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Chat

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- Please complete the brief evaluation at the conclusion of this webinar.
- A certificate of attendance will be sent to attendees within 2 weeks.



# *Connected Cars for Law Enforcement*

*March 28, 2023 | Presented by:*

Andrew Vallee, Associate, NCJTC



# Grant Funding Acknowledgement

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# Today's Presenter

**Andrew Vallee**

Associate, NCJTC

*Special Agent with the Tennessee Bureau of  
Investigation since 2014*

# Learning Objectives

- ✓ Students will be able to identify the types of data that is available from connected cars.
- ✓ Learn the difference between network connected cars and vehicle forensics options.
- ✓ Students will be able to query certain vehicles to determine their connection status to various service providers.
- ✓ Be able to draft legal process for the extraction of vehicle specific data.
- ✓ Students will learn resources and tools that can assist them in their investigations that involve vehicle data.







**Where do I get vehicle data from?**

# Internet of Things (IoT)



Always ready, connected, and fast. **Just ask.**

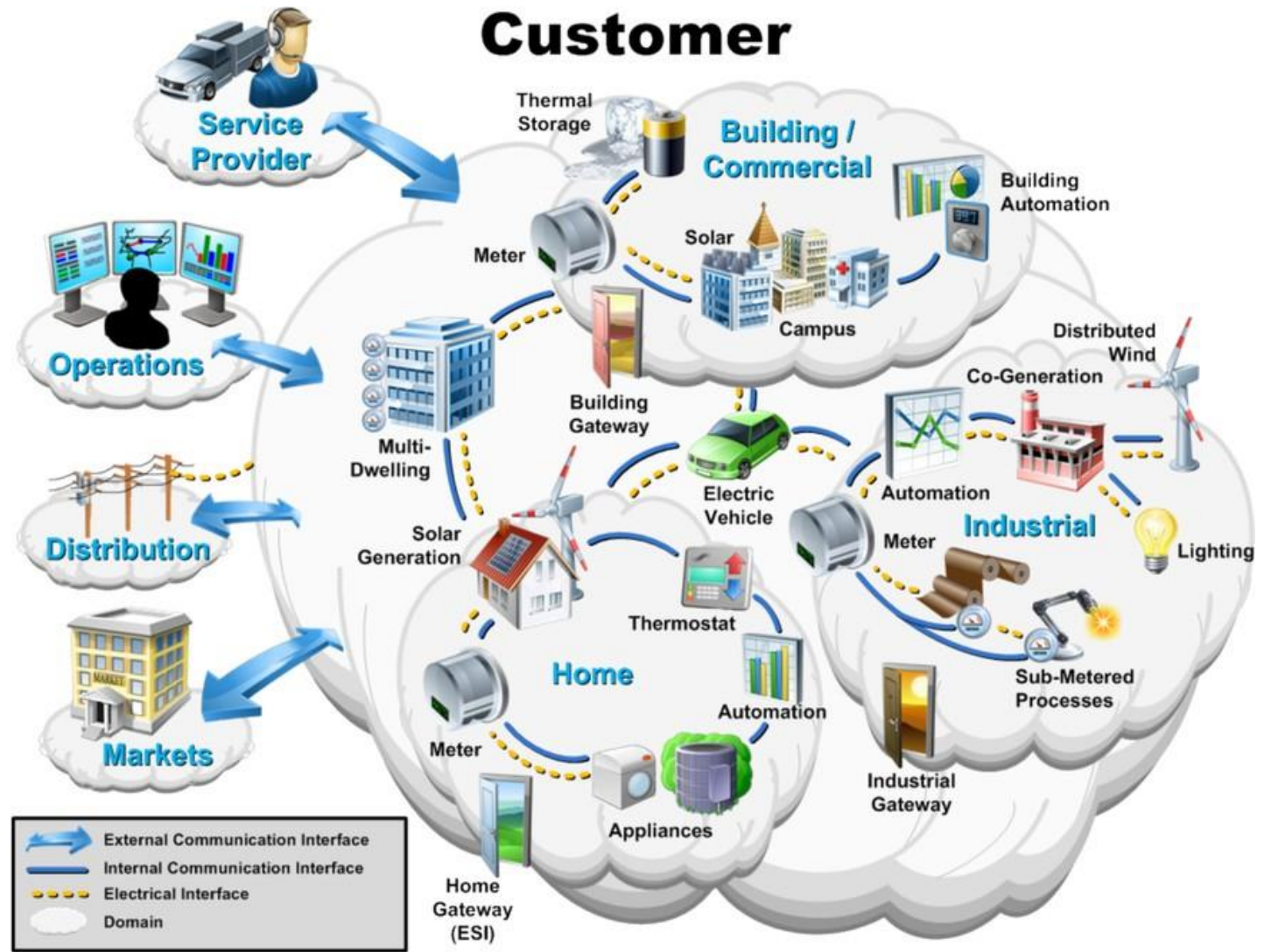




**Just like the devices on the previous slide are all connected to the internet, so are vehicles....**



# Internet of Things

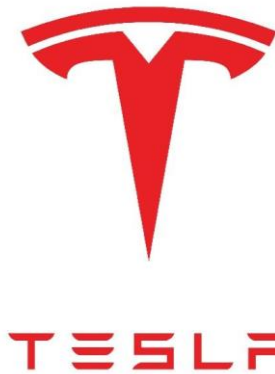


# **Six Main Sources of Data From Vehicles Are Possible**

# Connected Vehicle Services



mbrace  
Your World, From Your Car

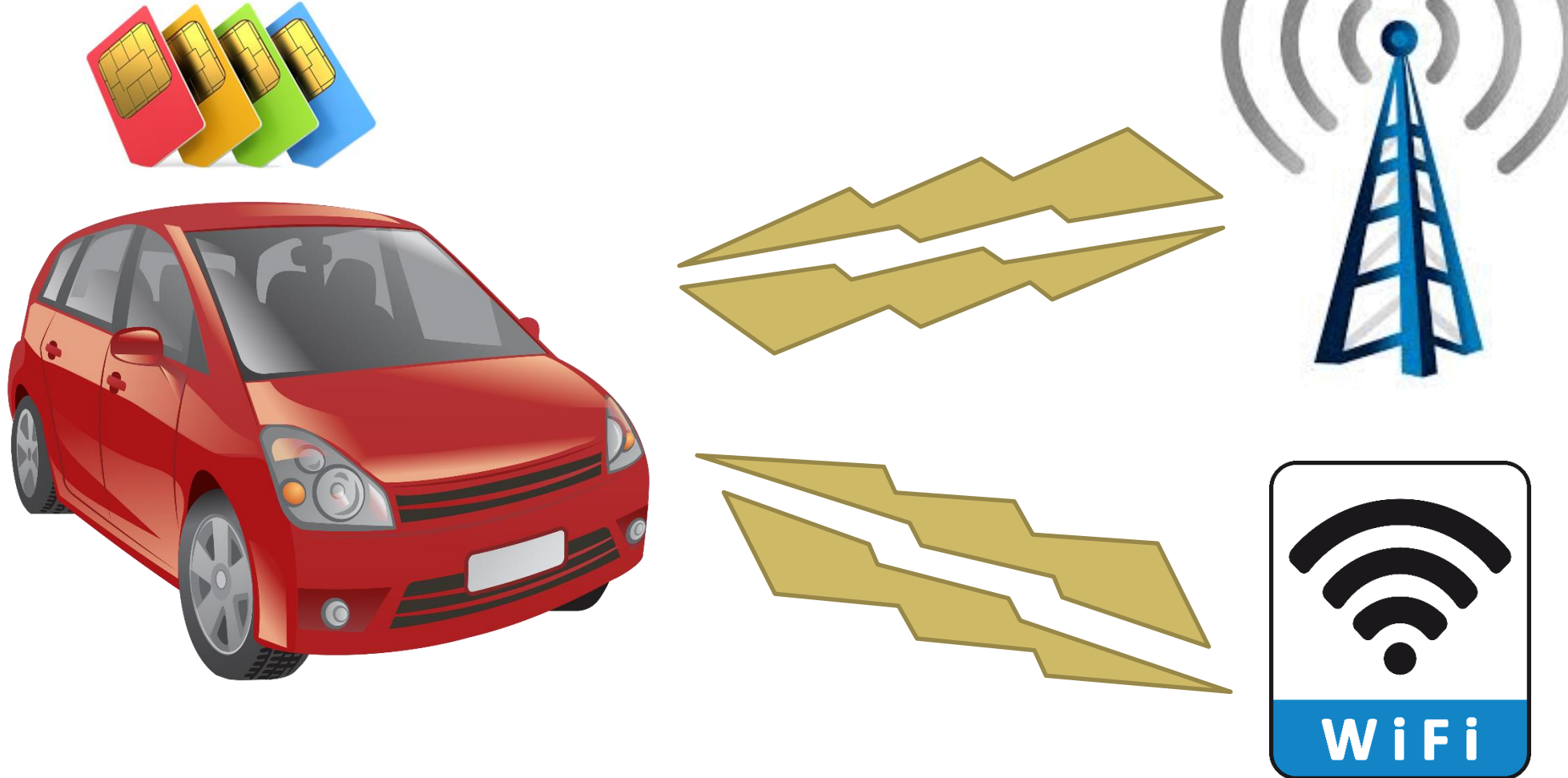




# Third Party Vehicle Data



# Cellular and Wi-Fi Capable Vehicles



# Vehicle Event Data Recorder (Black Box)



# Vehicle Digital Forensics (Infotainment System)





# Vehicle Video Recording Systems / Devices





# Connected Vehicle Services



# IoT and In-Vehicle Services

- What allows in-vehicle services to work when you push the button?
- What does this offer you from an investigative perspective?
- How do we get data from these services?



# AcuraLink



<https://mygarage.honda.com/s/acuralink-marketing>

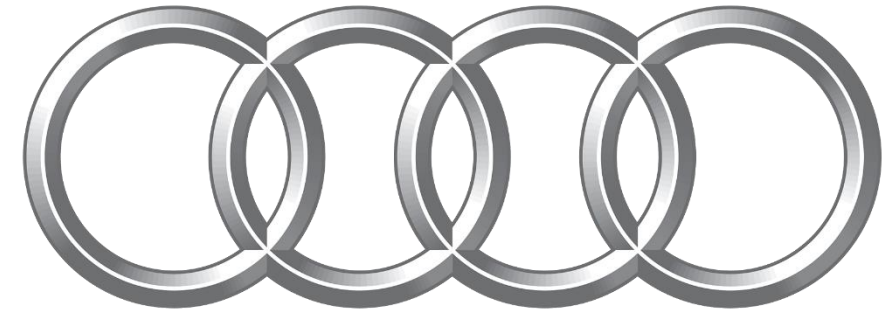
# ALFA Connect



2018 & newer

<https://www.volvocars.com/us/own/connected-car>

# Audi Connect



**Audi**

2016 & newer

<https://www.audiusa.com/us/web/en/inside-audi/innovation/audi-connect.html>



# BMW Connected Drive



2016 & newer

<https://www.bmwusa.com/explore/connecteddrive.html>

# FordPass



2018 & newer



FordPass

<https://www.ford.com/support/how-tos/fordpass/fordpass-connect/fordpass-connect-overview/>



# HondaLink



**HONDA**

2017 & newer

# HondaLink

<https://mygarage.honda.com/s/hondalink-product-compatibility>

# Hyundai BlueLink



**HYUNDAI**

2012 & newer

<https://owners.hyundaiusa.com/us/en/resources/blue-link/hyundai-blue-link-overview.html>

# Infiniti InTouch



INFINITI®

2020 & newer

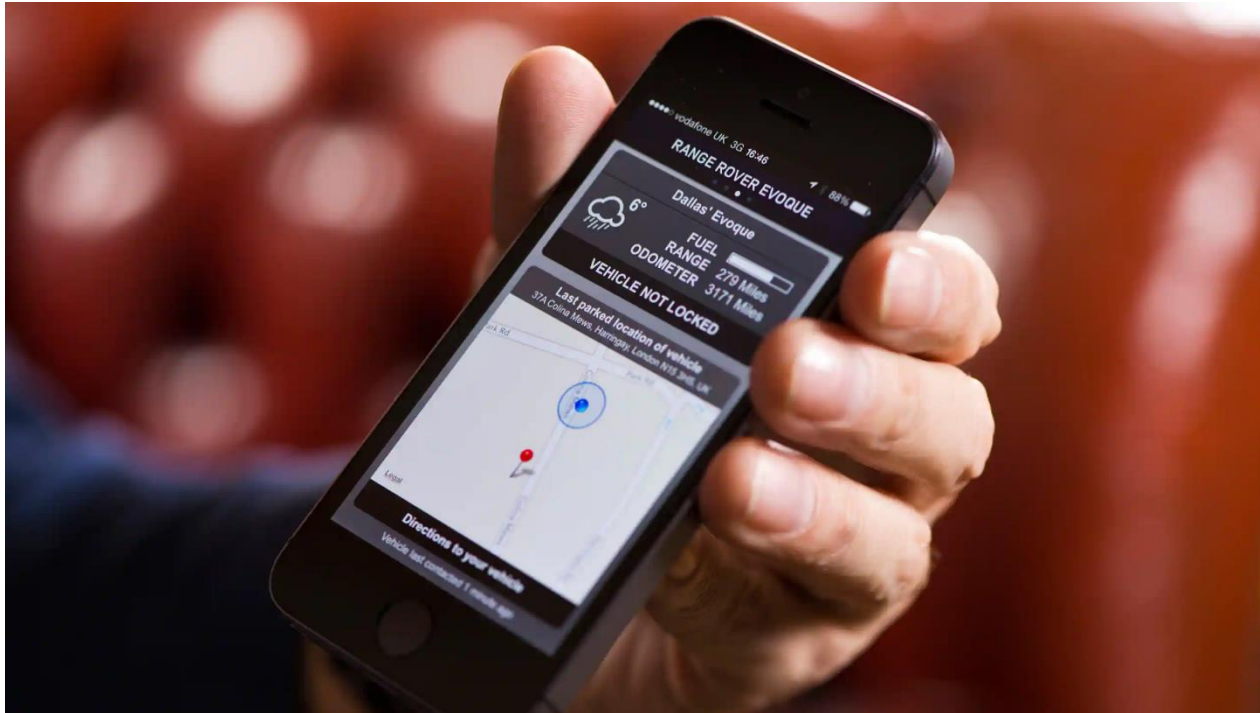
<https://www.infiniti.com/intouch/system-availability.html>

# Jaguar InControl



<https://www.jaguar.com/incontrol-global/index.html>

# Land Rover InControl

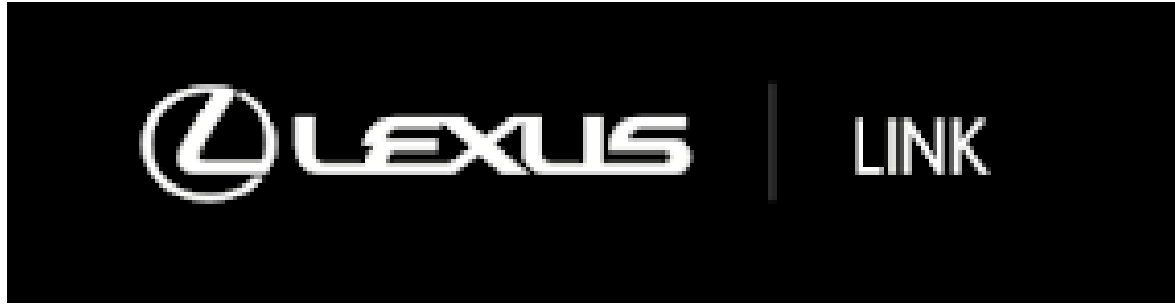


2016 & newer

<https://www.landroverusa.com/ownership/incontrol/index.html>



# Lexus Link



<https://www.lexus.eu/owners/about-my-lexus/lexus-link-connected-services>

# Lincoln Connect



<https://www.lincoln.com/support/how-tos/lincoln-way-app/lincoln-connect/how-does-lincoln-connect-work/>

# Maserati Connect



2021 & newer

<https://www.maserati.com/us/en/ownership/maserati-connect>

# Mazda Connected Services



**MAZDA**

2021 & newer

[https://mazda.custhelp.com/app/answers/detail/a\\_id/189/~/\\_/what-is-mazda-connected-services%3F](https://mazda.custhelp.com/app/answers/detail/a_id/189/~/_/what-is-mazda-connected-services%3F)

# Mercedes Me Connect



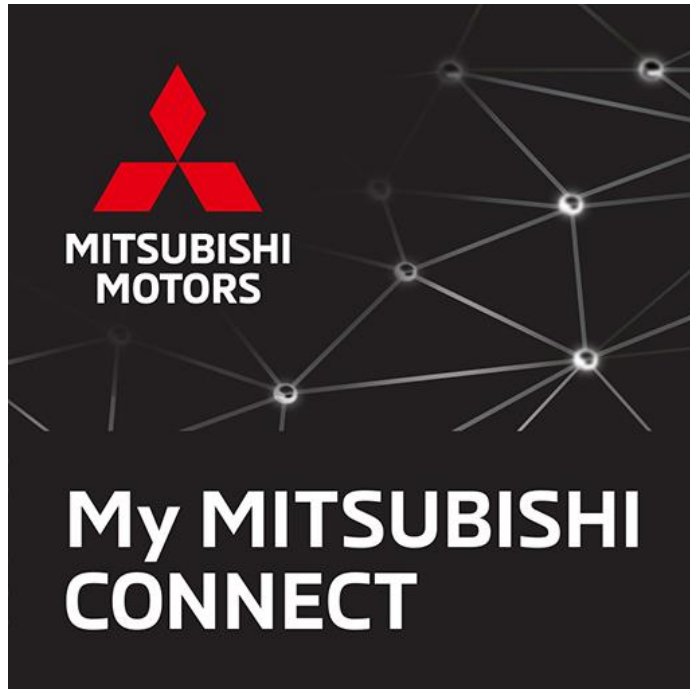
Mercedes-Benz

2015 & newer

<https://www.mbusa.com/en/legal-notices/connected-vehicle>



# Mitsubishi Connect



[https://www.mitsubishi-connect.com/en/SafeguardRemote/Manual/eclipse-cross\\_US/contents/tp\\_04\\_FAQ.html](https://www.mitsubishi-connect.com/en/SafeguardRemote/Manual/eclipse-cross_US/contents/tp_04_FAQ.html)

