N801 appendix

Created by Entur (kollektivdata@entur.org) on behalf of Jernbanedirektoratet.

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Norwegian SIRI profile

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> **Version**
> Current version for **Norwegian SIRI profile** is: **v1.0** (*last changed* 01 May 2019)

Preface

A Norwegian standard for exchanging uniform real-time data is extremely valuable for:

Entur AS on behalf of Jernbanedirektoratet

...in order to efficiently collect all real-time data from each data provider, ensure consistency of data, and increase data quality. This allows the creation of multimodal information systems which may be used to implement nationwide journey planning solutions and publicize business neutral information to all interested parties.

for travellers

...in order to present relevant, and up-to-date, high-quality journey suggestions.

for public transport operators

...in order to re-use the data in their own journey planning-, ticketing-, and information systems, and offer a better service to their customers.

for third party service providers

...in order to minimize unnecessary costs related to supporting multiple different exchange formats, and to contribute to continued growth of standardized public transport data exchange.

Introduction

Service Interface for Real Time Information (SIRI)

`Service Interface for Real Time Information (SIRI)` is a CEN-specification (`CEN/TS 15531, prCEN/TS-OO278181`) for exchanging real-time data for public transport and vehicles. Its development was a cooperative effort between France, Germany (Verband Deutscher Verkehrsunternehmen, VDV), Scandinavia and Great Britain (`UK Real Time Interest Group, RTIG`). The standard is based on the reference model **Transmodel** (`CEN TC278, EN12896`) and contains a general model for real-time data and an XML Schema for its implementation.

The SIRI format is used to update planned data with short term changes and deviations in the form of vehicle positions, estimated arrival times, and relevant textual messages.

The guidelines for using SIRI 2.0 XML Schema are specified by a local (Norwegian) profile of the SIRI format, which accounts for existing systems, as well as future needs. Just like the Norwegian NeTEx Profile, which defines the planned and fixed portion of public transport data, the Norwegian SIRI profile describes how- and which parts of the wider format to use. It is based on `Transmodel 5.1 (EN 12896: 2006)` which in turn is based on the standards of `NEPTUNE (AFNOR - PR NF P99-506 desember 2009)` and IFOPT (EN 28701 - Identification of Fixed Objects in Public Transport). The purpose of the profile is to clarify which events and data are expected to be included in a comprehensive data exchange and to make the implementation of common standards easier.

SIRI defines a standardised communication layer with procedures and mechanisms for exchanging data by means of a format which is openly described to the public and in wide use around the world.

- Well known interface
  - Openness
  - Scalability
  - Flexible for particular needs
- Re-useability for architecture, infrastructure and services (cost-saving)
  - Content independent from transfer protocols
  - Standardised publication and message handling
    - WebService (HTTP/SOAP with request/response) and WS-PubSub
    - Supports common mechanisms for access control, versioning and error handling
  - Configurable updating and filtering

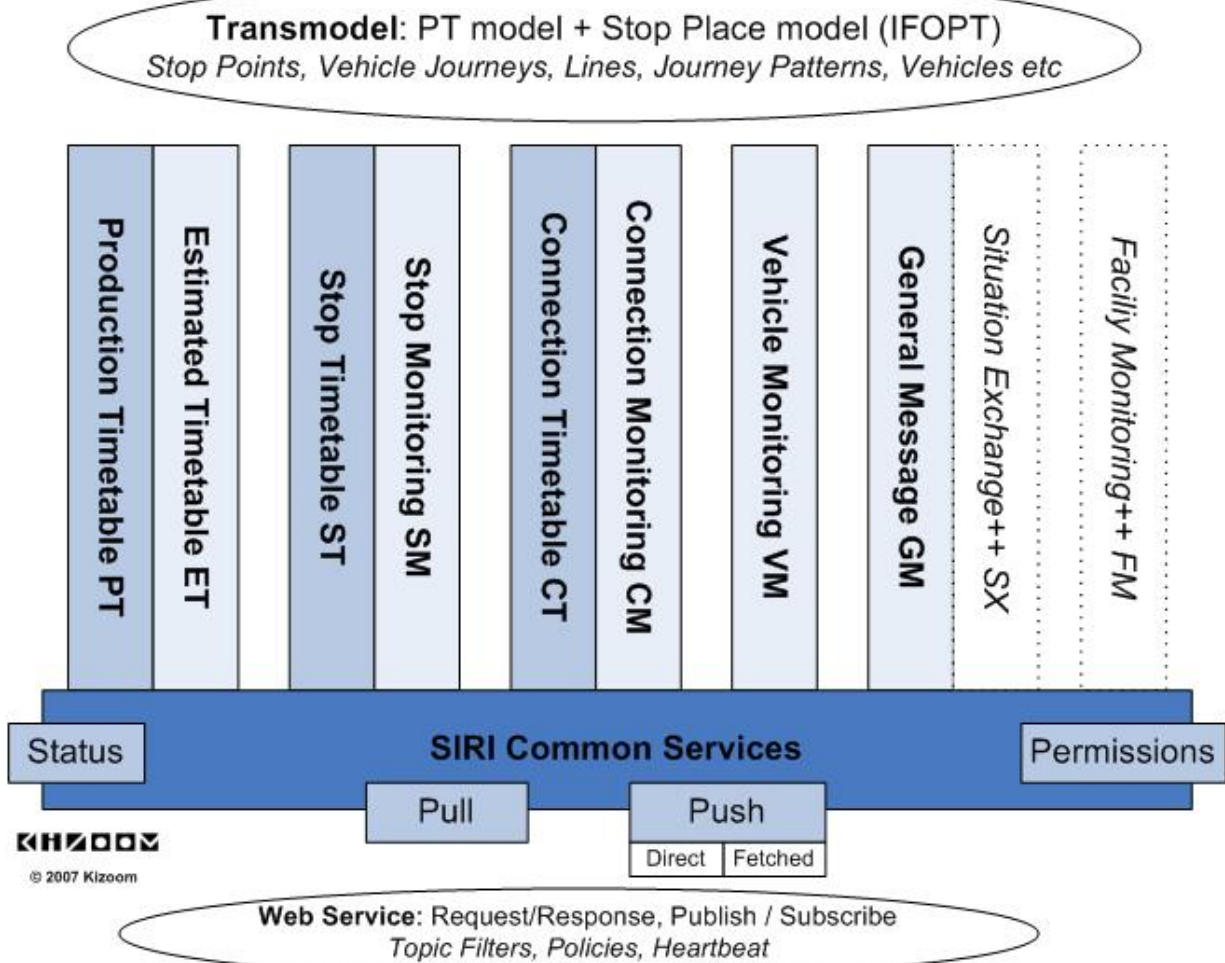**Links for more information about the formats**
- SIRI: https://www.vdv.de/siri.aspx
- Transmodel: http://transmodel-cen.eu
- NeTEx: http://netex-cen.eu/

SIRI high-level model

Overview of the functional services from the official SIRI-documentation:

SIRI Functional Services

Transmodel: PT model + Stop Place model (IFOPT)
Stop Points, Vehicle Journeys, Lines, Journey Patterns, Vehicles etc

TPEG2: Situation Model
PT & Road *Situations*

Datex2: Situation Model
Road *Situations*

| Production Timetable PT | Estimated Timetable ET | Stop Timetable ST | Stop Monitoring SM | Connection Timetable CT | Connection Monitoring CM | Vehicle Monitoring VM | General Message GM | Situation Exchange++ SX | Facility Monitoring++ FM |

Status   SIRI Common Services   Permissions

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Pull   Push
Direct | Fetched

Web Service: Request/Response, Publish / Subscribe
Topic Filters, Policies, Heartbeat

Services supported by the Norwegian SIRI-standard

Real-time information in Norway is exchanged in three formats, **SIRI-ET**, **SIRI-SX** and **SIRI-VM**:

1. **Estimated Timetable (ET)** for continuous updates per line, restricted to the current operational day (may differ from calendar days).
   a. Changes like delays, cancellations, additional departures, over-takes, or stops that are not going to be served.

