New for 2019:
- Greater range of screen brightness settings to better accommodate individual officer preferences
- Usable area on Uconnect 12.1-inch touchscreen has been increased to 97 percent (from 87 percent)
- New USB connectivity increases tracking and input speed for keyboard and mouse

The 2019 Dodge Charger Pursuit's advanced all-wheel-drive system transitions seamlessly from RWD to AWD, resulting in more control for officers. The segment-exclusive active transfer case and front-axle disconnect system monitor and adapt to environmental/road conditions, vehicle mode and driver habits. This system improves traction, acceleration and cornering balance. The 5.7L HEMI® V8 engine features Variable Valve Timing (VVT), which increases power output without sacrificing fuel economy through continuous adjusting of the camshaft tuning based on the level of performance required.

Pursuit package upgrades include performance-tuned suspension, load-leveling shocks, heavy-duty brakes and two-mode police-specific Electronic Stability Control (ESC). Additional officer-focused upgrades include specially developed seats to accommodate belt-mounted gear, a steering wheel with auxiliary buttons for controlling police equipment and an I/P-mounted gear shifter that frees up the center console for police-specific controls.

2019 Dodge Durango
3.6L AWD

MAKE & MODEL	2019 Dodge Durango Pursuit 3.6L
SALES CODE	2BZ, 514
POWERTRAIN INFORMATION	
CUBIC INCHES	220
LITERS	3.6
DRIVE SYSTEM	All Wheel Drive
HORSEPOWER	293 HP
TORQUE	260 ft./lbs.
ALTERNATOR	220 AMP
BATTERY	650 CCA + Aux 200 CCA
TRANSMISSION	8 Speed Automatic
AXLE RATIO	3.45
TURNING RADIUS	41.0 ft.
TIRE SIZE, LOAD & SPEED RATING	265/60R18T Michelin Latitude Tour HP
GROUND CLEARANCE, MINIMUM	8.1 inches
BRAKE SYSTEM	Power with dual piston front calipers, single piston rear calipers, anti-lock
FUEL CAPACITY	24.6 Gallons/93.12 Liters
GENERAL MEASUREMENTS	
WHEELBASE	119.8 inches
LENGTH	201.2 inches
CURB WEIGHT	4,849 lbs.
HEIGHT	70.9 inches
INTERIOR VOLUME	
FRONT	54.4 cu. ft.
REAR	44.8 cu. ft.
COMBINED	99.2 cu. ft.
TRUNK	47.7 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1640 lbs.
EPA MILEAGE EST. (MPG)	
CITY	18
HIGHWAY	25
COMBINED	21

MANUFACTURER VEHICLE HIGHLIGHTS

The 2019 Dodge Durango Pursuit – America's high-performance police SUV – is equipped with world-class safety and security features, segment-first technology and tactical equipment. The Uconnect 7.0-inch display integrates law enforcement systems and innovative technology. The 2019 Durango Pursuit embodies the three qualities that every Dodge law enforcement vehicle is designed to maximize: safety, performance and efficiency.

Dodge recognizes that the heroic men and women who protect us must be equipped with the best-performing pursuit-rated vehicle. With input from law enforcement officials, the 2019 Durango Pursuit continues to add improvements to meet the high expectations and performance needs of the heroes who protect us.

New for 2019

- The 2019 Dodge Durango Pursuit adds a new front fascia with integrated brake-cooling air ducts for improved brake performance and durability

Durango Pursuit models feature all-wheel-drive (AWD) and offer the standard 3.6-liter Pentastar V-6 engine rated at 293 horsepower and 260 lb.-ft. of torque, class-exclusive, K-9 friendly tri-zone interior temperature control and the segment's longest wheelbase (120 inches) for added stability and handling.

2019 Dodge Durango
5.7L AWD

MAKE & MODEL	2019 Dodge Durango 5.7L AWD
SALES CODE	22Z, 514
POWERTRAIN INFORMATION	
CUBIC INCHES	345
LITERS	5.7
DRIVE SYSTEM	All Wheel Drive
HORSEPOWER	360 HP
TORQUE	390 ft./lbs.
ALTERNATOR	220 AMP
BATTERY	700 CCA
TRANSMISSION	8 Speed Automatic
AXLE RATIO	3.09
TURNING RADIUS	41.0 ft.
TIRE SIZE, LOAD & SPEED RATING	265/60R18T Michelin Latitude Tour HP
GROUND CLEARANCE, MINIMUM	8.1 inches
BRAKE SYSTEM	Power with dual piston front calipers, single piston rear calipers, anti-lock
FUEL CAPACITY	24.6 Gallons/93.12 Liters
GENERAL MEASUREMENTS	
WHEELBASE	119.8 inches
LENGTH	201.2 inches
CURB WEIGHT	5,211 lbs.
HEIGHT	70.9 inches
INTERIOR VOLUME	
FRONT	54.4 cu. ft.
REAR	44.8 cu. ft.
COMBINED	99.2 cu. ft.
TRUNK	47.7 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1650 lbs.
EPA MILEAGE EST. (MPG)	
CITY	14
HIGHWAY	22
COMBINED	17

MANUFACTURER VEHICLE HIGHLIGHTS

The 2019 Dodge Durango Pursuit – America's high-performance police SUV – is equipped with world-class safety and security features, segment-first technology and tactical equipment. The Uconnect 7.0-inch display integrates law enforcement systems and innovative technology. The 2019 Durango Pursuit embodies the three qualities that every Dodge law enforcement vehicle is designed to maximize: safety, performance and efficiency.

Dodge recognizes that the heroic men and women who protect us must be equipped with the best-performing pursuit-rated vehicle. In addition to the legendary 5.7L V-8 HEMI® engine that delivers a best-in-class 360 horsepower, Durango Pursuit offers the segment's most advanced all-wheel-drive (AWD) system for maximum tactical performance, all-weather traction and fuel-efficiency. With input from law enforcement officials, the 2019 Durango Pursuit continues to add improvements to meet the high expectations and performance needs of the heroes who protect us.

New for 2019

- The 2019 Dodge Durango Pursuit adds a new front fascia with integrated brake-cooling air ducts for improved brake performance and durability

Durango Pursuit models feature all-wheel-drive (AWD) and the 5.7-liter V-8 HEMI model that's rated at a best-in-class 360 horsepower and 390 lb.-ft. of torque and includes the segment's most technologically advanced AWD system with a segment-exclusive active transfer case to improve real-world fuel economy while also enhancing the vehicle's traction and handling

2020 Ford Police Interceptor Utility Hybrid AWD

MAKE & MODEL	2020 Ford Police Interceptor Utility Hybrid AWD
SALES CODE	K8A, 99W
POWERTRAIN INFORMATION	
CUBIC INCHES	201
LITERS	3.3
DRIVE SYSTEM	All Wheel Drive
HORSEPOWER	TBD
TORQUE	TBD
ALTERNATOR	DC/DC Converter: 220 AMP
BATTERY	800 CCA
TRANSMISSION	10 Speed
AXLE RATIO	3.73
TURNING RADIUS	40.4 ft.
TIRE SIZE, LOAD & SPEED RATING	255/60R18 108V
GROUND CLEARANCE, MINIMUM	7.4 inches
BRAKE SYSTEM	ABS & Regenerative Braking with power dual piston front calipers, single piston rear calipers
FUEL CAPACITY	19.0 Gallons/72.0 Liters
GENERAL MEASUREMENTS	
WHEELBASE	119.1 inches
LENGTH	198.8 inches
CURB WEIGHT	5,303 lbs.
HEIGHT	69.5 inches
INTERIOR VOLUME	
FRONT	59.7 cu. ft.
REAR	58.5 cu. ft.
COMBINED	118.2 cu. ft.
TRUNK	89.9 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1637 lbs.
EPA MILEAGE EST. (MPG)	
CITY	TBD
HIGHWAY	TBD
COMBINED	TBD

MANUFACTURER VEHICLE HIGHLIGHTS

NEW FEATURES & CHANGES:

- All-new for 2020 Model Year, the Ford Police Interceptor Utility comes with standard Hybrid AWD and Ford Telematics
- Hybrid and AWD is ideal for law enforcement, due to optimal performance and significant fuel savings achieved by reduced engine idle time; with hybrid technology, on-board electrical equipment is powered via the lithium-ion hybrid battery, allowing the gas engine to shut off for extended periods, running intermittently to charge the battery
- Fuel savings of over $3,500 per year, per vehicle, at $2.75/gallon; see www.fordpoliceinterceptor.com for details

SAFETY:

- Ford Police Interceptors are the only vehicles in the world designed and engineered for the 75-mph rear-impact crash test
- New factory-installed Police Perimeter Alert monitors approximately 270° and secures vehicle if threatening motion detected
- Optional Level III & IV NIJ Ballistic Panels – includes additional LAPD special threat rounds
- Standard Anti-Stab plates in front seat backs

DURABILITY:

- Enhanced police durability-cycle tested, proven real-world durability results

PERFORMANCE:

- New standard Hybrid powertrain provides increased horsepower, torque, acceleration and top speed vs. 3.7L AWD
- Standard AWD provides optimum handling in all road conditions – dry, ice/snow, wet/rain, gravel, etc.

2020 Ford Police Interceptor Utility EcoBoost AWD

MAKE & MODEL	2020 Ford Police Interceptor Utility 3.0L EcoBoost AWD
SALES CODE	K8A, 99C
POWERTRAIN INFORMATION	
CUBIC INCHES	183
LITERS	3.0
DRIVE SYSTEM	All Wheel Drive
HORSEPOWER	TBD
TORQUE	TBD
ALTERNATOR	250 AMP
BATTERY	730 CCA
TRANSMISSION	10 Speed
AXLE RATIO	3.31
TURNING RADIUS	40.4 ft.
TIRE SIZE, LOAD & SPEED RATING	255/60R18 108V
GROUND CLEARANCE, MINIMUM	7.2 inches
BRAKE SYSTEM	Power - dual piston calipers front, single piston calipers rear, 4 circuit ABS
FUEL CAPACITY	21.4 Gallons/81.0 Liters
GENERAL MEASUREMENTS	
WHEELBASE	119.1 inches
LENGTH	198.8 inches
CURB WEIGHT	4,848 lbs.
HEIGHT	69.5 inches
INTERIOR VOLUME	
FRONT	59.7 cu. ft.
REAR	58.5 cu. ft.
COMBINED	118.2 cu. ft.
TRUNK	89.9 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1632 lbs.
EPA MILEAGE EST. (MPG)	
CITY	TBD
HIGHWAY	TBD
COMBINED	TBD

MANUFACTURER VEHICLE HIGHLIGHTS

NEW FEATURES & CHANGES:

- All-new for 2020 Model Year, the Ford Police Interceptor Utility comes with standard Hybrid AWD and Ford Telematics
- Hybrid and AWD is ideal for law enforcement, due to optimal performance and significant fuel savings achieved by reduced engine idle time; with hybrid technology, on-board electrical equipment is powered via the lithium-ion hybrid battery, allowing the gas engine to shut off for extended periods, running intermittently to charge the battery
- Optional 3.3L Direct Injection and 3.0L EcoBoost engines also available

SAFETY:

- Ford Police Interceptors are the only vehicles in the world designed and engineered for the 75-mph rear-impact crash test
- New factory-installed Police Perimeter Alert monitors approximately 270° and secures vehicle if threatening motion detected
- Optional Level III & IV NIJ Ballistic Panels – includes additional LAPD special threat rounds
- Standard Anti-Stab plates in front seat backs

DURABILITY:

- Enhanced police durability-cycle tested, proven real-world durability results

PERFORMANCE:

- New 3.0L EcoBoost AWD provides increased horsepower, torque, acceleration and top speed vs. 3.5L EcoBoost AWD
- Standard AWD provides optimum handling in all road conditions – dry, ice/snow, wet/rain, gravel, etc.

2020 Ford Police Interceptor Utility
3.3L AWD

MAKE & MODEL	2020 Ford Police Interceptor Utility 3.3L AWD
SALES CODE	K8A, 99B
POWERTRAIN INFORMATION	
CUBIC INCHES	201
LITERS	3.3
DRIVE SYSTEM	All Wheel Drive
HORSEPOWER	TBD
TORQUE	TBD
ALTERNATOR	250 AMP
BATTERY	730 CCA
TRANSMISSION	10 Speed
AXLE RATIO	3.73
TURNING RADIUS	40.4 ft.
TIRE SIZE, LOAD & SPEED RATING	255/60R18 108V
GROUND CLEARANCE, MINIMUM	7.6 inches
BRAKE SYSTEM	Power - dual piston calipers front, single piston calipers rear, 4 circuit and ABS
FUEL CAPACITY	21.4 Gallons/81.0 Liters
GENERAL MEASUREMENTS	
WHEELBASE	119.1 inches
LENGTH	198.8 inches
CURB WEIGHT	4,755 lbs.
HEIGHT	69.5 inches
INTERIOR VOLUME	
FRONT	59.7 cu. ft.
REAR	58.5 cu. ft.
COMBINED	118.2 cu. ft.
TRUNK	89.9 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1636 lbs.
EPA MILEAGE EST. (MPG)	
CITY	TBD
HIGHWAY	TBD
COMBINED	TBD

MANUFACTURER VEHICLE HIGHLIGHTS

NEW FEATURES & CHANGES:
- All-new for 2020 Model Year, the Ford Police Interceptor Utility comes with standard Hybrid AWD and Ford Telematics
- Hybrid and AWD is ideal for law enforcement, due to optimal performance and significant fuel savings achieved by reduced engine idle time; with hybrid technology, on-board electrical equipment is powered via the lithium-ion hybrid battery, allowing the gas engine to shut off for extended periods, running intermittently to charge the battery
- Optional 3.3L Direct Injection and 3.0L EcoBoost engines also available

SAFETY:
- Ford Police Interceptors are the only vehicles in the world designed and engineered for the 75-mph rear-impact crash test
- New factory-installed Police Perimeter Alert monitors approximately 270° and secures vehicle if threatening motion detected
- Optional Level III & IV NIJ Ballistic Panels – includes additional LAPD special threat rounds
- Standard Anti-Stab plates in front seat backs

DURABILITY:
- Enhanced police durability-cycle tested, proven real-world durability results

PERFORMANCE:
- New standard Hybrid powertrain provides increased horsepower, torque, acceleration and top speed vs. 3.7L AWD
- Standard AWD provides optimum handling in all road conditions – dry, ice/snow, wet/rain, gravel, etc.

2019 Ford F150 Police Responder
3.5L EcoBoost

MAKE & MODEL	2019 Ford F-150 Police Responder 3.5L EcoBoost
SALES CODE	W1P
POWERTRAIN INFORMATION	
CUBIC INCHES	213
LITERS	3.5
DRIVE SYSTEM	Four Wheel Drive
HORSEPOWER	375 HP
TORQUE	470 ft./lbs.
ALTERNATOR	240 AMP
BATTERY	800 CCA
TRANSMISSION	10-Speed SelectShift Automatic
AXLE RATIO	3.55
TURNING RADIUS	47.1 ft.
TIRE SIZE, LOAD & SPEED RATING	275/65R18, 110S
GROUND CLEARANCE, MINIMUM	9.3 inches
BRAKE SYSTEM	Power – dual piston calipers front, single piston calipers rear, 4 circuit and ABS
FUEL CAPACITY	26.0 Gallons/87 Liters
GENERAL MEASUREMENTS	
WHEELBASE	145.0 inches
LENGTH	231.9 inches
CURB WEIGHT	5,060 lbs.
HEIGHT	77.2 inches
INTERIOR VOLUME	
FRONT	79.9 cu. ft.
REAR	51.9 cu. ft.
COMBINED	131.8 cu. ft.
TRUNK	52.8 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	2030 lbs.
EPA MILEAGE EST. (MPG)	
CITY	16
HIGHWAY	22
COMBINED	18

MANUFACTURER VEHICLE HIGHLIGHTS

NEW FEATURES:
The Ford F-150 Police Responder™ is the first-ever pursuit-rated pickup truck to market, designed for on-road pursuit with Built Ford Tough off-road capability. The standard FX4 off-road package includes a purpose-tuned suspension, electronic-locking rear axle and underbody skid plates. Unique upgrades include brake pad-friction material, front stabilizer bar for improved braking and handling, and durable fabric front seats with slim bolsters for comfort and anti-stab plates in seat backs. Best interior passenger volume of any pursuit-rated police vehicle, as well as best front/rear shoulder room, front/rear hip room and rear leg room.

SAFETY:
- Curve Control
- Rear View Camera with Dynamic Hitch Assist
- Perimeter Alarm
- Keyless Entry
- Standard Anti-Stab plates in front seat backs

DURABILITY:
- Off-Road tuned shock absorbers
- Underbody skid plates
- Upgraded front stabilizer bar
- Best payload capacity (2,030 lbs.) and best standard towing capacity (7,000 lbs.) of any pursuit-rated vehicle

PERFORMANCE:
- Powerful 3.5L EcoBoost® engine generates 375 horsepower and 470 lb.-ft. of torque, highest of any pursuit-rated vehicle
- 10-Speed Transmission with selectable drive modes: Tow/Haul, Snow/Wet, EcoSelect and Sport
- 240 amp alternator
- Unique brake pad-friction material

2019 Ford Police Responder Hybrid Sedan

MAKE & MODEL	2019 Ford Police Responder Hybrid Sedan
SALES CODE	P0A
POWERTRAIN INFORMATION	
CUBIC INCHES	122
LITERS	2.0
DRIVE SYSTEM	Front Wheel Drive
HORSEPOWER	188 HP
TORQUE	129 ft./lbs.
ALTERNATOR	165 AMP
BATTERY	590 CCA
TRANSMISSION	eCVT (Automatic)
AXLE RATIO	2.57
TURNING RADIUS	37.6 ft.
TIRE SIZE, LOAD & SPEED RATING	235/50R17 96W
GROUND CLEARANCE, MINIMUM	6.3 inches
BRAKE SYSTEM	Regenerative Braking System and 4-wheel Disc with Anti-Lock Brake System (ABS)
FUEL CAPACITY	14.0 Gallons/53.0 Liters
GENERAL MEASUREMENTS	
WHEELBASE	112.2 inches
LENGTH	191.8 inches
CURB WEIGHT	3,748 lbs.
HEIGHT	58.0 inches
INTERIOR VOLUME	
FRONT	55.2 cu. ft.
REAR	47.6 cu. ft.
COMBINED	102.8 cu. ft.
TRUNK	12.0 cu. ft.
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1200 lbs.
EPA MILEAGE EST. (MPG)	
CITY	40
HIGHWAY	36
COMBINED	38

MANUFACTURER VEHICLE HIGHLIGHTS

NEW FEATURES:

A Greener Shade of Blue™

The first-ever pursuit-rated Hybrid police vehicle to market, the Ford Police Responder™ Hybrid Sedan provides a capable option that delivers multiple benefits, including potential fuel savings, reduced CO_2 emissions and fewer fill-ups – meaning less vehicle downtime to keep your vehicles and officers on the road. Our scenario shows potential savings of nearly $4,300 per year, per vehicle, at $2.75 per gallon. See www.fordpoliceresponder.com for details and to run your own scenarios. In Fall 2017 testing at MSP, 0-100 acceleration was similar to the last testing of V8-powered Crown Victoria Police Interceptor in Fall 2011.

SAFETY:

- Standard Anti-Stab plates in front seat backs
- Standard Individual Tire Pressure Monitoring System
- Standard Police Engine Idle feature
- Standard Rear View Camera
- Optional NIJ Level IIIa Ballistic Panels

DURABILITY:

- Enhanced Police durability-cycle tested
- Standard Front Underbody Deflector Plate

PERFORMANCE:

- Pursuit calibrated powertrain
- Police-tuned Regenerative Braking System
- Heavy duty suspension components, upgraded braking and cooling

VEHICLE DYNAMICS TESTING

TESTING OBJECTIVE

To determine each vehicle's high-speed pursuit or emergency response handling characteristics and performance in comparison to the other vehicles in the test group. The course used is a 2-mile road-racing type configuration, containing hills, curves, and corners. The course simulates actual conditions encountered in pursuit or emergency driving situations in the field, with the exception of other traffic. The evaluation is a true test of the success or failure of the vehicle manufacturers to offer vehicles that provide the optimum balance between handling (suspension components), acceleration (usable horsepower), and braking characteristics.

TESTING METHODOLOGY

Each vehicle is driven a total of 32 timed laps, using four separate drivers, each driving an eight-lap series. The final score for the vehicle is the combined average (from the four drivers) of the five fastest laps for each driver during the eight-lap series.