# Nissan Connect



2020 & newer

<https://www.nissanusa.com/connect.html>

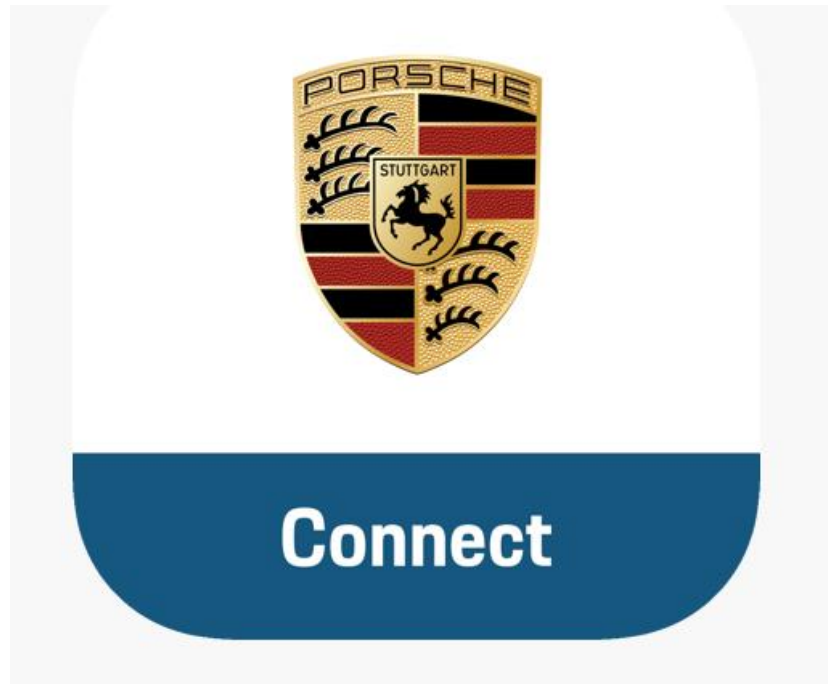
# OnStar



2014 & newer  
Buick, Cadillac, Chevrolet, & GMC

<https://www.public-safety.onstar.com/emergency-situations/>

# Porsche Connect



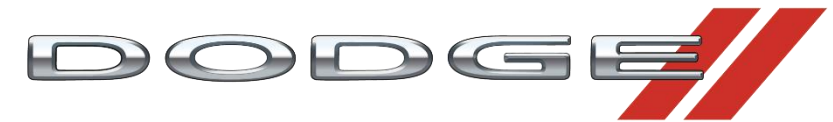
<https://www.porsche.com/usa/connect/>

# SiriusXM Radio





# SiriusXM Connected



2016 & newer  
Chrysler, Dodge, Fiat, & Jeep

<https://www.siriusxm cvs.com/>

# Stellantis



**RAM**

2016 & newer  
Dodge Ram Trucks

<https://www.stellantis.com/en/technology/intelligent-vehicles>

# Subaru StarLink



**SUBARU**

2018 & newer



<https://www.subaru.com/vehicle-info/subaru-starlink.html>

# Tesla Premium Connectivity



TESLA

2012 & newer

<https://www.tesla.com/legal/contact> - Click Gov't & LE Inquiries

# Toyota Connected Services



**TOYOTA**  
connected



2020 & newer

<https://www.toyota.com/connected-services/>



# Volkswagen Car-Net



Volkswagen

**Car-Net<sup>®</sup>**



**Volkswagen**

2020 & newer

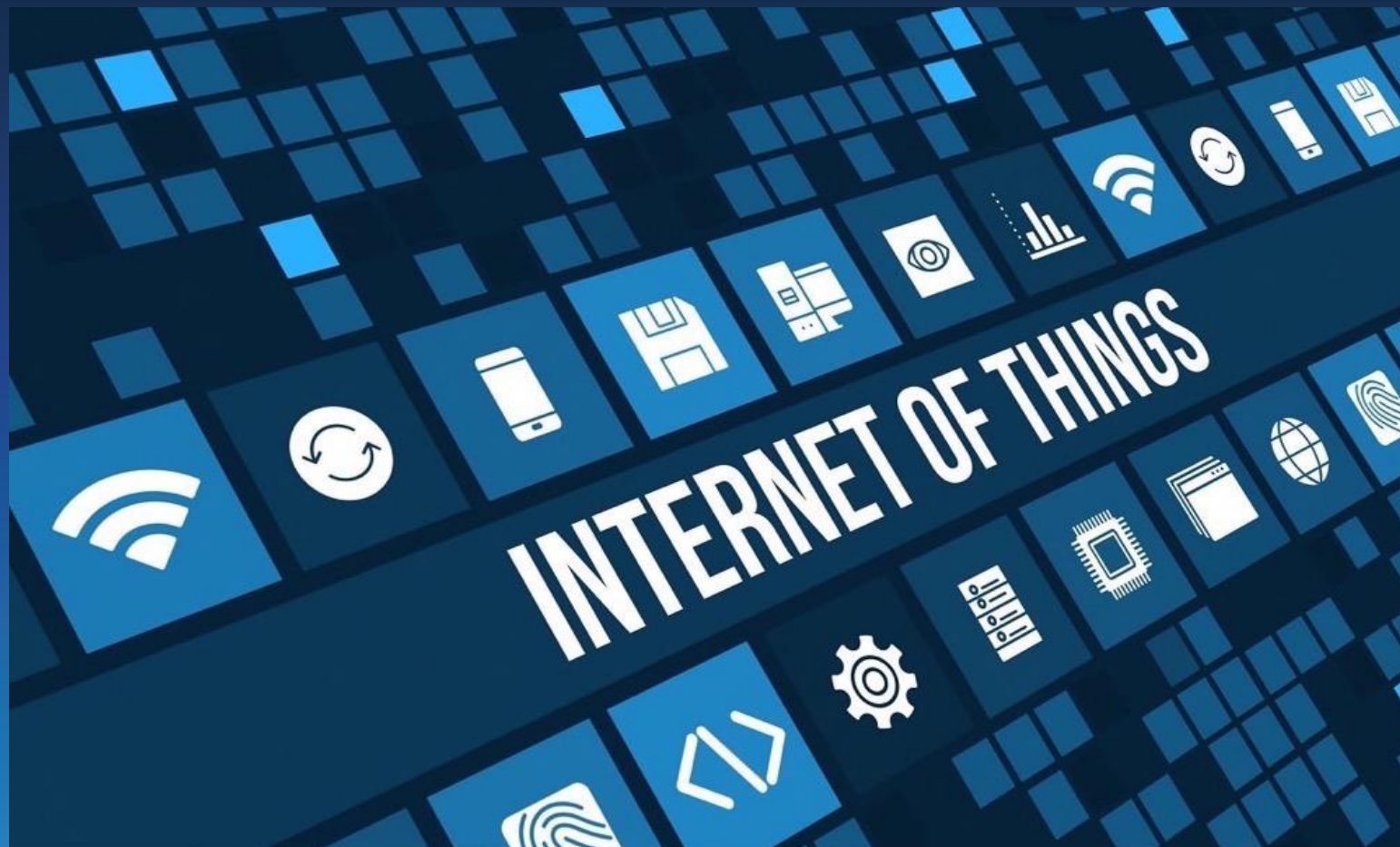
<https://carnet.vw.com/#/home>

# Volvo Connected Car



2018 & newer

<https://www.volvocars.com/us/own/connected-car>



# Third Party Vehicle Data

# Telematics Driving Usage-Based Auto Insurance







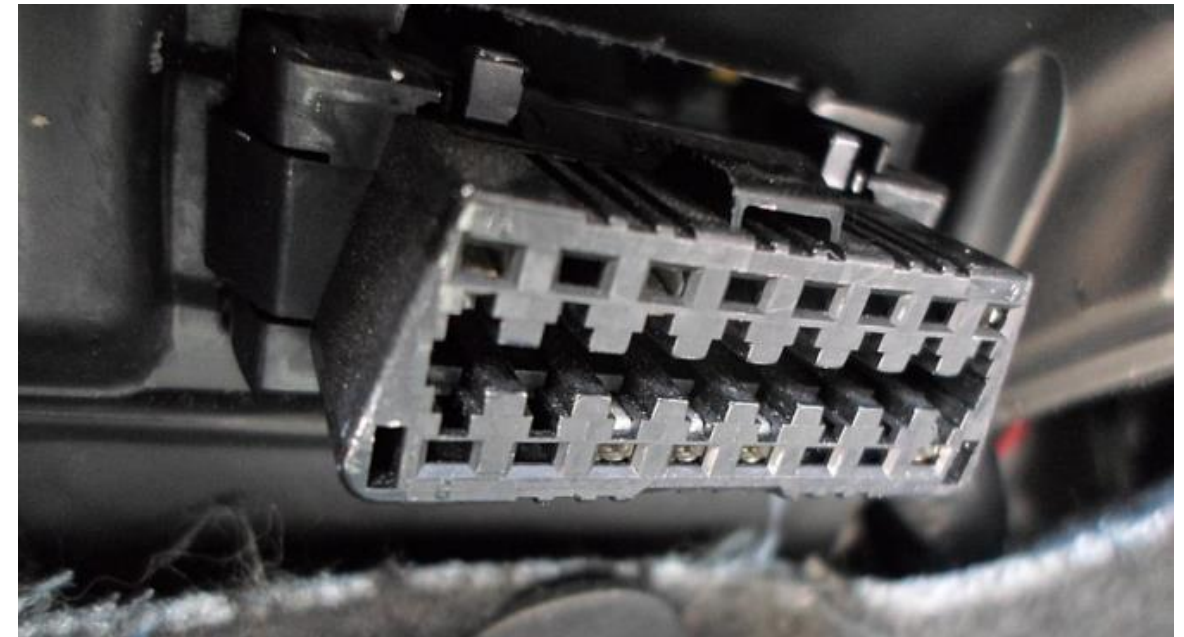
# Usage Based Vehicle Insurance (Device Physically Installed In Vehicle)



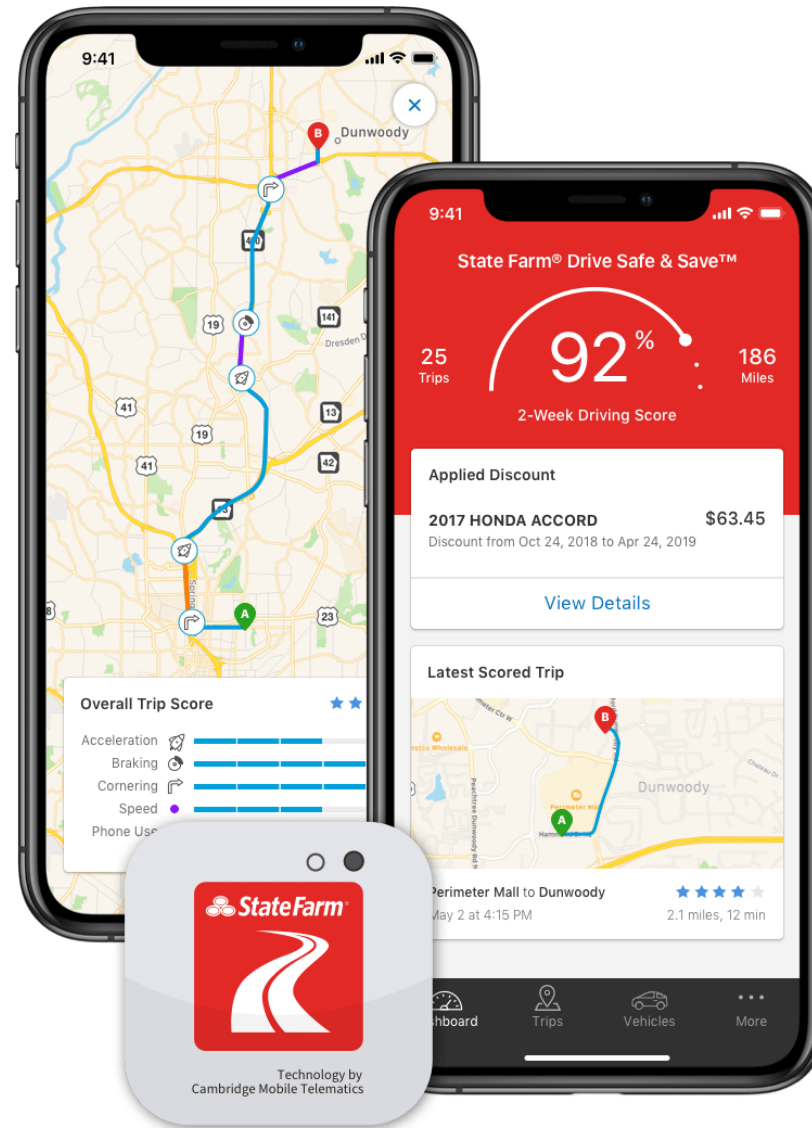
TESLA | Insurance

# Vehicle OBD-II Port

- On-Board Diagnostics II
- On-Board Computer that monitors speed, engine parameters, emissions, and other vehicle data
- Usually located under the driver's side dash



# Usage Based Vehicle Insurance (Smart Phone App)



# How to find out who the insurer is

- Check with the bank or financing company
- Check with the State DMV (many states are now online with insurance companies and import vehicle insurance data directly into State systems)
- National Insurance Crime Bureau (NICB)  
<https://www.nicb.org/law-enforcement>



# Lien Holder / “Tote The Note” Trackers

- Many lien holders will place discrete vehicle trackers on vehicle to recover them in case of non-payment.
- Trackers usually check-in every 12 hours or 24 hours.
- Most of the time these lien holders are cooperative with law enforcement.





# Rental Car Companies

- Most large rental car companies have vehicle tracking capabilities. These may not be real-time and may only check-in every 12 to 24 hours.
- Airport Police can often help with local law enforcement contacts for most rental car companies.



# Hertz, Dollar, & Thrifty Rental Car Law Enforcement Contact

Hertz Corporation  
Attn: Legal Dept  
8501 Williams Rd, 3<sup>rd</sup> Floor  
Estero, FL 33928

Email: [subpoena@hertz.com](mailto:subpoena@hertz.com)

Global Corporate Security Phone (24/7):  
800-654-5060 (LE Only)



# Budget & Avis Rental Car Law Enforcement Contact

Avis Budget Group  
6 Sylvan Way  
Parsippany, NJ 07054

Email:  
[subpoena.compliance@avisbudget.com](mailto:subpoena.compliance@avisbudget.com)

Security Desk Phone (24/7):  
800-533-9056 (LE Only)

The Avis logo consists of the word "AVIS" in a bold, red, sans-serif font. A small registered trademark symbol (®) is located at the top right of the letter "S".The Budget logo features the word "Budget" in a bold, blue, sans-serif font. Below the text is a stylized orange and white graphic element that resembles a folded corner or a flag.

# Enterprise Rental Car Law Enforcement Contact

EAN Holdings

600 Corporate Park Dr

St. Louis, MO 63105



Security Desk Phone (24/7):

866-279-2060 (LE Only)

Enterprise only retains GPS data and tolling transactions for a 14-day period and then it is deleted. They will honor preservation letters.

# Law Enforcement Vehicle Trackers





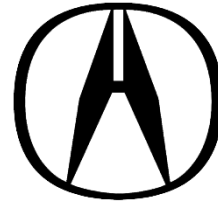


# Cellular Capable Vehicles

# Step 1: Check to see if the vehicle manufacturer is one of the following:



2018 & newer



ACURA

2019 & newer



2018 & newer



2021 & newer



2016 & newer

Chrysler, Dodge, Fiat, & Jeep



SUBARU

2018 & newer



2014 & newer

Buick, Cadillac, Chevrolet, & GMC



HONDA

2017 & newer



LINCOLN

2018 & newer

# Step 2: Check with AT&T for cellular service

## <https://www.att.com/plans/in-car-wifi/>



Deals Wireless Internet Accessories TV Prepaid Business

I'm looking for...



Support

My AT&T

Find a store

Ver en español

Get one month of in-car wi-fi, get one month on us.

IN-CAR WI-FI

## Reclaim your drivetime

Buckle up and stream your "Happy Tunes" playlist while running errands, entertain your kids with cartoons and games, or connect to today's staff meeting. Check if your car qualifies for a free trial.

Elig. vehicle & wireless service req'd. Coverage & service not avail. everywhere. Restr's apply. See plan details below.

Get started →

IN-CAR WI-FI FOR BUSINESS. →

Feedback



# Enter the VIN of the target vehicle



Deals Wireless Internet Accessories TV Prepaid Business

I'm looking for...



Support

My AT&T

Get one month of in-car wi-fi, get one month on us.



STEP 1 OF 2: CHECK YOUR VEHICLE'S COMPATIBILITY

## Does In-car Wi-Fi work with my vehicle?

Enter your VIN to see if your vehicle is Wi-Fi ready. We'll also check for any offers or promotions available to you.

1FTFW1E54NFA62167



[See offer details](#)

Submit VIN →



National Criminal Justice Training Center of Fox Valley Technical College

Feedback

# This vehicle has cellular capabilities, contact AT&T



Deals Wireless Internet Accessories TV Prepaid Business

I'm looking for...



