



FEDERATION INTERNATIONALE DE L'AUTOMOBILE

FIA SMART Rally Tracking System Evaluation Criteria

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1 Introduction

1.1 Overview

National Sporting Authorities (ASNs) use various tracking systems within their National and Local Rally Series. Among these systems, there are more and more SMART Rally Tracking Systems available for use.

The objective of the FIA is to support the ASNs in choosing tracking system solutions which are compliant with the needs of the Rally discipline and the specificities of region of use, and improve safety.

In this context, the FIA intends to establish an evaluation list of SMART Rally Tracking Systems, and to share it with the ASNs (the "SMART project"). Selection of a tracking system solution for a National or Local Rally Series will however remain with the relevant ASNs.

A SMART Rally Tracking System is a low-cost rally tracking system designed to run on competitors smartphones, to enable rapid growth in the amount of rallies being tracked worldwide. Targeting a low-cost solution, even though it may not work on all special stages at all rallies, means that the most useful safety features provided by a rally tracking system can be utilised by all levels of rallying, from the club level of the sport upwards.

In general, SMART systems contain two applications: the Event Officials application, and the Competitors application.

The Event Officials application allows the organiser to create and set up their event, and when the rally is live, it allows for live monitoring of the competitors locations and for safety features.

The Competitors application allows them to view/accept event invites, sends tracking data to the Event Officials application, and provides a simple UI for when they are competing.

Only one device & application should be used per vehicle for tracking purposes.

[This document outlines the criteria the FIA will use when evaluating SMART systems. Application developers should use this document in conjunction with the "FIA SMART Rally Tracking System Software Specification Guidance" document, available on the FIA website, when designing their application.](#)

1.2 Assumptions, Risks, Issues & Dependencies

- It is assumed that every rally competitor will own or have available a smartphone with a cellular connection & GPS sensor, running either iOS or Android, and that they will be able to download and install the tracking application
- It is assumed that event organisers will be able to create and edit their event online, without significant training other than the documentation/tutorials provided
- It is assumed that event organisers will have internet access in race control and can open a web application (website) in a modern web browser
- It is assumed that event organisers will have a way to contact each competitor; either through a phone number or email address, in order to send them a digital invite for the application
- It is assumed that competitors will nominate only one device per vehicle, and that only one device will be used for tracking purposes in each vehicle
- Compared to a traditional rally tracking system (powered and charged from the vehicle's power system) it is a risk to allow competitors control over the power status of the system.

They may not have power leads available in the car to keep their device charged throughout the rally, or may forget to charge it overnight

- Similarly to the above point, it is a risk to allow competitors control over the tracking system at all. They may forget their device, forget to activate the application, suffer issues installing and running the application, or a myriad of other issues
- It is a risk to install any loose object in the cockpit of a rally car which could come loose in an impact
- Lack of adequate cellular reception (covering all the special stage & liaison sections) on a lot of rallies will be an issue

1.3 Out of Scope

This section lists all those feasible features for rally tracking systems which have been excluded from the scope of the SMART project.

Each feature has been omitted in order to lessen the overall system cost to a degree where it is financially feasible for use in club level events.

- Tracking outside of cellular network areas
- Tracking delivered on any network other than cellular
- Dedicated tracking device units
- Tracking device rental
- Comprehensive user interface for competitors
- Rally computer functionality i.e. trip meters
- Speed monitoring features; i.e. quiet zones, speed restriction zones
- Logging of tracking data for Stewards/Coronial inquests
- Vehicle-to-Vehicle safety features

2 Evaluation Process

After a provider has registered their interest with the FIA to be evaluated as a SMART Rally Tracking System provider, the FIA will conduct an evaluation of their solution, assessing the proposed system on the basis of the evaluation criteria listed in this document. Extra features or capabilities will also be taken into account.

An overall rating will be generated for each solution, and as each solution is assessed, the evaluation list will be updated to show the ratings of each solution.

3 Evaluation Criteria

3.1 Management

Event organisers should be able to apply and set up an account easily

The process for an event organiser to register an account should be user-friendly. After initial creation, any extra account setup tasks should also be user-friendly.

