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SIRI
(Service Interface for Realtime Information)

A short introduction on the use of SIRI service

SIRI (Service Interface for Realtime Information)

BaneNOR offers SIRI v2.0 to third parties through the use of HTTP requests

A request/response is offered for the following services:
- PT – Production Timetable
- ET – Estimated Timetable
- SM – Stop Monitoring
- SX – Situation Exchange

The encoding of the URL-request is formulated as:
https://siri.banenor.no/jbv/<SERVICE><PARAMETERS/TOPICS>

SERVICE:
PT: pt/production-timetable.xml
ET: et/EstimatedTimetable.xml
SM: sm/stop-monitoring.xml
SX: sx/SituationExchange.xml

Following in this document is a short description of the filters and elements BaneNOR offers in the different services.

For more sources of SIRI-information please have a look at:
https://www.vdv.de/siri.aspx
https://www.siri.org.uk/schema/schemas.htm
https://enturas.atlassian.net/wiki/spaces/PUBLIC/pages/637370373/General+information+SIRI

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SIRI Production Timetable Service

Used to request a filtered version of the current production timetable (including data from LTP, STP. The service request consists of several filters specifying a concrete subset of the planned journeys.

TopicFiltering:

- **ValidityPeriod** - a period in which the returned journeys must occur. It refers to the departure time at the first stop of each VehicleJourney. If blank the default will be used (which is: "all journeys").

- **OperatorRef** - one or many operators. The journey is selected if one item matches.

- **Lines, LineDirection, DirectionRef, LineRef** - one or many lines with line references and direction references. The journey is selected if one item matches. Both line reference and direction reference are optional. If both parts are given, both parts must match. Given there are more than one filters, the filter conditions are "AND"-joined (all criteria must match in order to select the journey).

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- **DatedTimetableVersionFrame Element**
- LineRef: Line identifier
- DirectionRef: Direction the train is going to
- OperatorRef: Identifier for operator
- ProductCategoryRef: Reference to the product of the journey (eg. Lt)
- ServiceFeatureRef: Reference to the service features of the journey (eg. passengerTrain)
- DatedVehicleJourney. One or many journeys. See DatedVehicleJourneyElement
-
- **DatedVehicleJourney Element**
- DatedVehicleJourneyCode: A reference to the dated vehicle journey that the vehicle is making. Unique within the data horizon.
- DatedCall: One or many calls. See DatedCallElement. Calls are in order (first to last station)

- **DatedCall Element**
- StopPointRef: Reference to a scheduled Stop Point
- StopPointName: Long (and readable) name of the stop point
- RequestStop: Whether the train stops only if requested by passenger. (Default: false)
- AimedArrivalTime. Planned date and time of arrival. Usually omitted at the first stop.
- ArrivalPlatformName: Planned platform for the train to arrive.
- ArrivalBoardingActivity: Type of activities allowed for arriving passengers (default: alighting). One of the following values:
  - "alighting",
  - "noAlighting",
  - "passthru"
- AimedDepartureTime. Planned date and time of departure. Omitted at the last stop
- DeparturePlatformName: Planned platform for the train to depart
- DepartureBoardingActivity: Type of activities allowed for departing passengers (default: alighting). One of the following values:
  - "boarding"
  - "noBoarding",
  - "passthru"

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DatedCall - Extensions

Usually, the output of the production timetable should contain all customer relevant stops of a journey. If a journey contains partial cancellations these shall not be communicated to the requestor. Sometimes it makes sense to inform requestors about cancelled parts of a journey. Thus, there is an extension to the DatedCall element which might provide a

• Cancellation: Whether this call is cancelled or not - default: false

Example:

Show planned routes with operator: VY on the L1 service towards Lillestrøm on the 10 November between 0600 to 2300:

https://siri.banenor.no/jbv/pt/production-timetable.xml?ValidityPeriod.StartTime=2022-11-10T06:00:00Z&ValidityPeriod.EndTime=2022-11-10T23:00:00Z&OperatorRef=VY&Lines.LineDirection.DirectionRef=LLS&Lines.LineDirection.LineRef=L1

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SIRI Estimated Timetable Service

The Estimated Timetable Service is used to inform interested parties about the current status of all known Vehicle Journeys.

