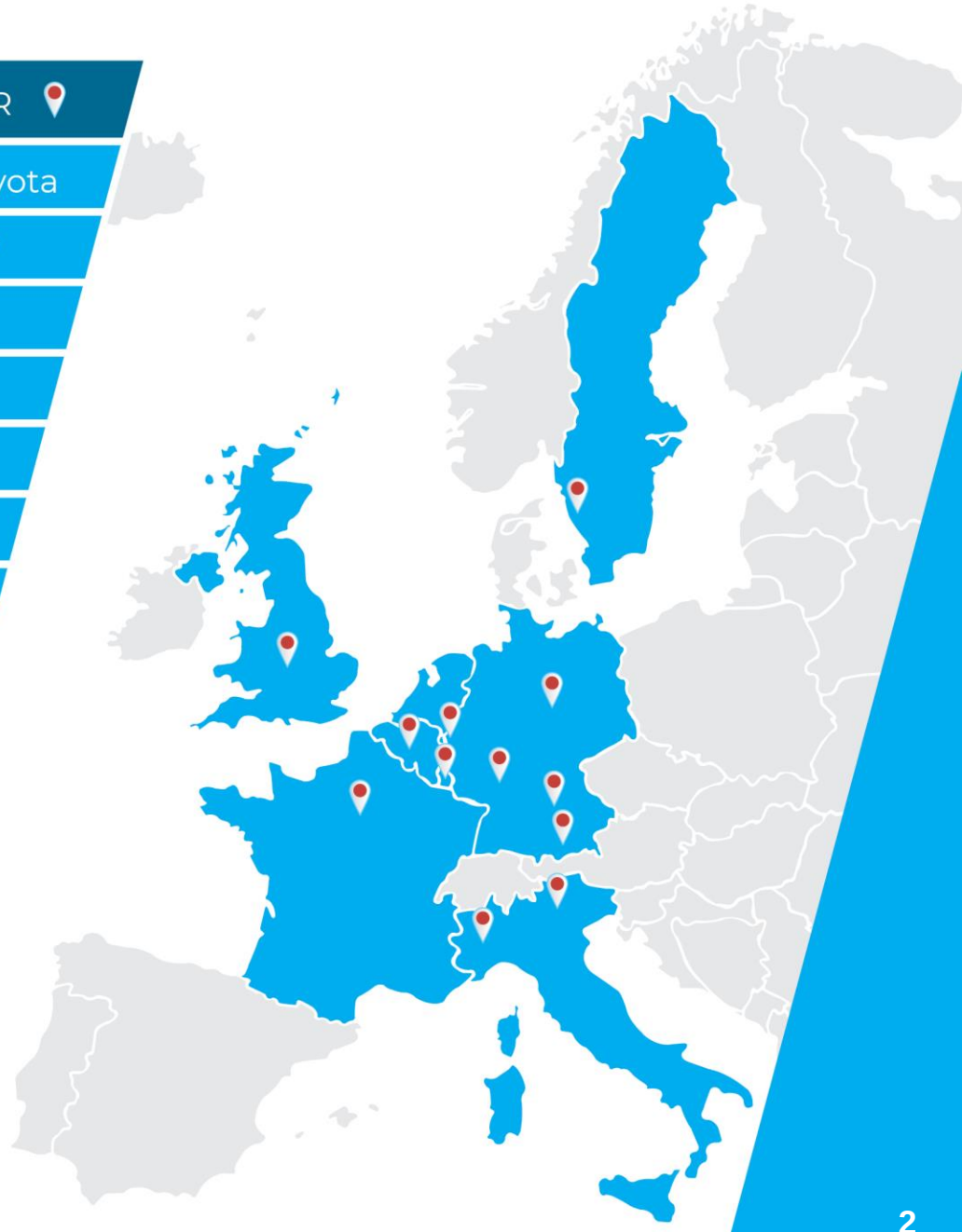
Getting from Vehicle Data to Evaluation Data

