SiriusXM
2016 Telematics Update

Our SiriusXM Response Center

Operating in the U.S. and Canada since 1996 as ATX, Agero

Vehicle-based emergency calls: automatic crash notification (ACN), advanced AACN, In-vehicle MayDay (ecall) button, stolen vehicle recovery.

24x7 call centers in Irving, Texas; Provo, Utah

Two agents on emergency calls

- One interfacing driver
- One interfacing PSAP

Automakers Served

				 	 		
United States	United States	United States	United States	United States Canada	United States Canada	United States	United States Canada
Veloster Veloster Turbo Sonata Sonata Hybrid Genesis Coupe Azera Enlantra Elantra GT Elantra Coupe Santa Fe Genesis Sedan	Avalon LTD Avalon Hybrid LTD 4Runner LTD Land Cruiser Sienna XLE Prius Prius PHV Camry XLE Camry Hybrid Camry Hybrid XLE RAV4 EV	CT Hybrid ES GS GS Hybrid GX HS Hybrid IS IS C IS F LFA LS LS Hybrid LX RX RX Hybrid	Q7 A4/S4 Q5/Q55 A5/S5 RS5	RLX MDX Honda Civic (Limited Trim Lines)	JX QX60 QX80 Q50 Q70 Nissan Leaf	Legacy Outback Forester Impreza WRX XV Crosstrek	F-type XJ Models Range Rover Ranger Rover Sport Evoque Models

***Mercedes-Benz in Canada (pre 2010 models in U.S.)**

Suite of Services

Safety and Security

Automatic Crash Notification – Emergency, Disaster, and Crisis Assistance – Stolen Vehicle Location – E-Call Enabled

Mercedes-Benz Legacy

Remote Lock
Remote Unlock
Alarm Notification
Dealer Connect
Operator Navigation
Personalized Traffic
POI Download
Information Services
E-Owner's FAQs
Concierge

14

Audi

4

Toyota

Maintenance Reminder*

5

Lexus

Online POIs
POI Download
Connected Messaging
Remote Diagnostics**

8

Hyundai

Remote Lock
Remote Unlock
Remote Horn/Lights
Remote Start
Alarm Notification
Panic Notification
Vehicle Slowdown
Vehicle Immobilize
Maintenance Alert
Scheduled Vehicle Diagnostics
Automated DTC Recall Campaign
Customer Feedback
POI Downloading
Personalized Traffic
T-B-T Navigation
Traffic, Weather
Gas Location/Prices
Eco Coach
Geo-Fence
Curfew Alert
Speed Alert
Personal POIs
Trip Planner
Restaurant Ratings
Text by Voice
Quick Reference Guide

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Infiniti / Nissan

Remote Lock
Remote Unlock
Alarm Notification
Maintenance Alert
MIL Notification
Google Calendar
POI Download by IVR
POI via Web Portal
Connected Search
MIS
Google Send to Car
Speed Alert
Valet Alert
Geo Fence
Concierge

Nissan Leaf, wireless Account management

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Acura

Remote Lock
Remote Unlock
Alarm Notification
POI Download by IVR
POI via Web Portal
CarFinder
Remote Diagnostics
Virtual Dashboard
Alarm notification
Roadside Access
Low Power Mode

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Honda

Honda FIT EV – PHEV
All of the following Services available Through owner's mobile Phone:

Roadside Assistance
Charge/Battery Status
Vehicle Schedules
Range Display
Climate/air conditioning Management
EVSE Charging Station Finder
Messages
Dealer Locations
Driving Directions
Multiple Vehicle support
Customer Profile
Customer Service
POI Search/POI Share

**Honda Link Assist, Just Automatic Crash Notification

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Subaru

Roadside Assistance
Remote Lock
Remote Unlock
Remote horn/Lights
Vehicle Locator

8

Jaguar / Land Rover

4

*TMS is pulling away from Maintenance reminders
**Only available to TMC Japan

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Call Center Operations

In the U.S.:

-- Telematics calls are delivered via native 9-1-1 trunk lines through a 3rd party VoIP Positioning Center to the designated primary PSAP for VoIP.

-- SIP invite includes

SXM Telematics	Incident field (future: VIN)
ALI-ANI	Class of Service (VOIP, TLMA/TELM)

TLMA identifies the incoming call as originating from a TCC

In Canada:

-- Transitioned away from proprietary 10-digit database

-- Moving to US configuration:

-- Connect to Northern 911 via voice.