2. **Situation Exchange (SX)** for information on disruptions in the public transport service
   a. Information about planned deviations (such as maintenance work on the tracks)
   b. Information about unplanned deviations (such as accidents, unforeseen issues with passengers, objects blocking the road, or severe weather)

3. **Vehicle Monitoring (VM)** for tracking the position of the vehicles used for public transport
   a. The actual position of vehicles as they traverse a route (GPS data).

SIRI also supports real-time information data types which are **not** included in the Norwegian profile:

1. **Production Timetable (PT)** for changes in planned time table data outside the current operational day.
2. **Stop Timetable (ST)** changes (theoretic, planned, or calculated) in arrivals and departures for stops outside the current operational day.
3. **Stop Monitoring (SM)** arrival- and transfer times for the same operational day.
   a. Calculated arrival time for a vehicle, usually based on GPS data.
4. **Connection Timetable (CT)** used to inform about guaranteed interchanges outside the current operational day.
5. **Connection Monitoring (CM)** for continuous updates on guaranteed interchanges.
   a. Whether the guarantee will be upheld.
   b. Unplanned interchanges (for example, a bus will wait for a train).
6. **General Messaging (GM)** for general text-based information, such as, for example, describing a widely impactful disruption.
7. **Facility Monitoring (FM)** for updating the status of equipment, or services.
   a. Elevators, escalators, ticket vending machines.

What does Norwegian SIRI profile include

Based on relevant use cases as well as experience from existing real-time systems, the following features have been included:

1. Identification of reference data:
    a. Lines, Routes, and VehicleJourneys with arrival- and departure information
    b. StopPlaces, including type and Quays
    c. Connections and Transfers
    d. Data values
        - ServiceCategory
        - ProductCategory
        - VehicleFeatures
2. Specify technical data exchanges
    a. Type of data stream/subscription
    b. Categorisation of messages and data
    c. Message receipts (when relevant)
    d. Filtering mechanisms
    e. Consolidation and forwarding of partner-data (including monitoring)
    f. Meaning of functions
3. Usage of data fields
    a. Meanings
    b. Whether the field is mandatory or not
4. The ability to describe possible expansions outside the bounds of the main SIRI profile.

What the profile does *not* include

Technical specifications, local protocols, and their referential implementations are *not* included in the Norwegian SIRI profile. The same is true for access privileges, the technical details for data transfers, and the administration of data sources and users.

Details regarding the methods of data transfer are however described in separate protocols, established and agreed upon between Entur, data sources and data users. This includes:

- User guides
- List of available services
- Access privileges
- Monitoring (uptime, technical disturbances, maintenance)

A complete list of available data streams can be found at https://developer.entur.org/content/real-time-information.

Terminology

Terms and concepts for real-time data in SIRI are, just as in the case of stops- and timetable data, defined according to the NeTEx format standard, based on the European reference model "Transmodel".

> For a more detailed description of Transmodel-specific terms, see the Norwegian NeTEx profile.

Exchanging data in a single format means all communication systems involved need to have a unified interpretation of the terms and concepts being used.

With Transmodel as the source for conceptual names, all objects will have English names, and any use of Norwegian terminology should be considered as guiding only since local concepts often have widely varying historical meanings and associations. For that reason, in particular, all users of the format should strive to use the unified terminology to the furthest extent possible.

It is likewise important to point out that all ID's for stop places (StopPlace, Quay, etc.) in the SIRI data must refer to the official stop ID's found in the national stop place registry. This is important for both data sources- as well as users.

SIRI-specific objects and formats

Definitions of Transmodel-related objects can be found in the Norwegian NeTEx profile. The following complementary table defines and clarifies SIRI-specific terms.

Please note that the list is not exhaustive, and the list may be expanded on when needs arise.

Data	Description of data type
Encoding	Primarily UTF-8, but ISO-8859-1 and ASCII can also be handled.
Date/Time	Dates and times must be in local time, according to `ISO 8601`, where "00:00" is midnight. Please note that the minimum granularity of times is in seconds, but even more precise timestamps can be used.
Language	The language used must be defined as a **two-letter code** according to `RFC 1766 / ISO 639-1`.

Location	Locations must always be defined according to `WGS84/GML` (normally `EPSG:4326`)
	Coordinates in other formats must be converted to WGS84 before being published in SIRI.
StopPoint	In accordance with Transmodel, objects refer to a logical stop point, normally where passengers can board and alight. For practical reasons these points always have to be references to valid stops in the national stop place registry.
Destination	Usually, the final, or an important intermediary stop place in the route.
Origin	Usually, the first stop place in the route.

General requirements on data

For real-time data delivered in XML, the structure and content must be in accordance with SIRI 2.0 XML Schema (XSD), where all data fields contain meaningful information and are correctly formatted.

- Values must be trimmed (no blanks first or last in data values)
- Characters must be valid and in accordance with the *encoding*.

Using ID's

Requirements on unique ID's are described with more detail in the Norwegian NeTEx profile. It is important that all ID's in the SIRI- and NeTEx datasets are constants (real-time, stops, timetables), in order to prevent mismatches and other irregularities.

- References to **stops** must always use ID's from the national stop place registry.
- The data source is responsible for ensuring that ID's are correctly linked between timetable- and real-time data.

Fixed ID's

Just as in the case of timetable data, it is strongly recommended that unchanged objects keep their ID's unchanged across datasets. This makes long term referencing, and tracking of changes easier.

Exchanging data

Communication of data must be implemented in accordance with the principles of REST-based services via HTTP.

In technical terms, the exchange of data must be identical for all types (SIRI-ET, SIRI-SX and SIRI-VM.

Three forms of data acquisition are allowed:

1. Publish/Subscribe - Direct delivery (asynchronous)
2. Publish/Subscribe - Fetched delivery (asynchronous)
3. Request/response (synchronous)

Asynchronous

The service has been designed to continuously deliver data updates to all subscribed consumers.

When establishing a subscription, the data stream must be validated or reported as erroneous through the protocols of the mechanism.

All services of the publish/subscribe type **must send *heartbeats*** in accordance with the subscription-request (*HeartbeatInterval*), to ensure verification of service availability and operational status.

Publish/Subscribe - Direct delivery

When using *Direct Delivery* the data is continuously streamed to all subscribers immediately after they are released into the stream. The recipient system is responsible for handling the received messages. A received message is acknowledged with a HTTP 200 "OK" success-response.
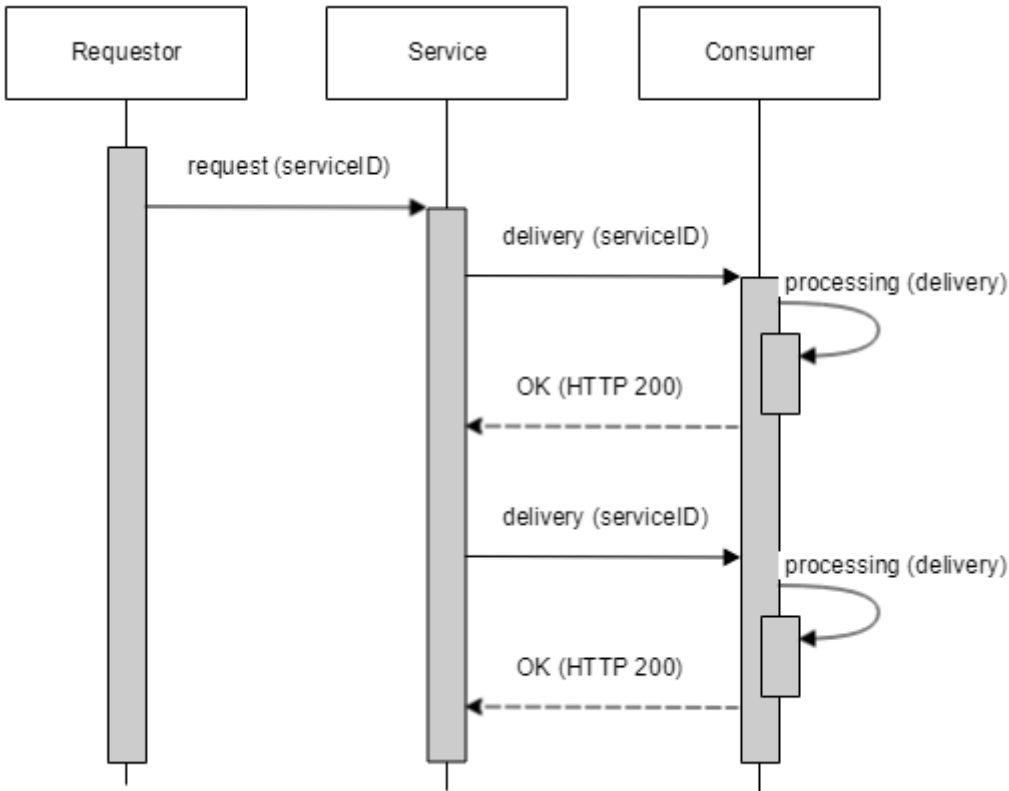
Publish/Subscribe - Fetched delivery

