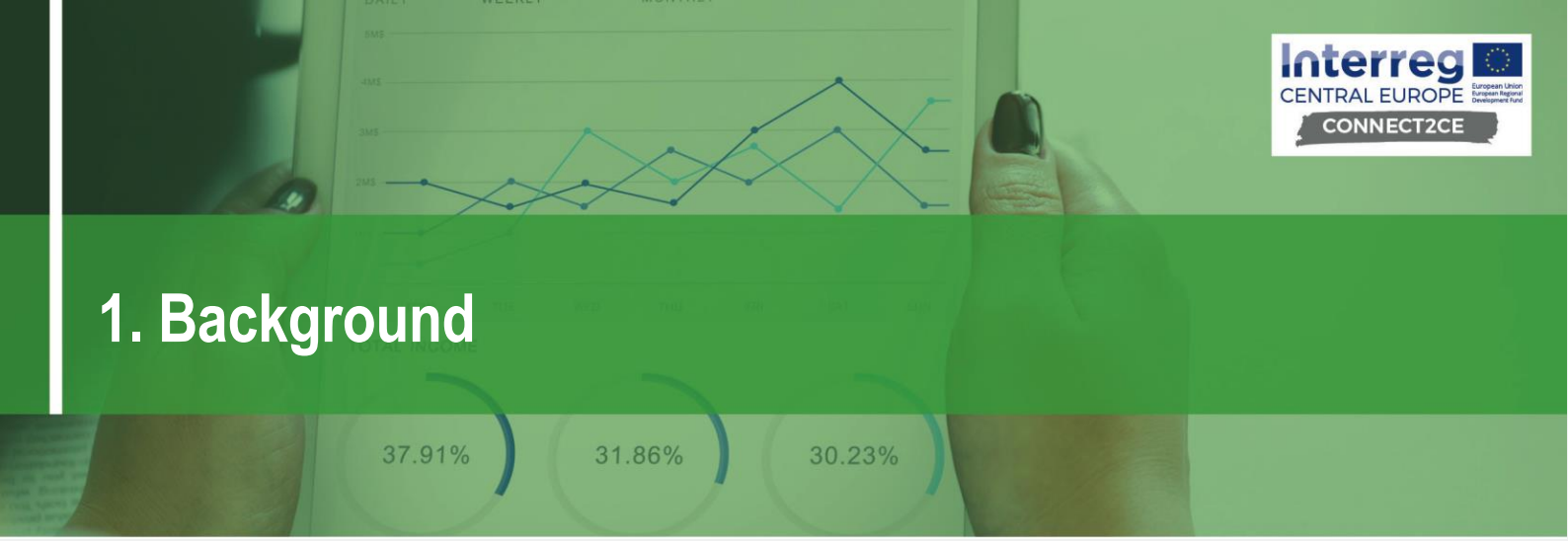
TOOLBOX

DELIVERABLE D.T3.2.3

TRANSNATIONAL TOOLBOX FOR IMPLEMENTING INFO-MOBILITY SYSTEMS IN CENTRAL EUROPE

Version 4.0

122019



1. Background

ABOUT THE PROJECT

CONNECT2CE project has worked on analysis of the current situation of Central Europe peripheral and cross-border accessibility to regional/national/European networks and hubs in order **to provide tools and toolboxes to help decision makers take the measures and prepare specific projects for gradual improvement of the situation**. A role of decision makers can be taken by any entity, authorised for improvement of cross-border public transport, i.e. public authority, transport agency or transport operator.

The aim of transnational toolboxes is to facilitate improvement of peripheral and cross-border accessibility in Central Europe to regional, national and European networks and hubs.

The objective of the transnational toolboxes is **to provide practical guidance** for public authorities and passenger transport operators **for implementation of measures to improve public transport in the area**.

Objective of transnational tools is to provide the user with identification of different options when strategically planning improvement of cross-border public transport connectivity and suggestions to choose among them (**WHAT TO DO**). The tools are available on EUSurvey web platform:

https://ec.europa.eu/eusurvey/runner/CONNECT2CE_Transnational_tool.

The toolbox gives the user practical guidelines on implementation of improvement system or service in cross-border public transport – **HOW TO DO a project implementation plan**.

2. Toolbox structure

Three different Toolboxes are implemented, to cover the three main topics addressed by CONNECT2CE:

*Toolbox for improving **regional and cross-border railway and public transport connections** in Central Europe*	*Toolbox for applying **multimodal integrated tariff schemes and ticketing** in Centrral Europe*	*Toolbox for implementing **info-mobility systems** in Central Europe*

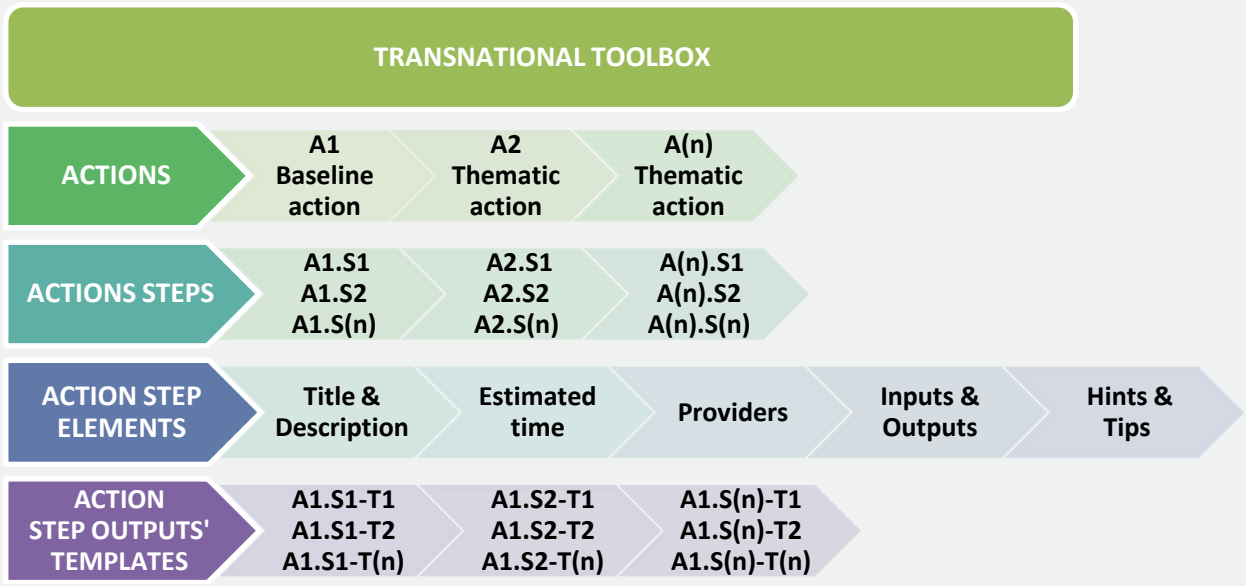
Both, tools and toolboxes together form an aggregated transnational toolbox that answers both questions – **WHAT AND HOW to implement** when taking **measures for improvement of peripheral and cross-border transport accessibility**.

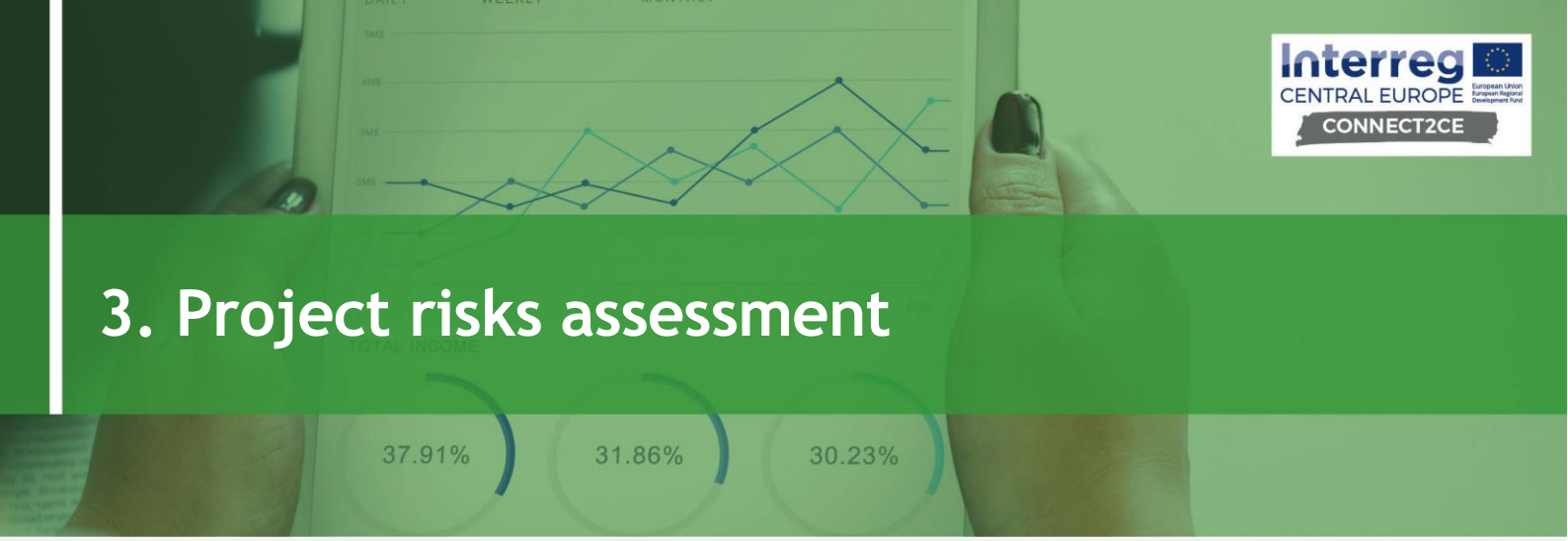
The toolbox is composed of **toolbox actions**. Each action is further **divided to several steps**, related to the thematic field of the particular toolbox. **Toolbox steps** are actually suggested activities for completing the toolbox actions. A particular focus is cast to a **"Project implementation risks assessment" step** for being a **baseline step** to be taken before starting implementation any thematic project activity.

Normally, the **steps** need to be taken in accordance with the time plan but they **can** still **be regarded and implemented independently** taking into consideration of the level of the already implemented integration steps (activities). For implementation of the action **not always all steps are necessary to take**.

The **toolbox is composed of three sections**:

- **toolbox outline**; giving overview of the toolbox (List of contents),
- **description of actions and steps**,
- **tables of contents** and descriptions of output documents; the **templates for all steps** are collected **in the appendix**.





3. Project risks assessment

A particular focus is cast to a **"Project implementation risks assessment" step** for being a **baseline step** to be taken before starting implementation any thematic project activity. This deals with the assessment of risks and barriers that can substantially affect feasibility of implementation of a cross-border project and identification of measures for risks mitigation. Risks and barriers to harmonisation of multimodal cross-border public transport systems and facilities are usually similar for the entire Central Europe area.