Grattan Raceway, 7201 Lessiter Road, Belding, MI 48809

616-691-7221

GRATTAN RACEWAY
2019 (2020) MODEL YEAR VEHICLE DYNAMICS SCHEDULE
SEPTEMBER 17, 2018

	SCHWALM	AGEMA	DOUVILLE	MERCER
9:30 a.m.	Ford Police Responder Hybrid Sedan	Ford F-150 Police Responder 3.5L EcoBoost	Dodge Durango Pursuit 3.6L	Pass
9:50 a.m.	Dodge Charger 3.6 RWD	Dodge Charger 5.7L RWD	Pass	Dodge Charger 5.7L AWD
10:10 a.m.	Ford PI Utility Hybrid AWD	Pass	Ford PI Utility 3.0L EcoBoost AWD	Ford PI Utility 3.3L AWD
10:30 a.m.	Pass	Chevrolet Tahoe 5.3L RWD	Chevrolet Tahoe 5.3L 4WD	Dodge Durango Pursuit 5.7L
10:50 a.m.	Pass	Ford Police Responder Hybrid Sedan	Ford F-150 Police Responder 3.5L EcoBoost	Dodge Durango Pursuit 3.6L
11:10 a.m.	Dodge Charger 5.7L AWD	Dodge Charger 3.6 RWD	Dodge Charger 5.7L RWD	Pass
11:30 a.m.	Ford PI Utility 3.3L AWD	Ford PI Utility Hybrid AWD	Pass	Ford PI Utility 3.0L EcoBoost AWD
11:50 a.m.	Dodge Durango Pursuit 5.7L	Pass	Chevrolet Tahoe 5.3L RWD	Chevrolet Tahoe 5.3L 4WD
12:50 p.m.	Dodge Durango Pursuit 3.6L	Pass	Ford Police Responder Hybrid Sedan	Ford F-150 Police Responder 3.5L EcoBoost
1:10 p.m.	Pass	Dodge Charger 5.7L AWD	Dodge Charger 3.6 RWD	Dodge Charger 5.7L RWD
1:30 p.m.	Ford PI Utility 3.0L EcoBoost AWD	Ford PI Utility 3.3L AWD	Ford PI Utility Hybrid AWD	Pass
1:50 p.m.	Chevrolet Tahoe 5.3L 4WD	Dodge Durango Pursuit 5.7L	Pass	Chevrolet Tahoe 5.3L RWD
2:10 p.m.	Ford F-150 Police Responder 3.5L EcoBoost	Dodge Durango Pursuit 3.6L	Pass	Ford Police Responder Hybrid Sedan
2:30 p.m.	Dodge Charger 5.7L RWD	Pass	Dodge Charger 5.7L AWD	Dodge Charger 3.6 RWD
2:50 p.m.	Pass	Ford PI Utility 3.0L EcoBoost AWD	Ford PI Utility 3.3L AWD	Ford PI Utility Hybrid AWD
3:10 p.m.	Chevrolet Tahoe 5.3L RWD	Chevrolet Tahoe 5.3L 4WD	Dodge Durango Pursuit 5.7L	Pass

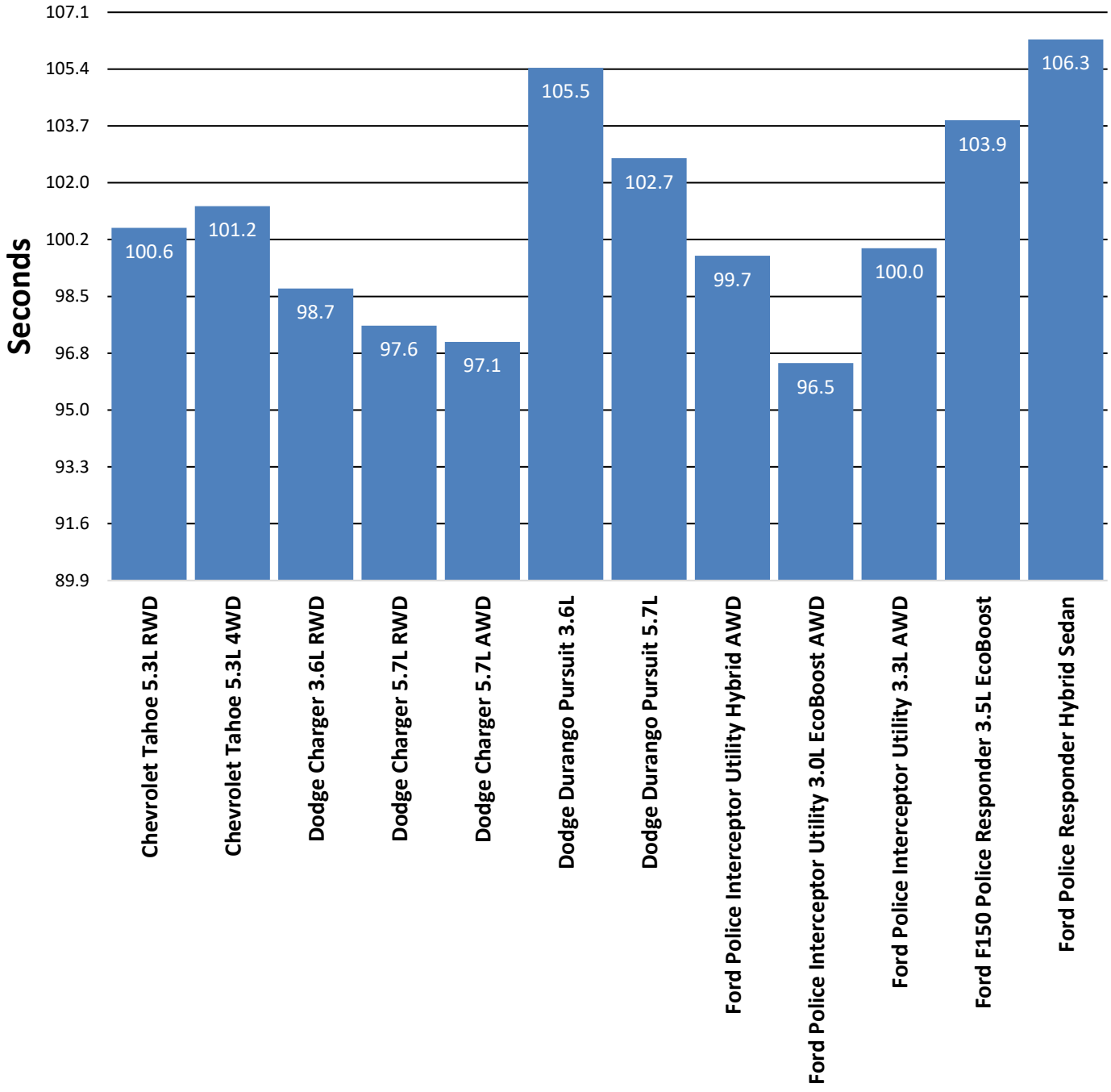
VEHICLE DYNAMICS TESTING ON SEPTEMBER 17, 2018

Vehicles	Drivers	Lap 1	Lap 2	Lap 3	Lap 4	Lap 5	Average
Chevrolet Tahoe 5.3L RWD	AGEMA	01:40.96	01:40.79	01:40.74	01:40.26	01:40.82	01:40.71
	DOUVILLE	01:40.46	01:40.28	01:40.29	01:40.98	01:41.11	01:40.62
	MERCER	01:40.00	01:39.49	01:39.90	01:39.67	01:39.75	01:39.76
	SCHWALM	01:41.53	01:40.68	01:41.22	01:40.85	01:41.89	01:41.23
OVERALL AVERAGE	*** Refer to page 3 for further details**						**01:40.58**
Chevrolet Tahoe 5.3L 4WD	DOUVILLE	01:41.98	01:41.69	01:42.01	01:42.25	01:41.66	01:41.92
	MERCER	01:39.71	01:40.11	01:39.77	01:40.32	01:40.73	01:40.13
	SCHWALM	01:41.81	01:40.95	01:41.38	01:42.17	01:43.15	01:41.89
	AGEMA	01:41.02	01:41.22	01:41.24	01:40.66	01:40.98	01:41.02
OVERALL AVERAGE	*** Refer to page 3 for further details**						**01:41.24**
Dodge Charger 3.6L RWD	SCHWALM	01:39.78	01:39.51	01:39.20	01:38.69	01:39.43	01:39.32
	AGEMA	01:38.24	01:39.30	01:38.93	01:38.59	01:39.11	01:38.83
	DOUVILLE	01:38.85	01:38.97	01:38.91	01:38.80	01:38.94	01:38.89
	MERCER	01:38.12	01:38.10	01:37.69	01:37.67	01:38.03	01:37.92
OVERALL AVERAGE							**01:38.74**
Dodge Charger 5.7L RWD	AGEMA	01:37.47	01:38.02	01:37.87	01:37.42	01:37.67	01:37.69
	DOUVILLE	01:37.39	01:37.29	01:37.38	01:37.45	01:37.45	01:37.39
	MERCER	01:36.83	01:36.93	01:36.80	01:36.91	01:36.79	01:36.85
	SCHWALM	01:38.56	01:37.82	01:38.92	01:38.79	01:38.49	01:38.52
OVERALL AVERAGE							**01:37.61**
Dodge Charger 5.7L AWD	MERCER	01:36.65	01:36.48	01:36.73	01:36.47	01:35.79	01:36.42
	SCHWALM	01:37.18	01:37.30	01:37.27	01:37.57	01:37.44	01:37.35
	AGEMA	01:37.23	01:36.98	01:36.84	01:36.89	01:37.21	01:37.03
	DOUVILLE	01:37.66	01:37.69	01:37.55	01:37.50	01:37.63	01:37.61
OVERALL AVERAGE							**01:37.10**
Dodge Durango Pursuit 3.6L	DOUVILLE	01:45.82	01:45.56	01:45.31	01:45.76	01:45.91	01:45.67
	MERCER	01:44.49	01:44.21	01:44.19	01:44.39	01:44.43	01:44.34
	SCHWALM	01:45.60	01:45.31	01:45.04	01:45.39	01:45.48	01:45.36
	AGEMA	01:46.38	01:46.22	01:46.40	01:46.79	01:46.42	01:46.44
OVERALL AVERAGE							**01:45.45**

VEHICLE DYNAMICS TESTING ON SEPTEMBER 17, 2018

Vehicles	Drivers	Lap 1	Lap 2	Lap 3	Lap 4	Lap 5	Average
Dodge Durango Pursuit 5.7L	MERCER	01:42.34	01:42.15	01:42.21	01:42.54	01:41.80	01:42.21
	SCHWALM	01:42.24	01:42.40	01:42.09	01:42.51	01:42.62	01:42.37
	AGEMA	01:43.80	01:42.86	01:43.70	01:44.09	01:44.16	01:43.72
	DOUVILLE	01:42.65	01:42.44	01:42.35	01:42.58	01:42.56	01:42.52
OVERALL AVERAGE							**01:42.70**
Ford Police Interceptor Utility Hybrid AWD	SCHWALM	01:39.48	01:39.22	01:39.39	01:39.48	01:39.46	01:39.41
	AGEMA	01:40.34	01:40.30	01:40.28	01:40.49	01:39.81	01:40.24
	DOUVILLE	01:40.39	01:40.13	01:39.75	01:40.26	01:40.36	01:40.18
	MERCER	01:38.61	01:39.25	01:39.06	01:39.22	01:39.24	01:39.08
OVERALL AVERAGE							**01:39.73**
Ford Police Interceptor Utility 3.0L EcoBoost AWD	DOUVILLE	01:36.54	01:36.90	01:36.82	01:36.79	01:36.81	01:36.77
	MERCER	01:35.82	01:35.77	01:35.62	01:35.22	01:35.41	01:35.57
	SCHWALM	01:36.56	01:36.58	01:36.58	01:36.43	01:36.62	01:36.55
	AGEMA	01:37.18	01:36.92	01:36.91	01:36.71	01:37.29	01:37.00
OVERALL AVERAGE							**01:36.47**
Ford Police Interceptor Utility 3.3L AWD	MERCER	01:39.15	01:38.92	01:38.98	01:39.11	01:39.39	01:39.11
	SCHWALM	01:39.09	01:39.38	01:39.68	01:39.38	01:39.31	01:39.37
	AGEMA	01:41.31	01:41.45	01:41.23	01:41.70	01:41.13	01:41.36
	DOUVILLE	01:39.85	01:40.05	01:40.12	01:40.10	01:39.96	01:40.02
OVERALL AVERAGE							**01:39.96**
Ford F150 Police Responder 3.5L EcoBoost	AGEMA	01:43.87	01:44.19	01:43.68	01:44.30	01:44.53	01:44.11
	DOUVILLE	01:43.61	01:43.84	01:43.63	01:43.56	01:44.01	01:43.73
	MERCER	01:44.16	01:43.46	01:43.37	01:42.40	01:42.52	01:43.18
	SCHWALM	01:44.75	01:44.14	01:43.99	01:44.35	01:44.58	01:44.36
OVERALL AVERAGE							**01:43.85**
Ford Police Responder Hybrid Sedan	SCHWALM	01:46.05	01:46.11	01:46.34	01:46.48	01:46.20	01:46.24
	AGEMA	01:46.24	01:45.79	01:46.02	01:45.97	01:45.82	01:45.97
	DOUVILLE	01:46.99	01:46.68	01:46.79	01:47.43	01:47.32	01:47.04
	MERCER	01:45.38	01:45.51	01:46.07	01:46.42	01:46.58	01:45.99
OVERALL AVERAGE							**01:46.31**

2019 Model Year
Vehicle Dynamics




Grattan
RACEWAY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ACCELERATION AND TOP SPEED TESTING

ACCELERATION TESTING OBJECTIVE

To determine the ability of each test vehicle to accelerate from a standing start to 60 mph, 80 mph, and 100 mph, and determine the distance to reach 100 mph and 120 mph.

ACCELERATION TESTING METHODOLOGY

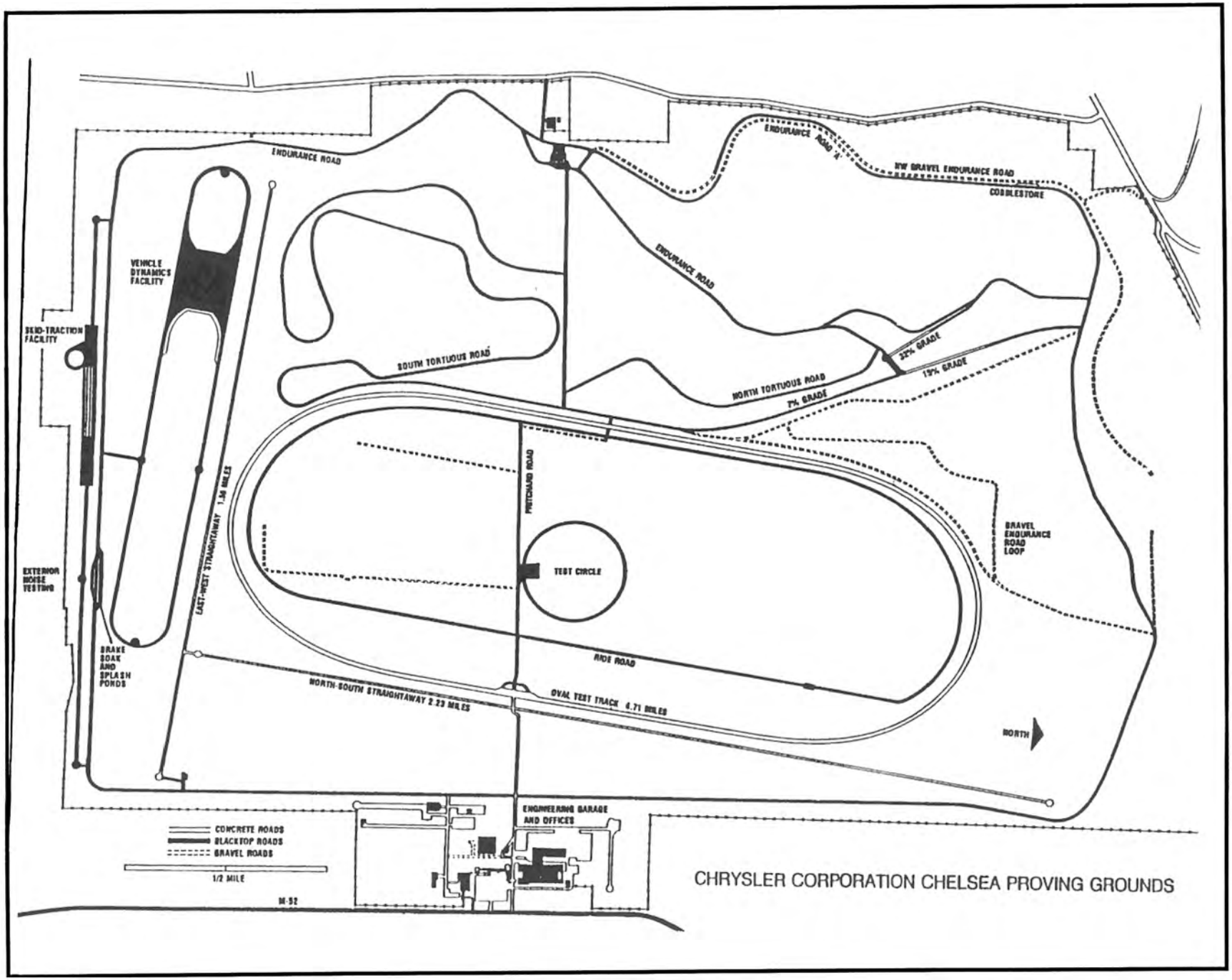
Using a Race Logic Vbox 3i GPS based data collection unit, each vehicle is driven through four acceleration sequences, two northbound and two southbound, to allow for wind direction. The four resulting times for each target speed are averaged and the average times are used to derive scores for acceleration.

TOP SPEED TESTING OBJECTIVE

To verify the electronically limited top speed reported by the manufacturer attainable by each test vehicle within a distance of 14 miles from a standing start.

TOP SPEED TESTING METHODOLOGY

Following the fourth acceleration run, each test vehicle continues to accelerate to the top speed attainable within 14 miles from the start of the run. The highest speed attained within the 14-mile distance is considered the vehicle's top speed.