Support

My AT&T

Get one month of in-car wi-fi, get one month on us.



Step 2 of 2: Get Connected

## Let's get started

Your 2022 FORD F-150 has a built-in Wi-Fi hotspot, AND your 3GB Data Plan trial is on us!

ACTIVATE MY TRIAL →



BONUS

## Your ride is about to get way more entertaining

Get 1000+ hours of on-demand shows, movies, and music on us with an unlimited In-car Wi-Fi plan. Just download the free WarnerMedia RIDE™ app.

Feedback



**If your vehicle was not on the previous list, it is still supported by AT&T. Unfortunately, with these manufacturers you cannot run the VIN directly to confirm cellular connectivity. You will need to obtain the IMSI and/or IMEI.**

- Alfa Romeo – 2018 and newer
- Audi – 2016 and newer
- BMW- 2016 and newer
- Infiniti- 2020 and newer
- Jaguar- 2016 and newer
- Land Rover- 2016 and newer
- Lexus- 2020 and newer
- Maserati- 2021 and newer
- Mitsubishi – 2022 and newer
- Nissan- 2020 and newer
- Porsche- 2017 and newer
- Toyota- 2020 and newer
- Tesla – 2012 and newer

# These manufacturers are supported by Verizon Wireless



**HYUNDAI**



**Volkswagen**



Mercedes-Benz

2018 & older

<https://www.verizon.com/od/prepaid/bring-your-own-device/?connectedCar=true#/checkDevice>

# These manufacturers are supported by T-Mobile



Mercedes-Benz

2019 & newer



2016 & newer



**Volkswagen**

# AT&T Spark – In-Vehicle Wi-Fi

- Tracks the location of the vehicle
- Logs vehicle health
- Impact detection
- Provides in-vehicle Wi-Fi
- Not searchable by VIN



# T-Mobile SyncUP DRIVE

- Tracks the location of the vehicle
- Logs vehicle performance
- Provides in-vehicle Wi-Fi
- Not searchable by VIN



T-Mobile®  
**SyncUP DRIVE™**



# MetroPCS Smart Ride – In Vehicle Wi-Fi



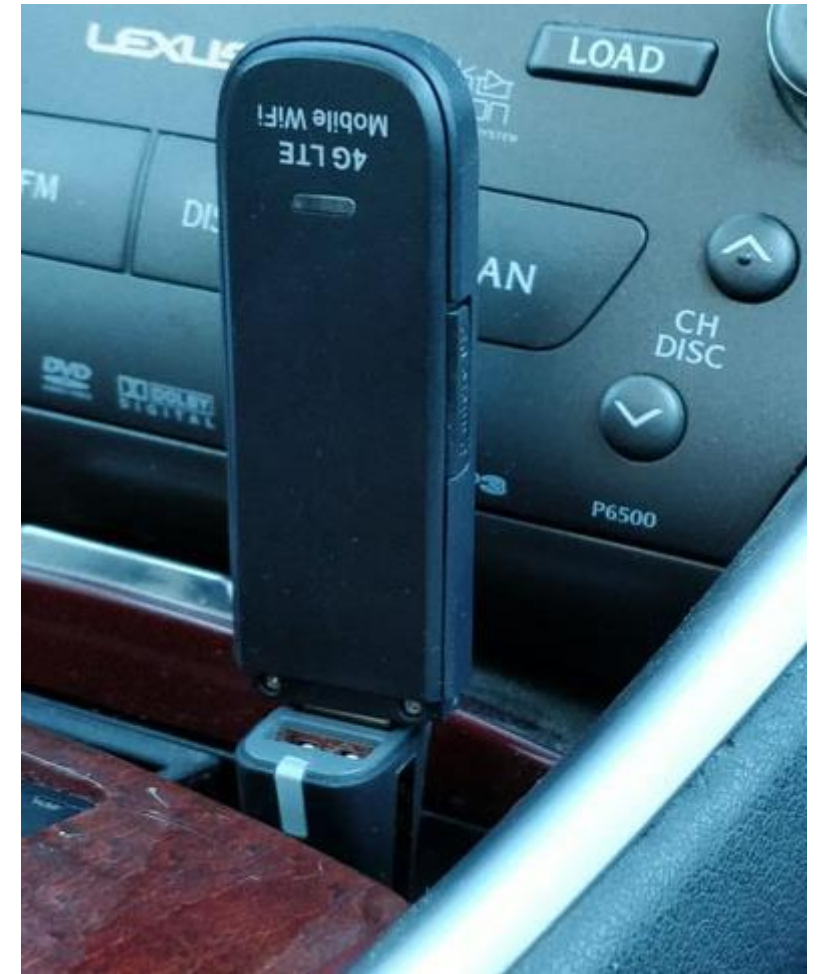
# Verizon Vehicle

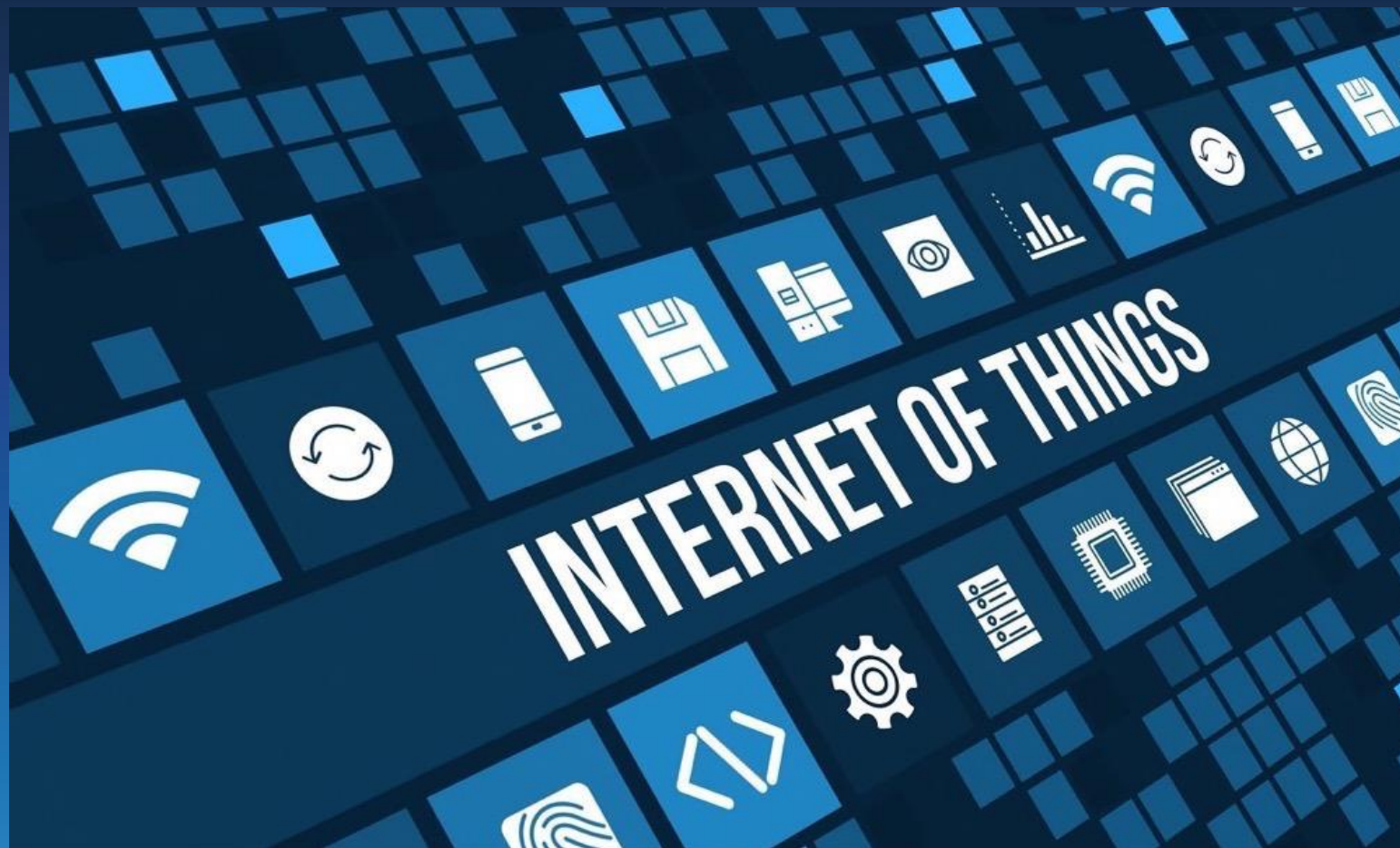
- Allows non-supported vehicles to have cellular connectivity, Wi-Fi connectivity, and voice calling.
- Plugs into the OBD2 port on the vehicle.
- Not searchable by VIN.

*verizon***vehicle** 



# There are many versions of cellular based in-vehicle Wi-Fi adapters





# Event Data Recorder (Black Box)



# Event Data Recorder (EDR)

- These devices record are intended to only record safety related data when an “event” occurs.
- Some EDRs were installed in vehicles back to 1998 but have never been formally required by NHTSA rules.
- EDRs are voluntarily installed on over 85% of vehicle manufactured today.
- The U.S. federal Driver Privacy Act of 2015 stated that the owner or lessee of a motor vehicle is the owner of the data collected by the EDR.

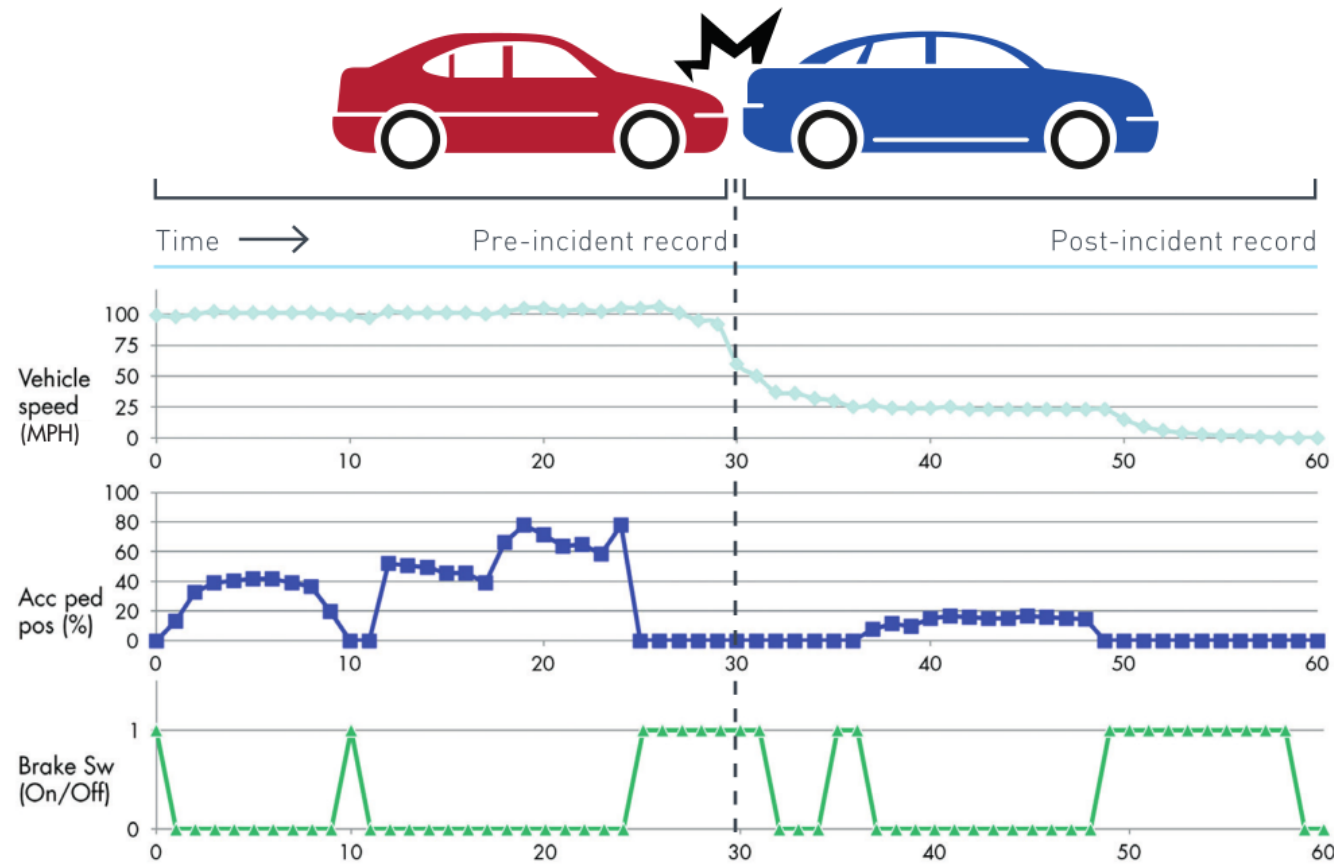




# Event Data Recorder (EDR)

- These devices record various data, such as:
  - Braking Status
  - Speed
  - Steering Angle
  - Seat Belts Buckled or Unbuckled
  - Cruise Control Status
  - Engine Speed / Throttle Position
  - Air Bag Deployment
  - Force of Impact

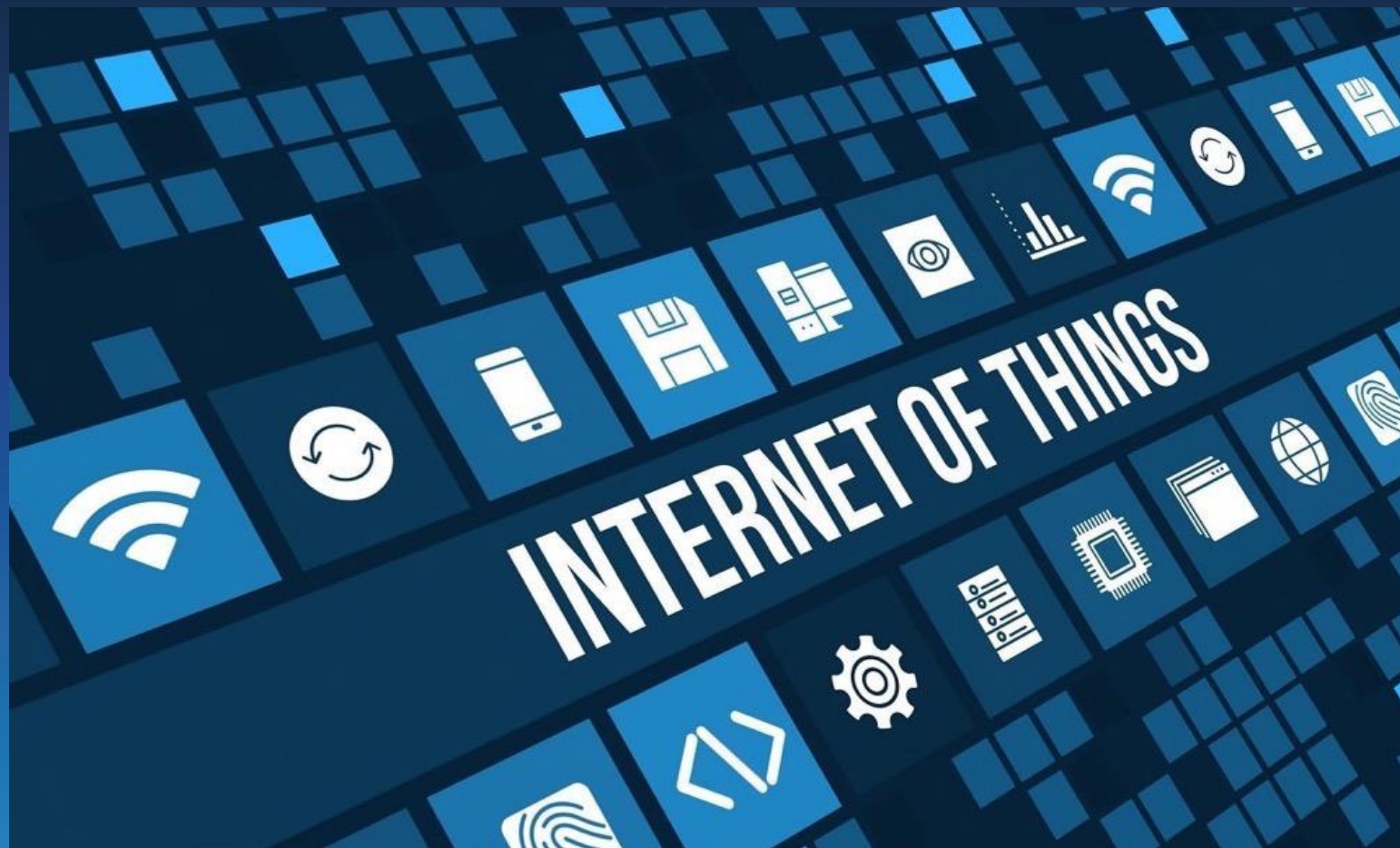
Usually include about 2 minutes of data and will not include any type of location data.



# Event Data Recorder (EDR)

- Downloading of the EDR can be done with specialized equipment and software.
- Contact your State Highway Patrol or the National Highway Traffic Safety Administration (NHTSA) for assistance with downloading EDR data.