To tackle such risks and barriers, it is important to **identify differences on each side of the border** that can represent obstacle for implementation in terms of e.g.: funding of public transport systems, responsibilities of transport authorities (national, regional level), tendering procedures and practices, development planning horizons (e.g. 15 years strategic planning horizon in Germany), commitment to bilateral agreements, technical backgrounds and existing solutions, organisational backgrounds, cultural characteristics, availability of financial resources etc. **Good practices** from other cross-border projects and experiences from previous cooperation in this cross-border area should be taken into consideration.

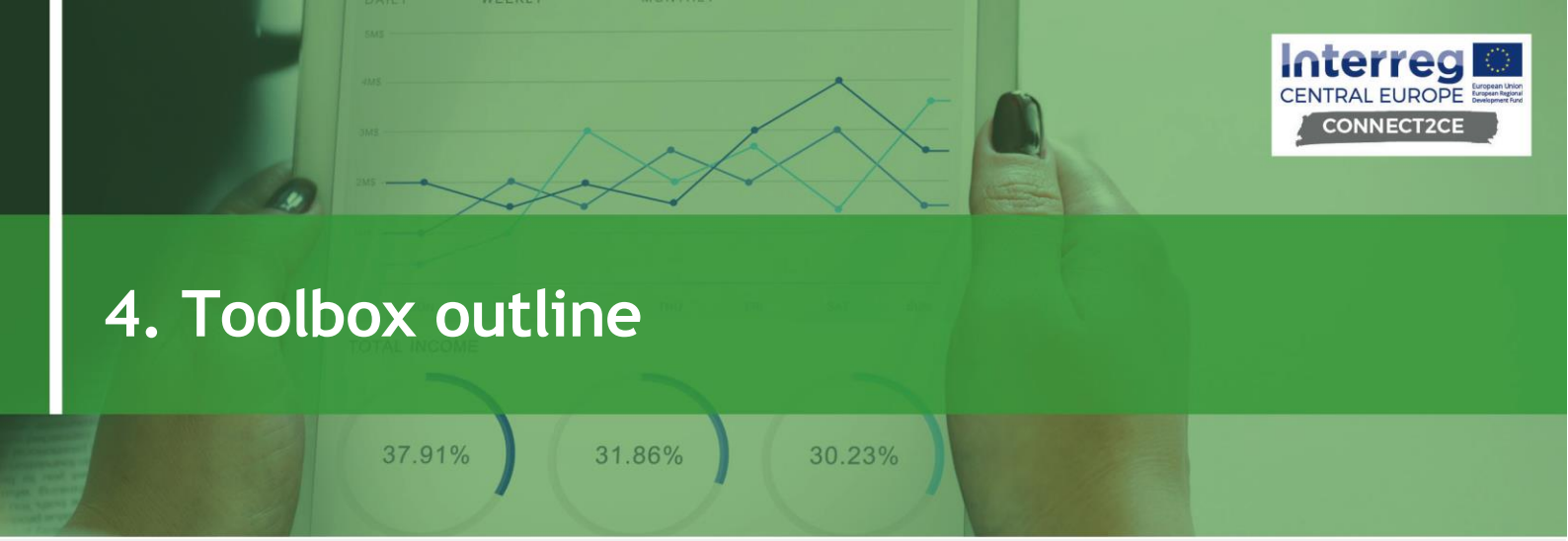
The **responsible actors** of such process are the project ordering authority or the appointed project research team, while transport operators and authorised public transport entities from the area are the **involved actors**. **Data** such as technical, social, organisational, legal environment data at cross-border transport area are needed for this process and can be obtained from **sources** as: transport authorities, transport operators, social contacts, reference projects, formal and informal initiatives, letter of intent, international agreements, national/local strategies, legislation and organisational acts on public transport, financial sources and funding schemes, etc.

The main **outputs** are the **Project implementation risks management plan** and the **Risk management table:**

Identified Risk	Probability of a risk (points) *Low = 1 point* *Medium = 2 points* *High = 3 points*	Possible risk impact (points) *Low = 1 point* *Medium = 2 points* *High = 3 points*	Risk assessment (points)	Risk mitigation measures	
				What to do	**Reference to step**
A	**B**	**C**	**D=B*C**	**E**	**F**

Accordingly, the **priority of risk mitigation measures actions** can be defined:

Risk assessment points	Level of priority	Actions
1-2	Low	Risk monitoring needed.
3-5	Medium	Risk monitoring, act if necessary.
6-9	High	Implementation of risk mitigation measures.

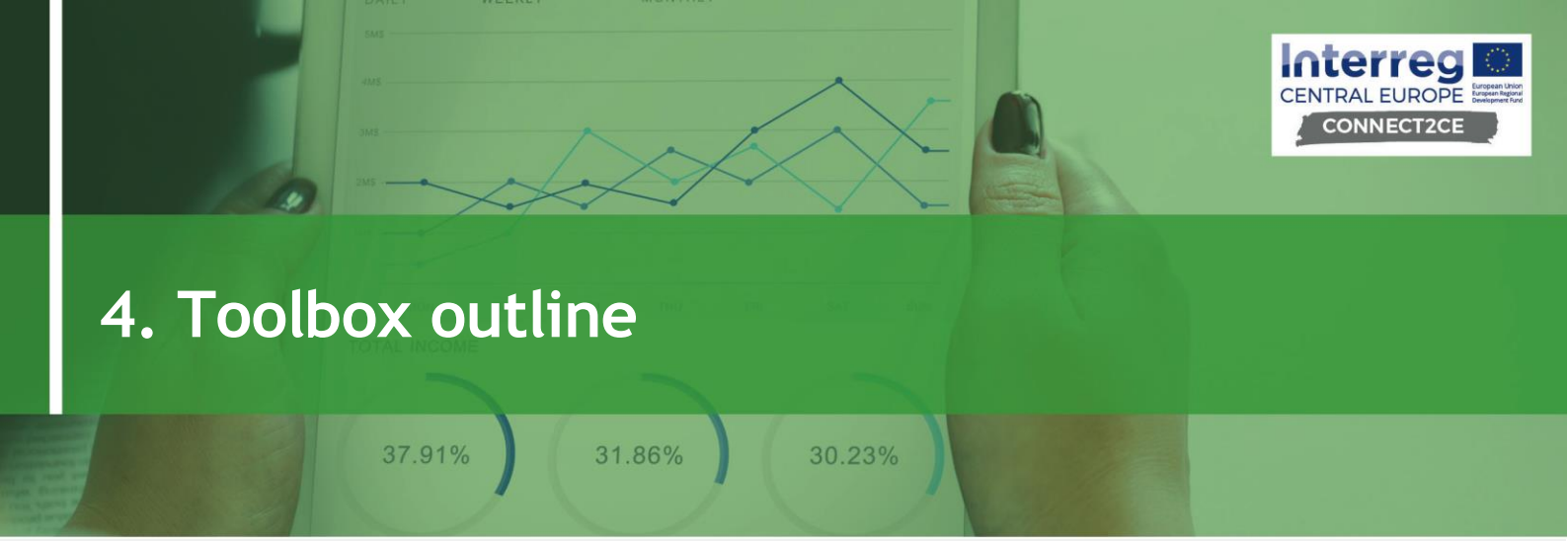


4. Toolbox outline

The toolbox for implementing info-mobility systems (IMSs) in CE explains how an existing local IMS can be integrated with transport information concerning a bordering region[1].
After the identification of the existing main local system to focus on (A1), the toolbox explains the process needed for the cross-border integration of pre-trip information (A2), on-trip information (A3), and ticketing information (A4). For Actions 2, 3 and 4, steps related to the **architecture adaptation** (e.g. A2.S2) forerun those concerning **data standardization** (e.g. A2.S3), but they can be performed also in parallel.
Besides integrating cross-border data, it is important to remember that information need to be **presented in a user-friendly and smooth manner** to be easily used by passengers. This toolbox do not deal with this aspect (since it does not concern the cross-border dimension specifically) but recommends considering it.
Actions and pertaining steps are presented in the table below. **A detailed description of each step follows the table.**

Action	Step
Action A1: Research of the main local Info-Mobility System/s (IMS) to focus on	Step A1.S1: Identification of all IMSs available in the area of analysis and first selection according to the covered area
	Step A1.S2: Selection of the suitable IMS/s to focus on according to the covered modes of transport and transport providers
	Step A1.S3: Establishment of an agreement with the provider of the selected IMS/s to focus on for the cross-border integration
Action A2: Integration of cross-border pre-trip information* into the chosen local IMS **timetables and topographic data for different transport means*	Step A2.S1: Access to available timetable data of the bordering operators
	Step A2.S2: Possible adaptation of the data exchange architecture
	Step A2.S3: Adjustment of static pre-trip data to the NeTEx Part 1 and 2 standard
	Step A2.S4: Adjustment of dynamic pre-trip data to the SIRI PT standard
	Step A2.S5: Adjustment of multimodal data to the OJP standard
	Step A2.S6: Inclusion of standardized data into the national access point
	Step A2.S7: Possible introduction of widgets and links

[1]A "bordering region" is a region across the border that is shared with the region of the observation. The same use applies to other applications, e.g. "bordering operator" or "bordering system".



4. Toolbox outline

Action	Step
Action A3: Integration of cross-border on-trip information* into the chosen local IMS **delay data, route updates, warnings, etc.*	Step A3.S1: Setting-up of a real-time data exchange with bordering operators
	Step A3.S2: Possible adaptation of the data exchange architecture
	Step A3.S3: Possible reorganization of the real-time data collection process
	Step A3.S4: Adjustment of dynamic on-line data to the SIRI-SX and SIRI-ET standards
	Step A3.S5: Adjustment of dynamic off-line data to the SIRI-ST standard
Action A4: Integration of cross-border ticketing information* into the chosen local IMS **ticket information and purchasing options*	Step A4.S1: Access to static fare data of the bordering PT providers
	Step A4.S2: Possible adaptation of the data exchange architecture
	Step A4.S3: Adjustment of static fare data to the NeTEx Part 3 standard
	Step A4.S4: Achievement of a commercial agreement with the bordering PT providers
	Step A4.S5: Opening of Application Programming Interfaces (APIs)

ACTION A1

Research of the main local Info-Mobility System/s (IMS) to focus on

A1.S1 A1.S2 A1.S3

STEP A1.S1 - Identification of all IMSs available in the area of analysis and first selection according to the covered area

To outline

Identification of all the available IMSs providing information on the public transport services performed in the area of analysis. Afterwards, only the systems covering the entire area of analysis are selected for next steps.

PROVIDERS

Responsible actors: Transport authority of the area of analysis (e.g. Region, Province).
Involved actors: Public/private authorities managing the available IMSs.

INPUTS

Data: Web platforms of transport providers, operators, and other info-mobility companies.

Sources: Web sources, open access datasets, and previous studies on the topic.

OUTPUTS

O1.1.1: List of all the IMSs dealing with public transport in the area of analysis, with highlighted those IMSs covering the whole area geographically.

