CTS SIRI-ET

Service Interface for Real Time Information
Estimated Timetable (ET)

CONSAT
Telematics

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Terms, Acronyms and Abbreviations

Abbreviation	Description
SIRI	Service Interface for Real Time Information, CEN/TS 15531.
Transmodel	An abstract general purpose model for public transport information (CEN TC278, Reference Data Model For Public Transport, ENV12896 revised, june 2001).
CTS	Consat Telematics Solution
Call	A visit by a vehicle to a stop point id. A journey is a series of calls.
Client	See Consumer.
Server	See Producer.
Consumer	A program that connects to an CTS SIRI server to retrieve data.
Producer	A program running within the CTS system that can provide consumers with information in near real-time using documents as defined in the SIRI specification.
CTS	Consat Telematics Solution

1. Introduction

This document contains a description of the CTS SIRI Estimated Timetable service.

2. Scope and Purpose

SIRI as a standard has a large number of features and several optional capabilities. This document is intended to give developers the information needed to use the SIRI functional service Estimated Timetable supplied with CTS. The capabilities and features of the CTS implementation are specified in detail.

3. SIRI Estimated Timetable (ET)

EstimatedTimetableSubscriptionRequest

These are the elements of the EstimatedTimetableSubscriptionRequest that are used in the CTS implementation. Please refer to the appendix for an example document.

Element	Description
SubscriberRef	A client reference that should be requested from Consat Telematics AB. The reference will be returned as SubscriberRef in the EstimatedTimetableDelivery.
SubscriptionIdentifier	An identifier that will be returned as SubscriptionRef in the EstimatedTimetableDelivery. It is up to the client (consumer) to manage and use subscription identifiers if necessary.
InitialTerminationTime	How long this subscription will last before it is terminated by the server. For continuous operation, which is recommended, this value should be far away.
EstimatedTimetableRequest	See below.

The EstimatedTimetableRequest element contains the following elements.

Element	Description
RequestTimestamp	The date and time that the client posted this request. The value is not used by the server.
MessageIdentifier	A unique identifier for the message.

EstimatedTimetableDelivery

These are the elements of the *EstimatedTimeTableDelivery* that are used in the ITS4mobility implementation. Please refer to the appendix for an example document.

Element	Description
ResponseTimestamp	The date and time that the server sent this document.
SubscriberRef	The subscriber (client) reference.
SubscriptionRef	The subscription reference which is the SubscriptionIdentifier that the client supplied in the EstimatedTimetableSubscriptionRequest.
EstimatedJourneyVersionFrame	See below.

The *EstimatedJourneyVersionFrame* element contains the following elements.

Element	Description
RecordedAtTime	The date and time that the information was published.
EstimatedVehicleJourney	See below.

The EstimatedVehicleJourney element contains the following elements.

Element	Description
RecordedAtTime	The date and time that the journey was updated.
LineRef	The line of the journey.
DirectionRef	The direction of the journey.
FramedVehicleJourneyRef	See below.
Cancellation	A boolean indicating if this journey has been cancelled or not. For partial cancellations of a journey RecordedCalls and/or EstimatedCalls are used instead.
VehicleMode	The type of vehicle that is providing the service (bus, tram, ferry etc).
OperatorRef	The reference of the operator running the vehicle.
Monitored	A boolean indicating if this journey is serviced by a vehicle or not. In case the value is false, there might be a vehicle but the system is unable to communicate with it.
Occupancy	Optional. The Occupancy of the vehicle. This element is only available if occupancy data is available from the vehicle(s) in the system.
VehicleRef	Optional. A reference to the vehicle that is assigned to the journey.The availability of this element depends on the server configuration.
RecordedCalls	A list of RecordedCall elements (the full sequence of already served stops in the journey) as described below.
EstimatedCalls	A list of EstimatedCall elements (the full sequence of stops that will be served) as described below.
Extensions	Available CTS extensions as described below.

The FramedVehicleJourneyRef element contains the following elements.

Element	Description
DataFrameRef	The operational date for the journey.
DatedVehicleJourneyRef	Id for the journey.

The RecordedCalls element contains a list of RecordedCall elements. An RecordedCall contains the following elements.

Element	Description
StopPointRef	The stop point that the call is for.
Order	The order of the call within the journey.
AimedArrivalTime	Arrival time according to the time table. This element is not available on the first call of the journey.
ActualArrivalTime	The actual arrival time. This element is not available on the first call of the journey.
AimedDepartureTime	Departure time according to the time table. This element is not available on the last call of the journey.
ActualDepartureTime	The actual departure time. This element is not available on the last call of the journey.