Event organisers can create accounts for race control access

Event organisers should be able to create accounts for their team. The account system should be role based, including a role for only viewing tracking access, and a role for the Clerk of the Course/Safety Officer, which should be the only role with the access to send Red Flags.

Event organisers can manage events (CRUD events/polylines/POI's/entries)

Event organisers should be able to easily manage their events, including creating, editing and deleting events. Events should have the following information:

- Event Name
- Location
- Country
- Start Date (inclusive)
- Finish Date (inclusive)

Inside each event, they should be able to create, edit and delete the stage polylines, points of interest and entries for the event. Being able to upload an Excel spreadsheet of entries would be useful. Entries should have the following information:

- Car number/name
- Type of vehicle (Racing/Course Car)
- Driver name
- Driver country (optional)
- Driver phone number
- Driver email
- Device identifier (phone number)
- Codriver name (optional)
- Codriver country (optional)
- Codriver phone number (optional)
- Codriver email (optional)
- Invite status (not sent/sent with no response/accepted/rejected)

Event organisers can invite competitors easily

The process for an event organiser to invite all the competitors in the entry list should be easy and intuitive. The invite process should use a unique identifier that is clearly known to the competitor (email address/phone number etc). Only one device should be used per vehicle. After sending the invites, the invite status of the competitor should be easy to view.

3.2 Competitors

Competitors can sign up to the service/download applications easily

Competitors should be able to easily sign up the service after downloading the appropriate mobile application. It should be clear to the competitor what their unique identifier is (email address/phone number etc) so that they can be sure event invites will reach them.

Competitors can receive/accept/reject event invitations easily

Competitors should be able to easily see their event invitations and to act on them. They should be able to see any pending invites they have not yet actioned, and they should be able to change their mind about an event invitation they have previously acted on.

Competitors can activate tracking mode easily

After accepting an invite for an event, and while the event is live, the competitor should be able to easily activate the tracking mode on the application. A visible alert to warn a competitor when they should be tracking (accepted invitation, event is live, tracking not enabled) would be useful.

Competitors can see no extra information

Competitors should never be able to see any extra information about the event – for example, the stage polylines. Only basic event information should be shown to the competitor.

3.3 Tracking

Interactive map with standard layers

The tracking map should be interactive and display standard vector & satellite layers to the user.

Tracking user interface easy to understand

The tracking user interface should be intuitive and quick to learn. The different information shown to the user should be clear and concise. Care should be taken to avoid screen clutter.

Tracking performance

The tracking of devices should be performant enough to allow adequate safety control of the race. Message rates, latencies and user interface refresh rates will all be taken into account when assessing this criteria. Note that tracking should be robust from the mobile application; regardless of user input (unless they choose to exit the tracking mode), the application should continue sending tracking information, even if the device is in standby mode. However it is understood that mobile device reception is completely outside of developer control.

Tracking UI differentiates vehicles based on safety alert/lost transmission

The tracking user interface should clearly differentiate between vehicles based on their safety alert status and whether or not they are currently transmitting tracking updates. Neutral colours should be used for normal conditions i.e. racing, lost transmission etc, while bright colours should be used for safety alerts. See the table below for recommended colours for situations:

<i>Situation</i>	<i>Colours</i>	<i>Background RGB</i>	<i>Background Hex</i>	<i>Text RGB</i>	<i>Text Hex</i>
<i>On Transport*</i>	TEXT	242,242,242	#F2F2F2	0,0,0	#000000
<i>On Stage, Moving</i>	TEXT	20,20,20	#141414	255,255,255	#FFFFFF
<i>On Stage, Stopped</i>	TEXT	252,232,10	#FCE80A	0,0,0	#000000
<i>OK Pressed</i>	TEXT	9,234,35	#09EA23	0,0,0	#000000
<i>SOS Pressed</i>	TEXT	232,27,02	#E81B00	255,255,255	#FFFFFF
<i>Lost Connection</i>	TEXT	53,53,53	#353535	170,170,170	#AAAAAA

**The ability to automatically distinguish which vehicles are on transport and which are on stage may not be present in all solutions*

3.4 Safety Alerts

All safety alerts should be implemented

The following lists the safety alerts of the system that should be implemented:

- OK
 - OK Road Clear
 - OK Road Blocked
- SOS
 - SOS Fire
 - SOS Medical

Both the OK and SOS states can be refined by a further button press to send more information to race control.