IMPLEMENTATION TIME

short		long
●	○	○

HINTS

Identification of all IMSs: All types of IMSs (both public and private) should be considered in this phase, e.g. those dealing with local transport services, with national services available also in the area of analysis (e.g. rail), with international services serving also the area of analysis (e.g. long-distance coaches).

Selection according to the covered area: Platforms covering smaller administrative units than the area of analysis should be discarded (e.g. platforms referring to municipalities compared to an area of analysis covering a whole region). In contrast, platforms covering the whole area of analysis or even a wider one (e.g. IMSs of national rail service) should be kept.

ACTION A1

Research of the main local Info-Mobility System/s (IMS) to focus on

A1.S1 | A1.S2 | A1.S3

STEP A1.S2 - Selection of the suitable IMS/s to focus on according to the covered modes of transport and transport providers

To outline

Among the selected systems, only that one covering as many transport modes as possible among those available in the area of analysis, and including as many transport providers as possible is selected. This is the system to take into account for the cross-border integrations described in the actions A2, A3 and A4.

PROVIDERS

Responsible actors: Transport authority of the area of analysis (e.g. Region, Province).

Involved actors: Public/private authorities managing the IMSs resulting from the selection of step A1.S1.

INPUTS

Data: The IMSs dealing with public transport services available in the area of analysis, and covering the whole area geographically.

Sources: Previous investigation conducted by the responsible actor.

OUTPUTS

O1.2.1: Choice of the main local info-mobility system/s to focus on for cross-border integrations proposed in actions A2, A3, and A4.

IMPLEMENTATION TIME

short		long
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HINTS

Selection according to the covered modes of transport: Among the remaining platforms, those providing information for e.g. just one transport mean (rail, bus, coaches, car sharing) should be discarded.

Selection according to the covered transport providers: Among the remaining platforms, only that/those providing information for as many transport providers as possible among those operating in the area should be considered.

ATTENTION: Identifying one already available info-mobility system providing complete information for the area of analysis is a **crucial baseline**. This allows focusing only on the cross-border integration of this system rather than on the implementation of a new one. Besides, it allows preserving the habits of customers in using systems they already know.

ATTENTON: If no one of available systems satisfies the proposed criteria, the area of analysis has to **improve its regional info-mobility supply before dealing with cross-border integration**.

Research of the main local Info-Mobility System/s (IMS) to focus on

A1.S1 A1.S2 A1.S3

STEP A1.S3 - Establishment of an agreement with the provider of the selected IMS/s to focus on for the cross-border integration

To outline

In order to start working on the cross-border integration of the selected IMS, an agreement has to be established between the authority interested in such integration, and the public/private authority managing the IMS selected through the previous steps (A1.S1 and A1.S2).

PROVIDERS

Responsible actors: Transport authority of the area of analysis (e.g. Region, Province).

Involved actors: Public/private authority managing the IMS selected for the cross-border integration (resulting from the selection of steps A1.S1 and A1.S2).

INPUTS

Data: Information on the management model of the selected IMS and its technical features

Sources: Database of the authority managing the selected IMS

OUTPUTS

O1.3.1: Agreement for the upgrade of the selected IMS, to integrate it with information concerning transport services in bordering areas.

IMPLEMENTATION TIME

short		long
○	●	○

HINTS

If the selected IMS is managed by an **in-house company of the public authority** interested in the cross-border development, founding an agreement should be a simple task. Conversely, this process could be more demanding and time-consuming if an agreement need to be established with a **private authority**.

Integration of cross-border pre-trip information* into the chosen local IMS

**Timetables and topographic data for different transport means*

STEP A2.S1 - Access to available timetable data of the bordering operators

To outline

Access to or collection of available timetable data concerning the involved bordering operators. In various cases, data may present different standards and qualities to adjust (see steps A2.S3, A2.S4, A2.S5).

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: Bordering public transport operators involved in the integration.

INPUTS

Data: List of public and private transport operators to involve, in order to set a cross-border coverage.

Sources: Analysis of the relevant transport operators performing services in the bordering region to integrate.

OUTPUTS

O2.1.1: Agreement upon the exchange of data

O2.1.2: Aggregated static dataset including all the involved bordering operators.

IMPLEMENTATION TIME

short		long
●	○	○

HINTS

In several cases, datasets of transport operators are **not yet updated to the latest standards**. However, the Commission Delegated Regulation n. 1936/2017 under the ITS Directive 2010/40/EU specifically asks operators to modify available data according to such standards, in order to ease the sharing of information. For this reason, steps A2.S3, A2.S4 and A2.S5 deal with the data harmonization.

Integration of cross-border pre-trip information* into the chosen local IMS

**Timetables and topographic data for different transport means*

STEP A2.S2 - Possible adaptation of the data exchange architecture

To outline

According to the introduction of new data standards (see steps A2.S3, A2.S4, A2.S5), the data exchange architecture could need adaptations. They may concern e.g. the real-time data hub and the data warehouse.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: Internal experts in data architecture.

INPUTS

Data: A: O2.1.2 - aggregated dataset including involved bordering operators; B: limits in the current architecture.

Sources: A: single databases of involved bordering operators; B: analysis of the current data exchange architecture.

OUTPUTS

O2.2.1: Updated data exchange architecture to host a standardized dataset, see next steps (A2.S2-T1).

IMPLEMENTATION TIME

short		long
○	○	●

HINTS

This depends for each IMS on the **baseline architecture already is use**. This step can be implemented also in parallel to the adjustment of data to CEN standards (described in steps A2.S3, A2.S4 and A2.S5).

Integration of cross-border pre-trip information* into the chosen local IMS

**Timetables and topographic data for different transport means*

STEP A2.S3 - Adjustment of static pre-trip data to the NeTEx Part 1 and 2 standard

To outline

Adjustment of local and bordering data about planned timetables and network topology to the NeTEx Part 1 and 2 (Network Timetable Exchange) CEN standard. This eases the exchange of planned timetable data among different computer systems.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS; Public/private authorities managing the involved bordering IMSs.
Involved actors: Possible external experts (as agencies) in charge to harmonize data according to EU standards.

INPUTS

Data: A: O2.1.2 - aggregated dataset including involved bordering operators; B: technical knowledge on the NeTEx Part 1 and 2 standards.

Sources: A: single datasets of involved bordering operators; B: EU Regulation n. 1936/2017.

OUTPUTS

O2.3.1: Tendering procedure to assign the harmonization of data to skilled companies.

O2.3.2: Aggregated static dataset harmonized according to the NeTEx Part 1 and 2 standards (A2.S[3,4,5]-T1).

IMPLEMENTATION TIME

short		long
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HINTS

The NeTEx Part 1 and 2 standards deal with the **network timetable exchange**. Part 1 covers the Public Transport **Network topology**, i.e. the physical route followed by services and the location of stops and points of interest. Part 2 covers the **scheduled timetables**, i.e. the static data that are seasonally updated. More info at: http://www.transmodel-cen.eu/standards/NeTEx/

Integration of cross-border pre-trip information* into the chosen local IMS

**Timetables and topographic data for different transport means*

STEP A2.S4 - Adjustment of dynamic pre-trip data to the SIRI PT standard

To outline

Adjustment of local and bordering data about daily timetables to the SIRI PT (Standard interface for real time information) CEN standard. This allows the continuous exchange of timetable updates among different computer systems.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS; Public/private authorities managing the involved bordering IMSs.

Involved actors: Local public transport operators involved in the integration; Bordering public transport operators involved in the integration; Possible external experts (as agencies) in charge to harmonize data.

INPUTS

Data: A: O2.1.2 - aggregated dataset including involved bordering operators; B: technical knowledge on the SIRI PT standard.

Sources: A: single datasets of involved bordering operators; B: EU Regulation n. 1936/2017.

OUTPUTS

O2.4.1: Tendering procedure to assign the harmonization of data to skilled companies.

O2.4.2: Aggregated dataset harmonized according to the SIRI PT standard (A2.S[3,4,5]-T1).

IMPLEMENTATION TIME

short		long
○	●	○

HINTS

The SIRI PT (Planned Timetables) standard deals with **real-time data concerning daily timetables**. By using this standard, an IMS can include daily modifications related e.g. to special events and offer always reliable information. More info at: http://www.transmodel-cen.eu/standards/siri/

Integration of cross-border pre-trip information* into the chosen local IMS

**Timetables and topographic data for different transport means*

STEP A2.S5 - Adjustment of multimodal data to the OJP standard

To outline

Adjustment of local and bordering data about different modes of transport to the OJP (Open API for distributed journey planning) CEN standard. This allows the provision of an optimal multimodal journey planning and door-to-door coverage.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS; Public/private authorities managing the involved bordering IMSs.
Involved actors: Possible external experts (as agencies) in charge to harmonize data according to EU standards.

INPUTS

Data: A: O2.1.2 - aggregated dataset including involved bordering operators; B: technical knowledge on the OJP standard.

Sources: A: single datasets of involved bordering operators; B: EU Regulation n. 1936/2017.

OUTPUTS

O2.5.1: Tendering procedure to assign the harmonization of data to skilled companies.

O2.5.2: Aggregated dataset harmonized according to the OJP standard (A2.S[3,4,5]-T1).

IMPLEMENTATION TIME

short		long
●	○	○

HINTS

The OJP standard eases the integration of different transport modes into a unique journey planner providing users with **door-to-door travel chains** even for long-distance travels. More info at: http://www.transmodel-cen.eu/standards/ijp/

Integration of cross-border pre-trip information* into the chosen local IMS

**Timetables and topographic data for different transport means*

STEP A2.S6 - Inclusion of standardized data into the national access point

To outline

Inclusion of local and bordering adjusted data into the respective national access point (as required by the EU ITS directive). This facilitates the sharing and usage of data by other systems.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: -

INPUTS

Data: A: O2.3.2 + O2.4.2 + O2.5.2 - aggregated and harmonized dataset; B: the national access point.

Sources: A: single datasets of involved bordering operators; B: indications for open access systems in the EU Regulation n. 1936/2017.

OUTPUTS

O2.6.1: Updated national access point containing data harmonized with CEN standards (A2.S6-T1).

IMPLEMENTATION TIME

short		long
●	○	○

HINTS

The national access point is part of the requirements of the Commission Delegated Regulation n. 1936/2017 under the ITS Directive 2010/40/EU. It facilitates the **sharing of data among countries** by developing a unified open access platform with transport data. More info at:
https://ec.europa.eu/transport/themes/its/road/action_plan/nap_en

Integration of cross-border pre-trip information* into the chosen local IMS

**Timetables and topographic data for different transport means*

STEP A2.S7 - Possible introduction of widgets and links

To outline

Complementary or alternative introduction of widgets and links to cover bordering systems without following a demanding harmonization process (as in steps A2.S3, A2.S4, A2.S5).

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: Public/private authorities managing the involved bordering IMSs.

INPUTS

Data: Info-mobility systems to link.

Sources: Analysis of the minor services operating in the bordering region to integrate.

OUTPUTS

O2.7.1: New widgets or links to external selected platforms.

IMPLEMENTATION TIME

short		long
●	○	○

HINTS

This solution can be applied to provide information **about minor complementary services** (e.g. car sharing), or as alternative to data harmonization in case of budget constraints hindering the implementation of structural modifications.

