XSD2017d

VDV-Implementation rules 453 – Swiss public transport

Based on VDV Guideline 453 version 2.6.1

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Contents

Change history from V 1.0 to 1.1

Section	Changes	Changed by	Changed on
Sect. 1.1	The implementation rules V1.1 support the new VDV Guideline 453 V2.4 dated July 2015	KIDS WG	22.09.15
Sect. 1.4.3	Mandatory fields: specifying mandatory fields without a value is not permitted in the Swiss public transport system Optional fields: resetting optional fields by omitting the value is allowed	KIDS WG	22.09.15
Sect. 5.1.4.2	Subscription data can be retransmitted in different successive data packets. Include as much detail as possible.	KIDS WG	22.09.15
Sect. 1.7	DIDOK stop list [4] was adopted as a reference for stops and transport companies (business organisation numbers) in implementation rules.	KIDS WG	22.09.15
Sect. 6.1.5	The FahrtID (journey ID) element was defined as mandatory (required for unique ID and referencing of journeys) Uniform format defined in Swiss public transport system for LinienID (line ID): [UIC country code]:[business organisation number]:[journey reference] The FahrtBezeichner [journey identifier] for the same journey must match in VDV453 and VDV454 services.	KIDS WG	22.09.15
Sect. 6.1.6	Uniform format defined in Swiss public transport system for LinienID (line ID): [UIC country code]:[business organisation number]:[technical line key] or [transport number]	KIDS WG	22.09.15
Sect. 6.2.4.1.1	Uniform delay of 30 seconds across all systems in Swiss public transport.	KIDS WG	22.09.15

Change history from V 1.1 to 1.3

Section	Changes	Changed by	Changed on
1.4	Reference [5] added	C. Heimlicher	18.12.17
5.1.4.1	Content deleted by link to section in text. DatensatzAlle=true (dataset all = true) redefined in section 4.1.4.2.1.	J. Wichtermann	02.11.17
5.1.4.2	Text added: The data supplier can decide whether or not to use the WeitereDaten (more data) mechanism.	D. Rubli	07.12.17
5.1.4.2.1	New section included from VDV Guideline 453.	J. Wichtermann	17.07.17
6.1.7	Section revised in accordance with the harmonisation of transport. In particular, the transport category sources were replaced by transport categories and the table was added.	C. Heimlicher	18.12.17
6.1.9	Section expanded in order to harmonise transport and table added. ????	C. Heimlicher	18.12.17
6.1.12	New section included from VDV Guideline 453. Numbering of the subsequent shifted.	J. Wichtermann	17.07.17
6.2.4.3.1	New content from VDV Guideline 453: AnkunftssteigText and AnkunftsSektorenText	J. Wichtermann	17.07.17
6.2.4.3.1. 6.2.4.3.2. 6.3.8.3.1. 6.3.8.3.5.	Transport category sources replaced by transport categories	C. Heimlicher	18.12.17
6.2.4.3.2	New content from VDV Guideline 453: Operational, AnkunftszeitASBPlan, HaltID, HaltepositionsText and FahrtInfo.	J. Wichtermann	17.07.17
6.3.8.2	Only the update added from VDV Guideline 453	J. Wichtermann	17.07.17
6.3.8.3.1	New content from VDV Guideline 453: FahrtBezeichnerText, AnkunftssteigText, AbfahrtssteigText, AnkunftsSektorenText, AbfahrtsSektorenText, Einsteigeverbot, Aussteigeverbot and Durchfahrt	J. Wichtermann	17.07.17
6.3.8.3.7	New content from VDV Guideline 453: VonRichtungsText, AnkunftszeitAZBPlan, AbfahrtszeitAZBPlan, HaltID, HaltepositionsText, FahrtInfo.	J. Wichtermann	17.07.17
6.2.3.1	New section included from VDV Guideline 453,	J. Wichtermann	02.11.17
6.2.3.2	New section included from VDV Guideline 453,	J. Wichtermann	02.11.17
6.2.3.3	New section included from VDV Guideline 453,	J. Wichtermann	02.11.17

6.2.3.3.1 6.2.4.3.1 6.2.4.3.2 6.3.8.3.1 6.3.8.3.5	The FahrtInfo structure and the ProduktID and Be-treiberID content are now mandatory.	J. Wichter-mann	02.11.17
6.2.4.2	Preview time added	J. Wichter-mann	02.11.17

Change history from V 1.3 to 1.4.2

Section	Changes	Changed by	Changed on
Var.	Only changes to the Guideline are listed in the struc-tures.	J. Wichter-mann	28.11.2019
1.1	Instruction repeated: version XSD2017.c must always be used in the Swiss public transport system.	J. Wichter-mann	14.09.2020
1.4	Adapted for new versions	J. Wichter-mann	31.08.2020
6.1.2	Date and time formats are already clearly defined in VDV Guideline 453 and can be omitted here.	J. Wichter-mann	28.11.2019
6.1.7	The list of permitted ProduktIDs (product IDs) was de-leted and replaced by a link to the current document in Section 1.4	J. Wichter-mann	28.11.2019
6.1.9	Cross-references added	J. Wichter-mann	14.09.2020
6.1.13	Missing section: "Latency and processing analysis" added and its use defined across the Swiss public transport system.	J. Wichter-mann	14.09.2020
6.1.14.1	The format for HaltepositionsText (stopping position text) was adopted in the implementation rules, including separator signs for rail.	J. Wichter-mann	14.09.2020
6.1.14.3	Durchfahrt (through travel) incl. conversions added	J. Wichter-mann	14.09.2020
6.1.14.4	Einsteigeverbot (no boarding) incl. conversions added	J. Wichter-mann	14.09.2020
6.1.14.5	Aussteigeverbot (no alighting) incl. conversions added	J. Wichter-mann	14.09.2020
6.2.3.3.1	Only changes to VDV Guideline 453 are listed. FahrtInfo (journey info), ProduktID (product ID) and Be-treiberID (operator ID) mandatory in xxxFahrplanlage and xxxFahrtLoeschen	J. Wichter-mann	31.08.2020
6.2.3.3.2	Missing section: "Information on direct communication" added.	J. Wichter-mann	28.11.2019
6.2.4.2	Only changes to VDV Guideline 453 are listed.	J. Wichter-mann	14.09.2020
6.2.4.2.2	Only changes to VDV Guideline 453 are listed. LinienID (line ID) clarification added	J. Wichter-mann	31.08.2020

6.2.4.2.3	Only changes to VDV Guideline 453 are listed.	J. Wichter-mann	14.09.2020
	AbbringerInfo (connector info): information on FahrtInfo (journey info), tracks, sectors and HaltepositionsText (stopping positions text) added.		
6.2.4.3.1	Only changes to VDV Guideline 453 are listed.	J. Wichter-mann	14.09.2020
	Cross-reference of HaltepositionsText (stopping position text) format among others added.		
6.2.4.3.2	Only changes to VDV Guideline 453 are listed.	J. Wichter-mann	14.09.2020
	Cross-reference to HaltepositionsText (stopping position text) format added.		
6.3.8.2	Only changes to VDV Guideline 453 are listed.	J. Wichter-mann	14.09.2020
6.3.8.3.1	Only changes to VDV Guideline 453 are listed.	J. Wichter-mann	14.09.2020
	Several cross-references added.		
	Implementation instruction: The new elements AnkunftFaelltAus (arrival cancelled) and AbfahrtFaelltAus (departure cancelled) must be received, evaluated and forwarded. More details about the conversion added.		
	Sending an AZBFahrtLoeschen message is recommended in place of AZBFahrplanlage mit AnkunftFaelltAus=true and AbfahrtFAelltAus=true		
6.3.8.3.5	Missing section: "Transmitting special text" added and its use defined across the Swiss public transport system.	J. Wichter-mann	14.09.2020
6.3.8.3.6	Missing section: "Deleting special text" added and its use defined across the Swiss public transport system.	J. Wichter-mann	14.09.2020
6.3.8.3.7	Only changes to VDV Guideline 453 are listed.	J. Wichter-mann	14.09.2020
	Several cross-references added.		
	Cross-reference of HaltepositionsText (stopping position text) format added.		
10	As well as removed from the VDV Guideline	J. Wichter-mann	31.08.2020

Change history from V 1.4.2 to 1.4.3

Section	Change	Changed by	Changed on
Page 1. Section 1.1 Section 1.4	XSD2017c replaced by XSD2017d.	KIDS WG	07.04.2021
Page 1. Section 1.1 Section 1.4	VDV453 version 2.6 replaced by version 2.6.1.	KIDS WG	07.04.2021
Section 1.4	VDV454 version 2.2 replaced by version 2.2.1.	KIDS WG	07.04.2021

Change history from V 1.4.3 to 1.5

Section	Changes	Changed by	Changed on
1.1 previously	The section was removed the redundant versions of VDV Guideline 453 and the XSD can be found in chapter 1.7 as well as on the front page.	KIDS WG	29.06.2021
1.1	New section Rules for Swiss public transport	KIDS WG	29.06.2021
1.2	Versioning of CUS subversions	KIDS WG	29.06.2021
1.4.3	Previously: If use deviates from the original VDV Guideline 453, the value in this document is shown in **bold** and **underlined**. Note: For some time now, only differences have been shown. The text was therefore obsolete.	KIDS WG	29.06.2021
1.7	The references were altered to the latest versions.	KIDS WG	29.06.2021
2.1.2	New definition of "preview time" in data platforms:	KIDS WG	09.09.2021
6.1.4	Text changed pertaining to ASBID / AZBID subscriptions	KIDS WG	29.06.2021
3.2.3 6.1.6.5 6.3.8.3.1	Intermediate destinations should always be stated in the Via element and the ViaHst1Lang, ViaHst2Lang and ViaHst3Lang elements. The Via element must always include the same information as Hst1Lang to ViaHst3Lang. When converting from XSD2015 to XSD2017, the information must be transferred to the Via element from ViaHst1Lang, as long as these are formatted 6.1.6.5by chapter.	KIDS WG	29.06.2021
6.1.6.1	Reference to the new IDS (SID4PT) added	KIDS WG	29.06.2021
6.1.14.2	Ankunfts-/AbfahrstSteigText must include content, whenever possible.	KIDS WG	29.06.2021
6.1.14.5	xxxFahrplanlage does not have to be forwarded when converting from XSD2017 to XSD2015, but xxxFahrtLoeschen *must* be forwarded.	KIDS WG	29.06.2021
6.2.3.3.1	The concessionaire is now included in the BetreiberID. However, the content must always match INFO+ Content of the Betreiber element defined more precisely.	KIDS WG	29.06.2021
6.2.4.2	Additional elements added and described.	KIDS WG	29.06.2021
1.1 (and subchapter) 1.3 1.4.4 1.4.5 1.4.6 1.6 2.1.3 4.3 6.2.4.2.4 6.3.8.1.1	New sections added, which are only relevant to CUS.	KIDS WG	29.06.2021

