

No	Category	Category2	Who's requirements?	Requirement	Feasibility	Comment	Responsible module	Vehicle Spec topic	Security	How to treat	Use case No.			
9	API Get	---	Developer	Geo-location should be obtained.	?	Depend on sensor	Web runtime(Browser)	Yes	no		13, 37			
10	API Get	---	Developer	Weather around car should be obtained.	?	Depend on sensor	Web runtime(Browser)	Yes	no		19			
11	API Get	---	Developer	Camera image around car should be obtained.	?	Depend on sensor	Web runtime(Browser)	Yes	no		20, 22			
27	Publicness	---	?	Automaker should have responsibility to comply with governmental regulations.	O		Web runtime(Browser)	Yes	Yes		13, 30			
17	API Set	Set API	Automaker?	Only one application can use "Set API" simultaneously.	?	How about background application?	Web runtime(Browser)	More general	Yes?		49			
19	API Set	Set API	Developer	Sheet position, Window and lock can be "set".	X		Web runtime(Browser)	Yes	Yes		28, 34, 17, 25,			
20	API Set	Set API	Developer?	Safety critical functionality (e.g. airbug) can be "set".	X	Even in the future this might have to be	Web runtime(Browser)	Yes	Yes		11, 43			
21	API Set	Set API	Automaker	Access to the drive-train must be prohibited in a clear way.	O		Web runtime(Browser)	Yes	Yes		2			
22	API Set	Set API	Automaker	"Set API" should be accessible only via an automaker's cloud server.	O	Even in the future this might have to be k	Cloud	Yes	Yes		31, 32			
6	API	API Accessibility	Developer, User	API should be available even if engine is off.	X	need architecture discussion	Car server?	Yes	Yes		47, 45, 28, 34, 17, 25			
1	API	API Accessibility	Automaker	Automakers expose a subset of Vehicle API to developer	?	Is not_supported_business_policy enough	Web runtime(Browser)	Yes	Yes		29			
2	API	API Accessibility	Automaker	Automakers expose API only for specific applications(website)	?	Is restriction based on whitelisted-hostna	Web runtime(Browser)	Yes	Yes		3			
3	API	API Accessibility	Automaker, Developer	There must be a way to verify application ID.	?	ssh seems to meet this purpose	SSH?	More general	Yes		9			
8	API Get	API Accessibility	Automaker	"Get API" can be accessible only via an automaker's cloud server.	O	if so vehicle API doesn't need	Cloud	Yes	Yes		31			
5	API	API Accessibility	User	Users should be possible to restrict API depending on application.	O		Web runtime(Browser), App?	More general	Yes		27, 44			
29	Trusted Commu	Communication	User	Users should be able to have access to his content which is stored in cloud servers.	O	Is current web service enough for this pu	App?	More general	Yes		53			
28	Trusted Commu	Communication	Developer	Application should be able to connect with external devices.	?	Is ssh enough for this purpose?	App?	More general	Yes		52, 54, 12, 14			
7	API	API Accessibility	Developer, User	API should be accessible remotely.	X	need architecture discussion	App?	Yes	Yes		17, 18, 25, 26, 28, 46, 47			
12	API Get	Communication	Developer	Obtained data cannot be tampered.	X		Hardware?, Web runtime(Browser)	More general	Yes		4, 7, 10, 55			
16	API Log	User's rights for their pers	User	Log is not recorded if DNT is turned to be ON.	O		Web runtime(Browser)	Yes	Yes		15			
24	Data Control	User's rights for their pers	User	Application should respect DNT setting.	O		App	More general	Yes		5			
4	API	User's rights for their pers	Automaker?	Any API restriction should be ignored if an emergency arise.	O		Web runtime(Browser)	Yes	Yes		5, 21, 40, 41, 43			
14	API Log	User's rights for their pers	Automaker	Log should be protected is an emergency arise.	O		Web runtime(Browser)	Yes	Yes		21			
13	API Log	API Accessibility	User	Log should be accessible only by application which obtained the log.	O		Web runtime(Browser)	Yes	Yes		24, 51			
