



Network Manager
nominated by
the European Commission



AFI Region AIXM e-AIP Implementation Workshop Dakar, Senegal, 3-5 October 2016

AIXM 5.1 UML

Razvan GULEAC
EUROCONTROL

AIXM 5.1 Logical Model - UML



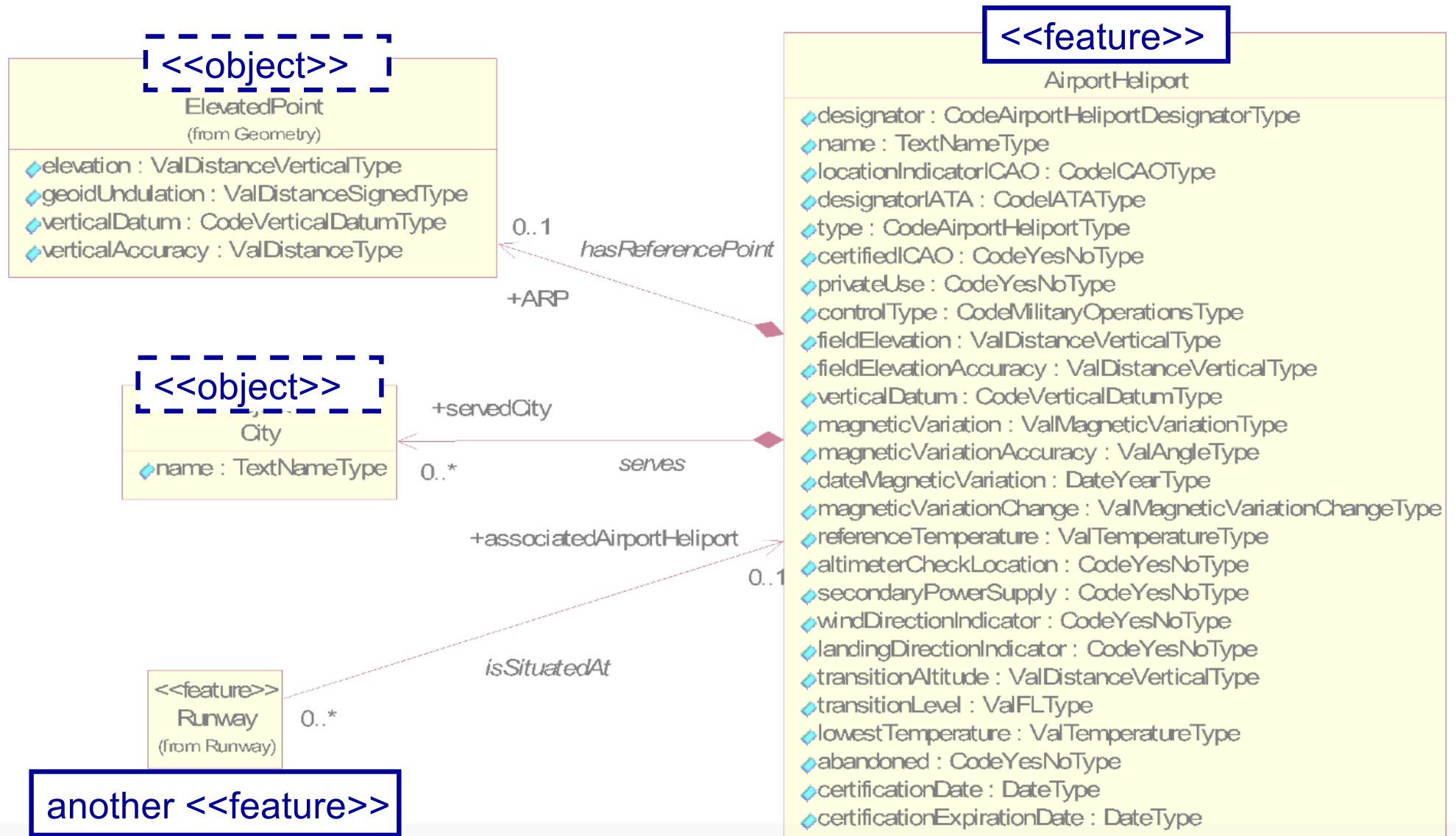
UNIFIED MODELING LANGUAGE™



- UML Class Diagrams
 - Classes (simple inheritance only)
 - Attributes, data types, lists of values
 - Associations
- Until 5.1 – IBM Rational Rose Data Modeller
- AIXM 5.1.1 – migration to Sparx EA (8.1)
- Important note: UML model is 'static' (Temporality Concept applied directly in the XML Schema generation process)
 - In order to keep the diagrams relatively de-cluttered

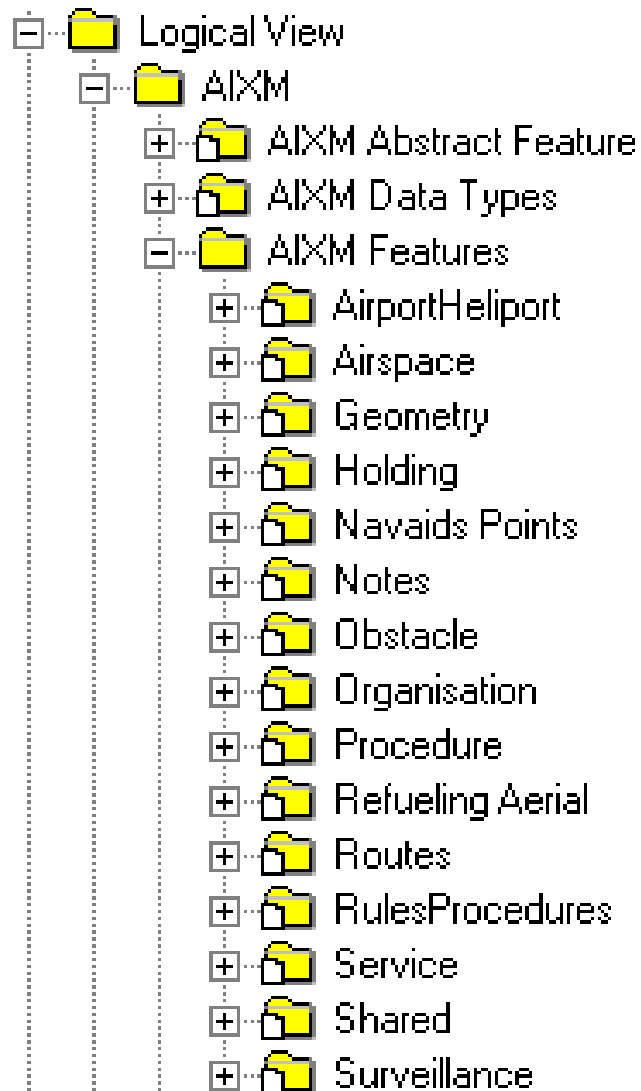


Stereotypes: feature vs. object



another <<feature>>

AIXM 5.1 - Packages



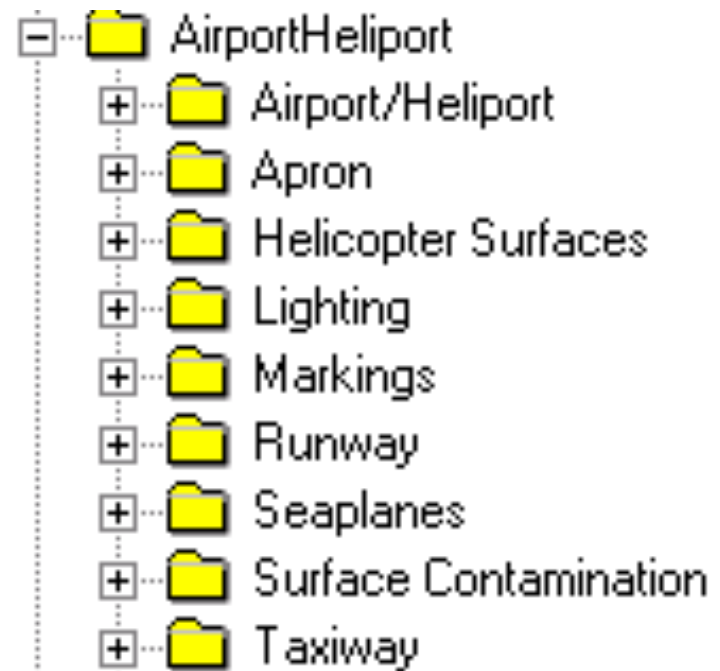
- 245 classes
- around 2200 attributes + associations



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Airport package



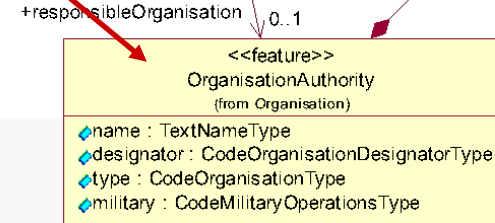
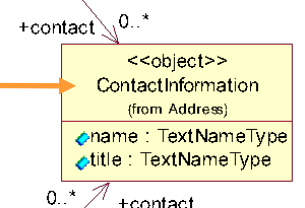
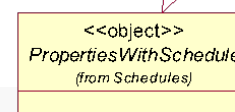
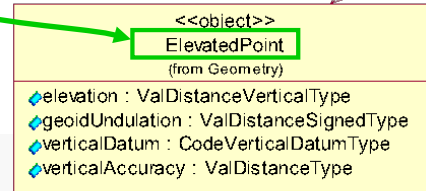
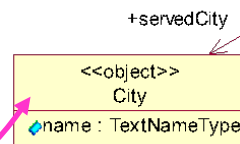
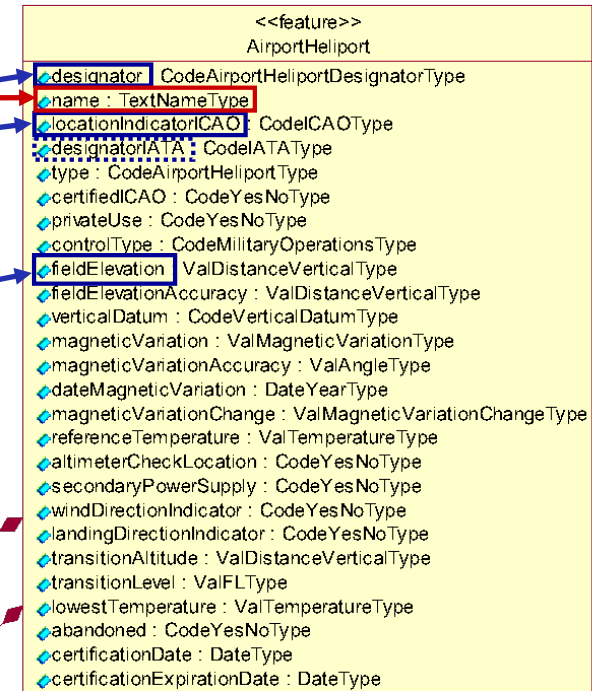
AirportHeliport feature

EBBR AD 2.1 AERODROME LOCATION INDICATOR AND NAME

EBBR - BRUSSELS - Brussels-National

EBBR AD 2.2 AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA

1	ARP COORD and site at AD	505405N - 0042904E 246° MAG / 1.8 km from the TWR
2	Direction and distance from (city)	6.5 NM NE from Brussels
3	ELEV / Reference temperature	184 ft / 23°C
4	Geoid undulation	141 ft
5	VAR / Annual change	0° (2010) / 0.12° decreasing
6	AD Administration, address, TEL, FAX, telex and AFS	Mail: The Brussels Airport Company Brussels Airport B-1930 Zaventem Tel:+32 (0) 2 753 42 00 (office hours only) Tel:+32 (0) 2 753 69 00 (Airport Inspection, H24) Fax:+32 (0) 2 753 69 09 (Airport Inspection) AFS:EBBRYDYX
7	Types of TFC permitted (IFR / VFR)	IFR / VFR
8	RMK	NIL



Airport collocation

AIP Belgium and G.D. of Luxembourg
AD 2.MIL-EBMB-1
04/09/2003

EBMB — BRUSSELS / Melsbroek (MIL)

EBMB AD 2.1 AERODROME LOCATION INDICATOR AND NAME

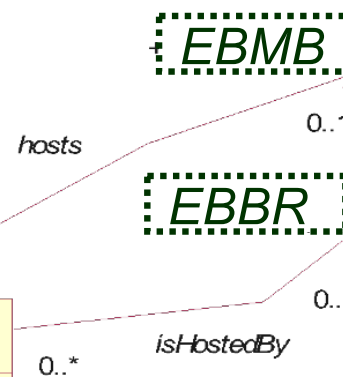
EBMB — BRUSSELS / Melsbroek (MIL)

EBMB AD 2.2 Military data

Fully collocated with EBBR

<<codelist>>	
CodeAirportHeliportCollocationBaseType (from AIXM Data Types)	
♦	FULL : string
♦	RWY : string
♦	PARTIAL : string
♦	UNILATERAL : string
♦	SEPARATED : string
♦	OTHER : string

<<feature>>	
AirportHeliportCollocation	
♦	type : CodeAirportHeliportCollocationType



<<feature>>	
AirportHeliport	
♦	designator : CodeAirportHeliportDesignatorType
♦	name : TextNameType
♦	locationIndicatorCAO : CodeCAOType
♦	designatorIATA : CodeIATAType
♦	type : CodeAirportHeliportType
♦	certifiedCAO : CodeYesNoType
♦	privateUse : CodeYesNoType
♦	controlType : CodeMilitaryOperationsType
♦	fieldElevation : ValDistanceVerticalType
♦	fieldElevationAccuracy : ValDistanceVerticalType
♦	verticalDatum : CodeVerticalDatumType
♦	magneticVariation : ValMagneticVariationType
♦	magneticVariationAccuracy : ValAngleType
♦	dateMagneticVariation : DateYearType
♦	magneticVariationChange : ValMagneticVariationChangeType
♦	referenceTemperature : ValTemperatureType
♦	altimeterCheckLocation : CodeYesNoType
♦	secondaryPowerSupply : CodeYesNoType
♦	windDirectionIndicator : CodeYesNoType
♦	landingDirectionIndicator : CodeYesNoType
♦	transitionAltitude : ValDistanceVerticalType
♦	transitionLevel : ValFLType
♦	lowestTemperature : ValTemperatureType
♦	abandoned : CodeYesNoType
♦	certificationDate : DateType
♦	certificationExpirationDate : DateType

Runway



RWY designator	TRUE BRG	Dimensions of RWY (m)	Strength (PCN) and surface of RWY and SWY	THR COORD RWY end COORD THR geoid undulation	THR ELEV and highest ELEV of TDZ of precision APCH RWY
1	2	3	4	5	6
02	014.43°	2 987 x 50	67/F/A/W/T ASPH	505314.39N 0042929.68E 141 ft	THR 183 ft TDZ 184 ft
20	194.43°	2 987 x 50	67/F/A/W/T ASPH	505439.64N 0043004.46E 141 ft	THR 113 ft TDZ 131 ft
07R	069.89°	3 211 x 45	62/F/A/W/T ASPH	505321.89N 0042855.40E 141 ft	THR 175 ft
25L	249.89°	3 211 x 45	62/F/A/W/T ASPH	505356.19N 0043123.88E 141 ft	THR 159 ft TDZ 165 ft

+associatedAirportHeliport 0..1

<<feature>>
AirportHeliport
(from Airport/Heliport)

<<feature>>
RunwayCentrelinePoint
◆role : THR RunwayPointRoleType
◆designator : TextDesignatorType

0..*

+onRunway 0..1

<<object>>
ElevatedPoint
(from Geometry)
◆elevation : ValDistanceVerticalType
◆geoidUndulation : ValDistanceSignedType
◆verticalDatum : CodeVerticalDatumType
◆verticalAccuracy : ValDistanceType

+location 0..1

<<feature>>
Runway
◆designator : 02/20 RunwayDesignatorType
◆type : CodeRunwayType
◆nominalLength : ValDistanceType
◆lengthAccuracy : ValDistanceType
◆nominalWidth : ValDistanceType
◆widthAccuracy : ValDistanceType
◆widthShoulder : ValDistanceType
◆lengthStrip : ValDistanceType
◆widthStrip : ValDistanceType
◆lengthOffset : ValDistanceSignedType
◆widthOffset : ValDistanceSignedType
◆abandoned : CodeYesNoType

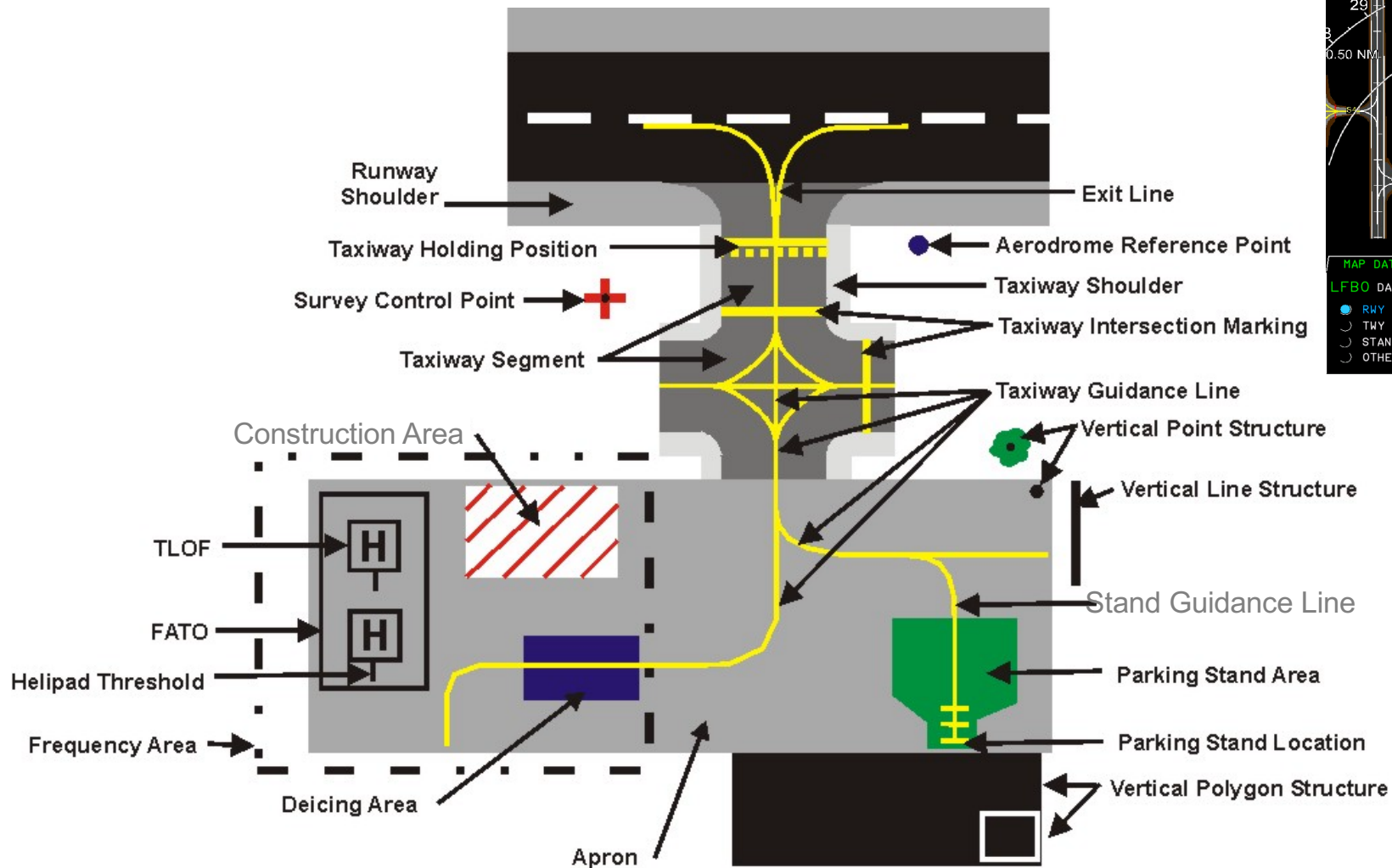
+usedRunway 0..1

0..*

<<feature>>
RunwayDirection
◆designator : 02/20 RunwayDesignatorType
◆trueBearing : ValBearingType
◆trueBearingAccuracy : ValAngleType
◆magneticBearing : ValBearingType
◆patternVFR : CodeDirectionTurnType
◆slopeTDZ : ValSlopeType
◆elevationTDZ : ValDistanceVerticalType
◆elevationTDZAccuracy : ValDistanceType
◆approachMarkingType : CodeRunwayMarkingType
◆approachMarkingCondition : CodeMarkingConditionType
◆classLightingJAR : CodeLightingJARType
◆precisionApproachGuidance : CodeApproachGuidanceType