ENDURANCE ROAD
ENDURANCE ROAD
NW GRAVEL ENDURANCE ROAD
COBBLESTONE
ENDURANCE ROAD
VEHICLE DYNAMICS FACILITY
SKID-TRACTION FACILITY
SOUTH TORTUOUS ROAD
NORTH TORTUOUS ROAD
22% GRADE
19% GRADE
7% GRADE
EAST-WEST STRAIGHTAWAY 1.56 MILES
PRITCHARD ROAD
TEST CIRCLE
GRAVEL ENDURANCE ROAD LOOP
EXTERIOR NOISE TESTING
BRAKE SOAK AND SPLASH PONDS
RIDE ROAD
NORTH-SOUTH STRAIGHTAWAY 2.23 MILES
OVAL TEST TRACK 4.71 MILES
NORTH
ENGINEERING GARAGE AND OFFICES
CONCRETE ROADS
BLACKTOP ROADS
GRAVEL ROADS
1/2 MILE
M-52
CHRYSLER CORPORATION CHELSEA PROVING GROUNDS

TEST LOCATION: Chelsea Proving Grounds **DATE:** September 15, 2018

Chevrolet Tahoe 5.3L RWD

BEGINNING TIME: 1:23 p.m. **TEMPERATURE:** 80.4° F
WIND VELOCITY: 2.4 mph **WIND DIRECTION:** 153°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	8.02	7.58	7.72	7.66	7.75
0 – 80	13.09	12.37	12.56	12.44	12.62
0 – 100	19.74	18.46	18.89	18.56	18.91

DISTANCE TO REACH 100 MPH: 0.32 mile
DISTANCE TO REACH 120 MPH: 0.69 mile

TOP SPEED ATTAINED: 134 mph

DISTANCE TO REACH TOP SPEED: 1.43 miles
TIME TO REACH TOP SPEED: 51.15 seconds

Chevrolet Tahoe 5.3L 4WD

BEGINNING TIME: 2:52 p.m. **TEMPERATURE:** 82.6° F
WIND VELOCITY: 4.1 mph **WIND DIRECTION:** 120°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	7.68	8.03	8.06	8.15	7.98
0 – 80	13.01	13.26	13.24	13.41	13.23
0 – 100	19.97	20.19	19.93	20.53	20.16

DISTANCE TO REACH 100 MPH: 0.35 mile
DISTANCE TO REACH 120 MPH: 0.77 mile

TOP SPEED ATTAINED: 121 mph

DISTANCE TO REACH TOP SPEED: 0.79 mile
TIME TO REACH TOP SPEED: 34.39 seconds

Dodge Charger 3.6L RWD

BEGINNING TIME: 3:45 p.m. **TEMPERATURE:** 85.2° F
WIND VELOCITY: 3.5 mph **WIND DIRECTION:** 98°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	8.10	7.87	7.85	7.85	7.92
0 – 80	13.34	12.70	12.57	12.64	12.81
0 – 100	20.56	20.04	19.49	19.96	20.01

DISTANCE TO REACH 100 MPH: 0.35 mile
DISTANCE TO REACH 120 MPH: 0.73 mile

TOP SPEED ATTAINED: 141 mph

DISTANCE TO REACH TOP SPEED: 1.94 miles
TIME TO REACH TOP SPEED: 64.77 seconds

TEST LOCATION: Chelsea Proving Grounds **DATE:** September 15, 2018

Dodge Charger 5.7L RWD

BEGINNING TIME: 9:54 a.m. **TEMPERATURE:** 69.9° F
WIND VELOCITY: 2.9 mph **WIND DIRECTION:** 323°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	6.47	6.02	6.10	6.00	6.15
0 – 80	9.71	9.18	9.27	9.14	9.33
0 – 100	15.13	14.56	14.41	14.52	14.66

DISTANCE TO REACH 100 MPH: 0.25 mile
DISTANCE TO REACH 120 MPH: 0.45 mile

TOP SPEED ATTAINED: 149 mph

DISTANCE TO REACH TOP SPEED: 3.16 miles
TIME TO REACH TOP SPEED: 88.59 seconds

Dodge Charger 5.7L AWD

BEGINNING TIME: 11:17 a.m. **TEMPERATURE:** 76.5° F
WIND VELOCITY: 0.8 mph **WIND DIRECTION:** 328°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	5.93	5.88	5.87	5.80	5.87
0 – 80	9.82	9.67	9.71	9.55	9.69
0 – 100	14.72	14.72	14.88	14.50	14.71

DISTANCE TO REACH 100 MPH: 0.26 mile
DISTANCE TO REACH 120 MPH: 0.51 mile

TOP SPEED ATTAINED: 149 mph

DISTANCE TO REACH TOP SPEED: 1.43 miles
TIME TO REACH TOP SPEED: 46.58 seconds

Dodge Durango Pursuit 3.6L

BEGINNING TIME: 3:32 p.m. **TEMPERATURE:** 84.7° F
WIND VELOCITY: 5.1 mph **WIND DIRECTION:** 164°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	8.73	8.59	8.51	8.51	8.59
0 – 80	14.32	14.22	13.95	14.19	14.17
0 – 100	22.79	23.16	22.44	23.05	22.86

DISTANCE TO REACH 100 MPH: 0.41 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 117 mph

DISTANCE TO REACH TOP SPEED: 0.96 mile
TIME TO REACH TOP SPEED: 40.36 seconds

TEST LOCATION: Chelsea Proving Grounds **DATE:** September 15, 2018

Dodge Durango Pursuit 5.7L

BEGINNING TIME: 1:57 p.m. **TEMPERATURE:** 80.8° F
WIND VELOCITY: 0.51 mph **WIND DIRECTION:** 138°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	6.94	7.01	7.35	7.01	7.08
0 – 80	11.34	11.45	11.90	11.52	11.55
0 – 100	17.92	18.36	18.82	18.25	18.34

DISTANCE TO REACH 100 MPH: 0.33 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 118 mph

DISTANCE TO REACH TOP SPEED: 0.63 mile
TIME TO REACH TOP SPEED: 28.10 seconds

Ford Police Interceptor Utility Hybrid AWD

BEGINNING TIME: 12:49 p.m. **TEMPERATURE:** 79.2° F
WIND VELOCITY: 4.47 mph **WIND DIRECTION:** 5°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	7.44	7.24	7.21	7.20	7.27
0 – 80	11.74	11.50	11.52	11.41	11.54
0 – 100	18.05	17.54	17.75	17.43	17.69

DISTANCE TO REACH 100 MPH: 0.31 mile
DISTANCE TO REACH 120 MPH: 0.62 mile

TOP SPEED ATTAINED: 137 mph

DISTANCE TO REACH TOP SPEED: 1.24 miles
TIME TO REACH TOP SPEED: 44.78 seconds

Ford Police Interceptor Utility 3.0L EcoBoost AWD

BEGINNING TIME: 10:39 a.m. **TEMPERATURE:** 73.9° F
WIND VELOCITY: 1.24 mph **WIND DIRECTION:** 102°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	5.87	5.95	5.67	5.60	5.77
0 – 80	9.57	9.18	8.79	8.68	9.06
0 – 100	14.68	13.56	13.08	13.02	13.59

DISTANCE TO REACH 100 MPH: 0.23 mile
DISTANCE TO REACH 120 MPH: 0.44 mile

TOP SPEED ATTAINED: 150 mph

DISTANCE TO REACH TOP SPEED: 1.45 miles
TIME TO REACH TOP SPEED: 46.23 seconds

TEST LOCATION: Chelsea Proving Grounds **DATE:** September 15, 2018

Ford Police Interceptor Utility 3.3L AWD

BEGINNING TIME: 3:18 p.m. **TEMPERATURE:** 84.6° F
WIND VELOCITY: 2.8 mph **WIND DIRECTION:** 113°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	8.02	7.78	7.76	7.79	7.84
0 – 80	12.53	12.36	12.18	12.43	12.38
0 – 100	19.36	19.56	18.78	19.63	19.33

DISTANCE TO REACH 100 MPH: 0.34 mile
DISTANCE TO REACH 120 MPH: 0.73 mile

TOP SPEED ATTAINED: 137 mph

DISTANCE TO REACH TOP SPEED: 2.48 miles
TIME TO REACH TOP SPEED: 80.41 seconds

Ford F150 Police Responder 3.5L EcoBoost

BEGINNING TIME: 2:30 p.m. **TEMPERATURE:** 84.3° F
WIND VELOCITY: 6.3 mph **WIND DIRECTION:** 195°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	6.94	6.78	7.08	6.79	6.90
0 – 80	10.94	10.57	10.85	10.59	10.74
0 – 100	16.94	16.28	16.45	16.23	16.48

DISTANCE TO REACH 100 MPH: 0.28 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 106 mph

DISTANCE TO REACH TOP SPEED: 0.42 mile
TIME TO REACH TOP SPEED: 21.24 seconds

Ford Police Responder Hybrid Sedan

BEGINNING TIME: 3:45 p.m. **TEMPERATURE:** 85.2° F
WIND VELOCITY: 3.5 mph **WIND DIRECTION:** 98°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	9.35	9.22	9.17	9.20	9.24
0 – 80	15.34	15.19	14.82	14.91	15.07
0 – 100	27.77	28.47	23.66	24.10	26.00

DISTANCE TO REACH 100 MPH: 0.48 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 119 mph

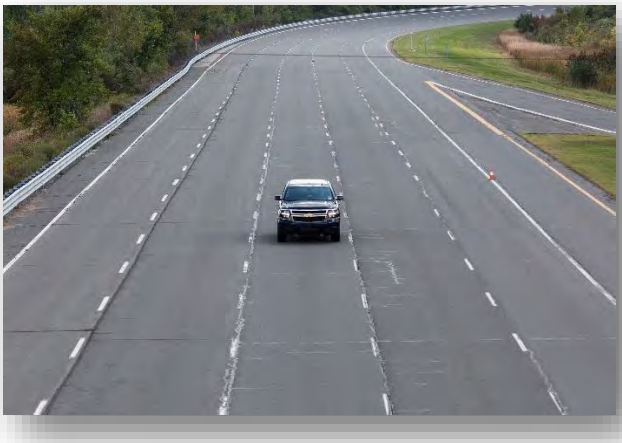
DISTANCE TO REACH TOP SPEED: 2.53 miles
TIME TO REACH TOP SPEED: 90.54 seconds

SUMMARY OF ACCELERATION AND TOP SPEED

	Chevrolet Tahoe 5.3L RWD	Chevrolet Tahoe 5.3L 4WD	Dodge Charger 3.6L RWD	Dodge Charger 5.7L RWD
ACCELERATION (seconds)				
0-20 mph	2.25	2.12	1.98	1.71
0-30 mph	3.26	3.21	3.37	2.65
0-40 mph	4.56	4.56	4.74	3.56
0-50 mph	6.12	6.21	6.16	4.74
0-60 mph	7.75	7.98	7.92	6.15
0-70 mph	10.05	10.39	10.27	7.61
0-80 mph	12.62	13.23	12.81	9.33
0-90 mph	15.51	16.42	15.63	11.86
0-100 mph	18.91	20.16	20.01	14.66
TOP SPEED (mph)	134	121	141	149
DISTANCE TO REACH (miles)				
100 mph	0.32	0.35	0.35	0.25
120 mph	0.69	0.77	0.73	0.45
Top Speed	1.43	0.79	1.94	3.16

SUMMARY OF ACCELERATION AND TOP SPEED

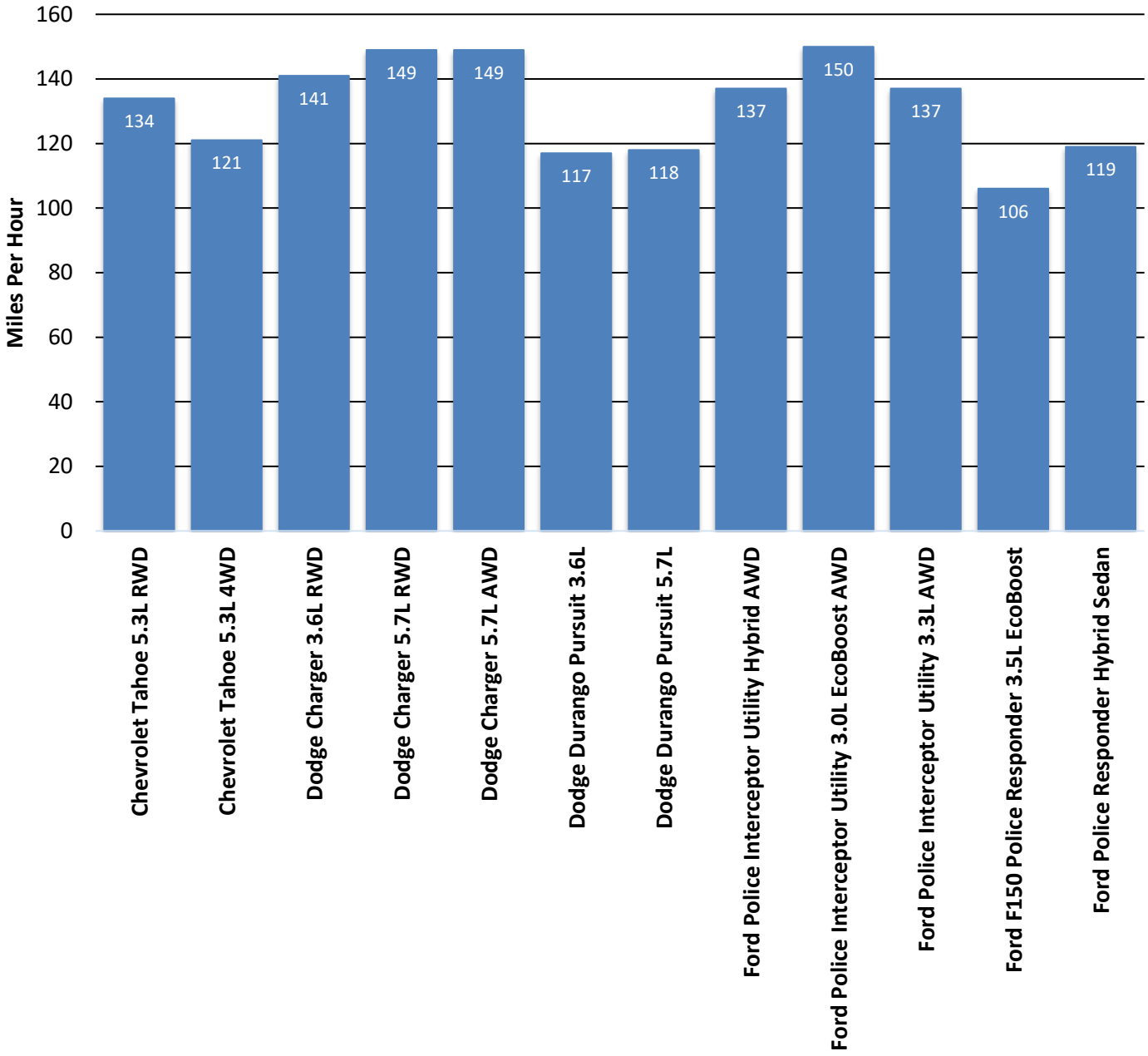
	Dodge Charger 5.7L AWD	Dodge Durango Pursuit 3.6L	Dodge Durango Pursuit 5.7L	Ford Police Interceptor Utility Hybrid AWD
ACCELERATION (seconds)				
0-20 mph	1.40	2.02	1.62	1.80
0-30 mph	2.29	3.16	2.54	2.95
0-40 mph	3.24	4.62	3.79	4.16
0-50 mph	4.54	6.27	5.21	5.63
0-60 mph	5.87	8.59	7.08	7.27
0-70 mph	7.56	11.12	9.09	9.17
0-80 mph	9.69	14.17	11.55	11.54
0-90 mph	12.02	18.04	14.50	14.37
0-100 mph	14.71	22.86	18.34	17.69
TOP SPEED (mph)	149	117	118	137
DISTANCE TO REACH (miles)				
100 mph	0.26	0.41	0.33	0.31
120 mph	0.51	N/A	N/A	0.62
Top Speed	1.43	0.96	0.63	1.24



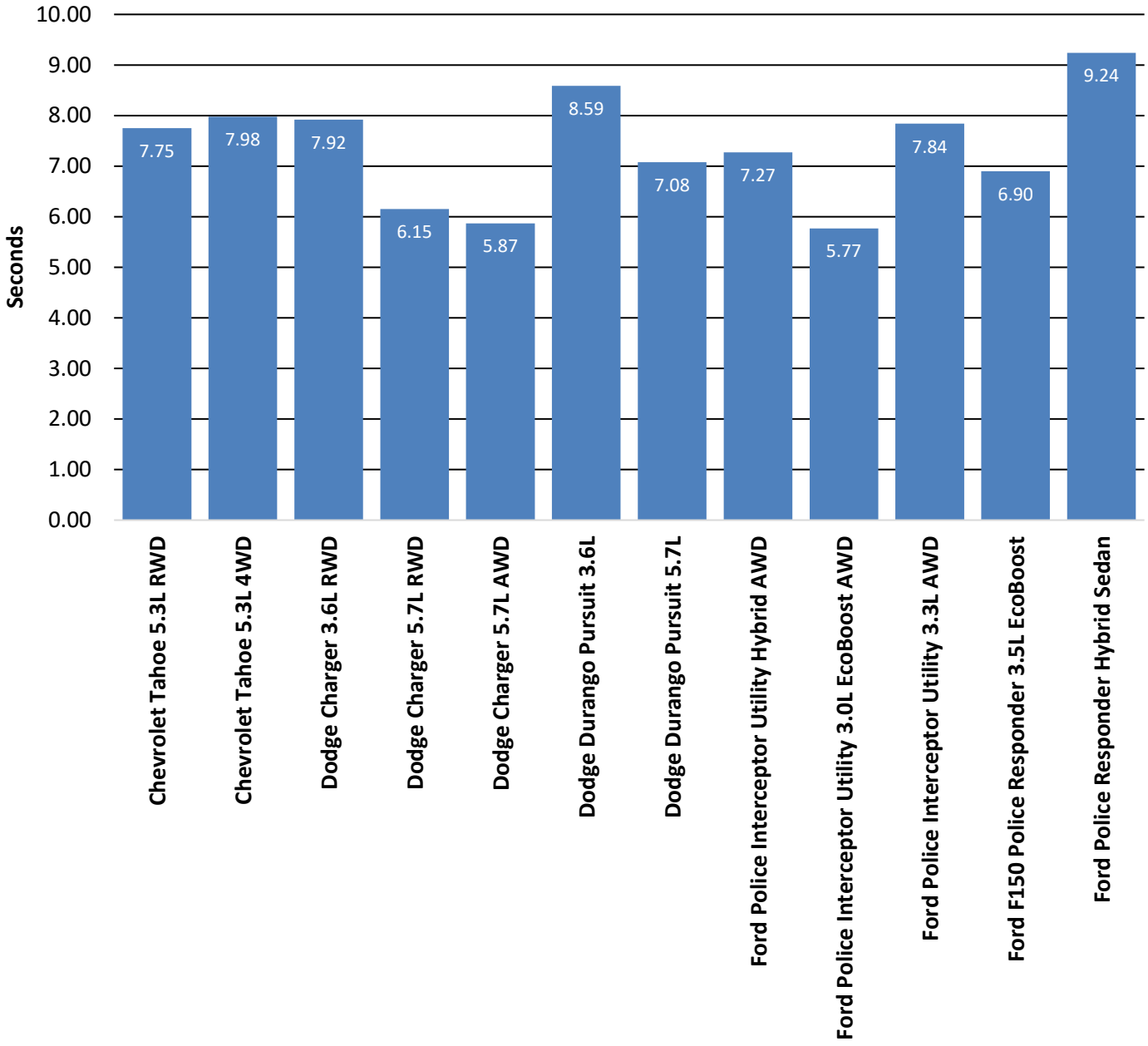
SUMMARY OF ACCELERATION AND TOP SPEED

	Ford Police Interceptor Utility 3.0L EcoBoost AWD	Ford Police Interceptor Utility 3.3L AWD	Ford F150 Police Responder 3.5L EcoBoost	Ford Police Responder Hybrid Sedan
ACCELERATION (seconds)				
0-20 mph	1.60	2.19	1.92	2.41
0-30 mph	2.32	3.30	2.93	3.63
0-40 mph	3.31	4.60	4.04	5.15
0-50 mph	4.41	6.16	5.35	7.01
0-60 mph	5.77	7.84	6.90	9.24
0-70 mph	7.23	9.92	8.63	11.89
0-80 mph	9.06	12.38	10.74	15.07
0-90 mph	11.05	15.45	13.33	19.47
0-100 mph	13.59	19.33	16.48	26.00
TOP SPEED (mph)	150	137	106	119
DISTANCE TO REACH (miles)				
100 mph	0.23	0.34	0.28	0.48
120 mph	0.44	0.73	N/A	N/A
Top Speed	1.45	2.48	0.42	2.53

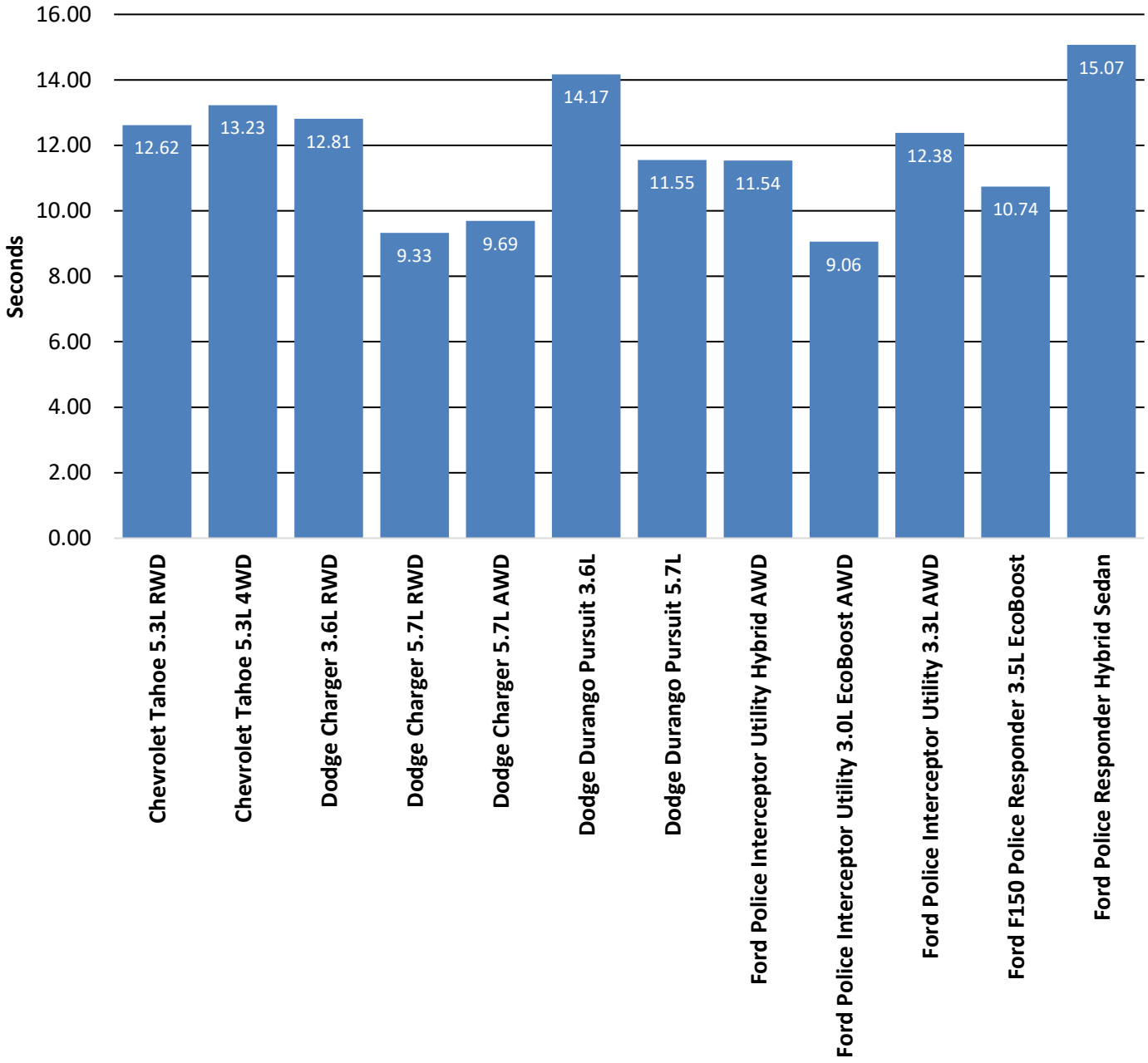
2019 Model Year
Top Speed Comparison
Top Speed Attained