When using *Fetched Delivery* data is only sent when the receiving system has verified that it is ready to receive data from the stream. The message has to remain available with the data source until an explicit *dataSupplyRequest* has been received, and the system has ensured data delivery in accordance with it. This delivery method allows the receiving system to hold off on data fetches until it is ready to do so. It is the responsibility of the data source to ensure that data is kept until the consumer has fully downloaded it.
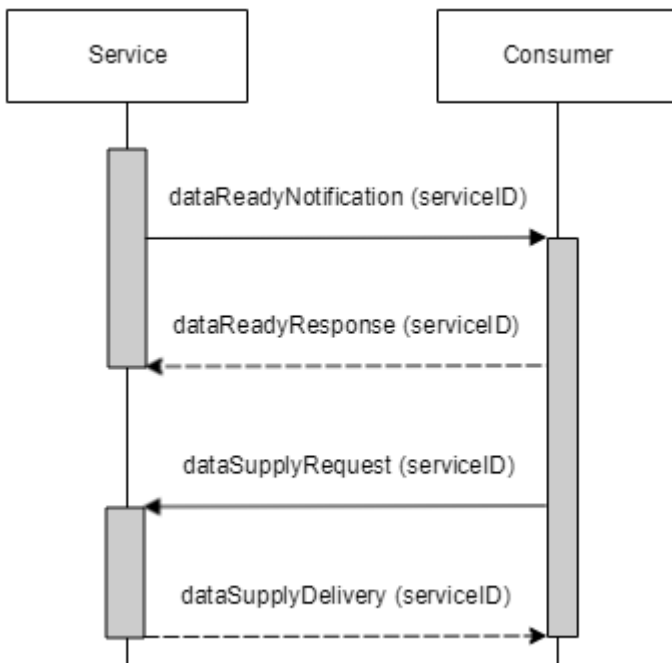
Synchronous

Explicit fetching of datasets based on service type, time, and possibly more parameters. When disruptions or other errors occur, the fetch attempt should result in predefined error messages.

Request/response

The service will be designed to deliver data per request, in accordance with the requestors filtering criteria (included in the fetch request).

General requirements

It is expected that normal data deliveries will contain updates/changes since the most recent push/request. If new messages also contain previously delivered messages, mechanisms must be implemented in the exchange protocol to prevent duplication or other corrupting issues.

Standard values

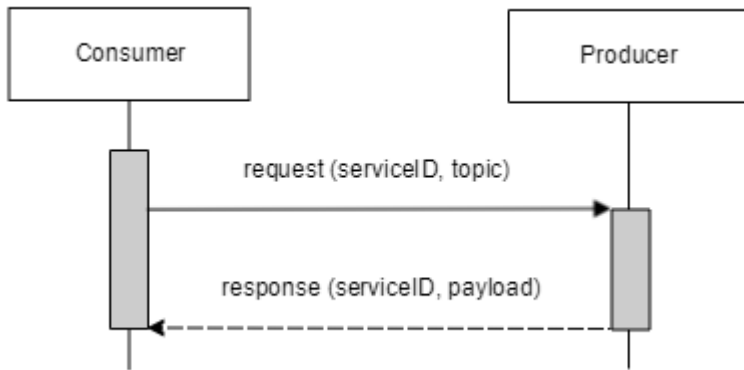All fields used when setting up a data stream, or when calling the services are expected to have meaningful values, defaults and accordance with request-parameters. For example in the cases of:

- The time range of the fetched data
- Filtering
- Change-before-update

Specification

When filtering the data it is expected to reduce the data stream content in accordance with the set input-parameters. Likewise, it is expected that when no input-parameters are present, a full dataset is requested.

Data freshness

It is expected that new messages are published at the soonest possible moment after the source data has been changed. For example:

- Changes in stops (EstimatedCall RecordedCall)
- Quay to be used has been determined or changed
- Adjustments in estimated arrivals or departures

Common components

This chapter describes the generic concept used for exchanging real-time information in accordance with the Norwegian SIRI profile.

Message objects

ServiceDelivery

Container for *SIRI Functional Service delivery*

Norwegian SIRI profile supports:

- EstimatedTimetableDelivery (*SIRI-ET*)
- SituationExchangeDelivery (*SIRI-SX*)
- VehicleMonitoringDelivery (*SIRI-VM*)

ServiceDelivery				
	Name	**Type**	**Cardinality**	**Description**
element	ResponseTimestamp	xsd:dateTime	1: 1	Time when the dataset was generated/published.
element	ProducerRef	xsd:NMTOKEN	1: 1	Codespace for dataset producer.

(choice) element	EstimatedTimetableDelivery	EstimatedTimetableDeliveryStructure	1: 1	Data element for Estimated Timetable (SIRI-ET), with changes in one or more planned *VehicleJourneys* within the same operating day.
	SituationExchangeDelivery	SituationExchangeDeliveryStructure		Data element for Situation Exchange (SIRI-SX), with information regarding one or more situations (or updates to previously published situations).
	VehicleMonitoringDelivery	VehicleMonitoringDeliveryStructure		Data element for Vehicle Monitoring (SIRI-VM), with monitoring information for one or more *VehicleJourneys* (for estimated adjustments of time table information)

Data types

NaturalLanguageStringStructure

Text strings with an assigned language code.

NaturalLanguageStringStructure				
	Name	**Type**	**Cardinality**	**Description**
attribute	xml:lang	xsd:string	0: 1	The language used must be defined as a **two-letter code** according to `RFC 1766 / ISO 639-1`. *Interpreted as the default "NO" unless otherwise specified. This **must** be specified when the message language is other than the default.*
element	(element content)	xsd:string (*non-empty*)	1: 1	The message text.

NaturalLanguagePlaceNameStructure

Text strings with an assigned language code.

NaturalLanguagePlaceNameStructure				
	Name	**Type**	**Cardinality**	**Description**
attribute	xml:lang	xsd:string	0: 1	The language used must be defined as a **two-letter code** according to `RFC 1766 / ISO 639-1`. *Interpreted as the default "NO" unless otherwise specified. This **must** be specified when the message language is other than the default.*
element	(element content)	xsd:string (*non-empty*)	1: 1	The message text

FramedVehicleJourneyRefStructure

Reference objects for *DatedVehicleJourneyRef* with a specified *DatedFrameRef* (date), in order to ensure that *VehicleJourney* objects with the same ID can be separated based on their dates.

FramedVehicleJourneyRefStructure				
	Name	**Type**	**Cardinality**	**Description**
element	DataFrameRef	xsd:NMTOKEN	1: 1	Date must have the ISO-format (YYY-MM-DD) for the departure in question. Must be in local time.
element	DatedVehicleJourneyRef	xsd:NMTOKEN	1: 1	ID for the related *VehicleJourney* (must be the same as the ID of the corresponding *VehicleJourney* in the NeTEx dataset).