Airport mapping data



Airport usage restrictions

EBBR AD 2.3 OPERATIONAL HOURS

1	AD Administration	H24
2	Customs and immigration	H24
3	Health and sanitation	H24
4	AIS Briefing Office	H24
5	ATS Reporting Office (ARO)	H24
6	MET Briefing Office	H24
7	ATS	H24
8	Fuelling	H24 (between 2100 and 0500, only with credit cards acceptable by the chosen petroleum company)
9	Handling	H24
10	Security	H24
11	De-icing	H24
12	RMK	See also Local Traffic Regulations (EBBR 2.20, § 1) and Noise Abatement Procedures (EBBR 2.21, § 1)

1 GENERAL

1.1 AIRPORT COORDINATION

EBBR is a coordinated airport. Unless exempted, and irrespective of noise abatement procedures (EBBR 2.21, § 1), ATFM slot, or traffic rights, take-off or landing of an IFR flight without an appropriate allocated slot is prohibited and punishable. Slots will be allocated for take-off during following periods:

- SAT, 0000 to SAT, 0500
- SAT, 2300 to SUN, 0500
- SUN, 2300 to MON, 0500

1.1.1 COORDINATION PROCEDURE

For every take-off and landing of an IFR flight, a slot shall be requested and obtained from the coordinator before the filing of the flight plan:

Mail:

Brussels Slot Coordination VZW
Mr Didier Hocq
Brussels Airport PB119
B-1930 Zaventem 4

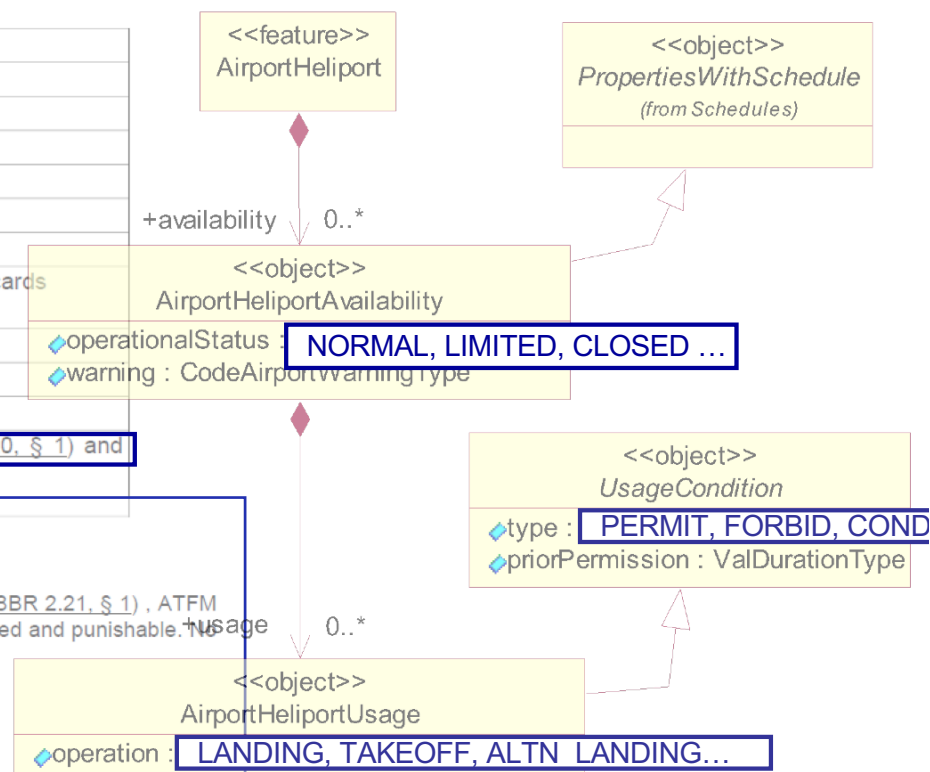
Tel: +32 (0) 2 753 57 91 to 94

Fax: +32 (0) 2 753 57 90

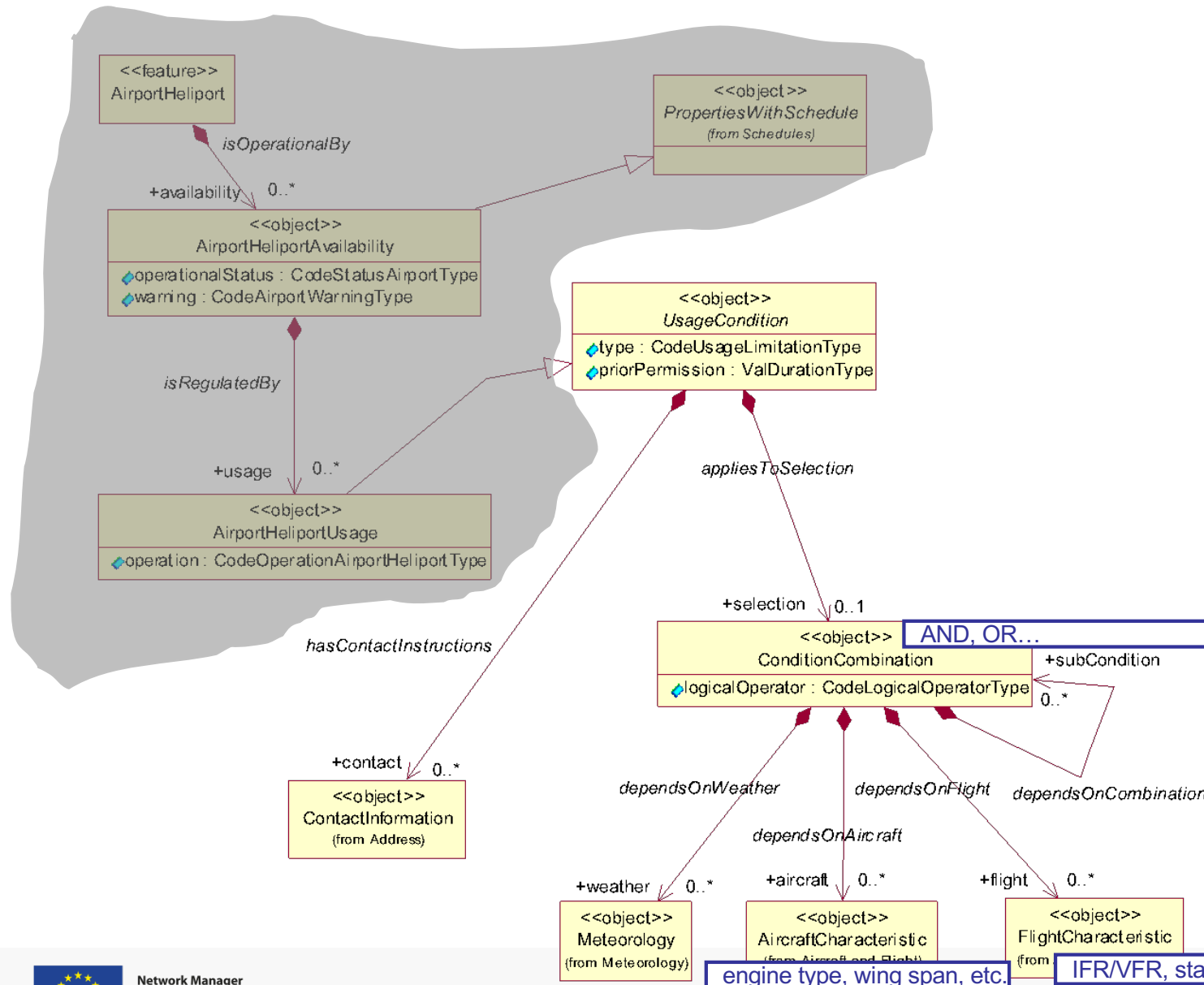
Email: BRUACX@brucoord.org or didier.hocq@brucoord.org

SITA: BRUACX

URL: <http://www.brucoord.org>



Airport Usage Restrictions



Airport services

EBBR AD 2.4 HANDLING SERVICES AND FACILITIES

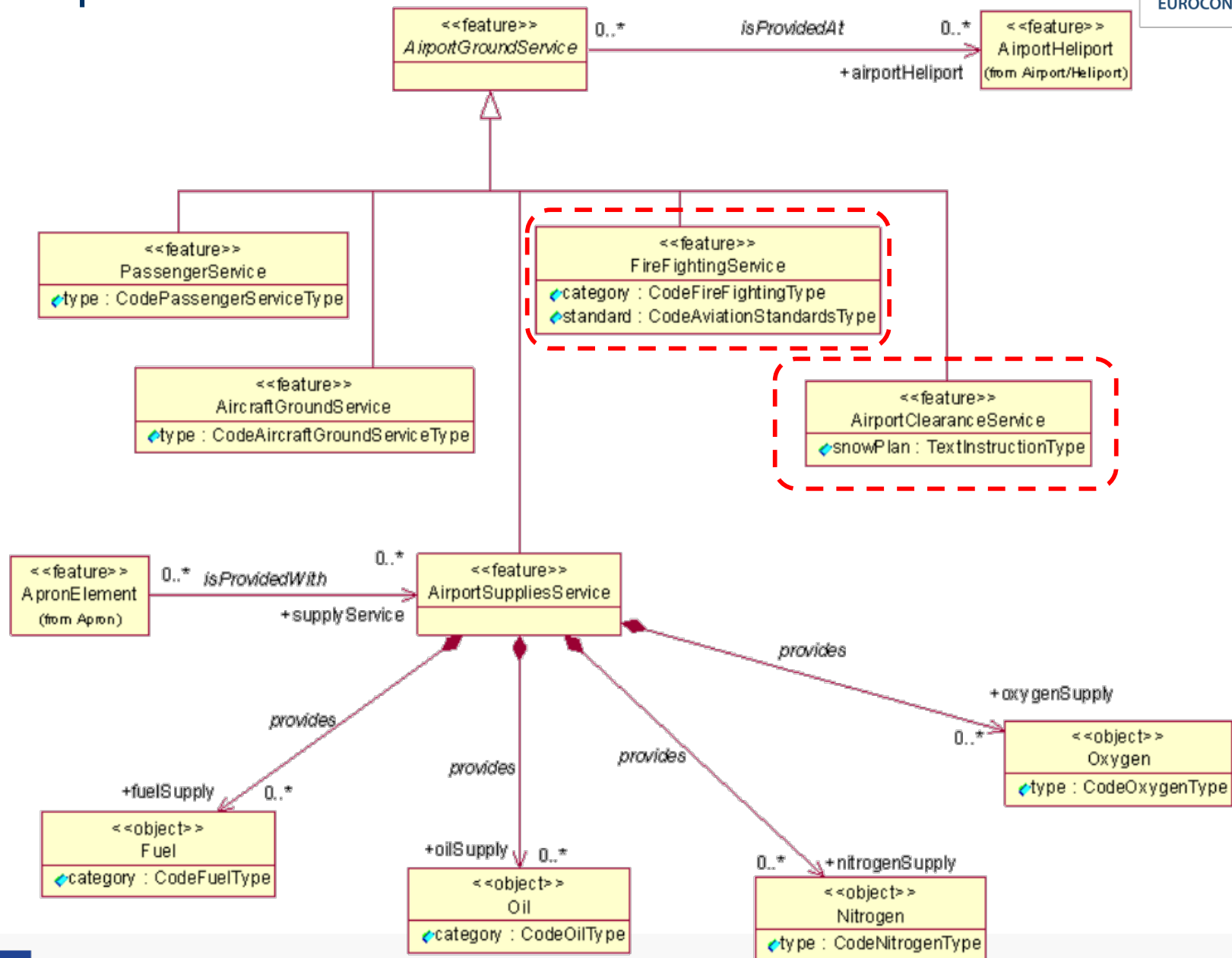
1	Cargo-handling facilities	Modern handling facilities Nearest railway siding: Brussels (10 km)
2	Fuel / Oil types	JET A1 / All
3	Fuelling facilities / Capacity	Pits and trucks / No limitations
4	De-icing facilities	By arrangement with handling agent
5	Hangar space for visiting ACFT	NIL
6	Repair facilities for visiting ACFT	All repairs
7	RMK	General aviation handling is compulsory

EBBR AD 2.18 ATS COMMUNICATION FACILITIES

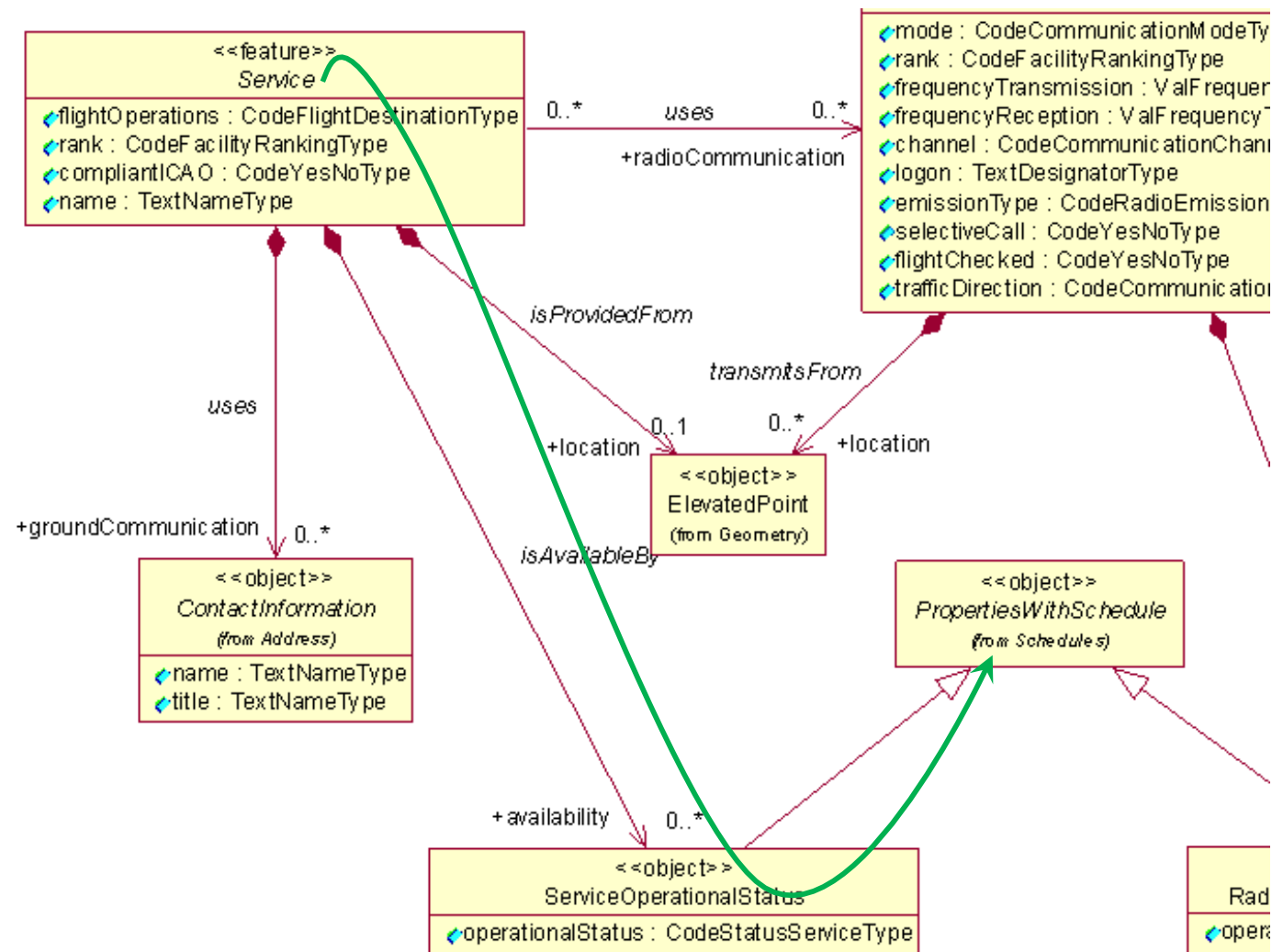
EBBR AD 2.5 PASSENGER FACILITIES

	Service designation	Call sign	FREQ	HRs of operation	RMK
1	Hotels		at AD and in the city		
2	Restaurants	1	2	3	4
3	Transportation	APP / TAR	Brussels	118.250 MHz	(1) EMERG FREQ
4	Medical facilities	ARR	Doctor, recovery rooms and ambulances Hospitals in Brussels (10 km) and in Vilvoorde (5 km)	(2)	(2) For ARR TFC via S, N and W except for TFC BLW FL-65 requesting to enter Brussels TMA. (See Brussels DEP.)
5	Bank / Post office		at AD	(3)	(3) For ARR TFC via E on ATC instruction only
6	Tourist information		at AD		
7	RMK		NIL		
			(1) 243.000 MHz (1)		
		Brussels DEP	126.625 MHz	H24	NIL
		Brussels Final	129.725 MHz (2) 127.575 MHz (3) 121.500 MHz (1)	H24	(1) EMERG FREQ (2) Final APP RWY 25R on ATC instruction only (3) Final APP RWY 25L on ATC instruction only
	TWR	Brussels TWR	118.600 MHz 120.775 MHz 388.525 MHz 257.800 MHz	H24	(1) EMERG FREQ (2) spare FREQ

Airport services



Airport services - schedule





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Questions?