ACTION A3

Integration of cross-border on-trip information* into the chosen local IMS

**delay data, route updates, warnings, etc.*

A3.S1 | A3.S2 | A3.S3 | A3.S4 | A3.S5

STEP A3.S1 - Setting-up of a real-time data exchange with bordering operators

To outline

Setting-up of a cooperation with the involved bordering operators to establish a real-time data exchange. In various cases, data may present different standards and collection processes to harmonize (see steps A3.S3, A3.S4, A3.S5).

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: Bordering public transport operators involved in the integration.

INPUTS

Data: List of public and private transport operators to involve, in order to set a cross-border coverage.

Sources: Analysis of the relevant transport operators performing services in the bordering region to integrate.

OUTPUTS

O3.1.1: Agreement upon the exchange of data.

O3.1.2: Real-time data exchange with the involved bordering operators.

IMPLEMENTATION TIME

short		long
●	○	○

HINTS

In several cases, datasets of transport operators are **not yet updated to the latest standards**. However, the Commission Delegated Regulation n. 1936/2017 under the ITS Directive 2010/40/EU specifically asks operators to modify available data according to such standards, in order to ease the sharing of information. For this reason, steps A3.S4 and A3.S5 deal with the data harmonization.

Integration of cross-border on-trip information* into the chosen local IMS

**delay data, route updates, warnings, etc.*

STEP A3.S2 - Possible adaptation of the data exchange architecture

To outline

According to the introduction of new data standards (see steps A3.S4, A3.S5), the data exchange architecture could need adaptations. They may concern e.g. the real-time data hub.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: Internal experts in data architecture.

INPUTS

Data: A: O3.1.2 - real-time data exchange with the involved bordering operators; B: limits in the current architecture.

Sources: A: single real-time datasets of involved bordering operators; B: analysis of the current data exchange architecture.

OUTPUTS

O3.2.1: Updated data exchange architecture to host a standardized dataset, see next steps (A3.S2-T1).

IMPLEMENTATION TIME

short		long
○	○	●

HINTS

This depends for each IMS on the **baseline architecture already is use**. This step can be implemented also in parallel to the adjustment of data to CEN standards (described in steps A3.S4 and A3.S5).

Integration of cross-border on-trip information* into the chosen local IMS

**delay data, route updates, warnings, etc.*

A3.S1 | A3.S2 | A3.S3 | A3.S4 | A3.S5

STEP A3.S3 - Possible reorganization of the real-time data collection process

To outline

According to the introduction of new data standards (see steps A3.S4 and A3.S5), the real-time data collection process could need adaptations. They may concern e.g. the installation of new on-board devices.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS; Local public transport operators involved in the integration.
Involved actors: Internal experts in charge to reorganize the collection process.

INPUTS

Data: A: O3.1.2 - real-time data exchange with the involved bordering operators; B: limits in the current data collection process.

Sources: A: single real-time datasets of involved bordering operators; B: analysis of the current data collection process.

OUTPUTS

O3.3.1: Updated real-time data collection process

IMPLEMENTATION TIME

short ○ ○ ● **long**

HINTS

This depends for each transport operator on the **collection process already is use**. This step can be implemented also in parallel to the adjustment of data to CEN standards (described in steps A3.S4 and A3.S5).

Integration of cross-border on-trip information* into the chosen local IMS

**delay data, route updates, warnings, etc.*

STEP A3.S4 - Adjustment of dynamic on-line data to the SIRI-SX and SIRI-ET standards

To outline

Adjustment of local and bordering real-time data for on-line tools to the SIRI-SX and SIRI-ET (Standard interface for real time information) CEN standards. This allows the exchange of data about exceptional events´ and timetable variations for delays/anticipations between pairs of server computers.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS; Public/private authorities managing the involved bordering IMSs.
Involved actors: Local public transport operators involved in the integration; Bordering public transport operators involved in the integration; Possible external experts (as agencies) in charge to harmonize data according to EU standards.

INPUTS

Data: A: O3.1.2 - real-time data exchange with the involved bordering operators; B: technical knowledge on the SIRI-SX and SIRI-ET standards.

Sources: A: single real-time datasets of involved bordering operators; B: EU Regulation n. 1936/2017.

OUTPUTS

O3.4.1: Tendering procedure to assign the harmonization of data to skilled companies.

O3.4.2: Connected datasets harmonized according to the SIRI-SX and SIRI-ET standards (A3.S[4,5]-T1).

IMPLEMENTATION TIME

short		long
○	●	○

HINTS

The SIRI SX (Situation Exchange) and the SIRI ET (Estimated timetables) ease the process of data exchange for a series of transport related information. For example, the **variation of timetables** caused by delays, warnings concerning exceptional events and **route updates** related to deviations. More info at: http://www.transmodel-cen.eu/standards/siri/

Integration of cross-border on-trip information* into the chosen local IMS

**delay data, route updates, warnings, etc.*

A3.S1 A3.S2 A3.S3 A3.S4 A3.S5

STEP A3.S5 - Adjustment of dynamic off-line data to the SIRI-ST standard

To outline

Adjustment of local and bordering real-time data for the off-line tools to the SIRI-ST (Standard interface for real time information) CEN standards. This allows the exchange of data about the variation of arrival and departure times at each stop between pairs of server computers.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS; Public/private authorities managing the involved bordering IMSs.
Involved actors: Local public transport operators involved in the integration; Bordering public transport operators involved in the integration; Possible external experts (as agencies) in charge to harmonize data according to EU standards.

INPUTS

Data: A: O3.1.2 - real-time data exchange with the involved bordering operators; B: technical knowledge on the SIRI-ST standard.

Sources: A: single real-time datasets of involved bordering operators; B: EU Regulation n. 1936/2017.

OUTPUTS

O3.5.1: Tendering procedure to assign the harmonization of data to skilled companies.

O3.5.2: Connected datasets harmonized according to the SIRI-ST standard (A3.S[4,5]-T1).

IMPLEMENTATION TIME

short		long
○	●	○

HINTS

The SIRI ST (Stop Timetable) standard is used to provide **real-time information about specific stops**. For example, updated arrival and departure times for the services passing through a specific stop, changes in the planned platform and other warnings. More info at: http://www.transmodel-cen.eu/standards/siri/

Integration of cross-border ticketing information* into the chosen local IMS

ticket information and purchasing options

STEP A4.S1 - Access to static fare data of the bordering PT providers

To outline

Access to or collection of available static fare data concerning the involved bordering PT providers. In various cases, data may present different standards to adjust (see step A4.S3).

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: Bordering public transport providers involved in the integration.

INPUTS

Data: List of public and private transport operators to involve, in order to set a cross-border coverage.

Sources: Analysis of the relevant transport operators performing services in the bordering region to integrate.

OUTPUTS

O4.1.1: Agreement upon the exchange of data.

O4.1.2: Aggregated static dataset including the involved bordering providers.

IMPLEMENTATION TIME

short		long
●	○	○

HINTS

In several cases, datasets of transport operators are **not yet updated to the latest standards**. However, the Commission Delegated Regulation n. 1936/2017 under the ITS Directive 2010/40/EU specifically asks operators to modify available data according to such standards, in order to ease the sharing of information. For this reason, steps A4.S3 deals with the data harmonization.

Integration of cross-border ticketing information* into the chosen local IMS

ticket information and purchasing options

STEP A4.S2 - Possible adaptation of the data exchange architecture

To outline

According to the introduction of new data standards (see step A4.S3), the data exchange architecture could need adaptations. They may concern e.g. the ticketing backend and the journey fare calculator.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: -

INPUTS

Data: A: O4.1.2 - aggregated static dataset including the involved bordering providers; B: limits in the current architecture.

Sources: A: single real-time datasets of involved bordering operators; B: analysis of the current data exchange architecture.

OUTPUTS

O4.2.1: Updated data exchange architecture to host standardized dataset, see next steps (A4.S2-T1).

IMPLEMENTATION TIME

short		long
○	○	●

HINTS

This depends for each IMS on the **baseline architecture already is use**. This step can be implemented also in parallel to the adjustment of data to CEN standards (described in cited steps).

Integration of cross-border ticketing information* into the chosen local IMS

*ticket information and purchasing options

STEP A4.S3 - Adjustment of static fare data to the NeTEx Part 3 standard

To outline

Adjustment of local and bordering data about fare structures, products and prices to the NeTEx Part 3 (Network Timetable Exchange) CEN standard. This eases the exchange of static information about PT fares among different computer systems.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS; Public/private authorities managing the involved bordering IMSs.
Involved actors: Local public transport provider involved in the integration; Bordering public transport providers involved in the integration.

INPUTS

Data: A: O4.1.2 - aggregated static dataset including the involved bordering providers; B: technical knowledge on the NeTEx Part 3 standard.

Sources: A: single datasets of involved bordering operators; B: EU Regulation n. 1936/2017.

OUTPUTS

O4.3.1: Aggregated static dataset harmonized according to the NeTEx Part 3 standard (A4.S3-T1).

IMPLEMENTATION TIME

short		long
○	●	○

HINTS

The ticketing integration and the establishment of integrated ticketing platforms has been **only partially included in the EU Directive** on ITS so far. Therefore it cannot be a used as reference for the implementation of this type of integration.

Integration of cross-border ticketing information* into the chosen local IMS

ticket information and purchasing options

A4.S1 | A4.S2 | A4.S3 | A4.S4 | A4.S5

STEP A4.S4 - Achievement of a commercial agreement with the bordering PT providers

To outline

To allow the selling of tickets concerning bordering providers on local systems, a commercial agreement with the involved providers is needed. It mainly deals with the sharing of revenues and the commissions due to the lead retailer.

PROVIDERS

Responsible actors: Public/private authority managing the chosen IMS.
Involved actors: Local public transport provider involved in the integration; Bordering public transport providers involved in the integration.

INPUTS

Data: Fare data, yielded price schemes, scheme of operated lines of all the involved providers.

Sources: Single datasets of involved bordering operators.

OUTPUTS

O4.4.1: Commercial agreement upon the use of fare data for distribution purpose (A4.S4-T1).

IMPLEMENTATION TIME

short		long
○	○	●

HINTS

Sharing data for commercial purpose may be hampered by different factors. For instance, the **competitiveness between operators** makes harder a dialogue between providers for the selling of tickets. At the same time, the **large number of available providers and operators** requires individual negotiations with each. Accordingly, this phase requires high cooperation and long times.

Integration of cross-border ticketing information* into the chosen local IMS

ticket information and purchasing options

STEP A4.S5 - Opening of Application Programming Interfaces (APIs)

To outline

Opening of Application Programming Interfaces (APIs) by the local and bordering PT providers. This eases the integration of several transport options in holistic platforms for the purchase of multimodal chains.

PROVIDERS

Responsible actors: Local public transport provider involved in the integration; Bordering public transport providers involved in the integration.
Involved actors: Internal experts in programming interfaces.