34	Intrusion	Protection against intrusio	User	Intrusion detection	X		?	More general	Yes		48			
33	Payment	Multi Drivers/Passengers/	Developer	Responsible party is charged	O		App?	More general	Yes		38			
38	Data Get	Multi Drivers/Passengers/	User	Valuable information should be protected from hackers or rogue mechanics.	O		App/runtime(Browser)	More general	Yes		60			
18	API Set	Set API	Developer	HVAC can be "set".	X		Web runtime(Browser)	Yes	Yes		16, 18, 26, 42			
37	Data Control	User's rights for their pers	User	Developer should offer ways for controlling user's data	O		Cloud	More general	Yes		58			
25	Data Control	User's rights for their pers	User	Data destination should be able to control depending on application	O		App	More general	Yes		27, 39, 44			
23	Data Control	User's rights for their pers	User	Users should be able to control data set and data granularity depending on applicati	?		Web runtime(Browser), App?	More general	Yes		6, 8, 15, 19, 27, 39, 44, 5			
15	API Log	User's rights for their pers	User	User can check log and remove it.	O		Web runtime(Browser)	Yes	Yes		23			
26	Data Control	User's rights for their pers	User	Users can clear his data from the car.	O	Should be implemented in a general way	Web runtime(Browser)	Yes	Yes		1			
30	User ID	Protection against intrus	Developer?	No user cannot log into system during driving.	?	need architecture discussion	Web runtime(Browser), App?	More general?	Yes		50			
31	User ID	Multi Drivers/Passengers/	Developer	Each passenger must be identifiable.	X		App?	Yes	Yes		36, 35, 50			
32	User ID	Multi Drivers/Passengers/	Developer	It must be identifiable whom an obtained data belongs to.	X		App?	Yes	Yes		15, 34			
35	User ID	Multi Drivers/Passengers/	User	Apps should operate in a personal basis	O		App/runtime(Browser)	More general	Yes		56			
36	API Get	User's rights for their pers	User	Sensitive location should not be known by apps	X		runtime	Yes?	Yes		57			

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No	Security/Privacy/Both/Other	Situation, Usecase of API	Name	Concern	Ref.	Reported by	Applies to Vehicle Info Spec	Remarks	Question	Examples	Reference	Sensitivity	Conclusive remarks	
1	Privacy	Rent-a-car	Removal of private data	As a user, I'd like to remove any private data from the car when I leave.		Junichi	yes	Perhaps consider broader shared use vehicles or split that into a separate use case		Rental vehicles may be used in order to synchronise contacts, read emails and browse the internet in the vehicle. In order to protect the user's personal information, including these contact details and browsing history, the user may wish to erase any onboard/offboard data associated with themselves before returning the vehicle.				
2	Security	Driving	Vehicle remote control permissions	As a driver, I don't want any remote person to control my car (eg. speed, door lock etc.)	25	Junichi	yes	Fundamental question as to whether API will be used remotely.		As a driver I don't want anyone to control the vehicle besides me or the vehicle with my consent.				
3	Security	Application certification	OEM permission for API usage	As an OEM, I don't permit any application to use Vehicle API without my check.	29	Junichi		Suppress specific values is a sub-case (JH) I report this as a possible requirement from OEMs, but not sure it is hoped and feasible.		Since data is inherently valuable, the data owner may not wish for data to be exposed to a third party without explicit permission. Original data owners could include the vehicle owner, a third party app developer, tier 1 supplier or an OEM. They may wish to block the data transmission to certain areas in order to protect exclusivity rights, vehicle attribute data, privacy or security.				