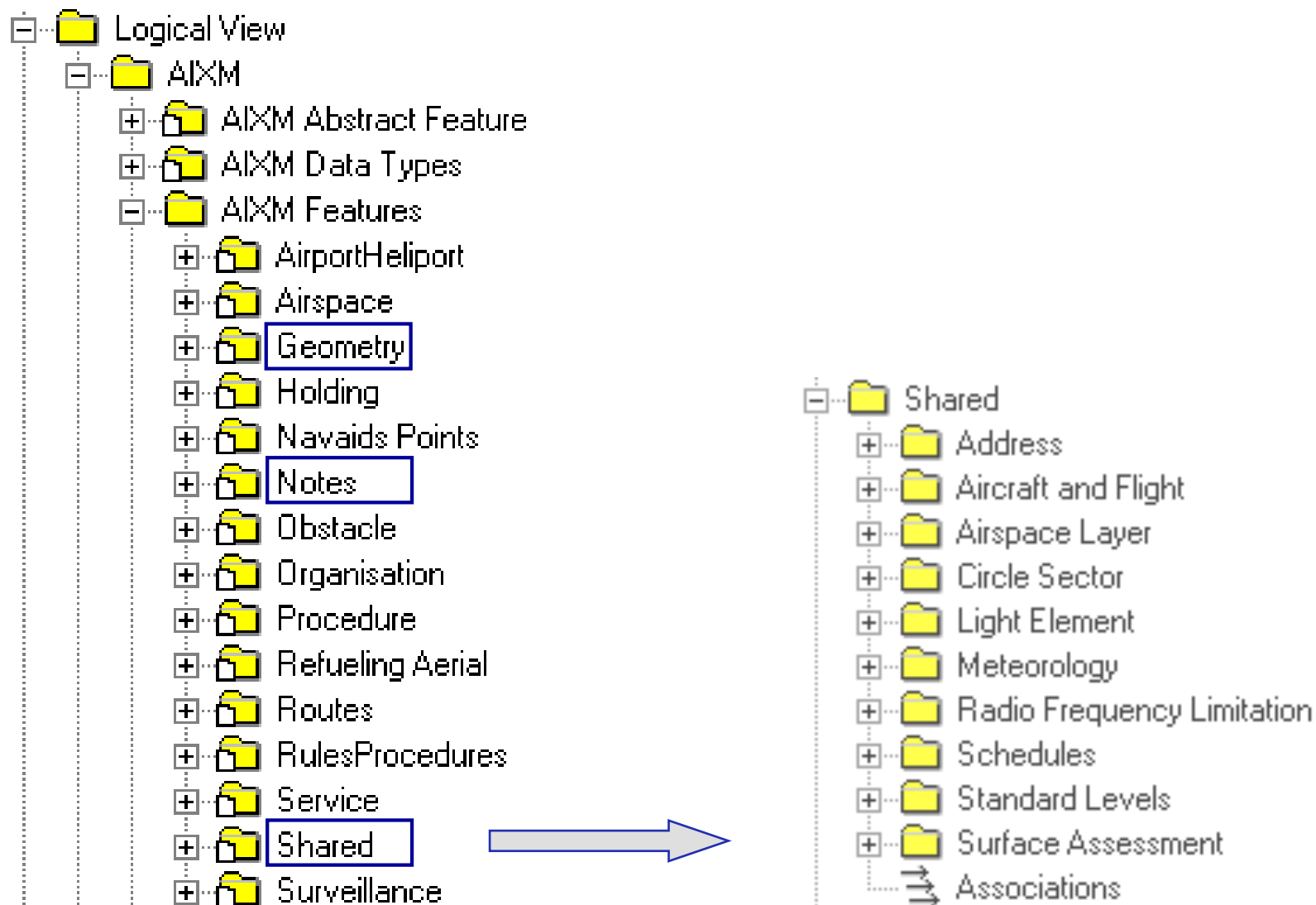


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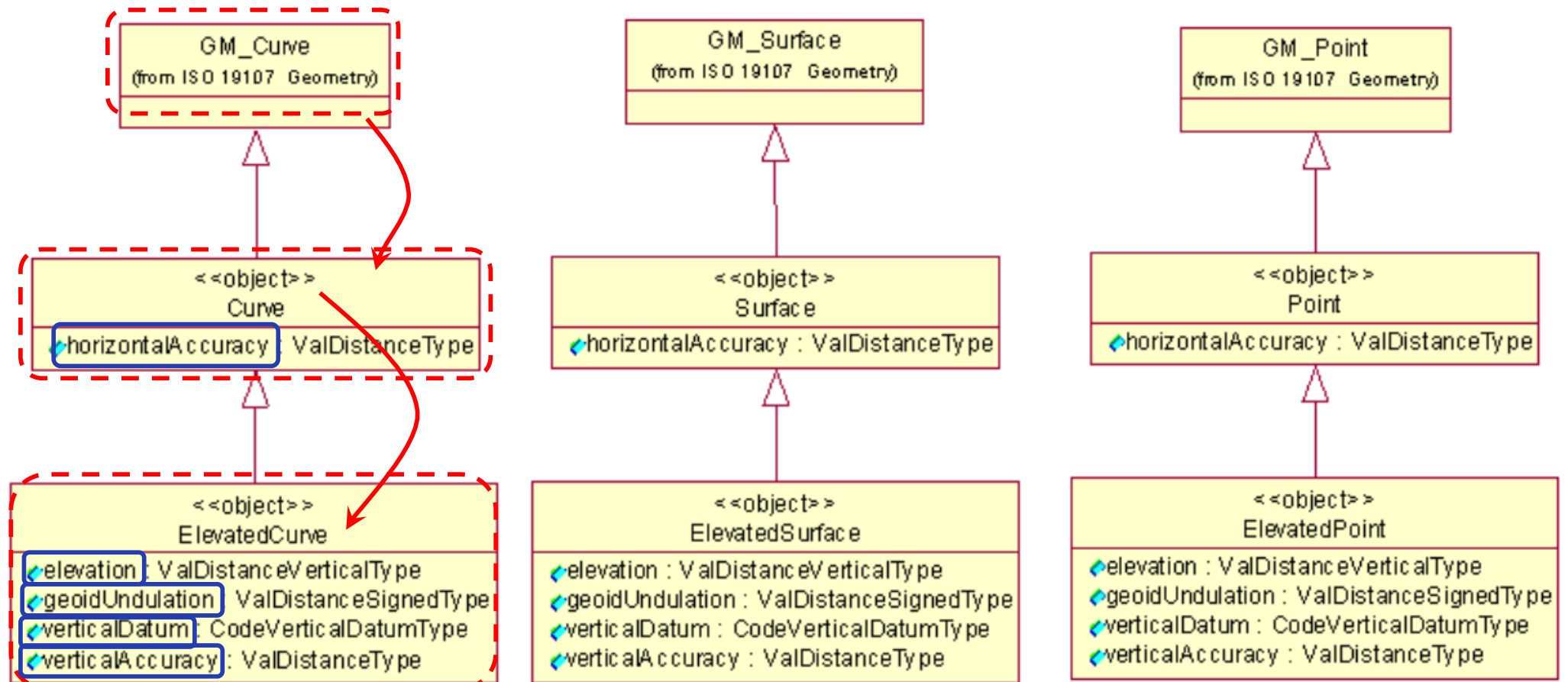


Shared packages

“Shared” packages



Geometries



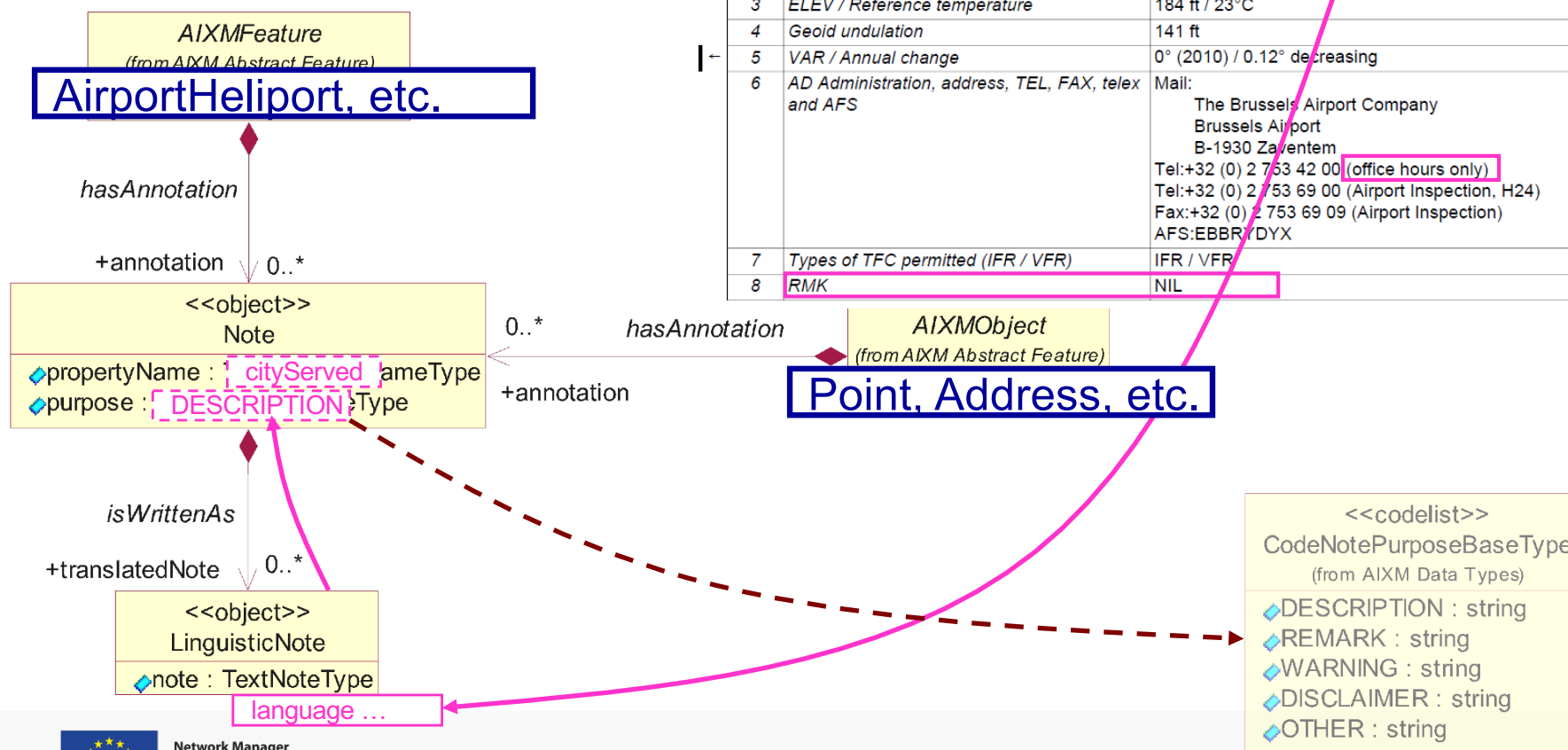
Notes

EBBR AD 2.1 AERODROME LOCATION INDICATOR AND NAME

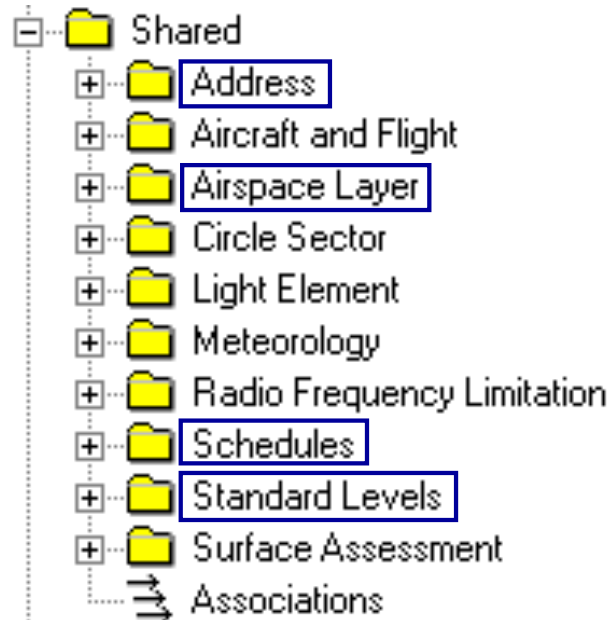
EBBR — BRUSSELS / Brussels-National

EBBR AD 2.2 AERODROME GEOGRAPHICAL AND ADMINISTRATIVE DATA

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7	Types of TFC permitted (IFR / VFR)	IFR / VFR
8	RMK	NIL



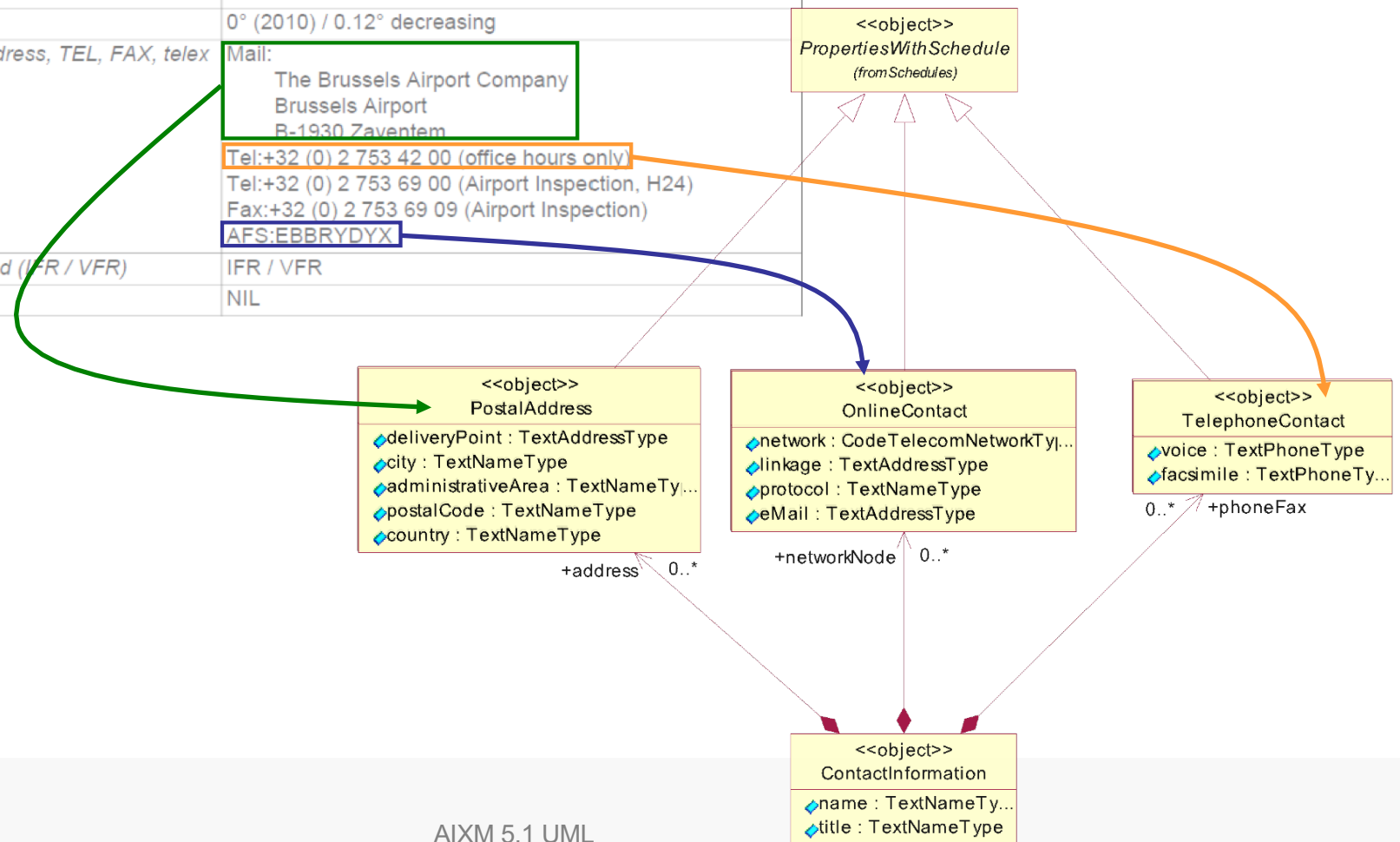
Shared packages



Address, phone, link...

