ID	Topic	Use Case	Description	EBS Vehicle (Board computer = bc)	EBS Control Center	DFI NDOV	Chance	Impact
UC001	*Start up*	Sign-on for a depot trip on a tour; trip goes from the depot to a stop on the main route; Pull-out trip (Ausrückfahrt)	The trip starts in the depot; the driver enters the tour number on the MMI; a sign-on message is triggered and sent to EBS; the driver leaves the depot; the terminal stop of the depot trip is a normal stop on the main route (the stop is not neccessarily equal to the starting/ending stop on the main route)	Driver is **on time**; on MMI, the driver selects: Line number, run number, destination code (it's always 91 for a depot trip); the bc determines the first trip on the tour (depot trip) based on the information (finds only one depot trip which fits in the given time frame); the terminal stop of a depot trip is selected automatically by the board computer; the bc sends the UKR_SIGN_IN telegram to EBS including the trip number, departure code, destination code; if the sign-on is delayed ≤ 1 hour, the bc doesn't find the depot trip; so it looks 1 hour ahead and 1 hour back, or looks in the future; > 1 hour delay see special use case; EBS confirms the trip within 5s -> DATCOM gets the ack message; driver presses OK, counter starts for leaving the depot; the deviation time is displayed in minutes; 50 m in front the starting stop on the main route, the following trip is selected automatically	Before the sign-in, only the scheduled information (trip information) is available; after EBS receives the UKR_Sign_In message, the status of the first trip changes to "SignedOn"; the status of the following trips also changes ("BlockSignedOn"); after leaving the depot, the status of the trip changes to "InProgress". ToDo: Check on Line Band; GVB prefers that the vehicle is shown on the Line Band at the actual starting point instead of the beginning of the Line Band	KV-message?	happens 450 times (of total 450 tours) on the day	
UC002	*Start up*	Sign-in for a trip from depot to endpoint (standard case)	see UC001 Route runs from depot to endpoint					
UC003	*Start up*	Sign-on for a stand trip (parking space trip)	same geografical situation but there are two different tours and run numbers (morning and evening rush hour); sign-in procedure the same: drivers enters a new tour; bc triggers the KV6 message	**Sign-on is on time**: Sign-on for depot trip (trip length is approx. 2m); bc activates the trip but notices that the vehicle is already at the terminal stop of the actual trip and therefore it signs in immediately for the following trip automatically; the bc sends the UKR_Sign_In message to EBS; sign-in processes are the same as for UC001/UC002 but in a shorter time frame; Note: very short test cases are required	The trip is displayed as a depot trip and shortly after displayed as a passenger trip; after sign-in, the vehicle is displayed at the beginning of the Line Band and jumps directly to the starting point when the vehicle starts its trip	KV6-message after sign-in for depot trip? KV6-message for following trip? KV-DELAY message?		
UC003a	*Start up*	Sign-on is too early: the sign-on is earlier than the departure time of previous trip						
UC003b	*Start up*	Ping-pong-effect between RIS and EBS	An early sign-on leads to a ping-pong-effect between RIS and EBS during very short trips (such as depot and parking space trips)					
UC004	*Start up*	Vehicle drives without sign-on		Assumption: Vehicle sends GPS-messages only		any telegrams?		
UC005	*Start up*	Sign-on of a training vehicle	Sign-on for line number 50 (reserved for training vehicle); there is no sign in for a trip because trips don't exist for those lines; line 50 is an "illegal" line vehicle only sends ist GPS position;	Assumption: sign-on for line 50; vehicle sends GPS-messages	Vehicle is displayed on GIS map without vehicle number but the line number should be displayed for distinguishing the vehicles?	any telegrams?		
UC006	*Start up (Exception)*	Sign-on for a nonexistent line	special ranges for lines are used (such as 48 for maintenance)					
UC007	*Start up*	Sign-on of a vehicle for a trip from depot to depot: empty trip without passengers (Umsetzfahrt)	Sign-on for a predefined line number (similar to the training trip)	sign-on for line 40; vehicle sends GPS-messages only	Vehicle is displayed on GIS map without vehicle number but the line number should be displayed for purpose of distinguishing the vehicles?	any telegrams?		
