SFERA STAKEHOLDER WORKSHOP

UIC HQ, Paris – 05/11/2018

Communication with Driver Advisory Systems
IRS 90940

INTRODUCTION (11:00-12:00)

INTRODUCTION
THE SFERA PROJECT / Organisation

Chloé LIMA-VANZELER – SNCF Mobilités

WHO WE ARE

INTERNATIONAL UNION OF RAILWAYS

Cooperation
between Railway Undertakings and Infrastructure Managers

- Coherency
- Interoperability
- Competitiveness

WHO WE ARE

SUSTAINABLE DEVELOPMENT

Making railways greener, quieter and more energy efficient

CO2 reduction
Standardization of energy management

WHO WE ARE

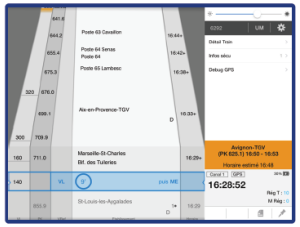
Infrastructure Manager	Railway Undertaking
DB Netz	DB Cargo
SNCF Réseau	SNCF Mobilités
ProRail	NS
Infrabel	SNCB
SBB	SBB
Trafikverket	
ÖBB	
Bane NOR	

#Drivers #DAS #Traffic management #Energy management

WAS IST DAS ?

Driver Advisory System

- ➔ Tool providing advice to the driver in order to **be on time & save energy**.
- ➔ It can be **stand-alone** or **connected** to the Traffic Management System.



SFERA PROJECT

Smart communications
For
Efficient
Rail
Activities

TARGETS

- ➔ Facilitate the use of Connected-Driver Advisory Systems (C-DAS) for international traffic by standardizing the data exchange between on-board systems and Traffic Management Systems (TMS).
- ➔ Automate the transmission of TMS decisions to all trains in a multi-RU environment, by implementing the conditions for the development of "off the shelf" C-DAS products.

The scope includes both ERTMS/ETCS Limited Supervision and Class B train protection systems.

OUTPUT

UIC International Railway Solution 90940 (IRS 90940) defining these data exchange requirements : model, content, format and mechanisms of C-DAS data exchange between on-board and ground systems

WHY WE DO IT ?