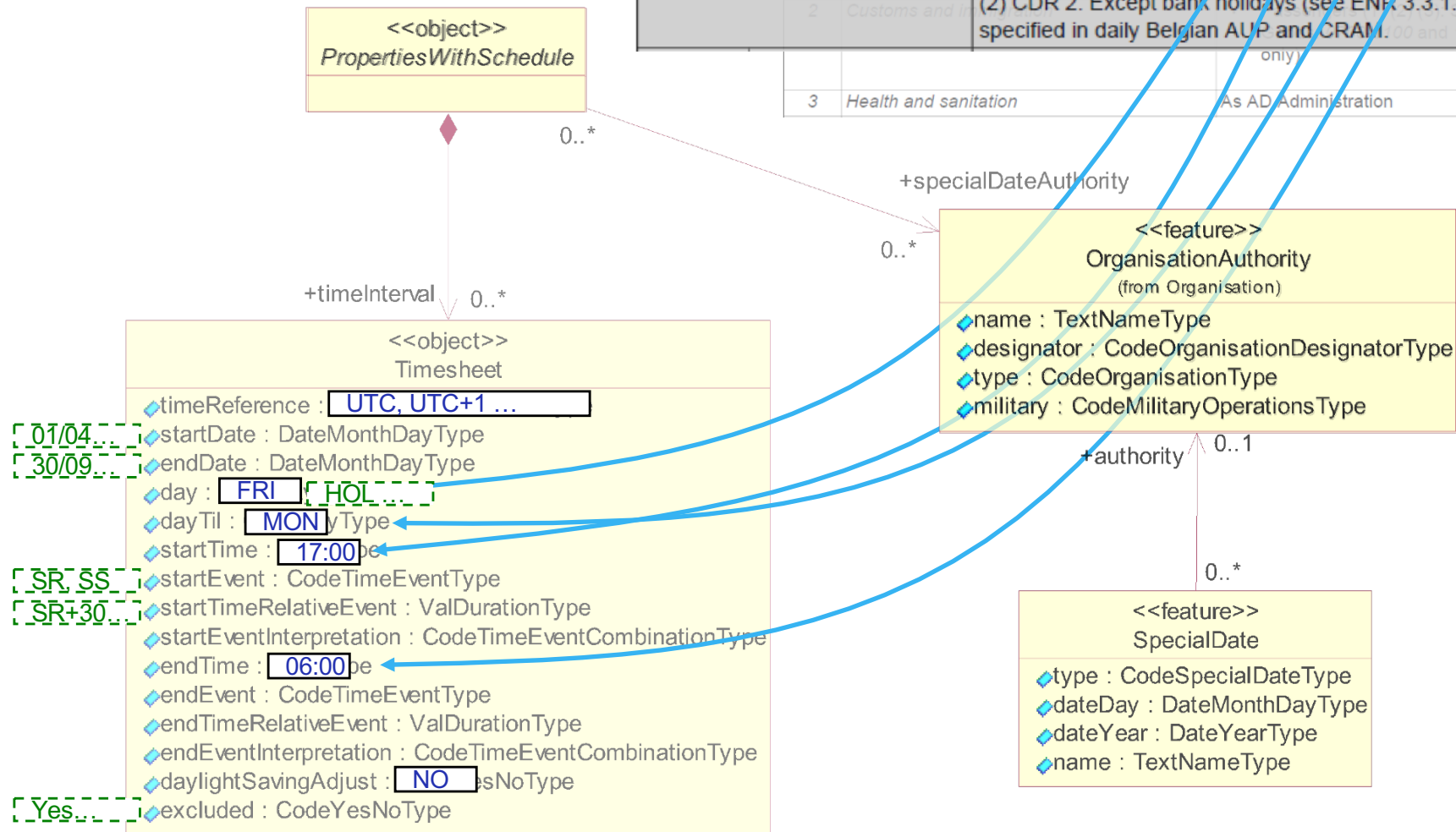
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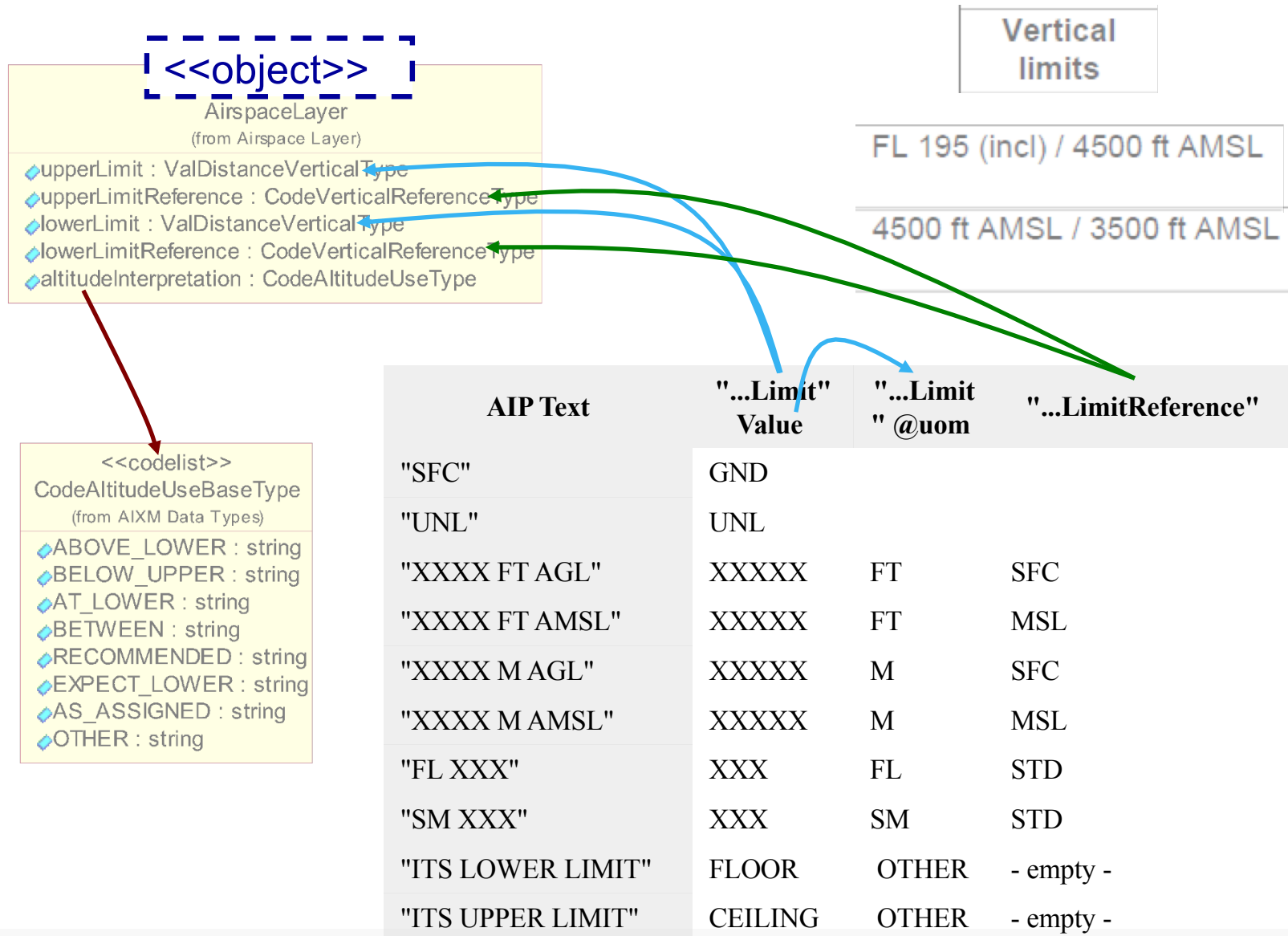


Schedules

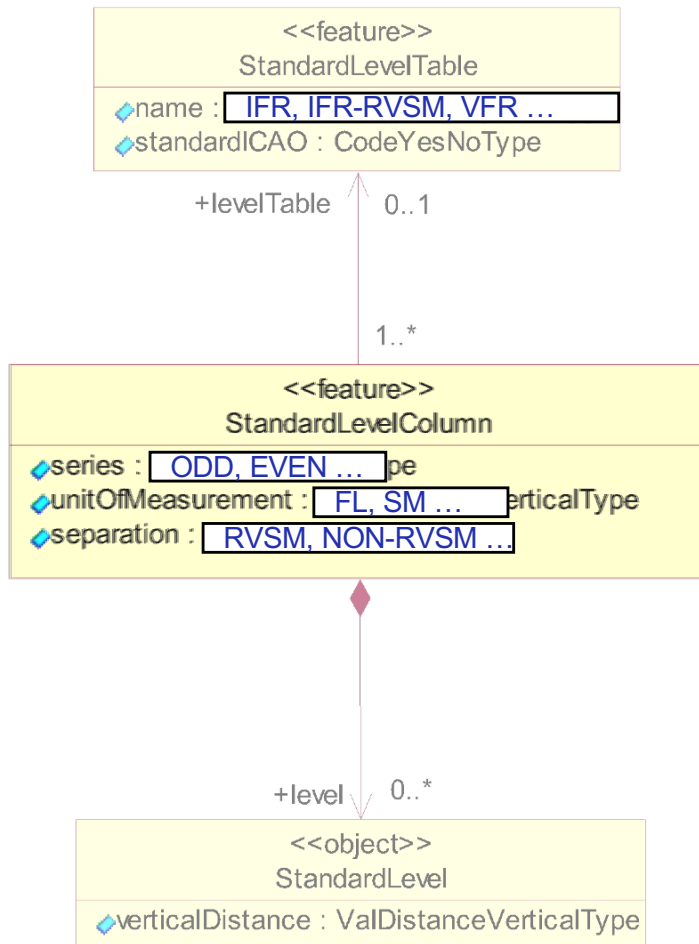
UQ624		Route availability:
1	AD Administration	(1) CDR 1: EV weekend: FRI 1700 - MON 0600 . EV NGT: MON to THU: 2300 - 0 due to MIL requirements.
2	Customs and immigration	(2) CDR 2: Except bank holidays (see ENR 3.3.1.3) EV week: MON to THU: 0600 and 1145-1545 (on working days specified in daily Belgian AUP and CRAM.
3	Health and sanitation	As AD Administration



Airspace layers



Standard Levels



[Route Usage Notes]		
Upper limit / Lower limit	FL series	
	↓	↑
FL 195 / FL 65	Odd ⁽¹⁾	Even ⁽¹⁾



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Questions?



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Airspace

Airspace

BRUSSELS UIR

Lateral limits	510521N 0023244E - 510700N 0020000E - 513000N 0020000E - 512223N 0032147E - along the Belgian-Dutch border - 504515N 0060116E - along the Belgian-German border - 500748N 0060816E - along the German-Luxembourg border - 492810N 0062202E - along the French-Luxembourg border - 493247N 0054907E - along the Belgian-French border - 510521N 0023244E.						
Vertical limits	UNL / FL 195						
Airspace class	C (1)						
Units	Maastricht UAC (2)		Call sign	Maastricht Radar (En)			
			OPR HR	H24 TRA SB - TRA SOUTH BRAVO			
			FREQ	See below (§ 3)			
	Brussels ACC (3)	Lateral limits	Call sign	Brussels C (3)	Vertical limits	Type of restriction / nature of hazard	Time of activity
			OPR HR	H24			
Remarks	(1) Unclassified		494735N 0054237E - 494137N 0051624E - below UNL (3)		UNL / FL 195	Air exercises. Crossing clearance shall be requested in-flight from Semmerzake ATCC.	HX (1)
	(2) Above FL 245 (GND, ADIZ, FIR and FIC)		494030N 0051133E - 494040N 0045055E -				
	(3) Below FL 245		494920N 0041830E - 495835N 0040853E -				
			500853N 0041028E - 503205N 0040655E -				
			503335N 0041212E - 503813N 0043620E -				
		503519N 0045040E - 500118N 0054241E -					
		494735N 0054237E.					
PROHIBITED AREAS							
(1) Activation can be checked pre-flight with Semmerzake ATCC (TEL +32 (0) 9 389 25 55) or Brussels FIC.							

EBP01 - BRUSSELS CITY

Lateral limits	Vertical limits	Type of restriction / nature of hazard	Time of activity
505311N 0042013E - an arc of circle, 1.5 km radius, centred on 505311N 0042130E and traced clockwise to 505316N 0042247E - an arc of circle, 5 km radius, centred on 505039N 0042142E and traced clockwise to 505311N 0042013E.	UNL / GND	Entry prohibited, unless instructed by ATC.	PERM



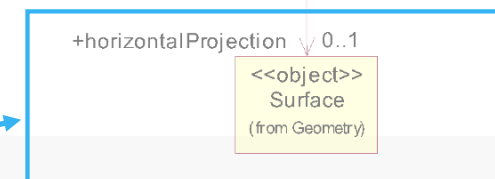
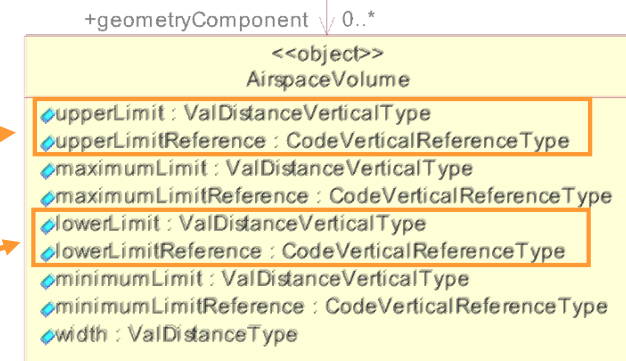
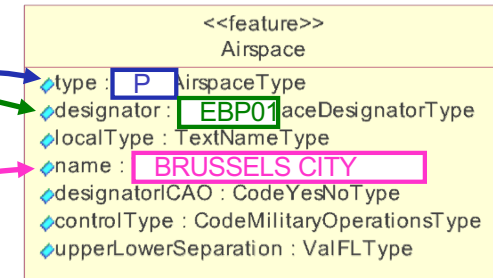
Airspace



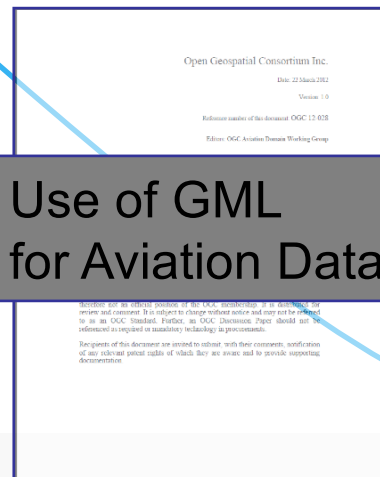
PROHIBITED AREAS

EBP01 - BRUSSELS CITY

Lateral limits	Vertical limits	Type of restriction / nature of hazard	Time of activity
505311N 0042013E - an arc of circle, 1.5 km radius, centred on 505311N 0042130E and traced clockwise to 505316N 0042247E - an arc of circle, 5 km radius, centred on 505039N 0042142E and traced clockwise to 505311N 0042013E.	UNL / GND	Entry prohibited, unless instructed by ATC.	PERM



Use of GML
for Aviation Data



AIXM 5.1 UML

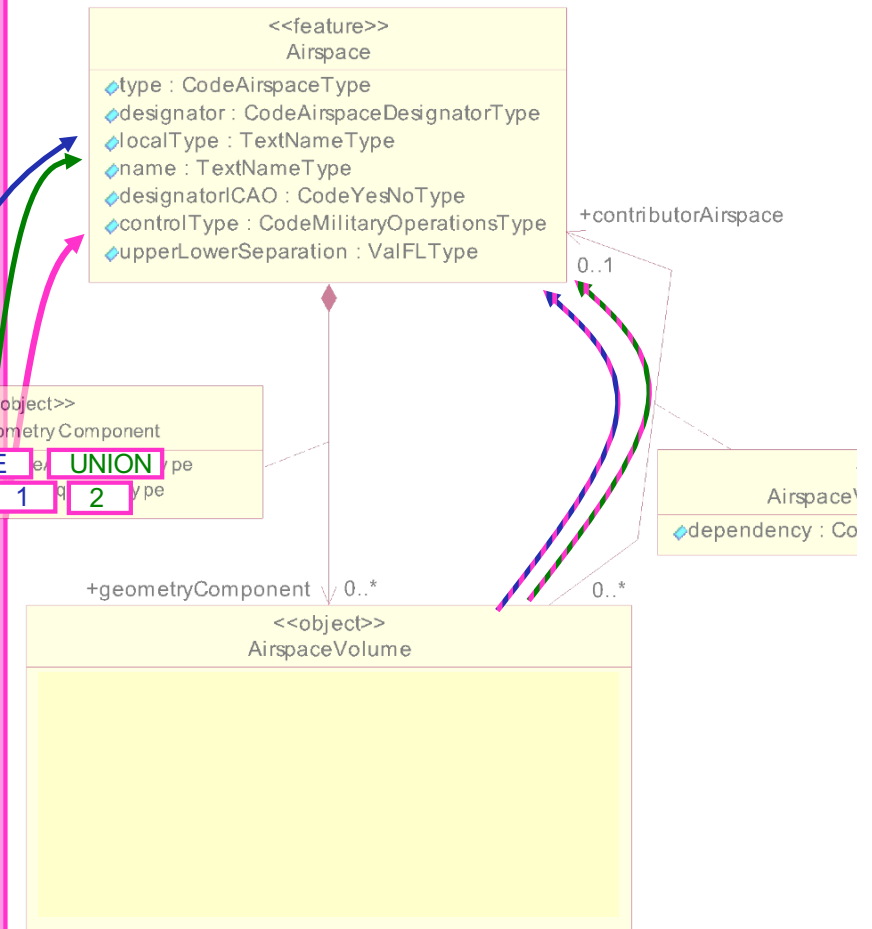
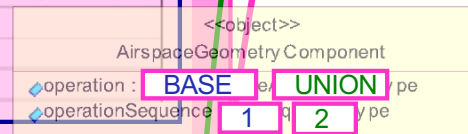


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Airspace defined by aggregation

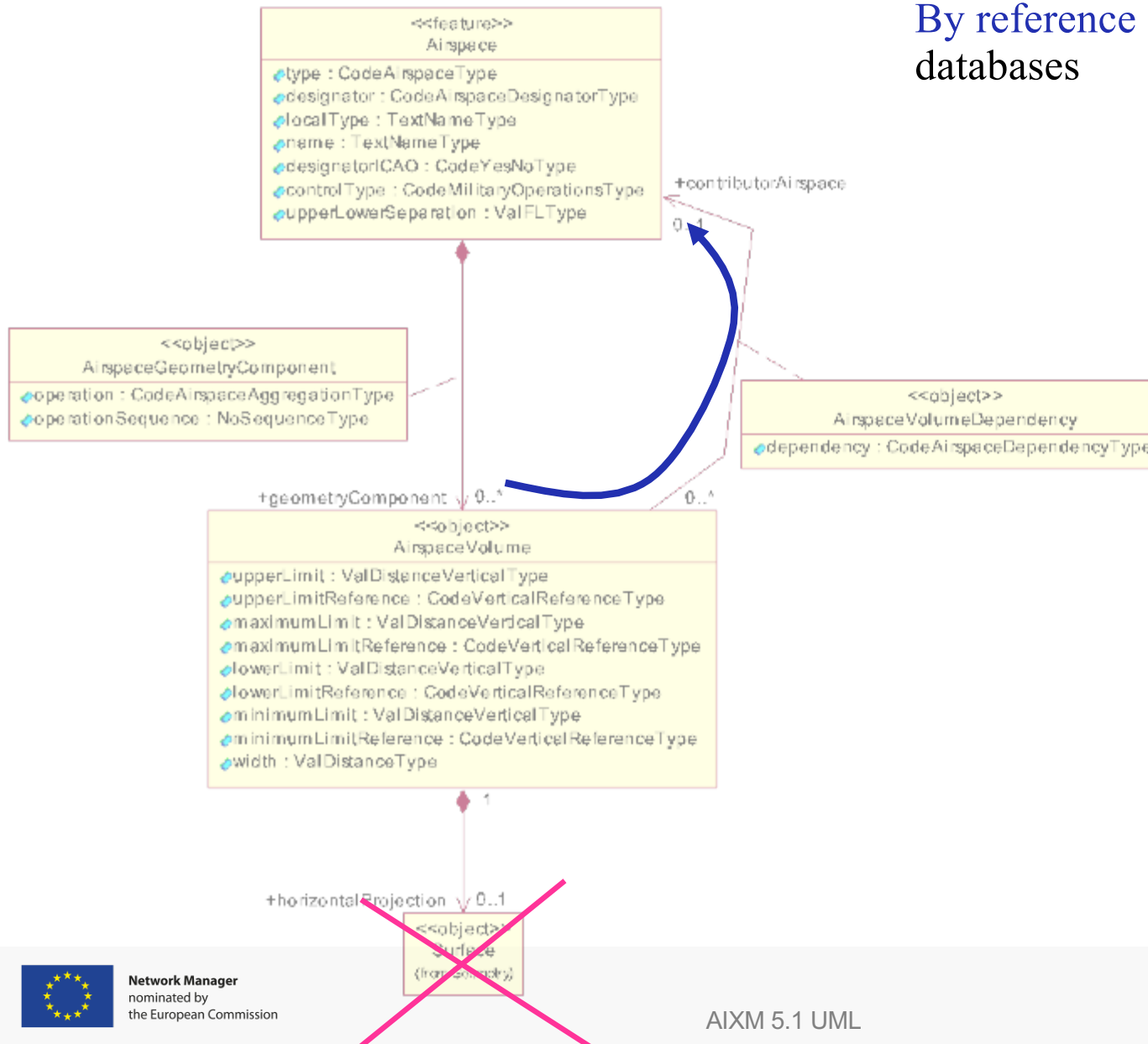
BRUSSELS TMA ONE			
Lateral limits	504036N 0040415E - 503852N 0035231E - 510207N 0040621E - 511005N 0044746E - 510251N 0045955E - 504111N 0042920E - 503823N 0042917E - 503205N 0040655E - an arc of circle, 6 NM radius, centred on 503532N 0035910E and traced counterclockwise to 504036N 0040415E.		
Vertical limits	FL 195 / 1500 ft AMSL		
Airspace class	C		
Control units	Brussels ACC	Call sign	Brussels Control (En)
		OPR HR	H24
		FREQ	See below (§ 3)
	Brussels APP (1)	Call sign	Brussels Arrival, Brussels Departure (En)
		OPR HR	H24
		FREQ	See EBBR AD 2.18
Remarks	(1) Aircraft entering Brussels TMA below FL 65 shall contact Brussels Departure.		