The EstimatedCalls element contains a list of EstimatedCall elements. An EstimatedCall contains the following elements.

Element	Description
StopPointRef	The stop point that the call is for.
Order	The order of the call within the journey.
Cancellation	Optional. A boolean that is true if the call has been cancelled and the stop will not be served.
AimedArrivalTime	Arrival time according to the time table. This element is not available on the first call of the journey.
ExpectedArrivalTime	Forecasted arrival time. This element is not available on the first call of the journey.
ArrivalStatus	Optional.
ArrivalBoardingActivity	Optional.

ArrivalStopAssignment	Optional. Assigned arrival stop point as described below.
AimedDepartureTime	Departure time according to the time table. This element is not available on the last call of the journey.
ExpectedDepartureTime	Forecasted departure time. This element is not available on the last call of the journey.
DepartureStatus	Optional.
DepartureBoardingActivity	Optional.
DepartureStopAssignment	Optional. Assigned departure stop point as described below.
PredictionInaccurate	Whether the vehicle is in congestion or other circumstances that makes the estimated times uncertain. If not, present, not known.
Extensions	Available CTS extensions as described below.

The ArrivalStopAssignment is used when a journey will arrive at another stop point than was planned. The element contains the following elements.

Element	Description
AimedQuayRef	The original planned StopPointRef that the call was for.
ExpectedQuayRef	The expected StopPointRef that the call is for.

The DepartureStopAssignment is used when a journey will depart from another stop point than was planned. The element contains the following elements.

Element	Description
AimedQuayRef	The original planned StopPointRef that the call was for.
ExpectedQuayRef	The expected StopPointRef that the call is for.

3.2.1. EstimatedCalls.Extensions

If the SIRI/ET server is configured to use the EstimatedCall.Extension element then extra information about the call may be available.

An example of the extension element is shown below:

```
<AA:Extensions>
     <CTS xmlns="http://tmix.se/siri">
```

```
        <MandatoryStop>true</MandatoryStop>
        <PrivateStop>true</PrivateStop>
    </CTS >
</AA:Extensions>
```

The Extensions element may contain the following elements:

Element	Description
MandatoryStop	If set to true the vehicle will always stop regardless of alighting and boarding activities. The default value is false.
PrivateStop	If set to true the stop should not be used (announced) for any information purposes. The default value is false.

If there are no extension elements their default values should be assumed.

3.2.2. EstimatedVehicleJourney.Extensions

Note: this is subject to change in the next version of CTS SIRI/ET.

If the SIRI/ET server is configured with the EnableJourneyOccupancyExtension server option then extra occupancy data may be delivered if available. The Extensions element can contain a CTS element with a single Vehicle element with the following content:

Element	Description
PassengerCapacity	See below.
PassengerCount	Current number of passengers on the vehicle.
OccupancyPercent	Percent occupancy on the vehicle. Values range between 0 and 200. The range 0 to 100 is for seated and 100 to 200 for standing.
Element	Description

The PassengerCapacity element contain the following elements:

Element	Description
Seats	Total number of available seats. If Stands exists, it is for seated passengers, otherwise it is the number of passengers the vehicle has room for.
Stands	Total number of available places for standing passengers.

4. Server Configurations

Some settings that are configurable on the server will affect the output from the server.

PublishVehicleRef

If set to ”true”, the EstimatedVehicleJourney.VehicleRef element will be published.

UseCallExtensions

If set to ”true” the EstimatedCall.Extensions element will be published.

UseJourneyExtensions

If set to ”true” the EstimatedVehicleJourney.Extensions element will be published.

5. References

CEN/TS 15531-1:2015 Service interface for real-time information relating to public transport operations: Context and framework.

CEN/TS 15531-2:2015 Service interface for real-time information relating to public transport operations: Communications infrastructure.

CEN/TS 15531-3:2015 Service interface for real-time information relating to public transport operations: Functional service interfaces.

6. Document history

Revision	Date	Comment
1	2014-02-15	Version 1 for SIRI 1.4.
2	2015-02-25	Misc changes.
3	2015-06-22	Misc changes.
4	2017-02-09	Misc changes.
5	2017-03-28	Misc changes.
6	2018-06-02	Misc changes.
7	2020-04-20	Version 7 for SIRI 2.0. Document renamed.