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TopicFiltering:

- **PreviewInterval** - Select all journeys for vehicles departing at start station in a period from now until the given duration

- **Lines, LineDirection, DirectionRef, LineRef** - one or many lines with line references and direction references. The journey is selected if one item matches. Both line reference and direction reference are optional. If both parts are given, both parts must match.

- **OperatorRef** - Select journeys based on this operator

- **ServiceFeatureRef** (passengerTrain, goodsTrain)

EstimatedVehicleJourney Element

Each EstimatedVehicleJourney contains an ordered list of EstimatedCall elements as well as other properties.
EstimatedVehicleJourneys are identified by a DatedVehicleJourneyRef element.

-
- **LineRef** - Reference to the line of the vehicle journey
- **VehicleMode** Possible values: air, bus, coach, ferry, metro, rail, tram, underground
- **OperatorRef** - operator e.g.name of train operation company
- **ProductCategoryRef** - The product in short form e.g. "Lx"
- **ServiceFeatureRef** - classification of service (e.g. "passengerTrain")
- **DirectionRef** - Reference to the relative direction of the vehicle journey
- **DatedVehicleJourneyRef** - A reference to the dated vehicle journey that the vehicle is making. Unique within the
- data horizon.
- **RecordedCalls** - Complete Sequence of stops already been visited along the route path.
- **EstimatedCalls** - Complete Sequence of onward stops from the vehicles current position
- **IsCompleteStopSequence** - True if the journey is complete (all stops of the journey are listed) of False if the journey is not complete. The value is always True if the request/response communication pattern is used. In case subscriptions are used along with option "incrementalUpdates" set to true, the value may be "false".

RecordedCall Element
- **StopPointRef** - Reference to a scheduled Stop Point (short code)
- **StopPointName** - long name of stop point
- **AimedArrivalTime** - Planned arrival time - is omitted at the first stop
- **ActualArrivalTime** - The actual observed time of arrival
- **ArrivalPlatformName** - Platform this vehicle is arriving at - omitted at the first stop
- **AimedDepartureTime** - see arrival - omitted at the last stop
- **DeparturePlatformName** - see arrival - omitted at the last stop
- **ActualDepartureTime** - The actual observed time of departure

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- **EstimatedCall Element**
- **StopPointRef** - Reference to a scheduled Stop Point (short code)
- **StopPointName** - long name of stop point
- **RequestStop** - true if the vehicle stops on demand only, otherwise false
- **DestinationDisplay** - destination of the train shown on displays at the given stop point (only present if it differs from the destination of the journey)
- **AimedArrivalTime** - Planned arrival time - is omitted at the first stop.
- **ExpectedArrivalTime** - Expected arrival time - omitted at the first stop.
- **ArrivalPlatformName** - Platform this vehicle is arriving at - omitted at the first stop.
- **ArrivalBoardingActivity** - possible values: alighting, noAlighting, passThru
- **AimedDepartureTime** - see arrival - omitted at the last stop.
- **ExpectedDepartureTime** - see arrival - omitted at the last stop.
- **DeparturePlatformName** - see arrival - omitted at the last stop.
- **DepartureBoardingActivity** - possible values: boarding noBoarding, passThru
- **StopsAtAirport (Extension)** - true if an airport is on the remaining sequence of calls
- **ArrivalStatus / DepartureStatus** - onTime, delayed, arrived, departed. Business Rules already applied - eg. delays of less than 3 minutes are not reported as delays.

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Examples:

Request without filters:
https://siri.banenor.no/jbv/et/EstimatedTimetable.xml

Only show trains for the next 2 hours (2x60M)
https://siri.banenor.no/jbv/et/EstimatedTimetable.xml?PreviewInterval=PT120M

Only show 2H ahead + only the operator: VY
https://siri.banenor.no/jbv/et/EstimatedTimetable.xml?PreviewInterval=PT120M&OperatorRef=VY

Only show 2H ahead + freight trains
https://siri.banenor.no/jbv/et/EstimatedTimetable.xml?PreviewInterval=PT120M&ServiceFeatureRef=freightTrain

Only show 5H ahead + line L1 in the direction Lillestrøm
https://siri.banenor.no/jbv/et/EstimatedTimetable.xml?PreviewInterval=PT300M&Lines.LineDirection.LineRef=L1&Lines.LineDirection.DirectionRef=LLS

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SIRI Stop Monitoring Service

The Stop Monitoring Services (SM) provides stop-centric information about current and forthcoming vehicle arrivals and departures at a Monitoring Point, typically for departures within the next 20-60 minutes for display to the public. The SM service is suited in particular for providing departure boards on all forms of device. A Monitoring Point is identified uniquely by a MonitoringRef.