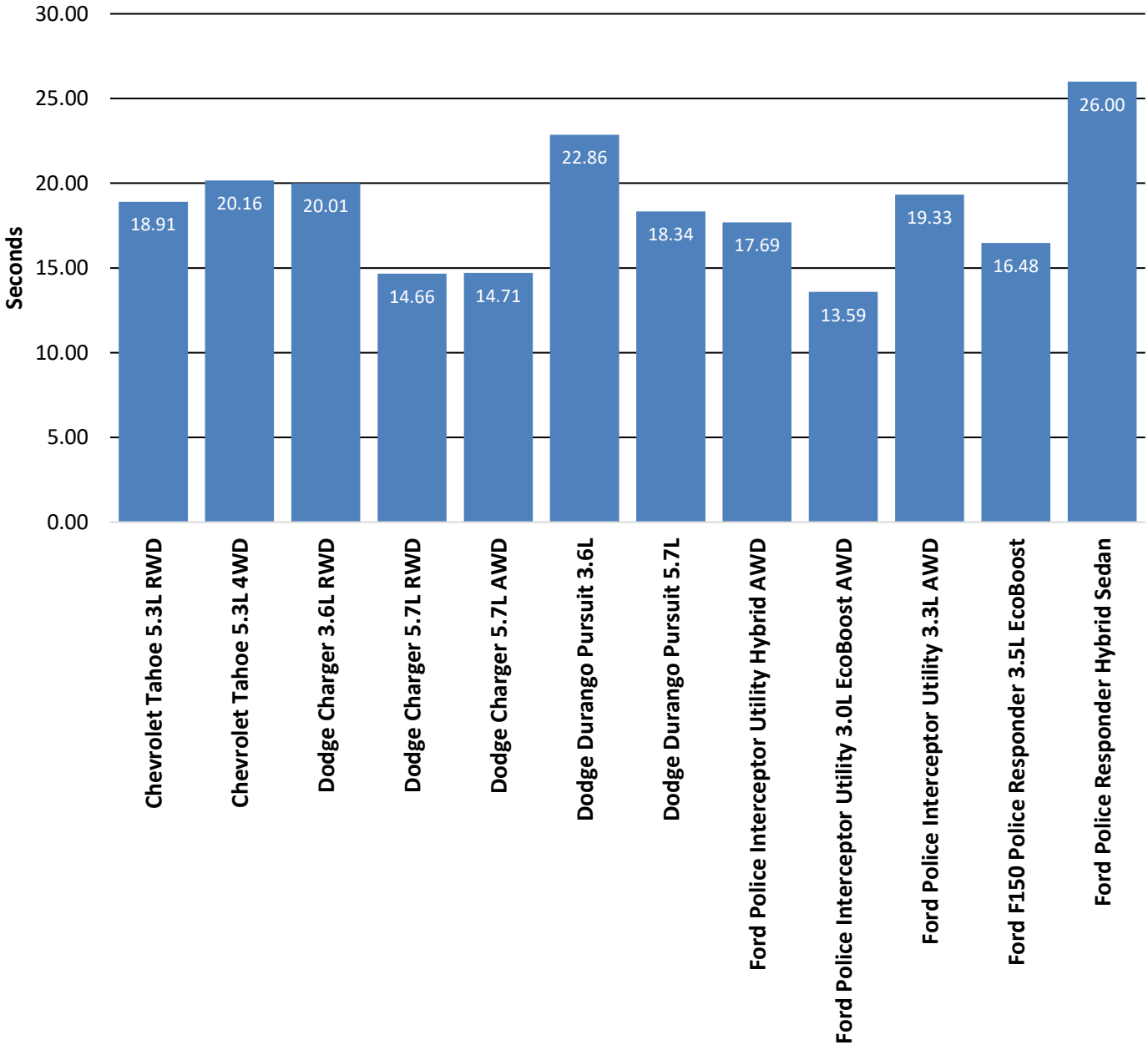
2019 Model Year
Acceleration Comparison
Acceleration Times
0-60 mph



2019 Model Year
Acceleration Comparison
Acceleration Times
0-80 mph



2019 Model Year
Acceleration Comparison
Acceleration Times
0-100 mph



BRAKE TESTING

BRAKE TESTING OBJECTIVE

To determine the deceleration rate attained by each test vehicle on twenty 60 – 0 mph full ABS stops. Each vehicle is scored on the average deceleration rate it achieves.

BRAKE TESTING METHODOLOGY

Each vehicle is driven to the north end of the straightaway on the east side of the oval. The vehicle then begins its sequence of stops heading in a southerly direction. The vehicle is stopped five times at pre-determined points on the roadway. The vehicle is then turned around and stops an additional five times again at pre-determined points on the roadway in a northerly direction. After the ten stops, the vehicle drives one lap around the oval at 45 mph. This is done in an effort to cool the brakes before the second sequence. After the cool down lap, the ten stops are repeated.

The data resulting from the twenty stops is used to calculate the average deceleration rate which is the vehicle's score for the test.

DECELERATION RATE FORMULA

$$\text{Deceleration Rate (DR)} = \frac{\text{Initial Velocity*(IV) squared}}{\text{2 times Stopping Distance (SD)}} = \frac{(IV)^2}{2\,(SD)}$$

EXAMPLE:

Initial Velocity = 89.175 ft/s (60.8 mph x 1.4667*)
Stopping Distance = 171.4 ft.

$$DR = \frac{(IV)^2}{2(SD)} = \frac{(89.175)^2}{2(171.4)} = \frac{7952.24}{342.8} = 23.198 \text{ ft/s}^2$$

Once a vehicle's average deceleration rate has been determined, it is possible to calculate the approximate stopping distance from any given speed by utilizing the following formula:

Select a speed; translate that speed into feet per second; square the feet per second figure by multiplying it by itself; divide the resultant figure by 2; divide the remaining figure by the average deceleration rate of the vehicle in question.

EXAMPLE:

60 mph = 88.002 ft/s x 88.002 = 7744.352 / 2 = 3872.176 / 23.198 ft/s^2 = 166.9 ft.

*Initial velocity must be expressed in terms of feet per second, with 1 mile per hour being equal to 1.4667 feet per second.


POLICE

BRAKE TESTING

Chevrolet Tahoe 5.3L RWD

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 1:58 p.m.	**TEMPERATURE:** 81° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.34	153.36	25.54
2	60.26	145.04	26.93
3	58.73	143.54	25.85
4	60.16	148.75	26.17
5	60.07	145.41	26.69
6	60.02	150.51	25.74
7	60.37	147.64	26.55
8	60.00	146.17	26.49
9	60.30	150.09	26.06
10	*Not recorded due to data collection error		
AVERAGE DECELERATION RATE:			**26.22 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.24	145.94	26.75
2	59.18	142.80	26.38
3	59.07	134.07	27.99
4	59.64	145.05	26.38
5	59.91	141.67	27.25
6	60.21	146.40	26.63
7	60.54	145.64	27.07
8	60.46	144.73	27.17
9	59.80	146.86	26.19
10	59.45	139.42	27.27
AVERAGE DECELERATION RATE:			**26.91 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**26.58 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**145.7 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Chevrolet Tahoe 5.3L 4WD

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 10:22 a.m.	**TEMPERATURE:** 73° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.45	151.89	25.88
2	60.16	146.93	26.49
3	59.11	134.44	27.95
4	59.29	139.25	27.15
5	59.86	145.11	26.56
6	58.93	135.74	27.52
7	59.83	142.34	27.05
8	59.89	141.81	27.21
9	60.29	145.72	26.83
10	60.13	149.64	25.99
AVERAGE DECELERATION RATE:			**26.86 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.20	135.78	27.76
2	59.81	139.20	27.64
3	60.53	141.16	27.92
4	59.78	143.23	26.84
5	59.99	143.28	27.02
6	60.59	143.23	27.57
7	60.57	143.09	27.58
8	60.42	142.34	27.59
9	59.91	139.27	27.72
10	*Not recorded due to data collection error		
AVERAGE DECELERATION RATE:			**27.51 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**27.17 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**142.5 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Dodge Charger 3.6L RWD

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 10:38 a.m.	**TEMPERATURE:** 74° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.70	130.06	29.48
2	59.89	130.21	29.63
3	59.25	125.46	30.10
4	58.93	124.42	30.02
5	59.68	125.23	30.59
6	58.85	121.58	30.64
7	59.54	125.42	30.40
8	58.72	121.67	30.48
9	59.85	127.23	30.28
10	59.61	125.34	30.49
AVERAGE DECELERATION RATE:			**30.21 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.91	129.50	30.81
2	59.51	123.49	30.85
3	59.96	124.81	30.98
4	59.63	126.12	30.32
5	60.32	132.07	29.63
6	60.27	125.94	31.02
7	60.04	124.05	31.26
8	59.75	122.81	31.27
9	61.07	130.22	30.81
10	60.59	127.22	31.04
AVERAGE DECELERATION RATE:			**30.80 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**30.51 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**126.9 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Dodge Charger 5.7L RWD

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 12:50 p.m.	**TEMPERATURE:** 79° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	61.16	133.85	30.06
2	59.12	122.93	30.58
3	60.25	128.05	30.49
4	60.15	126.51	30.76
5	58.93	120.83	30.91
6	60.15	126.32	30.81
7	58.65	122.06	30.31
8	58.46	121.51	30.25
9	59.81	125.21	30.73
10	59.88	130.85	29.47
AVERAGE DECELERATION RATE:			**30.44 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.48	129.10	30.48
2	61.09	137.37	29.22
3	58.85	126.48	29.45
4	60.34	129.97	30.13
5	59.65	129.97	29.45
6	59.87	126.87	30.39
7	61.05	131.15	30.57
8	60.73	131.45	30.18
9	60.33	129.32	30.27
10	60.25	128.05	30.49
AVERAGE DECELERATION RATE:			**30.06 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**30.25 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**128.0 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Dodge Charger 5.7L AWD

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 1:24 p.m.	**TEMPERATURE:** 81° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.48	143.32	27.45
2	59.37	133.45	28.41
3	60.68	139.38	28.41
4	60.61	135.32	29.20
5	60.00	133.93	28.91
6	60.64	134.57	29.39
7	59.93	132.70	29.11
8	59.62	130.40	29.32
9	60.44	134.92	29.12
10	60.71	141.19	28.08
AVERAGE DECELERATION RATE:			**28.74 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.95	132.19	29.24
2	60.03	133.32	29.07
3	59.84	133.57	28.84
4	60.12	136.53	28.47
5	60.59	140.71	28.06
6	60.47	133.24	29.52
7	60.33	135.28	28.94
8	60.65	133.11	29.72
9	58.89	125.13	29.81
10	60.26	131.89	29.61
AVERAGE DECELERATION RATE:			**29.13 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**28.94 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**133.8 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Dodge Durango Pursuit 3.6L

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 11:16 a.m.	**TEMPERATURE:** 77° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.77	128.81	29.83
2	59.19	123.83	30.43
3	58.70	121.00	30.63
4	59.90	126.55	30.50
5	59.58	126.36	30.22
6	59.56	128.23	29.76
7	59.78	128.12	30.00
8	59.02	124.62	30.07
9	59.75	129.05	29.76
10	59.61	127.73	29.92
AVERAGE DECELERATION RATE:			**30.11 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.78	128.79	29.85
2	59.63	127.26	30.05
3	58.14	120.53	30.17
4	59.65	126.87	30.17
5	60.22	130.00	30.00
6	59.50	128.21	29.70
7	60.15	128.75	30.23
8	59.48	125.38	30.35
9	59.49	126.13	30.18
10	59.15	126.82	29.67
AVERAGE DECELERATION RATE:			**30.04 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**30.07 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**128.8 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Dodge Durango Pursuit 5.7L

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 2:16 p.m.	**TEMPERATURE:** 83° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.63	132.96	28.76
2	60.55	134.80	29.25
3	60.66	132.03	29.98
4	60.11	133.81	29.04
5	59.30	127.27	29.72
6	59.87	129.81	29.70
7	59.82	131.83	29.20
8	59.55	132.28	28.84
9	58.74	127.63	29.08
10	59.62	134.47	28.43
AVERAGE DECELERATION RATE:			**29.20 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.31	134.36	29.12
2	59.85	130.91	29.43
3	58.86	129.02	28.88
4	60.28	133.60	29.25
5	59.67	131.78	29.06
6	60.03	131.25	29.53
7	60.17	130.84	29.76
8	59.79	133.24	28.86
9	60.48	137.56	28.60
10	59.43	131.01	29.00
AVERAGE DECELERATION RATE:			**29.15 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**29.18 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**132.7 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Ford Police Interceptor Utility Hybrid AWD

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 1:42 p.m.	**TEMPERATURE:** 84° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.65	137.91	28.69
2	60.37	133.31	29.41
3	60.93	135.83	29.40
4	59.43	128.45	29.58
5	61.32	136.79	29.57
6	59.83	132.24	29.12
7	60.72	134.79	29.42
8	60.50	134.34	29.31
9	60.82	137.26	28.99
10	59.59	132.26	28.88
AVERAGE DECELERATION RATE:			**29.23 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.92	132.97	29.04
2	60.55	135.96	29.00
3	59.62	130.97	29.19
4	60.18	135.27	28.80
5	59.94	131.72	29.34
6	59.68	132.13	28.99
7	59.80	128.80	29.86
8	61.10	134.37	29.88
9	59.72	130.93	29.30
10	60.37	134.70	29.10
AVERAGE DECELERATION RATE:			**29.25 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**29.24 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**132.4 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Ford Police Interceptor Utility 3.0L EcoBoost AWD

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 1:07 p.m.	**TEMPERATURE:** 80° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.22	134.61	28.98
2	60.15	131.65	29.56
3	59.52	129.92	29.33
4	60.47	133.25	29.52
5	59.89	127.91	30.16
6	60.06	131.02	29.61
7	59.35	128.98	29.37
8	59.58	128.08	29.81
9	61.06	136.72	29.33
10	59.64	129.45	29.55
AVERAGE DECELERATION RATE:			**29.52 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.94	130.33	29.65
2	60.25	136.41	28.62
3	60.96	135.46	29.51
4	59.89	131.93	29.24
5	59.58	130.82	29.19
6	60.80	137.23	28.97
7	60.01	133.34	29.05
8	59.54	128.25	29.73
9	59.44	127.23	29.87
10	60.08	130.48	29.76
AVERAGE DECELERATION RATE:			**29.36 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**29.44 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**131.5 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

*****All Vehicles Tested are Equipped with Anti-Lock Brakes*****

BRAKE TESTING

Ford Police Interceptor Utility 3.3L AWD

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 10:56 a.m.	**TEMPERATURE:** 76° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.37	130.43	29.07
2	59.98	130.66	29.62
3	59.72	132.73	28.90
4	59.94	133.99	28.84
5	59.89	132.74	29.06
6	59.17	131.52	28.63
7	61.15	137.48	29.26
8	59.53	134.59	28.32
9	59.72	130.63	29.37
10	*Not recorded due to data collection error		
AVERAGE DECELERATION RATE:			**29.01 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.05	133.70	29.01
2	60.54	135.26	29.15
3	60.00	133.79	28.94
4	60.81	137.67	28.89
5	60.48	138.88	28.33
6	60.31	137.69	28.41
7	61.56	139.18	29.29
8	59.29	127.36	29.69
9	60.40	135.24	29.01
10	59.48	130.66	29.12
AVERAGE DECELERATION RATE:			**28.98 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**29.00 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**133.5 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Ford F150 Police Responder 3.5L EcoBoost

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 9:24 a.m.	**TEMPERATURE:** 68° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.39	153.34	25.58
2	59.76	141.08	27.23
3	60.31	145.27	26.93
4	59.33	140.44	26.96
5	60.26	142.32	27.44
6	59.83	144.81	26.59
7	59.09	131.68	28.52
8	60.34	143.89	27.22
9	60.33	144.45	27.10
10	*Not recorded due to data collection error		
AVERAGE DECELERATION RATE:			**27.06 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.17	142.59	27.31
2	60.06	141.68	27.39
3	60.10	139.69	27.81
4	59.76	139.14	27.61
5	59.41	139.87	27.14
6	60.07	140.31	27.66
7	59.75	140.28	27.37
8	59.76	138.90	27.65
9	59.29	136.11	27.78
10	60.30	143.03	27.34
AVERAGE DECELERATION RATE:			**27.51 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**27.30 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**141.9 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Ford Police Responder Hybrid Sedan

TEST LOCATION: Chelsea Proving Grounds	**DATE:** September 15, 2018
BEGINNING TIME: 12:33 p.m.	**TEMPERATURE:** 79° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.36	134.47	29.14
2	59.43	128.41	29.58
3	60.76	132.86	29.89
4	60.30	129.26	30.26
5	60.61	132.22	29.88
6	60.98	131.22	30.48
7	61.22	133.12	30.28
8	60.34	129.91	30.15
9	60.32	132.25	29.59
10	60.14	131.48	29.59
AVERAGE DECELERATION RATE:			**29.62 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.61	130.70	29.24
2	61.05	132.53	30.25
3	59.53	124.79	30.55
4	59.59	133.39	28.63
5	59.39	125.77	30.16
6	60.26	128.44	30.41
7	61.21	134.37	29.99
8	60.78	131.82	30.14
9	60.33	127.80	30.63
10	60.31	131.61	29.73
AVERAGE DECELERATION RATE:			**29.97 ft/s²**

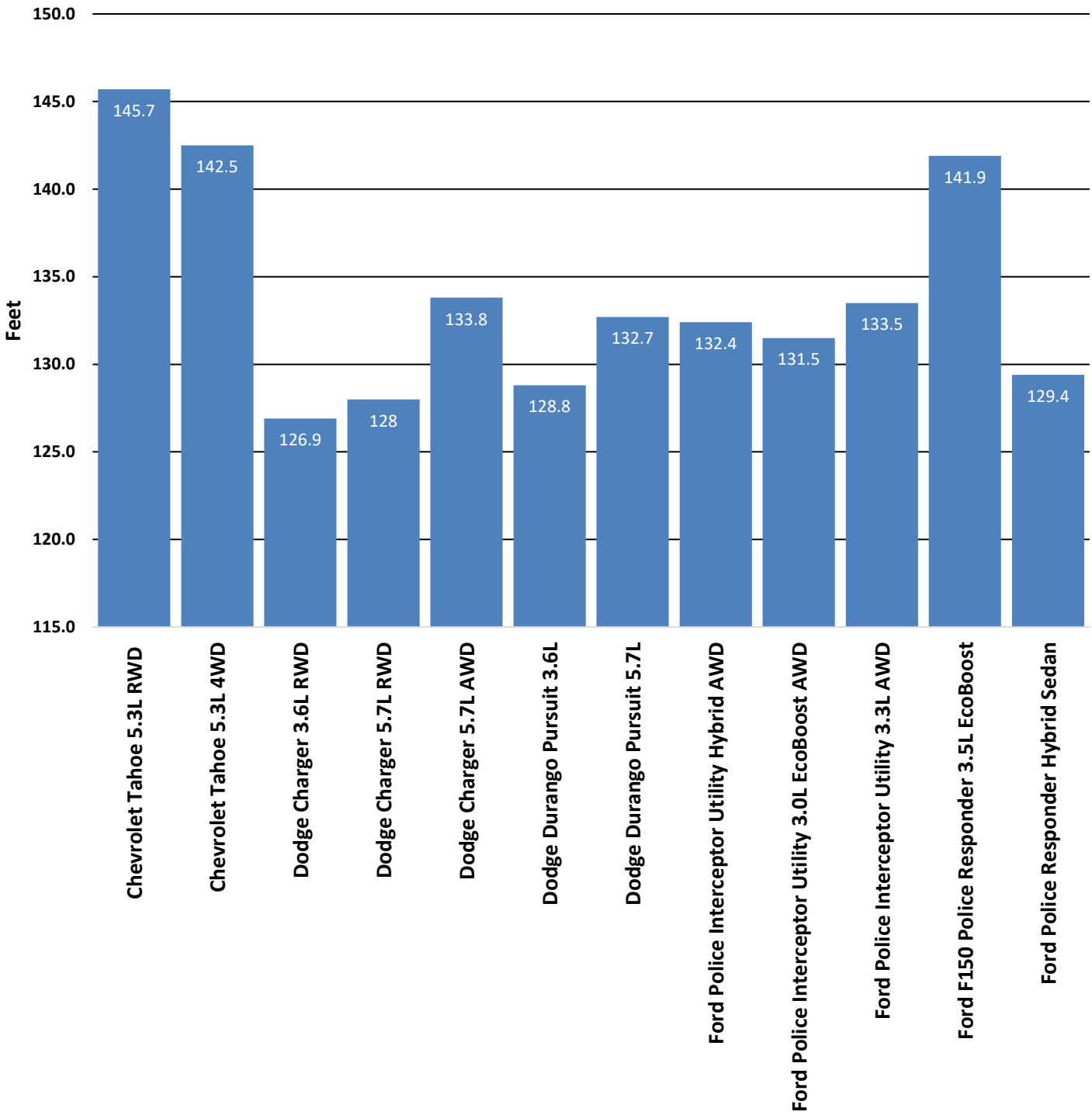
Phase III

OVERALL AVERAGE DECELERATION RATE:	**29.93 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**129.4 feet**

Evidence of Severe Fading?	No
Vehicle Stopped in Straight Line?	Yes
Vehicle Stopped Within Correct Lane?	Yes

All Vehicles Tested are Equipped with Anti-Lock Brakes*

2019 Model Year
Brake Testing
Projected Stopping Distance




TO PROTECT & SERVE
10

ERGONOMICS AND COMMUNICATIONS

TESTING OBJECTIVE

Rate each test vehicle's ability to:

1. Provide a suitable environment for the patrol officer in the performance of his/her assigned tasks.

2. Accommodate the required communications and emergency warning equipment and assess the relative difficulty of such installations.