7. Appendix

Example EstimatedTimetableSubscriptionRequest

```
<?xml version="1.0"?>
<AE:Siri xmlns:AE="http://www.siri.org.uk/siri"
xmlns:AC="http://datex2.eu/schema/1_0/1_0" xmlns:AB="http://www.ifopt.org.uk/ifopt"
xmlns:AD="http://www.ifopt.org.uk/acsb" xmlns:xs="http://www.w3.org/2001/XMLSchema-
instance" version="2.0">
  <AE:SubscriptionRequest>
    <AE:RequestTimestamp>2015-02-20T17:41:39</AE:RequestTimestamp>
    <AE:RequestorRef>ITS4mobilityTestClient</AE:RequestorRef>
    <AE:MessageIdentifier> d8984743-c99b-4189-9a35-251f995ac88f</AE:MessageIdentifier>
    <AE:ConsumerAddress>http://192.168.4.15:80/siri/client/</AE:ConsumerAddress>
    <AE:SubscriptionContext>
      <AE:HeartbeatInterval>PT1M</AE:HeartbeatInterval>
    </AE:SubscriptionContext>
    <AE:EstimatedTimetableSubscriptionRequest>
      <AE:SubscriberRef>ITS4mobilityTestClient</AE:SubscriberRef>
      <AE:SubscriptionIdentifier>ITS4mobilityTestClient</AE:SubscriptionIdentifier>
      <AE:InitialTerminationTime>9999-12-31T23:59:59.999</AE:InitialTerminationTime>
      <AE:EstimatedTimetableRequest version="2.0">
        <AE:RequestTimestamp>2015-02-20T17:41:39</AE:RequestTimestamp>
      </AE:EstimatedTimetableRequest>
    </AE:EstimatedTimetableSubscriptionRequest>
  </AE:SubscriptionRequest>
</AE:Siri>
```

Example EstimatedTimetableDelivery

```
<?xml version="1.0"?>
<AA:Siri xmlns:AA="http://www.siri.org.uk/siri"
xmlns:xs="http://www.w3.org/2001/XMLSchema-instance">
  <AA:ServiceDelivery>
    <AA:ResponseTimestamp>2019-10-23T13:20:16.81</AA:ResponseTimestamp>
    <AA:ProducerRef>CSELR-SIRI</AA:ProducerRef>
    <AA:RequestMessageRef>d8984743-c99b-4189-9a35-251f995ac88f</AA:RequestMessageRef>
    <AA:EstimatedTimetableDelivery>
      <AA:ResponseTimestamp>2019-10-23T13:20:16.82</AA:ResponseTimestamp>
      <AA:SubscriptionRef>TfNSW-SIRI-MB-SI</AA:SubscriptionRef>
      <AA:EstimatedJourneyVersionFrame>
        <AA:RecordedAtTime>2018-09-16T10:15:25</AA:RecordedAtTime>
        <AA:EstimatedVehicleJourney>
          <AA:LineRef>line-ref</AA:LineRef>
          <AA:DirectionRef>direction-ref</AA:DirectionRef>
          <AA:FramedVehicleJourneyRef>
            <AA:DataFrameRef>2018-09-16T04:00:00</AA:DataFrameRef>
            <AA:DatedVehicleJourneyRef>dated-vehicle-journey-
ref</AA:DatedVehicleJourneyRef>
          </AA:FramedVehicleJourneyRef>
          <AA:OriginRef>origin-ref</AA:OriginRef>
          <AA:DestinationRef>destination-ref</AA:DestinationRef>
```

```
          <AA:Monitored>true</AA:Monitored>
          <AA:Occupancy>seatsAvailable</AA:Occupancy>
          <AA:VehicleRef>vehicle-ref</AA:VehicleRef>
          <AA:RecordedCalls>
            <AA:RecordedCall>
              <AA:StopPointRef>stop-point-ref</AA:StopPointRef>
              <AA:VisitNumber>1</AA:VisitNumber>
              <AA:ActualArrivalTime>2019-10-23T13:20:16.854</AA:ActualArrivalTime>
              <AA:ActualDepartureTime>2019-10-23T13:20:16.854</AA:ActualDepartureTime>
            </AA:RecordedCall>
          </AA:RecordedCalls>
          <AA:EstimatedCalls>
            <AA:EstimatedCall>
              <AA:StopPointRef>stop-point-ref</AA:StopPointRef>
              <AA:VisitNumber>1</AA:VisitNumber>
              <AA:Occupancy>seatsAvailable</AA:Occupancy>
              <AA:AimedArrivalTime>2019-10-23T13:20:16.851</AA:AimedArrivalTime>
              <AA:ExpectedArrivalTime>2019-10-23T13:20:16.851</AA:ExpectedArrivalTime>
              <AA:ArrivalStatus>onTime</AA:ArrivalStatus>
              <AA:AimedDepartureTime>2019-10-23T13:20:16.852</AA:AimedDepartureTime>
              <AA:ExpectedDepartureTime>2019-10-
23T13:20:16.852</AA:ExpectedDepartureTime>
              <AA:DepartureStatus>onTime</AA:DepartureStatus>
            </AA:EstimatedCall>
          </AA:EstimatedCalls>
        </AA:EstimatedVehicleJourney>
      </AA:EstimatedJourneyVersionFrame>
    </AA:EstimatedTimetableDelivery>
  </AA:ServiceDelivery>
</AA:Siri>
```