SIRI Profile Documents

Documents

- SIRI-ET
- SIRI-SX
- SIRI-VM

Changelog

Date of change	Profile document	Description of change	Version
01 May 2019	SIRI-ET SIRI-SX SIRI-VM	The profile is now official and version is changed 1.0 without any changes to the content.	v. 1.0
22 Aug 2018	SIRI-ET SIRI-SX SIRI-VM	Corrections and clarifications of data structure and message contents.	v. 0.9.2 v. 0.9.2 v. 0.9.2
02 Mar 2018	General information SIRI, SIRI-ET, SIRI-SX, SIRI-VM	*Initial publication of Norwegian SIRI profile.*	v. 0.9

SIRI-ET

The Service Interface for Real Time Information - Estimated Timetable

> **Version**
> Current version for **SIRI-ET** is: **v1.0** (*last changed* 01 May 2019)

Content

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    - EstimatedJourneyVersionFrame
    - EstimatedVehicleJourney
    - SimpleContactStructure
    - SituationRefStructure
    - RecordedCall
    - RecordedCallStructure
    - EstimatedCall
    - EstimatedCallStructure
    - StopAssignmentStructure

This document is part of the Norwegian SIRI Profile and describes datasets and elements used for exchanging **continuous changes to planned data within the same calendar day** in the **SIRI Estimated Timetable (ET)** real-time format.

SIRI-ET is used to model the status of existing VehicleJourneys and to ensure that deviations from the planned data (within the same operational day) such as cancellations, additional departures, delays, detours and changes in stops, can be published on short notice. The data is linked to objects in the planned data by use of ID's, which ensures data quality.

Data requirements

Sending a *ServiceDelivery* of SIRI-ET data must be in accordance with this profile and the **entire dataset should be contained within a *single XML file***.

> When sending *Estimated Timetable* data, information should **always contain all stops**, that is **all served** *EstimatedCalls* when relevant *RecordedCalls* (and *IsCompleteStopSequence* = 'true')

Note that the profile does not present an exhaustive list of all real-time information technically possible to transfer via SIRI-ET, but it lays the foundation for which demands are placed on the datasets in order to meet the demands set by Håndbok N801.

It is permitted for client systems to send more than one *EstimatedVehicleJourney* per *EstimatedTimetableDelivery*, in order for real-time information to be conflated and be transferred as part of the same *ServiceDelivery*.

The examples associated with this profile are meant to show practical implementations of specific use cases, and can contain supplementary, lack certain data fields, or contain optional data, compared to a full and complete dataset. See SIRI-VM#Komponenter for closer descriptions of the data types, specifications and requirements on the unique elements of the SIRI VM-data.

Components

EstimatedTimetableDelivery

> A data type for representing information about time table changes for one or more VehicleJourneys within the same operational day.

		EstimatedTimetableDelivery ‹ **ServiceDelivery**		
	Name	**Type**	**Cardinality**	**Description**
attribute	version	xsd:NMTOKEN	1: 1	Version ID for EstimatedTimetableDelivery.
element	ResponseTimestamp	xsd:dateTime	1: 1	Timestamp for when the dataset was created/published.
element	EstimatedJourneyVersionFrame	SIRI-ET#EstimatedJourneyVersionFrame	1: *	A container element for sending one or more *Estimated Timetable* with a timestamp.

ESTIMATEDJOURNEYVERSIONFRAME

> Container-element for returning an *Estimated Timetable* comprised of one or more *EstimatedVehicleJourney.*

		EstimatedJourneyVersionFrame		
	Name	**Type**	**Cardinality**	**Description**
element	RecordedAtTime	xsd:dateTime	1: 1	The time when the data object was created/published.
element	EstimatedVehicleJourney	SIRI-ET#EstimatedVehicleJourney	1: *	Object for *Estimated Timetable* dataset.

ESTIMATEDVEHICLEJOURNEY

> Continuously updated timetable data with changes in the current operating day for a VehicleJourney (may also include a reference to a Vehicle), and its estimated arrival times at stops.

		EstimatedVehicleJourney		
	Name	**Type**	**Cardinality**	**Description**
element	LineRef	xsd:NMTOKEN	1: 1	Reference to the Line in question (*ID to the corresponding object in the timetable data*)
element	DirectionRef	xsd:NMTOKEN	1: 1	Direction reference. *Please note that the field is implemented as mandatory, but is not used as a free standing data type in the Norwegian SIRI profile. If it is not used, this value can be set to 0 (zero).*
(choice) element	FramedVehicleJourneyRef	FramedVehicleJourneyRefStructure	1: 1	Reference with date to VehicleJourney in question (*ID to the corresponding object in the timetable data*).
	EstimatedVehicleJourneyCode	xsd:NMTOKEN		Un-affected replacement departures must be given a new codespace-unique ID. For example: `RUT:VehicleJourney:51-108833-118720 56-00`
(choice) element	ExtraJourney	xsd:boolean	0: 1	The VehicleJourney in question is a replacement departure. *Must be 'true' if it is a replacement departure.*
	Cancellation	xsd:boolean		Used when the VehicleJourney in question is cancelled. *Set to 'true' only if the whole VehicleJourney is cancelled. When only parts of the VehicleJourney is cancelled: use RecordedCall and/or EstimatedCall.*
element	JourneyPatternRef	xsd:NMTOKEN	0: 1	Reference to JourneyPattern in question (*ID to the corresponding object in the timetable data*).

element	VehicleMode	VehicleModesEnumeration	0: 1	Transport type. *Must be defined for replacement departures!* Possible values: • air • bus • coach • ferry (*mapped to "water"*) • metro • rail • tram
element	RouteRef	xsd:NMTOKEN	0: 1	Reference to Route in question (*ID to the corresponding object in the timetable data*). *Must be defined for replacement departures!*
element	GroupOfLinesRef	xsd:NMTOKEN	0: 1	Reference to Network/GroupOfLines in question (*ID to the corresponding object in the timetable data*). *Must be defined for replacement departures!*
element	ExternalLineRef	xsd:NMTOKEN	0: 1	Reference to Line in question (*ID to the corresponding object in the timetable data*). *Must be defined for replacement departures!*
element	OriginName	NaturalLanguageStringStructure	0: 1	Name of the first stop of the departure (not used due to the reference to the national stop place registry, however *can* be included to make the XML easier to read).
element	DestinationName	NaturalLanguageStringStructure	0: 1	Name of the last stop of the departure (not used due to the reference to the national stop place registry, however *can* be included to make the XML easier to read).
element	OperatorRef	xsd:NMTOKEN	0: 1	Reference to Operator in question (ID to the corresponding company in the timetable data) *Must be defined for replacement departures where the operator has been changed!*
element	PublicContact	SIRI-ET#SimpleContactStructure	0: 1	Contact point for the public (if different from original timetable information). *At least one field must be filled out.*
element	OperationsContact	SIRI-ET#SimpleContactStructure	0: 1	Administrative contact details (if different from original timetable information). *At least one field must be filled out.*
element	SituationRef	SIRI-ET#SituationRefStructure	0: *	Unique reference to one or more *SituationNumber* which link to earlier published Situation elements (SIRI-SX) linked to the same EstimatedVehicleJourney.
element	PredictionInaccurate	xsd:boolean	0: 1	Whether the VehicleJourney is affected by traffic jams or other circumstances which lead to uncertainty around the time estimates.
element	DataSource	xsd:string	1: 1	Codespace of the data source (see codespace).
element	Occupancy	OccupancyEnumeration	0: 1	Open seats-status. Possible values: • full • seatsAvailable • standingAvailable
element	BlockRef	xsd:NMTOKEN	0: 1	Reference to block (*trip pattern*) *Internal (non-public) information.*
element	VehicleJourneyRef	xsd:NMTOKEN	0: 1	Reference to the VehicleJourney being replaced (*ID to the corresponding object in the timetable data*). Please note: use only for unplanned replacement departures. In other cases, use FramedVehicleJourneyRef.
element	AdditionalVehicleJourneyRef	xsd:NMTOKEN	0: *	Reference to other affected VehicleJourneys.
element	Monitored	xsd:boolean	0: 1	Whether the vehicle is currently reporting real-time data or not (for example set to *true* when the driver of the vehicle logs on to the system before departing).

element	RecordedCalls	SIRI-ET#RecordedCall	0: 1	The full sequence of already served stops in the order they were served by the VehicleJourney. *Please note that all stops in the sequence must be in chronological order.*
element	EstimatedCalls	SIRI-ET#EstimatedCall	0: 1	The full sequence of affected stops in the order they **will be** served by the VehicleJourney. *Please note that all stops in the sequence must be in chronological order.*
element	IsCompleteStopSequence	xsd:boolean	1: 1	Should always be 'true' as a confirmation that the sequence of RecordedCalls/EstimatedCalls is complete for the VehicleJourney in question (that is, containing all the stops).