TESTING METHODOLOGY

Utilizing the Ergonomics and Communications Form (as seen on page 70 of this book) each category is graded on a scale of 1-10, with 1 representing "totally unacceptable," 5 representing "average," and 10 representing "superior." The scores given are averaged to minimize personal prejudice for or against any given vehicle.

For the ergonomics portion of the form, a minimum of four officers (in this case six) individually and independently compare and score each test vehicle in several areas. These include comfort, convenience, instrumentation, and visibility.

The installation and communications portion of the evaluation is conducted by personnel from the Michigan Public Safety Communications System. The scores are given based on the relative difficulty of the necessary installations.

COMMUNICATIONS

	Chevrolet Tahoe	Dodge Charger	Dodge Durango	2020 Ford Police Interceptor Utility	Ford F150 Police Responder	Ford Police Responder Hybrid
COMMUNICATIONS						
Dashboard Accessibility	9.33	9.39	10.00	10.00	9.56	7.61
Trunk Accessibility	8.86	9.07	9.33	8.33	7.57	6.93
Engine Compartment	8.33	7.67	10.00	10.00	9.00	5.67
TOTAL SCORES	**8.84**	**8.71**	**9.78**	**9.44**	**8.71**	**6.74**

ERGONOMICS

	Chevrolet Tahoe	Dodge Charger	Dodge Durango	Ford Police Interceptor Utility	Ford F150 Police Responder	Ford Police Responder Hybrid
FRONT SEAT						
Padding	7.00	8.50	8.17	6.00	7.00	6.33
Depth of Bucket Seat	6.17	8.33	7.17	6.50	6.83	6.17
Adjustability – Front to Rear	8.67	8.67	8.17	7.50	7.50	5.17
Upholstery	7.67	7.50	7.83	6.20	6.33	5.00
Bucket Seat Design	7.83	8.00	7.83	6.33	6.67	5.50
Headroom	9.33	8.00	8.83	8.67	9.17	7.83
Seatbelts	6.00	8.67	7.83	7.67	7.67	8.00
Ease of Entry and Exit	8.50	7.33	8.50	7.67	7.50	5.33
Overall Comfort Rating	8.67	8.33	8.83	7.50	7.67	6.67
REAR SEAT						
Leg room – Front seat back	7.83	6.17	7.50	8.00	9.17	6.17
Ease of Entry and Exit	7.83	6.33	8.17	8.00	8.00	6.17
INSTRUMENTATION						
Clarity	8.67	9.00	9.00	8.00	8.50	7.83
Placement	7.83	8.67	8.83	8.00	8.17	7.50
VEHICLE CONTROLS						
Pedals, Size, and Position	8.17	8.17	8.17	6.67	8.50	7.67
Power Window Switch	9.17	9.17	8.67	7.83	8.67	7.33
Stability/Traction Control Switch	8.17	8.00	8.67	7.20	8.50	3.40
Door Lock Switch	8.00	8.83	8.67	7.50	6.83	7.67
Outside Mirror Controls	8.33	8.50	8.17	7.67	8.17	7.00
Steering Wheel, Size, Tilt Release, and Surface	7.83	8.33	8.17	7.67	7.50	7.17
Heat/AC Vent Placement and Adjustability	8.83	7.00	7.83	7.33	7.83	7.17
Trunk Release Switch	N/A	8.17	N/A	6.00	N/A	6.33
VISIBILITY						
Front (Windshield)	8.83	8.67	8.50	7.67	8.50	8.00
Rear (Back Window)	8.33	8.00	7.33	7.00	7.00	7.33
Left Rear Quarter	6.67	7.50	7.00	7.00	7.33	7.83
Right Rear Quarter	6.33	7.17	6.67	7.17	8.17	8.00
Outside Rear View Mirrors	7.50	7.33	7.17	8.17	9.17	8.50
TOTAL SCORES	**7.93**	**8.01**	**8.07**	**7.34**	**7.85**	**6.81**

FUEL ECONOMY

The respective auto manufacturers provided estimates for fuel economy as shown below.

This information has been certified by the Environmental Protection Agency.

Vehicles Make/Model/Engine	E.P.A. Miles Per Gallon		
	City Label	Highway Label	Combined Label
Chevrolet Tahoe 5.3L RWD	15	22	18
Chevrolet Tahoe 5.3L 4WD	14	21	16
Dodge Charger 3.6L RWD	18	26	20
Dodge Charger 5.7L RWD	16	25	18
Dodge Charger 5.7L AWD	15	23	18
Dodge Durango Pursuit 3.6L	18	25	21
Dodge Durango Pursuit 5.7L	14	22	17
Ford Police Interceptor Utility Hybrid AWD	TBD*	TBD*	TBD*
Ford Police Interceptor Utility 3.0L EcoBoost AWD	TBD*	TBD*	TBD*
Ford Police Interceptor Utility 3.3L AWD	TBD*	TBD*	TBD*
Ford F-150 Police Responder 3.5L EcoBoost	16	22	18
Ford Police Responder Hybrid Sedan	40	36	38

* Fuel mileage numbers are officially certified closer to the sale date of the vehicle. Ford anticipates these numbers may be available in early 2019.

MOTORCYCLES

Like many law enforcement agencies, the Michigan State Police used motorcycles until late 1942 and then switched to automobiles. The Michigan State Police rekindled interest in motorcycles for day to day patrol operations in 1993. In 2004, Michigan State Police headquarters asked if we had additional information as a resource for our purchasing decisions regarding motorcycles. During that time, we were given direction to expand vehicle testing to include motorcycle testing. It should be noted, the only motorcycles we test are those provided by the manufacturers which are purpose built as police motorcycles. We would like to thank BMW Motorrad USA, Harley-Davidson Motorcycles, and Yamaha Motorcycles for participating and providing their assistance in preparation for this year's successful testing program.

We are constantly evaluating our various tests with the manufacturers and the law enforcement industry to provide you with the most objective test data available. While there are many similarities to automobiles, there are also quite a few differences.

This year we conducted motorcycle brake testing on our track at the Precision Driving Unit in Lansing. Our facility provides a very flat and consistent surface for this type of testing. Thus, better information is provided to the reader as to the braking capabilities of each motorcycle.

The motorcycle dynamics portion was again conducted at Grattan Raceway. Grattan Raceway provides a two-mile road course that has several different curves and elevation changes that tests the motorcycle's high-speed handling characteristics and durability during pursuit and emergency response riding. See the motorcycle dynamics test objectives for further information.

When looking at the data, it is very important for the reader to apply your mission requirements to the motorcycle you are considering so you may make an appropriate decision. This report is not an endorsement of products, but a means of learning what's available for your officers so they can do their job more effectively and safely. If anything in this report requires further explanation or clarification, please call or write the Michigan State Police Precision Driving Unit.

BMW R1250 RT-P

MAKE & MODEL	BMW R1250 RT-P
SALES CODE	19RP
POWERTRAIN INFORMATION	
CUBIC INCHES	76.5
LITERS	1.254
HORSEPOWER SAENET	136 bhp @ 7,750 rpm
ALTERNATOR	508W with dual speed charge, 23A @ 1150 rpm
TORQUE	105 @ 6,500 rpm
BATTERY	2 x 16 Ah AGM no-maintenance batteries
TRANSMISSION	Constant mesh 6-speed w/helical cut gears
SUSPENSION TYPE (FRONT)	BMW Telelever, 37 mm stanchions, central spring strut
SUSPENSION TYPE (REAR)	BMW Paralever; travel related damping single strut
TURNING CIRCLE (CURB TO CURB)	16 feet
TIRE SIZE, LOAD & SPEED RATING	120-70 ZR 17 Front / 180-55 ZR 17 Rear
GROUND CLEARANCE, MINIMUM	5.2 inches
BRAKE SYSTEM	BMW partial-integral ABS with traction control & ABS Pro
FUEL CAPACITY	6.6 Gallons/ 25 Liters
GENERAL MEASUREMENTS	
WHEELBASE	58.5 inches
LENGTH	87.5 inches
TEST WEIGHT	684 lbs.
HEIGHT	55.7 inches
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1,114 lbs.
EPA MILEAGE EST.	
CITY	Not Provided by Manufacturer
HIGHWAY	Not Provided by Manufacturer
COMBINED	50 (WMTC)

MANUFACTURER HIGHLIGHTS

The R 1250 RT-P is the newest generation police motor derived from the K52 platform. The R 1250 RT-P model includes an unmatched list of standard features: Electronic Suspension Adjustment (ESA), ABS brakes with traction control, rain or road riding modes, heated handlebar grips, cruise control, tire pressure monitors and weather protection.

The new generation contains a multi-plate self-adjusting wet clutch that can be changed in an hour, variable valve timing, completely new emergency lighting system (including take-down lights and alley lights), handlebar switch system, power management system for all authority accessories, plus a host of special conveniences including electronic radio box latch release, saddlebag lights, alternating headlight system, selectable emergency light start sequence, narrower/lower seat with heat-reflective material (18° cooler in sun), adjustable dashboard angle, integrated PTT/PTPA switches, etc.

The test motorcycle options include Ride Modes Pro, enabling the selection of riding modes Rain, Road or Dynamic, Dynamic ESA electronic suspension control, Gear Shift Assist Pro, which allows you to shift up or down once the motorcycle is in motion without use of the clutch, ABS Pro enabling braking in corners, and additional fog lights, which also wig-wag with the headlight when there is sufficient ambient light (controlled by dashboard light sensor).

The R 1200 RT-P includes 6,000 mile oil change service intervals, comes with a 3-year / 60,000 mile limited warranty at no extra charge and now with EU4 management can be run on regular 87 Anti-Knock Index (AKI) fuel.

BMW F 750 GS-P

MAKE & MODEL	BMW F 750 GS-P
SALES CODE	FB
POWERTRAIN INFORMATION	
CUBIC INCHES	52
LITERS	853 CC
HORSEPOWER SAENET	77 hp @ 7,500
ALTERNATOR	416 Watts
TORQUE	61 ft./lbs.
BATTERY	2 - 10 Ah rated AGM maintenance free batteries
TRANSMISSION	Six speed constant mesh
SUSPENSION TYPE (FRONT)	Standard Fork 41mm
SUSPENSION TYPE (REAR)	Two sided aluminum swing arm
TURNING CIRCLE (CURB TO CURB)	16 ft.
TIRE SIZE, LOAD & SPEED RATING	Front 110/80 R19 Rear 15-/70 R17
GROUND CLEARANCE, MINIMUM	7.83 inches
BRAKE SYSTEM	BMW Motorrad ABS (disengageable)
FUEL CAPACITY	4 Gallons/ 15 Liters
GENERAL MEASUREMENTS	
WHEELBASE	61.3 inches
LENGTH	88.8 inches
TEST WEIGHT	593 lbs.
HEIGHT	48.2 inches
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	970 lbs.
EPA MILEAGE EST.	
CITY	Not Provided by Manufacturer
HIGHWAY	Not Provided by Manufacturer
COMBINED	57 mpg (WMTC)

MANUFACTURER HIGHLIGHTS

Today's needs for homeland security and law enforcement challenge every agency with limited budgets to utilize its resources as broadly as possible. The F 750 GS-P and F 850 GS-P models provide the widest range available to agencies for deploying resources. The GS-P's are not only capable of doing 100+ mph on the street, but can also tackle secondary roads, trails, greenbelts, parks and recreation areas, airports, dams, reservoirs, power plants, docks, ports, your college campus or anywhere else motors work best.

- **Performance:** will pleasantly surprise even seasoned motor veterans – few will evade you on or off pavement.
- **Lighting:** state-of-the-art emergency lighting system, with take-down & alley lights, wig-wag headlight, etc.
- **Two Suspension Versions:** 19" (BMW F 750 GS-P) or 21" (BMW F 850 GS-P) front wheel sizes provide the right suspension for your mission.
- **Standard ABS brakes:** provide superior stopping power which can be disabled on-the-fly when terrain demands.
- **Versatility:** multiple saddlebag options. The GS-P can fit through narrow gates and crossings that stop ATV's in their tracks.
- **Sure-starting:** linked auxiliary battery powers emergency lights and pre-wired equipment with engine "off" ensures restarting.
- **Superior cooling:** fan-driven water-cooled single won't over-heat in parades or congested traffic.
- **Economy:** 57 mpg on regular fuel, 6,000-mile service intervals and 3-year/36,000 miles limited warranty.

BMW F 850 GS-P

MAKE & MODEL	BMW F 850 GS-P
SALES CODE	19FP
POWERTRAIN INFORMATION	
CUBIC INCHES	52
LITERS	853 CC
HORSEPOWER SAENET	90 hp @ 8,000
ALTERNATOR	416 Watts
TORQUE	63 @ 6,250
BATTERY	2 - 10 Ah rated AGM maintenance free batteries
TRANSMISSION	Six speed constant mesh
SUSPENSION TYPE (FRONT)	Upside Down Fork 43mm
SUSPENSION TYPE (REAR)	Two sided aluminum swing arm
TURNING CIRCLE (CURB TO CURB)	16 ft.
TIRE SIZE, LOAD & SPEED RATING	Front 90/90 R21 Rear 150-/70 R17
GROUND CLEARANCE, MINIMUM	6.26 inches
BRAKE SYSTEM	BMW Motorrad ABS (disengageable)
FUEL CAPACITY	4 Gallons/ 15 Liters
GENERAL MEASUREMENTS	
WHEELBASE	62.7 inches
LENGTH	90.8 inches
TEST WEIGHT	600 lbs.
HEIGHT	53.4 inches (excluding mirrors)
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	981 lbs.
EPA MILEAGE EST.	
CITY	Not Provided by Manufacturer
HIGHWAY	Not Provided by Manufacturer
COMBINED	57 mpg (WMTC)

MANUFACTURER HIGHLIGHTS

Today's needs for homeland security and law enforcement challenge every agency with limited budgets to utilize its resources as broadly as possible. The F 750 GS-P and F 850 GS-P models provide the widest range available to agencies for deploying resources. The GS-P's are not only capable of doing 100+ mph on the street, but can also tackle secondary roads, trails, greenbelts, parks and recreation areas, airports, dams, reservoirs, power plants, docks, ports, your college campus or anywhere else motors work best.

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- **Two Suspension Versions:** 19" (BMW F 750 GS-P) or 21" (BMW F 850 GS-P) front wheel sizes provide the right suspension for your mission.
- **Standard ABS brakes:** provide superior stopping power which can be disabled on-the-fly when terrain demands.
- **Versatility:** multiple saddlebag options. The GS-P can fit through narrow gates and crossings that stop ATV's in their tracks.
- **Sure-starting:** linked auxiliary battery powers emergency lights and pre-wired equipment with engine "off" ensures restarting.
- **Superior cooling:** fan-driven water-cooled single won't over-heat in parades or congested traffic.
- **Economy:** 57 mpg on regular fuel, 6,000-mile service intervals and 3-year/36,000 miles limited warranty.

Harley-Davidson FLHTP

MAKE & MODEL	Harley-Davidson FLHTP
SALES CODE	Not Provided by Manufacturer
POWERTRAIN INFORMATION	
CUBIC INCHES	114 CID
LITERS	1868 CC
HORSEPOWER SAENET	Not Provided by Manufacturer
ALTERNATOR	48 Amp (producing approximately 28 amps at idle)
TORQUE	123 @3000 RPM
BATTERY	12VDC, 28 Amp/Hour, 405 CCA
TRANSMISSION	6 Speed Manual / Wet 10 Plate Assist and Slip Clutch
SUSPENSION TYPE (FRONT)	Hydraulic 49mm Telescopic Forks with Showa® Dual Bending Valve Technology (improving dampening performance)
SUSPENSION TYPE (REAR)	Swing Arm with Hand Adjustable Emulsion Rear Shocks
TURNING CIRCLE (CURB TO CURB)	<17 ft.
TIRE SIZE, LOAD & SPEED RATING	Tires / Front Dunlop D408F 130/80B17(65H) Rear Dunlop D407T 180/65B16(81H)
GROUND CLEARANCE, MINIMUM	5.1 inches
BRAKE SYSTEM	Hydraulic Disc / Reflex™ Electronically Linked with ABS (Dual Front Floating Rotors-Single Fixed Rear)
FUEL CAPACITY	6.0 Gallons/ 22.71 Liters
GENERAL MEASUREMENTS	
WHEELBASE	64 inches
LENGTH	96.5 inches
TEST WEIGHT	843 lbs.
HEIGHT	56.3 inches
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	GVWR-1360 lbs. / Payload-515 lbs.
EPA MILEAGE EST.	
CITY	Not Provided by Manufacturer
HIGHWAY	Not Provided by Manufacturer
COMBINED	43 mpg

MANUFACTURER HIGHLIGHTS

- The OE Engine is the 114 CID Milwaukee Eight™: pushrod-operated overhead valves with hydraulic self-adjusting lifters, four valves per cylinder and featuring EITMS (Engine Idle Temperature Management System), compression ratio: 10.5:1, Electronic Sequential Port Fuel Injection System (ESPFI), Single Cam design,
- Air and Oil cooled
- Fan Assisted Oil Cooler
- Hydraulically Actuated Assist and Slip 10 Plate wet clutch
- Showa® Dual Bending Valve Technology front suspension with 117mm of travel, larger pistons improve dampening performance over the range of suspension travel
- Hand Adjustable Rear Emulsion Shocks
- Daymaker™ LED Headlight
- Stealth Lighting Capable (rider controlled-disables all lights except brake and instrumentation)
- Cruise Control
- Emergency Equipment Power for 30 minutes with Ignition OFF or LOCKED
- Digital Speed Readout with Speed Capture
- Gear Indicator
- Polycarbonate Windshield designed to breakaway with minimal impact force
- One-Touch Saddlebag Lid Latches
- Pivoting Footboards
- Reflex™ electronically linked brake system with ABS (delinked below approximately 25 mph)
- Dunlop Multi-Tread Bead Retention Tires
- Long Stem True Vision Mirrors
- Heated Grips
- Security OE Standard
  2 Year Unlimited Mileage OE Warranty

