

# DIN CEN/TR 16959:2018-12 (E)

Public transport - Network and Timetable Exchange (NeTEx) - Examples, guidelines and explanatory materials; English version CEN/TR 16959:2016

---

<b>Contents</b>	<b>Page</b>
European foreword.....	6
Introduction .....	7
<b>1 Scope.....</b>	<b>13</b>
<b>2 Frequently Asked Questions (FAQ) .....</b>	<b>13</b>
<b>2.1 Introduction .....</b>	<b>13</b>
<b>2.2 Basic Commercial questions .....</b>	<b>13</b>
2.2.1 Do I have to pay for using NeTEx? .....	13
2.2.2 What skills do I need to deploy NeTEx? .....	13
2.2.3 What tools are available to support NeTEx? .....	13
2.2.4 How do I get new features added to NeTEx?.....	14
2.2.5 What is a profile?.....	14
2.2.6 What if I find a bug in NeTEx? .....	14
2.2.7 How do I get support for my NeTEx development?.....	14
<b>2.3 Basic scope questions .....</b>	<b>15</b>
2.3.1 Is NeTEx a GIS standard? .....	15
2.3.2 Is NeTEx a database?.....	15
2.3.3 Is NeTEx for real-time applications? .....	15
2.3.4 Can I use NeTEx for Rail? .....	15
2.3.5 Does NeTEx provide web services?.....	15
2.3.6 Does NeTEx cover ticket sales? .....	16
2.3.7 Can I use NeTEx for mobile applications? .....	16
<b>2.4 Pros and Cons questions.....</b>	<b>16</b>
2.4.1 What are the advantages of using NeTEx?.....	16
2.4.2 How can NeTEx reduce development costs? .....	16
2.4.3 How can NeTEx increase capability and improve design quality? .....	17
2.4.4 How can NeTEx simplify my software application development?.....	17
2.4.5 How can NeTEx protect my investment? .....	17
2.4.6 What are the disadvantages of using NeTEx?.....	18
2.4.7 Is NeTEx hard to understand? .....	18
2.4.8 Does increased generality make NeTEx is harder to work with? .....	18
2.4.9 Does NeTEx require more computing resources than other standards?.....	18
2.4.10 Are there missing validity checks in NeTEx ?.....	19
2.4.11 Is it quick to add new features in NeTEx?.....	19
<b>2.5 Further Specific questions of Scope.....</b>	<b>19</b>
2.5.1 Can NeTEx describe journey connection times? .....	19
2.5.2 Does NeTEx support accessibility? .....	19
2.5.3 Can NeTEx handle frequency based services? .....	19
2.5.4 Can I have different journey timings for different times of day? .....	20
2.5.5 Can NeTEx describe zone based fares?.....	20
2.5.6 Can I restrict certain products to certain classes of user? .....	20
2.5.7 Can I specify time based constraints on travel? .....	20
2.5.8 Can I integrate data from different countries with NeTEx? .....	20
2.5.9 Does NeTEx support dynamic/ yield managed pricing? .....	20
2.5.10 Can NeTEx define products for modern e-card based ticketing?.....	21
2.5.11 Does NeTEx support Flexible and Demand Responsive Travel?.....	21
2.5.12 Can I create applications to run in different national Languages?.....	21

2.5.13	Can I have different version of data for the same element extant at the same time? .....	21
2.5.14	Can I create Network maps with NeTEx?.....	21
2.5.15	I have my own classification for Stops/ Lines / etc. Can NeTEx handle this?.....	22
2.6	Comparison with other documents.....	22
2.6.1	How does NeTEx relate to Transmodel?.....	22
2.6.2	How does NeTEx relate to IFOPT?.....	22
2.6.3	How does NeTEx compare with VDV?.....	22
2.6.4	How does NeTEx compare with TransXChange? .....	22
2.6.5	How does NeTEx compare with NEPTUNE? .....	23
2.6.6	How does NeTEx compare with NOPTIS? .....	23
2.6.7	How does NeTEx compare with IFM?.....	23
2.6.8	How does NeTEx compare with BISON ?.....	23
2.6.9	How does NeTEx compare with the Taap/TSI standards?.....	24
2.6.10	How does NeTEx compare with GTFS? .....	24
3	NeTEx covered areas description .....	25
3.1	Introduction.....	25
3.2	General areas .....	25
3.3	Specific functional areas .....	25
Annex A	(informative) Getting Started .....	26
A.1	Introduction.....	26
A.2	Three common use cases .....	26
A.3	Basic Steps.....	27
A.4	Implementing a NeTEx System .....	29
A.5	Resources .....	31
A.6	NeTEx CEN Technical specifications, .....	31
A.7	NeTEx UML Models.....	31
A.8	NeTEx XML Schema .....	32
A.9	NeTEx WSDL Bindings.....	32
A.10	Tools and Technology .....	32
Annex B	(informative) Design Methodology.....	33
B.1	Introduction.....	33
B.2	Model driven design .....	33
B.3	Consistent Terminology .....	34
B.4	UML Notation.....	35
B.5	XML schema .....	35
B.6	Tools and Technology .....	37
B.7	Modularisation of the framework .....	37
Annex C	(informative) Framework.....	39
C.1	Introduction.....	39
C.2	The NeTEx Frameworks .....	39
C.3	NeTEx framework features .....	40