6.2.4.3	Tables with elements added and described	KIDS WG	29.06.2021
6.3.8.2	Tables with elements added and described	KIDS WG	29.06.2021
6.2.4.3.1 6.3.8.3.1	Ankunfts-/AbfahrtssteigText are obligatory in rail operations, with exceptions by mutual agreement.	KIDS WG	29.06.2021
6.2.4.3.2	Additional elements added and described. Note on Ursache: Ursache (cause) may only be stated when there is an Ausfall (cancellation).	KIDS WG	29.06.2021
6.3.8.3	Additional elements added and described.	KIDS WG	29.06.2021
6.3.8.3.1	Additional elements added and described. And text changed: If both elements are set as true, **(even stops at the start or finish of a route, both must be set as true)**, an AZ-BFahrtLoeschen element should be triggered with the Ursache=Ausfall (cause=cancellation) when converting to an older XSD version. In the Swiss public transport rail system, the FahrtBezeichnerText includes the train number.	KIDS WG	29.06.2021
6.3.8.3.1	Implementation note on service cancellation according to CR 0156	J. Wichtermann, C. Heimlicher	07.09.21
6.3.8.3.7	Additional elements added and described. Note on Ursache: Ursache (cause) may only be stated when there is an Ausfall (cancellation).	KIDS WG	29.06.2021
6.2.4.3.1 6.3.8.3.1	HaltID is now mandatory	KIDS WG	29.06.2021
7	Glossary extended	KIDS WG	29.06.2021
8.1	Index of tables deleted	KIDS WG	29.06.2021

Change history from V 1.5 to 1.6

Section	Changes	Changed by	Changed on
1.7	The use of the XSD "XML schema VDV453_incl_454_V2017d.xsd" is now mandatory. All elements from this XSD must be received without errors and forwarded in data hubs (CR_0200). The links have been adapted to the new repositories.	KIDS WG	28.04.2023
4.3 4.4	Chapter 4.4 on OAuth and subchapters has been removed. A reference to this repository has been added to Chapter 4.3.	KIDS WG	09.06.2022
4.4	With the introduction of the new Swiss IDs (SID4PT) and the necessary changes in the XSD2017, IDs may no longer be interpreted.	KIDS WG	25.02.2022
5.1.7 5.1.8	Application of the DataVersionID in Swiss public transport.	KIDS WG	21.06.2023

6.1.4	New subchapters 6.1.4.1 and 6.1.4.2 created for AZBID / AS-BID with and without SLOID. Special cases and explanations for AZBID / ASBID removed from RV. (CR 0175]	KIDS WG	15.12.2021 29.03.2022
6.1.5	New subchapters 6.1.5.1 and 6.1.5.2 for the trip identifier with or without SJYID. Default for SJYID removed, reference to specification. (CR 0175]	KIDS WG	15.12.2021 29.03.2022
6.1.7	The ProductID has been defined more precisely regarding national language and upper/lower case.	KIDS WG	25.02.2022
6.1.14	Chapter 6.1.14.4 renamed to HaltID without SLOID. Chapter 6.1.14.5 newly created, HaltID with SLOID (CR 0175]	KIDS WG	15.12.2021
6.1.14.1	The text length of the field HaltepositonsText is limited to 6 and not 5 characters in öV-Switzerland.	KIDS WG	25.02.2022
6.3.8.3.1	FahrtBezeichnerText: Description more precise..	KIDS WG	10.05.2022
6.2.3.3.1	Reminder of change in V1.5: In the element OperatorID always the transport company (GO number according to DiDok GO list [4]) is specified, which has the order (from BAV, canton, etc.) to operate this trip and has the concession for.	KIDS WG	28.04.2023
4.5	New chapter added with constraints to be considered during the SID4PT migration from Swiss public transport.	KIDS WG	12.05.2023
6.1.6	Chapter restructured and supplemented: conventional LinienID format unchanged, but new section for future SLNID format with references to SID4PT specification.	KIDS WG	12.05.2023
6.1.9	Definitions and implementation deadlines of ServiceAttributes NF and HL clarified, with HL newly added (origin is timetable).	KIDS WG	12.05.2023
6.1.14.4	Definition and rules regarding optional top point code clarified along with dependencies to DiDok.	KIDS WG	12.05.2023
6.1.14.5	Added new section with conversion rule between SLOID and HaltID via DiDok master data.	KIDS WG	12.05.2023

Release status

Version	Date	Status
1.0	07.11.2014	Approved by IT committee (VöV)
1.1	21.10.2015	Approved by IT committee (VöV)
1.2	01.10.2018	Reviewed by IT committee and recommended for release
1.2	24.10.2018	approved and declared binding by SKI management board
1.4.2	11.11.2020	approved and declared binding by SKI management board
1.4.3	05.05.2021	approved and declared binding by SKI management board
1.5	27.10.2021	approved and declared binding by SKI management board
1.6	30.08.2023	approved and declared binding by KKI

1.   Preliminary remarks

Based on the official VDV Guideline 453 (published by the German Association of Transport Companies (VDV), this document describes the implementation rules for public transport in Switzerland, hereinafter abbreviated to VDV-RV 453.[1]

It explains the specifics and deviations from the official guideline, with the aim of ensuring its uniform application across the entire Swiss public transport system.

**Implementations rules (VDV-RV 453) as a
common basis across the Swiss public transport system**
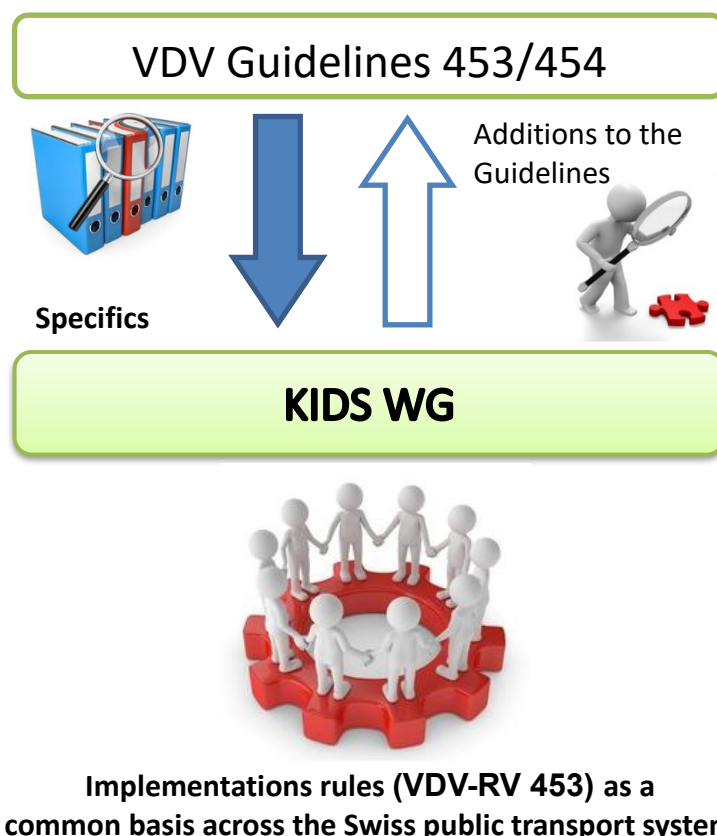
The implementation rules in this document have been agreed upon by the KIDS working group (Kundeninformationsdaten-Schnittstellen, or customer information data interface) in the Swiss public transport system) and are the result of a standardisation process that concerns the uniform application of VDV Guidelines across the Swiss public transport system.

The implementation rules are officially approved by the SKI management board.

The implementation rules consist largely of:

-   Concretisation of points that are purposely defined in an abstract and open-ended manner in the VDV Guideline.
-   Concretisation of points that were previously handled in an inconsistent manner by Swiss public transport.
-   Deliberate deviations from the official VDV Guideline within Swiss public transport.

1.1. Guidelines for Swiss public transport and CUS additions (additions to VDV RV 453)

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

1.2. Versioning of CUS subversions/change log (additions to VDV-RV 453)

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

1.3. On behalf of FOT (Addition in VDV-RV 453)

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

1.4. Document structure and scope (additions to VDV-RV 453)

1.4.1. Scope

These implementation rules for the Swiss public transport system (VDV-RV 453) supplement the official VDV Guideline 453 and describe only deviations, changes and concretisations of this guideline. This document does **not** replace the official VDV Guideline 453 and therefore does not contain the complete information needed to implement or understand the VDV453 interface.

In addition to these implementation rules, the respective partners require an agreement that is even more specific than described here and is tailored to the individual circumstances and needs of the individual partners. This agreement explains points not described here and may also contain explicit deviations and additions to VDV-RV 453, provided that both partners and all other relevant committees/partners concur. These bilateral or multilateral specifications (hereinafter referred to as Partner2Partner specifications) should always refer to this VDV-RV 453 and be based as closely as possible on this.

This document should not be interpreted as a contract. The contractual situation between two partners or their suppliers is not part of this document.

1.4.2. Uniform chapter structure

In order to facilitate direct comparison between the implementation rules and the official VDV Guideline, the section structure of the official VDV Guideline 453 [1] has been consistently applied in this document, **beginning with Section 2**.

More specifically, this means that:

- The official VDV Guideline 453 generally applies. The statements and definitions set out in the official VDV Guideline 453 [1] are not repeated in this document[1].
- A **blank section** in this document means that the original VDV Guideline apples without exceptions or additional stipulations. The section is marked as follows: "(see VDV Guideline 453)
- If specifics or deviation from the standard is necessary due to special circumstances within Swiss public transport, these will be described in detail in the section in question.

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[1]An exception to this rule will be made if a brief description of the normal case defined in VDV Guideline 453 is required or practical in order to understand a subsequent text or the general context.

- The official VDV Guideline 453 purposefully does not make any stipulations on metadata for data exchange between VDV partners. Stipulations on individual metadata and their structure, which apply to the whole Swiss public transport system[2], are described in the relevant sections.

The consistency of the section structure is guaranteed, with the following caveat:

If an explanation or addition is necessary and does not match the specified section structure, a separate section will be added at the end of the section level in question, which always has the extra text (**Addition in VDV-RV 453**) in the title. This section (including any subsections) does not correspond to the official VDV Guideline 453 and placing it at the end of the section level does not therefore affect other section numbers that follow it.

1.4.3. Mandatory, optional and non-supported fields

In the tables describing the XML structure of a data element, the last column specifies whether the element in question is mandatory or optional.

Mandatory	Element must be specified in the XML structure **and** contain a semantically meaningful value. Specifying a mandatory field without a value is not allowed.
optional	Element can be specified or can be omitted. If the element is specified, it should contain a semantically meaningful value.
	A previously delivered value can be reset by explicitly not specifying the value when the element is transferred again (if this is permitted by the XSD definition).
	If the optional element is omitted in the case of a change notification, the value from the last transfer applies.
	If the optional element is omitted in the case of a complete journey, the value is reset to the default (if defined) or otherwise left blank (null).
n/a	Element is not supported. If it is specified, the content will be ignored.
	All data elements that are not supported or are not known to the system-specific XSD are to be ignored by the system. A processing or validation error must not result from this.