BRUSSELS TMA TWO			
Lateral limits	503059N 0034410E - 504012N 0033609E - 510855N 0035649E - 511606N 0041600E - 511807N 0043011E - 511835N 0043325E - 511005N 0044746E - 510207N 0040621E - 503852N 0035231E - 504036N 0040415E, an arc of circle, 6 NM radius, centred on 503532N 0035910E and traced clockwise to 503205N 0040655E - 503039N 0040151E - 502920N 0034840E - 503059N 0034410E.		
Vertical limits	FL 195 / 2500 ft AMSL		
Airspace class	C		
Control units	Brussels ACC	Call sign	Brussels Control (En)
		OPR HR	H24
		FREQ	See below (§ 3)
	Brussels APP (1)	Call sign	Brussels Arrival, Brussels Departure (En)
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Airspace aggregation

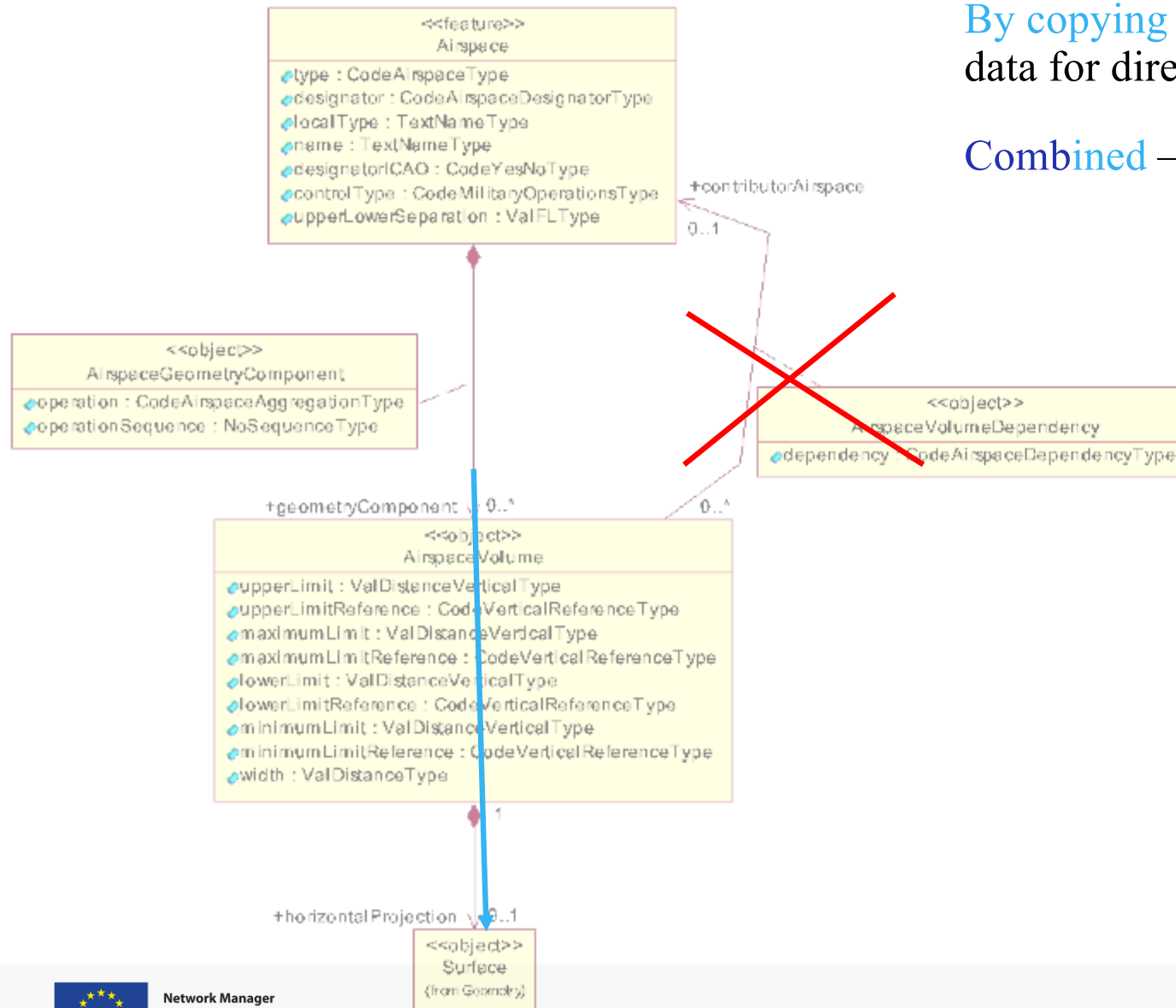
By reference - between synchronized databases



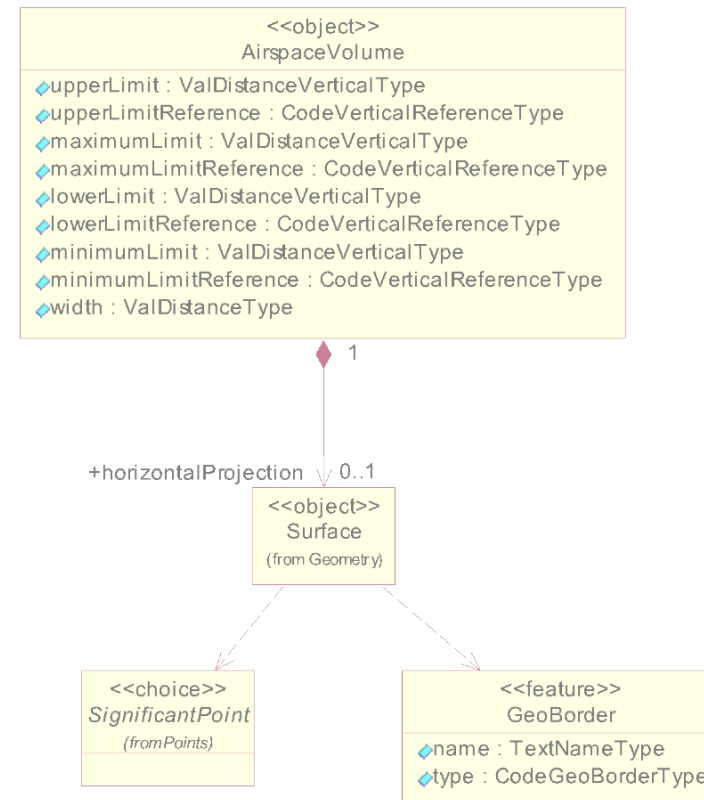
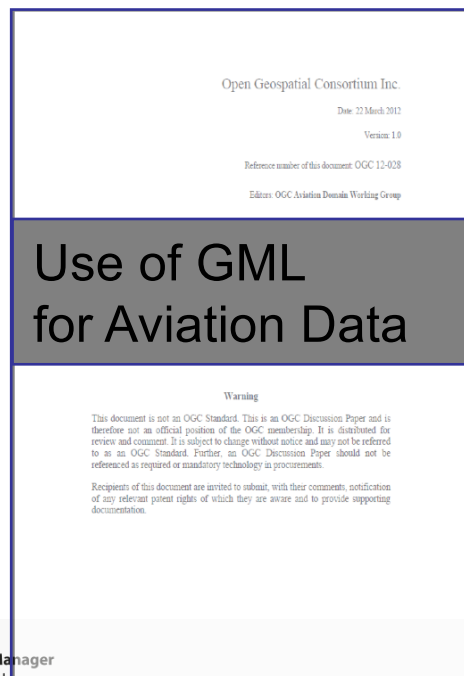
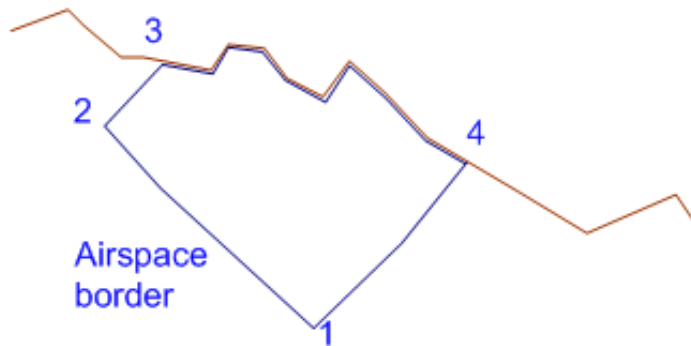
Airspace aggregation

By copying the geometry - geometrical data for direct consumption

Combined – also possible



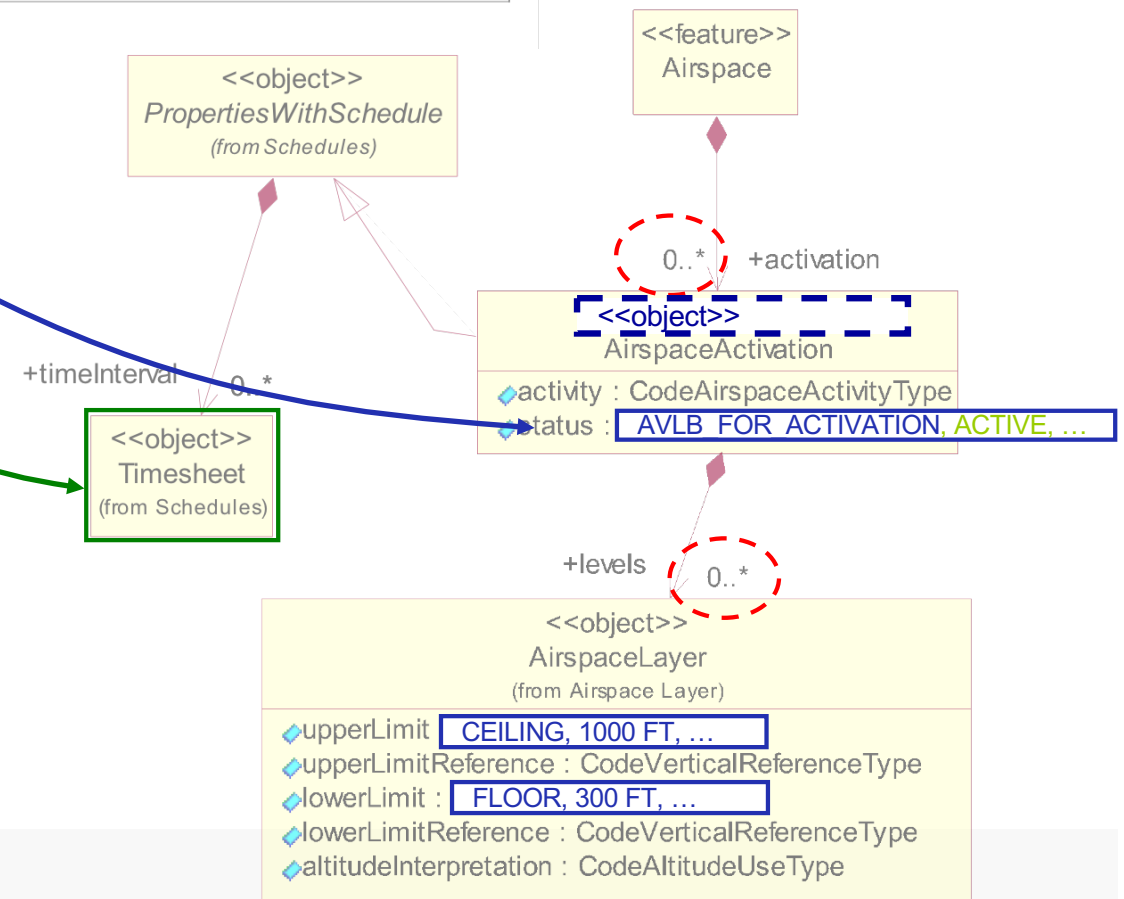
Geoborder and significant point references



Airspace activation

EBD32 - BERTRIX AREA

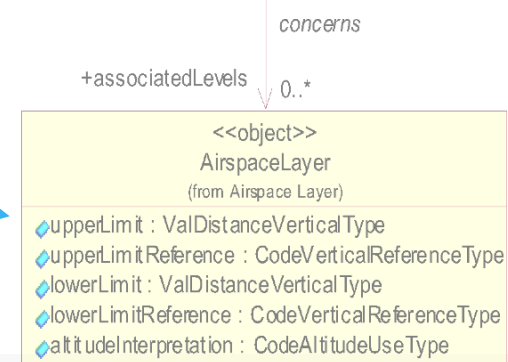
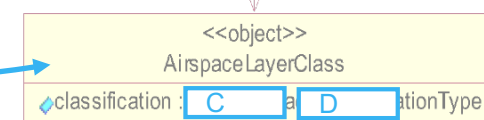
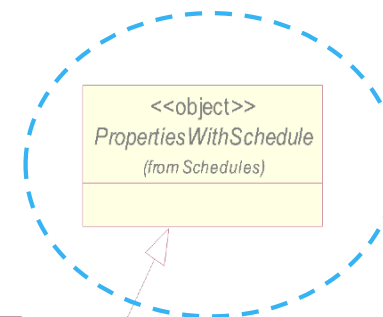
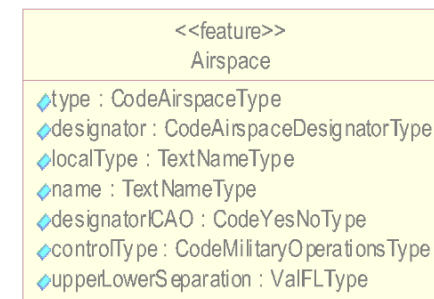
Lateral limits	Vertical limits	Type of restriction / nature of hazard	Time of activity
495900N 0050700E - 494800N 0050600E - 494800N 0052400E - 495100N 0052400E - 495900N 0051700E - 495900N 0050700E.	4500 ft AMSL / GND	CAS exercises target zone	HX (1)
(1) Announced by NOTAM May be active MON, 1230-1600; TUE to THU, 0830-1100 and 1230-1600; FRI, 0830-1100			



Airspace classification

LUXEMBOURG TMA FIVE ⁽¹⁾

Lateral limits	494328N 0054955E - 494032N 0054956E - 493537N 0054356E - 493232N 0054520E - along the Belgian-French border - 493247N 0054907E - along the Belgian-Luxembourg border - 494328N 0054955E.		
Vertical limits	FL 165 / 2500 ft AMSL		
Airspace class	C/D (2)		
Control units	Luxembourg APP	Call sign	Luxembourg Approach (En)
		OPR HR	H24
		FREQ	See ELLX AD 3.18
Remarks	(1) Delegation of ATS from Brussels ACC to Luxembourg APP. (2) Airspace class C above FL 95.		

