



Department
for Transport

UK Public Transport Information - SIRI

SIRI VM & Data Matching

Date: 20.12.2021

Background

- **The Bus Open Data programme**

- requirement on all bus operators to openly publish
 - timetables,
 - fares and
 - Location data for their registered services. This includes producing SIRI (VM) data containing their vehicles location.

- **History**

- Technical guidance SIRI-VM
- Published on DfT site October 2020

- **Research**

- KPMG for the BODS project carried out research June / July 2021
- Identified key data fields with data consumers and system providers



Compliance tag status proposal*



Non compliant

Consumer critical field(s)
+ (Fields as per regulation) are missing

- Bearing
- LineRef
- Monitored-VehicleJourney
- OperatorRef
- RecordedAtTime
- ResponseTimestamp
- VehicleJourneyRef
- VehicleLocation (Lat, Long)
- ProducerRef
- DirectionRef
- VehicleRef
- ValidUntilTime



Partial compliance

Non-critical consumer
field(s) are missing

- BlockRef (Until all publishers are able to provide)
- PublishedLineName
- VehicleMonitoringDelivery (Vehicle activity)
- DestinationRef
- OriginName
- OriginRef



BODS compliant

All fields are present

- Bearing
- LineRef
- Monitored-VehicleJourney
- OperatorRef
- RecordedAtTime
- ResponseTimestamp
- VehicleJourneyRef
- VehicleLocation (Lat, Long)
- ProducerRef
- DirectionRef
- *BlockRef*
- *PublishedLineName*
- *ValidUntilTime*
- *VehicleMonitoringDelivery (Vehicle activity)*
- *DestinationRef*
- *OriginName*
- *OriginRef*
- *VehicleRef*

*Agreed as compromise after 10x stakeholder sessions

Audience

- **Suppliers of systems providing location data to BODS.**
 - To ensure they know what data is required, its format and content expected and how it needs to match route and timetable data.
- **Technical staff within bus operators who are responsible for ensuring system suppliers are providing compliant data.**
 - To ensure they know what data is required, its format and content expected and how it needs to match route and timetable data.
- **Developers and technical managers of data consumers.**
 - To ensure they know what data they can expect from BODS, its format and content and how it can be combined with PTI-TxC data to create customer information.

Validation

- **Two stage validation:**
- **Is the data schema-compliant?**
 - Checks that the data compliant with SIRI 2.0q general schema.
- **Is the data SIRI-VM-PTI compliant?**
 - This is a programmatic check to ensure that the data meets the requirements of this profile, carried out by analysing the data in the SIRI.
 - Live December 2021

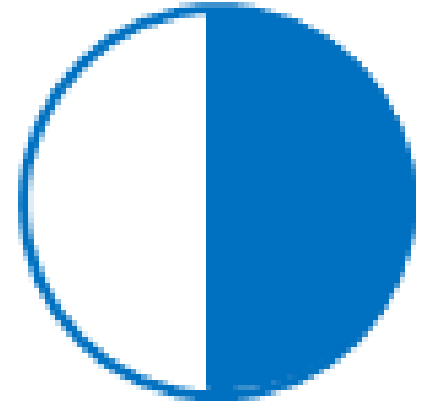


Minimum Essential Data to avoid Non-Compliance



- **ProducerRef**
- **ResponseTimestamp**
- **Monitored-VehicleJourney**
 - **RecordedAtTime**
 - **ValidUntilTime**
 - **LineRef**
 - **DirectionRef**
 - **OperatorRef**
 - **Bearing**
 - **VehicleJourneyRef**
 - **VehicleLocation (Longitude, Latitude)**
 - **VehicleRef**

Partial Compliance Data



- **VehicleMonitoringDelivery (Vehicle activity)**
 - **PublishedLineName**
 - **OriginRef**
 - **OriginName**
 - **DestinationRef**
 - **BlockRef**

- Date to be agreed - these will migrate to become minimum essential data to avoid non-compliance