Table 1: Mandatory and optional fields

1.4.4. Differentiation of the roles of CUS (Addition in VDV-RV 453)

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

1.4.5. CUS as data platform *(Addition in VDV-RV 453)*

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

1.4.6. CUS as rail data producer – DPB (Addition in VDV-RV 453)

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

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[2]The rules are defined by the KIDS working group and apply as the standard for the Swiss public transport system.

1.5. Binding nature (Addition in VDV-RV 453)

This document describes how VDV Guideline 453 is applied and interpreted specifically within Switzerland. It forms the basis of agreements for VDV connection between the individual public transport partners for exchanging current data.

In addition to the stipulations in this document, the respective partners will not need to agree upon metadata defined either here or in the official VDV specification.

1.6. VDV services supported by SBB (Addition in VDV-RV 453)

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

1.7. Documents referenced

[1] German Association of Transport Companies VDV
VDV Guideline 453 - Live data interface timetable information, version 2.6.1, Cologne (Germany), 2021
https://www.xn--v-info-vxa.ch/de/branchenstandard/branchenstandard-kundeninformation-bs-ki/technische-standards

[2] German Association of Transport Companies (VDV)
XML schema VDV453_incl_454_V2017.d.xsd (version: 2017.d), Cologne (Germany), 2021
https://www.vdv.de/i-d-s-downloads.aspx

[3] German Association of Transport Companies VDV
VDV Guideline 454 - Live data interface timetable information, version 2.2.1, Cologne (Germany), 2021
https://www.xn--v-info-vxa.ch/de/branchenstandard/branchenstandard-kundeninformation-bs-ki/technische-standards

[4] Federal Office for Transport (BAV)
Stops (DiDok list), Bern (Switzerland)
https://opentransportdata.swiss/en/dataset/didok

[5] Alliance Swiss Pass
V580 – FIScommun / product no. 06 Harmonisation of transport
06 Harmonisierung Verkehrsmittel
https://www.allianceswisspass.ch/de/tarife-vorschriften/uebersicht/V580/Produkte-der-V580-FIScommun-1

[6] Federal Office of Transport (FOT) - Swiss BAV
Service-level agreement SBB 2021 to 2024
https://www.bav.admin.ch/dam/bav/de/dokumente/das-bav/finanzierung/abgeschlossene-lv-2021-2024/lv-sbb-2021-2024.pdf.download.pdf/SBB%20LV%202021-2024.pdf

[7] SID4PT
https://www.xn--v-info-vxa.ch/de/branchenstandard/branchenstandard-kundeninformation-bs-ki/technische-standards

2. Introduction

2.1. General

This document, together with the official VDV Guideline 453 [1], defines the Swiss-wide standard for implementing the VDV interface, as well as individual data structures, based on the mutual exchange of real-time transport information between public transport companies using the ITCS (Intermodal Transport Control System) or data platforms.

Both documents, when taken together, describe in detail:

- what data can be exchanged between public transport partners?
- what data can be exchanged between CUS and a public transport partners?
- what elements of the VDV Guideline are supported within the Swiss public transport system?
- explicit deviations from the corresponding VDV Guideline
- the format of an individual data element
- the content and time-related data flows
- what agreements on metadata are necessary?
- what tasks are involved in the introduction of the interface and how these can be divided up or coordinated between CUS and the public transport partner.
- what needs to be considered when operating the interface?
- how the data is exchanged (formats, communication protocols, etc.)
- how data is to be interpreted when it is not clear from VDV Guideline 453 or when its use deviates from VDV Guideline 453

2.1.1. Transport (Addition in VDV-RV 453)

The term "*vehicle*" [5] and its abbreviation *VM* used in this document refers to all means of transport relevant to customer information (e.g. train, bus, tram, boat, funicular, etc.). An individual trip on a means of transport is called a *journey*.

2.1.2. Data storage and actuality (Addition in VDV-RV 453)

(see VDV Guideline 453)

Preview time in data platforms:
Preview time only makes sense in connection with a subscription to the ITCS; all other systems in the supply chain must apply this definition by default.

If a subscriber to a data platform wishes to extend the preview time, it can still only deliver the data covered by the ITCS subscription, i.e. in accordance with the preview time of the subscription to the ITCS.

If a subscriber of a data hub wishes to shorten the preview time, this would require the platform to withhold received data until the preview time occurs. To do this, the data platform would have to be able to tell whether this data is dependent on the preview time or would have to be forwarded immediately upon receipt anyway. The data platform is unable to do this, however, which is why a data platform must always forward all received data immediately. In doing so, the data platform will ignore the preview time of the subscriber.

2.1.3. Interoperability of DFI-ANS (Addition in VDV-RV 453)

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

2.2. Objectives

(see VDV Guideline 453)

2.3. Overall concept

(see VDV Guideline 453)

3. Introduction and basic terms

(see VDV Guideline 453)

3.1. Connection protection (ANS)

3.1.1. Mission and goals

(see VDV Guideline 453)

3.1.2. Feeder-fetcher principle

(see VDV Guideline 453)

3.1.3. Definition of company-wide connection protection

(see VDV Guideline 453)

3.1.4. Operational characteristics

(see VDV Guideline 453)

3.1.4.1. Railway station
(see VDV Guideline 453)

3.1.4.2. Multiple connections
(see VDV Guideline 453)

3.1.4.3. Multiple stops visited
(see section 6.1.8 for `<HstSeqZaehler>`)

3.1.5. Journey and connection planning (working timetable)

(see VDV Guideline 453)

3.1.6. Connection areas

(see VDV Guideline 453)

3.1.7. Passenger information interior display

(see VDV Guideline 453)

3.1.8. Journey-related connection protection

(see VDV Guideline 453)

(see VDV Guideline 453)

3.2. Dynamic passenger information (DFI)

(see VDV Guideline 453)

3.2.1. Mission and goals

(see VDV Guideline 453 [1], Section 3.2.1 and section in this document 2.2)

3.2.2. Data supply and transfer

The information flow is fully automated.

For information on the origin and currency of the data, see Section 2.1.2

3.2.3. Display areas

(see VDV Guideline 453)

3.3. Visualisation of external vehicles (VIS)

(see VDV Guideline 453)

3.4. General messaging service (AND)

(see VDV Guideline 453)

4. Architecture

(see VDV Guideline 453)

4.1. Communication vs. specialist services

(see VDV Guideline 453)

4.2. Reference vs. process data

(see VDV Guideline 453)

4.3. Protocols used

(see VDV Guideline 453)

4.4. IDs must not be interpreted *(addition in VDV-RV 453)*

With the introduction of the new Swiss IDs (SID4PT) and the necessary changes in the XSD2017 in this context, IDs may no longer be interpreted.

4.5. Change of the ID characteristic during SID4PT migration *(addition in VDV-RV 453)*

A change of the ID characteristics between non-SID4PT and SID4PT is generally only permitted after mutual agreement. If, for example, the stops of a trip are transmitted once with conventional

BPUICs and in the subsequent message with SLOIDs in the same subscription (or even across subscriptions if the corresponding configuration is missing), then the trip must be discarded. In general, the trip will be discarded if there are inconsistencies regarding ID characteristics.

In particular, it must be noted in the context of SLOID migration that changes in DiDok (e.g. new SLOID) may only be taken into account by control systems on the next operating day. An unknown SLOID in a real-time trip result in the trip being discarded.

5.   Basic infrastructure interface description

5.1.   Subscription procedure

5.1.1. Overview
(see VDV Guideline 453)

5.1.2. Setting up subscriptions
There are some events that require all the subscriptions taken out by a client to be set up again.

Client subscriptions are set up again in the following cases:

- After the client has been restarted (e.g. after a system failure or after client maintenance work), all subscriptions that the client set on the server previously need to be deleted internally. All subscriptions must then be set up again by the client.

- After a server restart, which the client recognizes by the fact that the server start time has been updated in the status responses.

- At a time specified by the partner in question (e.g. early morning outside of normal office hours). The reason for this may be the daily initialisation of the system or a subscription re-fresh. It is recommended to refresh subscriptions daily. To avoid problems caused by daylight saving time, a time after 3am is considered optimal for this process.

5.1.2.1. Subscription request (*AboAnfrage*)
(see VDV Guideline 453)

Element	Comments	Field
Sender	(attribute) see VDV Guideline 453	mandatory
ZST	(attribute) see VDV Guideline 453	mandatory
AboASBRef	see VDV Guideline 453	optional
AboASB	see VDV Guideline 453	optional
AboAZBRef	see VDV Guideline 453	optional
AboAZB	see VDV Guideline 453	optional
AboVIS	see VDV Guideline 453	optional
AboAND	see VDV Guideline 453	optional
AboLoeschen	see VDV Guideline 453	optional
AboLoeschenAlle	see VDV Guideline 453	optional

Table 3: Sub-elements of `<AboAnfrage>`

Client side

Before the subscriptions for a service are set up for the first time, a `<StatusAnfrage>` (status query) is sent to the partner system. If a positive `<StatusAntwort>` (status response) is then received, indicating that the partner is ready to send data, the subscriptions are set up on the server side.

If there is data at the server after setting up the subscription, this must be signalled via a `<Daten-BereitAnfrage>` [1] (data ready query, see [1], Section 5.1.3.1) or via the `<StatusAntwort>` (`<DatenBereit>` = `true`) (status response, data ready = true). As a response to the positive `<DatenBereit>` (data ready) message, the client requests the new data by means of a `<DatenAbrufenAnfrage>` (data query).

Server side

Since multiple subscriptions can be set up within one `<AboAnfrage>` (subscription query) but just one general error message is provided for the entire `<AboAnfrage>` (subscription query) process, the following applies in the event of an error:

- To receive a (potential) error message per subscription, a subscription must be set up individually, i.e. one `<AboAnfrage>` (subscription query) per subscription.
- If an error occurs when setting up or deleting a subscription, the subscription will not be set up or deleted. The partner receives an error message describing the problem in detail.
- If multiple subscriptions are set or deleted within one `<AboAnfrage>` (subscription query) and an error occurs, the query as a whole will be rejected, i.e. no subscription in this query will be created or deleted. In this case, the partner will receive an error message that refers to the subscription for which the first error occurred.

5.1.2.2. Subscription confirmation (*AboAntwort*)

(see VDV Guideline 453)

Note the following deviations in the `<AboAntwort>` type from the VDV Guideline 453:

Element	Comments	Field
XSDVersionID	(attribute, optional) version of the interface used by the server (file name of the XSD file)	optional

Table 4: Sub-elements of `<AboAntwort>`

Note the following deviations in the `<Bestaetigung>` type from the VDV Guideline 453:

Element	Comments	Field
DatenGueltigAb	See VDV Guideline 453	optional
DatenGueltigBis	See VDV Guideline 453	optional
Fehlernummer	See VDV Guideline 453	optional
KuerzMoeglicherZyklus	See VDV Guideline 453	optional

Table 5: Sub-elements of `<Bestaetigung>`

5.1.3. Providing data

(see VDV Guideline 453)

5.1.4. Calling up data

(see VDV Guideline 453)

5.1.4.1. Requesting data transfer (*DatenAbrufenAnfrage*)

(see VDV Guideline 453)

5.1.4.2. Transferring data (*DatenAbrufenAntwort*)

(see VDV Guideline 453)

Subscription data can be divided across multiple packets using the WeitereDaten (more data) mechanism. The data supplier can decide whether it wants to use the WeitereDaten (more data) mechanism or not.