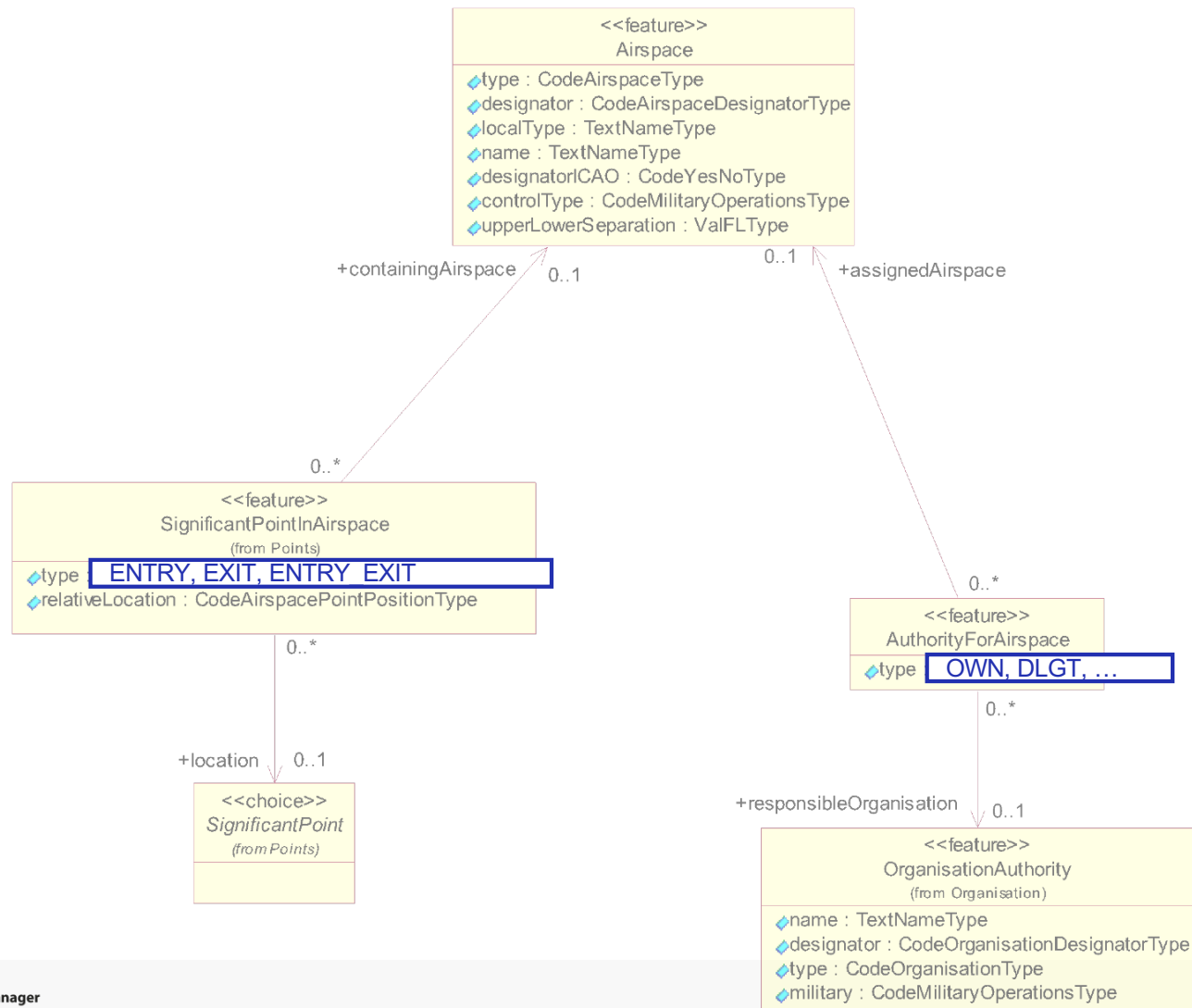


hasClassLayers
+class 0..*

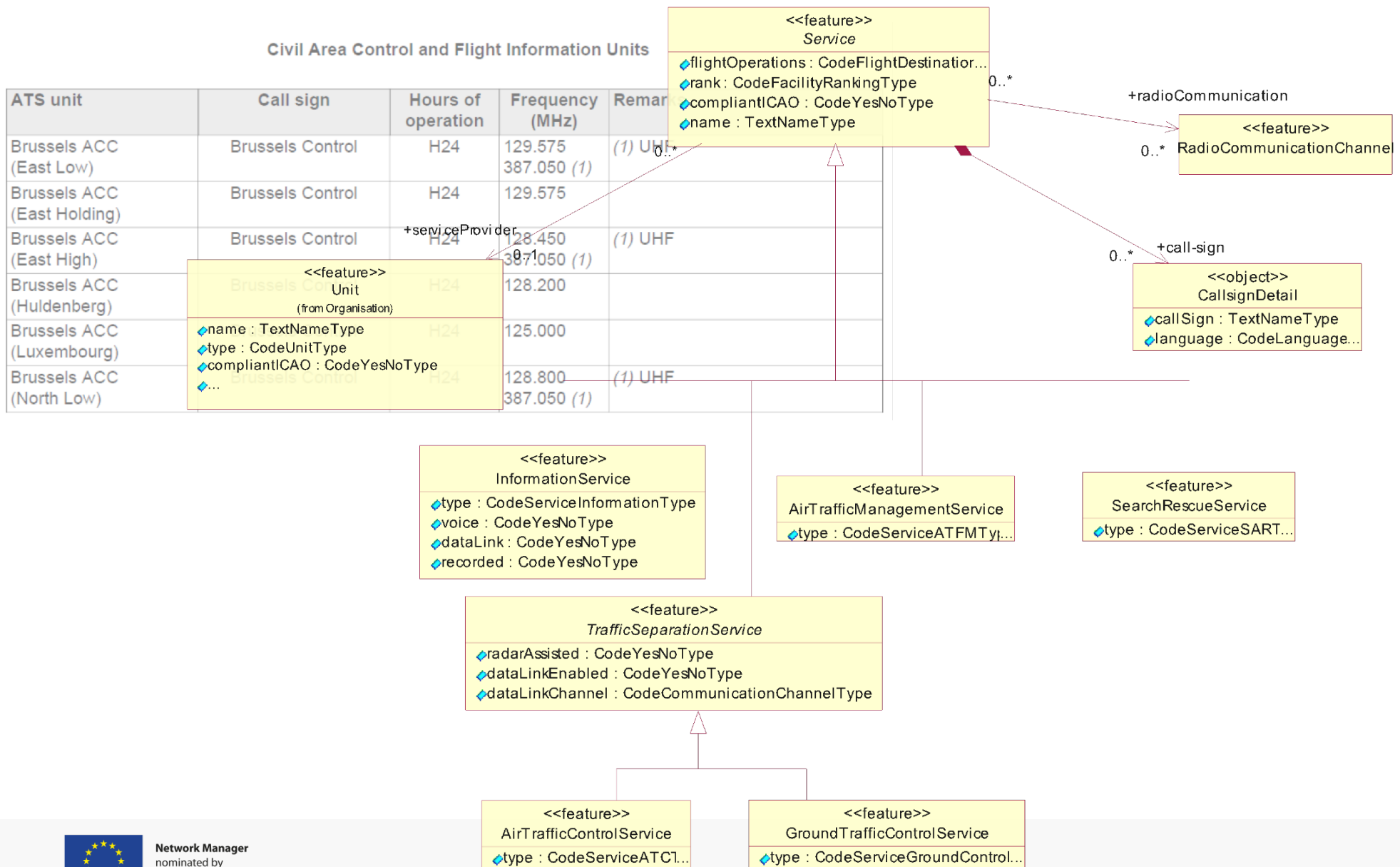
concerns

+associatedLevels 0..*

Other Airspace aspects



ATC and other Services





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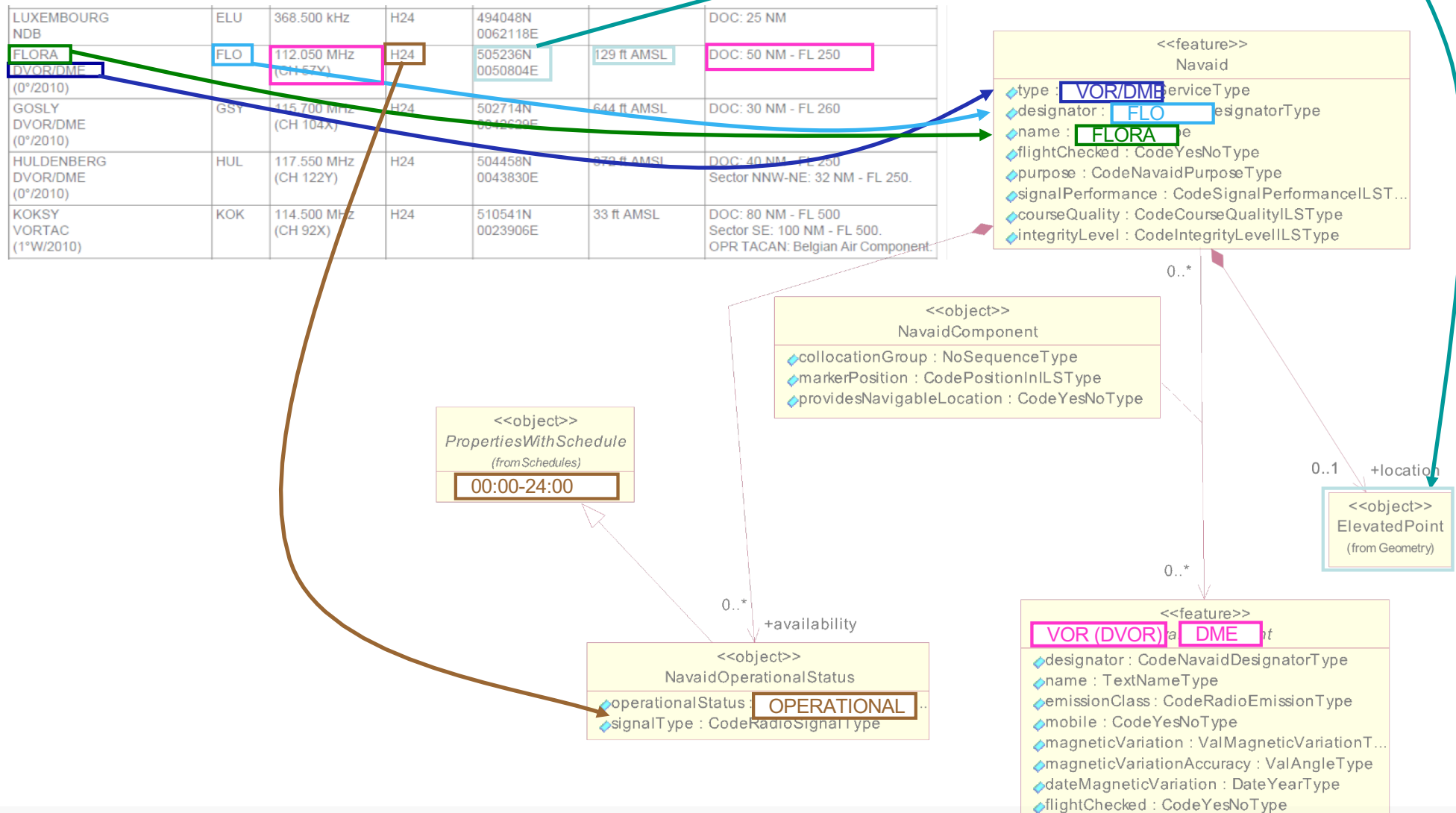


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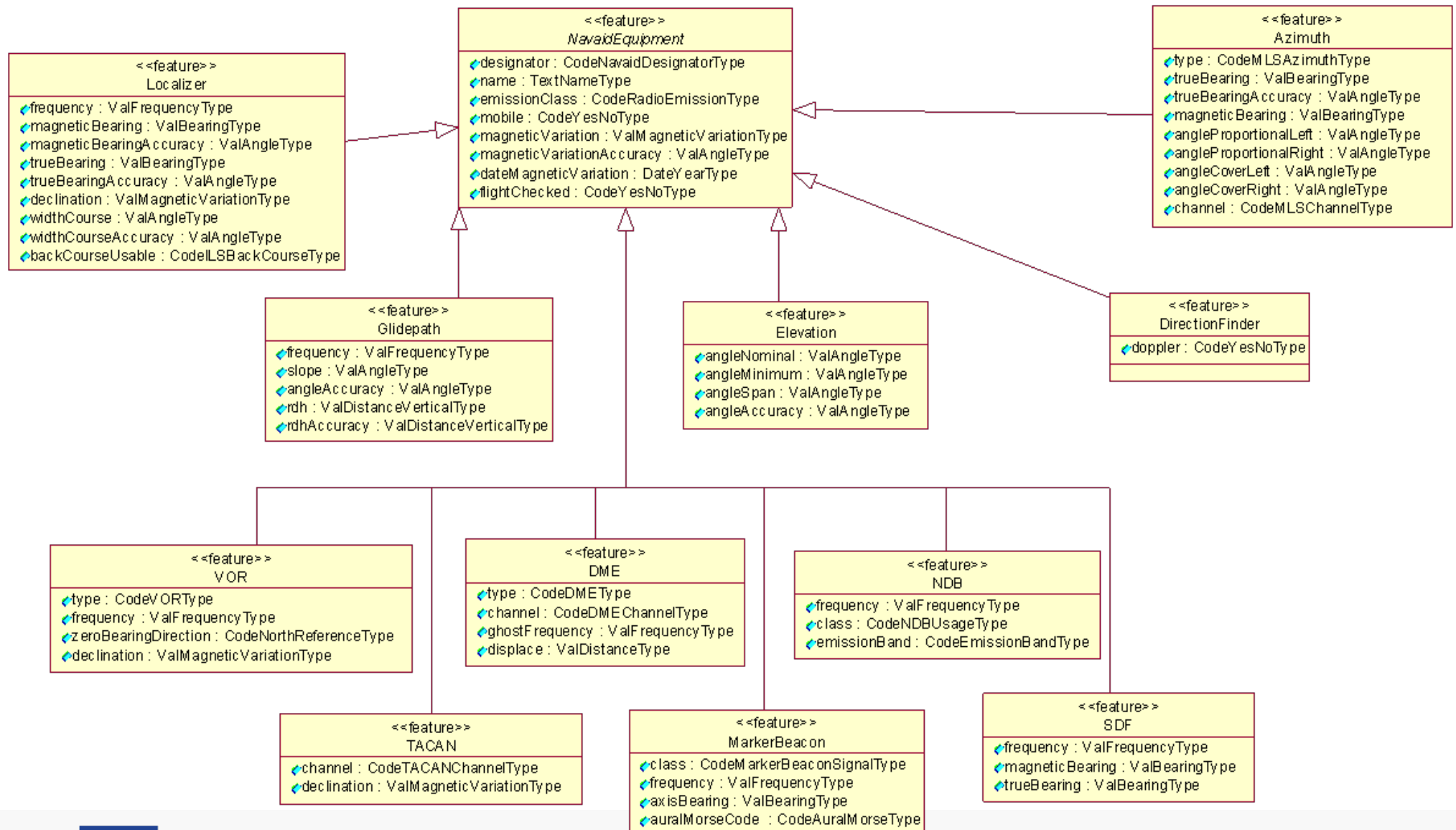