SIMPLECONTACTSTRUCTURE

> Contact details to be presented to the public in cases where the information stated in the planned time table data is no longer true.

SimpleContactStructure				
	Name	**Type**	**Cardinality**	**Description**
element	PhoneNumber	xsd:string	0: 1	Phone number
element	Url	xsd:anyURI	0: 1	Url

SITUATIONREFSTRUCTURE

> Reference to a related Situation Element in an existing SIRI-SX message.

SituationRefStructure				
	Name	**Type**	**Cardinality**	**Description**
element	SituationSimpleRef	xsd:string	1: 1	Unique referance to *SituationNumber* for previously published Situation Element (SIRI-SX)

RECORDEDCALL

> Wrapper object to describe information regarding already served stops in a VehicleJourney.
>
> *Specified RecordedCalls must, together with EstimadeCalls, define **all** stops of a complete EstimatedVehicleJourney (that is, IsCompleteStopSequence should always be 'true').*

RecordedCall				
	Name	**Type**	**Cardinality**	**Description**
element	RecordedCall	SIRI-ET#RecordedCallStructure	1: 1	Description

RECORDEDCALLSTRUCTURE

> Data structure with information regarding already served stops.

RecordedCall				
	Name	**Type**	**Cardinality**	**Description**
element	StopPointRef	xsd:NMTOKEN	1: 1	Reference to actually served Quay. (ID to the corresponding Quay in the timetable data and national stop place registry).
element	Order	xsd:positiveInteger	1: 1	Which number in the sequence of served stops this *RecordedCall* is describing. *Please not that the sequence must contain **all** described stops (Call), that is Order must be a continuous sequence from registered RecordedCall to upcoming EstimatedCall.*
element	StopPointName	NaturalLanguageStringStructure	0: *	Name (one per language).
(choice) element	ExtraCall	xsd:boolean	0: 1	Whether the served stop is in addition to the planned stop sequence.

	Cancellation			Whether this is a cancellation of a planned stop.
				Only used when the stop was not served, either for boarding or alighting.
element	Occupancy	OccupancyEnumeration	0: 1	Open seats-status.
				Possible values:
				- full - seatsAvailable - standingAvailable
element	AimedArrivalTime	xsd:dateTime	0: 1	Originally planned arrival time. Required, except for the first stop.
element	ActualArrivalTime	xsd:dateTime	0: 1	Actual arrival time. Required, except for the first stop.
element	AimedDepartureTime	xsd:dateTime	0: 1	Originally planned departure time. Required, except for the last stop.
element	ActualDepartureTime	xsd:dateTime	0: 1	Actual departure time. Required, except for the last stop.

ESTIMATEDCALL

Wrapper object for describing a stop which will be served in a VehicleJourney.

*Specified EstimatedCalls must, together with RecordedCalls, define **all** stops of a complete EstimatedVehicleJourney (that is, IsCompleteStopSequence should always be 'true').*

EstimatedCall				
	Name	**Type**	**Cardinality**	**Description**
element	EstimatedCall	SIRI-ET#EstimatedCallStructure	1: 1	Description

ESTIMATEDCALLSTRUCTURE

Data structure information about stops which will be served, in chronological sequence.

EstimatedCall				
	Name	**Type**	**Cardinality**	**Description**
element	StopPointRef	xsd:NMTOKEN	1: 1	Reference to the StopPlace in question (ID corresponding to objects in the national stop place registry).
element	Order	xsd:positiveInteger	1: 1	Which number in the sequence of served stops this *Estimated Call* is describing.
element	StopPointName	NaturalLanguageStringStructure	0: *	Name (one per language).
(choice) element	ExtraCall	xsd:boolean	0: 1	Whether the served stop is in addition to the planned stop sequence.
	Cancellation			Whether this is a cancellation of a planned stop.
				Only used when the stop was not served, either for boarding or alighting.
				When partially cancelled departures the last stop before the cancellation part is defined with DepartureStatus 'cancelled', while the first stop in the cancellation part is defined with Arrival Status 'cancelled'. The remaining non-served stops (the partial cancellation) are defined with Cancellation 'true'.
element	PredictionInaccurate	xsd:boolean	0: 1	Whether the VehicleJourney is affected by traffic jams or other circumstances which lead to uncertainty around the time estimates *for this call*. When the whole VehicleJourney is uncertain, this should instead be set on EstimatedVehicleJourney.
element	RequestStop	xsd:boolean	0: 1	Whether the passenger must signal the vehicle for the stop to be served.

	element	DestinationDisplay	NaturalLanguageStringStructure	0: *	The (destination) text displayed on the vehicle when arriving at a stop.
					*If this is **not** defined the original text of the departure will be used.*
					Please note that the text field **must** be defined in cases of ExtraJourney or when overriding a destination text from the planned timetable data.
element		SituationRef	SIRI-ET#SituationRefStructure	0: *	One or more *SituationNumber* linking to already published SIRI-SX messages for the Call in question.
element		AimedArrivalTime	xsd:dateTime	0: 1	Originally planned arrival time. Required, except for the first stop.
element		ExpectedArrivalTime	xsd:dateTime	0: 1	Estimated arrival time. Required, except for the first stop.
					Should be updated to the actual arrival time when the vehicle arrives at a stop.
element		ArrivalStatus	CallStatusEnumeration	0: 1	Status for arrival
					Possible values:
					• arrived • cancelled • early • onTime • delayed
element		ArrivalBoardingActivity	ArrivalBoardingActivityEnumeration	0: 1	Used when there are changes in the boarding restrictions (must be in accordance with ArrivalStatus).
					Possible values:
					• alighting • noAlighting • passThru
element		ArrivalStopAssignment	SIRI-ET#StopAssignmentStructure	0: 1	Assigned arrival place (Quay).
					*When necessary **either** the ArrivalStopAssignment **or** DepartureStopAssignment, are defined, but never both*
element		AimedDepartureTime	xsd:dateTime	0: 1	Originally planned departure time. Required, except for the last stop.
element		ExpectedDepartureTime	xsd:dateTime	0: 1	Estimated departure time. Required, except for the last stop.
element		DepartureStatus	CallStatusEnumeration	0: 1	Status for departure.
					Possible values:
					• cancelled • onTime • delayed
element		DepartureBoardingActivity	DepartureBoardingActivityEnumeration	0: 1	Used when there are changes in the boarding restrictions (assuming this is not the final stop. Must be in accordance with ArrivalStatus).
					Possible values:
					• boarding • noBoarding • passThru
element		DepartureStopAssignment	SIRI-ET#StopAssignmentStructure	0: 1	Assigned departure place (Quay).
					*When necessary **either** the ArrivalStopAssignment **or** DepartureStopAssignment, is defined, but never both*

STOPASSIGNMENTSTRUCTURE

> Assignment of stop place (Quay).

StopAssignmentStructure				
	Name	**Type**	**Cardinality**	**Description**
element	AimedQuayRef	xsd:NMTOKEN	1: 1	Reference to originally planned Quay (ID corresponding to objects in the national stop place registry).
element	ExpectedQuayRef	xsd:NMTOKEN	0: 1	Reference to expected/current Quay (ID corresponding to objects in the national stop place registry), when there are changes.

SIRI-SX

The Service Interface for Real Time Information - Situation Exchange

> **Version**
> Current version for **SIRI-SX** is: **v1.0** (last changed 01 May 2019)

Contents

This document is part of the Norwegian SIRI Profile and describes datasets and elements used for exchanging **textual traffic situation messages** in the **SIRI Situation Exchange (SX)** real-time format.

