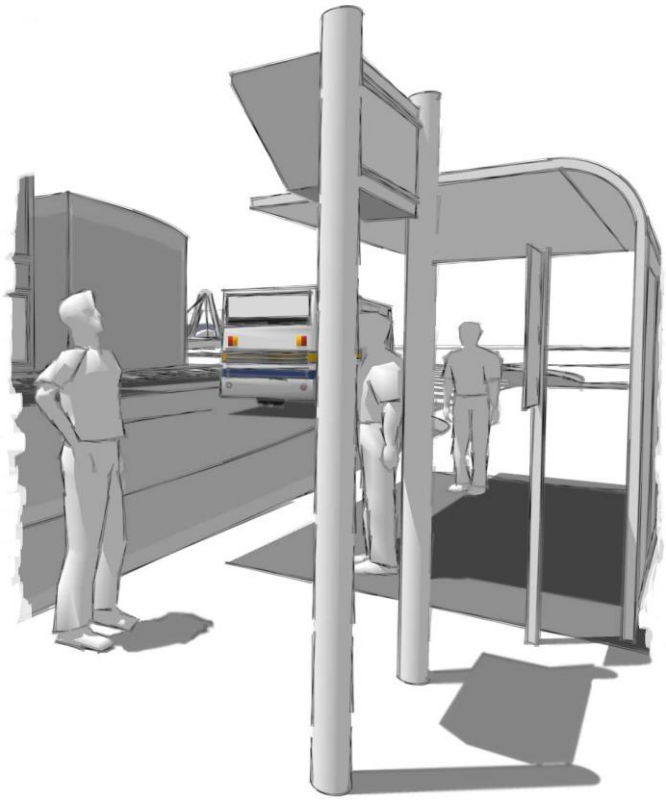
CONSAT
Telematics

ITS4mobility SIRI-ET

Service Interface for Real Time Information
EstimatedTimetable (ET)



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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).
I4M	ITS4Mobility
Call	A visit by a vehicle to a stop point id. A journey is a series of calls.
Client	A program that connects to an ITS4mobility SIRI server.
Server	A program running within the ITS4mobility system that can provide clients with information in near real-time using documents as defined in the SIRI specification.

1. Introduction

This document contains a description of the ITS4mobility SIRI Estimated Timetable module.

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 ITS4mobility. The capabilities and features of the ITS4mobility implementation are specified in detail.

3. SIRI Estimated Timetable (ET)

3.1. EstimatedTimetableSubscriptionRequest

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

Element	**Description**
SubscriberRef	A client reference, which can be any string. Will be returned in the *EstimatedTimetableDelivery*.
SubscriptionIdentifier	An identifier that will be returned as *SubscriptionRef* in the *EstimatedTimetableDelivery*.
InitialTerminationTime	How long this subscription will last before it is terminated by the server. For continuous operation this value should be far away.
ChangeBeforeUpdates	How much an estimated call must differ from a previously estimated call to trigger an update and new service delivery. The recommended setting is 20 seconds (PT20S).
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.
PreviewInterval	How far ahead data will be delivered. The recommended setting is 24 hours (PT24H). Since ITS4mobility is a real time system, data will not always be available this far ahead.

3.2. 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*.
ValidUntil	How long the data in the document is valid. Since a new document will be posted as soon as there is a change, this value is always set to cover a very large timespan and should be ignored by the client.
EstimatedJourneyVersionFrame	See below.

The *EstimatedJourneyVersionFrame* element contains the following elements.

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

The *EstimatedVehicleJourney* element contains the following elements.

Element	**Description**
LineRef	The line of the journey.
DirectionRef	The direction of the journey. *The use of this element depends on the server setting for UseDirectionRef.*
DatedVehicleJourneyRef	A reference to the instance of the journey. *The use of this element depends on the server setting for UseDatedVehicleJourneyIndirectRef.*
DatedVehicleJourneyIndirectRef	See below. *The use of this element depends on the server setting for UseDatedVehicleJourneyIndirectRef.*
Cancellation	A boolean indicating if this journey has been cancelled or not.
VehicleMode	The type of vehicle that is providing the service (bus, tram, ferry etc).
OperatorRef	The reference of the operator running the vehicle.
VehicleFeatureRef	One or more features of the vehicle running the journey. Vehicle features must be supplied to the ITS4mobility system by the customer using an agreed upon process. ITS4mobility supports the following features from the SIRI standard that are also TPEG compliant:

	1. lowFloor 2. suitableForWheelChairs 3. audioInformation 4. visualInformation 5. suitableForWheelChairs In addition, ITS4mobility also support the following features: 6. rampOrLift 7. toilet 8. strollerSpace 9. transportWheelchair 10. transportWheelchairSecureAttachment 11. has<n>WheelchairSpaces
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.
BlockRef	A reference to the block which the journey is a part of.
Occupancy	The Occupancy of the vehicle. This element is only available if the server option *EnableJourneyOccupancyExtension* is set.
VehicleRef	A reference to the vehicle that is assigned to the journey. *The use of this element depends on the server setting for PublishVehicleRef.*
EstimatedCalls	A list of *EstimatedCall* elements as described below.
Extensions	Occupancy data as an extension as described below.