5.1.4.2.1. Working with DatensatzAlle

(see VDV Guideline 453)

The following elements represent the most granular units of data for the different services, which must be sent in full within a data packet:

Service	Granularity (smallest unit)
REF-ANS	ASBFahrplan
ANS	ASBFahrplanlage / ASBFahrtLoeschen / HaltepositionsAenderung / WartetBis / AbbringerFahrtLoeschen
REF-DFI	AZBFahrplan
DFI	AZBFahrplanlage / AZBFahrtLoeschen
REF-AUS	Linienfahrplan
AUS	IstFahrt

Table 6: Services

5.1.5. Deleting data subscriptions (AboLoeschen/Alle)

(see VDV Guideline 453)

5.1.6. Resetting after interruption

(see VDV Guideline 453)

5.1.7. Resetting after crash

(see VDV Guideline 453)

The optional <DataVersionID> sub-element of the <StatusAntwort> element must not be evaluated for subscription-related behavior control of a client. As soon as the server transmits a new

<StartDienstZst> in the <StatusAntwort>, it must be assumed that all subscriptions are lost, regardless of whether the <DataVersionID> element exists or is filled. The client must therefore delete and restart them if further data is required.

5.1.8. Alive handling

(see VDV Guideline 453)

Siehe auch Kapitel 5.1.7 bezüglich dem Wiederaufsetzen der Abos nach einem Absturz.

5.1.8.1. Query (StatusAnfrage)

(see VDV Guideline 453)

5.1.8.2. Response (StatusAntwort, Status)

(see VDV Guideline 453)

<u>Client side</u>

If a client receives a "notok" back in the <StatusResponse> in the <Status> data element due to a made <StatusRequest> (status reply), it should be assumed that the entire service is not available. From this point, the client is not allowed to send any more queries to the partner system except for <StatusAnfragen > (status queries) that take place on a cyclical basis. As soon as the first ok is received in a <StatusAntwort>, the service in question is considered "available again" and regular data exchange can be resumed. The behaviour is no different from when absolutely no reply is received to a <StatusAnfrage>.

5.1.8.3. ClientStatusAnfrage

(see VDV Guideline 453)

5.2.   HTTP binding

5.2.1. Procedure

<u>XML namespace</u>: An explicit namespace (e.g. *vdv453ger*) is not used, pursuant to the official VDV Guideline 453.

<u>XML header</u>: The XML header must be completed as per HTTP specification RFC 2616.

5.2.2. Character set

(see VDV Guideline 453)

5.2.3. Service IDs

(see VDV Guideline 453)

5.2.4. Query URL

Since changes within a partner's system environment, which also acts as a server, can also affect application addressing, it is advisable to design the addressing of VDV queries so that they are configurable on the client side.

Changes to the URL of a service on the server side must be approved by the recipients.

Server side

Servers send and respond to the following messages:

Query ID	Responded to by the server	Sent by the server
status.xml	✓ **StatusAntwort**	✗
Clientstatus.xml	✗	✓ **ClientStatusAnfrage**
aboverwalten.xml	✓ **AboAntwort**	✗
datenbereit.xml	✗	✓ **DatenBereitAnfrage**
datenabrufen.xml	✓ **DatenAbrufenAntwort**	✗

Table 8: Server messages

Client side

Client sends and respond to the following messages:

Query ID	Responded to by the client	Sent by the client
status.xml	✗	✓ **StatusAnfrage**
Clientstatus.xml	✓ **ClientStatusAntwort**	✗
aboverwalten.xml	✗	✓ **AboAnfrage**
datenbereit.xml	✓ **DatenBereitAntwort**	✗
datenabrufen.xml	✗	✓ **DatenAbrufenAnfrage**

Table 9: Client messages

5.2.5. Error handling

(see VDV Guideline 453)

5.3.

Both sides are responsible for implementing protective measures (e.g. DMZ, firewall, etc.). Appropriate security components must be used here. The demilitarised zones (DMZs) of the public transport partners form the infrastructure for the setup of a VPN and the routing of HTTP requests. The level of security desired or required for the respective connection must be agreed upon bilaterally by the partners.

6. "Business services" interface description

6.1. General stipulations

The following sections describe the metadata required for data exchange and provide more detail for VDV Guideline 453 [1].

Metadata that is neither defined in this document nor in the official VDV Guideline must be agreed upon and defined by the relevant partners.

6.1.1. Operating days

The operating day for a journey defines its relationship to a specific date:

- The operating days **must** match the days on the period timetable (number of travel days).
- The operating day usually matches the date of departure for the journey at the start operating point according to the timetable.
- For journeys that start after midnight, the operating day may be the previous day.
- The timetable planner can assign a journey to one or the other day based on operational needs. There are no fixed rules in this case.
- A journey always retains its assigned operating day regardless of the duration of the journey.

6.1.2. Date and time format

(see VDV Guideline 453)

6.1.3. ITCS identifier

The ITCS ID is included in both the access URL and in the message itself in the form of the

In addition to the **sender of a message** (system ID), the ITCS ID also identifies the **platform** from which a message is sent (platform ID). Both components are connected with a "_" (underscore sign) between them:

<Systemkennung>_<Plattformkennung>

It is recommended to specify the ITCS identifier in lowercase letters.

The system ID can be freely selected. The underscore sign "_", however, must not be used within the system ID. It is a good idea to specify in the system ID the respective abbreviations for the partner and, if necessary, the abbreviation for the system designation (e.g. sbb, aags, riv, zvv, zvb, sip_hub, etc.).

The platform from which data is exchanged is specified in the platform ID.

The following IDs are defined as standard: Platform Platform ID:

Platform	Platform ID
Development	entw
Test	test
Integration	int
Production	prod

Table 10: Platform IDs

If the platform IDs defined here are not sufficient, more IDs can be added with the agreement of both sides. Partners that operate fewer than the platforms listed here are limited to the ones they have available.

„Valid ITCS IDs include, for example: zvv_test, zvv_prod, riv_prod, sbb_int, sbb_prod, sip_hub_test, sip_hub_prod.

6.1.4. Location references

Location identifiers for the ANS and DFI services are based on the respective connection areas (ANS) and display areas (DFI) for which a subscription is set up.

Service	Location identi-fier	Key name
Connection protection	Connection area	ASBID
Dynamic passenger information	display area	AZBID

Table 13: Location references in the specialist services

The AZBID and ASBID for a stop (i.e. for an operating point defined in DiDok) is supported by all partners in Swiss public transport. Finer granularities such as AZBID / ASBID for a specific platform / stop must be agreed bilaterally.

6.1.4.1. Format for ASBID / AZBID without SLOID (addition in RV 453)

Until the changeover to the SLOID (according to separate migration planning), each system must deliver the ASBID / AZBID in the format described here.

For technical reasons, different prefix codes are given to the subscription queries for individual services:

- a leading **Z** for the AZBID of the DFI service
- a leading **S** for the ASBID of the ANS service

In both cases, what follows is the two-digit UIC country code and the five-digit UIC code (without check digit) for specifying the stop.

<div style="border:1px solid black; text-align:center">

AZBID = Z + UIC-Country-Code + UIC-Code

ASBID = S + UIC- Country-Code + UIC-Code

</div>

The UIC country codes and the UIC stop codes for the local references also apply to bus stops, streetcar stops, etc. They are based on the Switzerland-wide operating point list (master data DIDOK [4]).

6.1.4.2. Format for ASBID / AZBID with SLOID (addition in RV 453)

After the changeover to the SLOID (according to separate migration planning), each system must supply the ASBID / AZBID in the SLOID-based format described here.

The prefixes Z or S for AZBID or ASBID are no longer specified. The two IDs correspond one-to-one to the SLOID of the respective stop.

AZBID = SLOID
ASBID = SLOID

6.1.5. *Journey reference (FahrtID)*

The `<FahrtID>` (journey ID) must be specified (applies to all VDV453 and VDV454 services) and is used to uniquely identify a transmitted journey and compare it to existing data on this journey (if possible, also to planning data from INFO+).

The `<FahrtID>` (journey ID) element consists of the two subelements `<FahrtBezeichner>` (journey identifier) and `<Betriebstag>` (operating day):

Element	Comments	Field
- FahrtBezeichner (journey identifier)	Unique journey identifier (see below)	**Mandatory**
- Betriebstag (Operating day)	(see Section 6.1.1)	**Mandatory**

Table 14: **Structure of `<FahrtID>`**

6.1.5.1. Format for journey identifier without SJYID (addition in VDV RV 453)

Until the changeover to the SJYID (according to separate migration planning), each system must transmit the `<FahrtBezeichner>` (journey identifier) in the format described below and it must always be unique within an operating day. The `<FahrtBezeichner>` must be consistent in all VDV453/454 services!

FahrtBezeichner = [UIC- LänderCode]:[GO-Nummer]:[Fahrt-Referenz]

The individual components of the trip identifier are defined as follows:

Identifier	Meaning	Example
UIC-LänderCode (UIC country code	The country code of the transport undertaking (as per UIC) operating the journey. Numeric value with max. 2 digits	85

Identifier	Meaning	Example
GO-Nummer (business organisation number)	Number of the business organisation of a transport company operating the journey, as per the FOT DiDok list [4] or reference for the country in question. (Synonym: TU-Code, or transport company code) The number should not start with a leading zero. Max. six-character alphanumerical value (permissible characters are { A-Z, a-z, 0-9, _ }). The GO-Nummer (business organisation number) must be identical in the FahrtBezeichner (journey identifier) and LinienID (line ID) elements. If the numbers are different, it may not be possible to process the journey (inconsistencies).	37
Fahrt-Referenz (Journey reference)	Open key that can be defined by the data producer or planning transport company itself in order to ensure that a journey is unique. The journey reference must be unique within the business organisation of a transport undertaking (business organisation number) and must refer to one journey per `<Betriebstag>` (operating day). Max. **50-character, alphanumerical value** permitted. Permissible characters are { A-Z, a-z, 0-9, _ , - }. **Note:** The colon (:) is a special separator and is therefore explicitly not permitted in this field (except for rail transport).	6624325-234-001_A
	Composition of FahrtReferenz (journey reference) for rail transport For compatibility reasons the following format is used in rail transport for the "journey reference" field: **FahrtReferenz = [VM-Fahrtnummer (transport journey number)]:[Erweiterte Referenz (extended reference)]**	63003:001
	Permissible characters are { A-Z, a-z, 0-9,"„","-"}. **Note:** The colon (:) is a special separator and is therefore explicitly only permitted in this field at the point defined above (solely for rail transport).	