4	Security	Insurance	Data integrity for black box insurance	As an insurer, I need to be sure that probe data is not tampered.		Junichi		(JH) To be sure this, hardware support is required. I think this is out of scope for current spec.		Black box insurance (telematics car insurance) is an increasingly common method of actively monitoring a person's driving style in order to calculate tailored insurance premiums. This can be used to save drivers money and aid insurers' risk calculations. The integrity of the data is essential to ensure that the system gives an appropriate indications of risk and therefore cost. This method of insurance provides another stakeholder who could actively take an interest in maliciously affecting vehicle data for monetary gain.				
5	Privacy	Do Not Track	"Do Not Track" except for in emergency	I usually set "Do Not Track", but help me immediately after the accident.	15	Hira		(JH) DNT should be touched in the scope.	Should we have normal mode and emergency mode? Can WebApps handle emergent situations?			Further Discussion		
6	Privacy	Probe data	Traceability of crowd sourced data	I am willing to provide vehicle data for traffic monitoring, but does not want a police officer to know my destination and the exact speed of my car.		Hira		(JH) This seems as an application layer topic.	Granularity of data?	Data about my trip in aggregate may be given in consent, by my specific driving behavior should not be held against me.				
7	Security	ADAS	Data integrity of on-board sensors	Advanced Driver Assistance System (ADAS) Controller accepts input from authorized onboard sensors		Kevin Gavigan		(JH) Is there a standard way for authorizing sensors? Otherwise this will be too heavy requirements for the spec implementers.		Monitoring of use of ADAS activation could be useful to insurance companies or others interested in monitoring driving behavior like V2X applications for municipalities	<a href="https://www.w3.org/auto/security/wiki/Use_Cases#Use_Case:_Advanced_Driver_Assistance_System_28ADAS_29_Controller_accepts_input_from_authorized_onboard_sensors">https://www.w3.org/auto/security/wiki/Use_Cases#Use_Case:_Advanced_Driver_Assistance_System_28ADAS_29_Controller_accepts_input_from_authorized_onboard_sensors</a>			
8	Privacy	Data Sharing	Context dependant data granularity	As a user, I'd like to apply different data granularity depending on whom to send the data.		Junichi		This may also apply to requirements in specific places (based on laws in different countries) or differing restrictions across the OEMs. The general use case is the ability to control or set granularity of specific fields (e.g. timestamp, lat/lon, etc.)		The user may wish to dictate the extent to which data is distributed to third parties. An example of this would include traffic mapping services which may call upon data throughout the driver's commute in order to aggregate the data for traffic services. An application designed for personal tracking may wish to only provide data on request and after driver verification.				
9	Security	Application Certification	Identity mechanism for third parties	Ability to query registry of trusted 3rd parties, retrieve identification mechanisms		Ted Guild		(JH) In order to reject apps from untrusted developers? Can we utilize SSH certificate or connection?						
10	Security	ADAS	Data integrity of off board data sources	Advanced Driver Assistance System (ADAS) Controller accepts input from authorized external source(s)		Kevin Gavigan		(JH) Usually, this is done by signing on data. JSON web token and the signing mechanism could be a solution. (KG 4-Aug-15): In order for input to be authorised, identity of sender (at least) must be securely established.			<a href="https://www.w3.org/auto/security/wiki/Use_Cases#Use_Case:_Advanced_Driver_Assistance_System_28ADAS_29_Controller_accepts_input_from_authorized_external_source.28s.29">https://www.w3.org/auto/security/wiki/Use_Cases#Use_Case:_Advanced_Driver_Assistance_System_28ADAS_29_Controller_accepts_input_from_authorized_external_source.28s.29</a>			