Harley-Davidson FLHP Stage 1

MAKE & MODEL	Harley-Davidson FLHP Stage 1
SALES CODE	Not Provided by Manufacturer
POWERTRAIN INFORMATION	
CUBIC INCHES	114 CID
LITERS	1868 CC
HORSEPOWER SAENET	Not Provided by Manufacturer
ALTERNATOR	48 Amp (producing approximately 28 amps at idle)
TORQUE	110 @ 3000 RPM RWTQ
BATTERY	12VDC, 28 Amp/Hour, 405 CCA
TRANSMISSION	6 Speed Manual / Wet 10 Plate Assist and Slip Clutch
SUSPENSION TYPE (FRONT)	Hydraulic 49mm Telescopic Forks with Showa® Dual Bending Valve Technology (improving dampening performance)
SUSPENSION TYPE (REAR)	Swing Arm with Hand Adjustable Emulsion Rear Shocks
TURNING CIRCLE (CURB TO CURB)	<17 ft.
TIRE SIZE, LOAD & SPEED RATING	Tires / Front Dunlop D408F 130/80B17(65H) Rear Dunlop D407T 180/65B16(81H)
GROUND CLEARANCE, MINIMUM	5.1 inches
BRAKE SYSTEM	Hydraulic Disc / Reflex™ Electronically Linked with ABS (Dual Front Floating Rotors-Single Fixed Rear)
FUEL CAPACITY	6.0 Gallons/ 22.71 Liters
GENERAL MEASUREMENTS	
WHEELBASE	64 inches
LENGTH	96.5 inches
TEST WEIGHT	831 lbs.
HEIGHT	56.3 inches
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	GVWR-1360 lbs. / Payload-515 lbs.
EPA MILEAGE EST.	
CITY	Not Provided by Manufacturer
HIGHWAY	Not Provided by Manufacturer
COMBINED	43 mpg

MANUFACTURER HIGHLIGHTS

H-D Milwaukee Eight™ 114 Stage 1 Performance Engine. H-D High Flow Air Cleaner Part # 29400245 SE Pro Street Tuner Part # 41000008C

- The OE Engine is the 114 CID Milwaukee Eight™ Engine: pushrod-operated, overhead valves with hydraulic, self-adjusting lifters, four valves per cylinder and featuring EITMS (Engine Idle Temperature Management System), Compression ratio: 10.5:1, Electronic Sequential Port Fuel Injection System (ESPFI), Single Cam design, Air and Oil cooled
- Fan-assisted oil cooler
- Hydraulically actuated clutch with Assist and Slip 10 plate wet clutch
- Showa® Dual Bending Valve Technology front suspension with 117mm of travel, larger pistons improve dampening performance over the range of suspension travel
- Hand Adjustable Rear Emulsion Shocks
- Dual Halogen Headlight
- Stealth Lighting Capable (rider controlled-disables all lights except brake and instrumentation)
- Cruise Control
- Emergency Equipment Power for 30 minutes with Ignition OFF or LOCKED
- Digital Speed Readout with Speed Capture
- Gear Indicator
- Polycarbonate Windshield designed to breakaway with minimal impact force
- One-Touch Saddlebag Lid Latches
- Pivoting Footboards
- Reflex™ electronically linked brake system with ABS (delinked below approximately 25 mph)
- Dunlop Multi-Tread Bead Retention Tires
- Long Stem True Vision Mirrors
- Security OE Standard
- 2 Year Unlimited Mileage OE Warranty

Harley-Davidson FLHTP Stage II

MAKE & MODEL	Harley-Davidson FLHTP Stage 2
SALES CODE	Not Provided by Manufacturer
POWERTRAIN INFORMATION	
CUBIC INCHES	114 CID
LITERS	1868 CC
HORSEPOWER SAENET	Not Provided by Manufacturer
ALTERNATOR	48 Amp (producing approximately 28 amps at idle)
TORQUE	115 @ 3500 RPM RWTQ
BATTERY	12VDC, 28 Amp/Hour, 405 CCA
TRANSMISSION	6 Speed Manual / Wet 10 Plate Assist and Slip Clutch
SUSPENSION TYPE (FRONT)	Hydraulic 49mm Telescopic Forks with Showa® Dual Bending Valve Technology (improving dampening performance)
SUSPENSION TYPE (REAR)	Swing Arm with Hand Adjustable Emulsion Rear Shocks
TURNING CIRCLE (CURB TO CURB)	<17 ft.
TIRE SIZE, LOAD & SPEED RATING	Tires / Front Dunlop D408F 130/80B17(65H) Rear Dunlop D407T 180/65B16(81H)
GROUND CLEARANCE, MINIMUM	5.1 inches
BRAKE SYSTEM	Hydraulic Disc / Reflex™ Electronically Linked with ABS (Dual Front Floating Rotors-Single Fixed Rear)
FUEL CAPACITY	6.0 Gallons/ 22.71 Liters
GENERAL MEASUREMENTS	
WHEELBASE	64 inches
LENGTH	96.5 inches
TEST WEIGHT	841 lbs.
HEIGHT	56.3 inches
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	GVWR-1360 lbs. / Payload-515 lbs.
EPA MILEAGE EST.	
CITY	Not Provided by Manufacturer
HIGHWAY	Not Provided by Manufacturer
COMBINED	43 mpg

MANUFACTURER HIGHLIGHTS

H-D Milwaukee Eight™ 114 Stage 2 Torque Performance Engine Upgrade

- H-D High Flow Air Cleaner Part # 29400246
  SE Pro Street Tuner Part # 41000008C
- SE Milwaukee Eight Stage II Torque Kit Part # 92500047
- The OE Engine is the 114 CID Milwaukee Eight™: pushrod-operated overhead valves with hydraulic self-adjusting lifters, four valves per cylinder and featuring EITMS (Engine Idle Temperature Management System), compression ratio: 10.5 :1, Electronic Sequential Port Fuel Injection System (ESPFI), Single Cam design, Air and Oil cooled
- Fan Assisted Oil Cooler
- Hydraulically Actuated Assist and Slip 10 Plate wet clutch
- Showa® Dual Bending Valve Technology front suspension with 117mm of travel, larger pistons improve dampening performance over the range of suspension travel
- Hand Adjustable Rear Emulsion Shocks
- Daymaker™ LED Headlight
- Stealth Lighting Capable (rider controlled-disables all lights except brake and instrumentation)
- Cruise Control
- Emergency Equipment Power for 30 minutes with Ignition OFF or LOCKED
- Digital Speed Readout with Speed Capture
- Gear Indicator
- Polycarbonate Windshield designed to breakaway with minimal impact force
- One-Touch Saddlebag Lid Latches
- Pivoting Footboards
- Reflex™ electronically linked brake system with ABS (delinked below approximately 25 mph)
- Dunlop Multi-Tread Bead Retention Tires
- Long Stem True Vision Mirrors
- Heated Grips
- Security OE Standard
- 2 Year Unlimited Mileage OE Warranty

Yamaha FJR1300P-AB

MAKE & MODEL	Yamaha FJR1300P-AB
SALES CODE	RP31Y
POWERTRAIN INFORMATION	
CUBIC INCHES	79.2
LITERS	1.298
HORSEPOWER SAENET	144.2 bhp @8000RPM
ALTERNATOR	590W
TORQUE	138Nm @7000RPM
BATTERY	12v-24Ah
TRANSMISSION	6 Speed Manual / Wet, Multiple Disc Clutch
SUSPENSION TYPE (FRONT)	48mm fork fully adjustable
SUSPENSION TYPE (REAR)	Single Shock – adjustable spring preload and rebound damping
TURNING CIRCLE (CURB TO CURB)	122.0 inches
TIRE SIZE, LOAD & SPEED RATING	FR – 120/70/ZR17 RR – 180/55/ZR17
GROUND CLEARANCE, MINIMUM	5.1 Inches
BRAKE SYSTEM	FR – Dual 12.6 in discs; Unified Brake System and ABS RR – 11.1in; Unified Brake System and ABS
FUEL CAPACITY	6.6 gallons
GENERAL MEASUREMENTS	
WHEELBASE	60.8 inches
LENGTH	87.8 inches
TEST WEIGHT	689 lbs.
HEIGHT	Low 55.7 inches / High – 61 inches
MAXIMUM PAYLOAD CAPACITY (INCLUDING PASSENGERS)	1111 lbs.
EPA MILEAGE EST.	
CITY	Not Provided by Manufacturer
HIGHWAY	Not Provided by Manufacturer
COMBINED	36 mpg

MANUFACTURER HIGHLIGHTS

The FJR1300 has made its mark as a truly iconic model for Yamaha Motor Company since its introduction to the U.S. market in 2003, with tens of thousands of this incredibly reliable “supersport touring” model having been sold since that time.

Known for its sportbike-like engine performance, impeccable handling, and superb braking capabilities, the FJR1300 has proven itself to be extremely reliable, with many retail customers racking up well over 100,000 miles on their personal bikes.

The FJR1300 has also undergone 4 significant generational updates and multiple refinements since its introduction, the last of which coming in the 2016 model year, with the addition of a six-speed transmission and advanced electronic additions. These upgrades have only added to the reliability, versatility, comfort, and sophistication of this motorcycle, without inhibiting the impressive performance or rider adjustability of this uniquely capable sport-touring motorcycle.

MOTORCYCLE DYNAMICS TESTING

MOTORCYCLE DYNAMICS TESTING OBJECTIVE

To determine each motorcycle's high-speed handling characteristics and performance in comparison to other motorcycles. The course used is a two-mile road racing type configuration containing hills, curves, and corners. The course simulates actual conditions encountered in pursuit or emergency driving situations in the field, with the exception of other traffic. The evaluation is a true test of the motorcycle manufacturers in offering balanced packages of acceleration capabilities, suspension components, and braking characteristics.

MOTORCYCLE DYNAMICS TESTING METHODOLOGY

Each motorcycle is ridden over the course a total of 32 timed laps using four separate riders, each riding an eight-lap series. The final score for the motorcycle is the combined average (from the four riders) of the five fastest laps for each rider during the eight-lap series.

MOTORCYCLE DYNAMICS SCHEDULE

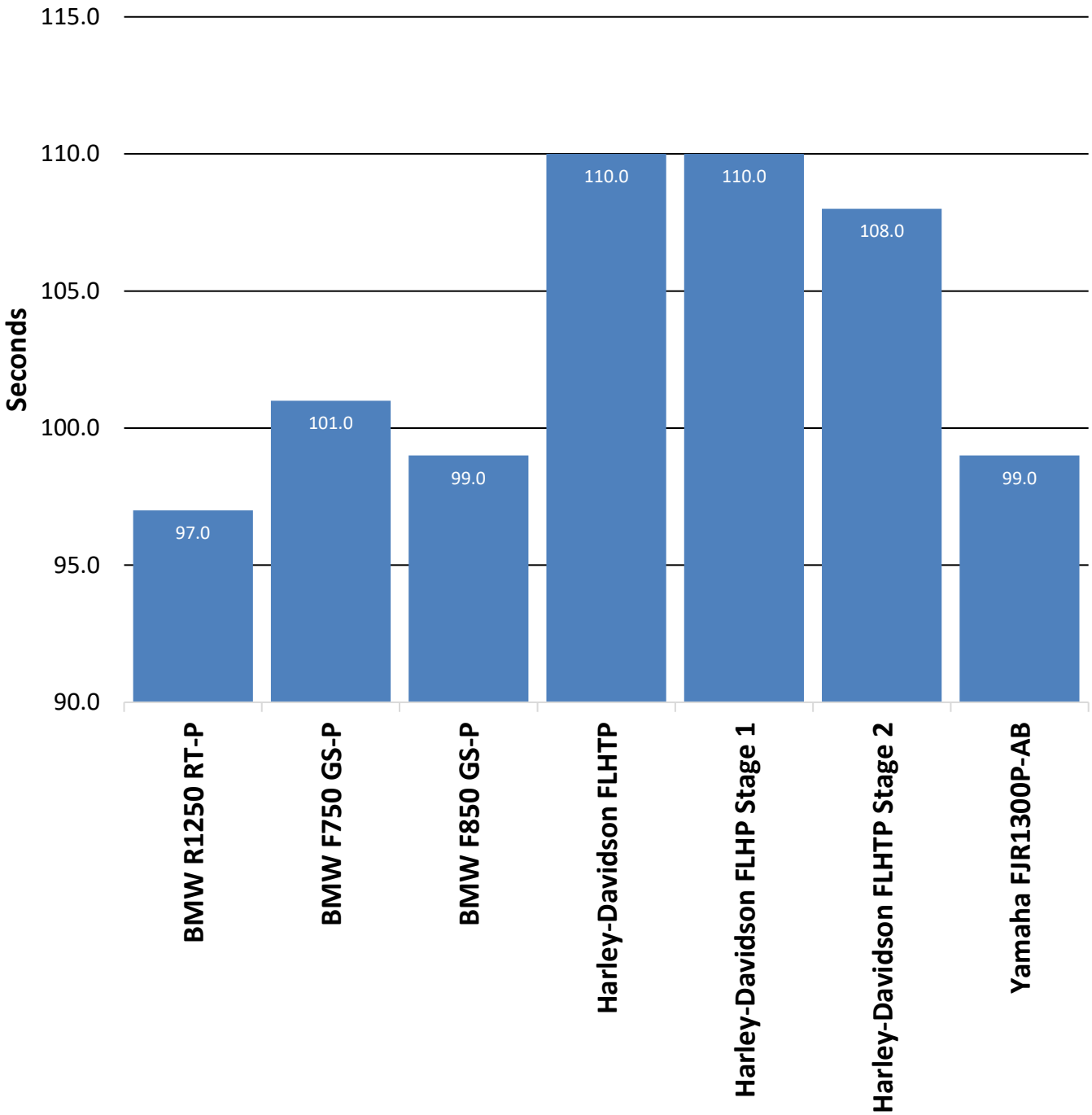
GRATTAN RACEWAY
2019 MODEL YEAR MOTORCYCLE DYNAMICS SCHEDULE
SEPTEMBER 13, 2018

	DARLINGTON	ROGERS	TIBAUDO	CUPP
9:30 a.m.	BMW R1250 RT-P	Yamaha FJR1300P-AB		
10:00 a.m.			BMW F750 GS-P	BMW F850 GS-P
10:30 a.m.	Harley-Davidson FLHTP	Harley-Davidson FLHP Stage 1	Harley-Davidson FLHTP Stage 2	
11:00 a.m.	Yamaha FJR1300P-AB			BMW R1250 RT-P
11:30 a.m.		BMW F750 GS-P	BMW F850 GS-P	
12:30 p.m.	Harley-Davidson FLHP Stage 1	Harley-Davidson FLHTP Stage 2		Harley-Davidson FLHTP
1:00 p.m.			BMW R1250 RT-P	Yamaha FJR1300P-AB
1:30 p.m.	BMW F750 GS-P	BMW F850 GS-P		
2:00 p.m.	Harley-Davidson FLHTP Stage 2		Harley-Davidson FLHTP	Harley-Davidson FLHP Stage 1
2:30 p.m.		BMW R1250 RT-P	Yamaha FJR1300P-AB	
3:00 p.m.	BMW F850 GS-P			BMW F750 GS-P
3:30 p.m.		Harley-Davidson FLHTP	Harley-Davidson FLHP Stage 1	Harley-Davidson FLHTP Stage 2

MOTORCYCLE DYNAMICS TESTING
SEPTEMBER 13, 2018

Vehicles	Drivers	Lap 1	Lap 2	Lap 3	Lap 4	Lap 5	Average
BMW R 1250 RT-P	DARLINGTON	01:36.81	01:36.03	01:36.58	01:36.56	01:36.89	01:36.58
	CUPP	01:35.73	01:35.44	01:36.39	01:36.53	01:36.09	01:36.03
	TIBAUDO	01:36.75	01:36.94	01:37.15	01:36.54	01:36.81	01:36.84
	ROGERS	01:37.54	01:37.36	01:37.22	01:36.56	01:36.10	01:36.96
Overall Average							**01:36.60**
BMW F 750 GS-P	TIBAUDO	01:41.19	01:40.43	01:40.07	01:39.45	01:39.61	01:40.15
	ROGERS	01:42.91	01:42.63	01:42.40	01:41.72	01:41.04	01:42.14
	DARLINGTON	01:41.53	01:40.96	01:40.74	01:40.79	01:40.57	01:40.92
	CUPP	01:41.52	01:41.66	01:41.48	01:40.71	01:39.93	01:41.06
Overall Average							**01:41.07**
BMW F 850 GS-P	CUPP	01:37.69	01:37.62	01:37.85	01:37.19	01:37.12	01:37.49
	TIBAUDO	01:38.89	01:38.83	01:38.86	01:38.03	01:39.33	01:38.79
	ROGERS	01:41.93	01:40.81	01:40.13	01:39.32	01:39.29	01:40.30
	DARLINGTON	01:38.72	01:38.70	01:38.09	01:37.63	01:38.05	01:38.24
Overall Average							**01:38.70**
Harley-Davidson FLHTP	DARLINGTON	01:48.89	01:48.83	01:48.76	01:48.51	01:48.53	01:48.70
	CUPP	01:49.83	01:49.88	01:50.17	01:49.95	01:50.13	01:49.99
	TIBAUDO	01:50.11	01:49.07	01:50.19	01:49.48	01:49.20	01:49.61
	ROGERS	01:50.08	01:49.65	01:49.63	01:49.95	01:49.74	01:49.81
Overall Average							**01:49.53**
Harley-Davidson FLHP Stage 1	ROGERS	01:51.05	01:51.24	01:50.38	01:51.34	01:50.45	01:50.89
	DARLINGTON	01:50.44	01:50.14	01:49.81	01:50.48	01:50.01	01:50.18
	CUPP	01:50.27	01:50.59	01:50.52	01:51.00	01:51.21	01:50.72
	TIBAUDO	01:50.48	01:50.29	01:50.14	01:49.82	01:49.59	01:50.06
Overall Average							**01:50.46**
Harley-Davidson FLHTP Stage 2	TIBAUDO	01:47.65	01:48.27	01:47.85	01:47.24	01:47.79	01:47.76
	ROGERS	01:47.63	01:47.90	01:47.76	01:47.82	01:48.03	01:47.83
	DARLINGTON	01:46.88	01:47.25	01:47.20	01:47.19	01:46.86	01:47.08
	CUPP	01:47.67	01:47.56	01:48.06	01:48.25	01:48.19	01:47.95
Overall Average							**01:47.65**
Yahama FJR1300P-AB	ROGERS	01:38.99	01:38.66	01:37.82	01:37.65	01:38.40	01:38.31
	DARLINGTON	01:38.84	01:38.27	01:38.65	01:38.34	01:38.33	01:38.49
	CUPP	01:38.85	01:38.66	01:38.08	01:38.28	01:38.67	01:38.51
	TIBAUDO	01:38.92	01:38.51	01:39.40	01:38.73	01:39.06	01:38.92
Overall Average							**01:38.56**

2019 Model Year
Motorcycle Dynamics



MOTORCYCLE ACCELERATION
&
TOP SPEED TESTING

ACCELERATION TEST OBJECTIVE

To determine the ability of each test motorcycle to accelerate from a standing start to 60 mph, 80 mph, and 100 mph.

ACCELERATION TEST METHODOLOGY

Using a Race Logic Vbox 3i GPS data collection unit, each motorcycle is driven through four acceleration sequences, two northbound and two southbound, to allow for wind direction. The four resulting times for each target speed are averaged and the average times are used to derive scores for acceleration. To ensure accuracy, the same rider performs the test for all motorcycles.

TOP SPEED TEST OBJECTIVE

To determine the actual top speed attainable by each test motorcycle within a distance of 14 miles from a standing start.

TOP SPEED TEST METHODOLOGY

Following the fourth acceleration run, each test motorcycle will continue to accelerate to the top speed attainable within 14 miles from the start of the run. The highest speed attained within the 14-mile distance will be recorded as the vehicle's top speed.