# Vehicle Digital Forensics



# Vehicle Digital Forensics



# BERLA

## iVE - Vehicle Digital Forensics for Telematics and Infotainment Systems

Initial Cost: \$10,500 + shipping

Annual Renewal: \$3,250

Training: \$4,500

This is not an endorsement, however Berla is a sole-source provider





# Why focus on vehicles?

- We may not have the phone, but even if we do have the phone there are encryption issues.
- We can't always rely on cell site data for precise accuracy. We would normally only have a general area the device was in.
- **Berla can bridge the gap!**



# Typical Scenarios

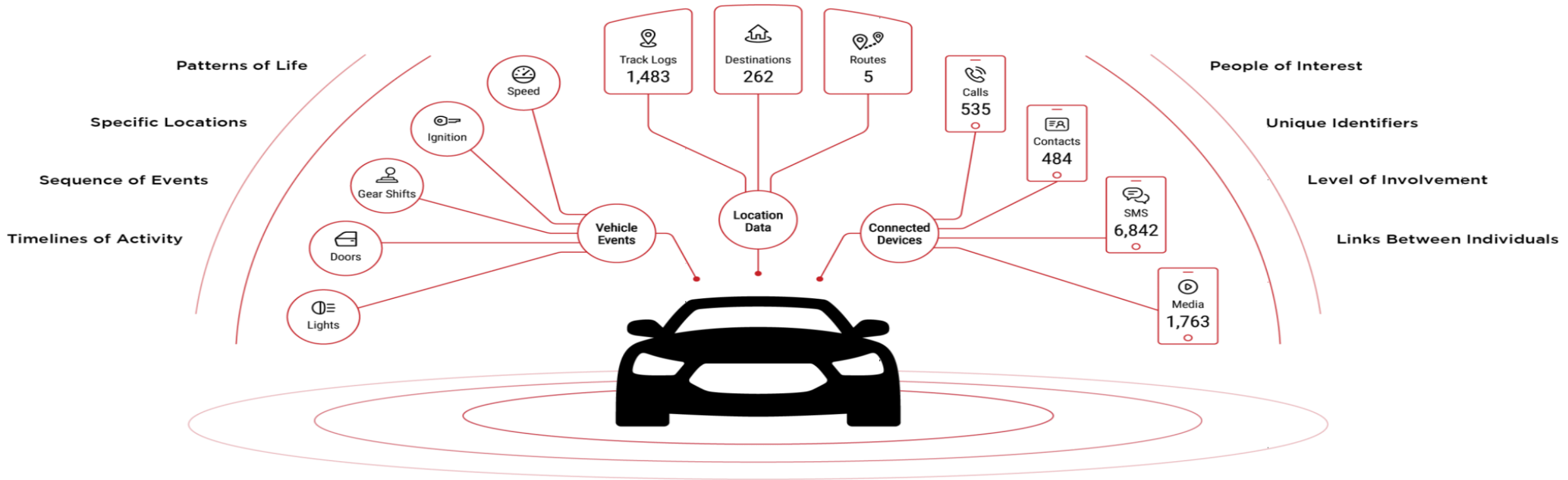
- I know he drives to Atlanta to get his drugs, but I don't know exactly where he goes.
- The suspect drove off and dumped the body but turned off their cell phone.
- The vehicle was involved in a hit and run.

# VEHICLES HOLD A VAST AMOUNT OF DATA



BERLA Proprietary and Confidential

# VEHICLE DATA CAN BE USED AS KEY EVIDENCE



BERLA Proprietary and Confidential

# Infotainment

- The combination of information entertainment
- Connects the occupants to their digital world
- Provides information on vehicle performance, schedule maintenance, and current status
- Generally interacts directly with occupants and is main focal point





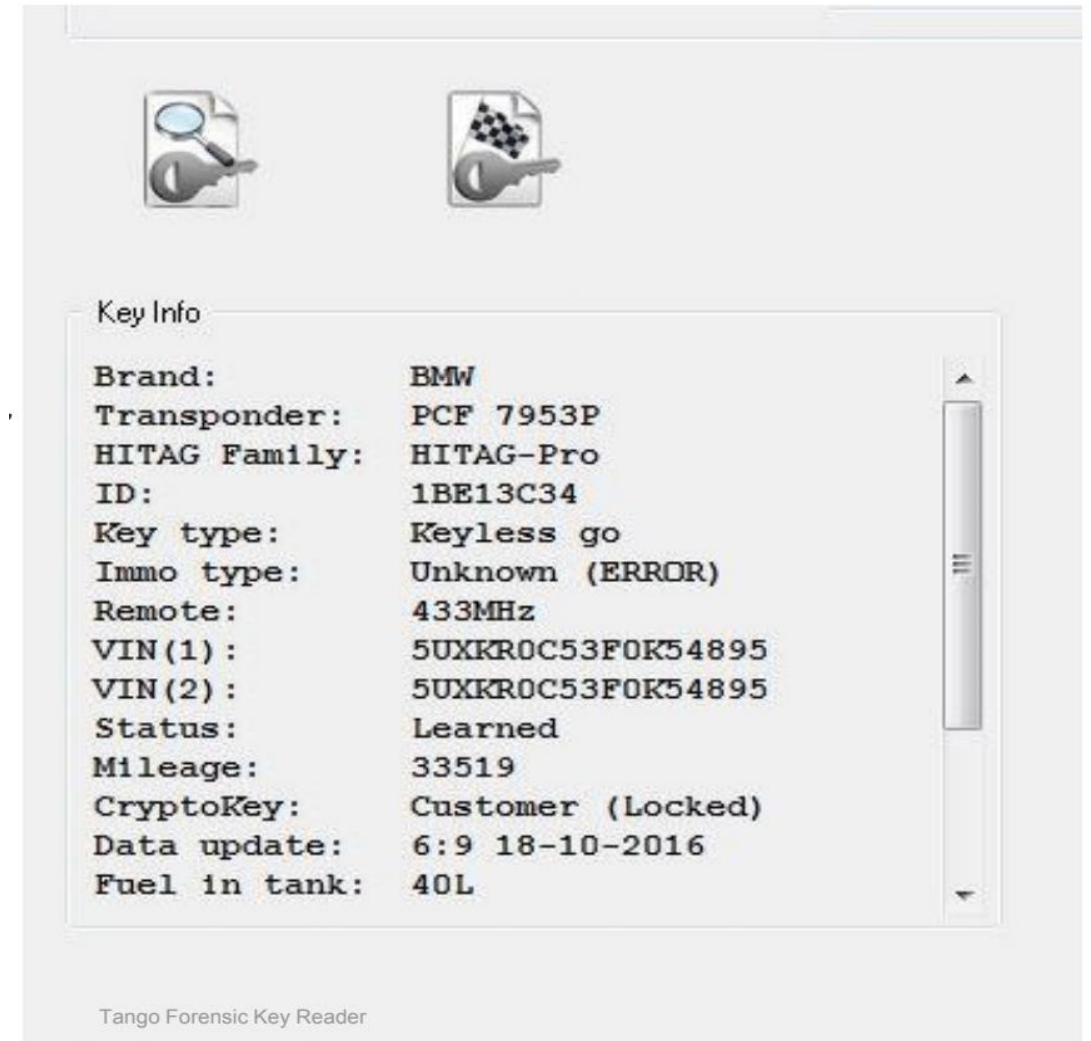
# Telematics

- The integration of telecommunications and information
- Basically wireless connectivity, usually Vehicle to Infrastructure (V2I) or Vehicle to Vehicle (V2V)
- Facilitates requests to/from infotainment system



# Key FOB data

- BMW and Audi store the most user data in key fobs
- Brand information, Transponder Type, HITAG Family, Key ID, Key Type, Key Number, Immobilizer Type, Remote Frequency, VIN, Key Status, Vehicle Mileage, CryptoKey, Last Time in Vehicle, Fuel Level, Coolant Temperature, Outside Temperature, Battery Voltage, Exterior Color, Interior Color



The screenshot displays the 'Key Info' window of the Tango Forensic Key Reader. It features two icons at the top: a magnifying glass over a key and a key with a checkered flag. The main area contains a list of key details for a BMW. A vertical scrollbar is visible on the right side of the text area.

Brand:	BMW
Transponder:	PCF 7953P
HITAG Family:	HITAG-Pro
ID:	1BE13C34
Key type:	Keyless go
Immo type:	Unknown (ERROR)
Remote:	433MHz
VIN(1):	5UXKR0C53F0K54895
VIN(2):	5UXKR0C53F0K54895
Status:	Learned
Mileage:	33519
CryptoKey:	Customer (Locked)
Data update:	6:9 18-10-2016
Fuel in tank:	40L

Tango Forensic Key Reader

# INFORMATION



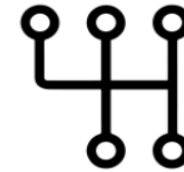
## Connected Devices

Identify devices that have been connected to a vehicle via Wi-Fi, Bluetooth and/or USB, and all of the data associated with those devices



## Location Data

Recover location data and navigation information such as tracklogs, saved locations, active routes and previous destinations



## Vehicle Events

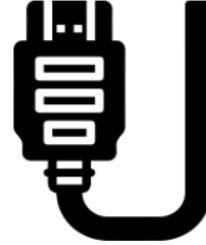
See events associated with a vehicle such as doors opening/closing, lights turning on/off, locations and timestamps

# METHODS



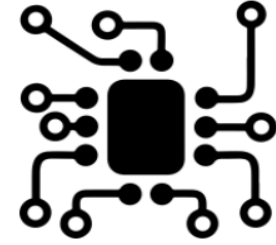
## Media

Custom USB cable to connect to one of the USB ports in the center stack of the vehicle



## Diagnostic

Diagnostic port located under the steering column or near the driver's side of the dashboard



## Direct

Remove the target system, disassemble it down to the PCB level and connect directly into it

# Bluetooth Connections

- BT MAC addresses
- Connection times
- Device phone number
- Phone type
- Phone OS

iVe - Infotainment & Vehicle System Forensics

File View Tools Ben LeMere 1

**2018 Ford Ranger**  
Sync Gen3

Systems  
Content  
Tags  
Search  
Timeline

Applications  
Connections  
Devices (28)

- ANE-LX1, unknown, HUAWEI
- Anthony's iPhone
- Biemsi's iPhone
- Caitlin's iPhone
- Chantelle's Iphone
- Chantelle's Iphone
- Christian's iPhone
- Galaxy A7 (2017)
- Galaxy On5
- Galaxy S8+
- Galaxy-J2
- Hiran's iPhone
- HUAWEI
- HUAWEI P20 lite
- HUAWEI P20 lite
- HUAWEI P20 lite
- iPhone
- Joseph's iPhone
- Mervyn Fraser's iPad
- Mobile\_Device\_1\_BT
- Mobile\_Device\_6\_BT
- Mobile\_Device\_7\_BT
- Neels

Flags	Device Name	Device Type(int)	Device Type	Unique Number	Unique Number Type	Ma
	Caitlin's iPhone			Device_ID_13		
	Chantelle's Iphone			567bcfac61641a1a1d2699125bc668743f1695d3	Serial Number	Apf
	Chantelle's Iphone			6bc899aaa2722d33ad2ed0fa035fd03a3bea125c	Serial Number	Apf
	Christian's iPhone			3C2EFFF21C58	Bluetooth Address	*Ap

Key	Value
SupportedProfiles	HFP 0.0, PBAP 0.0, A2DP 0.0, AVRCP 1.4, MAP 0.0
BRSF value available	
CHLD capabilities = Three way calling Enabled	
Phonebook Download Support	PBAP, AT Command
In-BandRinging supported	
Service Supported	3591
subscriberNum	276437
networkName	Cl
deviceSoftwareVersion	Version 12.0 (Build 16A366)
Class Of Device	0x0c:02:7a
Subscriber Number	276437
Model Number	iPhone10,4

Device Name	Unique Number	Unique Number Type	Ma
Galaxy A7 (2017)	60A4D0A4819D	Bluetooth Address	san
Galaxy On5	C011736FC984	Bluetooth Address	san
Galaxy S8+	900628307B26	Bluetooth Address	san
Galaxy-J2	7C2EDD73D0A3	Bluetooth Address	san
Hiran's iPhone	C0F2FBB87038	Bluetooth Address	*Ap
HUAWEI	9WVDU18711006811		
HUAWEI P20 lite	74C14F311296	Bluetooth Address	HU,
HUAWEI P20 lite	Device_ID_1002		



# Device Call Logs

- Multiple versions of the call logs are kept from a phone
- Includes incoming outgoing and missed
- Call times normally come from the mobile phone

iVe - Infotainment & Vehicle System Forensics

File View Tools Ben LeMere 1 ?

2018 Ford Ranger  
Sync Gen3

	Start Time	Timestamp Type	Flags	Timestamp Confidence	Phone Number	Contact Name	Call Type
	8/10/2018 7:17:18 PM	Local		Medium	+27609101639	LYNCH MARYBETH	Outgoing
	8/11/2018 2:11:45 PM	Local		Medium	+27 0 60 910 1639	LYNCH MARYBETH	Missed
	8/11/2018 2:24:58 PM	Local		Medium	+27 0 60 910 1639	LYNCH MARYBETH	Outgoing
	8/11/2018 2:36:20 PM	Local		Medium	+27 0 60 910 1639	LYNCH MARYBETH	Incoming
	8/11/2018 3:12:06 PM	Local		Medium	066376672		Outgoing
	8/11/2018 3:13:50 PM	Local		Medium	0663376672	John Verga	Outgoing
	8/13/2018 7:36:42 AM	Local		Medium	0832823134	Hanno Botha	Outgoing
	8/13/2018 12:36:24 PM	Local		Medium	+27822290344	Mashego	Missed
	8/13/2018 12:53:04 PM	Local		Medium	+27822290344	Mashego	Outgoing
	8/15/2018 3:38:51 PM	Local		Medium	+27609101639	LYNCH MARYBETH	Missed
	8/15/2018 4:05:21 PM	Local		Medium	+27609101639	LYNCH MARYBETH	Outgoing
	8/15/2018 5:34:20 PM	Local		Medium	+27609774887	Dhiren 2 Vanmali	Outgoing
	8/16/2018 6:24:07 AM	Local		Medium	+27609101639	LYNCH MARYBETH	Incoming
	8/16/2018 9:03:49 AM	Local		Medium	+27609774887	Dhiren 2 Vanmali	Missed
	8/16/2018 1:11:01 PM	Local		Medium	+27609774887	Dhiren 2 Vanmali	Incoming
	8/16/2018 6:57:53 PM	Local		Medium	+27609101639	LYNCH MARYBETH	Missed
	8/16/2018 7:13:52 PM	Local		Medium	+27609101639	LYNCH MARYBETH	Outgoing
	8/17/2018 11:09:41 AM	Local		Medium	+27609101639	LYNCH MARYBETH	Incoming
	8/17/2018 5:05:28 PM	Local		Medium	+27 0 60 910 1639	LYNCH MARYBETH	Outgoing
	8/17/2018 6:25:28 PM	Local		Medium	0827890206	Carla Terblanche	Outgoing
	8/18/2018 5:48:22 PM	Local		Medium	+27 0 60 910 1639	LYNCH MARYBETH	Outgoing
	8/18/2018 6:11:27 PM	Local		Medium	+27 0 60 910 1639	LYNCH MARYBETH	Incoming
	8/18/2018 8:53:55 PM	Local		Medium	0664779462	Christo Vangelis Dad	Outgoing

# Device Contacts

- Multiple versions of the contact list are kept from phone
- Full contact information downloaded
- Including contact card photos

iVe - Infotainment & Vehicle System Forensics

File View Tools Ben LeMere 1 ?

2018 Ford Ranger  
Sync Gen3

First Name	Last Name	Company	Phone Number	Work Number	Home Number	Mobile Number	Email
Christian's iPhone							
Galaxy A7 (2017)							
Galaxy On5							
Galaxy S8+							
Galaxy-J2							
Hiran's iPhone							
HUAWEI							
HUAWEI P20 lite							
▼ HUAWEI P20 lite							
▼ HUAWEI P20 lite							
▼ iPhone							
Joseph's iPhone							
Mervyn Fraser's iPad							
^ Mobile_Device_1_BT							
<b>Contacts (1747)</b>							
Call Logs (51)							
▼ Mobile_Device_6_BT							
▼ Mobile_Device_7_BT							
Neels							
SM-A720F							
SM-G965U, SAMSUNG							
Tanita's iPhone							
Unwired Technology							
Unwired Technology							
▼ Events (1585)							
▼ Navigation							
Viljoen	Roelof			0824606505			roelof.viljoen@tasima.co.za
Renai	Moorhilal			0113924060		0836590494	renai@naacam.co.za
Catherine	Mokwena			3522710			cmokwena@ford.com
Vinesh	Moonoo			+27123931826	+27837785617		divcomm.det@saps.gov.za
Mongezi	Milela			+27123419763			drmilela@telkomsa.net
Kekana	Reuben			0112887310			Info@saias.co.za
Ferreira	Phillip			0125469643			PhillipF@nissandiesel.co.za
Mukela	Mulaudzi			+27128034770	+27837589459		muks@muksauto.co.za
EH	Human			0117911449			ehuman@iburst.co.za
Thabo	Lekota			0126800484		0835222301	LekotaJT@telkom.co.za
Newsome	Nigel			0414032361		0833033062	nigel.newsome@gm.com
Sibisi	Msebenzi			0114977154		0824149220	SibisiMsebenzi@saps.gov.za
	Lynette de Wit			0124286191			DEWITL@sabs.co.za
Benjamin	Raletsatsi					071327298	ben@futuresustain.org
	Stuart Rayner			3522438		0729592752	srayner3@ford.com
Senuma,	Andrew (A.)			0128422513		0710246092	asenuma@ford.com
Faltermeier	Michael					0837954994	michael.faltermeier@za.tuv.com
Moletsane	Refilwe			0117265381		0833258680	Refilwe@saia.co.za
Len	van Driel			0124286133		0824126915	vandriel@sabs.co.za
George	Jacobs					0829334311	
Shell	GR					0710268957	
Bigza						+2779127243	
Me Mb						+27798000517	

# Navigation Tracklogs

- Breadcrumb trail of everywhere the vehicle has been
- Recorded at one-second intervals

iVe - Infotainment & Vehicle System Forensics

File View Tools Ben LeMere 1 ?