INPUTS

Data: A: O4.1.2 - aggregated static dataset including the involved bordering providers; B: technical knowledge on the API interfaces.

Sources: A: Single datasets of involved bordering operators; B: national directives in terms of API (if available) or technical reports.

OUTPUTS

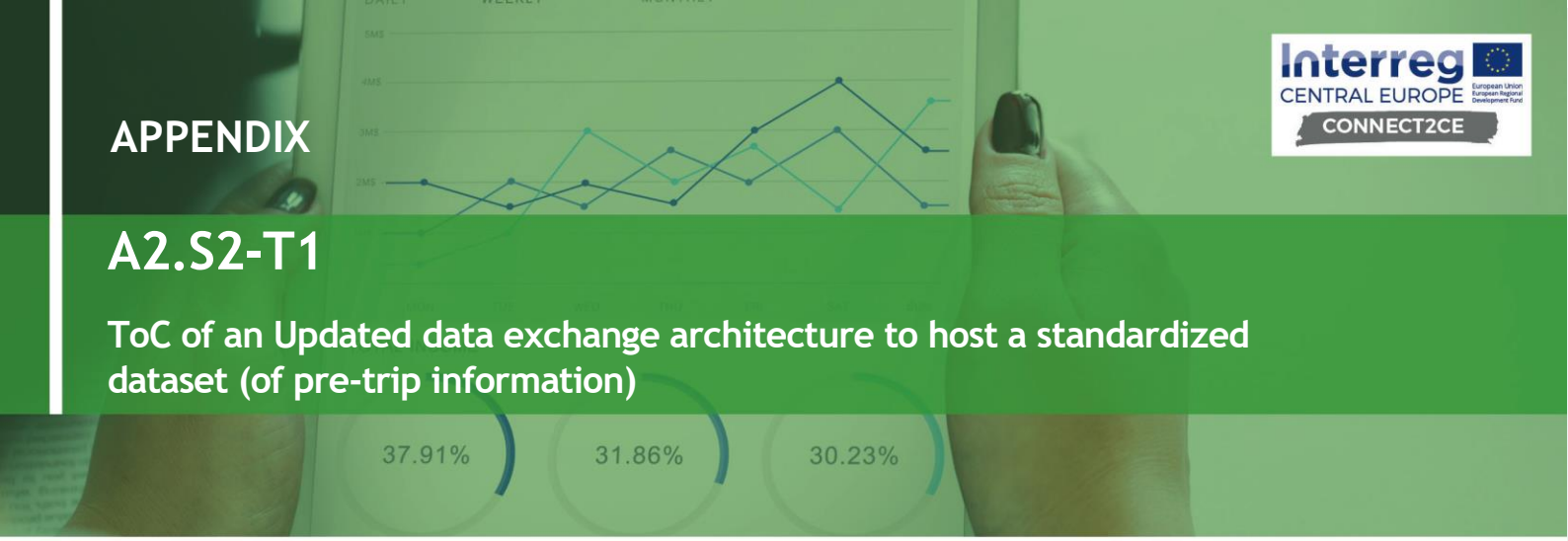
O4.5.1: New APIs platforms for each involved provider to ease the sharing of data for distribution purpose.

IMPLEMENTATION TIME

short		long
○	●	○

HINTS

Both at European level and for several national laws, the **establishment of APIs is not yet mandatory**. However, it can be very helpful to increase cross-border integration. An exception is the Finnish Act on Transport Service, which requires all public and private transport providers to open an API to allow the integration of transport options into comprehensive mobile payment systems.



APPENDIX

A2.S2-T1

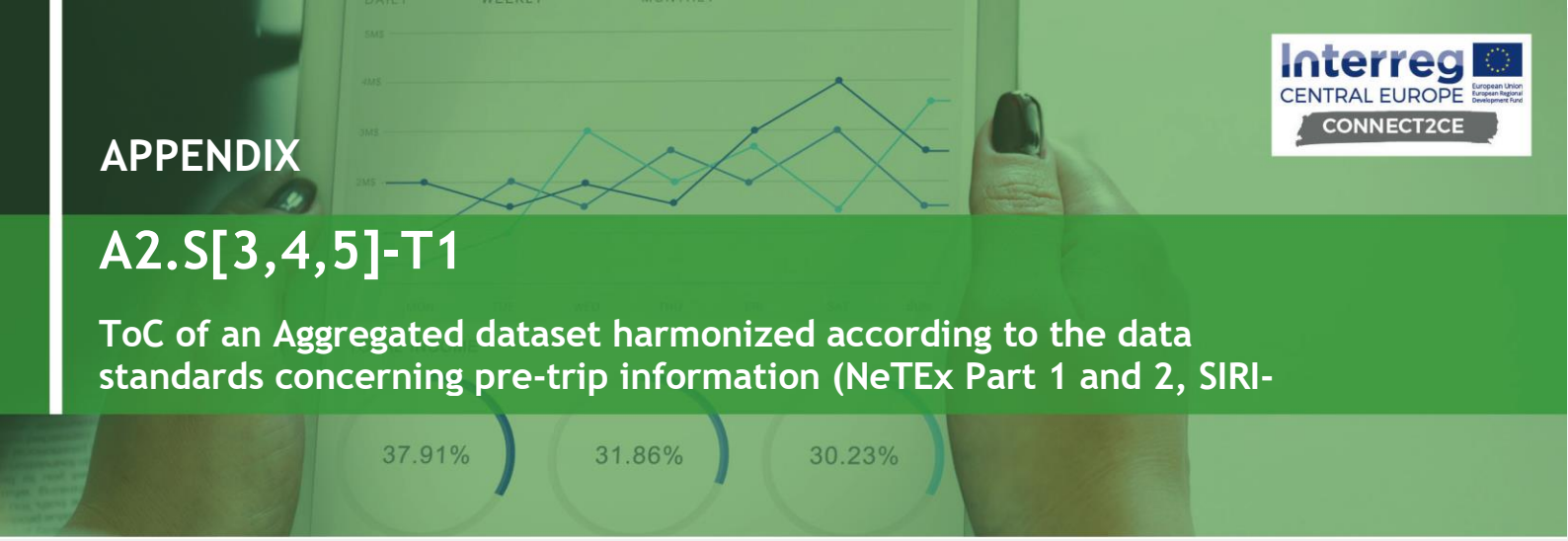
ToC of an Updated data exchange architecture to host a standardized dataset (of pre-trip information)

Contents

To outline To step

The following list explains an exemplificative data flow structure dealing with pre-trip information. A data exchange architecture can adopt this structure before integrating local and cross-border data harmonized according to proposed CEN standards.

1. **Back-end: Timetable and Network Topology Planning Tool**
   - Processing of data on planned timetables and line topology (NeTEx Part 1 and 2 standards)
   - Transmission of data (planned timetables and line topology) to back-end tools of involved local and bordering operators
   - Transmission of data (planned timetables and line topology) to intern back-end units, i.e. the Travel Planner and Data Warehouse
2. **Back-end: Real-time Data Hub**
   - Reception of data on daily enriched timetables from the back-end tools of involved local and bordering operators (in SIRI PT format)
   - Transmission of data on daily timetables to the back-end Travel Planner
   - Transmission of data on planned and services to the Data Warehouse
3. **Back-end: Travel Planner**
   - Reception of data on daily timetables from the back-end Real-time data Hub (in SIRI PT format)
   - Processing of data on daily timetables (e.g. OJP standard) and transmission to front-end tools as screens, web platforms and mobile platforms
4. **Back-end: Data Warehouse**
   - Reception and storage of data on planned timetables and line topology from the back-end Timetable and Network Topology Planning Tool (in NeTEx Part 1 and 2)
   - Reception and storage of data on daily enriched timetables from the back-end Real Time Data Hub (in SIRI PT standard)
   - Reception of additional data from the back-end tools of involved local and bordering operators (different formats according to custom protocol)
   - Reception of complementary information from the back-end tools of operators (e.g. data on bus fleet)
   - Transmission of data to Service Monitoring Tools (evaluating the proper execution of the service compared to contract constraints)
5. **Front-end: Screens, Web platform, Mobile platform**
   - Reception of travel information data form the back-end Travel Planner
   - Display of data on front-end tools



APPENDIX

A2.S[3,4,5]-T1

ToC of an Aggregated dataset harmonized according to the data standards concerning pre-trip information (NeTEx Part 1 and 2, SIRI-

Contents

To outline To step

The following list summarizes main contents that can be included in a dataset of pre-trip information harmonized according to the corresponding CEN standards considered in steps A2.S3, A2.S4 and A2.S5 (i.e. NeTEx Part 1 and 2, SIRI-PT and OJP).