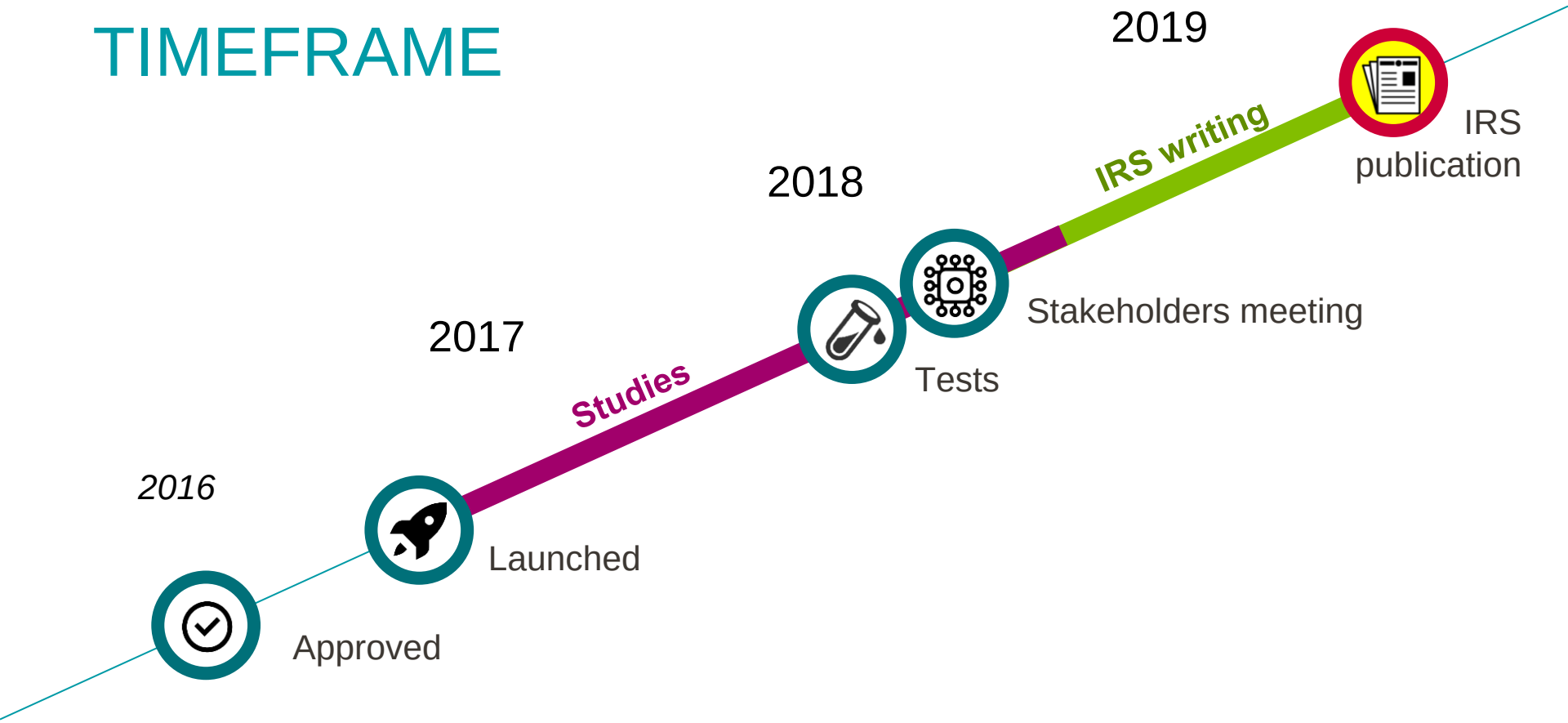
- Energy costs for EU railways total about 6 Billion € per year
- DAS is a **major lever to reduce energy consumption**: average savings are estimated between 5-10% for simple DAS and up to 12% for connected-DAS
- Current **implementation is very low**
- **Different solutions** are developed
- **Different communication protocols** used by infrastructure managers

WHAT'S THE PROBLEM ?

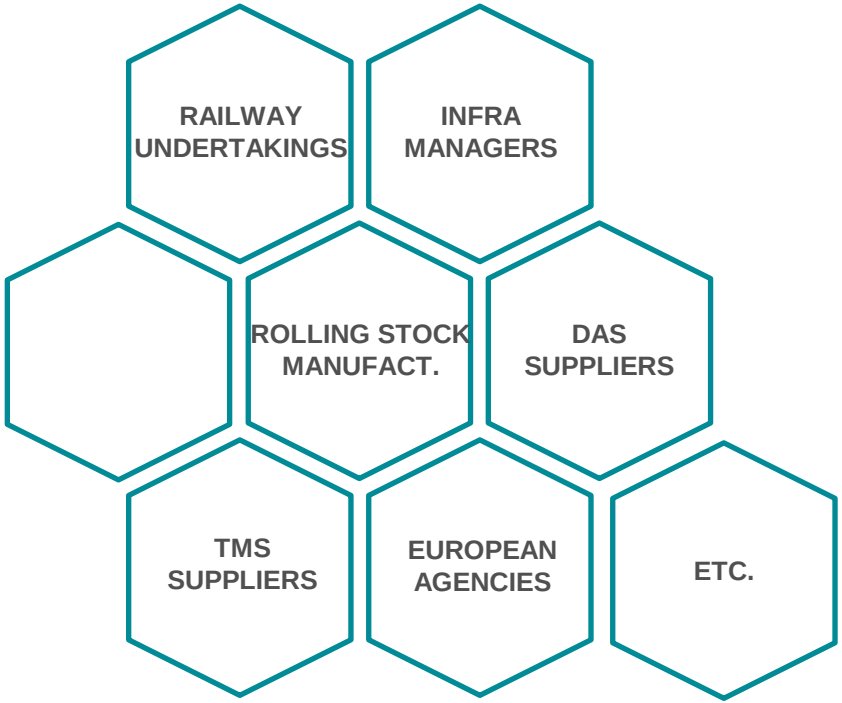
If we don't do SFERA, the risks are :