Point and Navaid Package

Nav aids

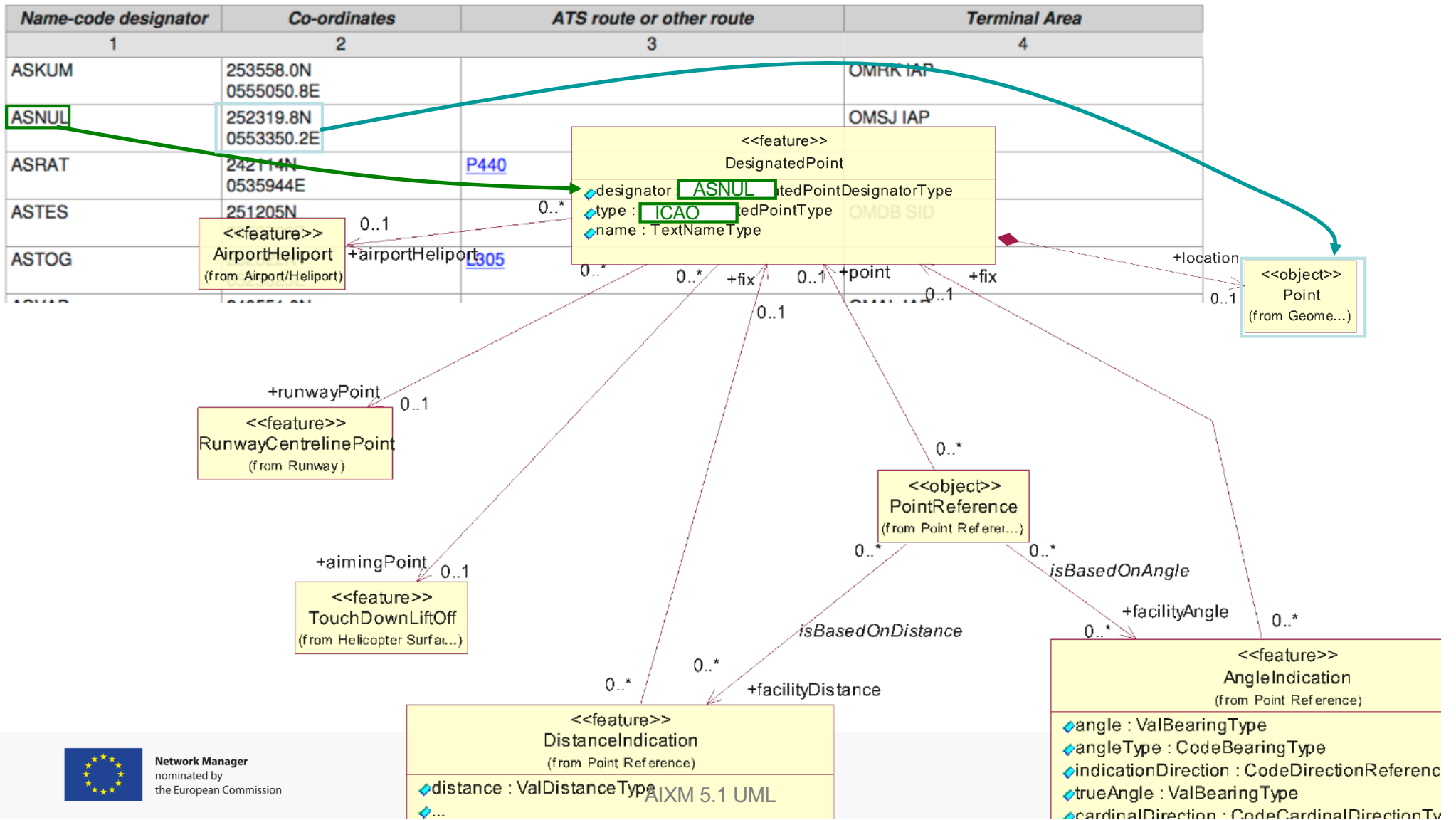


NAVAID Equipment

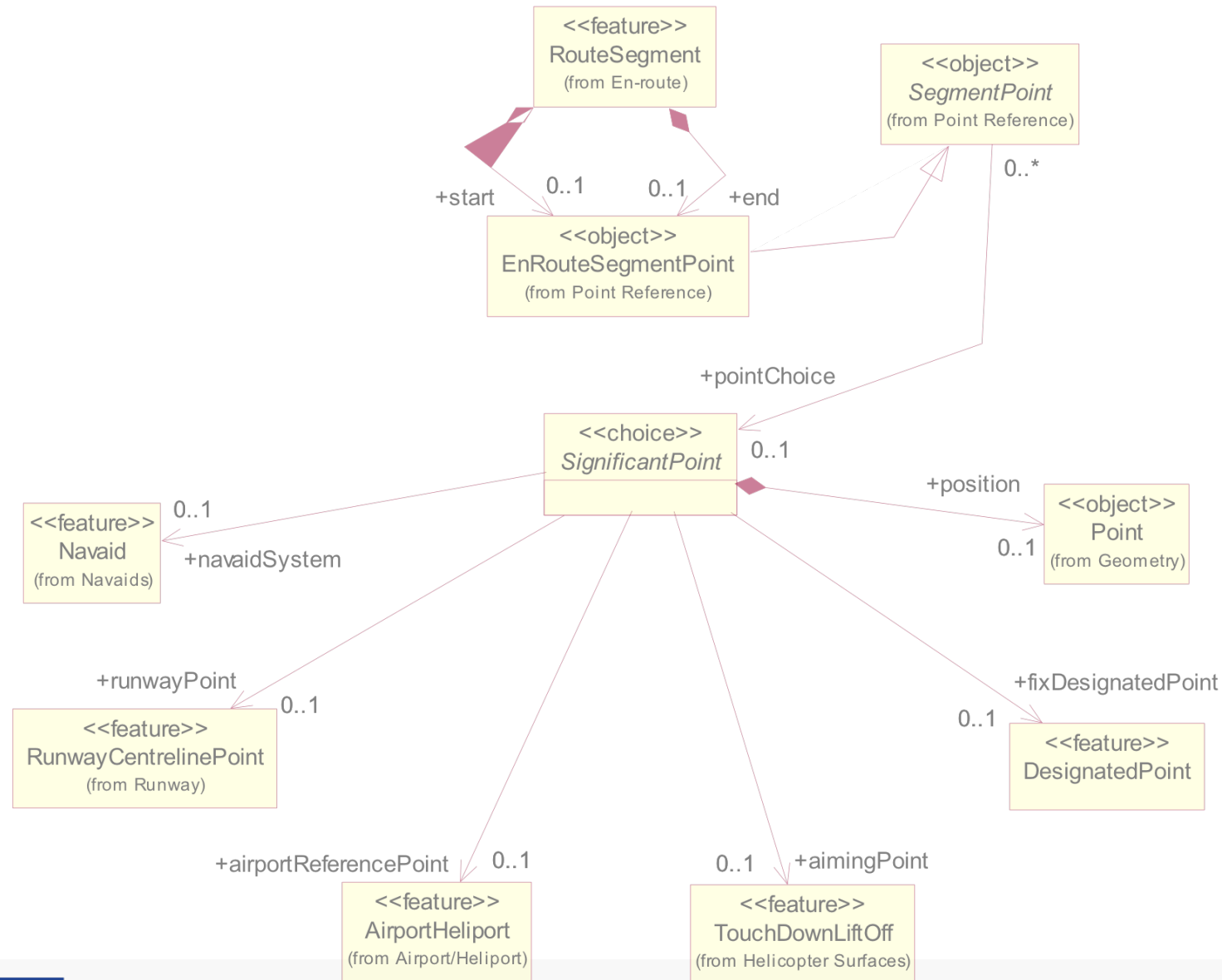


Points

ENR 4.4 Name code designators for significant points



Significant Points





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Route package

Routes

Route Designator {RNP Type}		[Route Usage Notes]					
	Significant Point Name	Significant Point Coordinates					Remarks
{RNP Type}		Initial Track MAG ↓ / ↑	Great Circle Dist (NM)	Upper limit / Lower limit	FL series		Controlling unit {Airspace class} Remarks
					↓	↑	
UM170		Route availability: (1) H24 (2) CDR 1: EV weekend: FRI 1700 - MON 0600. EV NGT: MON to THU 2300 - 0600. TEMPO CLSD on UAC/ACC instructions due to MIL requirements. (3) CDR 2: Except bank holidays (see ENR 3.3.1.3) EV week: MON to THU 0600 - 2300. EV FRI 0600 - 1700. AVBL as specified in daily French and Belgian AUPs and CRAM.					
Δ	PODAT Langen FIR - Hannover UIR / Brussels UIR	504145N 0060811E					(5)
1		249 / 069	9.4NM	FL 660 / FL 195	Even ⁽¹⁾	Odd ⁽¹⁾	[class C] (4)
	DINKI	503821N 0055422E					
2		247 / 067	8.1NM	FL 660 / FL 195	Even ⁽¹⁾	Odd ⁽¹⁾	[class C] (4)
	QI NO DVOR/DME (LNO)	503509N 0054237E					
3		198 / 018	47.6NM	FL 660 / FL 195	Even ^{(2) (3)}		[class C]
	DINAN	494955N 0051953E					
4		198 / 018	8.8NM	FL 660 / FL 195	Even ^{(2) (3)}		[class C]
	KUDIN Brussels UIR / France UIR	494135N 0051546E					(6)
<u>Route Remarks:</u> Control unit(s): BRUSSELS ACC (BLW FL 245); MAASTRICHT UAC (ABV FL 245) <u>Point/Segment Remarks:</u> (4) Not AVBL for TFC DEST EBLG and EHBK. Not AVBL for TFC DEP from or with DEST in Brussels TMA. WB TFC planned via UL608 shall be conducted from DINKI to BATTY (290°/2 NM). (5) For continuation see AIP Germany. (6) For continuation see AIP France.							

```

<<feature>>
Route
designatorPrefix : U
designatorSecondLetter : M
designatorNumber : 170
multiplierIdentifier : CodeUpperAlphaType
locationDesignator : TextDesignatorType
name : TextNameType
type : ATS
flightRuleCode : IFR
internationalUse : CodeINT
militaryUse : CodeMilitaryStatusType
militaryTrainingType : CodeMilitaryTrainingType
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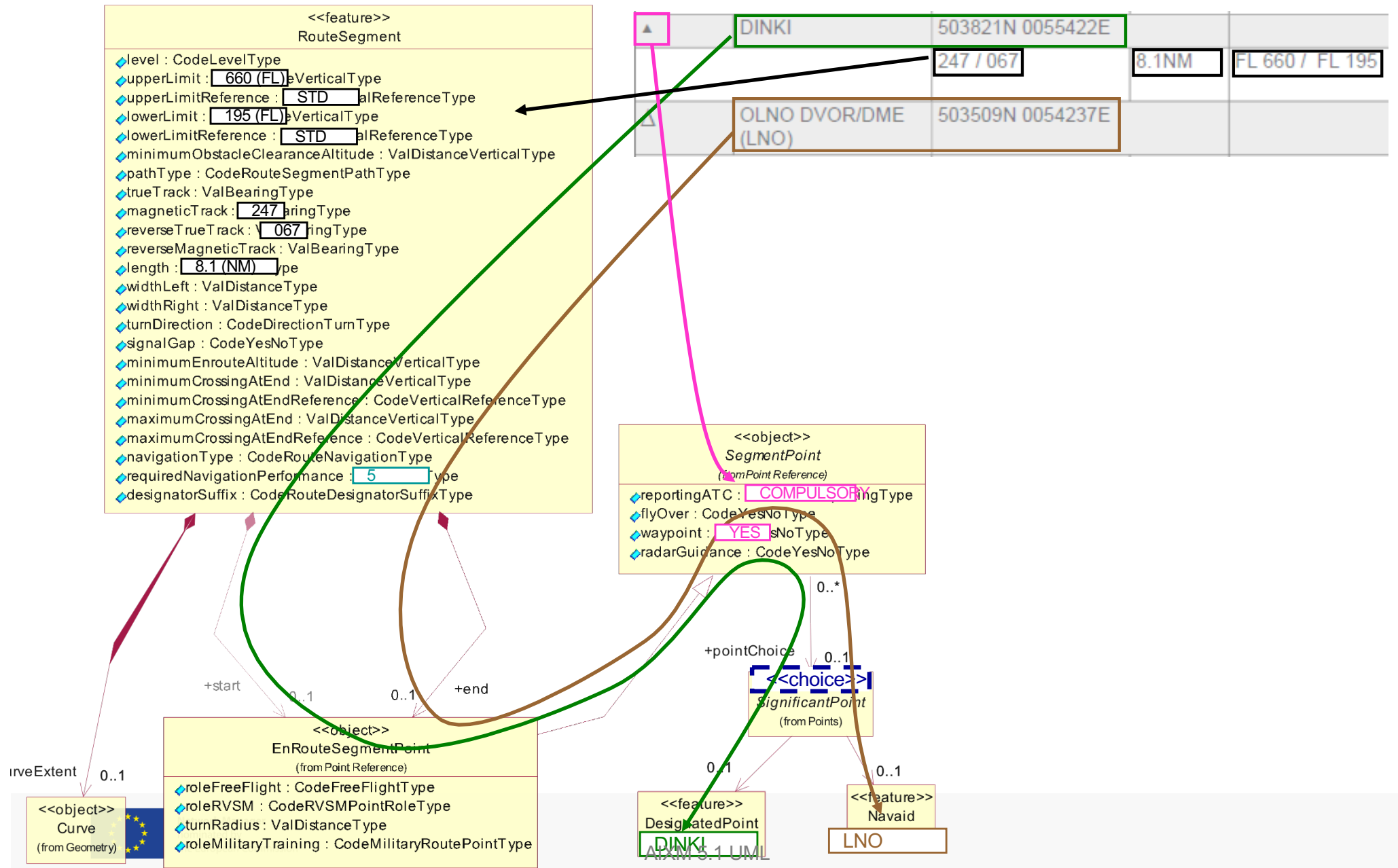
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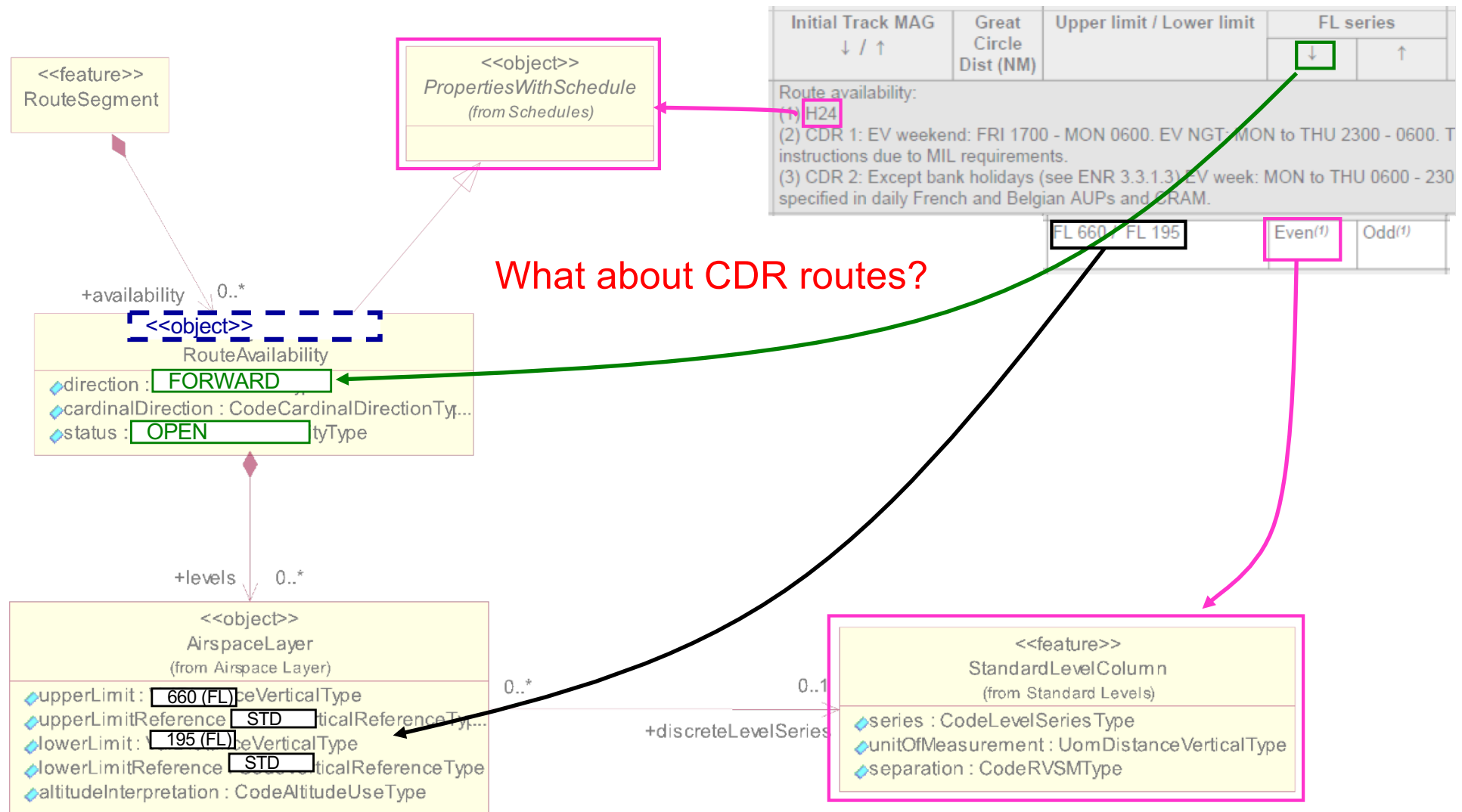
<<feature>>
RouteSegment
level : CodeLevelType
upperLimit : ValDistanceVerticalType
upperLimitReference : CodeVerticalReferenceType
lowerLimit : ValDistanceVerticalType
lowerLimitReference : CodeVerticalReferenceType
minimumObstacleClearanceAltitude : ValDistanceVerticalType
pathType : CodeRouteSegmentPathType
trueTrack : ValBearingType
magneticTrack : ValBearingType
reverseTrueTrack : ValBearingType
reverseMagneticTrack : ValBearingType
length : ValDistanceType
widthLeft : ValDistanceType
widthRight : ValDistanceType
turnDirection : CodeDirectionTurnType
signalGap : CodeYesNoType
minimumEnrouteAltitude : ValDistanceVerticalType
minimumCrossingAtEnd : ValDistanceVerticalType
minimumCrossingAtEndReference : CodeVerticalReferenceType
maximumCrossingAtEnd : ValDistanceVerticalType
maximumCrossingAtEndReference : CodeVerticalReferenceType
navigationType : CodeRouteNavigationType
requiredNavigationPerformance : CodeRNPType
designatorSuffix : CodeRouteDesignatorSuffixType