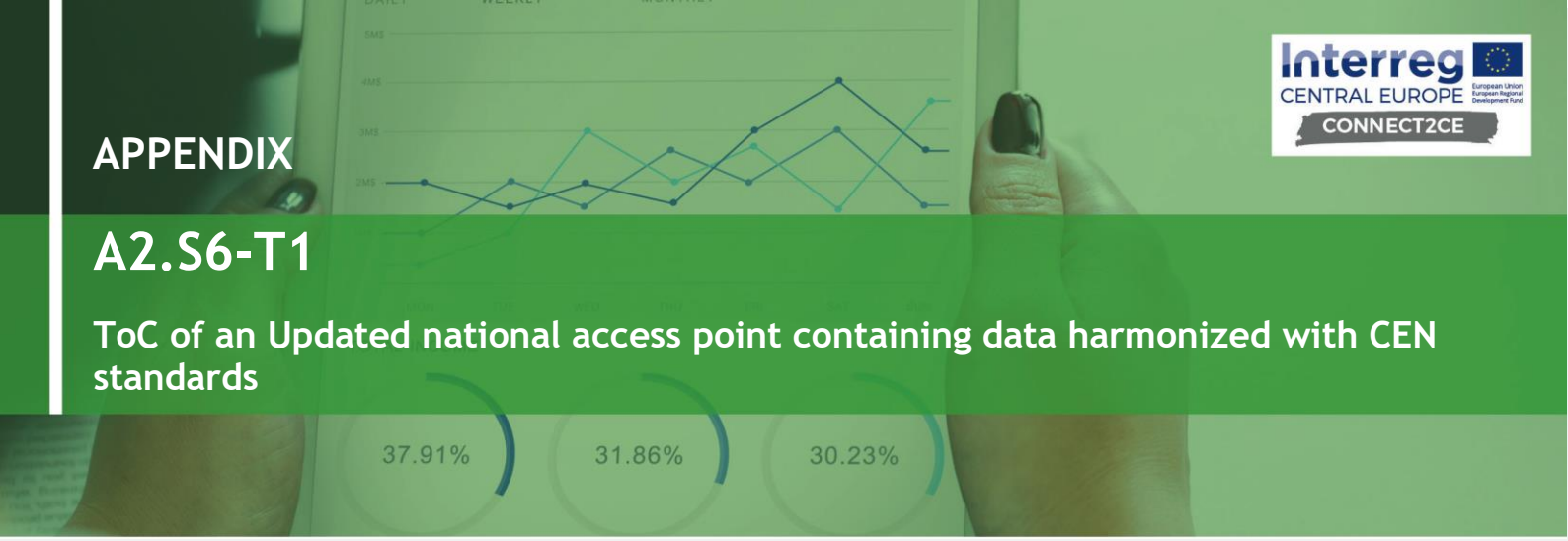
1. **Planned timetables (including local and bordering services)**
   a. ***Involved standard/s:*** NeTEx (Network Timetable Exchange) Part 2
   b. ***Purpose of the standard:*** Exchanging timetables concerning any mode of public transport (as bus, coach, rail, etc.) and related operational data among different data-storing and data-generating systems.
   c. ***Introductive info on the standard:*** NeTEx includes a CEN specification document in three parts; a data model that is presented in UML; an XML schema that can be used by data processing software (both NeTEx Part 1, 2 and 3 stick to this structure).
   d. ***Technical sources for developers:*** The "NeTEx VDV Application Handbook" (VDV, 2017); the "Schemas for Timing information exchange" (netex-cen.eu).
2. **Topology of the lines (including local and bordering services)**
   a. ***Involved standard/s:*** NeTEx (Network Timetable Exchange) Part 1
   b. ***Purpose of the standard:*** Exchanging information on routes, stops, and map coordinates for any mode of public transport (as bus, coach, rail, etc.) as well as for combinations of modes among different data-storing and data-generating systems.
   c. ***Introductive info on the*** standard*:* see point 1.c
   d. ***Technical sources for developers:*** The "NeTEx VDV Application Handbook" (VDV, 2017); the "Schemas for Network description" (netex-cen.eu).
3. **Daily (real-time) timetables (including local and bordering services)**
   a. ***Involved standard/s:*** SIRI-PT (Service Interface for Real Time Information – Production Timetable Service)
   b. ***Purpose of the standard:*** Exchanging information about the expected timetables of a transport network on daily basis. A SIRI PT Service is produced day by day and it includes all known timetable variations that affect the considered network in the observed day.
   c. ***Introductive info on the standard:*** All SIRI standards incorporate various existing standards to deliver them through a XML schema and a TransModel modelling concept. At the same time, all SIRI services are provided over a standard Communication layer based on a Web Service Architecture.
   d. ***Technical sources for developers:*** The "SIRI White Paper" (CEN TC 278 Working Group 3 Sub Group 7, 2005); the "SIRI Handbook" (Kizoom, 2008); the "SIRI XML Schema – SIRI PT" (VDV, 2015).
4. **Multimodal travel planning service (including local and bordering services)**
   a. ***Involved standard/s:*** OJP (Open Journey Planner)

To outline To step

b. ***Purpose of the standard:*** Providing a multimodal journey planner able to cover long-distance travels and wide geographical areas (as cross-border contexts).

c. ***Introductive info on the standard:*** Based on the experience of main Distributed Journey Planning systems (i.e. large-scale planners), the OJP standard allows a system to generate a single interface that can be made available widely, and thus support more Distributed systems jointly.

d. ***Technical sources for developers:*** The "Public transport—Open API for distributed journey planning" (CEN, 2017); the "OJP XDS Schema" (VDV, 2016)



APPENDIX

A2.S6-T1

ToC of an Updated national access point containing data harmonized with CEN standards

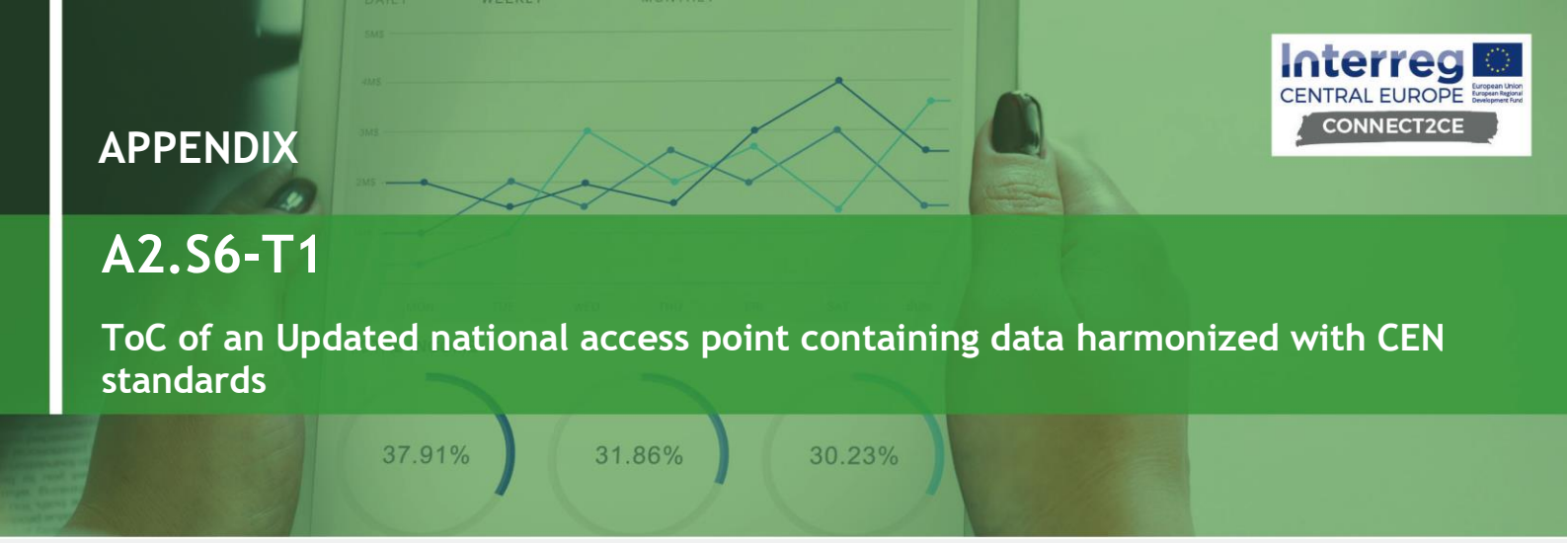
Contents

To outline To step

The following list describes main contents that should be included in a National Access Point according to the requirements of the ITS Directive 2010/40/EU. Exemplificative in this sense is the platform available for Austria, while the document "National Access Points - A mechanism for accessing, exchanging and reusing transport related data" provides an EU-level overview on the development of these databases.

A National Access Point has the objective to ease the sharing of data on mobility among EU countries, in order to move towards a Single European Transport Area. To build up such point, common standards, interfaces and data ecosystems are fundamental. To meet these requirements, points can take different forms, such as database, data warehouse, and web portal. A National Access Point is expected to cover four actions, regulated by corresponding Commission Delegated Regulations.

1. **Action a - Commission Delegated Regulation (EU) 2017/1926**
   - ***Addressed topic:*** Provision of EU-wide multimodal travel information services.
   - ***Data categories to consider:*** Data for scheduled, demand-responsive and personal transport means; both static and dynamic travel data. Detailed information at the Annex of the Regulation 2017/1926.
   - ***Main standards to consider:*** Providers and authorities managing considered transport services shall provide static data in NeTEx formats, while dynamic data in SIRI format. Personal transport means require other standards, i.e. DATEX II for dynamic data in standardized formats or in other machine-readable formats.
2. **Action b - Commission Delegated Regulation (EU) 2015/962**
   - ***Addressed topic:*** Provision of EU-wide real-time traffic information services.
   - ***Data categories to consider:*** Static road data (as road network, classification, traffic signs), dynamic road status data (as availability of parking spaces, road closures, weather conditions affecting road transport), traffic data (as traffic volume, speed, location of queues).
   - ***Main standards to consider:*** Road authorities and operators managing considered data shall provide static road data either in standardized formats or in other machine-readable formats, while dynamic and traffic data in DATEX II format.
3. **Action c - Commission Delegated Regulation (EU) 2013/886**
   - ***Addressed topic:*** Provision – where possible - of road safety-related minimum universal traffic information free of charge to users.
   - ***Data categories to consider:*** For a series of road safety-related events (e.g. short-term road work, temporary slippery road, unprotected accident area), information concerning the location and typology of event, as well as driving behaviour advice should be provided.
   - ***Main standards to consider:*** Responsible authorities and involved providers shall provide information either in DATEX II format or in any other format comparable and interoperable with it.
4. **Action d - Commission Delegated Regulation (EU) 2013/885**



APPENDIX

A2.S6-T1

ToC of an Updated national access point containing data harmonized with CEN standards

To outline To step

- ***Addressed topic:*** Provision of information services about safe and secure parking places for trucks and commercial vehicles
- ***Data categories to consider:*** First, all member states shall identify areas where traffic and security conditions require the provision of such information. Afterwards, they shall provide static data on parking spaces, information on safety and equipment available in each area, and dynamic data on the availability of parking places in each place.
- ***Main standards to consider:*** Responsible authorities and operators should provide all required data in NETEX II format (both for dynamic and static data).

APPENDIX

A3.S2-T1

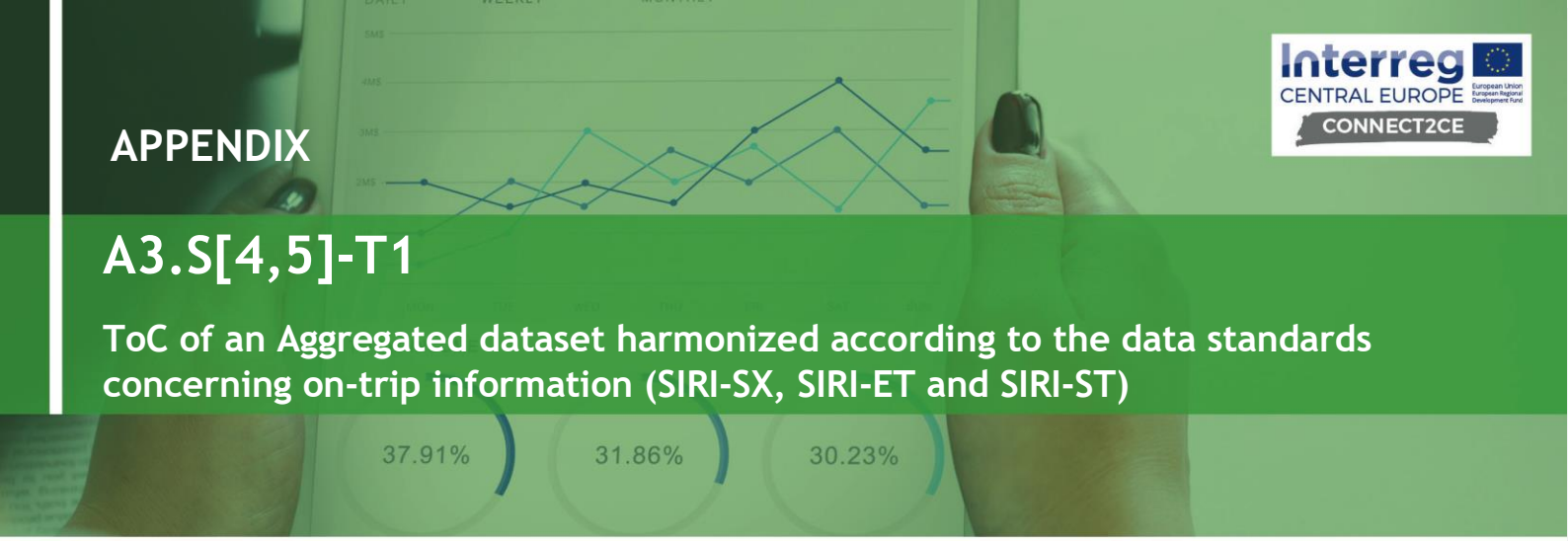
ToC of an Updated data exchange architecture to host a standardized dataset (of on-trip information)

Contents

To outline To step

The following list explains an exemplificative data flow structure dealing with on-trip information. A data exchange architecture can adopt this structure before integrating local and cross-border data harmonized according to proposed CEN standards.