ARCADE: Workshop on Data Sharing for Automated Driving

Johannes Hiller, ika RWTH Aachen

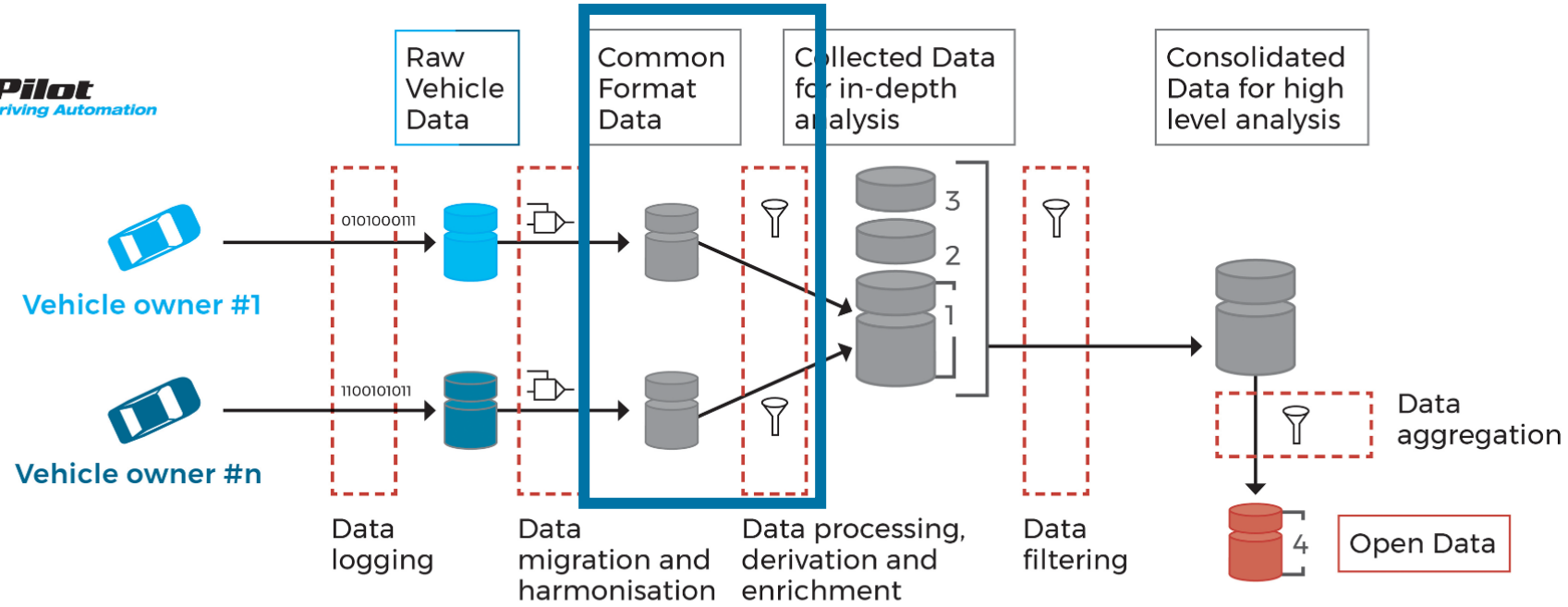
Pilot across Europe

COUNTRY / REGION / PARTNER	
BE / Brussels	Toyota
DE / Aachen, Cologne	FEV
DE / *UK* / *BE*	Ford
DE / Munich	BMW
DE / Aachen, Cologne	ika
DE / Offenbach	Honda
DE / Wolfsburg, Hamburg	VW
DE / Ingolstadt	Audi
FR / Paris and other regions	Renault
FR / *DE*	PSA
IT / Turin, Trento	CRF
DE / *FR* / *LU*	Aptiv
SE / Gothenburg	Volvo
UK / Coventry	JLR
+ Cross-border activities	



L3Pilot Common Data Format

Data Flow



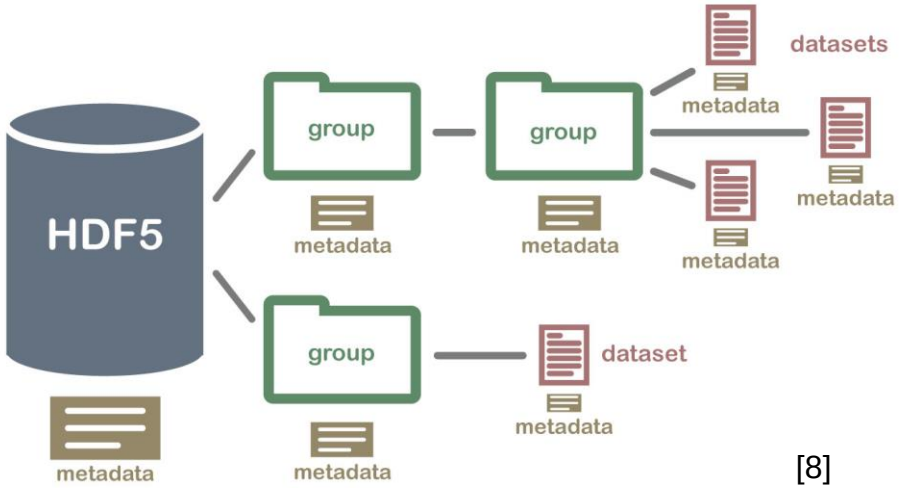
Categories of data:

1 Derived Vehicle Data (CAN, GPS, PIs, video, and/or video annotations)
2 Subjective Data (interviews, questionnaires, simulator studies)
3 External Data (weather, map, ...)
4 Open Data (aggregated data)

Tools provided by SP5

L3Pilot Common Data Format
HDF5

- Many file formats were checked
- Hierarchical Data Format (HDF) was selected
- Portable, binary format
  - Compression optional
- Open source and free to use
- Available for many platforms & languages
  - Windows, Linux, …
  - Matlab, C/C++, Python, Java, …



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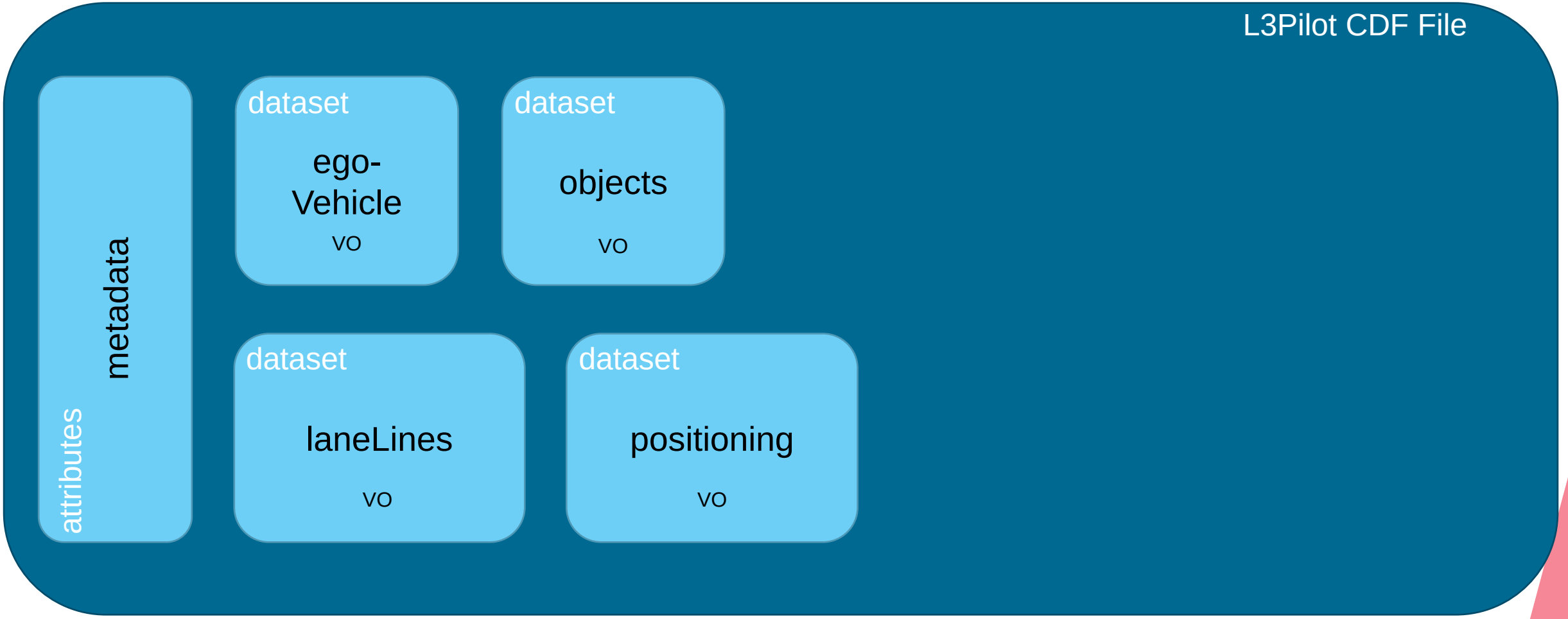
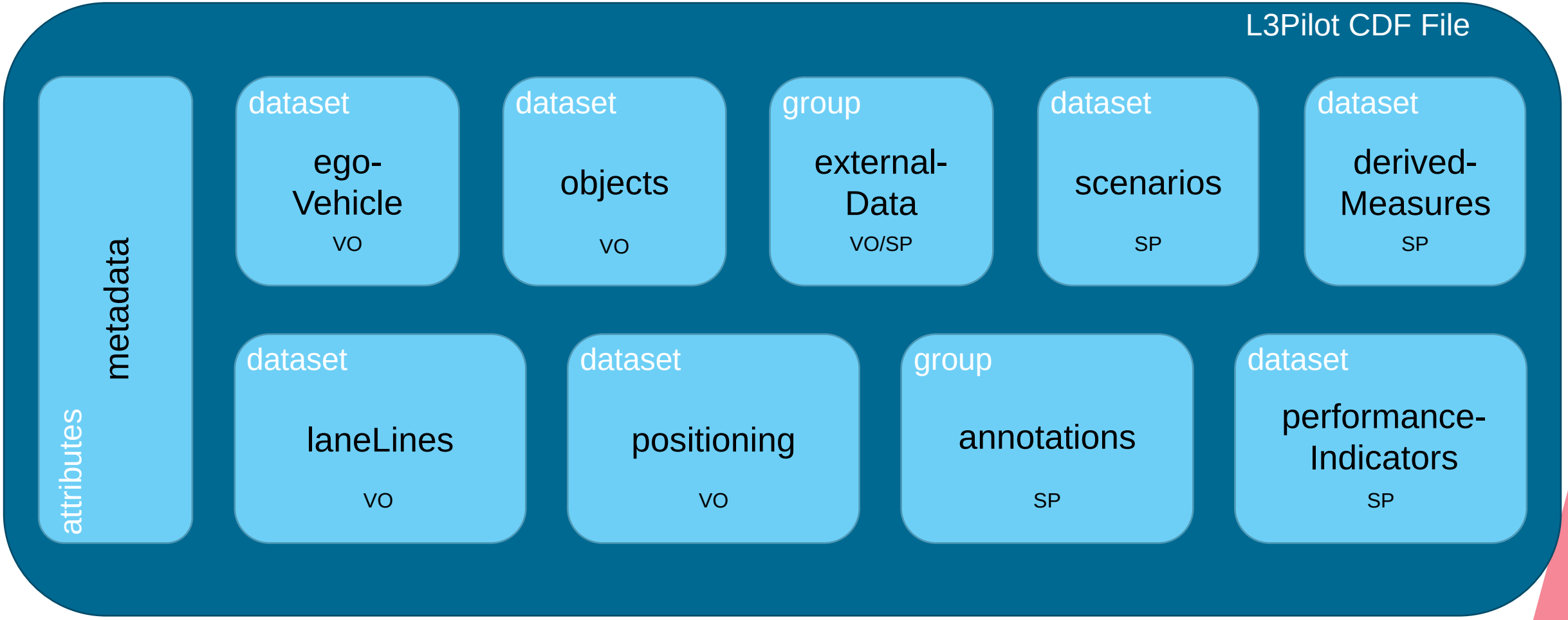
L3Pilot Common Data Format
Structure with Vehicle Signals



