XML Format and Schema – Communication between EGTRAIN & Route Choice   
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This document describes a proposed XML format for the communication between EGTRAIN and the Route Choice Function. Initially, EGTRAIN provides the route choice with the passengers’ origin, destination, and departure time for a specific trip\_id. The route choice then responds with the passengers route choice for said trip\_id. Each trip is divided into legs, which correspond to the number of transfers. A trip can be composed by a undefined number of legs, which adds flexibility to the XML format and is more adaptable to different scenarios. Each leg includes the leg index, the leg boarding station, the leg alighting station and the leg rail service line that the passenger will take. This XML format was created based on the EGTRAIN passenger module process, the example route choice output .csv files from DTU for the French case study, as well as the outcomes and feedback of the SortedMobility team.

1. Message from EGTRAIN to Route Choice

XML format:

<person person\_id="0" trip\_id="1">

<origin>Guingamp</origin>

<destination>Paimpol</destination>

<departure\_time>18:20</departure\_time>

</person>

XML schema (XSD):

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">

<xs:element name="person">

<xs:complexType>

<xs:sequence>

<xs:element name="origin" type="xs:string"/>

<xs:element name="destination" type="xs:string"/>

<xs:element name="departure\_time" type="xs:dateTime"/>

</xs:sequence>

<xs:attribute name="person\_id" type="xs:string" use="required"/>

<xs:attribute name="trip\_id" type="xs:string" use="required"/>

</xs:complexType>

</xs:element>

</xs:schema>

Notes:   
In this scenario, the Route Choice function receives the XML data from EGTRAIN as input to determine the route choice of the passenger. The route choice function would then extract the person\_id and the trip\_id attributes to identify the passenger and their trip, and use the sub-elements as inputs for the route choice function of a specific trip made by the passenger to determine the passengers route choice. The sub-elements, origin, destination, and departure\_time, are found in the passenger database of the passenger module in EGTRAIN. The route choice function then gets the total travel time by train (TT\_train) based on the planned timetable or the currently implemented RTTP, which it receives as a GTFS timetable.

1. Message from Route choice to EGTRAIN

XML Format:

<person>

<person\_id>0</person\_id>

<trip\_id>1</trip\_id>

<transfer\_count>2</transfer\_count>

<leg>

<leg\_index>1</leg\_index>

<leg\_boarding\_station>Station A</leg\_boarding\_station>

<leg\_alighting\_station>Station B</leg\_alighting\_station>

<leg\_railservice\_line>Red Line</leg\_railservice\_line>

</leg>

<leg>

<leg\_index>2</leg\_index>

<leg\_boarding\_station>Station B</leg\_boarding\_station>

<leg\_alighting\_station>Station C</leg\_alighting\_station>

<leg\_railservice\_line>Green Line</leg\_railservice\_line>

</leg>

</person>

XML schema (XSD):

<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">

<xs:element name="person">

<xs:complexType>

<xs:sequence>

<xs:element name="person\_id" type="xs:integer"/>

<xs:element name="trip\_id" type="xs:integer"/>

<xs:element name="transfer\_count" type="xs:integer"/>

<xs:element name="leg" maxOccurs="unbounded">

<xs:complexType>

<xs:sequence>

<xs:element name="leg\_index" type="xs:integer"/>

<xs:element name="leg\_boarding\_station" type="xs:string"/>

<xs:element name="leg\_alighting\_station" type="xs:string"/>

<xs:element name="leg\_railservice\_line" type="xs:string"/>

</xs:sequence>

</xs:complexType>

</xs:element>

</xs:sequence>

</xs:complexType>

</xs:element>

</xs:schema>

Notes:

In this scenario, the EGTRAIN passenger module that receives this XML data from the Route Choice is used for the assignment of the passengers to train services as well as tracking the passenger movement through the network. For example, the EGTRAIN passenger module uses the person\_id and trip\_id attributes to identify a specific person and trip within the simulation. The transfer count attribute specifies the number of transfers that the passenger will take during that trip. The leg attribute contains the leg\_index, leg\_boarding\_station, leg\_alighting\_station, and leg\_railservice\_line sub-elements. These sub-elements are then used alongside the departure time to assign the passengers to a specific railway service. By considering legs portions of trips, the XML file is more flexible and can consider an undefined number of legs per trip. Meaning that each passenger could take any number of transfers within their trip.