SIRI-SX is used to model textual descriptions of disruptions, or deviations from the planned public transport information. The messages can be applied directly to stops, lines, vehicles etc. in the already existing public transport data by the use of ID references.

Data requirements

Sending of a SIRI-SX *ServiceDelivery,* data must be in accordance with this profile and the **entire dataset should be contained within a *single XML file*.**

Note that the profile does not present an exhaustive list of all real-time information technically possible to transfer via SIRI-SX, but it lays the foundation for which demands are placed on the datasets in order to meet the demands set by Håndbok N801.

It is permitted for client systems to send more than one *Situations (PtSituationElement)* per *SituationExchangeDelivery*, in order for real-time information to be conflated and be transferred as part of the same *ServiceDelivery*.

The examples associated with this profile are meant to show practical implementations of specific use cases, and may contain supplementary *opt onal* data fields, or lack *mandatory* data fields, compared to a full and complete dataset. See SIRI-SX#Komponenter for closer descriptions of the data types, specifications and requirements on the unique elements of the SIRI SX-data.

Components

SituationExchangeDelivery

SITUATIONEXCHANGEDELIVERY

> A data type for the representation of one or more situations, or updates on previously published situations through *Situations (PtSituationElement)* per *SituationExchangeDelivery* with the status and scope of the affected services.

SituationExchangeDelivery ⊂ **ServiceDelivery**				
	Name	**Type**	**Cardinality**	**Description**
attribute	version	xsd:NMTOKEN	1: 1	Version ID for SitutaionExhangeDelivery
element	ResponseTimestamp	xsd:dateTime	1: 1	Timestamp for when the dataset was created/published.
element	Situations	SIRI-SX#PtSituationElement	1: *	Data object for a Public Transport Situation Exchange.

A container element for situation data.

	Name	Type	Cardinality	Description
		PtSituationElement		
element	CreationTime	xsd:dateTime	1: 1	Timestamp for when the situation was created.
element	ParticipantRef	ParticipantCode	1: 1	Codespace of the data source (see codespace).
element	SituationNumber	xsd:anyURI	1: 1	**Unique** situation-ID for *PtSituationElement*. Format: `CODESPACE:SituationNumber:ID` *e.g.:* ABC:SituationNumber:123
element	Source	SIRI-SX#SituationSource	1: 1	Information on the source of the message.
element	Progress	WorkflowStatusEnumeration	1: 1	Status of a situation message. Possible values: • open • closed (*the situation is over and traffic has returned to normal*) *Please note that when Progress is set to 'closed' the message is considered expired and should not be presented to the public.*
element	VersionedAtTime	xsd:dateTime	0: 1	Timestamp when the situation element was updated.
element	ValidityPeriod	SIRI-SX#HalfOpenTimestampRangeStructure	1: *	Validity period(s) set with a start time and optionally with an end time. When the end time of the situation is undefined the expiration of the situation is considered unknown until cancellation status for the situation is sent. If the situation has several periods, all but the last period must have an end date. Note that for closed (*Progress=closed*) messages, the ValidityPeriod **must** have an EndTime with a minimum of **five hours** into the future to ensure the message is properly delivered and received by all systems. Once EndTime has expired, the message will no longer be re-distributed in real-time data streams or services.
element	*UndefinedReason*	Reason	1: 1	*Reason* should always be **<UndefinedReason/>**. The field is mandatory due to format spesification, but is not used.
element	Severity	SeverityEnumeration	0: 1	How severely the situation affects public transport services. Possible values: • noImpact • slight • normal (*default*) • severe
element	Priority	xsd:nonNegativeInteger	0: 1	Number value indicating the priority of the situation message. The highest number gives the highest priority.
element	ReportType	ReportTypeEnumeration	1: 1	Type of situation report. The field is required in order to differentiate general information from incidents. Possible values: • general (used for public information not impacting the actual operation of the PT-service. eg. "No food service on this journey") • incident (used for public information impacting the operation of the PT-service. eg. "expect delays due to road construction work")
element	Planned	xsd:boolean	0: 1	Whether the situation in question is due to planned events, or an unexpected incident.
element	Summary	NaturalLanguageStringStructure	1: *	The textual summary of the situation (which is not already described by structured data). One summary per language (if more than one, the *xml:lang* attribute **must** be set). **Maximum 160 characters** (to keep the message readable).

element	Description	NaturalLanguageStringStructure	0: *	Expanded textual description (if more than one, the *xml:lang* attribute **must** be set) of the situation (do not repeat information from Summary, or structured data). Please do not add advice on how to avoid the situation, as this should be presented in the Advice field.
element	Advice	NaturalLanguageStringStructure	0: *	Textual advice (if more than one, the *xml:lang* attribute **must** be set) on how a passenger should react/respond to the situation.
element	InfoLinks	SIRI-SX#InfoLinks	0: 1	Link to a website which has further information on the situation.
element	Affects	SIRI-SX#Affects	1: 1	A description of what the situation affects. Can be blank when message progress is changed to *'closed'*.

SITUATIONSOURCE

Information on the source of the message.

	SituationSource			
	Name	**Type**	**Cardinality**	**Description**
element	SourceType	SourceType	1: 1	Information type Possible values: • directReport *Required by the format spesification, but not used.*

HALFOPENTIMESTAMPRANGESTRUCTURE

Period can be open- or closed-ended,

	HalfOpenTimestampRangeStructure			
	Name	**Type**	**Cardinality**	**Description**
element	StartTime	xsd:dateTime	1: 1	Start time for the period.
element	EndTime	xsd:dateTime	0: 1	End time for the period.

INFOLINKS

Collection of information links

	InfoLinks			
	Name	**Type**	**Cardinality**	**Description**
element	InfoLink	SIRI-SX#InfoLink	1: 1	Link to a website which has further information on the situation.

INFOLINK

Link to a website which has further information on the situation.

	InfoLink			
	Name	**Type**	**Cardinality**	**Description**
element	Uri	xsd:anyUri	1: 1	Link to a website which has further information on the situation.
element	Label	NaturalLanguageStringStructure	0: 1	Label for the link.

AFFECTS

Data objects for closer description of required element affected by the situation.

Affects				
	Name	**Type**	**Cardinality**	**Description**
(choice) element	Networks	SIRI-SX#AffectedNetwork	0: *	Network with operators and lines affected by the situation.
	StopPlaces	SIRI-SX#AffectedStopPlace		Stops affected by the situation.
	StopPoints	SIRI-SX#AffectedStopPoint		Stops affected by the situation, with the possibility of specifying criteria of situation relevance.
	VehicleJourneys	SIRI-SX#AffectedVehicleJourney		Trips affected by the situation.

AFFECTEDNETWORK

References to affected Network element(s).

Please note that VehicleMode and Submode are the same as in Norwegian NeTEx profile, TransportModes

AffectedNetwork				
	Name	**Type**	**Cardinality**	**Description**
element	AffectedOperator	SIRI-SX#AffectedOperatorStructure	0: 1	Reference to affected operator.
element	NetworkRef	xsd:NMTOKEN	1: 1	Reference to affected Network.
element	VehicleMode	VehicleModesOfTransportEnumeration	0: 1	Affected modality. Possible values: - all - air - bus - coach - funicular (please note: does not have a corresponding *submode*) - metro - rail - taxi (please note: does not have a corresponding *submode*) - telecabin (*mapped to til cableway*) (please note: does not have a corresponding *submode*) - tram - water - selfDrive *Modes must be specified together with corresponding submode (when applicable), whenever the situation does not affect all modalities in the affected planned data.*
(choice) element	AirSubmode	AirSubmodesOfTransportEnumeration	0: 1	Possible values: - domesticFlight - helicopterService - internationalFlight
	BusSubmode	BusSubmodesOfTransportEnumeration		Possible values: - airportLinkBus - expressBus - localBusService (mapped to *localBus*) - nightBus - railReplacementBus - regionalBus - schoolBus - shuttleBus - sightseeingBus
	Coach	CoachSubmodesOfTransportEnumeration		Possible values: - internationalCoachService (mapped to *internationalCoach*) - nationalCoachService (mapped to *nationalCoach*) - touristCoachService (mapped to *touristCoach*)
	MetroSubmode	MetroSubmodesOfTransportEnumeration		Possible values: - metro - urbanRailway