The *DatedVehicleJourneyIndirectRef* element (if present) contains the following elements.

Element	**Description**
OriginRef	The first stop point for the journey.
AimedDepartureTime	Departure time from the first stop point according to the time table.
DestinationRef	The destination stop point for the journey.
AimedArrivalTime	Arrival time to the destination stop point according to the time table.

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	A boolean that is true if the call has been cancelled.
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.
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.
PredictionInaccurate	Whether the vehicle is in congestion. If not, present, not known.

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>
    <ITS4mobility xmlns="http://tmix.se/siri">
        <MandatoryStop>true</MandatoryStop>
        <PrivateStop>true</PrivateStop>
    </ITS4mobility>
</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

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 an ITS4mobility 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.

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:

4.1. UseDirectionRef

If set to “true”, the direction from the planned traffic database will be used to populate the *DirectionRef* element of the *EstimatedVehicleJourney* element.

If set to “false”, the value of the *DirectionRef* element will always be “unknown”.

4.2. UseDatedVehicleJourneyIndirectRef

If set to “true”, the *DatedVehicleJourneyRef* element will be used to identify the journey.

If set to “false”, the *DatedVehicleJourneyIndirectRef* will be used to identify the journey.

4.3. UseJourneyAndCallNotes

If set to “true”, the *EstimatedVehicleJourney.JourneyNote* element will be used if there are notes available for the journey.

If set to “true”, the *EstimatedVehicleJourney.EstimatedCalls*.*EstimatedCall.CallNote* element will be used if there are notes available for the call.

4.4. PublishVehicleRef

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

4.5. UseCallExtensions

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

4.6. EnableJourneyOccupancyExtension

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

5. References

CEN/TS 15531-1:2007 Service interface for real-time information relating to public transport operations: Context and framework.

CEN/TS 15531-2:2007 Service interface for real-time information relating to public transport operations: Communications infrastructure.

CEN/TS 15531-3:2007 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.
2	2015-02-25	Version 2. Fixed error in example of an EstimatedTimetableSubscriptionRequest.
3	2015-06-22	Added description of PredictionInaccurate.
4	2017-02-09	Added VehicleRef as configurable element.
5	2017-03-28	Added ArrivalBoardingActivity to EstimatedCall. Added DepartureBoardingActivity to EstimatedCall. Added optional Extensions.ITS4mobility to EstimatedCall with optional elements MandatoryStop and PrivateStop. Added section 7.3 EstimatedCall Extension Schema. Updated section 7.2 Example EstimatedTimetableDelivery with a new example. Added section 4.5 UseCallExtensions Updated section 3.2. EstimatedTimetableDelivery with information on added elements. Added section 3.2.1EstimatedCalls.Extensions.
6	2018-06-02	Added occupancy information.

7. Appendix

7.1. 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="1.4">
  <AE:SubscriptionRequest>
    <AE:RequestTimestamp>2015-02-20T17:41:39</AE:RequestTimestamp>
    <AE:RequestorRef>ITS4mobilityTestClient</AE:RequestorRef>
    <AE:MessageIdentifier>ITS4mobilityTestClientMID</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="1.4">
        <AE:RequestTimestamp>2015-02-20T17:41:39</AE:RequestTimestamp>
        <AE:PreviewInterval>PT24H</AE:PreviewInterval>
      </AE:EstimatedTimetableRequest>
      <AE:IncrementalUpdates>false</AE:IncrementalUpdates>
      <AE:ChangeBeforeUpdates>PT20S</AE:ChangeBeforeUpdates>
    </AE:EstimatedTimetableSubscriptionRequest>
  </AE:SubscriptionRequest>
</AE:Siri>
```

7.2. Example EstimatedTimetableDelivery