1. **Back-end: Real-time Data Hub**
   - Reception of real-time data from the back-end tools of each involved local and bordering operator (in SIRI ET and SIRI SX standards)
   - Transmission of all real-time data to the back-end Travel Planner
   - Processing of real-time data (SIRI CT and SIRI SX standards) and transmission to each local and bordering operator involved in the integration of data of the other operators
   - Processing of real-time data (SIRI ST and SIRI SX standards) and transmission to front-end tools such as Stop server and Stop displays
   - Processing of real-time data (SIRI ET standard) and transmission to the back-end Data Warehouse
2. **Back-end: Travel Planner**
   - Reception of real-time data (in SIRI ET and SIRI SX standards) from the back-end Real-time Data Hub
3. **Back-end: Data Warehouse**
   - Reception of real-time data (in SIRI ET standard) from the back-end Real-time Data Hub
   - Reception of data e.g. on driver performance, crowding index, accident index from the back-end tools of the involved operators
   - Reception of data e.g. on passenger information and comfort from the back-end customer complaint management system
   - Transmission of data to Service Intelligence Tools (evaluating the overall system performance)
   - Transmission of data to Service Monitoring Tools (evaluating the proper execution of the service compared to contract constraints)
4. **Front-end: Stop server, Stop displays**
   - Reception of real-time travel information (in SIRI ST and SIRI SX standard) from the back-end Real-time Data Hub
   - Display of data on front-end tools



APPENDIX

A3.S[4,5]-T1

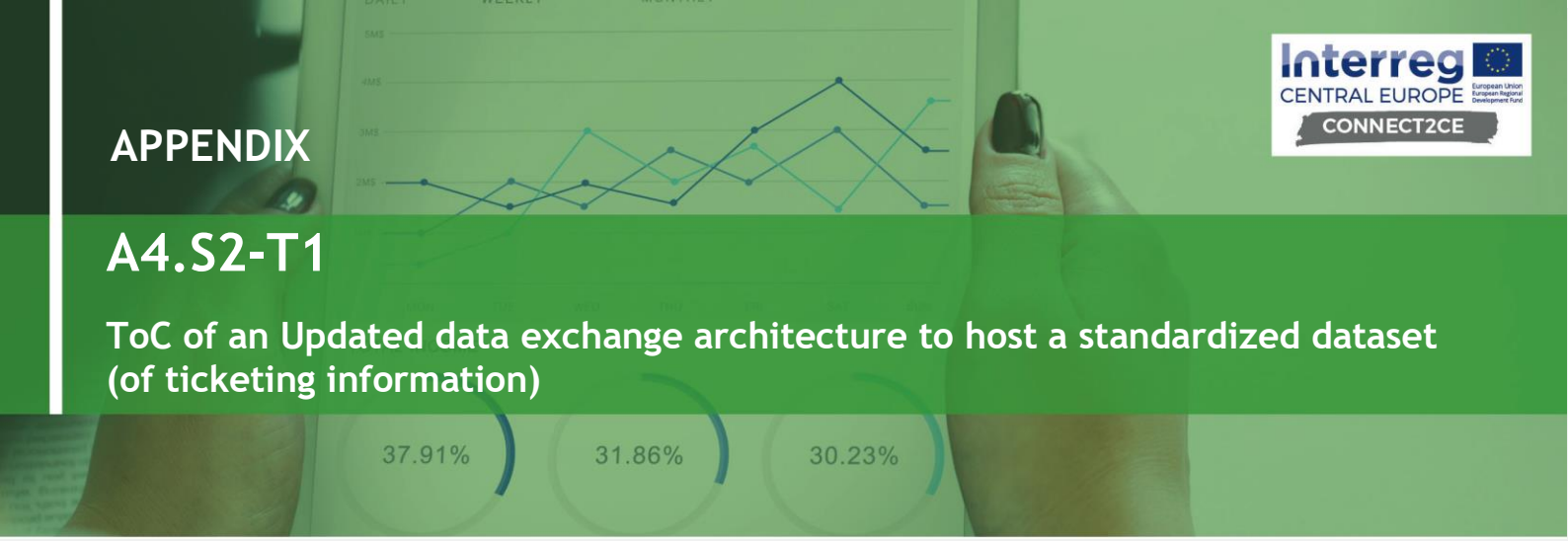
ToC of an Aggregated dataset harmonized according to the data standards concerning on-trip information (SIRI-SX, SIRI-ET and SIRI-ST)

Contents

To outline To step

The following list summarizes main contents that can be included in a dataset of on-trip information harmonized according to the corresponding CEN standards considered in steps A3.S4 and A3.S5 (i.e. SIRI-SX, SIRI-ET and SIRI-ST).

1. **Detailed real-time timetable updates (including local and bordering services)**
   a. ***Involved standard/s:*** SIRI-ET (Service Interface for Real Time Information – Estimated Timetable Service)
   b. ***Purpose of the standard:*** Providing detailed information about real-time variations of the timetables planned within the current day, according to e.g. delays, cancellations, detours and other real-time events.
   c. ***Introductive info on the standard:*** All SIRI standards incorporate various existing standards to deliver them through a XML schema and a TransModel modelling concept. At the same time, all SIRI services are provided over a standard Communication layer based on a Web Service Architecture.
   d. ***Technical sources for developers:*** The "SIRI White Paper" (CEN TC 278 Working Group 3 Sub Group 7, 2005); the "SIRI Handbook" (Kizoom, 2008); the "SIRI XML Schema – SIRI EX" (VDV, 2015).
2. **Major planned and unplanned events (including local and bordering services)**
   a. ***Involved standard/s:*** SIRI-SX (Service Interface for Real Time Information – Situation Exchange Service)
   b. ***Purpose of the standard:*** Providing real-time updates about particular events that can affect also the planned performing of the transport network. For examples: major public events, incidents, and ongoing infrastructural works.
   c. ***Introductive info on the standard:*** See point 1.c
   d. ***Technical sources for developers:*** The "SIRI White Paper" (CEN TC 278 Working Group 3 Sub Group 7, 2005); the "SIRI Handbook" (Kizoom, 2008); the "SIRI XML Schema – SIRI SX" (VDV, 2015).
3. **Stop-related information and updates (including local and bordering services)**
   a. ***Involved standard/s:*** SIRI-ST (Service Interface for Real Time Information – Stop Timetable Service)
   b. ***Purpose of the standard:*** Providing real-time information specifically concerning the stops of a network. For instance, the expected arrival and departure time of each service passing through a considered stop.
   c. ***Introductive info on the standard:*** See point 1.c
   d. ***Technical sources for developers:*** The "SIRI White Paper" (CEN TC 278 Working Group 3 Sub Group 7, 2005); the "SIRI Handbook" (Kizoom, 2008); the "SIRI XML Schema – SIRI ST" (VDV, 2015).



APPENDIX

A4.S2-T1

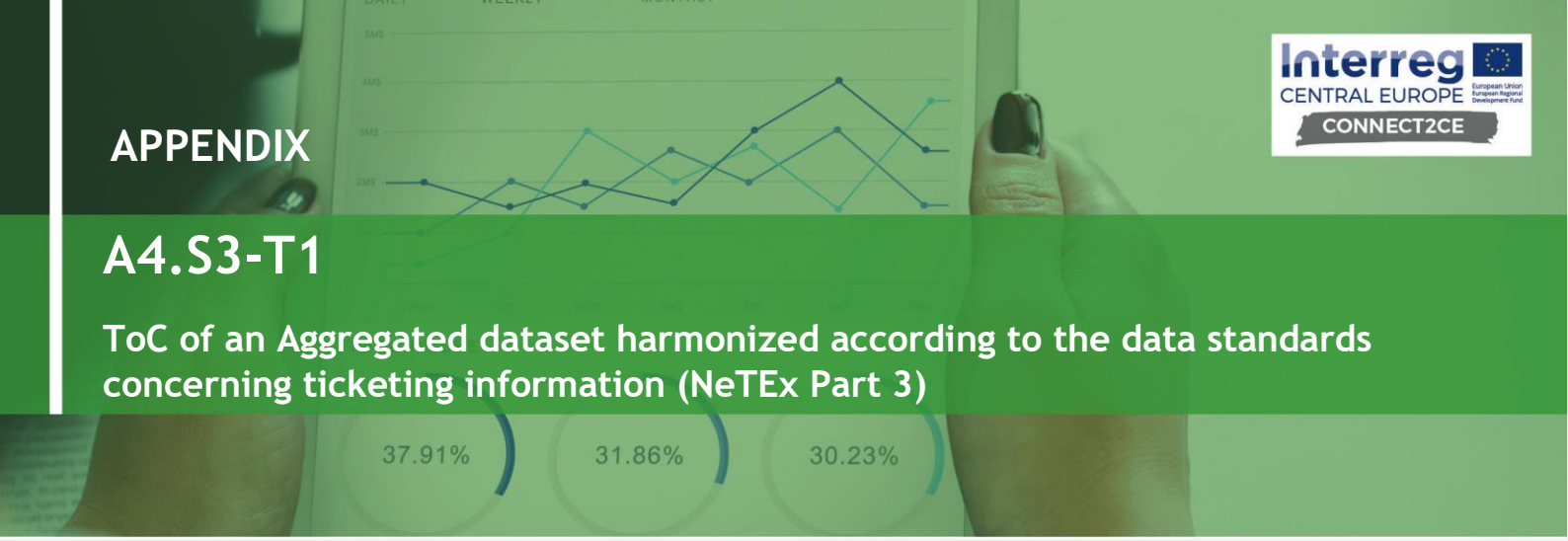
ToC of an Updated data exchange architecture to host a standardized dataset (of ticketing information)

Contents

To outline To step

The following list explains an exemplificative data flow structure dealing with ticketing information. A data exchange architecture can adopt this structure before integrating local and cross-border data harmonized according to proposed CEN standards.