Identifier	Meaning		Example
	VM-Fahrtnummer (transport journey number)	This must be unique within the business organisation of a transport company (GO-Nummer, or business organisation number) for one operating day. Multiple journeys within the same day must be identified by different transport journey numbers. A **max. 5-character numerical value is permitted.**	63003
	Erweiterte Referenz (Extended reference)	An alphanumerical technical key that can be defined by the planning transport company itself to ensure that a journey is unique. This value is also used for identification if the journey cannot be made unique using only the key elements described above. If this key is not used for differentiation, the **placeholder 000** must be used. Permissible characters are {A-Z, a-z, 0-9, _ , - }.	001

Table 15: Components of `<FahrtID>`

Examples of a correctly formatted FahrtBezeichner:

      SBB: 85:11:21814:001

      NAV: 85:846:241291-00319-1

      International: 80:678:439244-DR24-434-223_01

Example for FahrtID (journey reference):

```
<FahrtID>
    <FahrtBezeichner>85:11:21814:001</FahrtBezeichner>
    <Betriebstag>2012-05-14+02:00</Betriebstag>
</FahrtID>
```


6.1.5.2. Format for journey identifier with SJYID (addition in VDV RV 453)

After the changeover to the SJYID (according to separate migration planning (see also chapter 4.5) each system must send the `<trip identifier>` according to these specifications. Furthermore, the `<FahrtBezeichner>` must always be unique within an operating day. The `<FahrtBezeichner>` must match in all VDV453/454 services and INFO+!

> ### FahrtBezeichner = SJYID

The SJYID is described in [7].

6.1.6. Line and direction references

6.1.6.1. Format LinienID without SLNID (Addition in VDV-RV 453)

The `<LinienID>` (line ID) is a purely technical key not used for the customer information display.

Formatting in the Swiss public transport system (except for rail traffic):
In the Swiss public transport system (except rail transport), the LinienID (line ID) must be provided in the following format for all VDV453 and VDV454 services:

[**UIC-Ländercode**]:[**GO-Nummer**]:[**Technischer Linienschlüssel**]

Identifier	Meaning	Example
UIC-LänderCode (UIC country code)	The country code of the transport undertaking (as per UIC) operating the journey. Numeric value with max. 2 digits	85
GO-Nummer (business organisation number)	Number of the business organisation of a transport company operating the journey, as per the FOT DiDok list [4] or reference for the country in question. (Synonym: TU-Code, or transport company code.) Number should not start with a leading zero. Max. six-character alphanumerical value (permissible characters are { A-Z, a-z, 0-9, _ }). The GO-Nummer (business organisation number) must be identical in the `<FahrtBezeichner>` (journey identifier) and `<LinienID>` (line ID) elements. If the numbers are different, it may not be possible to process the journey (inconsistencies).	37
Technischer Linien-Schlüssel (technical line key)	Technical key for the line. The line key must be unique within the business organisation number (GO-Nummer). Alphanumerical number (permissible characters are {A-Z, a-z, 0-9, "_"}).	1250_2

Table 16: Format for `<LinienID>` without SLNID

Please note: With the format described above, the `<LinienID>` (line ID) itself is uniquely defined in the Swiss public transport system across countries and business organisations.

Recommendation: The KIDS working group recommends using a unique `<LinienID>` (line ID) based on the above format when transmitting the period timetable (e.g. HRDF), the day target timetables (REF-AUS) and also when transmitting changes during a day (AUS). The aim is to be able to avoid `<LinienID>` (line ID) mappings in the information systems in future.

In the Hafas raw data format (HRDF), HaCon explicitly stipulates the use of the `<LinienID>` (line ID) in the line key for this purpose from format version 5.40.0.

Example for specifying the `<LinienID>` (line ID) in VDV454 and HRDF (from 5.40.0):

VDV454	HRDF (from version 5.40.0)
LinienID= "**85:827:2**"	Linien-Schlüssel= "1234567K**85:827:2**"

Comment on migration path: During transition, the `<LinienID>` (line ID) may still be operated in accordance with existing metadata agreements in terms of VDV453 services. The format of the `<LinienID>` (line ID) should be converted in the VDV453 service by the transport company within a reasonable amount of time. The `<LinienID>` (line ID) must be transmitted identically in the format defined above for all services at the latest when the VDV454 services or the new IDs (SID4PT) are used.

Formatting of the `<LinienID>` (line ID) for rail traffic:
In rail transport, the `<LinienID>` (line ID) is handled differently for the VDV453 and VDV454 services until further notice. In the VDV453 services, the metadata agreed between the partners is transmitted. In the VDV454 services, the journey number (normally the train number) for the journey in question is transmitted in the `<LinienID>` (line ID) element.

6.1.6.2. Format LinienID with SLNID (Addition in VDV-RV 453)

The specification of the <LineID> is mandatory (applies to all VDV453 and VDV454 services) and serves the unique identification of a line in the line directory of Swiss public transport. The <LineID> is a purely technical key that is not used for customer display (see instead the <LineText> in the following section).

After the changeover to the SLNID (according to separate migration planning (see also chapter 4.5), each system must send the <LineID> according to these specifications. The <LineID> must match in all VDV453/454 services and INFO+!

LinienID = SLNID

The SLNID is described in [7].

6.1.6.3. LinienText (line text): (Addition in VDV-RV 453)

The `<LinienText>` (line text) element is of relevance to customers and must therefore be forwarded to the appropriate display systems.

6.1.6.4. Direction reference (Addition in VDV-RV 453)

The `<RichtungsID>` (direction ID) defines the direction of a journey and is a purely technical key that is not used for customer display. This can change from operating point to the next during the journey[3]. The `<RichtungsID>` (direction ID) for a journey can therefore change between stops. It is recommended to use a RichtungsID (direction ID) that is meaningful and easy for human observers to interpret[4].

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[3]While the RichtungsID (direction ID) remains constant for a journey in linear local transport, it may change multiple times during the journey in rail transport.

The RichtungsID (direction ID) is not intended for passenger information. However, it should have a structure that is meaningful and easy for human observers to interpret. This makes it easier to understand the metadata and analyse log files

[4] Among other things, this facilitates the understanding of metadata and the analysis of log files.

6.1.6.5. Specifying intermediate stations ((Via elements)) (Addition in VDV-RV 453)

For reasons of compatibility, intermediate destinations should always be stated in the Via element and the ViaHst1Lang, ViaHst2Lang and ViaHst3Lang elements. The Via element always has higher priority.

6.1.7. Product types

(see VDV Guideline 453)

The transport category is communicated as the `<ProduktID>` [5] (product ID) in the Swiss public transport system.

When specifying the `<ProduktID>` (product ID), the data-producing transport company must ensure that the transmitted transport categories match the transport categories used in the time-table collection in the Swiss public transport system (INFO+).

Note

- Specifying the ProduktID (product ID) is partly used for the assignment of pictograms in the information systems.
- The current transport categories can be found on the home page of Alliance Swiss Pass [5]. The use of German-language values, incl. upper and lower case, are mandatory and must be adhered to in Swiss public transport whenever possible.
- Nonetheless, the values for the transport category may change at short notice and some-times even without any notice. Recipient systems should therefore be able to respond rapidly to such changes and must not discard data with unknown transport categories.

6.1.8. Diversions

See VDV Guideline 453

The definition of the stop sequence counter (`<HstSeqZaehler>`[5]) when there are multiple visits to a stop.

6.1.9. Service attributes

Attributes and notes (see [5]) are transmitted via service attributes. The following values are defined in the Swiss public transport system:

Name of the service attribute	Meaning	Remarks
NF	Low Floor: The value 1 is set if the vehicle used is BehiG-compliant and thus generally enables level entry and exit. This is generally the case if collectively:	Implementation deadline for the inclusion of BehiG in the inventory, i.e. 31.12.2023.

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[5] In the event of a double visit, i.e. when a stop is visited on more than one occasion (e.g. - Hardbrücke - Zürich HB – Hardbrücke -). According to VDV Guideline 453, strictly in ascending order.

	a. The vehicle or at least one car is "low-floor", i.e., the vehicle floor height in the door area is such that level access/exit is possible at BehiG-compliant stopping point (e.g., with a height of 22 cm in bus traffic) (i.e., independently or with spontaneous support from the driving personnel). b. Spontaneous boarding aids (usually extendable or foldable ramps) are available if residual gaps or varying stopping point heights must be compensated. c. Vehicle has no steps in the boarding area. d. Clear width of the doors in the low-floor boarding area (and possibly in the passageways) is greater than the minimum value required by law.	Attention: This requirement applies exclusively to TUs which have non-accessible vehicles in operation after the expiry of the BehiG deadline (i.e. which have neither NF nor HL characteristics) and which can operate these vehicles on other routes/lines at short notice (short notice means hours/days before the start of the journey or which can no longer be handled via the timetable).
HL	Lift: The value 1 is set if the vehicle used (usually high-floor) is equipped with an integrated lift that can be operated spontaneously by the driving personnel and allows entry/exit at any stopping point height (without prior notification). In addition, the requirements c. and d. of the definition NF apply.	See NF
PH	No low floor	
(… to be defined by INFO+)	Autonomous and spontaneous access for manual and electric wheelchairs.	Phase 2, implementation between interested partners
(… to be defined by INFO+)	Access for manual and electric wheelchairs with advance notice	Phase 2, implementation between interested partners
(… to be defined by INFO+)	Limited access for manual and electric wheel-chairs	Phase 2, implementation between interested partners
(… to be defined by INFO+)	Limited access for manual and electric wheelchairs.	Phase 2, implementation between interested partners
Z	Supplement payable	Phase 2, implementation between interested partners
TX	Taxi	Phase 2, implementation between interested partners
TT	Tilting technology	Phase 2, implementation between interested partners

Table 18: Values for `<ServiceMerkmale>`

Clarification: Service attributes NF and PH are to be considered independent, so that no NF does not automatically mean a high floor.

Service attributes value	Meaning	Remarks
NF vorhanden (NF exists)	Value 1 = low floor Value 0 = not low floor	
NF fehlend (NF missing)	No information on low floor	uneven high floor
PH vorhanden (PF exists)	Value 1 = high floor Value 0 = not high floor	
PH fehlend (PH missing)	No information on high floor	uneven low floor

Table 19: Special values for `<ServiceMerkmale>`

6.1.10. Error in technical shift

(see VDV Guideline 453)

6.1.11. Optional fields

(see VDV Guideline 453)

6.1.12. Text for publication

(see VDV Guideline 453)

6.1.13. Latency and processing analysis using the protocol entry element

(see VDV Guideline 453)

The `<Protokolleintrag>` (log entry) does not need to be sent, evaluated, added or forwarded in the Swiss public transport system. However, if a `<Protokolleintrag>` (log entry) is received, an XSD validation error must never be triggered.

6.1.14. Stop information (addition in VDV-RV 453)

6.1.14.1. HaltepositionsText (stopping position text)

The `<HaltepositionsText>` (stopping position text) element describes the transport stop used by a vehicle in a format ready to display to the customer. The content of this field is therefore relevant to publication (vehicle's interior display, general monitor, etc.).