TEST LOCATION: Chelsea Proving Grounds **DATE:** September 15, 2018

BMW R1250 RT-P

BEGINNING TIME: 10:59 a.m. **TEMPERATURE:** 75.4° F
WIND VELOCITY: 0.15 mph **WIND DIRECTION:** 132°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	4.07	4.12	4.00	3.93	4.03
0 – 80	6.00	5.93	6.00	5.80	5.93
0 – 100	8.84	8.84	8.76	8.63	8.77

DISTANCE TO REACH 100 MPH: 0.14 mile
DISTANCE TO REACH 120 MPH: 0.30 mile

TOP SPEED ATTAINED: 137 mph

DISTANCE TO REACH TOP SPEED: 4.72 miles
TIME TO REACH TOP SPEED: 133.37 seconds

BMW F750 GS-P

BEGINNING TIME: 1:40 p.m. **TEMPERATURE:** 82.5° F
WIND VELOCITY: 1.54 mph **WIND DIRECTION:** 324°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	5.26	5.10	4.91	4.90	5.04
0 – 80	8.76	8.71	8.36	8.48	8.58
0 – 100	15.92	16.44	15.84	15.80	16.00

DISTANCE TO REACH 100 MPH: .30 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 113 mph

DISTANCE TO REACH TOP SPEED: 1.79 miles
TIME TO REACH TOP SPEED: 66.38 seconds

BMW F850 GS-P

BEGINNING TIME: 2:43 p.m. **TEMPERATURE:** 84.8° F
WIND VELOCITY: 4.76 mph **WIND DIRECTION:** 145°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	5.02	4.96	5.06	4.95	5.00
0 – 80	8.48	8.59	8.68	8.44	8.55
0 – 100	16.85	14.18	17.68	15.65	16.09

DISTANCE TO REACH 100 MPH: 0.31 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 118 mph

DISTANCE TO REACH TOP SPEED: 1.50 miles
TIME TO REACH TOP SPEED: 53.49 seconds

TEST LOCATION: Chelsea Proving Grounds **DATE:** September 15, 2018

Harley-Davidson FLHTP

BEGINNING TIME: 10:13 a.m. **TEMPERATURE:** 71.7° F
WIND VELOCITY: 0.94 mph **WIND DIRECTION:** 158°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	5.18	5.22	5.32	5.18	5.23
0 – 80	9.18	9.06	9.45	9.23	9.23
0 – 100	18.23	20.04	19.63	20.07	19.49

DISTANCE TO REACH 100 MPH: 0.39 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 109 mph

DISTANCE TO REACH TOP SPEED: 0.80 mile
TIME TO REACH TOP SPEED: 33.11 seconds

Harley-Davidson FLHP Stage 1

BEGINNING TIME: 2:17 p.m. **TEMPERATURE:** 82.8° F
WIND VELOCITY: 2.70 mph **WIND DIRECTION:** 126°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	5.02	5.03	4.89	5.16	5.03
0 – 80	8.65	8.67	8.55	8.85	8.68
0 – 100	16.35	15.81	16.20	16.17	16.13

DISTANCE TO REACH 100 MPH: 0.31 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 109 mph

DISTANCE TO REACH TOP SPEED: 0.63 mile
TIME TO REACH TOP SPEED: 27.10 seconds

Harley-Davidson FLHTP Stage 2

BEGINNING TIME: 12:34 p.m. **TEMPERATURE:** 79.5° F
WIND VELOCITY: 5.49 mph **WIND DIRECTION:** 12°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	4.80	4.55	4.49	4.50	4.59
0 – 80	7.86	7.77	7.41	7.69	7.68
0 – 100	13.25	13.88	12.82	14.04	13.50

DISTANCE TO REACH 100 MPH: 0.25 mile
DISTANCE TO REACH 120 MPH: N/A

TOP SPEED ATTAINED: 109 mph

DISTANCE TO REACH TOP SPEED: 0.40 mile
TIME TO REACH TOP SPEED: 18.39 seconds

TEST LOCATION: Chelsea Proving Grounds **DATE:** September 15, 2018

Yamaha FJR1300P-AB

BEGINNING TIME: 1:06 p.m. **TEMPERATURE:** 79.9° F
WIND VELOCITY: 4.50 mph **WIND DIRECTION:** 360°

SPEEDS	RUN 1	RUN 2	RUN 3	RUN 4	AVERAGE (seconds)
0 – 60	3.92	3.88	3.68	3.65	3.78
0 – 80	5.72	5.79	5.54	5.54	5.65
0 – 100	8.46	8.60	8.19	8.29	8.39

DISTANCE TO REACH 100 MPH: 0.14 mile
DISTANCE TO REACH 120 MPH: 0.27 mile

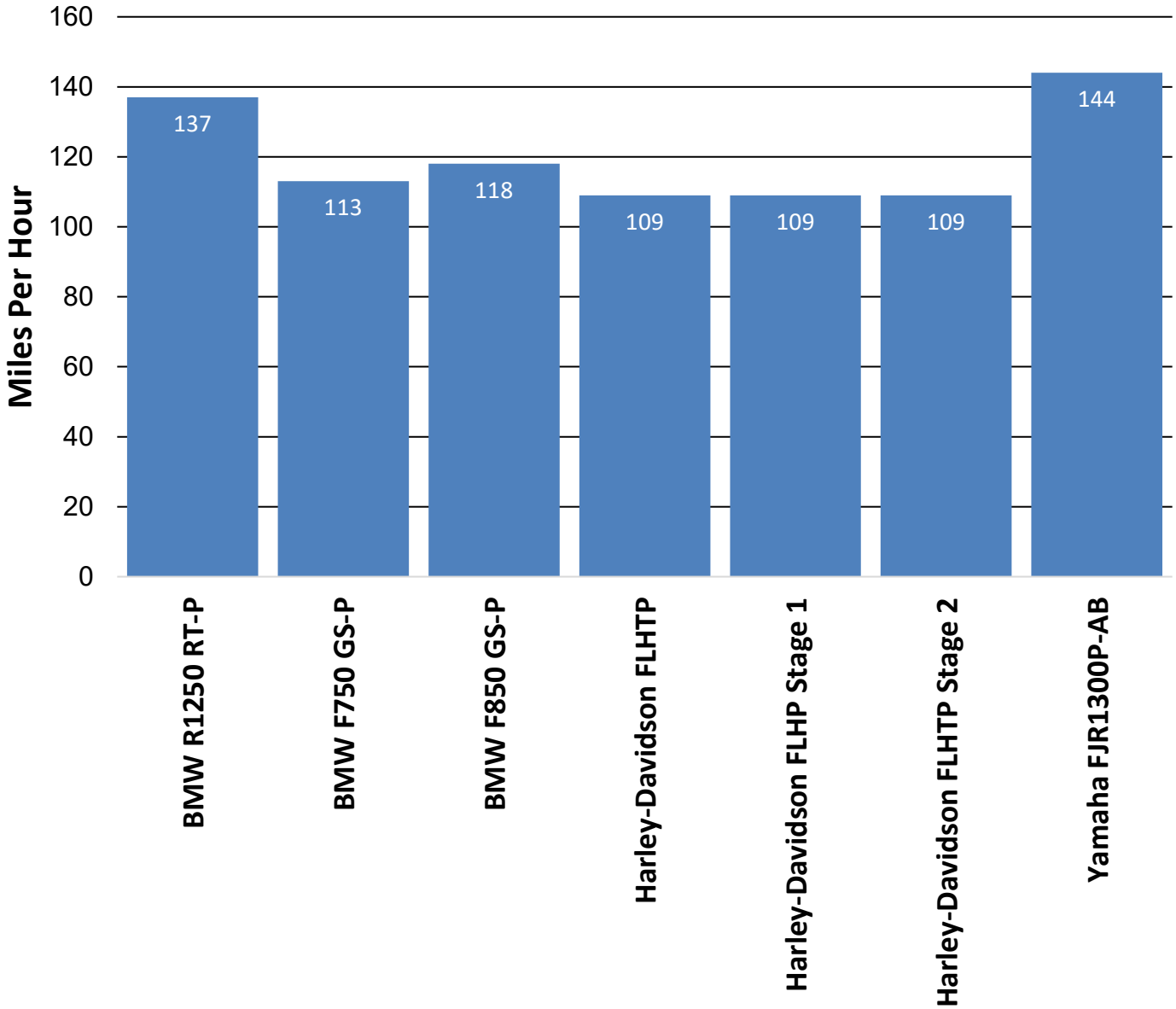
TOP SPEED ATTAINED: 144 mph

DISTANCE TO REACH TOP SPEED: 2.56 miles
TIME TO REACH TOP SPEED: 72.29 seconds

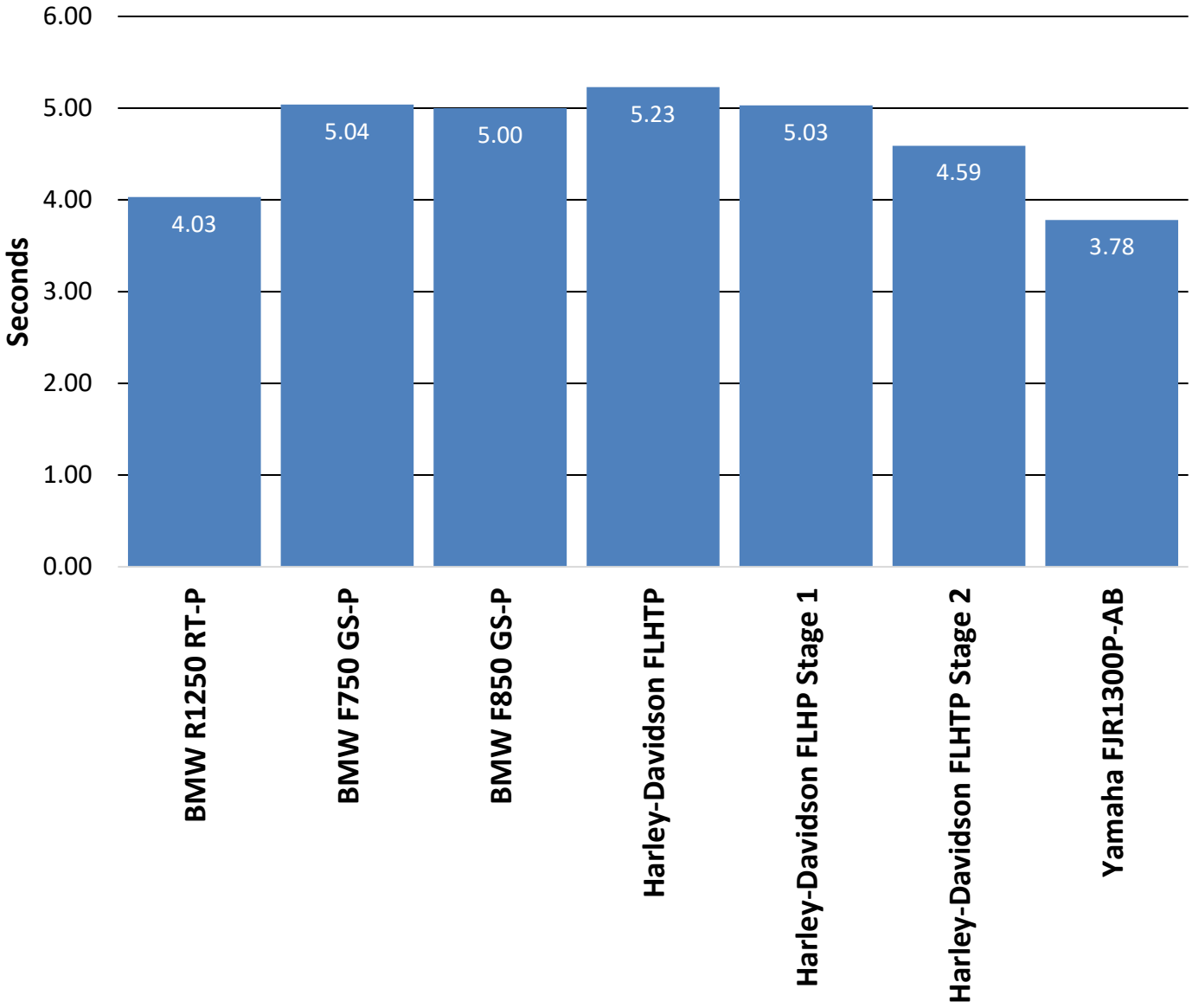
SUMMARY OF MOTORCYCLE ACCELERATION & TOP SPEED

	BMW R 1250 RT-P	BMW F 750 GS-P	BMW F 850 GS-P	Harley-Davidson FLHTP	Harley-Davidson FLHP Stage 1	Harley-Davidson FLHTP Stage 2	Yahama FJR1300 P-AB
ACCELERATION (seconds)							
0-20 mph	1.55	1.41	1.49	1.22	1.29	1.26	1.29
0-30 mph	2.14	2.15	2.20	1.86	1.92	1.87	1.91
0-40 mph	2.71	2.90	2.93	2.73	2.72	2.58	2.52
0-50 mph	3.36	3.87	3.87	3.81	3.82	3.58	3.10
0-60 mph	4.03	5.04	5.00	5.23	5.03	4.59	3.78
0-70 mph	4.90	6.53	6.48	6.88	6.74	6.05	4.72
0-80 mph	5.93	8.58	8.55	9.23	8.68	7.68	5.65
0-90 mph	7.18	11.39	11.41	12.47	11.87	10.22	6.98
0-100 mph	8.77	16.00	16.09	19.49	16.13	13.50	8.39
TOP SPEED (mph)	137	113	118	109	109	109	144
DISTANCE TO REACH (miles)							
100 mph	0.14	0.30	0.31	0.39	0.31	0.25	0.14
120 mph	0.30	N/A	N/A	N/A	N/A	N/A	0.27
Top Speed	4.72	1.79	1.50	0.80	0.63	0.40	2.56

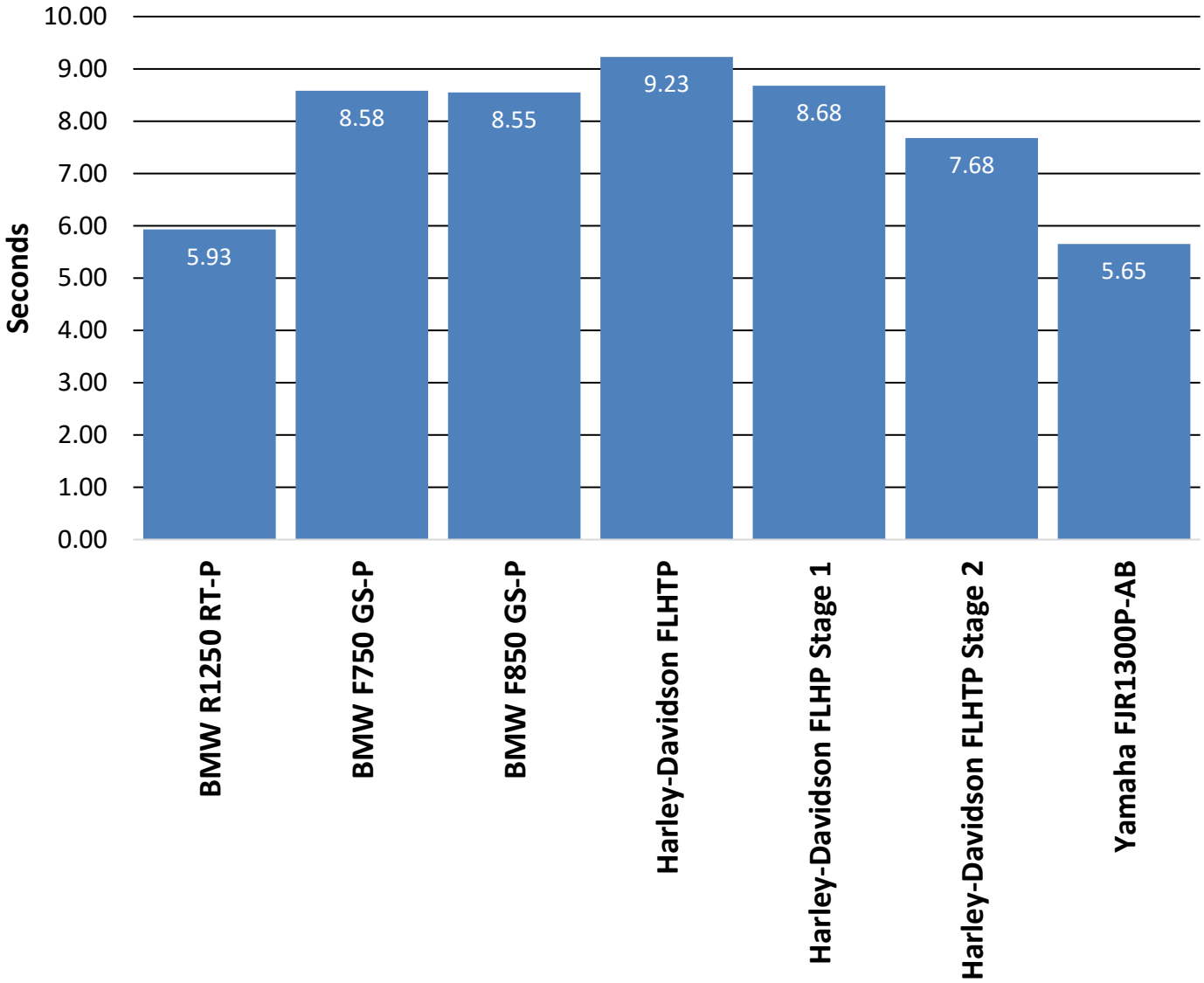
2019 Model Year
Motorcycle Top Speed Comparison
Top Speed Attained



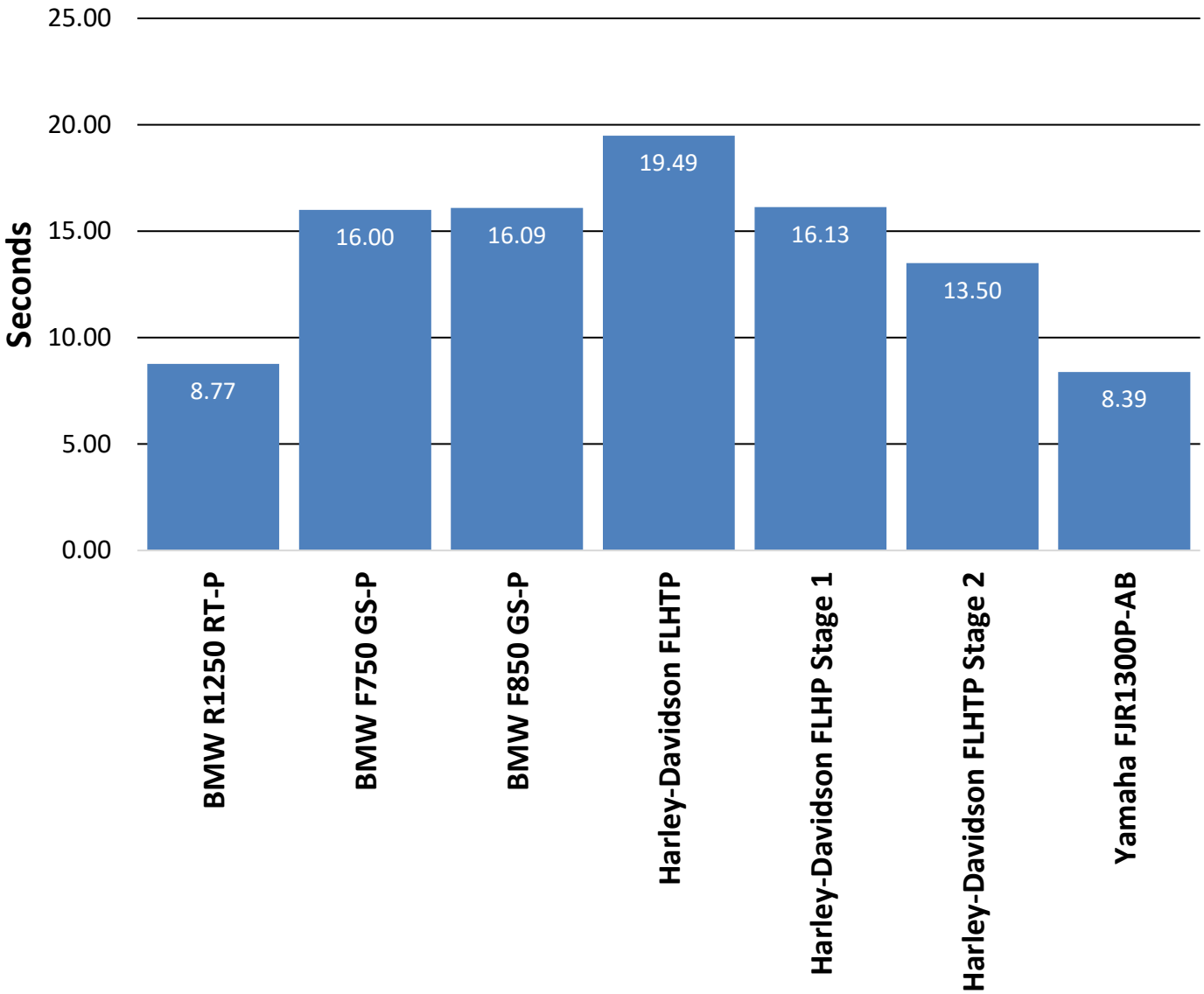
2019 Model Year
Motorcycle Acceleration Comparison
Acceleration Times
0-60 mph



2019 Model Year
Motorcycle Acceleration Comparison
Acceleration Times
0-80 mph



2019 Model Year
Motorcycle Acceleration Comparison
Acceleration Times
0-100



MOTORCYCLE BRAKE TESTING

BRAKE TEST OBJECTIVE

To determine the deceleration rate attained by each test motorcycle on twenty 60 – 0 mph full ABS maximum deceleration panic stops. Each motorcycle will be scored on the average deceleration rate it attains.