Safety alert is transmitted reliably

All safety alerts should be transmitted in a reliable fashion, the mobile application should make allowances for the unreliability of cellular networks.

Safety alert feedback to competitor

Whilst a safety alert is being transmitted, the mobile application's user interface should show the status of the transmission – that is, whether or not the information has been received by race control, or it is unable to send for some reason (poor reception etc).

Safety alerts usability

The process of activating/deactivating a safety alert should be obvious and intuitive to the mobile application user. Bright colours with high contrast text should be used to highlight the available options. See the table below for recommended colours for options:

<i>Option</i>	<i>Colours</i>	<i>Background RGB</i>	<i>Background Hex</i>	<i>Text RGB</i>	<i>Text Hex</i>
OK	TEXT	9,234,35	#09EA23	0,0,0	#000000
SOS	TEXT	232,27,02	#E81B00	255,255,255	#FFFFFF

SOS anti-mistake

The process of activating an SOS should contain an anti-mistake feature. Some possible options could be a long-press (3s or more) or pressing two different buttons.

SOS race control alarm (audible/visible)

The race control application should contain an audible and visible alarm when a new SOS is triggered.

3.5 Red Flag

Red flag can be received by competitors with alarm

The red flag should be able to be received by the mobile application, with a prominent visible and audible alarm. The recommended UI is a bright red background with white "RED FLAG" text.

Competitors should be able to acknowledge the red flag to silence the alarm.

Red flag can only be sent by Clerk of Course role

The red flag should only be able to be sent by a user signed into the race control application with the Clerk of the Course role.

Red flag activation process

The standard FIA red flag for rally stipulates that if a running stage needs to be stopped, a red flag should be shown to competitors who are currently racing on that stage at a distance less than the distance of the accident causing the stoppage. Only the FIA red flag procedure is described below; however ASN's may use different flagging procedures and may request different flagging functionality.

Activating a red flag in the race control application should be an easy and intuitive process. When a stage is red-flagged, only those cars behind the accident should be red flagged; and so the user

interface should allow for quickly and easily selecting a sub-set of cars or a section of the stage to send the flag to.

Red flag is transmitted reliably

The system should be designed to account for the transient nature of cellular communications; at the time of the red flag activation a particular device may be out of coverage, but may soon come back into coverage. The system should transmit the red flag in such a fashion that the device receives it as soon as it comes back into coverage.

3.6 Stage Polylines & Points of Interest

Easy to upload from standard formats

Stage polylines and points of interest (POI) should be easy to upload for event organisers in standard formats such as KML/KMZ. Preferably, the application would be optimised to accept KML files in the WRC format (see Appendix A).

Way to correct mistakes in-app (optional)

Stage polylines and POI's can often contain mistakes, or be far higher-fidelity than required for race control purposes. Optionally, the race control application would contain a function to allow organisers to edit the stage polylines and POI's after uploading.

3.7 Usability

Adequate help/tutorial available for mobile applications

The mobile application should contain adequate help and/or tutorials to allow users to understand how to use it in a short amount of time.

Adequate help/tutorial available for race control application

The race control application should make available help and/or tutorials to allow users to understand how to use it in a short amount of time.

Mobile application ease of use

The mobile application should follow modern usability practices to ensure that the user experience is as intuitive and quick to learn as possible.

Race control application ease of use

The race control application should follow modern usability practices to ensure that the user experience is as intuitive and quick to learn as possible.

3.8 Technical

Mobile applications should be performant and widely compatible

The mobile applications should be performant enough for purpose; there should not be any noticeable latency or excessive loading times. Note that as the intended audience covers a wide cross-section of society worldwide, the applications should be designed with maximum device capability in mind and acceptable performance even on mid-range older devices.