11	Security	ADAS	Safety critical interfaces for ADAS	Advanced Driver Assistance System (ADAS) Controller sets safety critical controls when driving vehicle		Kevin Gavigan		(JH) Controlling the driving system from webapps is too challenging at this moment. (KG 4-Aug-15) Prototype apps are being created to control vehicles remotely, see e.g. <a href="http://www.landrover.com/experiences/news/jlr-remote-control-range-rover-sport.html">http://www.landrover.com/experiences/news/jlr-remote-control-range-rover-sport.html</a>			<a href="https://www.w3.org/auto/security/wiki/Use_Cases#Use_Case:_Advanced_Driver_Assistance_System_28ADAS_29_Controller_sets_safety_critical_controls_when_driving_vehicle">https://www.w3.org/auto/security/wiki/Use_Cases#Use_Case:_Advanced_Driver_Assistance_System_28ADAS_29_Controller_sets_safety_critical_controls_when_driving_vehicle</a>			
12	Both	Sharing	Personal journey sharing privacy	Driver and/or passenger(s) in car want to share journey with virtual passenger(s) that are not in car		Kevin Gavigan		(JH) Application layer topic. KG6 (4-Aug-15). This has both security and privacy aspects. Need to mutually authenticate before two way communication can be authorised and need to strongly encrypt communication to ensure privacy. Also, the implementation needs avoid storing/caching/logging data where a hacker could access it later.			<a href="https://www.w3.org/auto/security/wiki/Use_Cases#Use_Case:_Driver_and_2for_passenger.28s.29_in_car_want_to_share_journey_with_virtual_passenger.28s.29_that_are_not_in_car">https://www.w3.org/auto/security/wiki/Use_Cases#Use_Case:_Driver_and_2for_passenger.28s.29_in_car_want_to_share_journey_with_virtual_passenger.28s.29_that_are_not_in_car</a>			
13	Privacy	Sharing Regulation	Regulated journey sharing privacy	Required/regulated data sharing with municipal, state, federal, government entities		Ted Guild		(JH) Should the data collector take this into account? If so, this is a serverside topic.				probe data,		
14	Privacy	Sharing	Personal/regulated journey sharing privacy	Vehicle owner/driver/passenger sharing with individual parties commercial or personal	6,12	Ted Guild		(AC) How does this differ from 12 and 13?						
15	Privacy	Do Not Track	"Do Not Track" setting logs no data	When I turn DO-NO-TRACK on, I expect any of my activities are not monitored nor recorded.		5 Junichi								

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16	Security	HVAC Control	HVAC integration with IVI	IVI system shows the status of various climate control equipments as GUI and lets a user control it via touch screen. (Even set API is not recommended)	42	Data Spec 12.1.6		(JH) For 'set' functionality, we have 2 options: (1) Forbid completely, (2) Allow for HVAC or so, (2) seems very challenging at this moment and I would say (1)						
17	Security	Remote Control	Remote checking and control of vehicle windows	A user uses his smart devices to remotely check whether side windows of his parked car are closed or not, and to send a request to the car for closing it if opened.	46	Data Spec 12.1.6		(JH) Required features are (1) waking up car (2) contacting with app on the car and (3) closing the door. (1) is out of scope, (2) might be an application layer topic. Perhaps out of scope.						
18	Security	Remote Control	Remote starting and heating	A user uses his smart devices to start his car remotely, and turns heaters on to warm up the car inside before getting in the car.	26	Data Spec 12.1.6		(JH) See 17.						
19	Privacy	Data Gathering	Crowd sourcing weather information	If users agree to provide vehicle information to the weather station, many cars can be used to get weather information such as amounts of rain and ambient temperatures.		Data Spec 12.1.6		RainSensor				Non-sensitive		
20	Other	ADAS Notification	Lane departure integration with IVI	IVI warns when the vehicle goes on another lane (Lane departure warning function)		Data Spec 12.1.7		laneDepartureDetection						
21	Privacy	Emergency	Accident testimony recording	IVI records the scene before and after an accident (for insurance or testimony)		Data Spec 12.1.7		(JH) Perhaps, Application layer topic.						
22	Other	ADAS	IVI night vision	IVI improves vision in the dark		Data Spec 12.1.7		(JH) Is it feasible by the current spec?						
23	Privacy	Logging	Driving events log for personal use	Driver would like to see log of ADAS/driving events				(JH) Perhaps, Application layer topic.						
24	Privacy	Logging	Driving events log for third party use	3rd party would like to see log of driving events				(JH) Perhaps, Application layer topic.	At a maintenance?					