The official stop designation (e.g. "A" for the bus stop of the same name or "12" for the corresponding track) should be transmitted if available. If the departure location cannot be uniquely identified, the field is not transmitted.

Implementation instruction:

The text length for fields is limited to 6 characters in the Swiss public transport system.

The value is interpreted as follows if the element is filled:
- Value without spaces:
  ➔ The value is adopted as the actual track or actual stop.
- Value with spaces:

➔ Values with spaces are permitted only for trains.
➔ The space is interpreted as a separator between the actual track and the actual sector. The text before the space will be interpreted as the track; the text after the space as the sector (e.g. "12 A refers to track 12 and sector A).

If tracks and/or sectors are transmitted together with `<HaltepostionsText>` (stopping position text), the tracks and/or sectors have a higher priority. If `<HaltepostionsText>` (stopping position text) is missing, `<AbfahrtssteigText>` and `<AbfahrtsSektorenText>` must be converted to `<HaltepositionsText>` (stopping position text) when converting to the older XSD version. When converting from an older XSD version, there is no conversion from `<HaltepositionsText>` (stopping position text) to SteigText (bay text) and/or SektorenText (sector text).

6.1.14.2. Bays (AnkunftssteigText, AbfahrtssteigText): (Addition in VDV-RV 453)
For rail travel, the Steig (bay) corresponds to the track identifier, without the sector. This is normally a number.

Both elements must be transmitted with their content whenever possible.

6.1.14.3. Sectors (AnkunftsSektorenText, AbfahrtsSektorenText): (Addition in VDV-RV 453)
The following format must be observed in rail travel:
Sectors are specified in the following format to save space:

- Letters A to Z, max. three-characters without spaces (e.g. "ABC")
- For more than three letters, describe as a range with a hyphen (e.g. "A-D, corresponds to "ABCD")

This is to be ensured by the source systems (INFO+, CUS, VDV supplier partners, etc.).

Sectors only have to be transmitted if the stopping point deviates from the usual location (e.g. two trains at the same platform).

6.1.14.4. HaltID without SLOID
(see VDV Guideline 453) The `<HaltID>` (stop ID) element defines the stop or the stopping point to which a vehicle travels.

Format:
Until the changeover to SLOID (according to separate migration planning), each system must supply the <HaltID> in the format described here.
The `<HaltID>` (stop ID) should be specified in as much detail as possible, if available, and should be treated the same in the application of Guidelines VDV453 and VDV454. It should be structured as follows:

- unique, two-digit UIC country code for Switzerland
- the five-digit UIC code (without check digit) for specifying the stop in question.
- (Optional) two-digit stop code for identifying the stopping point at the stop in the form of a natural number with leading zero ("01", ... "99") to identify the breakpoint within the stop. The stop code must correspond to the BEZEICHNUNG_BETRIEBLICH of the stop edge in DiDok [4]. Attention: the designation in DiDok [4] is managed without leading zero.

If there are several stops within a stop, the two-digit stop code can be used to identify and distinguish the exact position. Attention: in the case of stops that are served by several transport companies, the stop code or the BEZEICHNUNG_BETRIEBLICH in DiDok [4] must be identical and thus agreed upon. If the subdivision within stops is not needed and the stop position corresponds to the stop itself, the two-digit stop code must not be specified, e.g. "00" is not allowed. The resulting code for the `<HaltID>` is thus usually seven digits (`<HaltID>` corresponds to stop globally), but can also be nine digits if used in a fine-granular way (`<HaltID>` corresponds to a concrete stop).

Composition of `<HaltID>`:

UIC country code + UIC code+ (stopping point code)

Example for Zürich HB:8503000, 850300002

The UIC country codes and UIC stop code for identifying the stop also apply to bus stops, tram stops, etc. They are based on the Swiss-wide operating point list (according to the DiDok list of the BAV [4]).

The `<HaltID>` is also now being transmitted for rail traffic. The track without sector is transmitted in the Ankunfts-/AbfahrtsSteigText.

6.1.14.5. Halt with SLOID

(see VDV-Schrift 453)

The `<HaltID>` element defines the stop or the stopping point at which a vehicle operates.

Format:

After the changeover to SLOID (according to separate migration planning), each system must supply the `<HaltID>` in the format described here.

The `<HaltID>` shall be specified in the finest granularity available, if possible, and shall also be handled in the same way in the application of the VDV453 and VDV454 fonts.

`<HaltID>` **= SLOID**

Depending on the system and the application, the SLOID of the stop or the SLOID of the landing/stop is specified. See also chapter 4.5

During migration, recoding between conventional format and SLOID is provided using DiDok [4] lists of services and transportation point elements as follows:

a. StopID 7 digits -> DiDok DB field BPUIC directly provides SLOID of the stop.
No match -> trip is discarded.
b. HaltID 9-digit -> the first 7 digits are interpreted as BPUIC and the last two digits are interpreted as BEZEICHNUNG_BETRIEBLICH. Both DB fields together provide the corresponding stop edge or its SLOID.
No match -> trip is discarded.

6.1.14.6. Durchfahrt (non-stopping pass)

The `<Durchfahrt>` (non-stopping pass) element must be interpreted. The `<Durchfahrt>` element does not appear in older XSD versions. When converting to an old XSD version, a xxxFahrtLoeschen (delete journey) element with `<Ursache=Durchfahrt>` (cause=non-stopping pass) is also transmittedSs as well as a xxxFahrplanlage (timetable situation) element. When converting from an older XSD version, it is not possible to generate the `<Durchfahrt>` (non-stopping pass) element. It is not set.

6.1.14.7. Einsteigeverbot (no boarding)

The `<Einsteigeverbot>` (no boarding) element must be interpreted. The arrival and departure times are provided. The `<Einsteigeverbot>` (no boarding) element does not appear in older XSD versions. When converting to an old XSD version, `<AbfahrtszeitAZBPlan>` and `<AbfahrtszeitAZBPrognose>` are omitted. When converting from an older XSD version, it is not possible to generate the `<Einsteigeverbot>` (no boarding) element. It is not set.

6.1.14.8. Aussteigeverbot (no alighting)

The Aussteigeverbot (no alighting) element must be interpreted. The arrival and departure times are provided. The Aussteigeverbot (no alighting) element does not appear in older XSD versions. When converting to an old XSD version, AbfahrtszeitAZBPlan and AbfahrtszeitAZBPrognose are omitted. When converting from an older XSD version, it is not possible to generate the Aussteigeverbot (no alighting) element. It is not set.

6.1.15. Arrival information (AufASB/AufAZB) (Addition in VDV-RV 453)

The two elements `<AufASB>` and `<AufAZB>` are used within a timetable system to indicate for the service in question whether a means of transport has reached the operating point in question or if it is highly likely to reach it at the stated time:

- `<AufAZB>:` in the DFI service, if this field is `true`, this means that the vehicle is waiting at the operating point (i.e. passengers can board) at the predicted time stated (`<AnkunftszeitAZBPrognose`).

- `<AufASB>:` in the ANS service, if this field is `true` this means that the means of transport has reached the operating point (i.e. passengers can alight) at the predicted time stated (`<AnkunftszeitASBPrognose>`).

The arrival (value = "true") of a journey must be transmitted consistently and reliably in order to ensure correct displays (customer information) and functional connections.

For the `<AufASB>` and `<AufAZB>` elements the default value is set to `false` . A missing `<AufASB>` or `<AufAZB>` element therefore indicates that the means of transport has not reached the operating point yet.

The elements are set to `true` as soon as the arrival prediction for the means of transport can be interpreted as the effective arrival time at the operating point (technically this element is set to `true` by SBB, for example, as soon as the referenced means of transport passes the home signal at the operating point in question). In this case, the arrival prediction is the anticipated ACTUAL arrival time.

6.2. Connection protection (REF-ANS, ANS)

(see VDV Guideline 453)

6.2.1. Introduction

(see VDV Guideline 453)

6.2.2. Operational data supply and maintenance

(see VDV Guideline 453)

6.2.3. Reference data service (REF-ANS)

(see VDV Guideline 453)

6.2.3.1. Data sharing

(see VDV Guideline 453)

6.2.3.2. Requesting area timetables (AboASBRef)

(see VDV Guideline 453)

6.2.3.3. Transmitting area timetables (ASBFahrplan)

(see VDV Guideline 453)

6.2.3.3.1. Additional information on the journey (FahrtInfo)

(see VDV Guideline 453)

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
KursNr (run number)	See VDV Guideline 453 (the `<KursNr>`, or run number, for local services is not the published journey number but the VDV Kursnummer, or run number)	optional
LinienfahrwegID / Line route ID)	see VDV Guideline 453	optional
ProduktID (product ID	see VDV Guideline 453 Unique reference to the product (boat, bus, train, etc.)	**manda-tory**
BetreiberID (operator ID)	see VDV Guideline 453 The operator ID element always contains the transport company (GO number according to DiDok GO list[4]) that has been commissioned (by the FOT, canton, etc.) to operate this trip and holds the concession for it. Note: An operator can deliver either rail or local transport services data with a `<BetreiberID>`. If an operator needs to deliver both rail and lo-al transport data, this must be delivered with a different `<Be-treiberID>` (operator ID) even if both use the same line. Special predefined operator IDs should be used for replacement rail services in consultation with the BAV.	**manda-tory**

Element	Comments	Field
Betreiber (Operator)	Contains the concessionaire (operator (abbr.)), the TU_ABKUER-ZUNG field of the DiDok GO list [4], determined via the unique TC code. TU_NUMMER field of the DiDok GO list [4].	optional

Table 20: Structure of `<FahrtInfo>`

6.2.3.3.2. Information on direct communication (*Direktruf)*

(see VDV Guideline 453)

6.2.4. Process data service (ANS)

(see VDV Guideline 453)

6.2.4.1. Data sharing

(see VDV Guideline 453)

6.2.4.1.1. Updating / hysteresis

(see VDV Guideline 453)

For application in the Swiss public transport system, a standard value of 30 seconds has been defined for the hysteresis for all systems. If a subscription contains a different value, the servers are nevertheless entitled to process the subscription with a delay of 30 seconds.

6.2.4.1.2. Vorschauzeit (preview time)

(see VDV Guideline 453)

6.2.4.2. Subscribe to connection data (*AboASB*)

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
ASBID	AnschlussbereichsID (connection area ID) (e.g. S8506016 for operating point Oberwinterthur) See Section 6.1.4	mandatory
Fahrtfilter (Journey filter)	see VDV Guideline 453	optional
Zeitfilter (Time filter)	See VDV Guideline 453 and Section 6.2.4.2.2	optional
Hysterese (hysteresis)	Fixed at 30 seconds	mandatory
AbbringerInfo (feeder info)	see VDV Guideline 453	optional

Table 21: Structure of AboAnfrage (subscription query) **with** `<AboASB>`

6.2.4.2.1. Journey-related data (*Fahrtfilter, or journey filter*)

(see VDV Guideline 453)

6.2.4.2.2. Time-related data (*Zeitfilter, or time filter)*

(see VDV Guideline 453)

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
LinienID (line ID)	If the LinienID (line ID) is omitted, all lines are subscribed to from this operating point. See also Section 6.1.6	optional
Vorschauzeit (preview time)	Time in minutes before the planned arrival time of the feeder at which feeder forecasts may be sent.	optional

Table 22: Structure of `<ZeitFilter>`

Recommendation: The `<SpaetesteAnkunftszeit>` (latest arrival time) element should occur after the subscription time up to max. 24 hours in the future. The value for the `<Frueheste-Ankunftszeit>` (earliest arrival time) element can be any value in the past.