- ✘ Each actor will develop a system on its own (algorithm, data, functional rules…)
- ✘ Systems will not be interoperable → difficult for international railways to reduce their energy consumption and costs
- ✘ Infrastructure Manager will have to be able to handle different languages according to the DAS used by the railway operators
- ✘ Higher costs for DAS systems if each project needs to define its own protocol
- ✘ Difficulty in the evolution of the systems
- ✘ ...

TIMEFRAME


2019
IRS writing
IRS publication
2018
Stakeholders meeting
Tests
2017
Studies
Launched
2016
Approved

WHO YOU ARE


RAILWAY UNDERTAKINGS
INFRA MANAGERS
ROLLING STOCK MANUFACT.
DAS SUPPLIERS
TMS SUPPLIERS
EUROPEAN AGENCIES
ETC.

WHAT WE NEED FROM YOU

Get your feedbacks in order to improve the IRS :

QUESTIONS

RISKS IDENTIFIED

REMARKS

And after the meeting on: sferafeedback@gmail.com

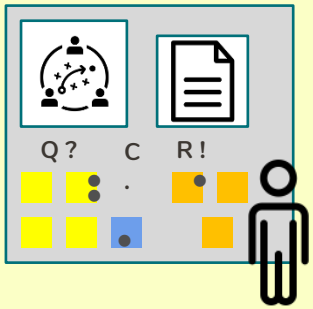
ORGANIZATION OF THE DAY

11:00	12:00	13:00	14:00	15:30	17:00
INTRO	PLENARY SESSION	LUNCH BREAK	INTERACTIVE SESSION	PLENARY SESSION	

6 stands = 6 topics
2 project members

1 / Write down on post-its :