25	Security	Remote Control	Remote unlocking	Driver would like to remotely lock/unlock vehicle.	2 and 17			(JH) To be merged with 17	In proximity?					
26	Security	Remote Control	Remote starting and heating	Driver would like to remotely start vehicle and turn on/set heat or air conditioner	18			(JH) To be merged with 18						
27	Privacy	Owner's management	Subscription to remote vehicle health monitoring	Vehicle owner subscribes to 3rd party monitoring of vehicle data and trouble codes to ensure vehicle is running in good health				(JH) Do we need a such as admin mode?					No problem.	
28	Security	Remote Control	Remote seat settings	Driver would like to configure seat settings remotely.	34									
29	Both	Data Access	Context dependant data availability	Automaker has access to all data elements including elements such as those relating to vehicle quality or operating data whereas application developer only has access to subset.	3			(JH) How about providing different results for availableFor*() method depending on the origin of app? (AC) Merge with 8?					User?	
30	Security	Regulation	Third party vehicle interaction effect on regulations	Automaker has concerns around impact compliance with emissions regulations due to 3rd party access to interact with vehicle systems.				(JH) Depends on which 'set' functionalities we will expose to apps						
31	Security	IVI as a service?	Data sharing via off-board	Automaker would only like to allow API to access data from their remote servers not directly from car.				(JH) Does it mean they don't need client side APIs?						
32	Security	Remote Control	Remote settings through off-board only	Automaker only wants to allow remote settings via cloud not by direct connection.				(JH) Perhaps, Application layer topic.						
33	Privacy	user recognition & retention limitation	Tailored data settings for multiple users	The car can have multiple users/owners. Automaker needs to know which vehicle data belongs to whom, to provide notice and choice to users/owners	35, 36	Hlra		(JH) Perhaps, Application layer topic. Is this feasible?					Passenger's privacy	
34	Privacy	Driving	Preemptive driver recognition and settings	Ted a tall driver of the family car approaches the car and the seat adjusts to his settings	28	Ted								
35	Privacy	Identity	Driver recognition	Current driver is identified.	33			(JH) I think application is responsible and API doesn't need to support this.						
36	Privacy	Identity	Passenger recognition	Family is travelling in vehicle and all passengers are identified.	33			Could be used for group oriented recommendation systems, individual screen showing movie preferences etc. (JH) I think application is responsible and API doesn't need to support this.						
37	Other	Location Based	Location based settings	Vehicle travels from one country (e.g. US) to another (e.g. Canada), settings change to metric.		Paul		(JH) Perhaps, Application layer topic.						
38	Security	Payment	Automated toll payment	Driving across toll bridge the responsible party is identified and payment from their account is made. Could apply to any 3rd party vendor.				(JH) Perhaps, Application layer topic.						
39	Other	Notification Location Based	Contextual user recommendations	Customer is alerted to low tire pressure, repair locations are recommended.				(JH) Perhaps, Application layer topic.						
40	Privacy	Emergency	Driver medical records in emergency	Emergency responder is called to accident, vehicle reports who is in the car and can report if there are existing medical conditions				(JH) Checking medical condition seems very hard.					PSAP? (Euro?)	
41	Privacy	Emergency	Airbag reporting in emergency	Emergency responder is called to accident, vehicle reports where airbags are in car.										
42	Security		HVAC integration with IVI	Customer has the ability to set HVAC controls.	16	Paul								
43	Security	Emergency	Airbag deployment recording	Airbag has deployed the event is captured.				(JH) It is critical and should be isolated from infotainment or other apps.						

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44	Privacy	Monitoring	Subscription to battery monitoring	Diagnostics application is monitoring battery voltage for the event where it drops below a specific voltage. Event monitoring.				Code samples/examples for how to use subscribe/unsubscribe to make this happen.					non-sensitive	
45	Security	Self Control	Weather monitoring for window control	Service monitors weather and checks if windows are open, they are closed.				(JH) Is it feasible? To realize this, some service must be awake even if car is parked.						