	RailSubmode	RailSubmodesOfTransportEnumeration		Possible values: • interbational [*sic*]. *Please note, **the typo** is incorrectly implemented in the official standard. Mapped to 'international'.* • interRegionalRailService (mapped to *interregionalRail*) • local • longDistanceTrain (mapped to *longDistance*) • sleeperRailService (mapped to *nightRail*) • regionalRail • specialTrainService (mapped to *airportLinkRail*) • touristRailway
	TramSubmode	TramSubmodesOfTransportEnumeration		Possible values: • localTramService (mapped to *localTram*)
	WaterSubmode	WaterSubmodesOfTransportEnumeration		Possible values: • highSpeedPassengerService • highSpeedVehicleService • internationalCarFerryService (mapped to *internationalCarFerry*) • internationalPassengerFerry • localCarFerryService (mapped to *localCarFerry*) • localPassengerFerry • nationalCarFerryService (mapped to *nationalCarFerry*) • sightseeingService
(choice) element	AffectedLine	SIRI-SX#AffectedLineStructure	1: *	Reference(s) to affected line(s).
	AllLines	xsd:string (*empty*)	1: 1	Must be stated explicitly *AffectedLine* or *AllLines* due to technical demands on the element in the SIRI standard.

AFFECTEDOPERATORSTRUCTURE

Reference to an affected *Operator*.

		AffectedOperatorStructure		
	Name	**Type**	**Cardinality**	**Description**
element	OperatorRef	xsd:NMTOKEN	1: 1	Reference to an affected operator.

AFFECTEDLINESTRUCTURE

Information about an affected *Line*.

		AffectedLineStructure		
	Name	**Type**	**Cardinality**	**Description**
element	LineRef	xsd:NMTOKEN	1: 1	Reference to *Line* in question (*ID to the corresponding object in the timetable data*).
element	Routes	SIRI-SX#AffectedRoute	1: *	Reference to *Route(s)* in question (*ID to the corresponding object in the timetable data*), when the situation does not apply to the entire Line.

AFFECTEDROUTE

Wrapper object to describe information about a Route affected by the situation.

		AffectedRouteStructure		
	Name	**Type**	**Cardinality**	**Description**
element	AffectedRoute	SIRI-SX#AffectedRouteStructure	1: 1	Reference to *Route* in question (*ID to the corresponding object in the timetable data*).

AFFECTEDROUTESTRUCTURE

Information about an affected Route

AffectedRouteStructure		

	Name	Type	Cardinality	Description
element	RouteRef	xsd:NMTOKEN	0: 1	Reference to *Route* in question (*ID to the corresponding object in the timetable data*).
element	StopPoints	SIRI-SX#AffectedStopPoint	0: *	Reference to affected stop(s) in the affected Line.

AFFECTEDSTOPPOINT

Reference(s) to affected stop(s).

		AffectedStopPoint		
	Name	**Type**	**Cardinality**	**Description**
element	StopPointRef	xsd:NMTOKEN	1: 1	Reference to the Quay in question (ID corresponding to objects in the national stop place registry). *If the quay is currently unknown, or the message applies to **all** quays, a reference to StopPlace may be used instead.*
element	StopPointName	NaturalLanguageStringStructure	0: 1	Name of StopPlace (*Not used, but may be set to increase human readability.*)
element	StopCondition	RoutePointTypeEnumeration	0: *	Specifies which passengers the message applies to, for example, people who are disembarking at an affected stop. Possible values: - exceptionalStop (*for passengers expecting an interchange*) - destination (*for passengers expecting to disembark, of at the last stop*) - notStopping (*when passing a stop*) - requestStop (*when a passenger must request the serving of a stop*) - startPoint (*at departure or when passengers expect to board*) - stop (default - *affects all interactions with the stop (boarding, alighting, arrival, departure, interchanges)*) If this field is left blank or omitted the message will be interpreted as affecting boarding and alighting.

AFFECTEDSTOPPLACE

References to affected stops.

		AffectedStopPlace		
	Name	**Type**	**Cardinality**	**Description**
element	AccessibilityAssessment	SIRI-SX:AccessibilityAssessment	0: 1	Specifies whether the object is still available for users with special needs.
element	StopPlaceRef	xsd:NMTOKEN	1: 1	Reference to StopPlace or specific Quay (ID corresponding to objects in the national stop place registry).
element	PlaceName	NaturalLanguageStringStructure	0: 1	Name of the stop (not used due to the reference to the national stop place registry, but *can* be included to make the XML easier to read).
element	AffectedComponents	SIRI-SX#AffectedComponent	0: *	Reference(s) to which part(s) of the stop(s) are being affected.

ACCESSIBILITYASSESSMENT

Description of (changed) availability as a result of the situation.

		AccessibilityAssessment		
	Name	**Type**	**Cardinality**	**Description**
element	acsb:MobilityImpairedAccess	xsd:boolean	1: 1	Specifies whether the object is still available for users with special needs.
element	acsb:Limitations	acsb:AccessibilityLimitation	1: 1	Specifies limitations for users with special needs.

ACCESSIBILITYLIMITATION

Descriptions of limitations for users with special needs.

*Must be in accordance with **AccessibilityLimitation** for the stop, defined in accordance with the Norwegian NeTEx profile for **stops**.*

AccessibilityLimitation			
	Name	Type	Cardinality	Description
element	WheelchairAccess	AccessibilityEnumeration	1: 1	Possible values: • true • false • unknown
element	StepFreeAccess	AccessibilityEnumeration	1: 1	Possible values: • true • false • unknown
element	EscalatorFreeAccess	AccessibilityEnumeration	1: 1	Possible values: • true • false • unknown
element	LiftFreeAccess	AccessibilityEnumeration	1: 1	Possible values: • true • false • unknown

AFFECTEDCOMPONENT

Complementary information regarding parts of a stop being affected by the situation (for example which quay).

AffectedComponent			
	Name	Type	Cardinality	Description
element	ComponentRef	xsd:NMTOKEN	0: 1	Reference to the Quay in question (ID corresponding to objects in the national stop place registry). *Used if ComponentType is "quay"*
element	ComponentType	ifopt:StopPlaceComponentTypeEnumeration	1: 1	Possible values: • accessSpace • boardingPosition (*only for trains*) • entrance • quay
element	AccessFeatureType	ifopt:AccessibilityFeatureEnumeration	0: 1	Possible values: • escalator • lift • narrowEntrance • ramp • stairs *Used when it necessary to specify limitations for users with special mobility needs.*

AFFECTEDVEHICLEJOURNEY

Reference(s) to affected VehicleJourney(s) with Route.

AffectedVehicleJourney			
	Name	Type	Cardinality	Description
(choice) element	VehicleJourneyRef	xsd:NMTOKEN	1: 1	Reference to affected VehicleJourney (*ID to the corresponding object in the timetable data*).
	FramedVehicleJourneyRef	FramedVehicleJourneyRefStructure		Reference **with date** to affected VehicleJourney (*ID to the corresponding object in the timetable data*).
element	Operator	SIRI-SX#AffectedOperatorStructure	0: 1	Reference to affected Operator (*ID to the corresponding object in the timetable data*). *Not used, but may be set to increase human readability.*

element	LineRef	xsd:NMTOKEN	0: 1	Reference to affected Line (*ID to the corresponding object in the timetable data*).
				Not used, but may be set to increase human readability.
element	Route	SIRI-SX#AffectedRouteStructure	1: *	Reference to affected Route(s) (*ID to the corresponding object in the timetable data*).
				*Mandatory field (due to format implementation), but can be blank if the situation affects **all** stops in AffectedVehicleJourney.*
element	OriginAimedDepartureTime	xsd:dateTime	0: 1	Originally planned departure time (per time table) from the first stop of the departure.