2018 Ford Ranger Sync Gen3

Systems Content Tags Search Timeline

Applications

- Connections
- Devices (28)
- Events (1585)
- Navigation
  - Track Logs (36)
  - Locations
  - Routes
  - Velocity Logs (55)

Name	Start Time	End Time	Times	Elapsed Time	Distance	Average Speed	Count
Track 0012	10/29/2018 3:00:01 PM	10/29/2018 3:22:31 PM	Local	22m 30.33s	4.8 mi	12.9 mph	1,172
Track 0013	10/29/2018 4:44:53 PM	10/29/2018 4:58:09 PM	Local	13m 16.06s	3.6 mi	16.5 mph	795
Track 0014	10/29/2018 5:04:09 PM	10/29/2018 5:42:07 PM	Local	37m 58.13s	3.6 mi	5.7 mph	2,279
Track 0015	10/29/2018 5:47:09 PM	10/29/2018 6:18:46 PM	Local	31m 37.05s	7.1 mi	13.4 mph	1,898
Track 0016	10/29/2018 6:38:55 PM	10/29/2018 7:00:30 PM	Local	21m 34.28s	11.8 mi	32.8 mph	1,295
Track 0017	10/29/2018 8:14:39 PM	10/29/2018 8:16:59 PM	Local	2m 20.09s	47.4 ft	0.2 mph	141
Track 0018	10/29/2018 8:31:07 PM	10/29/2018 8:31:25 PM	Local	17.15s	76.3 ft	3 mph	18
Track 0019	10/29/2018 10:15:30 PM	10/29/2018 10:56:13 PM	Local	40m 42.11s	12.4 mi	18.3 mph	2,443
Track 0020	10/30/2018 12:39:28 AM	10/30/2018 1:04:34 AM	Local	25m 6.02s	9.3 mi	22.3 mph	1,506
Track 0021	10/30/2018 8:01:30 AM	10/30/2018 8:03:42 AM	Local	2m 12.11s	6.6 ft	0 mph	133
Track 0022	10/30/2018 8:09:24 AM	10/30/2018 8:28:10 AM	Local	18m 46.14s	4.9 mi	15.5 mph	1,124

OpenStreetMaps

-25.7297127444854, 28.3210728869565

# Vehicle Events

- System log files that are recording different events taking place throughout the vehicle
- Examples: doors activity, gear shifts, hard braking, wheel slip, odometer readings, phone calls, system reboots

The screenshot displays the iVe - Infotainment & Vehicle System Forensics application. The interface is divided into several sections:

- Header:** "iVe - Infotainment & Vehicle System Forensics" with a user profile for "Ben LeMere" and a notification bell.
- Menu:** "File View Tools" and a sidebar with "Systems", "Content", "Tags", "Search", and "Timeline" (highlighted).
- Vehicle Info:** "2018 Ford Ranger" (Sync Gen3) with an "Apply Date Filter" button.
- Filtering Options:**
  - DATA TYPE:** System Information (checked), Device, Call Log (checked), Media, Track (checked), Power (checked), Odometer, Valet Mode, Gear Shift (checked), Driver Distraction Preventio, Door (checked), Seat Belt, Android Auto, Wheel Traction, Hard Acceleration.
  - TIMESTAMP CONFIDENCE:** Low, Medium, High.
  - FLAGS:** Deleted, Non-Deleted.
- Event Timeline:** A vertical timeline of events:
  - 8:13:56 PM(Local) Monday, Oct 29, 2018:** Power On (green icon).
  - 8:14:06 PM(Local) Monday, Oct 29, 2018:** Door Open (green icon).
  - 8:14:39 PM(Local) Monday, Oct 29, 2018:** Track 'Track 0017' start (blue icon). Details: Elapsed Time: 2m 20.09s, Count: 141, Distance: 47.4 ft, Average Speed: 0.2 mph.
  - 8:16:59 PM(Local) Monday, Oct 29, 2018:** Track 'Track 0017' end (blue icon). Details: Elapsed Time: 2m 20.09s, Count: 141, Distance: 47.4 ft, Average Speed: 0.2 mph.
  - 8:23:31 PM(Local) Monday, Oct 29, 2018:** Missed call from Juma(+27834924169) (teal icon).
  - 8:24:44 PM(Local) Monday, Oct 29, 2018:** (teal icon).



# Vehicle Events

- Event type: Doors
- Shows the time and location of which door was opened or closed

The screenshot displays the iVe - Infotainment & Vehicle System Forensics interface. The top window title is "iVe - Infotainment & Vehicle System Forensics". The user is logged in as "Ben LeMere". The main content area shows a list of events for a "2018 Ford Ranger" (Sync Gen3). The left sidebar contains a navigation menu with categories like Systems, Content, Tags, Search, and Timeline. The event list table has columns for Date/Time, Event Identifier, Event Type, Action, Latitude, Longitude, and Flags. Below the table is a map of Pretoria, South Africa, showing a blue route with green markers indicating event locations. The map includes labels for various areas like Swartspuit, Atteridgeville, Irene, and Mamelodi.

Date/Time	Event Identifier	Event Type	Action	Latitude	Longitude	Flags
10/29/2018 5:03:48 PM	Driver Door Closed	Door	Closed	-25.759661000	28.347407000	
10/29/2018 5:17:19 PM	Driver Door Open	Door	Open	-25.739128000	28.311182000	
10/29/2018 5:42:03 PM	Driver Door Closed	Door	Closed	-25.739123000	28.311187000	
10/29/2018 5:46:40 PM	Driver Door Open	Door	Open	-25.739123000	28.311186000	
10/29/2018 6:00:01 PM	Driver Door Closed	Door	Closed	-25.739126000	28.311189000	
10/29/2018 6:00:26 PM	Driver Door Open	Door	Open	-25.739125000	28.311188000	
10/29/2018 6:00:50 PM	Driver Door Closed	Door	Closed	-25.739124000	28.311189000	
10/29/2018 6:17:56 PM	Driver Door Open	Door	Open	-25.786339000	28.279723000	
10/29/2018 6:18:38 PM	Driver Door Closed	Door	Closed	-25.786338000	28.279722000	
10/29/2018 6:22:07 PM	Driver Door Closed	Door	Closed	-25.786338000	28.279722000	



# Vehicle Events

- Event type: Gear shifts
- Shows which gear the user shifted the transmission into, along with time and location

The screenshot displays the iVe - Infotainment & Vehicle System Forensics interface. The top window title is "iVe - Infotainment & Vehicle System Forensics". The user is identified as "Ben LeMere". The main content area shows data for a "2018 Ford Ranger" (Sync Gen3). A table lists gear shift events with columns for Date/Time, Event Identifier, Event Type, Action, Latitude, and Longitude. Below the table is a map of Pretoria, South Africa, with a blue route overlaid on the roads. The map includes labels for various areas like Swartskruin, Polson, Mamelodi, Atteridgeville, Irene, and Silver Lakes. The map's coordinates are -25.7202747347252, 27.9404397639754.

Date/Time	Event Identifier	Event Type	Action	Latitude	Longitude
10/29/2018 5:04:17 PM	Gear Shift to Drive	Gear Shift	to Drive	-25.759677000	28.347415000
10/29/2018 5:16:42 PM	Gear Shift to Parking	Gear Shift	to Parking	-25.739129000	28.311181000
10/29/2018 6:00:57 PM	Gear Shift to Reverse	Gear Shift	to Reverse	-25.739124000	28.311189000
10/29/2018 6:01:07 PM	Gear Shift to Drive	Gear Shift	to Drive	-25.739115000	28.311260000
10/29/2018 6:15:37 PM	Gear Shift to Reverse	Gear Shift	to Reverse	-25.786324000	28.279746000
10/29/2018 6:16:05 PM	Gear Shift to Drive	Gear Shift	to Drive	-25.786337000	28.279727000
10/29/2018 6:16:08 PM	Gear Shift to Parking	Gear Shift	to Parking	-25.786337000	28.279727000
10/29/2018 6:38:23 PM	Gear Shift to Drive	Gear Shift	to Drive	-25.786338000	28.279722000
10/29/2018 6:59:19 PM	Gear Shift to Reverse	Gear Shift	to Reverse	-25.862326000	28.174775000
10/29/2018 6:59:28 PM	Gear Shift to Drive	Gear Shift	to Drive	-25.862326000	28.174781000

# Vehicle Events

- Event type: Odometer Reading
- Shows the time and location for when and where the odometer reading was recorded

The screenshot displays the iVe - Infotainment & Vehicle System Forensics interface. The top window title is "iVe - Infotainment & Vehicle System Forensics" with a user profile for "Ben LeMere". The main content area is titled "2018 Ford Ranger" (Sync Gen3) and shows a table of events. The left sidebar contains a navigation menu with categories like Systems, Content, Tags, Search, and Timeline, and a list of event types such as Connections, Devices (28), Events (1585), Media (2), Device (377), System Information (10), Power (49), Odometer (301), Valet Mode (47), Gear Shift (111), Driver Distraction Prevention (4), Door (156), Seat Belt (40), Android Auto (23), Wheel Traction (2), Hard Acceleration (1), Navigation, Track Logs (36), Locations, Routes, and Velocity Logs (55).

Date/Time	Timestamp Type	Event Identifier	Event Type	Action	Latitude	Longitude	Flags
10/29/2018 10:50:06 PM	Local	Odometer = 6905 KM (4290.6 Miles)	Odometer	Read	-25.749492000	28.229727000	
10/30/2018 12:42:28 AM	Local	Odometer = 6906 KM (4291.2 Miles)	Odometer	Read	-25.743313000	28.233080000	
10/30/2018 12:44:11 AM	Local	Odometer = 6907 KM (4291.8 Miles)	Odometer	Read	-25.742615000	28.243167000	
10/30/2018 12:45:11 AM	Local	Odometer = 6908 KM (4292.4 Miles)	Odometer	Read	-25.741394000	28.253352000	
10/30/2018 12:45:56 AM	Local	Odometer = 6909 KM (4293.1 Miles)	Odometer	Read	-25.738474000	28.262748000	
10/30/2018 12:46:51 AM	Local	Odometer = 6910 KM (4293.7 Miles)	Odometer	Read	-25.739595000	28.272722000	
10/30/2018 12:47:43 AM	Local	Odometer = 6911 KM (4294.3 Miles)	Odometer	Read	-25.740596000	28.282721000	
10/30/2018 12:48:49 AM	Local	Odometer = 6912 KM (4294.9 Miles)	Odometer	Read	-25.744238000	28.291840000	
10/30/2018 12:50:15 AM	Local	Odometer = 6913 KM (4295.5 Miles)	Odometer	Read	-25.749985000	28.296408000	
10/30/2018 12:50:58 AM	Local	Odometer = 6914 KM (4296.2 Miles)	Odometer	Read	-25.753116000	28.306038000	

Below the table is a map of Pretoria, South Africa, showing a blue route. The map includes labels for Swartspuit, Polson, Mamelodi, Rayton, Atteridgeville, AFB Swartkop, Silver Lakes, Irene, and Kitty Hawk Aerodrome. The map is powered by OpenStreetMaps. The bottom status bar shows coordinates: -25.8062194594141, 27.9978271850934.

# Event Patterns

- Combining events and tracklogs allows an examiner to quickly see what happened during a specific trip
- Pattern of life for the vehicle's users can be determined by looking for commonalities

The screenshot displays the iVe - Infotainment & Vehicle System Forensics interface. The top window title is "iVe - Infotainment & Vehicle System Forensics". The user is identified as "Ben LeMere". The main content area is titled "2018 Ford Ranger" and "Sync Gen3".

The left sidebar contains navigation options: Systems, Content, Tags, Search, and Timeline. The "Content" section is expanded to show "Events (1585)". The event categories listed are: Media (2), Device (377), System Information (10), Power (49), Odometer (301), Valet Mode (47), Gear Shift (111), Driver Distraction Prevention (4), Door (156), Seat Belt (40), Android Auto (23), Wheel Traction (2), Hard Acceleration (1), Navigation, Track Logs (36), Locations, Routes, and Velocity Logs (55).

The main table lists events with the following columns: Date/Time, Timestamp Type, Event Identifier, Event Type, Action, Latitude, and Longitude. The events listed are:

Date/Time	Timestamp Type	Event Identifier	Event Type	Action	Latitude	Longitude
10/29/2018 5:03:38 PM	Local	ECU Powered ON / rebooted	Power	On	-25.759661000	28.347
10/29/2018 5:03:48 PM	Local	Valet Mode disabled	Valet Mode	Disabled	-25.759661000	28.347
10/29/2018 5:03:48 PM	Local	Driver Distraction Prevention Disable	Driver Distraction Pr	Disabled	-25.759661000	28.347
10/29/2018 5:03:48 PM	Local	Driver Door Closed	Door	Closed	-25.759661000	28.347
10/29/2018 5:03:50 PM	Local	Seatbelt Reminder is True	Seat Belt	is buckled and/or	-25.759661000	28.347
10/29/2018 5:04:07 PM	Local	Gear Shift to Reverse	Gear Shift	to Reverse	-25.759661000	28.347
10/29/2018 5:04:09 PM	Local	HUAWEI P20 lite connected	Device	Device Connected	NaN	NaN
10/29/2018 5:04:11 PM	Local	Media Device Name <HUAWEI P20 li	Device	Device Connected	-25.759622000	28.347
10/29/2018 5:04:11 PM	Local	Media Device Name <HUAWEI P20 li	Device	Device Connected	-25.759622000	28.347
10/29/2018 5:04:17 PM	Local	Gear Shift to Drive	Gear Shift	to Drive	-25.759677000	28.347

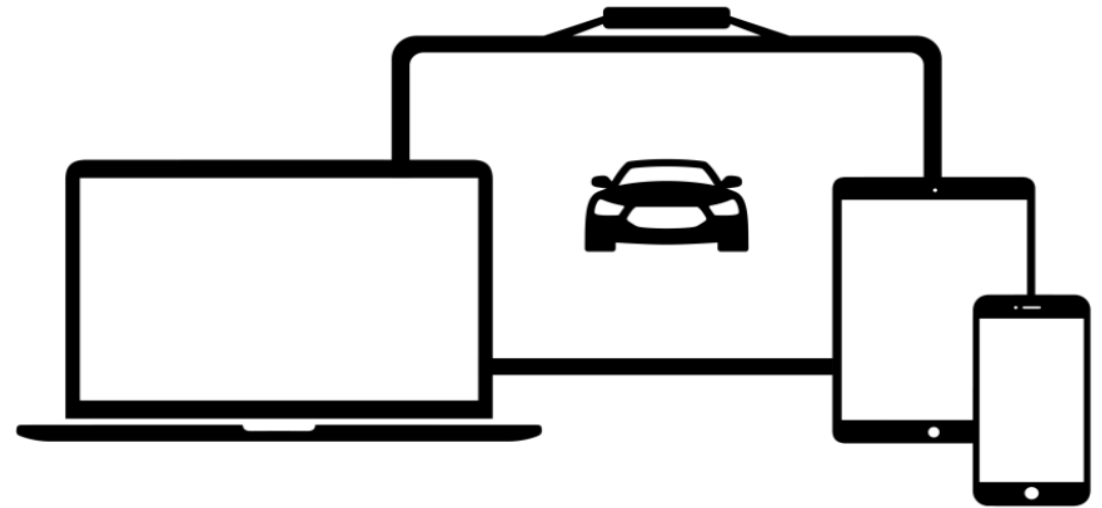
The bottom section of the interface shows a map of Pretoria, South Africa, with a blue tracklog overlaid. The map includes labels for various locations such as Swartspuit, Polson, Atteridgeville, Irene, and Mamelodi. The map is powered by OpenStreetMaps.