BRAKE TEST METHODOLOGY

Each motorcycle makes ten measured 60 – 0 mph full ABS maximum deceleration panic stops, at specific predetermined points. After a one-mile lap to cool the brakes, the entire sequence is repeated. The exact initial velocity at the beginning of each of the 60 – 0 mph decelerations, and the exact distance required to make each stop, is recorded by means of a Race Logic Vbox 3i GPS based data collection unit. The data resulting from the twenty total stops is used to calculate the average deceleration rate which is the motorcycle's score for this test. To ensure consistency, the same rider performs all the stops on every motorcycle.

DECELERATION RATE FORMULA

$$\text{Deceleration Rate (DR)} = \frac{\text{Initial Velocity*(IV) squared}}{\text{2 times Stopping Distance (SD)}} = \frac{(IV)^2}{2\,(SD)}$$

EXAMPLE:

Initial Velocity = 89.175 ft/s (60.8 mph x 1.4667*)
Stopping Distance = 171.4 ft.

$$DR = \frac{(IV)^2}{2(SD)} = \frac{(89.175)^2}{2(171.4)} = \frac{7952.24}{342.8} = 23.198 \text{ ft/s}^2$$

Once a motorcycle's average deceleration rate has been determined, it is possible to calculate the approximate stopping distance from any given speed by utilizing the following formula:

Select a speed; translate that speed into feet per second; square the feet per second figure by multiplying it by itself; divide the resultant figure by 2; divide the remaining figure by the average deceleration rate of the motorcycle in question.

EXAMPLE: 60 mph = 88.002 ft/s x 88.002 = 7744.352 / 2 = 3872.176 / 23.198 ft/s^2 = 166.9 ft.

BRAKE TESTING

BMW R1250 RT-P

TEST LOCATION: MSP Precision Drive Track	**DATE:** September 14, 2018	**BEGINNING TIME:** 1:03 p.m.

AIR TEMPERATURE: 73° F	**TRACK SURFACE TEMPERATURE:** 88° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.70	131.10	29.24
2	58.80	128.20	29.01
3	59.00	125.50	29.83
4	60.80	132.50	30.01
5	62.10	136.00	30.50
6	59.70	129.90	29.51
7	60.20	130.90	29.78
8	60.30	129.10	30.29
9	60.50	132.10	29.80
10	60.90	136.90	29.14
AVERAGE DECELERATION RATE:			**29.71 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.00	130.30	29.72
2	60.30	133.20	29.36
3	59.50	129.10	29.50
4	60.00	127.90	30.28
5	60.10	132.40	29.34
6	59.70	129.60	29.58
7	60.00	132.40	29.25
8	59.50	130.00	29.29
9	60.40	131.50	29.84
10	59.90	132.00	29.24
AVERAGE DECELERATION RATE:			**29.54 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**29.63 ft/s²**

PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**130.7 feet**

Evidence of Severe Fading?	No
Motorcycle Stopped in Straight Line?	Yes
Motorcycle Stopped Within Correct Lane?	Yes

All Motorcycles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

BMW F750 GS-P

TEST LOCATION: MSP Precision Drive Track	**DATE:** September 14, 2018	**BEGINNING TIME:** 12:03 p.m.

AIR TEMPERATURE: 76° F	**TRACK SURFACE TEMPERATURE:** 88° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.80	141.70	28.06
2	58.30	120.20	30.41
3	59.00	125.90	29.74
4	58.70	122.80	30.18
5	60.20	135.60	28.75
6	59.70	125.60	30.52
7	60.10	128.90	30.14
8	58.30	123.40	29.63
9	60.60	133.80	29.52
10	No record due to data collection error		
AVERAGE DECELERATION RATE:			**29.66 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	57.70	125.40	28.56
2	59.70	132.60	28.91
3	59.70	127.80	30.00
4	60.20	137.50	28.35
5	58.90	131.30	28.42
6	61.10	135.90	29.55
7	59.30	124.10	30.48
8	60.20	135.60	28.75
9	59.80	128.60	29.91
10	59.90	130.40	29.60
AVERAGE DECELERATION RATE:			**29.25 ft/s²**

Phase II

OVERALL AVERAGE DECELERATION RATE:	**29.45 ft/s²**

PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**131.5 feet**

Evidence of Severe Fading?	No
Motorcycle Stopped in Straight Line?	Yes
Motorcycle Stopped Within Correct Lane?	Yes

Refer to page 3 for further details

All Motorcycles Tested are Equipped with Anti-Lock Brakes

BRAKE TESTING

BMW F850 GS-P

TEST LOCATION: MSP Precision Drive Track	**DATE:** September 14, 2018	**BEGINNING TIME:** 1:35 p.m.

AIR TEMPERATURE: 75° F	**TRACK SURFACE TEMPERATURE:** 93° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.50	136.80	28.78
2	58.60	133.00	27.77
3	58.60	130.00	28.41
4	60.20	126.50	30.81
5	59.50	124.50	30.59
6	59.30	136.70	27.67
7	59.30	134.00	28.23
8	59.20	131.50	28.67
9	59.00	140.60	26.63
10	57.70	128.50	27.87
AVERAGE DECELERATION RATE:			**28.54 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.90	135.30	28.52
2	59.20	130.00	29.00
3	57.20	126.30	27.86
4	59.30	131.40	28.79
5	57.60	121.00	29.49
6	60.60	138.20	28.58
7	59.30	128.30	29.48
8	59.80	130.30	29.52
9	59.10	124.50	30.18
10	59.80	131.20	29.32
AVERAGE DECELERATION RATE:			**29.07 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**28.81 ft/s²**

PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**134.4 feet**

Evidence of Severe Fading?	No
Motorcycle Stopped in Straight Line?	Yes
Motorcycle Stopped Within Correct Lane?	Yes

Refer to page 3 for further details

All Motorcycles Tested are Equipped with Anti-Lock Brakes

BRAKE TESTING

Harley-Davidson FLHTP

TEST LOCATION: MSP Precision Drive Track	**DATE:** September 14, 2018	**BEGINNING TIME:** 12:54 p.m.

AIR TEMPERATURE: 72° F	**TRACK SURFACE TEMPERATURE:** 92° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.50	131.00	29.07
2	60.00	133.00	29.11
3	60.00	132.50	29.22
4	59.70	133.90	28.63
5	59.50	132.50	28.74
6	60.80	139.80	28.44
7	60.10	136.10	28.55
8	59.40	140.90	26.93
9	60.10	138.10	28.13
10	60.00	140.30	27.60
AVERAGE DECELERATION RATE:			**28.44 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.60	130.80	29.21
2	59.80	140.10	27.45
3	60.20	138.60	28.12
4	59.70	135.80	28.23
5	60.30	141.70	27.60
6	60.70	147.60	26.85
7	60.70	141.10	28.09
8	60.20	138.20	28.21
9	59.80	139.00	27.67
10	60.10	142.80	27.21
AVERAGE DECELERATION RATE:			**27.86 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**28.15 ft/s²**
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**137.5 feet**

Evidence of Severe Fading?	No
Motorcycle Stopped in Straight Line?	Yes
Motorcycle Stopped Within Correct Lane?	Yes

All Motorcycles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Harley-Davidson FLHP Stage 1

TEST LOCATION: MSP Precision Drive Track	**DATE:** September 14, 2018	**BEGINNING TIME:** 12:18 p.m.

AIR TEMPERATURE: 71° F	**TRACK SURFACE TEMPERATURE:** 93° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.00	127.40	29.39
2	59.80	129.60	29.68
3	59.90	136.00	28.38
4	59.90	132.10	29.21
5	60.00	136.50	28.37
6	59.50	136.00	28.00
7	61.40	140.80	28.80
8	59.80	136.70	28.14
9	60.70	140.80	28.15
10	59.90	138.60	27.84
AVERAGE DECELERATION RATE:			**28.60 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.60	134.80	28.34
2	61.30	147.00	27.50
3	60.80	146.90	27.07
4	60.40	141.80	27.67
5	61.00	149.80	26.72
6	60.40	144.10	27.23
7	60.00	136.90	28.28
8	60.40	142.80	27.48
9	59.70	144.30	26.57
10	60.20	148.80	26.20
AVERAGE DECELERATION RATE:			**27.31 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**27.95 ft/s²**

PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**138.5 feet**

Evidence of Severe Fading?	No
Motorcycle Stopped in Straight Line?	Yes
Motorcycle Stopped Within Correct Lane?	Yes

All Motorcycles Tested are Equipped with Anti-Lock Brakes*

BRAKE TESTING

Harley-Davidson FLHTP Stage 2

TEST LOCATION: MSP Precision Drive Track	**DATE:** September 14, 2018	**BEGINNING TIME:** 12:36 p.m.

AIR TEMPERATURE: 71° F	**TRACK SURFACE TEMPERATURE:** 96° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.40	132.00	28.75
2	60.00	133.60	28.98
3	60.30	135.50	28.86
4	60.50	139.40	28.24
5	60.40	142.60	27.52
6	59.90	135.70	28.44
7	60.60	140.80	28.05
8	60.50	144.30	27.28
9	Not recorded due to data collection error		
10	Not recorded due to data collection error		
AVERAGE DECELERATION RATE:			**28.27 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	60.20	131.60	29.62
2	60.40	144.90	27.08
3	60.50	142.90	27.55
4	60.20	141.30	27.59
5	60.40	142.70	27.50
6	60.60	142.00	27.82
7	60.40	139.20	28.19
8	60.90	148.00	26.95
9	Not recorded due to data collection error		
10	Not recorded due to data collection error		
AVERAGE DECELERATION RATE:			**27.79 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**28.03 ft/s²**

PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**138.2 feet**

Evidence of Severe Fading?	No
Motorcycle Stopped in Straight Line?	Yes
Motorcycle Stopped Within Correct Lane?	Yes

*****All Motorcycles Tested are Equipped with Anti-Lock Brakes*****

BRAKE TESTING

Yamaha FJR1300P-AB

TEST LOCATION: MSP Precision Drive Track	**DATE:** September 14, 2018	**BEGINNING TIME:** 12:42 p.m.

AIR TEMPERATURE: 72° F	**TRACK SURFACE TEMPERATURE:** 97° F

Phase I

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.50	141.20	26.97
2	60.30	143.80	27.20
3	59.90	123.80	31.17
4	60.50	149.70	26.30
5	59.70	135.80	28.23
6	60.80	148.50	26.78
7	60.50	152.60	25.80
8	60.50	144.40	27.26
9	60.00	143.20	27.04
10	61.20	148.60	27.11
AVERAGE DECELERATION RATE:			**27.39 ft/s²**

(One cool down lap at 45 mph)

Phase II

(Ten 60 – 0 mph full ABS maximum deceleration stops)

Stop #	Initial Velocity *(mph)*	Stopping Distance *(feet)*	Deceleration Rate *(ft/s²)*
1	59.50	140.70	27.06
2	61.10	160.50	25.02
3	60.00	144.40	26.82
4	60.60	153.80	25.68
5	60.00	138.00	28.06
6	59.40	145.60	26.07
7	60.10	140.60	27.63
8	60.40	146.30	26.82
9	59.90	142.70	27.04
10	60.30	148.10	26.41
AVERAGE DECELERATION RATE:			**26.66 ft/s²**

Phase III

OVERALL AVERAGE DECELERATION RATE:	**27.02 ft/s²**

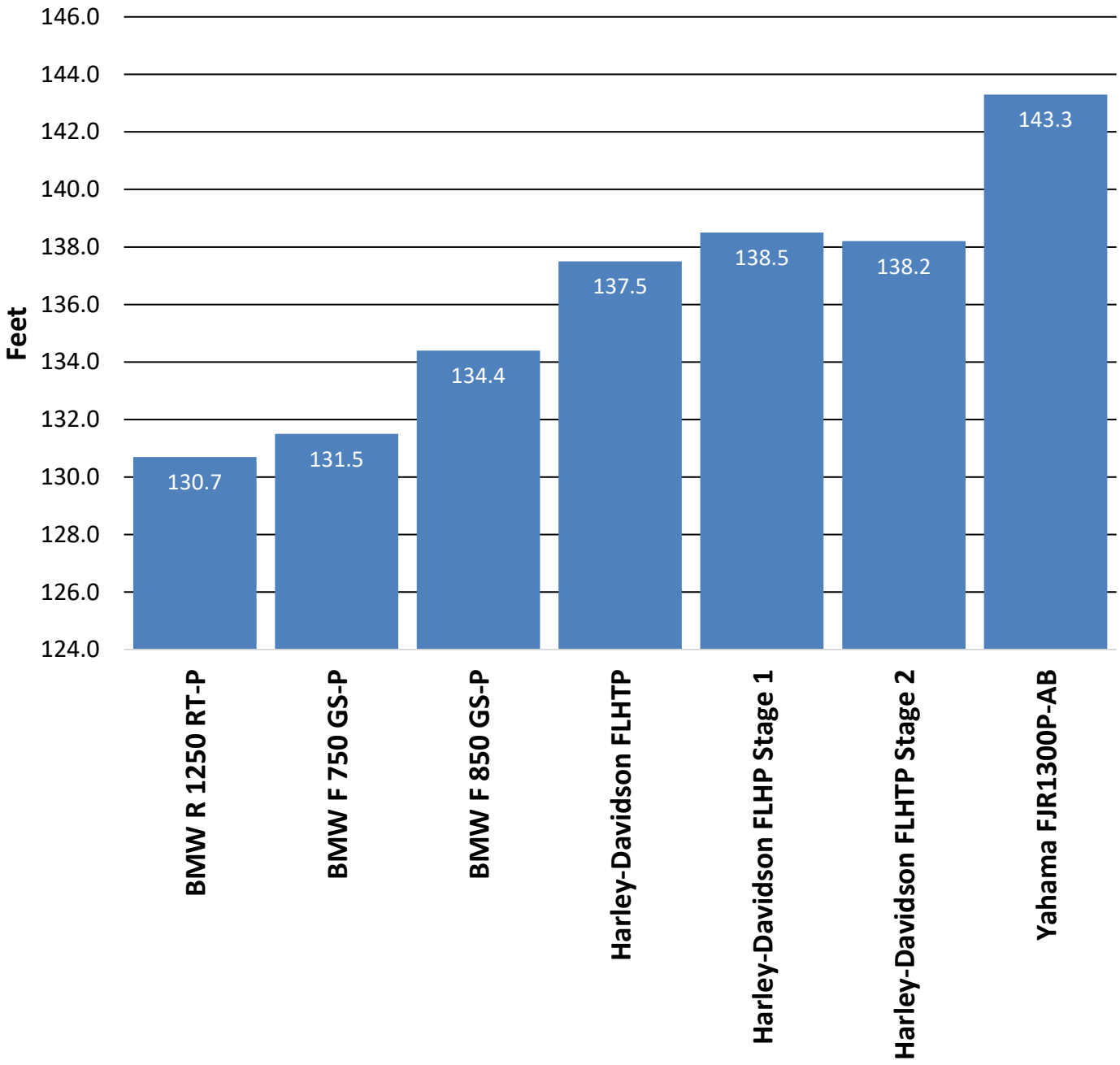
PROJECTED STOPPING DISTANCE FROM 60.0 mph:	**143.3 feet**

Evidence of Severe Fading?	No
Motorcycle Stopped in Straight Line?	Yes
Motorcycle Stopped Within Correct Lane?	Yes

All Motorcycles Tested are Equipped with Anti-Lock Brakes*

2019 Motorcycle Brake Testing

Projected Stopping Distance



For Your Information

About the National Institute of Justice

NIJ — the research, development, and evaluation agency of the U.S. Department of Justice - is dedicated to improving knowledge and understanding of crime and justice issues through science. NIJ provides objective and independent knowledge and tools to inform the decision-making of the criminal justice community to reduce crime and advance justice, particularly at the state and local levels.

NIJ's pursuit of this mission is guided by the following principles:

- Research can make a difference in individual lives, in the safety of communities and in creating a more effective and fair justice system.
- Government-funded research must adhere to processes of fair and open competition guided by rigorous peer review.
- NIJ's research agenda must respond to the real world needs of victims, communities, and criminal justice professionals.
- NIJ must encourage and support innovative and rigorous research methods that can provide answers to basic research questions as well as practical, applied solutions to crime.
- Partnerships with other agencies and organizations, public and private, are essential to NIJ's success.

The National Institute of Justice is committed to being a transformative force in the criminal justice field by meeting five strategic challenges:

1. **Fostering science-based criminal justice practice** - supporting rigorous scientific research to ensure the safety of families, neighborhoods, and communities.
2. **Translating knowledge to practice** - disseminating rigorous scientific research to criminal justice professionals to advance what works best in preventing and reducing crime.
3. **Advancing technology** - building a more effective, fair and efficient criminal justice system through technology.
4. **Working across disciplines** - connecting the physical, forensic and social sciences to reduce crime and promote justice.
5. **Bolstering the research infrastructure** - supporting young scholars, encouraging researchers from a broad array of disciplines to apply their work to criminal justice, and increasing the availability of research findings and data.
6. **Adopting a global perspective** - understanding crime in its social context within the U.S. and globally.

About the Standards and Testing Program

The NIJ Standards and Testing Program develops and publishes equipment standards that specifically address the needs of law enforcement, corrections, and other criminal justice agencies. The goal is to ensure to the degree possible that equipment is safe, reliable, and performs according to established minimum requirements.

NIJ standards are voluntary standards. Manufacturers are neither required nor mandated to follow them. They are also performance standards. They do not specify a particular solution, but rather define what a potential solution must accomplish.

Even though NIJ standards are not regulatory in nature, they are nevertheless influential because they articulate best practice. They obtain their influence from an agency's consideration of the legal or monetary penalties that may ensue as a consequence of a bad outcome resulting from not adopting a standard.

Having a standard provides the end user with performance information on key equipment characteristics, provides a level of confidence in a product's fitness for use and allows comparison of products based on standardized testing methods and minimum performance requirements.

NIJ standards are an articulation of the criminal justice practitioner's operational needs and associated performance levels with regard to particular tools and technology. They reflect the practical experiences of the community in the field articulated in such a way as to enable testing in a valid and consistently replicable manner.

NIJ also supports testing programs based on the standards.

For more information, please visit the NIJ website at http://www.nij.gov/topics/technology/standards-testing/Pages/welcome.aspx, or JUSTNET, the website of the Justice Technology Information Center, at https://www.justnet.org/compliant/Learn-about-testing.html. JTIC manages the Compliance Testing Program for NIJ>

Resolution Regarding Acquisition of Conservation Easements
Background Information:
As we all know we have been working to get easements for the streambank restoration process for over two years. We have roughly half of the necessary easements and will likely have to acquire the remaining easements by eminent domain. This process has taken so long that we need to reassure the CWMTF that we will get the easements and move forward with the project. This resolution will help to do so.

Staff Recommendation:	Staff recommends that the Board adopt this resolution as presented.

Possible Board of Commissioner Actions

- Approve the resolution as presented.
- Make changes to the resolution and approve.
- Deny approval to the resolution
- Send back to staff for further review
- Table to a later date
- Take no action

Attachments

- Resolution 2019-20-03

STATE OF NORTH CAROLINA **TOWN OF PILOT MOUNTAIN**

COUNTY OF SURRY **RESOLUTION NO. 2019/20-03**

RESOLUTION COMMITTING TO ACQUISITION OF STREAMBANK RESTORATION EASEMENTS

WHEREAS, the Town has received two $400,000 grants from the NC Clean Water Management Trust Fund and a $300,000 grant from the NC Division of Water Resources to conduct stream bank restoration along an unnamed tributary to Tom's Creek, and;

WHEREAS, as a part of the CWMTF grant the Town is required to secure permanent conservation easements along the stream, and;

WHEREAS, the Town of Pilot Mountain will use the value of the conservation easements as the match for the NC CWMTF grants.

NOW, THEREFORE, BE IT RESOLOVED by the Board of Commissioners that:

1. That the Town of Pilot Mountain does hereby commit to acquiring all of the necessary conservation easements for this project.

ADOPTED by the Board of Commissioners of the Town of Pilot Mountain this the 18th day of September 2019.

Attest:

_____ _____

Evan Cockerham, Mayor *Holly Utt, Town Clerk*