UC008	*Start up (Exception)*	Sign-on for a trip while the vehicle is still in the depot (there is no depot trip at all)	Vehicle is in the depot; sign-on for the depot trip is too late; driver enters the tour number but the 901 for a depot trip is not available anymore; vehicle wants to sign on for a trip on main route; destination code either for the starting or ending point; the bc suggests trips related to the actual time	Vehicle sends the sign-in for the trip and sends GPS-position as long as it's moving (on the way to the main route); when the vehicle reaches the destination point on the main route, the trip is considered as a "normal" passenger trip	In the Line Band, after the sign-on the vehicle is displayed at the beginning of the Line Band; before the start of the trip from the starting/ending point, the vehicle is displayed off-route	vehicle displays expected time until it reaches the stop on the main route; if the starting point is not accepted, it sends an error code	happens between 5 and 10 times on the day	Passengers are not fully informed; the dispatcher should know what's going on; can the dispatcher put the vehicle on the starting position?
UC009	*Start up (Exception)*	Sign-on is too early; means: the sign-on for the following (partial) trip is later than the departure time of the previous (depot) trip	Sign-on for depot trip is too early but within a (1) hour; trip starts with a depot trip;	bc calculates the arrival time plus the departure time of the following partial trip	PSI recommends a forecast (overstepping point)			consequences: the too early sign-on for the partial trip is a problem for the passenger information because the departure time is decreased automatically
UC010	*Start up (Exception)*	Sign-on for an endpoint-buffer trip is way too early	see the case before, except this trip is even shorter than the depot trip					
UC011	*Start up (Exception)*	Sign-on is way too early	The sign-on for the following (partial) trip is earlier than the departure time of the previous (depot) trip	The early sign-on results in a ping-pong-effect between RIS and EBS; sign-on for the following (partial) trip is earlier than the departure time of the previous (depot) trip (reason: the (depot) trip before is too short)				
UC012	*Start up (Exception)*	Sign-on for (depot/endpoint-buffer) trip is too late	The sign-on is later than a hour after the scheduled departure time				happens between 5-10 times the day	
UC013	*Start up (Exception)*	Schedule has no depot trip (there is no sign-on for depot trip)	Vehicle leaves the depot or endpoint-buffer		How can the dispatcher recognize the situation of an open depot trips? GVB prefers that open depot trips are displayed in Kitchen Screen; PSI thinks about it: runs with open depot trips could be displayed below the Kitchen Screen Does the dispatcher contacts the driver?			
UC014	*Start up (Exception)*	Sign-on for the following trip on the tour without sign-on for a depot trip						
UC015	*Start up (Exception)*	The actual route of the vehicle differs from the planned route		Vehicle sends GPS information only	Vehicle is displayed "off-route" and "on depot trip" in all graphical views; problem with passenger information (expected time of arrival is unknown)			
UC016	*Start up (Exception)*	Sign-on for a trip with correct line number and destination but wrong run number		Bc provides an invalid run number; the trip of this run doesn't exist in schedule	EBS rejects the trip; EBS responses with trip "0"; driver should start over again			
UC017	*Start up (Exception)*	Sign-on for a trip with correct line and run number but wrong destination						
UC018	*En route*	Sign-on for the next trip		Automatic process				
UC019	*En route*	Trip sign-out		Automatic sign out for the previous trip when sign-on for the following trip on the tour				

UC020	*En route*	Trips with separated exit and entrance for the passengers (Fahrtübergang)	Departure stop is different to arrival stop			Problem with passenger information
UC021	*En route*	Trip passes overstepping (interchange) point (Umsteigepunkt) (Overstaphaltes)	Driver has not to wait for its scheduled departure time; (inofficial timing stop)		of no importance to EBS	
UC022	*En route*	Trip passes intersection point (Kreuzungspunkt) (Knooppunthaltes)	Driver has to wait for its scheduled departure time; (official timing stop)	DFI in the vehicle displays all the connection points	of no importance to EBS	
UC023	*En route*	Inter-line trips (wechselnde Linien auf einer Fahrt)	Trip transition between different lines in the same run; problems for passenger information		combination of different lines in one view (procedure has to be described in user's manual)	
UC024	*En route*	At the endpoint: Track change (Gleiswechsel)	TAS functionality; actual situation at CS: one stop but 4 tracks where the vehicle can go; Perron indicator displays the platform for one line; procedure should be transferred to other endpoints		see TAS use cases; no message transfer between vehicle and EBS	
UC025		Shortening of a trip; new start/endpoint is not part of the original trip	A trip is shortened; the new start/endpoint is not part of the trip			it's an existing problem at CS (east/west): two station codes
UC026	*En route*	Empty trips on one route without passengers during the rush hour	Concerns the rush hour in the morning to CS and in the evening back to the outer endpoints; vehicle on the way back to the outer endpoints/CS is empty; different routes are used for the way to CS and back from CS; two different lines		How to visualize empty trips in Line Bands, and graphical views in general? In the Kitchen Screen, empty trips could be displayed below with a special sign? Problem: display ≥ main routes for one line; possible by an integrated line selection area? Would it be helpful to use STRH information to figure out which vehicles are on the main route? Problem now: selection is based on number of stops	should be applied to the tram too
UC027	*En route*	Endpoint-to-endpoint trip without passengers and passenger information (empty trips) (Umsetzfahrten)	trip goes from one endpoint on the 1st line to another endpoint on the 2nd line: connection trip (empty trip); there are only 2 stops, the vehicles are out of service		see the case above another type of trips is necessary to distinguish the vehicles, especially in the graphical views; how are empty trips displayed in Line Band?	