# IVE Ecosystem

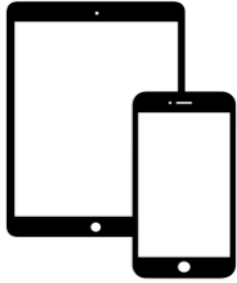
# IVE Ecosystem

- iVe is a collection of tools that support investigators throughout the entire vehicle forensics process
- iVe currently supports the acquisition and analysis of over 14,000 vehicles
- Brand include Audi, BMW, Buick, Cadillac, Chevrolet, Chrysler Citroen, Dodge, FIAT, Ford, GMC, Holden, Hummer, Infiniti, Jeep, Lamborghini, Lexus, Lincoln, Maserati, Mercedes, Mercury, Nissan, Opel, Peugeot, Pontiac, RAM, SRT, Saturn, Seat, Skoda, Toyota and Volkswagen



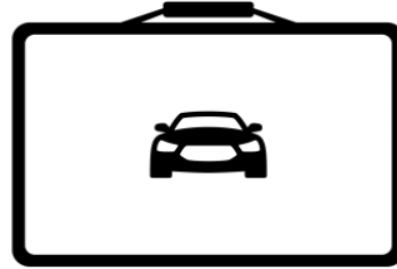


# IVE ECOSYSTEM



## Mobile Applications

- Vehicle Lookup Tool
- Obtainable Data Types
- Identification Guides
- Removal Walkthroughs
- Acquisition Instructions



## Hardware Kit

- Trim Removal Pry Tools
- System Removal Tools
- Device Interface Boards
- System Interface Cables
- Portable Power Supplies



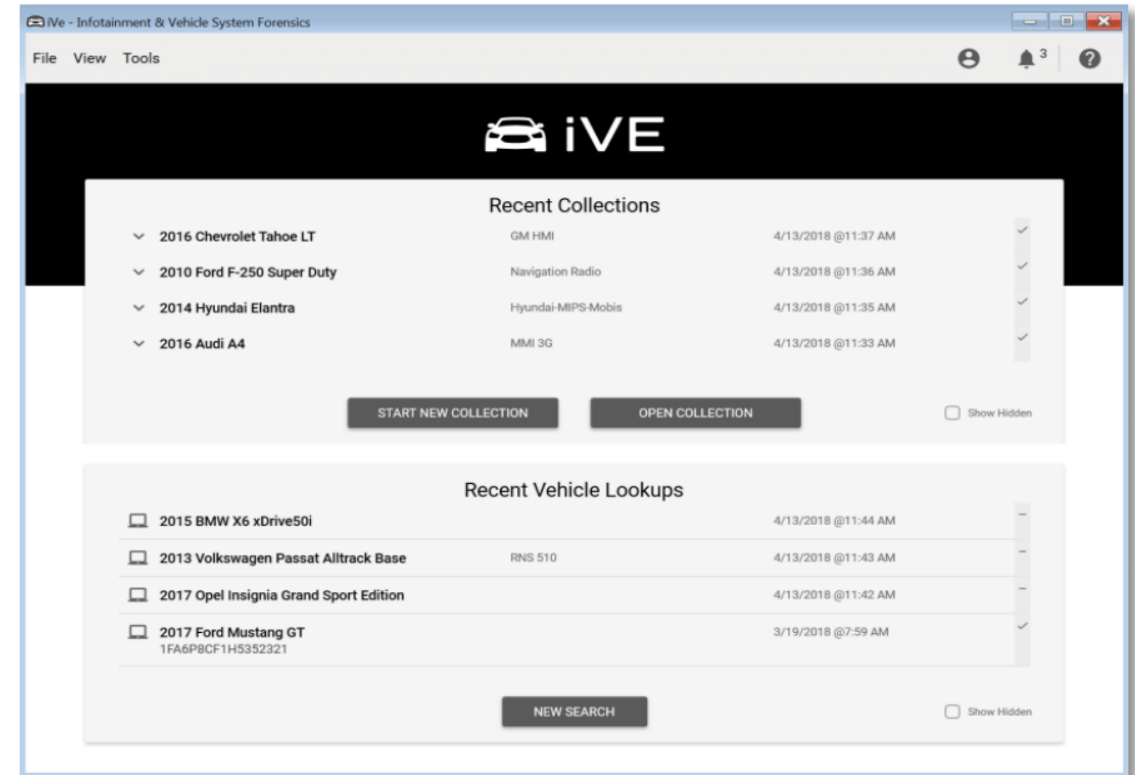
## Desktop Software

- Raw Data Analysis Tools
- Advanced Data Parsing
- Custom Report Builder
- Multifaceted Data Filtering
- Complex Search Capabilities

# IVE Software

iVe Desktop is a Windows based application. It is the workhorse of the iVe ecosystem and is used for all acquisitions. It is used to parse data, recover deleted information and view raw file systems. iVe Desktop includes a full suite of analysis and reporting tools to include mapping, data export, search, and timeline analysis.

- Raw Data Analysis Tools
- Advanced Data Parsing
- Custom Report Builder
- Multifaceted Data Filtering
- Complex Search Capability



# IVE Hardware

The iVe Toolkit is a collection of specially developed interface boards and cables used to acquire various supported vehicle systems. The toolkit includes tools to help remove the systems from a vehicle when required. The interface boards and cables are used in conjunction with the iVe software to acquire the data.

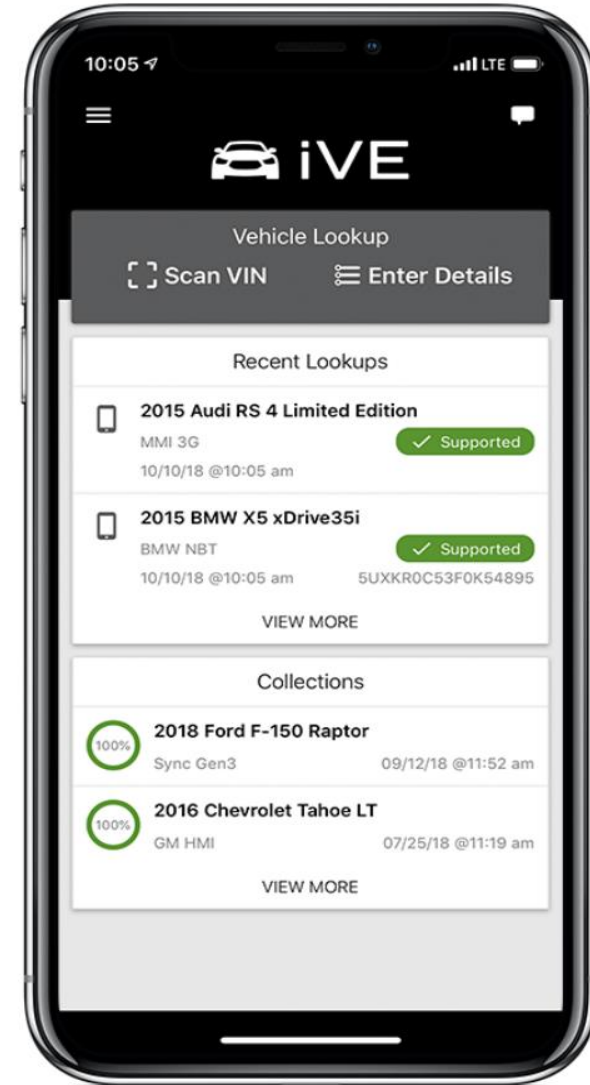
- Trim Removal Pry Tools
- System Removal Tools
- Device Interface Board
- System Interface Cables
- Portable Power Supplies



# IVE Mobile

iVe Mobile allows investigations to identify vehicles supported by iVe, determine which systems are installed, know what data can be retrieved, and how to acquire the data – all prior to taking action. It provides instructions for locating and removing vehicle systems, and it lets investigators monitor the progress of long-running acquisitions

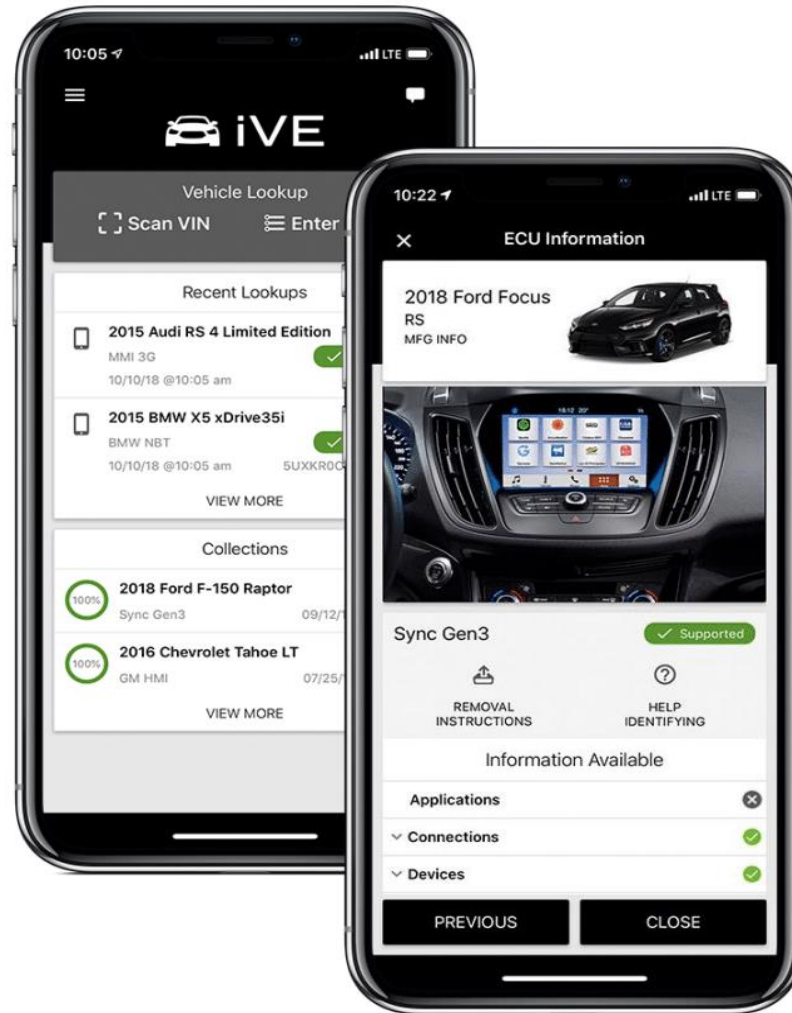
- Supported Vehicle Lookup Tools
- System Identification Guides
- System Removal Instructions
- Available System Data



# Getting Started

Download the Mobile App and create an iVe mnAccount to identify supported vehicles and systems in your investigations

Enter Berla or iVe Mobile





# Case Study Involving Vehicle Digital Forensics

# Vehicular Homicide and Hit-and-Run

## July 03, 2018

- Two vehicles, fatal head-on collision with suspect fleeing on foot
- One vehicle was on the wrong side of the road (divided highway)
- Roadway evidence
- 911 call
- Call detail records with cell site/sector
- Text message content
- Event data recorder (EDR / black box)
- **District Attorney says “I want more. I want to know where he got on highway going the wrong way.”**

# Suspect Vehicle – 2016 Ford F-150 Pickup Truck





















FLEXTRONICS TECHNOLOGIES  
MODEL: SYNGO.L  
IC: 2168 SYNGO.L  
FCC ID: ACJ-SYNGO.L  
CMTI:  
KOREA CENT # KCC-CM:PIK-SYNGO.L

TA-2012-1001  
N136

CE

↑

FLEXTRONICS TECHNOLOGIES MEXICO S DE RL DE CV  
ASSEMBLY IN MEXICO

Assy No. QJ5T-14Q371-CFC SERIAL No. VUCAXXMA

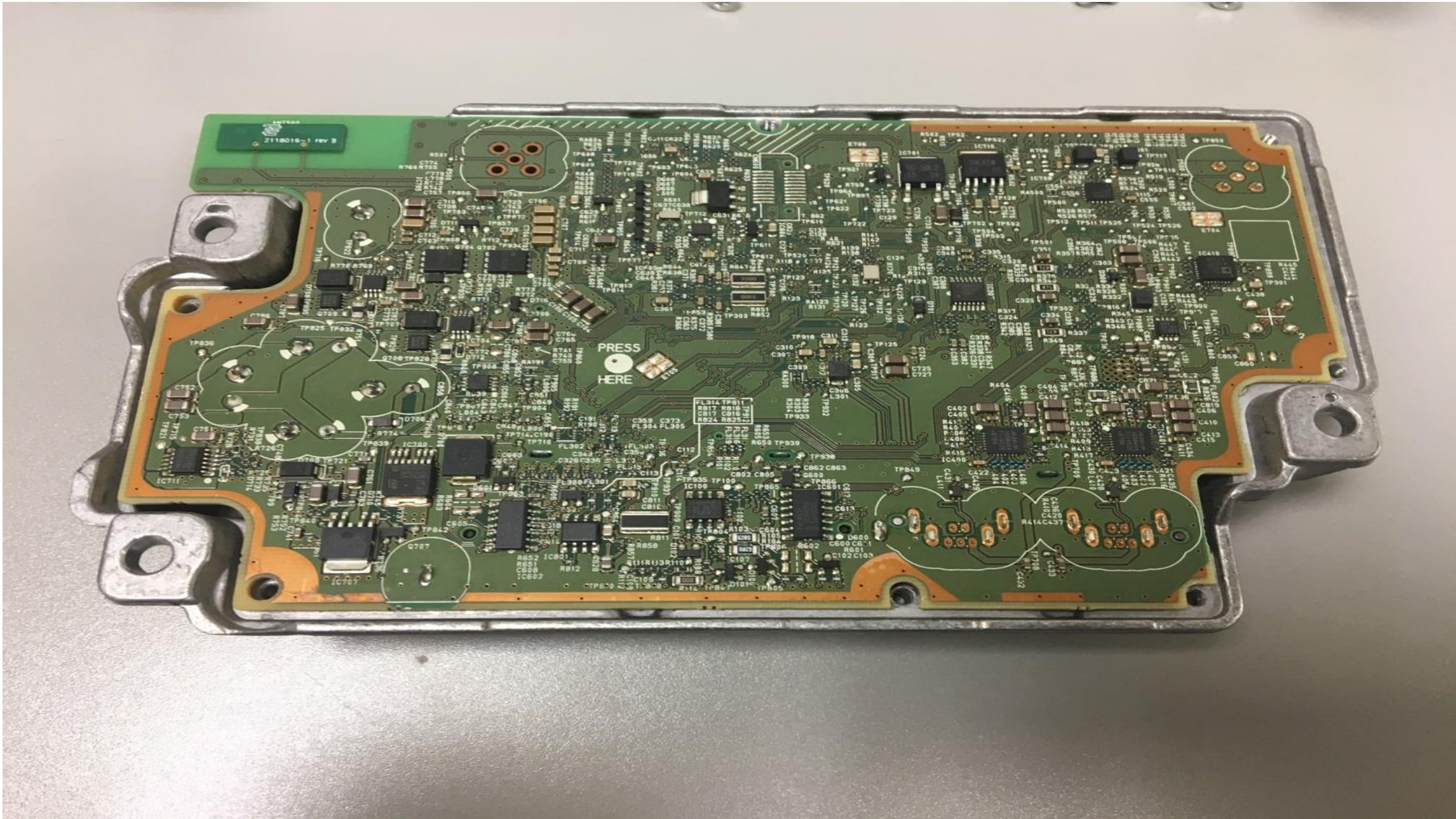
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) The device may not cause harmful interference, and (2) This device must accept any interference received including interference that may cause undesired operation.

WIFI MAC: 8C:11:27:88:F9:52  
BT MAC: 8C:11:27:88:F9:52  
Scrap if Dropped

Manufacture Date: 12/11/2015

FoMoCo









- Systems
- Content
- Tags
- Search
- Timeline

**2016 Ford F-150**  
Sync Gen3

- ^ Ford Sync Gen3 (27)
  - Acquisition Files (2)
  - File Systems

Name	Group	Value
Database Version	Database	2.0.0
Database Created	Database	9/19/2018 00:41
Application Version	Application	1.11.4
LicenceNumber	Application	20 [REDACTED]
Case Name	Case	2016 Ford F-150
Case Number	Case	
Case Type	Case	Vehicular Homicide
Acquisition Unit	Acquisition	Ford Sync Gen3
Acquisition Location	Acquisition	Hamilton County Sheriff's Office-West Sector
Acquisition Details	Acquisition	Assist Hamilton County DA's Office
Acquisition Date	Driver	9/19/2018 00:41
Manufacturer	Device	Ford
Model	Device	Ford Sync Gen3
Unique Number Type	Device	Serial Number
Unique Number	Device	VUCA [REDACTED]
Berla SBC Version	Device	1.12.0 03/20/2017
Device storage size	Device	31.3 GB
Vehicle VIN	Device	1FTEW [REDACTED]
Serial Number	Device	VI [REDACTED]
Build Number	Device	SYNCGen3.0_1.0.15049_PRODUCT



Systems

Content

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)**
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
    - Recovered 0004 (1178)
    - Recovered 0005 (493)
    - Recovered 0006 (42)
    - Recovered 0008 (194)
    - Recovered 0009 (31)
    - Recovered 0012 (178)
    - Recovered 0016 (153)
    - Recovered 0020 (195)
    - Recovered 0022 (57)
    - Recovered 0023 (778)
    - Recovered 0024 (31)
    - Recovered 0026 (194)

		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map navigation icons: pan, zoom, location, flag, share, camera

Bing Aerial

Search bar



Systems

Content

Tags

Search

Timeline

### 2016 Ford F-150

Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
    - Recovered 0004 (1178)
    - Recovered 0005 (493)
    - Recovered 0006 (42)
    - Recovered 0008 (194)
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		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
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		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
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		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map navigation icons: Home, Layers, Full Screen, Location, Erase, Flag, Share, Camera

Bing Aerial

Search bar

35.3661634061053, -85.1602273457109

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:25  
 Track Name: Track 0085  
 Lat: 35.366168  
 Lng: -85.160229  
 Alt: NaN  
 Bearing:  
 Distance:  
 Speed:



Systems

Content

Tags

Search

Timeline

### 2016 Ford F-150

Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
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    - Recovered 0020 (195)
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    - Recovered 0023 (778)
    - Recovered 0024 (31)
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		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map controls: layers, zoom, pan, pan, pan, pan, Bing Aerial

35.3662005667438, -85.1602577254577

**SELECTED TrackPoint:**

Timestamp(Local) 7/3/2018 05:25

Track Name: Track 0085

Lat: 35.366201

Lng: -85.160259

Alt: NaN

Bearing: 323°

Distance: 15 ft

Speed: 9.5 mph



Systems

Content

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)**
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
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		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		<b>Track 0085</b>	<b>7/3/2018 05:25</b>	<b>7/3/2018 07:07</b>	Local		Medium	<b>1h 42m 13.09s</b>	<b>8.5 mi</b>	<b>5 mph</b>	<b>6,133</b>		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map controls: Bing Aerial, search, zoom, pan

**Suspect's Friend's Residence**

35.3668746775452, -85.1572810270831

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:28  
 Track Name: Track 0085  
 Lat: 35.366914  
 Lng: -85.1572  
 Alt: NaN  
 Bearing: 116°  
 Distance: 56.9 ft  
 Speed: 38.8 mph

Map labels: Back Valley Rd, Hodgetown, Rocky T



Systems

Content

Tags

Search

Timeline

### 2016 Ford F-150

Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
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		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map controls: Layer selector, Full screen, Location pin, Erase, Flag, Share, Camera, Bing Aerial, Search bar

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:35  
 Track Name: Track 0085  
 Lat: 35.334052  
 Lng: -85.130422  
 Alt: NaN  
 Bearing: 202°  
 Distance: 93.5 ft  
 Speed: 62 mph

Coordinates: 35.3345691882428, -85.1301974099171



Systems

Content

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
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		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
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		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
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		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map controls: layers, zoom in, zoom out, pan, pan lock, full screen, camera, Bing Aerial





Systems

Content

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)**
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
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		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
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		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
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		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		<b>Track 0085</b>	<b>7/3/2018 05:25</b>	<b>7/3/2018 07:07</b>	Local		Medium	<b>1h 42m 13.09s</b>	<b>8.5 mi</b>	<b>5 mph</b>	<b>6,133</b>		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map navigation icons: pan, zoom, location, etc.