<b>Annex D (informative) Reusable Components .....</b>	<b>45</b>
<b>D.1 Introduction.....</b>	<b>45</b>
<b>D.2 The NeTEx Reusable Components.....</b>	<b>45</b>
<b>D.3 Summary of Reusable Components.....</b>	<b>45</b>
<b>D.4 Summary of Reusable Data types.....</b>	<b>47</b>
<b>Annex E (informative) Representing Public Transport Networks in NeTEx .....</b>	<b>48</b>
<b>E.1 Introduction.....</b>	<b>48</b>
<b>E.2 NeTEx Methodology.....</b>	<b>48</b>
<b>E.3 Scope.....</b>	<b>48</b>
<b>E.4 Corresponding NeTEx documentation .....</b>	<b>48</b>
<b>E.5 Approach .....</b>	<b>49</b>
<b>E.6 Basic spatial network aspects.....</b>	<b>51</b>
<b>Annex F (informative) Representing Flexible Networks and Multimodality in NeTEx .....</b>	<b>56</b>
<b>F.1 Introduction.....</b>	<b>56</b>
<b>F.2 Scope.....</b>	<b>56</b>
<b>F.3 Corresponding NeTEx documentation .....</b>	<b>56</b>
<b>F.4 NeTEx Methodology.....</b>	<b>57</b>
<b>F.5 Flexible networks.....</b>	<b>57</b>
<b>F.6 Multimodality .....</b>	<b>60</b>
<b>Annex G (informative) Support for Accessibility in NeTEx .....</b>	<b>63</b>
<b>G.1 Introduction.....</b>	<b>63</b>
<b>G.2 Scope.....</b>	<b>63</b>
<b>G.3 Corresponding NeTEx documentation .....</b>	<b>63</b>
<b>G.4 NeTEx Methodology.....</b>	<b>64</b>
<b>G.5 Approach .....</b>	<b>64</b>
<b>G.6 Accessibility of sites .....</b>	<b>64</b>
<b>G.7 Accessibility and connections.....</b>	<b>65</b>
<b>G.8 Accessibility of navigation paths .....</b>	<b>66</b>
<b>G.9 Accessibility of journeys.....</b>	<b>66</b>
<b>Annex H (informative) Representing Timetables in NeTEx.....</b>	<b>67</b>
<b>H.1 Introduction.....</b>	<b>67</b>
<b>H.2 Corresponding NeTEx documentation .....</b>	<b>67</b>
<b>H.3 Approach to Timetables in NeTEx.....</b>	<b>68</b>
<b>H.4 The representation of a timetable .....</b>	<b>69</b>
<b>H.5 Example of a simple timetable in NeTEx.....</b>	<b>71</b>
<b>Annex I (informative) Representing Fares in NeTEx.....</b>	<b>74</b>

<b>I.1</b>	<b>Introduction.....</b>	<b>74</b>
<b>I.2</b>	<b>Scope .....</b>	<b>74</b>
<b>I.3</b>	<b>Functional areas.....</b>	<b>74</b>
<b>I.4</b>	<b>Provision of information on fares.....</b>	<b>75</b>
<b>I.5</b>	<b>Approach.....</b>	<b>77</b>
<b>I.6</b>	<b>Selecting a Fare.....</b>	<b>81</b>
	<b>Bibliography .....</b>	<b>83</b>