UC028	*En route*	Needle routes	route in the 1st direction ends at the endpoint - vehicle turns back and starts from the same endpoint;	Bc can't handle it; problem with the box which detects the vehicle's direction		
UC029	*En route*	Circle routes	starts and ends at different nodes; same GPS-area			
UC030	*En route*	School lines	see needle routes; only two stops on the line; same implication as empty trips have; special school lines for getting the pupils; afterwards the vehicle gets another line number (regular trip)			
UC031	*En route*	Replacement trips (Ersatzfahrzeug)	e.g. line 26 is an isolated line; goes back and forth; the only connection is CS (endpoint); has it's own depot; a fixed number of trams running on this line 26	Vehicle related issue	copy of this trip -> replacement trip (trip on demand); solution for EBS2.1 will be discussed later; maybe sign-on for a nonexistent line and creating a trip for this line	
UC032	*En route*	Add a new run (Verstärkerfahrt)	In times where more passengers are than normal, some more vehicles are sent to the endpoints	Which run number would be used in MELMAC? Sign-on for the new run which is not known in MELMAC; so the bc searches for the 1. run number and destination; but the wrong run number is provided; the telegram with the wrong run number is sent to EBS	Dispatcher chooses a number of trips in EBS and put them together to a new run after receiving the telegram the dispatcher has to correlate the sent run number, trip and destination to the newly added run	
UC033	*En route*	delay < recovery time				effects the following trips;
UC034	*En route*	delay > recovery time		assumption: bc creates a delay message		
UC035	*En route*	delay < trip driving time (the whole circle)				
UC036	*En route*	delay > trip driving time (the whole circle)			How can this case to be visualized in the Line Band? How does the line (associated with the vehicle and indicating ist position on the Line Band) display the scheduled position of the vehicle (Does the line reaches out to the return route?)	
UC037	*En route*	delay < driving time of the trip (half the circle)				
UC038	*En route*	delay > driving time of the trip (half the circle)				
UC039	*En route*	PIDs don't show the delayed trips if there are too less lines on the display because the departured trips pushes away the delayed trips	it's a problem with the order rules on the passenger information		no EBS issue; only the KV6	
UC040	*En route*	Cancellation of a trip without applying regularity			dispatcher has to remove one or more trips; the removed trips are displayed as "open"; GVB will decide about: "Remove a trip" instead of "Remove a vehicle"	
UC041	*En route*	Cancellation of a trip with applied regularity to 2 or 4 vehicles		vehicle is informed about new regularity intervall via KV17 message; KV17 sends negative values	dispatcher changes two or four surrounding trips; regularity is used to apply for lines with high frequency otherwise it would lead to confusion for passengers; departure times of the respective trips are moved ahead (-x min); for now no negative values are allowed in the old EBS; should be allowed in EBS2.1	
UC042	*En route*	Cancellation of a trip with regularity applied to an entire line			see above: GVB states that the regularity function is not used; nobody uses the function "Apply regularity on a entire line"; GVB thinks about to delete this function GVB wants rather reliable, better information than solutions for the problem caused by a traffic jam for incident; dispatcher needs to know exactly the position of the vehicle; the accuracy of the data depends on the messages sent by the vehicle: GPS positions are only displayed on GIS; Line Band shows logical position of the vehicle	
UC043	*En route*	Change the bus number in case of an irregularity on a route; Renumbering the vehicles	Renumbering of the run numbers of the busses at the endpoint; busses overtake the run numbers of each other	the change of the order happens by sign-on/sign-out	How to realize renumbering in EBS? Maybe, text messages to the driver? But, actually, it's up to the dipatcher to deal with this case; dispatcher can shorten the trip; dispatcher needs a common procedure how to deal with it	