```
<?xml version="1.0"?>
<AA:Siri xmlns:AA="http://www.siri.org.uk/siri" version="1.4">
    <AA:ServiceDelivery>
        <AA:ResponseTimestamp>2017-03-28T00:59:50</AA:ResponseTimestamp>
        <AA:ProducerRef>ITS4mobility-ET</AA:ProducerRef>
        <AA:EstimatedTimetableDelivery xs:type="AA:EstimatedTimetableDeliveryStructure" version="1.4">
            <AA:ResponseTimestamp>2017-03-28T00:59:50</AA:ResponseTimestamp>
            <AA:SubscriberRef>ITS4mobilityTestClient</AA:SubscriberRef>
            <AA:SubscriptionRef>ITS4mobilityTestClient</AA:SubscriptionRef>
            <AA:ValidUntil>9999-12-31T23:59:59</AA:ValidUntil>
            <AA:EstimatedJourneyVersionFrame xs:type="AA:EstimatedVersionFrameStructure">
                <AA:RecordedAtTime>2017-03-28T00:59:50</AA:RecordedAtTime>
                <AA:EstimatedVehicleJourney>
                    <AA:LineRef>83</AA:LineRef>
                    <AA:DirectionRef>2</AA:DirectionRef>
                    <AA:DatedVehicleJourneyRef>5905928_82569</AA:DatedVehicleJourneyRef>
                    <AA:Cancellation>false</AA:Cancellation>
                    <AA:VehicleMode>bus</AA:VehicleMode>
                    <AA:OperatorRef xs:type="AA:OperatorRefStructure">35</AA:OperatorRef>
                    <AA:Monitored>true</AA:Monitored>
                    <AA:BlockRef>8301</AA:BlockRef>
                    <AA:EstimatedCalls>
                        <AA:EstimatedCall>
                            <AA:StopPointRef>012011146</AA:StopPointRef>
                            <AA:Order>1</AA:Order>
                            <AA:Cancellation>false</AA:Cancellation>
                            <AA:PredictionInaccurate>false</AA:PredictionInaccurate>
                            <AA:AimedDepartureTime>2017-03-28T00:30:00</AA:AimedDepartureTime>
                            <AA:ExpectedDepartureTime>2017-03-28T00:30:00</AA:ExpectedDepartureTime>
                            <AA:DepartureBoardingActivity>boarding</AA:DepartureBoardingActivity>
                        </AA:EstimatedCall>
                        <AA:EstimatedCall>
                            <AA:StopPointRef>012011145</AA:StopPointRef>
                            <AA:Order>2</AA:Order>
                            <AA:Cancellation>false</AA:Cancellation>
                            <AA:PredictionInaccurate>false</AA:PredictionInaccurate>
                            <AA:AimedArrivalTime>2017-03-28T00:31:00</AA:AimedArrivalTime>
                            <AA:ExpectedArrivalTime>2017-03-28T00:31:00</AA:ExpectedArrivalTime>
                            <AA:ArrivalBoardingActivity>alighting</AA:ArrivalBoardingActivity>
                            <AA:AimedDepartureTime>2017-03-28T00:31:00</AA:AimedDepartureTime>
                            <AA:ExpectedDepartureTime>2017-03-28T00:31:00</AA:ExpectedDepartureTime>
                            <AA:DepartureBoardingActivity>boarding</AA:DepartureBoardingActivity>
                        </AA:EstimatedCall>
                        <AA:EstimatedCall>
                            <AA:StopPointRef>012011141</AA:StopPointRef>
                            <AA:Order>3</AA:Order>
                            <AA:Cancellation>false</AA:Cancellation>
                            <AA:PredictionInaccurate>false</AA:PredictionInaccurate>
                            <AA:AimedArrivalTime>2017-03-28T00:32:00</AA:AimedArrivalTime>
                            <AA:ExpectedArrivalTime>2017-03-28T00:32:00</AA:ExpectedArrivalTime>
                            <AA:ArrivalBoardingActivity>alighting</AA:ArrivalBoardingActivity>
                            <AA:AimedDepartureTime>2017-03-28T00:32:00</AA:AimedDepartureTime>
                            <AA:ExpectedDepartureTime>2017-03-28T00:32:00</AA:ExpectedDepartureTime>
                            <AA:DepartureBoardingActivity>boarding</AA:DepartureBoardingActivity>
                            <AA:Extensions>
                                <ITS4mobility xmlns="http://tmix.se/siri">
                                    <MandatoryStop>true</MandatoryStop>
                                    <PrivateStop>true</PrivateStop>
                                </ITS4mobility>
                            </AA:Extensions>
                        </AA:EstimatedCall>
                    </AA:EstimatedCalls>
                    <AA:IsCompleteStopSequence>true</AA:IsCompleteStopSequence>
                </AA:EstimatedVehicleJourney>
            </AA:EstimatedJourneyVersionFrame>
        </AA:EstimatedTimetableDelivery>
    </AA:ServiceDelivery>
</AA:Siri>
```

7.3. 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="ITS4mobility">
      <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>
```

7.4. 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="ITS4mobility">
      <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>
```