Full Compliant Data



- **Minimum Essential Data to avoid Non-Compliance**
- **Plus**
- **Partial Compliance Data**



SIRI-VM-PTI to TxC-PTI data Match

SIRI Field	Description of data	Source	TXC-PTI Match
Bearing	Direction of Travel in degrees	GPS / AVL Equipment	-
LineRef	Public facing service number. Unique within a document	TxC	LineName
MonitoredVehicle Journey			
OperatorRef	Operators Public Facing Name	NOC	NationalOperatorCode
RecordedAtTime	Time that the VM data was recorded (normally the time of VehicleLocation).	AVL Equipment	-

SIRI-VM-PTI to TxC-PTI data Match

SIRI Field	Description of data	Source	TXC-PTI Match
ResponseTimestamp	Time the SIRI message was sent.	Backoffice or AVL Equipment	-
VehicleJourneyRef	Unique identifier for current journey	Operator / Running Board	VehicleJourneyCode
VehicleLocation (Lat, Long)	Location of vehicle	GPS / AVL Equipment	-
LongitudeType	-180 to +180		-
LatitudeType	-90 to +90		-

SIRI-VM-PTI to TxC-PTI data Match

SIRI Field	Description of data	Source	TXC-PTI Match
ProducerRef	reference that identifies producer of data	Backoffice or AVL Equipment	-
DirectionRef	inbound/outbound, clockwise/anticlockwise	Operator	Direction from JourneyPattern
BlockRef	Running board for the vehicle	Operator / Running Board	BlockNumber
PublishedLineName	the public identifier	Operator	LineName
ValidUntilTime	Time until which message is valid	Backoffice or AVL Equipment	-

SIRI-VM-PTI to TxC-PTI data Match

SIRI Field	Description of data	Source	TXC-PTI Match
VehicleMonitoringDelivery (Vehicle activity)			-
DestinationRef	NaPTAN for the journey destination (last stop)	TxC	StopPointRef
OriginName	name of the origin stop the journey	CommonName from NaPTAN	-
OriginRef	NaPTAN for the journey start (first stop)	TxC	StopPointRef
VehicleRef	Unique reference for the vehicle that is consistent.	Vehicle Equipment	-

SIRI-VM-PTI to TxC-PTI data Match

SIRI Field	Description of data	Source	TXC-PTI Match
DestinationName	Destination of the journey. Should match the destination blind on the front of the vehicle	TxC	DynamicDestinationDisplay or DestinationDisplay depending on what used for the journey.
Occupancy	Current occupancy of vehicle SIRI v2.0 implementation		-

Updating Data

- **Update Frequency**
- every 30 seconds minimum
 - maximum 10 second frequency
- **Heartbeat**
- Every 30 seconds



Data Matching

- **Validation of data and compliance**
 - ensure that the data can easily be used to produce a predicted or calculated arrival time of bus at a bus stop.
- **Quality of data**
 - Key to customer experience
 - Achieving BODS outcomes
 - Analyse BODS
 - Bus Service Improvement Plans



Matching Process

- **VehicleJourneyRef based**
- Match between SIRI and TransXChange

- **OperatorRef**
- **LineRef**
- **VehicleJourneyRef**
- **BlockRef**

- BlockRef important for cross journey predictions



Alternative Data Matching

- **No VehicleJourneyRef match one suggested approach :**
 - **OperatorRef**
 - **LineRef**
 - **Direction**
 - **Origin Ref**
 - **DestinationRef**
 - **VehicleJourneyRef**
 - Try match to scheduled journey <DepartureTime> in TxC-PTI

Documentation Sources

- **Current DfT Guidance:**
- <https://www.gov.uk/government/publications/technical-guidance-publishing-location-data-using-the-bus-open-data-service-siri-vm>
- **Draft Profile Documents:**
- https://www.rtig.org.uk/bods/SIRI_VM_Data_Matching



Questions

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