UC044	*En route*	Exchange vehicles without cancellation the trip (Verstärkerfahrt)	Exchange happens during the trip; new vehicle is sent which replaces the broken vehicle (takes usually 15 min)	the broken vehicle signs out; the other vehicle signs on for the same trip but the trip starts from the beginning and not from the actual stop, vehicle is off-route; that's unpleasant; this causes problems with passenger information too it's the same situation as it is for a depot route to partial route	Alternative: the dispatcher can undertake a manual trip assignment and defines the starting point of the trip but it's often not the right one; Should the MTA-dialogue extended for more possibilities such as choosing the actual starting point based on the GPS position of the vehicle to figure out the location of the vehicle (after sign-on); a solution is wanted without influence the PIDs; GVB: solution is wanted by using existing function; replacing function should be happen automatically		happens 3 times the day
UC045	*En route*	Shortening of 1 trip	message about shortening will sent to the respective vehicle;	bc accepts the shortening if the new starting/ending point is an existing stop on the route;	it's possible at the end or beginning of a trip if the trip hasn't started yet		
UC046	*En route*	Shortening of trips with a different endpoint (are possible turning points) (these endpoints are not part on the line) it's an issue only for trams	Only at specific points a trip can be shortened; those are points, where the tram can turn around; for busses it doesn't matter where to shorten a trip; it's only important for trams; the network for trams only allows a few points where a shortening of a trip is possible	Vehicle communication is limited; drivers are informed on the new endpoint by phone call; the new correct route could be sent to the vehicle	it's complicated to find out the fitting points but GVB states that they have not to be found automatically by the system; GVB likes to get : reduce all these options of endpoints in the combo box to a certain number of predefined endpoints on one line; predefined by GVB; PSI suggests: special remarks next to the respective endpoints in the combo box: information for the dispatcher about those stops where a shortening is possible; to those stops an endpoint could be assigned where the vehicle can drive		
UC047	*En route*	Shortening of trips applied to all vehicles on a line	see UC045				
UC048	*En route*	Shortening of trips applied to all vehicles on a line with different endpoints (means, the stops are not part on the line) (is an issue of trams)	see UC046				
UC049	*En route*	Bring a vehicle back on time	the dispatcher informs the driver to go to a certain place where the vehicle can wait until a certain time point and turn around; there are 6 or 7 places for trams; more for busses; similar to shortening function		kind of shortening; vehicle waits at a stop where it would be without a delay; to test: the next trip should get the same departure time as it would have before the delay happened		
UC050	*En route*	Detour without known route			part of the scenarios		
UC051	*En route*	Detour with known route			scenario is not part of the project		
UC052	*En route*	Defective vehicles	defective communication module (GPRS)	What is the vehicle doing?			
UC053	*En route*	Defective vehicles	antenna is broken	What is the vehicle doing?			
UC054	*En route*	Bc has an old schedule					
UC055	*Finishing*	Pull-in trip	Vehicle uses depot routes; when the last stop is reached on a route, the route changes to depot route (next trip on a tour is the depot trip)	The driver parks the vehicle on the depot; a half hour later, the radio system and, after that, the RIS shut down and the bc sends a trip sign-out automatically			
UC056	*Finishing*	Trip to parking place	very short trip from the last stop to the parking lot				
UC057	*Finishing*	Vehicle turns back to the depot	after reaching the depot, the driver changes the track and line number to 64 before entering the depot; procedure causes problems with the radio system		not an issue of EBS; a sign-out to EBS is not sent because the radio system signs over to the another line number		
UC058	*Finishing*	Normal trip sign-out during operation	bc signs out for a trip when the line has to be changed		EBS gets a sign-out message		
UC059	*Finishing*	vehicle signs out for a trip and continous driving					
	TAS scenarios		PSI: a list of use cases is required; part of the next workshop				
	Large incidents (scenarios)	such as power failure, break down of a bridge	PSI: a list of use cases is required				