Race control application should be performant and widely compatible

The race control application should be performant enough for purpose; there should be any noticeable latency or excessive loading times. Note that as the intended audience covers a wide cross-section of society worldwide, the application should be designed with a large range of browser

compatibility in mind. The application should provide the same user experience on the latest version of the most popular browsers, including Google Chrome, Mozilla Firefox, Apple Safari, Microsoft Internet Explorer and Microsoft Edge. Note that there is no requirement for the race control application to function on mobile browsers.

Industry best practices for IAM

Industry best practices should be followed for identity and access management purposes.

3.9 Other

Regional Coverage

In order to reach the largest possible audience, as many regions as possible should be covered. Details about regional coverage will be collected for comparison purposes, however, no judgement will be made.

Pricing

The pricing model should be consistent and publicly accessible. Details about pricing will be collected for comparison purposes, however, no judgement will be made.

Tracking Visibility

The race control application may support public viewing of the tracking map, or it may be only visible to authenticated users. If the tracking map is visible to the public, sensitive information should never be shown to members of the public. This includes any information about safety alerts, and speeds of vehicles in transit between stages.

Note that some rally events are organised 'blind', and organisers may not want the public to know even basic information such as the event route before the event has started, or even while it is live.

Support

The amount and level of support offered to ASN's, event organisers and competitors is up to the provider to determine. It should be noted, however, that rally events take place mostly on weekends, and when issues arise, they need to be resolved quickly, or the safety of the event can be impacted.

Service Level Agreement

A service level agreement guarantees customers a certain percentage of uptime for the service they are purchasing. No system is perfect, and services can rarely run for extended periods of time without disruption. There is no requirement for a service level agreement, however if the provider wishes to offer one, details will be collected for comparison purposes.

Internationalisation

There is no requirement on any particular language support, however, in order to reach the largest possible audience, multiple language support is important. Details about language support and other internationalisation efforts will be collected for comparison purposes, however, no judgement will be made.

Regulation Compliance

Both the Event Officials application and the Competitors Application must be compliant with any and all applicable personal data protection laws and regulations. It is however specified that the FIA will not evaluate such compliance.

3.10 Other Features

Whilst no other features will be evaluated, there is nothing to prevent developers creating innovative new features on top of the basic tracking features described above. Details about other features will be collected for comparison purposes, however, no judgement will be made.

3.11 Other Systems

Other rally tracking systems which may be more advanced and suitable to higher standards of rallying than those targeted by the SMART project may be offered by the provider. ASN's and event organisers may be interested in those other systems, and so details about them will be collected for display purposes, however no judgement will be made.

4 Legal notice

Interested providers are made aware that this document – as well as subsequent evaluation of the SMART Rally Tracking Systems by the FIA – reflects the views of the FIA only, and that the ASNs remain free to select their providers based on any criteria they deem appropriate. As a consequence, the FIA makes no representations that the ASNs will make their decisions based on the criteria listed in this document or on the evaluation of the FIA.

This document is thus for informational purposes only and is not intended to offer advice on which reliance should be placed. To the extent permissible under applicable law, the FIA therefore disclaims all liability and responsibility arising from any reliance placed on this document.

By participating in the SMART project, interested providers: (i) accept to do so at their own risk and cost, (ii) accept that their SMART Rally Tracking System will be evaluated by the FIA acting at its sole discretion, (iii) accept not to contest such evaluation by the FIA, and (iv) acknowledge that they won't be entitled to seek any kind of indemnification or compensation from the FIA in connection with this document, the evaluation of the SMART Rally Tracking Systems by the FIA and the selection of tracking system solutions by the ASNs.

Interested providers further acknowledge that nothing in this document or any communication made by the FIA or its employees, affiliates, subcontractors and/or any other third party it may engage in relation to this document shall: (i) constitute an offer or a contract between the FIA and any interested provider, or (ii) be construed as placing an obligation on the FIA to grant rights to any interested provider, or (iii) constitute any appointment of an interested provider by the FIA, or (iv) not act as a representation that any interested provider will be granted any right(s) or appointed by the FIA in any capacity.