Bing Aerial

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:37  
 Track Name: Track 0085  
 Lat: 35.300456  
 Lng: -85.15118  
 Alt: NaN  
 Bearing: 174°  
 Distance: 91.3 ft  
 Speed: 60.5 mph

**60.5 mph**

35.300463828431, -85.1511659204858



**Systems**

**Content**

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)**
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    - Track 0086 (1)
    - Recovered 0001 (1)
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		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
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		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		<b>Track 0085</b>	<b>7/3/2018 05:25</b>	<b>7/3/2018 07:07</b>	Local		Medium	<b>1h 42m 13.09s</b>	<b>8.5 mi</b>	<b>5 mph</b>	<b>6,133</b>		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map controls: Bing Aerial, search, zoom, pan

**131**

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:38  
 Track Name: Track 0085  
 Lat: 35.298019  
 Lng: -85.151063  
 Alt: NaN  
 Bearing: 186°  
 Distance: 47.7 ft  
 Speed: 32 mph

**32 mph**

35.2980375648006, -85.1510546254517



Systems

Content

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)**
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
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		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
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		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
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Map navigation icons: pan, zoom, location, flag, share, camera

Bing Aerial

Search bar

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:38  
 Track Name: Track 0085  
 Lat: 35.297697  
 Lng: -85.151137  
 Alt: NaN  
 Bearing: 141°  
 Distance: 2.4 ft  
 Speed: 1.6 mph

35.2977028362707, -85.1511457646922

**1.6 mph**





Google

Elapsed Time	Distance	Average Speed	Count		
1m 8.16s	0.3 mi	16.4 mph	69	👁	📄
10m 38.09s	0.7 mi	4 mph	639	👁	📄
34m 20.18s	18.7 mi	32.7 mph	2,060	👁	📄
4m 29.57s	0.1 mi	1.2 mph	230	👁	📄
21m 55.1s	24.5 mi	67 mph	1,316	👁	📄
23m 21.65s	18.1 mi	46.5 mph	1,277	👁	📄
1h 42m 13.09s	8.5 mi	5 mph	6,133	👁	📄
14m 22.07s	91.8 ft	0.1 mph	862	👁	
35m 20.03s	219.1 ft	0.1 mph	2,083	👁	

- Recovered 0009 (31)
- Recovered 0012 (178)
- Recovered 0016 (153)
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- Recovered 0022 (57)
- Recovered 0023 (778)
- Recovered 0024 (31)
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**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:38  
 Track Name: Track 0085  
 Lat: 35.297697  
 Lng: -85.151137  
 Alt: NaN  
 Bearing: 141°  
 Distance: 2.4 ft  
 Speed: 1.6 mph

35.2977028362707, -85.1511457646922

1.6 mph



Systems

Content

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)**
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
    - Recovered 0004 (1178)
    - Recovered 0005 (493)
    - Recovered 0006 (42)
    - Recovered 0008 (194)
    - Recovered 0009 (31)
    - Recovered 0012 (178)
    - Recovered 0016 (153)
    - Recovered 0020 (195)
    - Recovered 0022 (57)
    - Recovered 0023 (778)
    - Recovered 0024 (31)
    - Recovered 0026 (194)

		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map controls: Bing Aerial, search, zoom, pan

**33.4 mph**

35.2982421204428, -85.1509027267175

Map showing a road with a red arrow pointing to a track point. A data popup is visible for the selected track point.

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:39  
 Track Name: Track 0085  
 Lat: 35.298228  
 Lng: -85.150909  
 Alt: NaN  
 Bearing: 6°  
 Distance: 49.1 ft  
 Speed: 33.4 mph



Systems

Content

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)**
    - Breadcrumbs (803)
    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
    - Recovered 0004 (1178)
    - Recovered 0005 (493)
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    - Recovered 0008 (194)
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    - Recovered 0012 (178)
    - Recovered 0016 (153)
    - Recovered 0020 (195)
    - Recovered 0022 (57)
    - Recovered 0023 (778)
    - Recovered 0024 (31)
    - Recovered 0026 (194)

		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Bing Aerial

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:39  
 Track Name: Track 0085  
 Lat: 35.300651  
 Lng: -85.150718  
 Alt: NaN  
 Bearing: 358°  
 Distance: 85.1 ft  
 Speed: 57.7 mph

57.7 mph

35.3006774372305, -85.1507359302237



Systems

Content

Tags

Search

Timeline

**2016 Ford F-150**  
Sync Gen3

Applications

- Connections
- Devices (36)
- Events (5248)
- Navigation
  - Track Logs (143)**
    - Breadcrumbs (803)
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    - Recovered 0001 (1)
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    - Recovered 0003 (1)
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    - Recovered 0023 (778)
    - Recovered 0024 (31)
    - Recovered 0026 (194)

		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map navigation icons: pan, zoom, location, etc.

Bing Aerial

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:39  
 Track Name: Track 0085  
 Lat: 35.302937  
 Lng: -85.152168  
 Alt: NaN  
 Bearing: 309°  
 Distance: 99.6 ft  
 Speed: 67.9 mph

**67.9 mph**

35.3029616664046, -85.152172227132



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**2016 Ford F-150**  
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- Connections
- Devices (36)
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- Navigation
  - Track Logs (143)**
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    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
    - Recovered 0004 (1178)
    - Recovered 0005 (493)
    - Recovered 0006 (42)
    - Recovered 0008 (194)
    - Recovered 0009 (31)
    - Recovered 0012 (178)
    - Recovered 0016 (153)
    - Recovered 0020 (195)
    - Recovered 0022 (57)
    - Recovered 0023 (778)
    - Recovered 0024 (31)
    - Recovered 0026 (194)

		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map navigation icons: pan, zoom, location, etc. Bing Aerial

**Crash Site**

**71.5 mph**

**SELETED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:39  
 Track Name: Track 0085  
 Lat: 35.303458  
 Lng: -85.153443  
 Alt: NaN  
 Bearing: 287°  
 Distance: 104.8 ft  
 Speed: 71.5 mph

35.3034765993346, -85.1534575241135



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**2016 Ford F-150**  
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    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
    - Recovered 0004 (1178)
    - Recovered 0005 (493)
    - Recovered 0006 (42)
    - Recovered 0008 (194)
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    - Recovered 0012 (178)
    - Recovered 0016 (153)
    - Recovered 0020 (195)
    - Recovered 0022 (57)
    - Recovered 0023 (778)
    - Recovered 0024 (31)
    - Recovered 0026 (194)

		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map navigation icons: pan, zoom, location, etc. Bing Aerial

**Crash Site**

**65.3 mph**

SELETED TrackPoint:  
 Timestamp(Local) 7/3/2018 05:39  
 Track Name: Track 0085  
 Lat: 35.303509  
 Lng: -85.153765  
 Alt: NaN  
 Bearing: 281°  
 Distance: 97.7 ft  
 Speed: 65.3 mph

35.3035147423843, -85.1537846906178



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**2016 Ford F-150**  
Sync Gen3

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  - Track Logs (143)**
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    - Track 0086 (1)
    - Recovered 0001 (1)
    - Recovered 0002 (4)
    - Recovered 0003 (1)
    - Recovered 0004 (1178)
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    - Recovered 0016 (153)
    - Recovered 0020 (195)
    - Recovered 0022 (57)
    - Recovered 0023 (778)
    - Recovered 0024 (31)
    - Recovered 0026 (194)

		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		<b>Track 0085</b>	<b>7/3/2018 05:25</b>	<b>7/3/2018 07:07</b>	Local		Medium	<b>1h 42m 13.09s</b>	<b>8.5 mi</b>	<b>5 mph</b>	<b>6,133</b>		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map navigation controls: Bing Aerial, search, zoom, pan

**Crash Site**

**46.5 mph**

**SELECTED TrackPoint:**  
 Timestamp(Local) 7/3/2018 05:39  
 Track Name: Track 0085  
 Lat: 35.303506  
 Lng: -85.153994  
 Alt: NaN  
 Bearing: 269°  
 Distance: 68.2 ft  
 Speed: 46.5 mph

Map labels: Newman Rd, Old Dayton Pike

Coordinates: 35.3035147423843, -85.1539716429061

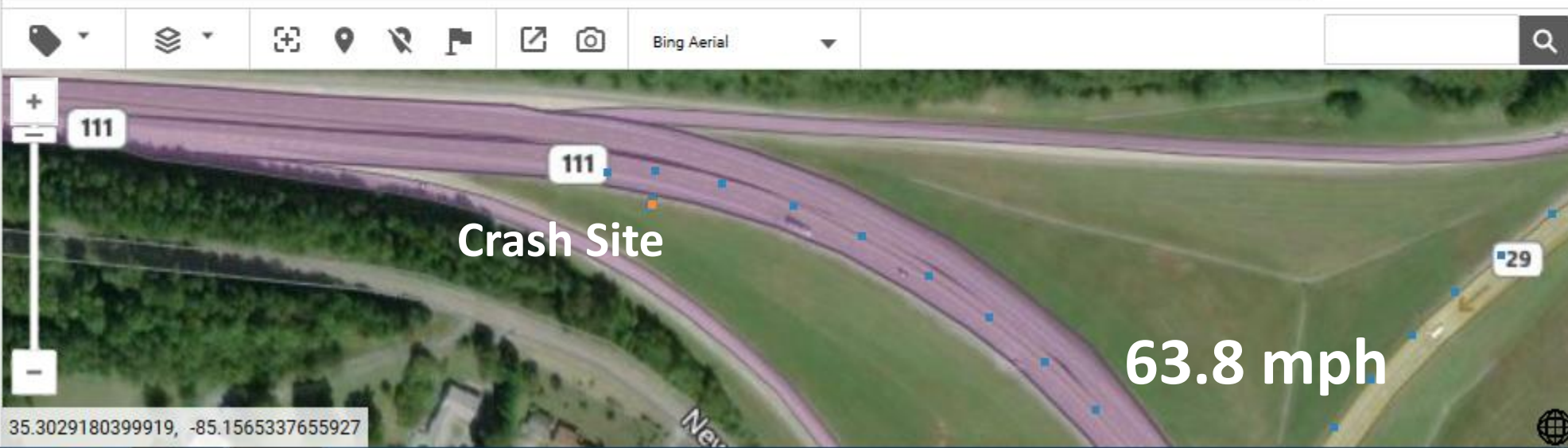


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    - Power (94)
    - Call Log (59)
    - Wheel Traction (14)
    - Hard Acceleration (71)
    - Hard Braking (35)**
    - Reboot (1)
  - Navigation
    - Track Logs (143)
    - Locations (10)
    - Routes
    - Velocity Logs (178)

# Hard Braking Events

		Date/Time	Timestamp Type	Event Identifier	Event Type	Action	Latitude	Longitude	Flags	Timestamp C
		6/23/2018 09:10	Local	Hard Braking: Wheel speed = 4.7 MPH, Decel = -0.64 G's (implied)	Hard Braking	Above -0.45 G's	35.550353000	-85.474201000		Medium
		6/23/2018 09:10	Local	Hard Braking: Wheel speed = 2.9 MPH, Decel = -0.83 G's (implied)	Hard Braking	Above -0.45 G's	35.550353000	-85.474201000		Medium
		6/23/2018 09:10	Local	Hard Braking: Wheel speed = 1.3 MPH, Decel = -0.68 G's (implied)	Hard Braking	Above -0.45 G's	35.550353000	-85.474201000		Medium
		6/23/2018 15:52	Local	Hard Braking: Wheel speed = 0.9 MPH, Decel = -0.49 G's (implied)	Hard Braking	Above -0.45 G's	35.552415000	-85.476151000		Medium
		6/23/2018 15:52	Local	Hard Braking: Wheel speed = 1.5 MPH, Decel = -0.55 G's (implied)	Hard Braking	Above -0.45 G's	35.552536000	-85.476141000		Medium
		7/3/2018 05:39	Local	Hard Braking: Wheel speed = 63.8 MPH, Decel = -0.91 G's (implied)	Hard Braking	Above -0.45 G's	35.303375000	-85.153106000		Medium
		7/3/2018 05:39	Local	Hard Braking: Wheel speed = 59.7 MPH, Decel = -0.61 G's (implied)	Hard Braking	Above -0.45 G's	35.303375000	-85.153106000		Medium
		7/3/2018 05:39	Local	Hard Braking: Wheel speed = 55.2 MPH, Decel = -0.89 G's (implied)	Hard Braking	Above -0.45 G's	35.303458000	-85.153443000		Medium





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    - Recovered 0002 (4)
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    - Recovered 0004 (1178)
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    - Recovered 0024 (31)
    - Recovered 0026 (194)

		Name	Start Time	End Time	Timestamp Type	Flags	Timestamp Confidence	Elapsed Time	Distance	Average Speed	Count		
		Track 0079	6/29/2018 18:45	6/29/2018 18:46	Local		Medium	1m 8.16s	0.3 mi	16.4 mph	69		
		Track 0080	6/30/2018 20:38	6/30/2018 20:48	Local		Medium	10m 38.09s	0.7 mi	4 mph	639		
+		Track 0081	7/2/2018 12:55	7/2/2018 13:29	Local		Medium	34m 20.18s	18.7 mi	32.7 mph	2,060		
		Track 0082	7/2/2018 14:29	7/2/2018 14:34	Local		Medium	4m 29.57s	0.1 mi	1.2 mph	230		
		Track 0083	7/2/2018 19:22	7/2/2018 19:44	Local		Medium	21m 55.1s	24.5 mi	67 mph	1,316		
		Track 0084	7/2/2018 20:44	7/2/2018 21:07	Local		Medium	23m 21.65s	18.1 mi	46.5 mph	1,277		
+		Track 0085	7/3/2018 05:25	7/3/2018 07:07	Local		Medium	1h 42m 13.09s	8.5 mi	5 mph	6,133		
		Track 0087	7/16/2018 10:43	7/16/2018 10:57	Local		Medium	14m 22.07s	91.8 ft	0.1 mph	862		
+		Track 0088	7/16/2018 11:38	7/16/2018 12:14	Local		Medium	35m 20.03s	219.1 ft	0.1 mph	2,083		

Map navigation controls: zoom, pan, layers, location, Bing Aerial

**Final Location of Vehicle After Crash**

**0 mph**

35.3033705138833, -85.1537616136939





Ed Merritt 1 ?

Time	Elapsed Time	Distance	Average Speed	Count		
1m	8.16s	0.3 mi	16.4 mph	69	👁	📄
10m	38.09s	0.7 mi	4 mph	639	👁	📄
34m	20.18s	18.7 mi	32.7 mph	2,060	👁	📄
4m	29.57s	0.1 mi	1.2 mph	230	👁	📄
21m	55.1s	24.5 mi	67 mph	1,316	👁	📄
23m	21.65s	18.1 mi	46.5 mph	1,277	👁	📄
1h 42m	13.09s	8.5 mi	5 mph	6,133	👁	📄
14m	22.07s	91.8 ft	0.1 mph	862	👁	
35m	20.03s	219.1 ft	0.1 mph	2,083	👁	

- Recovered 0008 (194)
- Recovered 0009 (31)
- Recovered 0012 (178)
- Recovered 0016 (153)
- Recovered 0020 (195)
- Recovered 0022 (57)
- Recovered 0023 (778)
- Recovered 0024 (31)
- Recovered 0026 (194)



**Final Location of Vehicle After Crash**

Timestamp: 7/6/2016 07:03  
 Track Name: Track 0085  
 Lat: 35.30338  
 Lng: -85.153781  
 Alt: NaN  
 Bearing: 0°  
 Distance:  
 Speed: 0 mph



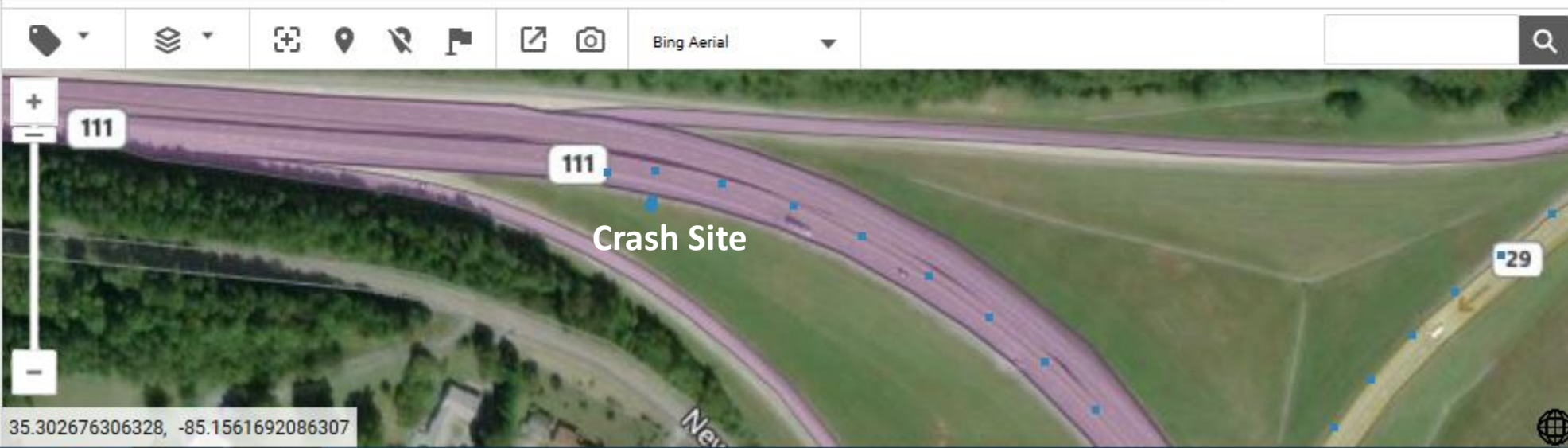
**0 mph**



### Cellular Device Connection Log; Able To Tie Vehicle to Suspect's Cell Phone via Serial Number

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    - Media (413)
    - Driver Distraction Prevention (669)
    - Gear Shift (1754)
    - Door (723)
    - System Information (23)
    - Odometer (1309)
    - Power (94)
    - Call Log (59)
    - Wheel Traction (14)
    - Hard Acceleration (71)
    - Hard Braking (35)
    - Reboot (1)
  - Navigation
    - Track Logs (143)
    - Locations (10)
    - Routes
    - Velocity Logs (178)