SIRI-VM

The Service Interface for Real Time Information - Vehicle Monitoring

> **Version**
> Current version for **SIRI-VM** is: **v1.0** (*last changed* 01 May 2019)

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This document is part of the Norwegian SIRI Profile and describes datasets and elements used for exchanging **updates on position and status, as well as estimated delays** in the **SIRI Vehicle Monitoring (VM)** real-time format.

SIRI-VM is used to model vehicle-movements and their progress compared to a planned timetable. The data is linked to objects in the planned data by use of ID's, which ensures data quality.

Data requirements

Sending a *ServiceDelivery* of SIRI-VM data must be in accordance with this profile and the **entire dataset should be contained within a *single XML file***.

> When sending *Vehicle Monitoring* data, information should be restricted to the next stop only, that is the current *MonitoredCall* (and *IsCompleteStopSequence* = 'false')

Note that the profile does not present an exhaustive list of all real-time information technically possible to transfer via SIRI-VM, but it lays the foundation for which demands are placed on the datasets in order to meet the demands set by Håndbok N801.

It is permitted for client systems to send more than one *VehicleActivity* per *VehicleMonitoringDelivery*, in order for real-time information to be conflated and be transferred as part of the same *ServiceDelivery*.

The examples associated with this profile are meant to show practical implementations of specific use cases, and can contain supplementary, lack certain data fields, or contain optional data, compared to a full and complete dataset. See SIRI-VM#Komponenter for closer descriptions of the data types, specifications and requirements on the unique elements of the SIRI VM-data.

> *It is a fundamental requirement that valid timetable data (as NeTEx or SIRI-ET-data) is delivered **before** sending in position- and status information as SIRI-VM.*

Components

VehicleMonitoringDelivery

VEHICLEMONITORINGDELIVERY

> A data type for representing vehicle monitoring (for estimated adjustment of times) for one or more *VehicleJourneys*.

VehicleMonitoringDelivery < **ServiceDelivery**				
	Name	**Type**	**Cardinality**	**Description**
attribute	version	xsd:NMTOKEN	1: 1	Version ID for EstimatedTimetableDelivery
element	ResponseTimestamp	xsd:dateTime	1: 1	Timestamp for when the dataset was created/published.
element	VehicleActivity	SIRI-VM#VehicleActivity	1: *	A container element for sending one or more *VehicleActivity* with a timestamp.

VEHICLEACTIVITY

Container-element for returning one or more *VehicleActivity.*

VehicleActivity				
	Name	**Type**	**Cardinality**	**Description**
element	RecordedAtTime	xsd:dateTime	1: 1	Timestamp for when the dataset was created/published.
element	ValidUntilTime	xsd:dateTime	1: 1	Validity-expiration date and time of the dataset.
element	ProgressBetweenStops	SIRI-VM#ProgressBetweenStops	0: 1	Information on the progress of the vehicle between stops.
element	MonitoredVehicleJourney	SIRI-VM#MonitoredVehicleJourney	1: 1	Data object for a real-time monitored *VehicleJourney*.

PROGRESSBETWEENSTOPS

Information on the progress of the vehicle along the current *ServiceLink* or between current-, and next *ScheduledStopPoint.*

ProgressBetweenStops				
	Name	**Type**	**Cardinality**	**Description**
element	Percentage	xsd:decimal	1: 1	How much of the total distance (percentage) that has been traversed at the time of the message.
element	LinkDistance	xsd:decimal	0: 1	Distance in meters between previous and next stop (*MonitoredCall*). *Corresponds to Distance for current ServiceLink, when available.*

MONITOREDVEHICLEJOURNEY

Data objects with elements to describe a real-time monitored VehicleJourney, including supplementary locational information, and data about the current stop.

Used to enrich existing timetable data.

MonitoredVehicleJourney				
	Name	**Type**	**Cardinality**	**Description**
element	LineRef	xsd:NMTOKEN	1: 1	Reference to the Line in question (*ID to the corresponding object in the timetable data*)
element	FramedVehicleJourneyRef	FramedVehicleJourneyRefStructure	1: 1	Reference to VehicleJourney in question. Has a date.
element	VehicleMode	VehicleModesEnumeration	0: 1	Transport types Possible values: • air • bus • coach • ferry (*mapped to "water"*) • metro • rail • tram
element	OperatorRef	xsd:NMTOKEN	0: 1	Reference to Operator in question (ID to the corresponding company in the timetable data)
element	OriginRef	xsd:NMTOKEN	0: 1	Reference to origin Quay in question (ID to the corresponding Quay in the timetable data and national stop place registry)
element	OriginName	NaturalLanguagePlaceNameStructure	0: 1	Name describing the origin of the departure.

element	DestinationRef	xsd:NMTOKEN	0: 1		Reference to destination Quay in question (ID to the corresponding Quay in the timetable data and national stop place registry)
element	DestinationName	NaturalLanguagePlaceNameStructure	0: 1		Name describing the destination of the departure.
element	Monitored	xsd:boolean	0: 1		Whether the vehicle is currently reporting real-time data or not (for example set to *true* when the driver of the vehicle logs on to the system before departing).
element	DataSource	xsd:string	1: 1		Codespace of the data source (see codespace).
element	VehicleLocation	SIRI-VM#Location	1: 1		The position of a vehicle as a geospatial point.
element	Bearing	xsd:float	0: 1		Current compass bearing (direction of VehicleJourney)
element	Occupancy	OccupancyEnumeration	0: 1		Open seats-status. Possible values: • full • seatsAvailable • standingAvailable
element	Delay	xsd:duration	1: 1		Delay-time. *Defined as "PT0S" (0 seconds) when there are no delays.*
element	InCongestion	xsd:boolean	0: 1		Whether the vehicle is affected by traffic jams or other circumstances which may lead to further delays.
element	VehicleStatus	VehicleStatusEnumeration	0: 1		Vehicle status. Possible values: • assigned (*a vehicle has been assigned, but not yet deployed*) • atOrigin (*VehicleJourney has not begun, the vehicle is still at the first stop*) • cancelled • completed (*verification that the VehicleJourney has been completed*) • inProgress • offRoute (*VehicleJourney is taking a detour*)
element	MonitoredCall	SIRI-VM#MonitoredCallStructure	0: 1		Information on the next or current (the vehicle has not yet departed) stop place for a *VehicleJourney*.
element	IsCompleteStopSequence	xsd:boolean	1: 1		**Always** set to 'false' when the submitted data only contains MonitoredCall.

LOCATION

> Specifies location of something.

Location				
	Name	**Type**	**Cardinality**	**Description**
attribute	srsName	xsd:string	0: 1	The reference system for longitude and latitude. If stated, use `WGS84` or if necessary a valid coordinate-reference to the standard used (for example `"EPSG:4326"`).
(choice) element	Longitude Latitude	xsd:decimal xsd:decimal	1: 1	Longitude (-180 to 180) Latitude (-90 to 90)
	Coordinates	xsd:NMTOKENS		Location coordinates. For example: `<gml: pos srsName="urn:ogc:def:crs:EPSG::4326"> -59.123 -45.1254 </gml:pos>` *Note! The stop place registry only accepts WGS84-coordinates.*

MONITOREDCALLSTRUCTURE

> Information regarding the current stop for VehicleJourney (the stop the vehicle is headed to or has stopped at.

MonitoredCallStructure				
	Name	**Type**	**Cardinality**	**Description**
element	StopPointRef	xsd:NMTOKEN	1: 1	Reference to the Quay in question (ID corresponding to objects in the national stop place registry).

element	StopPointName	NaturalLanguageStringStructure	0: 1	Name of the stop (not used due to the reference to the national stop place registry, but *can* be included to make the XML easier to read).
element	VehicleAtStop	xsd:boolean	0: 1	Whether the vehicle is at the stop.
element	VehicleLocationAtStop	SIRI-VM#Location	0: 1	Where the vehicle is at the stop. Used for significant deviations from planned and published information.
element	DestinationDisplay	NaturalLanguageStringStructure	0: 1	Destination text (not but *can* be included to make the XML easier to read).

element	StopPointName			
element	VehicleAtStop			
element	VehicleLocationAtStop	SIRI-VM#Location		
element	DestinationDisplay			