-- By end of year, via SIP invite + voice.

-- N911 introduces call, SXM provides details; may use N911 agents for calls into Quebec

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Common Telematics Services Requiring PSAP Connection

Automatic Collision or Crash Notification (ACN)

Immediately after certain crash thresholds have been exceeded, the vehicle's location and vehicle data is automatically sent via wireless technology to a Telematics Call Center. The system automatically establishes a voice connection between the vehicle and the Telematics Call Center.

Advanced ACN (AACN)

The automatic transmission to a Telematics Call Center of additional enhanced crash-severity data collected by embedded, in-vehicle crash sensors .

Remote Ignition Block

After reported stolen, a remote signal can be sent to prevent the stolen vehicle from starting the next time someone attempts to start it.

In-Vehicle Emergency Button (MayDay-SOS-eCall)

Configured in-vehicle as a designated button or screen tab to summon emergency assistance. When manually activated by a vehicle occupant, the call and vehicle location is relayed to the Telematics Call Center for processing or in some systems, routed directly to the PSAP where it is delivered with automated voice prompts, information.

Stolen Vehicle Location and Slowdown:

After vehicle reported stolen, GPS technology is used to find the vehicle's location and reported to authorities. In certain vehicles with Stolen Vehicle Slowdown capability, the Telematics Call Center remotely slows the vehicle to a minimum speed or stop. This capability can also be used for stuck accelerators.

Lost or Missing Persons –

Lost Person – A person (or persons) who is temporarily disoriented and / or incapacitated and desires to be found, e.g., a stranded motorist, Alzheimer's patient

Missing Person – A person who is voluntarily missing, has control over their actions, and who has decided upon a course of action, e.g., wishes to leave home due to abuse or desires to commit suicide OR a person who is influenced by a third party and has gone missing against their will, e.g., abduction or murder victim.

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SiriusXM Telematics Call Center (TCC) Protocol for Interfacing with 9-1-1

TCC will attempt to verify the emergency event and location prior to contacting the PSAP. After contacting the PSAP, the TCC will normally provide the following information:

- TCC name & operator name
- Type of call
- Location with nearest cross street based on the latitude/longitude of the vehicle
- If ***vehicle crash data indicates a likelihood of severe injury.***
- Indication of other ACN data if available (e.g., rollover, airbag deployment)
- Movement data, if appropriate
- Whether voice contact with occupants has been established
- Number of occupants if known
- Vehicle description, if available
- Other information relevant to appropriate emergency-response.

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Advantages of TSP Response Center vs. Direct 9-1-1 via Bluetooth Phone

Better Location Accuracy

- Doesn't rely on cell tower location to determine PSAP, potential delay in transferring call to correct PSAP
- Can accommodate PSAPs relying on maps either lat/lon or nearest cross streets
- Doesn't rely on pairing phone with car

Quicker ID of Vehicle Emergencies

- Calls distinguished as vehicle-based rather than wireless based; critical in separating source of crash from wave of bystander reports

Enables Data to be Appended

- Owner-provided data: Emergency contacts, instructions for responders
- Vehicle data to help ID vehicle
- Crash data to help assess severity

Provides Virtual Eyewitness

- Can reconnect to PSAP if situation changes
- Remotely activate horn, lights to help guide responders
- Can bridge PSAP into vehicle

Screen Non-emergencies

- Sensor activation during service, tow

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Screening MayDay Calls
(thru December 31st, 2015)

OEM	Presses	PSAP Contacted
#1	464,759	2,543
#2	206,524	2,653
#3	82,771	427
#4	46,439	1,768
#5	14,618	378
#6	9,319	22
Total	**824,430**	**7,790**

Top Reasons:

- Customer Error
- Customer Cancel
- Dropped Calls
- Equipment Malfunctioning
- Non-emergency request

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Emergency Call Performance

Based on 2016 SiriusXM review

of quality performance audiotapes of emergency calls,

75% of emergency calls appeared to arrive at PSAP

before wireless e911 calls were received of the same accident.

AACN – Predicting Crash Severity, Likelihood of Trauma Injuries

GOAL: Right Patient to the Right Place at the Right Time.