- → Your questions
- → Your comments
- → The risks that you identify



2 / Vote with stickers on the post-its that make sense to you

INTRODUCTION
THE SFERA PROJECT / How we do it

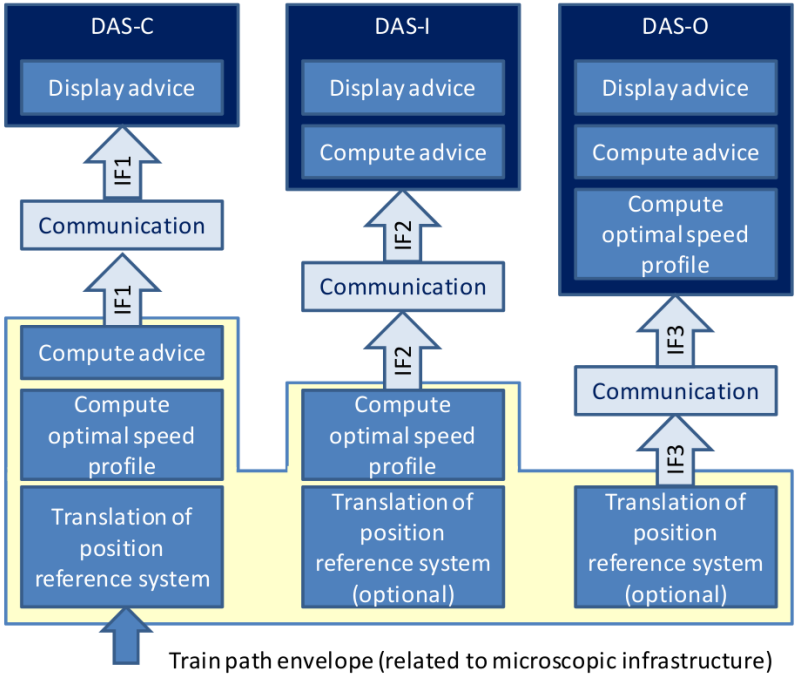
Jan HOOGENRAAD – NS

PROBLEM DEFINITION – BIRDS EYE

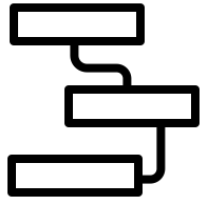
- DAS and ATO need good data
- The simplest case is S-DAS, where data is loaded once to train / tablet
- S-DAS should be internationally interoperable, too
- Even for S-DAS, no data standard was present
- C-DAS is just data updates (DAS-O) or moving parts of calculations (DAS-I, DAS-C)

So:

- SFERA project first tackled S-DAS
- Then, the project proceeded to C-DAS and ATO



WORK PACKAGES



Work Package 1: S-DAS (Standalone DAS)

- ➔ Main objective: Define data format
- ➔ Formalise data communication roles and processes

Work Package 2: C-DAS (Connected DAS)

- ➔ Extend S-DAS work and define
  - Use cases
  - Model
  - Data format

Work Package 3: DX (Data Exchange)

- ➔ Define data exchange methods and protocols between on-board and ground (TMS) systems

WAY OF WORKING

- Group with representatives of IM-s and RU-s
- Takes into account all national particularities
- Consults with internal organisation and suppliers
- Makes a proposal
- Bi-weekly conference calls
- Bi-monthly group meetings

- End product tested

RELATED PROJECTS

For each of the projects below, Link person(s) have been assigned from SFERA

ON-TIME Project (*Optimal Networks for Train Integration Management across Europe*)

- Link: ON-TIME has developed a “Specification of a driving advisory systems (DAS) data format” (Deliverable 6.1)

ERA/Shift2Rail ATO (Automatic Train Operation)

- Link: ERA and Shift2Rail are working on ATO over ERTMS. They limit their scope to C-DAS and ATO under ETCS Full Supervision, not covering other train protection systems.

railML and RailTopoModel

- Link: railML is a language to model railway data and RailTopoModel is a topology model of the railway system.

QUALITY PROCESS SETUP

Internal Approval

IRS should be accepted by all opt-in members.

Stakeholder Feedback

External parties (e.g. non-SFERA RUs, IMs, manufacturers of TMS + DAS systems, ERA, Shift2Rail, railML) are welcomed to give feedback

Implementation & Testing

The SFERA railways have performed the following 4 tests and reported the results:

1. First test: Develop test tools (proof-of-concept) that convert existing data to SFERA format
2. Second test: Convert data to SFERA and from SFERA to specific S-DAS devices
3. Third test: Live train runs for S-DAS
4. Fourth test: Validate compatibility with subset-126

QUALITY OUTCOMES

Internal Approval

All opt-in members support the solution, and are preparing for implementation

Stakeholder Feedback

This workshop, and follow-up review rounds

Implementation & Testing

The SFERA railways have performed the following 3 tests and reported the results:

1. First test: Converted existing data to SFERA format from Infrabel, SNCF, NS, SBB
2. Second test: SFERA converted specific S-DAS devices: SNCF, NS
3. Third test: Live train runs for S-DAS: Thalys
4. Fourth test: Validate compatibility with subset-126

IS THIS SUFFICIENT ?
PLEASE HELP US TODAY

Is the SFERA process sufficient to mitigate the risks ?

- ✘ Each actor will develop a system on its own (algorithm, data, functional rules…)
- ✘ Systems will not be interoperable → difficult for international railways to reduce their energy consumption and costs
- ✘ Infrastructure Manager will have to be able to handle different languages according to the DAS used by the railway operators
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