EstimatedCall Extension Schema

```
<?xml version="1.0" encoding="utf-8" ?>
<xs:schema xmlns="http://tmix.se/siri" attributeFormDefault="unqualified"
elementFormDefault="qualified" targetNamespace="http://tmix.se/siri"
xmlns:xs="http://www.w3.org/2001/XMLSchema">
    <xs:element name="CTS">
      <xs:complexType>
          <xs:sequence>
            <xs:element name="MandatoryStop" type="xs:boolean" default="false"
                        minOccurs="0">
              <xs:annotation>
                <xs:documentation>If the vehicle will always stop.
                                  Default is false. ArrivalBoardingActivity and
                                  DepartureBoardingActivity should still be
                                  observed.</xs:documentation>
              </xs:annotation>
            </xs:element>
```

```
            <xs:element name="PrivateStop" type="xs:boolean" default="false"
                        minOccurs="0">
              <xs:annotation>
                <xs:documentation>If the stop is private or not.
                                  Default is false, the stop is
                                  public.</xs:documentation>
              </xs:annotation>
            </xs:element>
          </xs:sequence>
        </xs:complexType>
      </xs:element>
</xs:schema>
```

The EstimatedVehicleJourney.Extensions Schema

```
<?xml version="1.0" encoding="utf-8" ?>
<xs:schema xmlns="http://tmix.se/siri/et/evj" targetNamespace="http://tmix.se/siri/et/evj"
xmlns:xs="http://www.w3.org/2001/XMLSchema" attributeFormDefault="unqualified"
elementFormDefault="qualified">


    <xs:element name="CTS">
      <xs:complexType>
        <xs:sequence>

          <xs:element name="Vehicle" minOccurs="0">
            <xs:complexType>
              <xs:sequence>

                <xs:element name="PassengerCapacity" minOccurs="0">
                  <xs:complexType>
                    <xs:sequence>

                      <xs:element name="Seats" type="xs:int" minOccurs="0">
                        <xs:annotation>
                          <xs:documentation>Total number of available seats. If AvailableStands exists, it
is for seated passengers, otherwise it is the number of passengers the vehicle has room
for.</xs:documentation>
                        </xs:annotation>
                      </xs:element>

                      <xs:element name="Stands" type="xs:int" minOccurs="0">
                        <xs:annotation>
                          <xs:documentation>Total number of available places for standing
passengers.</xs:documentation>
                        </xs:annotation>
                      </xs:element>

                    </xs:sequence>
                  </xs:complexType>
                </xs:element>

                <xs:element name="PassengerCount" type="xs:int" minOccurs="0">
```

```
                <xs:annotation>
                  <xs:documentation>Current number of passengers on the vehicle.</xs:documentation>
                </xs:annotation>
              </xs:element>

              <xs:element name="OccupancyPercent" type="xs:int" minOccurs="0">
                <xs:annotation>
                  <xs:documentation>
                    Percent occupancy on the vehicle. Values range between 0 and 200. The range 0 to 100
is for seated and 100 to 200 for standing.
                  </xs:documentation>
                </xs:annotation>
              </xs:element>

            </xs:sequence>
          </xs:complexType>
        </xs:element>

        </xs:sequence>
      </xs:complexType>
    </xs:element>

</xs:schema>
```