TopicFiltering:

- **StartTime, PreviewInterval (Time filter)** - The combination of both attributes specifiies a time frame which must contain the expected departure time of the monitored stop visit (if expected departure time is not given, the expected arrival time is used instead). StartTime and PreviewInterval are optional. So there are two special cases:
  - StartTime is not given (but PreviewInterval is given): StartTime is now (the point in time when either request or subscription update occurs)
  - PreviewInterval is not given (but StartTime is given): The end time of the time frame is in infinity The reference time (expected departure or arrival time) must be after the start time

- **LineRef**: Can occur only once. Selects only monitored stop visits for vehicles of the given line.

- **DirectionRef**: Can occur only once. Selects only monitored stop visits for vehicles heading to the given direction. The end station (destination station) of the journey is used to indicate the direction.Intermediate stops are not allowed

- **DestinationRef**: Can occur only once. Selects only monitored stop visits for vehicles heading to the given destination station. Only the end station of the station can be used as destination, no intermediate stop

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- **OperatorRef**: Can occur only once. Selects only monitored stop visits whose operator is matching the given value

- **StopVisitTypes**: Can occur only once. Selects only monitored stop visits that belong to the given type of stops

  - Possible types include

    - all: Stop includes arrival or departure or both

    - arrivals: Train at least arrives (including all stops except those beginning at the monitored location)

    - departures: Train at least departs (including all stops except those ending at the monitored location)

- **MaximumStopVisits**: The maximum number of monitored stop visits to be retrieved. Only vehicles that departs next to now are considered (if the vehicle does not depart, the expected arrival time is used instead of expected departure time)

- **ServiceFeatureRef** (passengerTrain, goodsTrain)

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MonitoredStopVisit Element

The MonitoredStopVisit describes a Call at a sheduled Stop Point by a Vehicle making a monitored vehicle journey including scheduled and/or predicted real-time times.

- **RecordedAtTime** - Time at which data was recorded.
- **ValidUntilTime** - Time until which data is valid.
- **MonitoringRef** - unique identifier of the Monitoring Point

MonitoredVehicleJourney Element

Each MonitoredStopVisit has a MonitoredVehicleJourney element which associates the MonitoredStopVisit with the MonitoredVehicleJourney being made by the Vehicle arriving at the stop.

- **LineRef** - Reference to a Line
- **DirectionRef** - Reference to a Direction the Vehicle is running along the Line. Eg. to Oslo or from Oslo.
- **FramedVehicleJourneyRef** - A reference to the dated vehicle journey that the vehicle is making. Unique within the
- data horizon.
- **VehicleMode** - Possible values: air, bus, coach, ferry, metro, rail, tram, underground
- **PublishedLineName** - Name or Number by which the Line is known to the public.
- **DirectionName** - Name of the relative direction the Vehicle is running along - to Oslo or from Oslo.
- **ProductCategoryRef -** The product in short form e.g. "Lx"
- **ServiceFeatureRef** - classification of service (e.g. "passengerTrain")
- **OriginName** - Name of the origin of the vehicle.
- **PredictionInaccurate** - Boolean flag set to true if the vehicle is standing still unexpectedly or sth else happend
- which made it impossible to provide an accurate prediction
- **DestinationName** - Name of the destination of the vehicle.
- **VehicleRef** - Id of the vehicle (also known as "train id")
- **OperatorRef** - code for the operator of this journey.
- **Via** - Zero or more elements of this name indicate the list of via stations which will be passed by the journey on it's upcoming route
  - **PlaceRef** - Reference to a station name
  - **PlaceName** - Name of the station passed by the journey

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MonitoredCall Element
The MonitoredCall is the stop requested in the request MonitoringRef (Logical Display)

- **VehicleAtStop** - Boolean flag which indicates whether the vehicle is at the stop or not.
- **AimedArrivalTime** - Arrival time of the Vehicle in either the original or Production Timetable.
- **ExpectedArrivalTime** - Estimated time of arrival.
- **ActualArrivalTime** - Observed time of arrival.
- **ArrivalPlatformName** - Platform this vehicle is arriving at.
- **ArrivalBoardingActivity** - Activities allowed for arriving passengers. Possible values: alighting, noAlighting, passthru
- **AimedDepartureTime** - see arrival
- **ExpectedDepartureTime** - see arrival
- **ActualDepartureTime** - Observed time of departure.
- **DeparturePlatformName** - see arrival
- **DepartureBoardingActivity** - Activities allowed for departing passengers. Possible values: boarding, noBoarding, passthru
- **StopsAtAirport (Extension)** - true if an airport is on the remaining sequence of calls
- **ArrivalStatus / DepartureStatus** - onTime, delayed, arrived, departed. Business Rules already applied - eg. Delays of less than 3 minutes are not reported as delays.