1. **Back-end: Timetable and Network Topology Planning Tool**
   - Processing of static fare data from involved local and bordering providers (NeTEx Part 3 standard)
   - Transmission of static fare data to back-end tools as Travel Planner, Data Warehouse and Ticketing System
2. **Back-end: Travel Planner**
   - Reception of static fare data (in NeTEx Part 3 standard) from the back-end Timetable and Network Topology Planning Tool
   - Transmission of static fare data to the front-end tools such as Screens, Web platform and Mobile platform
3. **Back-end: Ticketing System**
   - Reception of static fare data (in NeTEx Part 3 standard) from the back-end Timetable and Network Topology Planning Tool
   - Reception of data on fare transactions from the back-end On-board Ticketing Units (installed in the on-board units managed by involved operators)
   - Processing of data on fare transaction (NeTEx Part 3 standard) and transmission of data to the Data Warehouse
   - Exchange of data on fare structure and network topology with the back-end On-board Ticketing Units
   - Transmission of fare data thorough a journey fare calculation service to front-end tools such as Web platforms and Mobile platforms
4. **Back-end: On-board Ticketing Unit**
   - Transmission of data on fare transactions to the back-end Ticketing System
   - Exchange of data on fare structure and network topology with the back-end Ticketing System
5. **Back-end: Data Warehouse**
   - Reception of static fare data (in NeTEx Part 3 standard) from the back-end Timetable and Network Topology Planning Tool
   - Reception of data on fare transactions from the back-end Ticketing System (in NeTEx Part 3 standard)
6. **Front-end: Screens, Web platform, Mobile platform**
   - Reception of static fare data (in NeTEx Part 3 standard) from the back-end Travel Planner
   - Reception of aggregated information about the fares of searched journeys from the calculator of the back-end Ticketing System
   - Display of data on front-end tools



APPENDIX

A4.S3-T1

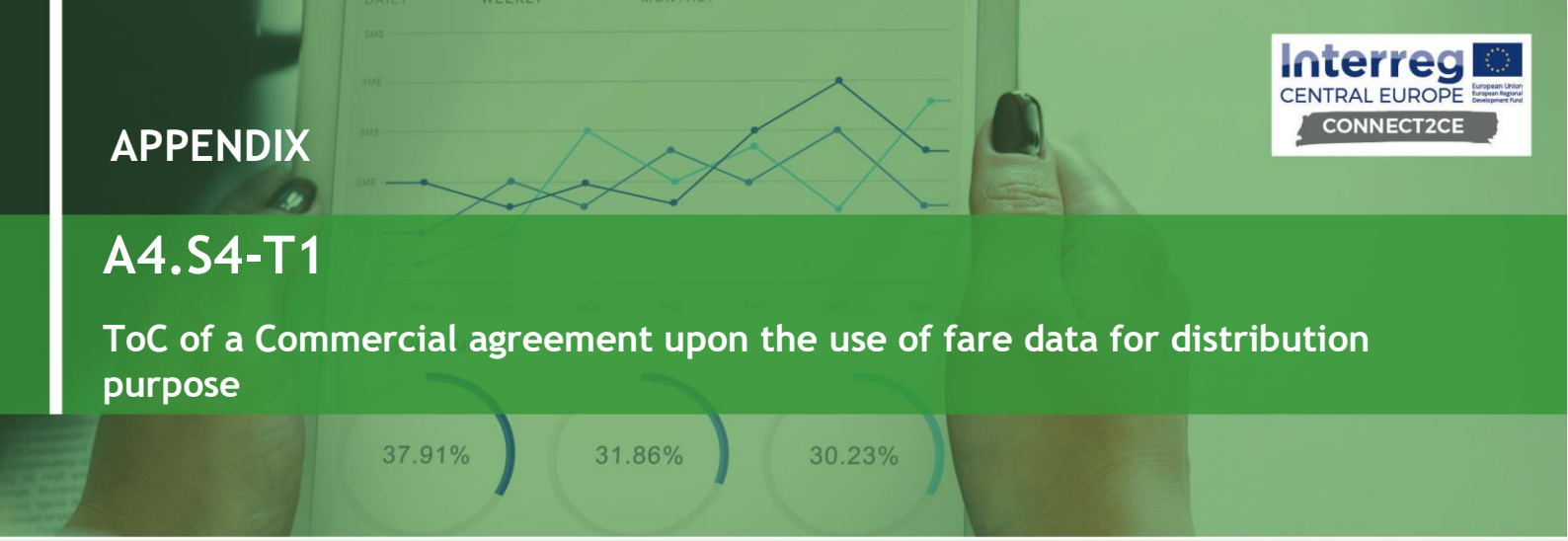
ToC of an Aggregated dataset harmonized according to the data standards concerning ticketing information (NeTEx Part 3)

Contents

To outline To step

The following list describes main contents that can be included in a dataset of ticketing information harmonized according to the corresponding CEN standards considered in steps A4.S3 (i.e. NeTEx Part 3).

1. **Fare structures, products and prices (including local and bordering services)**
   a. ***Involved standard/s:*** NeTEx (Network Timetable Exchange) Part 3
   b. ***Purpose of the standard:*** Exchanging information on the types of fare structures, products and prices for the calculation of overall fares for multimodal journeys even on long distances and at cross-border level. Such exchange of data is among different data-storing and data-generating systems.
   c. ***Introductive info on the standard:*** NeTEx includes a CEN specification document in three parts; a data model that is presented in UML; an XML schema that can be used by data processing software (both NeTEx Part 1, 2 and 3 stick to this structure).
   d. ***Technical sources for developers:*** The "NeTEx VDV Application Handbook" (VDV, 2017); the "Schemas for Fare information exchange" (netex-cen.eu).



APPENDIX

A4.S4-T1

ToC of a Commercial agreement upon the use of fare data for distribution purpose

Contents

To outline To step

The following dot list explains the main aspects to take into account when setting a commercial agreement to obtain the permission for the sale of tickets concerning other transport providers (e.g. providers operating in bordering areas).

1. **Usual limitations to commercial use: Regulations** as those of the ITS Directive require transport provider to make ticketing information publicly available even for sharing purpose. However, no similar duty exists to make data available for commercial use.

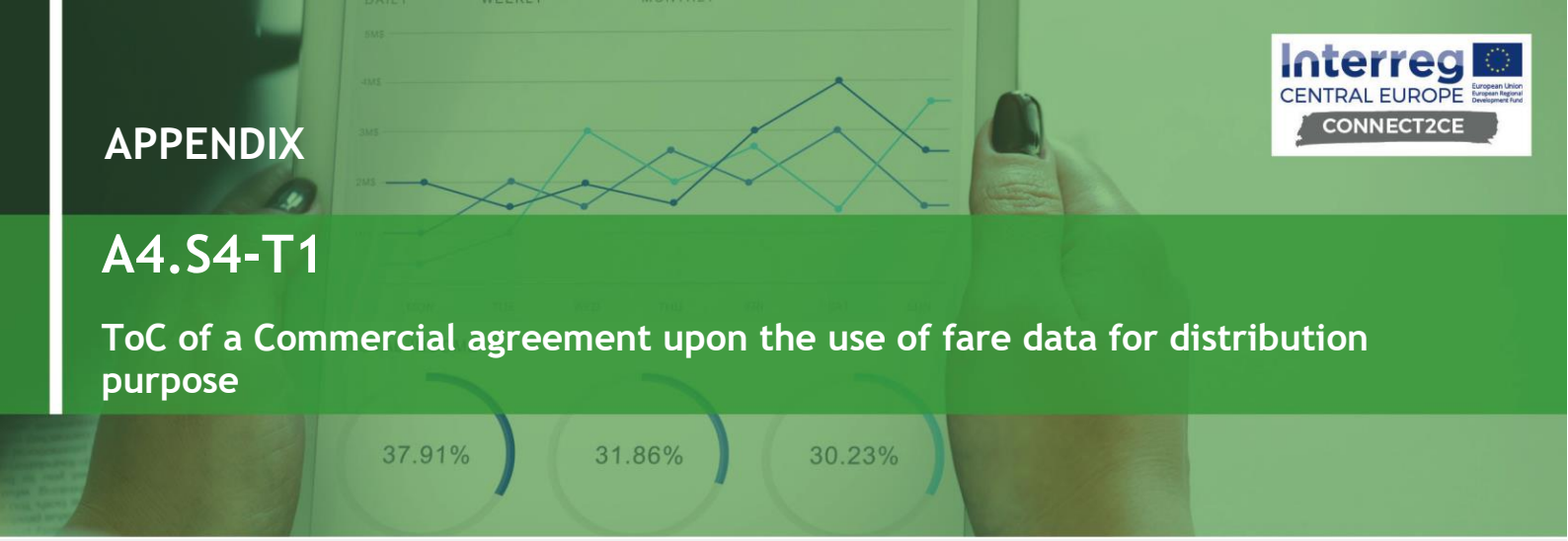
2. **Sensible factors related to competition:** Sharing fare for **distribution** purpose implies also competition issues. For instance, yielded prices (i.e. prices changing according to demand as happened for rail and air transport) are sensible data not easy to share among competitors.

3. **Revenue sharing:** When multi-provider travels are booked and paid by customers, the **ticketing** system has to calculate the share of the revenue to allocate to each provider. For this purpose, involved parts have to share detail information on the prices of each segment, which can be a demanding task.

4. **Commissions to lead retailer:** When a ticketing platform acts as lead retailer by selling tickets of services within the domain of different providers, a commission is due for the sale service performed. An agreement on such commission has to be reached among all the parts involved in the commercial agreement.

The following dot list displays main points of an exemplificative template of distribution agreement called "General terms and conditions for the sale of tickets and products" provided by Trenitalia (IT). Given its general approach, it can be used as basic reference also for other geographical and regulative contexts.

1. **Description of the contractor´s activities and obligations**
   - Promote the transport services included in the ticketing platform
   - Provide customers with complete information on the services and products of the transport providers
   - Install sales systems according to the requirement of the transport providers
   - Ask authorisation to transport providers before modifying the sales system
   - Comply with the fee levels agreed with the transport providers
   - Pay the transport providers according to agreed terms
2. **Obligations concerning the sale points**
   - Inform transport providers about the deployed platforms (both physical, web and mobile)
   - Include complete information about e.g. timetables offered by transport providers
   - Indicate clearly that products are sold on behalf of corresponding transport providers
3. **Controls and inspections**
   - Transport providers have the right to carry out inspections to verify the correct compliance of the obligations
   - Contractor guarantees complete cooperation for this purpose



A4.S4-T1

ToC of a Commercial agreement upon the use of fare data for distribution purpose

To outline To step

4. **Booking, sales and accounting system**
   - Transport providers give to contractor access to their data and booking system in order to perform the sale service
   - The contractor has to use the accounting system of Trenitalia to report sales data
5. **Commissions**
   - For the sale of tickets and product and for the fulfilment of agreed activities, the contractor receives a commission from transport providers
   - The commission is calculated on the basis of a percentage of the value of tickets and products sold by the contractor

Other points: Agency Rights, Guarantee, Stock and Custody, Payment of proceeds, Interest on arrears, Accounting, Transport provider's obligations, Transfer and Subcontracting, Exclusive rights, Penalties, Restriction on telematics links, Duration, renewal and entry into force, Non-transferability of credits, Security of Information and IT Systems