Formula: `<SpaetesteAnkunftszeit>` - subscription time =< 24

Example:

In the following example, feeder data of the trips on line 2, direction "railway station", are subscribed for a trip approaching a connection area (ITCS A). Data is only sent for vehicles that reach the connection area between 15:50 and 16:10 according to the current forecast.

```
<AboAnfrage Sender=ITCSa_prod Zst=2014-04-08T15:45:00>
      <AboASB AboID=25 VerfallZst=2014-04-08T16:10:00>
            <ASBID>S8506016</ASBID>
            <ZeitFilter>
                  <LinienID>S12</LinienID>
                  <RichtungsID>W-OWT</RichtungsID>
                  <FruehesteAnkunftszeit>
                        2014-04-08T15:50:00
                  </FruehesteAnkuntszeit>
                  <SpaetesteAnkunftszeit>
                        2014-04-08T16:10:00
                  </SpaetesteAnkuntszeit>
            </ZeitFilter>
            <Hysterese>30</Hysterese>
      </AboASB>
</AboAnfrage>
```

6.2.4.2.3. Additional information on the feeder (*AbbringerInfo*)

(see VDV Guideline 453)

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
FahrtInfo (journey info)	see VDV Guideline 453 see also Section 6.2.3.3.1	**manda-tory**
AbfahrtssteigText (departure bay text)	see VDV Guideline 453 see also Section 6.1.14.1	optional
HaltepositionsText (stop position text)	Customer-relevant boarding area (track) of a vehicle, see also Section 6.1.14.1	optional

Element	Comments	Field
AbfahrtsSektoren (de-parture sectors text)	see VDV Guideline 453 see also Section 6.1.14.1	optional

Table 23: Structure of `<AbbringerInfo>`

6.2.4.2.4. Implicit preview time with ANS (Addition in VDV-RV 453)

(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

6.2.4.3. Message to feeder (*Zubringernachricht*)

(see VDV Guideline 453)

Element	Comments	Field
AboID (subscription ID)	(attribute) see VDV Guideline 453	manda-tory
ASBFahrplan (ASB timetable)	Is not supported.	optional
ASBFahrplanlage (ASB timetable status)	see VDV Guideline 453	optional
ASBFahrtLoeschen (delete ASB journey)	see VDV Guideline 453	optional

Table 24: Structure of `<Zubringernachricht> (feeder message)`

6.2.4.3.1. Transmit connection data (*ASBFahrplanlage*)

(see VDV Guideline 453)

The stipulations of VDV Guideline 453 generally apply to the sending of `<ASBFahrplanlage>` elements.

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
Protokolleintrag (Log entry)	see VDV Guideline 453	optional
ASBID	AnschlussbereichsID (connection area ID) (e.g. S8506016 for operating point Oberwinterthur) See Section 6.1.4	manda-tory
FahrtID (journey ID)	See Section 6.1.5	manda-tory
HstSeqZaehler (Stop sequence counter)	Strictly in ascending order - (see Section 6.1.8)	manda-tory
LinienID (line ID)	Metadata, exclusively used for subscription. See Section 6.1.6	manda-tory
LinienText (line text)	Customer-relevant line name or train category, displayed as line name for a vehicle. See also Section 6.1.6.	manda-tory

Element	Comments	Field
RichtungsID (direction ID)	Metadata, exclusively used for subscription. See Section 6.1.6	manda-tory
RichtungsText (direc-tion text)	Customer-relevant destination. See Section 6.1.6.	manda-tory
VonRichtungsText (from direction text)	Customer-relevant origin of vehicle. See Section 6.1.6	optional
AufASB	Arrival information (default = "false"). See also Section 6.1.15	optional
Umsteigewillige	see VDV Guideline 453	optional
ZubringerHstLang	see VDV Guideline 453	optional
SpaetesteAbbringerInfo (latest feeder info)	see VDV Guideline 453	optional
HaltID (stop ID)	Technical ID for a stop 7 stopping position (track). See also Section 6.1.14.4	manda-tory
AnkunftssteigText (arri-val bay text)	(please refer to VDV Guideline 454 and Section 6.1.14.2) Details of boarding area (e.g. platform) without sector. Does not apply to the starting point, but see also Section 6.1.14.1	optional / Rail: manda-tory, excep-tions are possi-ble by mutual agree-ment
HaltepositionsText (stop position text)	Customer-relevant vehicle stop (track). See also Section 6.1.14.1	optional
AnkunftsSektorenText (arrival sector text)	see VDV Guideline 453 see also Section 6.1.14.1 Does not apply to the starting point.	optional
Stauindikator (conges-tion indicator)	see VDV Guideline 453	optional
FahrtInfo (journey info)	see VDV Guideline 453 See also Section 6.2.3.3.1	**manda-tory**

Table 25: Structure of `<ASBFahrplanlage>` (ABS timetable status)

6.2.4.3.2. Feeder cancellation (*ASBFahrtLoeschen*)

(see VDV Guideline 453)

The reasons why a journey might be cancelled are stated in [1]. Otherwise, the same restrictions and special considerations as for transmitting the `<ASBFahrplanlage>` apply in principle.

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
Protokolleintrag (log entry)	see VDV Guideline 453	optional
ASBID	AnschlussbereichsID (connection area ID) (e.g. S8506016 for operating point Oberwinterthur) See Section 6.1.4	mandatory
FahrtID (journey ID)	See Section 6.1.5	mandatory
LinienID (line ID)	See Section 6.1.6	mandatory
LinienText (line text)	Customer-relevant line name or train category, displayed as line name for a vehicle. See also Section 6.1.6	mandatory
RichtungsID (direction ID)	See Section 6.1.6	mandatory
RichtungsText (direction text)	Customer-relevant destination. See Section 6.1.6	mandatory
VonRichtungsText (from direction text	Passenger-relevant origin text	optional
AnkunftszeitASBPlan (arrival time ASB plan)	see VDV Guideline 453	optional
HaltID (stop ID)	Technical ID for a stop (track). See also Section 6.1.14.4	optional
HaltepositionsText (stop position text)	Customer-relevant vehicle stop (track). See also Section 6.1.14.1	optional
FahrtInfo (journey info)	see VDV Guideline 453 See also Section 6.2.3.3.1	**mandatory**
Ursache (cause)	see VDV Guideline 453 Note: The cause may only be stated in the event of a cancellation.	conditionally optional

Table 26: Structure of `<ASBFahrtLoeschen>` (delete ASB journey)

6.2.4.4. Connector messages (Abbringernachricht)

(see VDV Guideline 453)

6.3.   Dynamic passenger information (REF-DFI, DFI)

6.3.1. Introduction

(see VDV Guideline 453)

6.3.2. Operational data supply and maintenance

(see Section 2.1.2 and VDV Guideline 453)

6.3.3. DFI systems with key control

(see VDV Guideline 453)

6.3.4. DFI systems with autonomous prediction display
(see VDV Guideline 453)

6.3.5. Sharp deletion
(see VDV Guideline 453)

6.3.6. Tractions / through carriages / dividing journeys
(see VDV Guideline 453)

6.3.7. Reference data service (REF-DFI)
(see VDV Guideline 453)

6.3.8. Process data service (DFI)
(see VDV Guideline 453)

6.3.8.1. Data sharing
(see VDV Guideline 453)

6.3.8.1.1. Preview time (Addition in VDV-RV 453)
(Because the following text is only relevant for direct connection to CUS, it may potentially be hidden. The documentation in its entirety is available only in the CUS version)

6.3.8.2. Querying DFI data (*AboAZB*)
(see VDV Guideline 453)

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
AZBID	AnzeigerbereichsID (display area ID) (e.g. Z8506016 for operating point Oberwinterthur) See Section 6.1.4	mandatory
LinienID (line ID)	If the `<LinienID>` (line ID) is omitted, all lines are subscribed to from this operating point. See also Section 6.1.6.	optional
RichtungsID (direction ID)	If the `<RichtungsID>` is omitted, all directions are subscribed to from this operating point. See also section 6.1.6.4.	optional
MaxAnzahlFahrten (max. no. journeys)	See VDV Guideline 453	optional
Hysterese (Hysteresis)	Fixed at 30 seconds.	mandatory
MaxTextLaenge (max. text length)	See VDV Guideline 453	optional
NurAktualisierung (update only)	See VDV Guideline 453	optional

Table 27: Structure of AboAnfrage (subscription query) with `<AboAZB>` (display user subscription)

6.3.8.3. Display user messages (AZBNachricht) (*AZBNachricht*)

(see VDV Guideline 453)

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
AboID (subscription ID)	(attribute) see VDV Guideline 453	manda-tory
AZBFahrplan (display user timetable)	see VDV Guideline 453	optional
AZBFahrplanlage (dis-play user timetable status)	see VDV Guideline 453	optional
AZBFahrtLoeschen (delete display user journey)	see VDV Guideline 453	optional
AZBLinienSpezialtext (display user line spe-cial text)	see VDV Guideline 453	optional
AZBLinienSpezialtext-Loeschen (delete dis-play user line special text)	see VDV Guideline 453	optional
AZBSondertext (dis-play user special text)	(sub-element, optional, multiple) Transmission of free special texts with-out any technical reference (although may contain a text reference) to a journey or line (shown, for example, as a ticker in the lower portion of the display).	n/a
AZBSondertext-Loeschen (delete dis-play user special text)	(sub-element, optional, multiple) Delete special text information	n/a

Table 28: Structure `<AZBNachricht>` (display user message)

6.3.8.3.1. Transmit forecast data (*AZBFahrplanlage) (display user timetable status)*
(see VDV Guideline 453)

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
Protokolleintrag (log entry)	See VDV Guideline 453	optional
AZBID	AnzeigerbereichsID (display area ID) (e.g. Z8506016 for operating point Oberwinterthur) See Section 6.1.4	manda-tory
FahrtID (journey ID)	See Section 6.1.5.	manda-tory
HstSeqZaehler (Stop sequence counter)	Strictly in ascending order - (see Section 6.1.8).	manda-tory
Traktion (Traction)	See VDV Guideline 453	optional