46	Security	Remote Control	Remote checking and control of vehicle windows	Remotely close windows, sunroof, etc...	17			(JH) It is better to list up what we want to control remotely. What we saw so far are - windows, sunroof, door lock - seat setting - air conditioner						
47	Other	Notification	Park brake remote alert	Driver/Owner is alerted that parking brake is not set		Qing An								
48	Security	Notification	Vehicle intrusion remote alerts	Driver/Owner is alerted that that intrusion in the vehicle		Qing An							out of scope	
49	Security	API Call	Multiple sources for set API	One "Set" API is only allowed to accept input from one source at one moment		Qing An							Further discussion	
50	Security	Remote Access	Inhibit remote control whilst driving	During the driving, prevent other users from login and controlling the vehicle		Qing An								
51	Privacy	Application Manage	Application logging security	An application can only access the log created by itself		Qing An								
52	Both	Vehicle to Home integration	Vehicle cameras and sensors integrate with home alarm system	Sensors and cameras in the car are included in the set of sensors providing input to customer (and e.g. neighbours) home security alarm. To do this the vehicle and home alarm system will need to mutually authenticate so that home alarm trusts inputs and customer's vehicle only provides input to alarm system(s) selected by the customer. Normally just their own system, but e.g. in future, a neighbourhood watch group could agree to share external sensor / camera data		Kevin Gavigan								
53	Security	Vehicle to Home integration	Vehicle media system seamlessly shares content with customers cloud storage, home media system/server and devices	Media (including photos, videos, music (subject to DRM licencing)) is seamlessly shared between all of the user's devices including their car and with offline cloud storage e.g User's Dropbox, OneDrive etc account. User can seamlessly view and play their content on any device including their car. Requires that each device or service that the user has content stored on can securely share the user's content. To do this, either the device or the identity of the user logged in on the device or service will need to be verified before content can safely and securely be shared between devices. If content is to be seamlessly downloaded from cloud storage, may need to obtain and use security token (e.g. OAuth2) to access user's content		Kevin Gavigan								
54	Security	Vehicle to Home integration	Vehicle informed by fridge in customer's home that customer needs to buy e.g. milk on journey home	Vehicle needs to trust that the input comes from the fridge in the customer's home and needs to establish identity of customer's fridge in order to trust input. Fridge should only communicate with customer's vehicle (and any other parties authorised by the customer) in part to protect customer's privacy.		Kevin Gavigan							wot	
55	Security	Vehicle to infrastructure (V2I, V2X)	Vehicle provides data about potholes etc to other vehicles and to body responsible for maintaining roads	Vehicle suspension sensors, front facing cameras etc can detect damage to road surface (potholes, broken manholes, broken drain covers etc) and communicate location and details of damage to other vehicles and to the local authority responsible for repairing roads. Vehicle needs to prove its identity to other vehicles and to local authority service so that input can be trusted.		Kevin Gavigan							Signed Data API	
56	Privacy	Application Manage	IVI apps for multi-user	IVI apps such as recommendation, reservation, shopping, pay-per-use service, etc., should operate in a personal basis, which means that apps and its API have to be changed by driver/user.		Hira								
57	Privacy	Probe data (Location)	Protection of Sensitive Location	Consumer has some locations he/she does not want other people to know. (Home, religious site, specialized hospital, secret 3rd place, etc.)		Hira								
58	Privacy	Data Sharing	User's right of choice	Consumer has less right of choice for data elements, rectification and erasure of data.		Hira								
59	Privacy	Driving Context	Individual recognition	Individual can be presumed/recognized by driving context, seat arrangement, music selection etc, in registered users.		Hira			(JH) Shouldn't it?					
60	Both	ID Theft	Protection of Sensitive Information	E-commerce from the dashboard for drivers' purchases of fast food, gas etc. has been available. Cars become hackers' and rogue mechanics' target for identity theft (credit card numbers, home address, e-mail information and all the other personal details).		Hira								