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Train Formation as part of the SIRI-SM Response (extension)

If the KARI system knows about formations of a train along its journey this information will be appended to the SIRI-SM response. Additionally, if the operating company provides APC (Automatic Passenger Counting) for this train and sends updated values to the KARI system, these values will be added to the SIRI-SM response as well.

When using the Request/Response communication pattern the most recent train formation and the most recent APC values for the train will be used.

```xml
<Extensions>
  <SiriExtensionsContainer>
    <tf:TrainFormation xmlns:tf="http://www.funkwerk-itk.com/Siri/TrainFormationExport" direction="FROM">
      <tf:Vehicle>
        <tf:TrainPart type="MAIN">
          <tf:Wagon id="74552" type="BMB74" length="22.25" state="OPEN" commercialNumber="5">
            <tf:Passenger>
              <tf:Service category="reservation"/>
            </tf:Passenger>
          </tf:Wagon>
          <tf:Wagon id="74452" type="BPB74" length="18" state="OPEN" commercialNumber="4">
            <tf:Passenger>
              <tf:Service category="bicycle"/>
              <tf:Service category="toddlerCompartment"/>
            </tf:Passenger>
          </tf:Wagon>
          <tf:Wagon id="74352" type="BCMU74" length="21.5" state="OPEN" commercialNumber="3">
            <tf:Passenger>
              <tf:Service category="impairedToilet"/>
              <tf:Service category="toddlerCompartment"/>
              <tf:Service category="wheelchair"/>
            </tf:Passenger>
          </tf:Wagon>
          <tf:Wagon id="74252" type="BPA74" length="21.5" state="OPEN" commercialNumber="2">
            <tf:Passenger>
              <tf:Service category="bicycle"/>
              <tf:Service category="conductor"/>
              <tf:Service category="toddlerCompartment"/>
            </tf:Passenger>
          </tf:Wagon>
          <tf:Wagon id="74152" type="BMA74" length="22.25" state="OPEN" commercialNumber="1">
            <tf:Passenger>
              <tf:Service category="quiet"/>
            </tf:Passenger>
          </tf:Wagon>
        </tf:TrainPart>
        <tf:TrainPart type="MAIN">
          <tf:Wagon id="75518" type="BMB75" length="22.25" state="CLOSED">
            <tf:Passenger/>
          </tf:Wagon>
          <tf:Wagon id="75418" type="BPB75" length="18" state="CLOSED">
            <tf:Passenger/>
          </tf:Wagon>
          <tf:Wagon id="75318" type="BCMU75" length="21.5" state="CLOSED">
            <tf:Passenger/>
          </tf:Wagon>
          <tf:Wagon id="75218" type="BPA75" length="21.5" state="CLOSED">
            <tf:Passenger/>
          </tf:Wagon>
          <tf:Wagon id="75118" type="BMA75" length="22.25" state="CLOSED">
            <tf:Passenger/>
          </tf:Wagon>
        </tf:TrainPart>
      </tf:Vehicle>
    </tf:TrainFormation>
  </SiriExtensionsContainer>
</Extensions>
```

tf:TrainFormation

Attributes

Name	Type	Content
direction	string	TO / FROM - Indicator whether the train is heading to datum or coming from datum
stopPoint	float	Optional float value providing the stopping position of the train in meters. A value of 0.0 indicates that the train stops at the beginning of sector A.

Child Elements
- tf:Vehicle (exactly 1)

tf:Vehicle

Attributes
- none

Child Elements
- tf:TrainPart (1..*)

tf:TrainPart

Attributes

Name	Type	Content
destination	string	Optional human readable name of the station where this train part is going to (eg. if different train parts have different destinations)

Child Elements
- tf:Engine (1..*)
- tf:Wagon (1..*)

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tf:Engine
Represents an engine within the formation.