Element	Comments	Field
Betriebliche Fahrzeugnummer (Operational vehicle number)	See VDV Guideline 453	optional
LinienID (line Id)	Metadata, exclusively used for subscription. See Section 6.1.6	mandatory
LinienText (line text)	Customer-relevant line name or train category, displayed as line name for a vehicle. See also Section 6.1.6.	mandatory
FahrtBezeichnerText (journey description text)	See VDV Guideline 453 The Zugnummer (train number) is transmitted in this element in the Swiss public transport system.	optional/mandatory
RichtungsID (direction ID)	Metadata – not for customer display. See Section 6.1.6.	mandatory
RichtungsText (direction text)	Customer-relevant destination. See Section 6.1.6.	mandatory
VonRichtungsText (from direction text)	VonRichtungsText Customer-relevant origin of vehicle. See also Section 6.1.6.	optional
AbmeldeID (log off ID)	See VDV Guideline 453	optional
ZielHst	Operational destination as operational abbreviation as per DiDok (e.g. ZUE for Zürich HB, BN for Bern, LS for Lausanne, etc.).	mandatory
AufAZB	Arrival information. See also Section 6.1.15.	optional
ViaHst1Lang	See Section 6.1.6.5 and VDV Guideline 453	optional
ViaHst2Lang	See Section 6.1.6.5 and VDV Guideline 453	optional
ViaHst3Lang	See Section 6.1.6.5 and VDV Guideline 453	optional
Via	See Section 6.1.6.5 and VDV Guideline 453 The Via element must always include the same information as Hst1Lang to ViaHst3Lang. When converting from XSD2015 to XSD2017, the information must be transferred to the Via element from ViaHst1Lang, as long as these are formatted 6.1.6.5 by chapter.	optional
FahrtStatus (journey status)	See VDV Guideline 453	mandatory
AnkunftszeitAZBPlan, AbfahrtszeitAZBPlan (arrival time display user plan, departure time display user plan)	Planning times, see [1] Section 6.3.8.3.1.	optional

Element	Comments	Field
AnkunftszeitAZBPrognose, AbfahrtszeitAZBPrognose	See [1] Section 6.3.8.3.1 Times forecast based on the current position of the vehicle. (no allowance for deployment)	optional
AnkunftFaelltAus (arrival cancelled)	See VDV Guideline 453	optional
AbfahrtFaelltAus (departure cancelled)	See VDV Guideline 453	optional
AbfahrtszeitAZBDisposition (display user departure time deployment)	For transmitting the timing effects of a deployment decision. As soon as the deployment is lifted, the element is no longer set.	optional
Fahrtspezialtext (journey special text)	See VDV Guideline 453	optional
Sprachausgabe (Language version)	See VDV Guideline 453	optional
HaltID (stop ID)	Technical ID for a boarding area (track). See Section 6.1.14.4.	mandatory
AnkunftssteigText (arrival bay text)	See VDV Guideline 453 and Section 6.1.14.1 Details of boarding area (e.g. platform) without sector. Does not apply to the starting point.	Optional/rail: mandatory, exceptions are possible by mutual agreement
AbfahrtssteigText (departure bay text)	as in VDV Guideline 453 see also Section 6.1.14.1 Details of boarding area (e.g. platform) without sector. Does not apply to starting point.	Optional/rail: mandatory, exceptions are possible by mutual agreement
HaltepositionsText (stop position text)	Customer-relevant vehicle boarding area. See also Section 6.1.14.1	optional
AnkunftsSektorenText (arrival sector text)	see VDV Guideline 453 see also Section 6.1.14.1 Does not apply to the starting point. See AbfahrtsSektorenText below.	optional
AbfahrtsSektoren (departure sectors text)	see VDV Guideline 453 see also Section 6.1.14.1	optional

Element	Comments	Field
FahrtInfo (journey info)	see VDV Guideline 453 See also Section 6.2.3.3.1	**<u>manda-tory</u>**
Einsteigeverbot (no boarding)	see VDV Guideline 453	optional
Aussteigeverbot (no alighting require-ments)	see VDV Guideline 453 See also Section 6.1.14.8	optional
Durchfahrt (non-stop-ping pass)	see VDV Guideline 453 See also Section 6.1.14.6	optional

Table 29: Structure of the `<AZBFahrplanlage>` (display user timetable status)

Implementation information:

Instead of `<AZBFahrplanlage>` with:

- `<AnkunftFaelltAus = true>`
- `<AbfahrtFaellAus = true>`
- With `<AnkunftszeitAZBPlan>`
- With `<AbfahrtszeitAZBPlan>`

Is recommended to send an `<AZBFahrtLoeschen>` (delete display user journey) with cause = cancellation. This implementation information on the use of `<AnkunftFaelltAus>` (arrival cancelled) and `<AbfahrtFaellAus>` (departure cancelled) was added in VDV 453 version 3.

The new elements `<AnkunftFaelltAus>` and `<AbfahrtFaelltAus>` must be received, evaluated and forwarded. If both elements are set as true, (and both must be true even at a start or end stop), a `<AZBFahrtLoeschen>` element should be triggered with `<Ursache=Ausfall>` (cause=cancellation) when converting to an older XSD version. It is not possible to generate the elements `<AnkunftFaelltAus>` and `<AbfahrtFaelltAus>` when converting from an older XSD version, they are not set.

Explanation for `<AbfahrtszeitAZBDisposition>` (departure time display user deployment)

cf. VDV Guideline 453, Section 6.3.8.3.1 Transmitting forecasting (*AZBFahrplanlage*) [1]

Attribute	Meaning
`<AbfahrtszeitAZBDisposition>` not available	1.) No planning deployment takes place. **or** 2.) A deployment measure that was sent previously has been reset.
`<AbfahrtszeitAZBDisposition>` populated with specific value	planning measures that purposely delay the journey

Table **30**: Explanation for **`<AbfahrtszeitAZBDisposition>`**

6.3.8.3.2. Traction in network (*Traktion*)

(see VDV Guideline 453)

6.3.8.3.3. Transmitting special line texts (*AZBLinienSpezialtext*)

(see VDV Guideline 453)

6.3.8.3.4. Deleting special line texts (*AZBLinienSpezialtextLoeschen*)
(see VDV Guideline 453)

6.3.8.3.5. Transmitting special texts (AZBSondertext)
(see VDV Guideline 453)

In the Swiss public transport system, `<AZBSondertext>` does not need to be sent, evaluated or forwarded. If an `<AZBSondertext>` is received, an XSD validation error must never be triggered.

6.3.8.3.6. Deleting special texts (AZBSondertextLoeschen)
(see VDV Guideline 453)

In the Swiss public transport system, `<AZBSondertextLoeschen>` does not need to be sent, evaluated or forwarded. If an `<AZBSondertextLoeschen>` is received, an XSD validation error must never be triggered.

6.3.8.3.7. Journey cancellation/departure (AZBFahrtLoeschen)
(see VDV Guideline 453)

`<AZBFahrtLoeschen>` is used in VDV Guideline 453 to delete a journey from the display if it leaves the display area (operating point) or is cancelled at this operating point (full or partial cancellation of a journey).

Deviations from and clarifications to the VDV Guideline 453 are:

Element	Comments	Field
Protokolleintrag (log entry)	see VDV Guideline 453	optional
AZBID	AnzeigerbereichsID (display area ID) (e.g. Z8506016 for operating point Oberwinterthur) See Section 6.1.4	mandatory
FahrtID (journey ID)	See Section 6.1.5.	mandatory
LinienID (line ID)	Metadata, exclusively used for subscription. See Section 6.1.6	mandatory
LinienText (line text)	Customer-relevant line name or train category, displayed as line name for a vehicle. See also Section 6.1.6.	mandatory
RichtungsID (direction ID)	Metadata – not for customer display. See Section 6.1.6	mandatory
RichtungsText (direction text)	Customer-relevant destination. See Section 6.1.6	mandatory
VonRichtungsText (from direction text)	(optional) passenger-relevant journey origin text.	optional

Element	Comments	Field
AnkunftszeitAZBPlan (arrival time display user plan)	see VDV Guideline 453	optional
AbfahrtszeitAZBPlan	See AnkunftszeitAZBPlan above.	optional
HaltID (stop ID)	see VDV Guideline 453	optional
HaltepositionsText (stop position text)	Customer-relevant boarding area (track) or a vehicle. See also 6.1.14.1	optional
FahrtInfo (journey info)	see VDV Guideline 453 See also Section 6.2.3.3.1	**mandatory**
AbmeldeID (log off ID)	see VDV Guideline 453	optional
Ursache (cause)	See description below the table. Note: The cause may only be stated in the event of a cancellation.	conditionally optional

Table 31: Structure of `<AZBFahrtLoeschen>`

6.4.   Visualisation of external vehicles (VIS)

(see VDV Guideline 453)

6.5.   General messaging service (AND)

(see VDV Guideline 453)

7. Glossary

AND	General messaging service: VDV specification for the exchange of operational information between employees of the transport company control points involved.
ANS	Connection protection: VDV specification for data exchange between transport companies with the aim of mutual assurance of connections between feeding and connecting means of transport.
ASB	Connection area
AZB	Display area
BP	Operating point (train station, stop)
CUS	The Swiss public transport system's data platform, run by SBB
CUS core	Is basically the CUS data producer. Also, all rail data are loaded into the core. The CUS core offers additional services (e.g. computer interface, VDV453<-> VDV454 conversion, etc.) for other railways.
Data subscribers	This document refers to the following data subscribers: - Display system - Timetable information system - Data platform In some cases, data subscribers are restricted.
Data producers	The following systems are designated as data producers: - All systems that process data and send it to a data platform Data platforms do not produce any data!
DFI	Dynamic passenger information: VDV specification for data exchange between transport companies with the aim of displaying external journeys at their own shared stops.
DIDOK	Service point documentation: master system for managing the master data of all service points, the international union of railways (UIC) and the Swiss public transport system.
GO-Nr.	Business organisation number: DiDok [4]maintains a directory of business organisations. These can be the business organisations of transport companies (e.g. sub-organisations such as SBB-P, SBB-I, etc.) as well as other business organisations (such as Hotelplan Schweiz). The GO-Nr (GO no.) is the unique identifier of these business organisations. The DiDok conversion systems almost exclusively require the GO no. (synonym: TC code) and not the transport company number.
INFO+	Collection of Swiss public transport timetables
ITCS	Intermodal Transport Control System.
KTU / TU	(Licensed) transport companies.
NeTS	Network-wide train path system: national planning system for train paths and services.
Seasonal timetable	Timetable valid for a defined period of time and containing the (working) timetable data, normally for that particular season. It can be adjusted to suit changing circumstances. Example: INFO+. The complete period timetable is not available via VDV interfaces.
RBL	Computer-aided control system -> this term has been replaced by ITCS and is no longer used.
RCS	Rail Control System: used by SBB and some private railway companies. It is used to help carry out rail operations.

Working timetable data	Working timetable data includes all working timetable data (such as daily working timetable, period timetable)
Daily working timetable	The daily working timetable contains the (working) timetable data for a short amount of time (approx. 24 to 48 hrs.) This data is exchanged via the VDV454 REF-AUS data service.
VDV	Verband Deutscher Verkehrsunternehmen (German Association of Transport Companies)
VM	Vehicle; synonym for all means of transport relevant to customer information (e.g. train, bus, tram, boat, funicular, etc.)

8. References

(see VDV Guideline 453)

9. English alias designation

(see VDV Guideline 453)