VO – vehicle owner

L3Pilot Common Data Format

Structure with Vehicle Signals



VO – vehicle owner

SP –selected partner

Pseudonymization Process

Confidentiality

Data Detail

Personal information

First name	Last name	Driver ID	SHA256(Driver ID + salt)	Age	Gender	Nationality	…
David	Davidson	001	1a064a72…1afe5341	26	Male	Earth	…
Stan	Stanson	002	b2452fbb…02753647	38	Male	Mars	…
Nelly	Nelson	003	339b0d9a…212960be	29	Female	Venus	…

Master table of participants which only OEM has access to

SHA256 driverID is only link between these

H5 file	Start timestamp	End timestamp	Driver ID	Trip ID (SHA256 of start timestamp + salt)	var
2019-04-23.h5	1530364592574	1530364652474	1a064a72	691ea24d…b79b5524	…
2019-04-24.h5	1530364651438	1530364677843	b2452fbb	4a8c43dd…1d228db6	…
2019-04-25.h5	1530364651778	1530364651234	339b0d9a	dc0d005d…4e26967a	…

H5 data for selected partner

Consolidated database (Consortium has access)

Trip ID	Max/min/avg var
691ea24d	…
4a8c43dd	…
dc0d005d	…

Needed for database mechanics

- CDF

Selected partners

Vehicle owners

Collect **raw data** from vehicle

Quality check on raw data

Conversion of raw data to L3Pilot **Common Data Format** (CDF)

Quality check on converted data

Vehicle owner transfers converted data to **selected partner**

Quality check on converted data

Run **Derived measures** (DM) and **scenario scripts**

Video annotation based on generated DMs and Scenarios

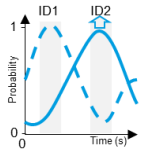
Run **Performance Indicators** (PI) **scripts**

Aggregate enriched data

Upload aggregated data to **consolidated database** (CDB)

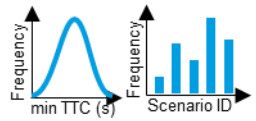
Query aggregated data from consolidated database (CDB)

Perform evaluation and **produce results** for technical and traffic evaluation



Generate input for **impact assessment**

Calculate impact



Vehicle owners

Selected partners

Vehicle owner transfers converted data to **selected partner**

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Aggregate enriched data

Upload aggregated data to **consolidated database** (CDB)

Vehicle owner fixes bugs in data

Thank you for your kind attention.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 723051.