Attributes

Name	Type	Content
id	string	Optional unique identifier for this wagon - only available if provided by the operating company.
occupancy	number	Optional APC value provided by the operating company. Only available if provided by the operating company and if an identifier for this wagon is available.
type	string	A string value indicating the type of the wagon.
length	float	A floating point value which provides the length in meters of this wagon.
status	open / closed / void / wagonNoLength	Reporting whether this engine wagon is opened or closed for passengers - default: opened. Void is used fo wagons which are physically on the platform but not part of the train - like the wagon arrived with the train but will stay at the station. Wagon length is used for stop point calculation. wagonNoLength is similar to closed but the length is not used for stop point calculation.

Child Elements
- none

tf:Wagon
Attributes

Name	Type	Content
id	string	Optional unique identifier for this wagon - only available if provided by the operating company.
occupancy	number	Optional APC value provided by the operating company. Only available if provided by the operating company and if an identifier for this wagon is available.
type	string	A string value indicating the type of the wagon.
length	float	A floating point value which provides the length in meters of this wagon.
status	open / closed / void / wagonNoLength	Reporting whether this wagon is opened or closed for passengers - default: opened. Void is used for wagons which are physically on the platform but not part of the train - like the wagon arrived with the train but will stay at the station. Wagon length is used for stop point calculation. wagonNoLength is similar to closed but the length is not used for stop point calculation.

Child Elements
- Exactly one of
  - tf:Goods
  - tf:Passenger

tf:Passenger
Represents a wagon for passengers.

Attributes
- None

Child Elements
- For every passenger service that is available in this wagon there is a separate tf:Service element

tf:Goods
Element indicates that this is a goods wagon. Doesn't have any further attributes or child elements.

tf:Service

Attributes

Name	Type	Content
category	string	A string referring to the provided service.

Currently the following service categories are available:

- class1
- class2
- class3
- comfort
- conductor
- quit
- standing
- wheelchair
- bicycle

- couchette
- bed
- chair
- bistro
- restaurant
- foldingSeat
- impairedToilet
- toilet
- businessCompartment

- familyCompartment
- toddlerCompartment
- wlan
- mobileCatering

Child Elements
- none

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Examples:

A request needs to specify a station:

Show trains at Dovre station
https://siri.banenor.no/jbv/sm/stop-monitoring.xml?MonitoringRef=DOV

Dovre for the next 6 hours
https://siri.banenor.no/jbv/sm/stop-monitoring.xml?MonitoringRef=DOV&PreviewInterval=PT360M

Oslo S for the next 6 hours + only VY Gjøvikbanen
https://siri.banenor.no/jbv/sm/stop-monitoring.xml?MonitoringRef=OSL&PreviewInterval=PT360M&OperatorRef=VYG

Oslo S + only the next 2 trains
https://siri.banenor.no/jbv/sm/stop-monitoring.xml?MonitoringRef=OSL&MaximumStopVisits=2

Oslo S + only trains in the direction of Moss
https://siri.banenor.no/jbv/sm/stop-monitoring.xml?MonitoringRef=OSL&DestinationRef=Moss

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SIRI Situation Exchange

TopicFiltering:

- **PreviewInterval** - Select all situations for vehicles departing at start station in a period from now until the given duration

Structure of created situations
Automatically created situations will always refer to a single journey only. If a journey has multiple (partial) cancellations these will be included in a single situation. Such a situation will get the following data assigned:

SituationNumber - A unique identifier for the situation.

ValidityPeriod
Automatically created situations will start at the point in time when the first departure of the journey has been scheduled.
Situations will not get an end of validity assigned. Situations will be closed (by providing an end of validity) when the last stop of the journey is removed from the operating timetable.

UnknownReason - The reason for cancellations cannot be read from TPS, so an unknown reason is assumed

Affects / VehicleJourneys / AffectedVehicleJourney
This element contains the affected vehicle journey including all affected stops. If the situation is related to a fully cancelled journey the element will contain all scheduled stops of the journey.

Consequences
This array contains a consequence element for each affected station. If the TOC provided some information regarding replacement services these services will be listed under the extensions element as well as the provided customer information.

Example:
Situations for the next 6 hours
https://siri.banenor.no/jbv/sx/SituationExchange.xml?PreviewInterval=PT360M

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