- Severely injured patient has a 25% greater chance of survival if they are transported to a Level 1 trauma center *(MacKenzie study, NE Journal of Medicine, 2006)*

2011 Revision: Guidelines for the Field Triage of Injured Patients

- Physiologic criteria (vital signs and level of consciousness)
- Anatomic criteria (anatomy/type of injury)
- Mechanism of Injury (evidence of high energy impact) . High Risk Auto Crash Considerations:
- Intrusion, including roof: >12 inches occupant site , 18 inches any site
- Ejection (partial or complete) from vehicle)
- Death in same passenger compartment
- Vehicle telemetry data consistent with high risk of injury
- Special Considerations (i.e. age, gender burns, >20 week pregnancy etc.)

In past: Vehicle telemetry = whether airbag has activated

Today: vehicle telemetry = crash severity data, injury algorithm

- Vehicle data includes: Principal direction of force, change of velocity, multiple impacts, seat belt engagement, rollover.
- Crash sensor data + vehicle type used to calculate an Injury Severity Score (ISS).
- There is a high likelihood of severe injury if the ISS score is 15 or greater.
- CDC National Expert Panel has recommended that injury prediction algorithms consider a 20% risk of ISS 15 or greater as the threshold to identify a crash with high risk of severe injury to the occupant(s).

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Telematics Role in Natural Disasters

First 12 Hours of SuperStorm Sandy – Call Types Received

Destination Assist	4, 896
Information Requests	1, 977
Roadside Assistance	998
Mayday	157
ACN	135

Telematics Potential Role in a Next-Generation Environment

Crash data +

VIN, call type (crash v. ecall v. SVR)
Use of onboard cameras
Fuel type/body material (extraction)
Number of passengers/presence of child
Who owns the vehicle?
Whose driving the vehicle?

Vehicle-to-Vehicle, V2I Communications

- **Cordon off incident areas**
- **Notify of approaching responder vehicle**

Wearable Tech Meets Car

- Heart Rate Monitoring, can notify 911 if a driver's heart rate changes rapidly
- Driver alertness monitor with rest recommendation messages
- Alcohol detection

Photo's courtesy of BMW and Hyundai

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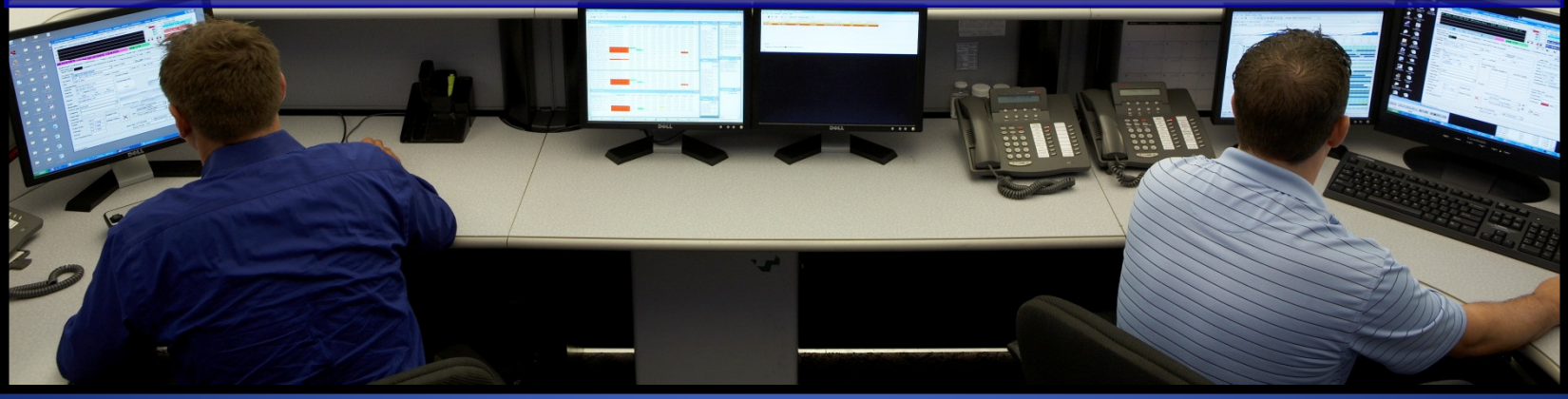

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