		Date/Time	Timestamp Type	Event Identifier	Event Type	Action	Latitude	Longitude	Flags
		6/29/2018 08:37	Local	Media Device Name <Galaxy S8> is AVAILABLE, Serial Number <14:56:3e:f8>	Device	Device Connected	35.279492000	-85.105427000	
		6/29/2018 13:39	Local	Media Device Name <Galaxy S8> is AVAILABLE, Serial Number <14:56:3e:f8>	Device	Device Connected	35.549326000	-85.473407000	
		6/29/2018 17:27	Local	Media Device Name <Galaxy S8> is AVAILABLE, Serial Number <14:56:3e:f8>	Device	Device Connected	35.550444000	-85.472447000	
		6/29/2018 17:28	Local	Media Device Name <Galaxy S8> has become UNAVAILABLE	Device	Disconnected	35.553831000	-85.473645000	
		6/29/2018 18:45	Local	Media Device Name <Galaxy S8> is AVAILABLE, Serial Number <14:56:3e:f8>	Device	Device Connected	35.553829000	-85.473645000	
		7/2/2018 19:21	Local	Media Device Name <Galaxy S8> is AVAILABLE, Serial Number <14:56:3e:f8>	Device	Device Connected	35.549279000	-85.473285000	
		7/3/2018 05:25	Local	Media Device Name <Galaxy S8> is AVAILABLE, Serial Number <14:56:3e:f8>	Device	Device Connected	35.366118000	-85.160042000	
		7/3/2018 05:43	Local	Media Device Name <Galaxy S8> has become UNAVAILABLE	Device	Disconnected	35.303392000	-85.153779000	





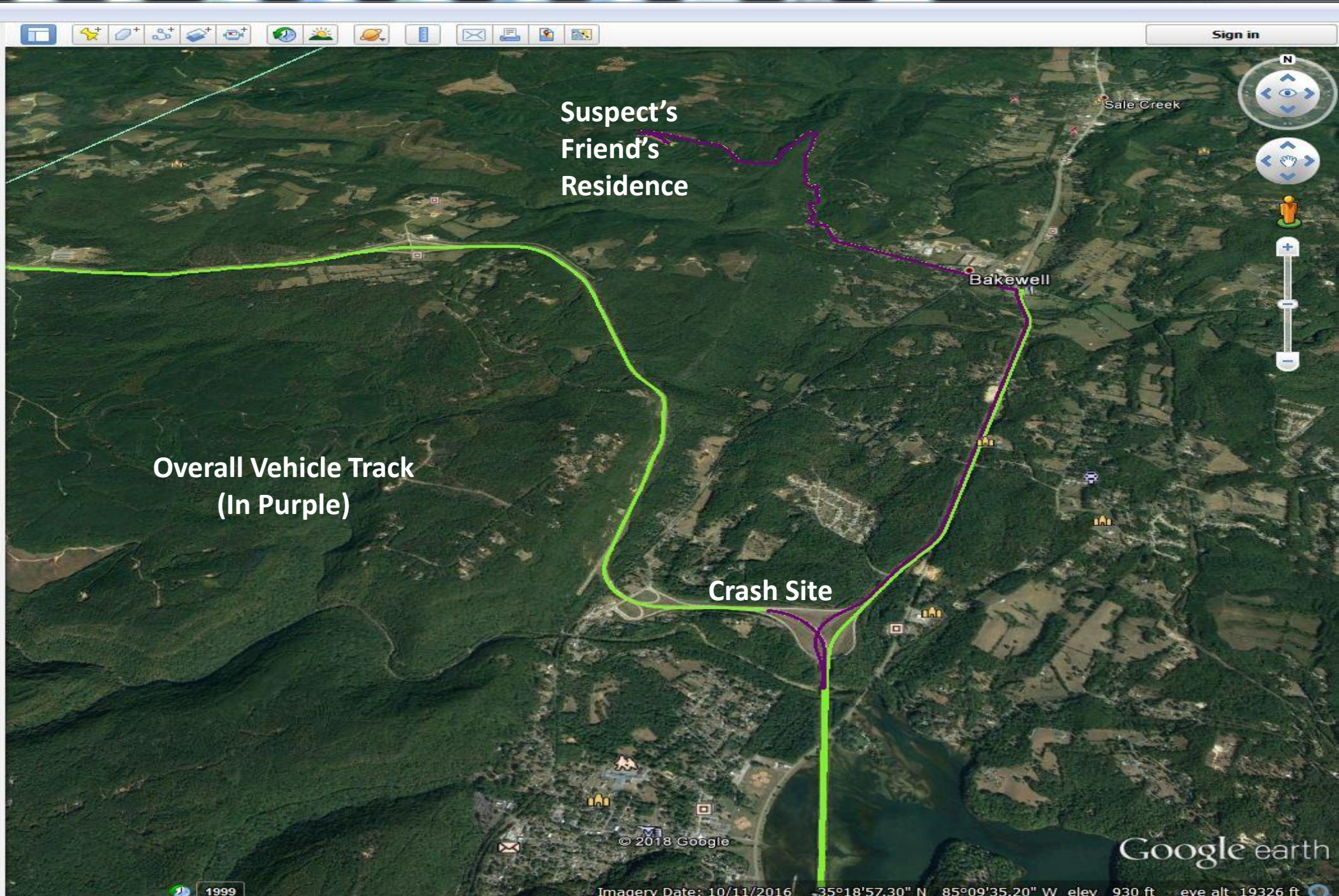
Search Search

ex: Restaurants Get Directions History

- Places
- My Places
  - Sightseeing Tour
    - Make sure 3D Buildings layer is checked
- Temporary Places
- Exported Items

Layers

- Primary Database
- Upgrade available
- Announcements
- Borders and Labels
- Places
- Photos
- Roads
- 3D Buildings
- Ocean
- Weather
- Gallery
- Global Awareness
- More
- Terrain



Suspect's Friend's Residence

Overall Vehicle Track (In Purple)

Crash Site

Bakewell

Sale Creek





# Vehicle Video Recording Systems / Devices

# Vehicle Video Recording Systems and Devices

- Many vehicle manufacturers are now including vehicle video recording systems to help owners protect their vehicle against vandalism and liability claims.
- Even vehicles that do not come with video recording systems may have after-market systems that may contain valuable evidence.



# Vehicle Video Recording Systems and Devices

- Walking through a parking lot while investigating a crime may yield several of these vehicles that have excellent surveillance video.
- These videos are often superior to store or parking lot cameras as they are closer to the suspects and often have very high-definition cameras.





# After Market Surveillance Camera Examples





*Cadillac*

# Cadillac – Surround Vision Recorder

- Available in model CT6 (2016-2020), CT5 (2020-2023), XT6 (2021-2023), along with CT4, Lyriq, & Escalade (2023).
- Surround Vision Recorder utilizes 4 cameras, 1 on front grille, 1 on rear trunk lid, and 1 on each side mirror.
- Continuously records when vehicle is disturbed, or motion is detected within 1 foot of the vehicle.
- Surround Vision Recorder footage is stored on an external SD card. The system is programmed to overwrite old data when no more space is available. Overwritten data is non-retrievable.
- Footage is typically stored in 5-minute video files.
- Resolution is high definition in 2020 and newer and is standard definition in vehicles prior to 2020.



# Rivian – Gear Guard

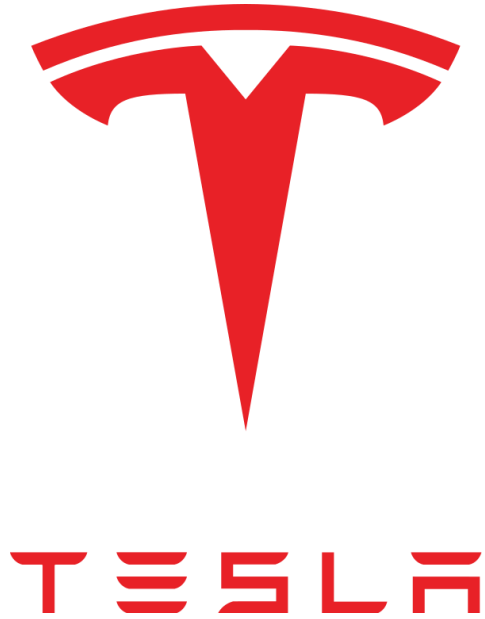


- Available in all Rivian vehicles
- Gear Guard utilizes 5 cameras on the R1T Truck, 2 rear-facing on each side, 1 front, 1 rear, and 1 rear truck bed. The R1S SUV has all the same cameras, except the rear truck bed camera.
- Continuously records when motion is triggered.
- Gear Guard footage is stored on an internal hard drive and can be exported to an external drive. The system is programmed to delete data after 10 days.
- Footage is typically stored in 30-second video files.
- Recording resolution is in high definition.





# Tesla – Sentry Mode



- All Tesla models and versions August 2017 and newer
- Sentry Mode utilizes 5 cameras, 2 rear-facing on each side, 1 front, 1 rear, and 1 interior.
- Continuously records when motion is triggered, and vehicle owner can view a live feed on their mobile device.
- Sentry Mode footage is stored on a user provided flash drive or external drive. The system is programmed to overwrite old data when no more space is available. Overwritten data is non-retrievable.
- Footage is typically stored in 10-minute video files.
- Resolution is 1280 x 980 at 30 frames per second.





# Legal Demands and Resources

# https://www.hawkanalytics.com/hawk-toolbox/

Hawk Toolbox Login CellHawk Login



HOME CELLHAWK TRAINING ▾ HAWK TOOLBOX CONTACT US REGISTER

## Hawk Partner Highlight – KlaasKids

by Nicole Poser | Mar 30, 2021 | Announcements, Press Releases

Hawk Analytics was founded over a decade ago by Mike Melson and his wife, Dr. Bridget Melson who are passionate about helping families find their missing loved ones. Furthering Hawk Analytics commitment to this cause we are proud to announce our partnership with the Klaas Kids Foundation.

[read more](#)

## Lost Hiker Rescued Alive by Emergency Cell Phone Record Analysis

by Nicole Poser | Apr 30, 2020 | Blog, Press Releases

Tuolumne County, CA – March 26, 2020 started out as a beautiful day in Tuolumne County California, filled with blue skies and an unusual tranquility due to the COVID-19 global pandemic. Throughout the state residents struggled to find activities to occupy their time as California issued a “stay-at-home” order.

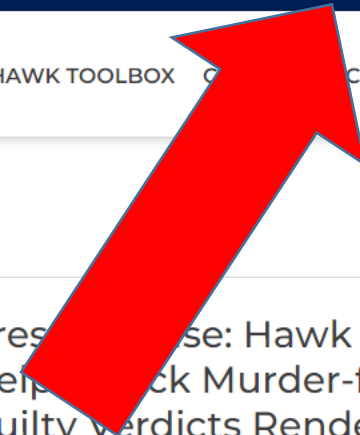
[read more](#)

## Press Release: Hawk Analytics Helps Crack Murder-for-Hire Case: Guilty Verdicts Rendered

by Nicole Poser | Dec 19, 2019 | Press Releases

Fort Myers, FL – Four years after Dr. Teresa Sievers was found deceased in her home, her family has found closure in a multi-trial case. Lee County Sheriff’s Office painted a picture of an inter-state murder-for-hire conspiracy by using Hawk Analytics proprietary...

[read more](#)



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National Criminal Justice Training Center of Fox Valley Technical College





## 2023 Training Classes Posted!

Posted November 17, 2022 by Nicole Poser

We are excited to be offering high quality training in the new year and have started adding 2023 training classes. For the most up to date training offerings please refer to the website here: <https://w4.leadsonline.com>

## IMPORTANT INFO: Updated T-Mobile Cost Reimbursement Rate Schedule Include New Fee for Timing Advance Records

Posted June 17, 2022 by Tom Bruce

As of May 20, 2022, T-Mobile updated their Cost Reimbursement Rate Schedule, which reflects adjusted pricing on some already charged for services, but this form now has a new service type reimbursement rate not seen in the past, that frankly is rather troubling. Timing Advance (TDOA/PCMD) record requests will now require submission of their

## LeadsOnline Acquires Hawk Analytics

Posted June 15, 2022 by Nicole Poser

LeadsOnline, LLC, a nationwide provider of data, technology and investigation tools used by law enforcement agencies and businesses, today announced the completion of its acquisition of Hawk Analytics, Inc., a provider of mapping and analytics technology built for law enforcement. Together, LeadsOnline and Hawk Analytics aim to provide law enforcement with expanded coverage and enhanced ...

[Click Here to Read Past Announcements...](#)

## NEWS & EVENTS

FREE TRIAL

## CHASING CONNECTED CARS CDR'S



An all-inclusive car look-up and Search Warrant Tool



Law Enforcement Technology Investigations Resource Guide

CLICK HERE FOR LATEST VERSION

POLICE LINE - DO NOT CROSS

## Google Geofence Tool

With only a few clicks, you can create your Geofence map and download the completed Stage 1 Geofence Search Warrant. Stage 2 & 3 search warrant templates also available for download

CLICK HERE



# Vehicle Search Warrants

- 
- **Draw a Nexus**
  - **Any and All (Don't Do It!)**
  - **Date Ranges / Time Ranges**
  - **Affidavit/Warrant Mirror**



# Search Warrant Templates

## Evidence to be Searched and Seized

This application seeks permission to search for and seize evidence of the crimes described above, that are currently securely stored at the secure Property/Evidence facility of the [insert law enforcement agency name], [insert address/location], [insert City], County of [insert County], and State of [insert State]. The devices and vehicle to be searched are uniquely described as:

Vehicle / Devices to be Searched and Seized:                    *[Describe vehicle in detail]*

1. Vehicle year, make, model, color, license plate, VIN, etc.
2. Infotainment System and related digital storage media associated with the above described vehicle.





# Course Closing

**These investigations  
take a lot of work, but  
depending on your case  
it may well be worth it!**



# COURSE CLOSING

- **This is only the beginning to a long road of learning**
- **Never stop learning, this data can change daily**
- **Ask Questions**



**All of the redacted slides, website links, and other documents will be available for download at:**

**<https://bit.ly/NCJTC-Connected-Cars>**

**Password: NCJTC#1**

**(Type Exactly as Shown; The Link and Password are Case Sensitive!)**



**All of the redacted slides, website links, and other documents will be available for download at:**

**<https://bit.ly/NCJTC-Connected-Cars>**

**Password: NCJTC#1**

**(Type Exactly as Shown; The Link and Password are Case Sensitive!)**



# IoT ListServ and Other Trainings (https://ncjtc.org)

The screenshot displays the NCJTC website with the following elements:

- Header:** NCJTC National Criminal Justice Training Center of Fox Valley Technical College. Navigation links: TRAINING, RESOURCES, PROGRAMS, ABOUT NCJTC, SIGN IN, and a search icon.
- Announcement:** NCJTC announcement regarding COVID-19 (coronavirus). For information concerning continuing education units, please view our policies page.
- Main Content:**
  - Image:** A globe with a hexagonal grid overlay, representing IoT technology.
  - Section Header:** Internet of Things (IoT) National Training and Technical Assistance Program
  - Text:** The Internet of Things (IoT) National Training and Technical Assistance Program provides training and resources to criminal justice agencies to improve their ability prevent, solve, and prosecute crimes involving IoT devices. Training encompasses understanding these devices, the data they collect, how to properly collect and analyze the data, and its value as it relates to an investigation.
  - Text:** Additionally, the training and materials will enable law enforcement agencies to better inform their communities about the security and privacy issues associated with IoT devices to reduce victimization.
- Upcoming Training:** A dropdown menu showing two training cards for "Internet of Things Privacy Concerns: What Can...". Each card features a shield icon and the text "LIVE ONLINE INSTRUCTOR LED".
- Right Sidebar:**
  - Request IoT Listserv Access:** Includes a Wi-Fi icon, the text "REQUEST IOT LISTSERV ACCESS", "Subscribe now to stay up to date with IoT news.", and a "SUBSCRIBE!" button.
  - Join Our Mailing List:** Includes an envelope icon, the text "JOIN OUR MAILING LIST", "Subscribe now to get the latest training news FIRST", and a "SIGN ME UP!" button.
  - Image:** A stack of wooden gavel blocks.





# Questions?

*info@ncjtc.org*

*www.ncjtc.org*

*(855) 866-2582*

# Post-Webinar Reminders

- A recording of this webinar will be available in the coming weeks at [www.NCJTC.org](http://www.NCJTC.org).
- Please complete the brief evaluation at the conclusion of this webinar.
- A certificate of attendance will be sent to attendees within 2 weeks.



# NCJTC Services & Opportunities

*Visit [www.ncjtc.org](http://www.ncjtc.org) for additional training and technical assistance services, offerings and opportunities.*

*Watch your inbox for upcoming webinars and scheduled trainings!*