```

Route Segment

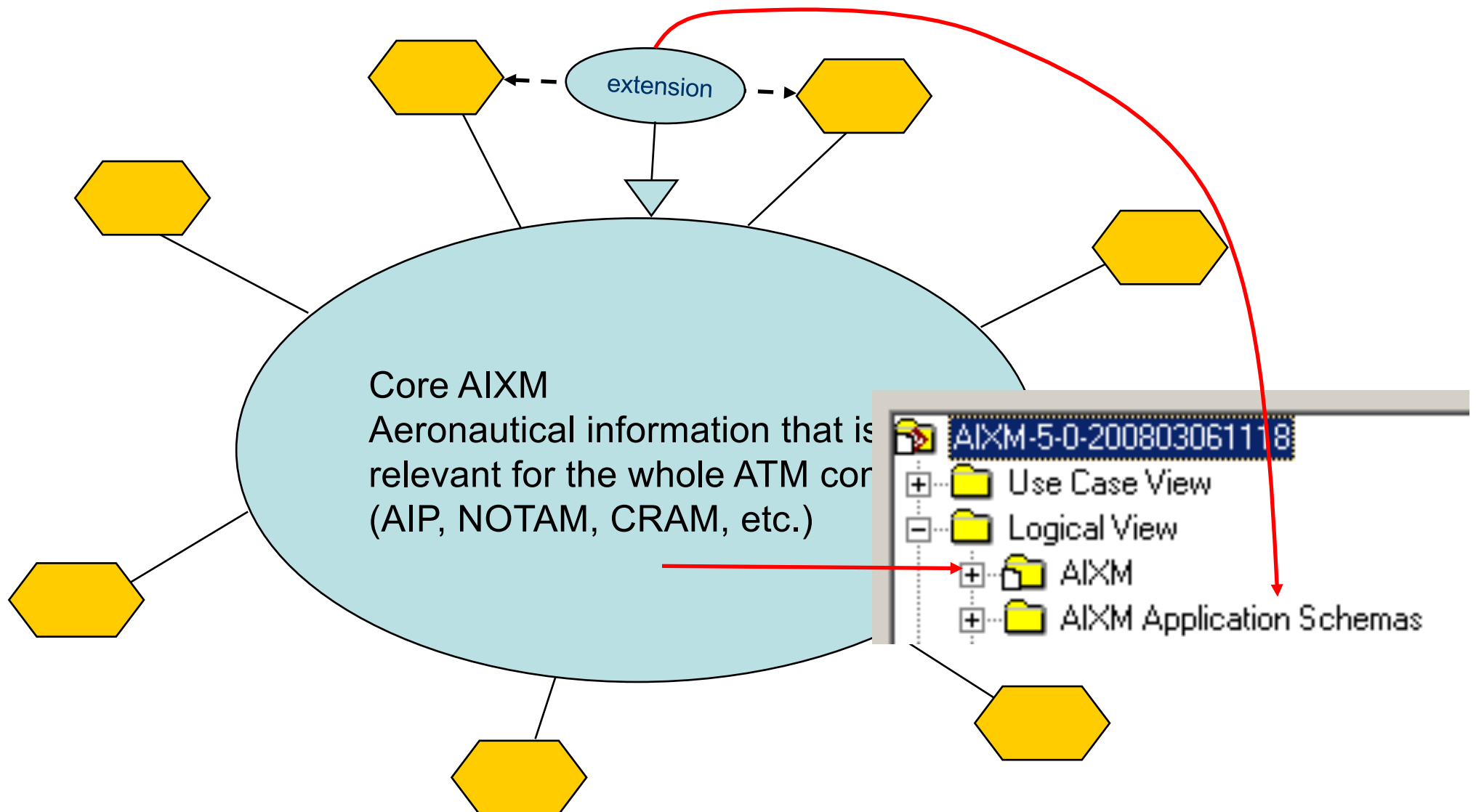


Route availability



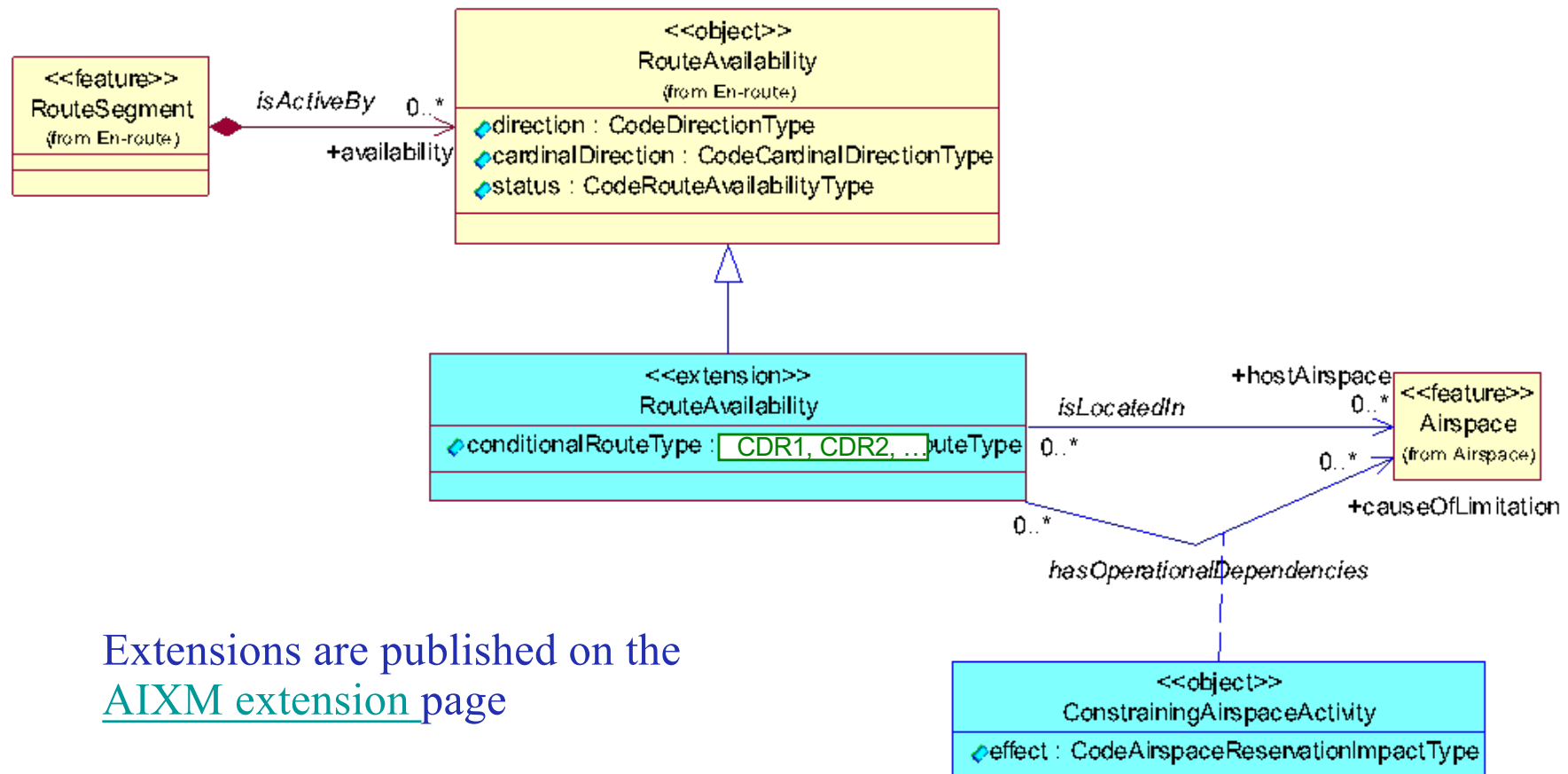
AIXM 5.1 and extensions

Additional information exchanged between selected partners



eASM extension of AIXM 5.1

Classes and associations in blue color are extensions specific to the eASM package. The rest are part of AIXM Core.



Extensions are published on the [AIXM extension page](#)



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Flight Restrictions Package (eRAD)

Flight (routing) restrictions

Route Remarks:

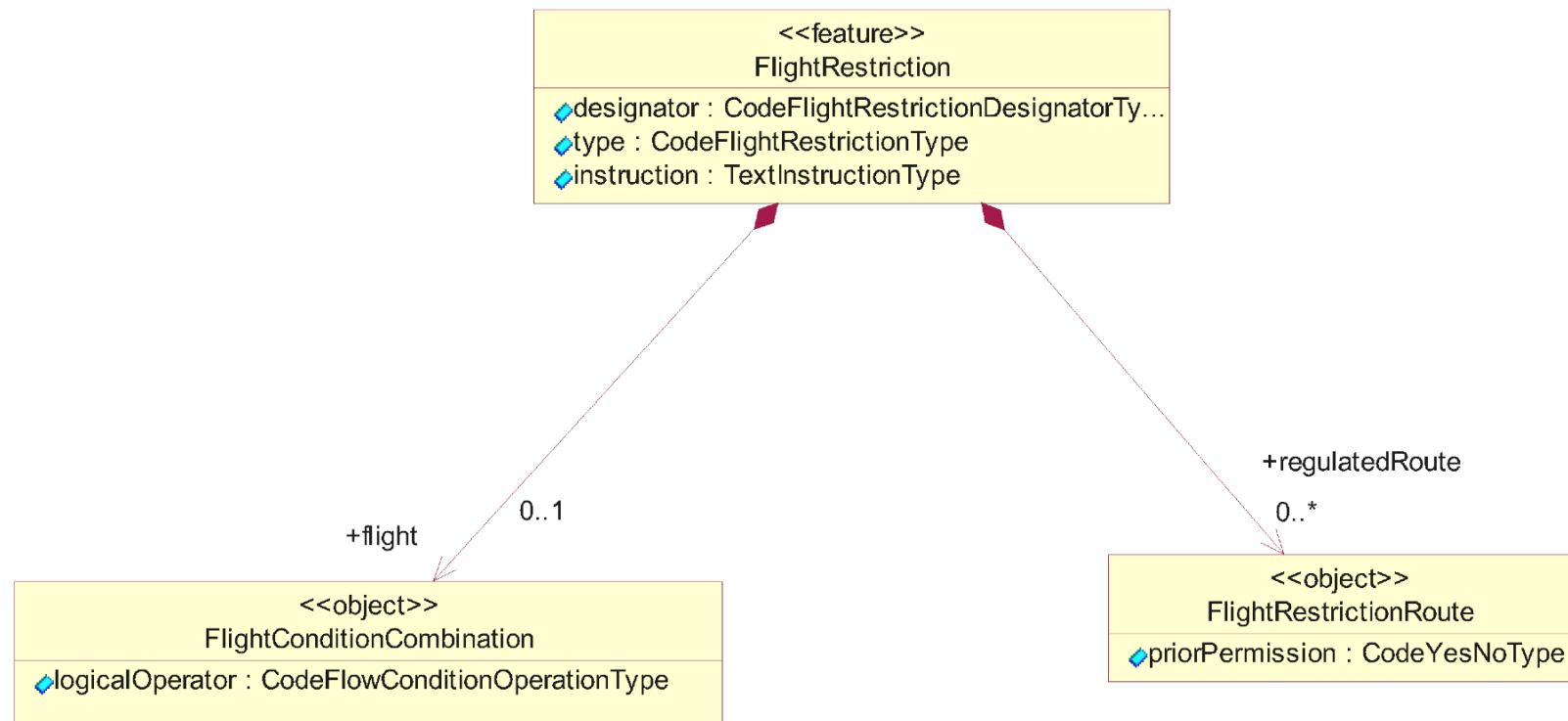
Control unit(s): BRUSSELS ACC (BLW FL 245); MAASTRICHT UAC (ABV FL 245)

Point/Segment Remarks:

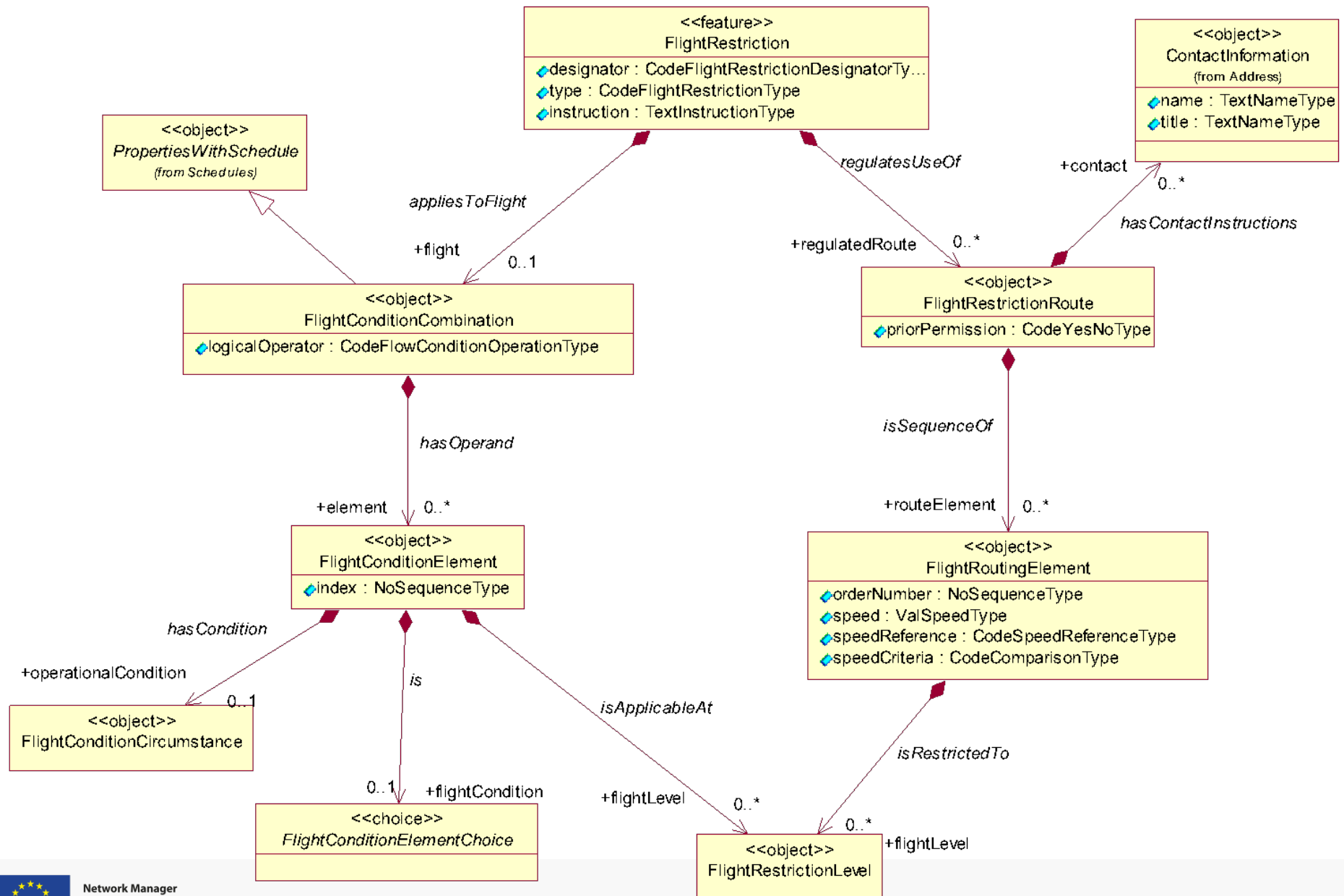
(4) Not AVBL for TFC DEST EBLG and EHBK. Not AVBL for TFC DEP from or with DEST in Brussels TMA. WB TFC planned via UL608 shall be conducted from DINKI to BATTY (290°/2 NM).

(5) For continuation see AIP Germany.

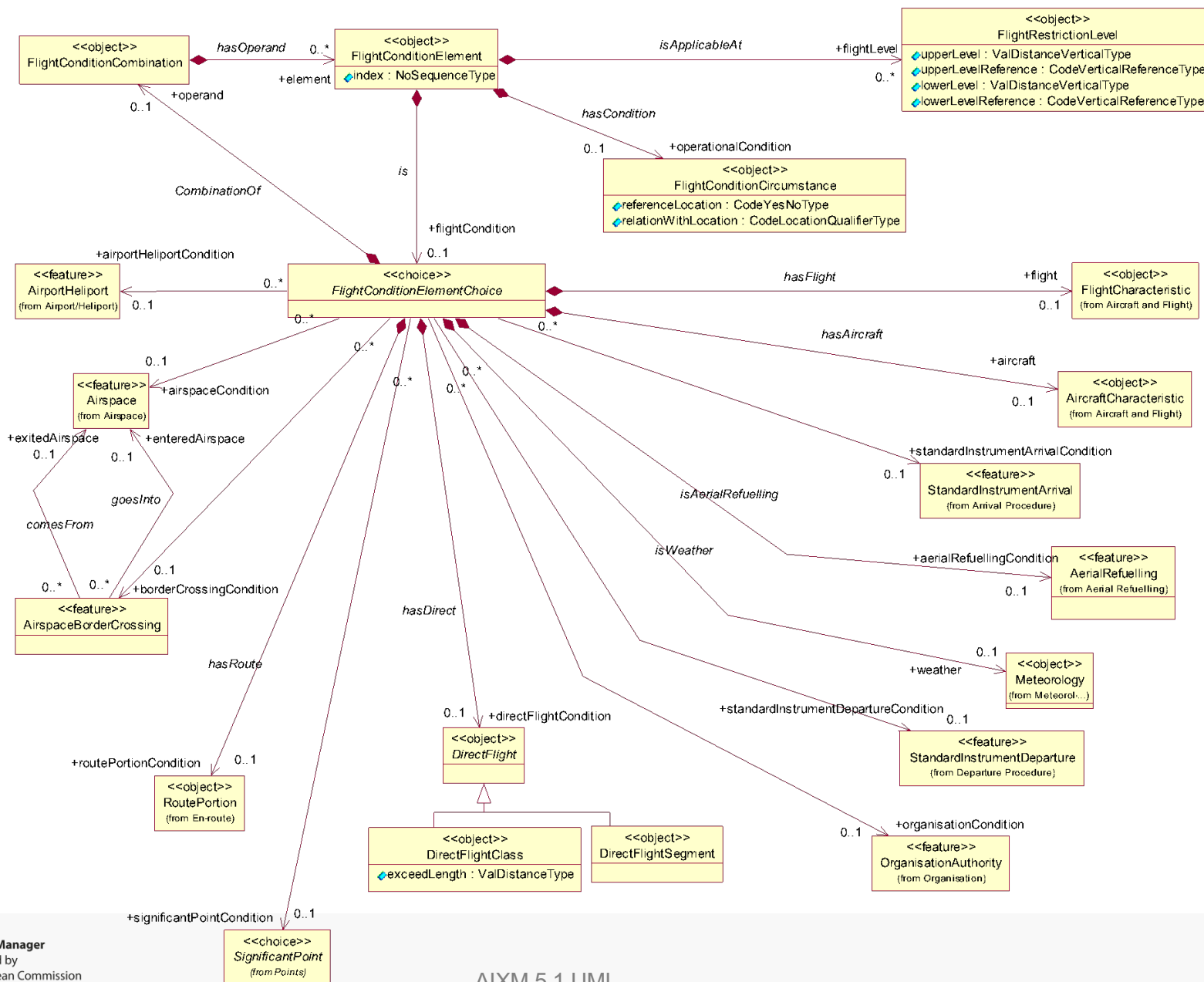
(6) For continuation see AIP France.



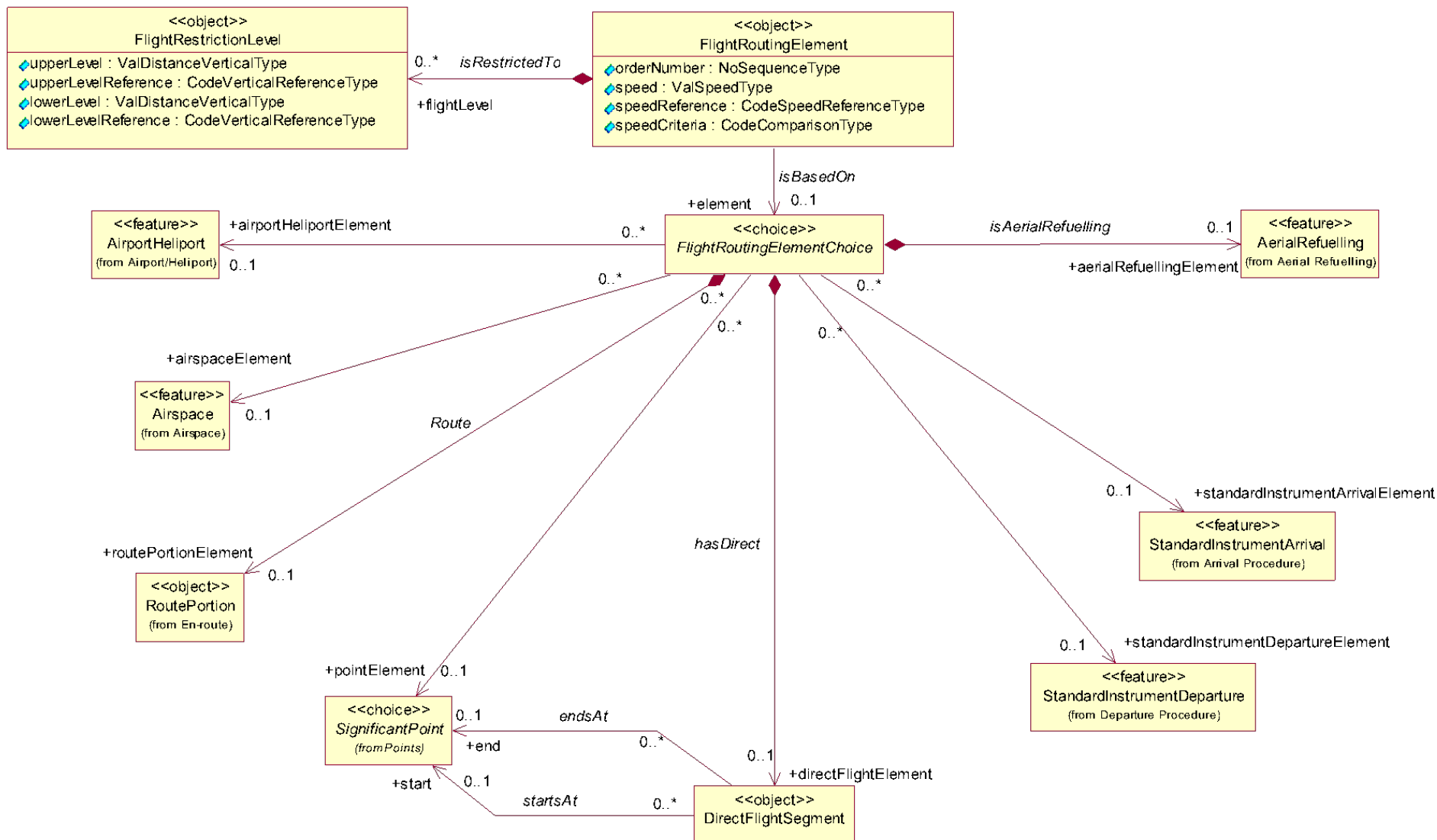
Overview



Conditions



Routings





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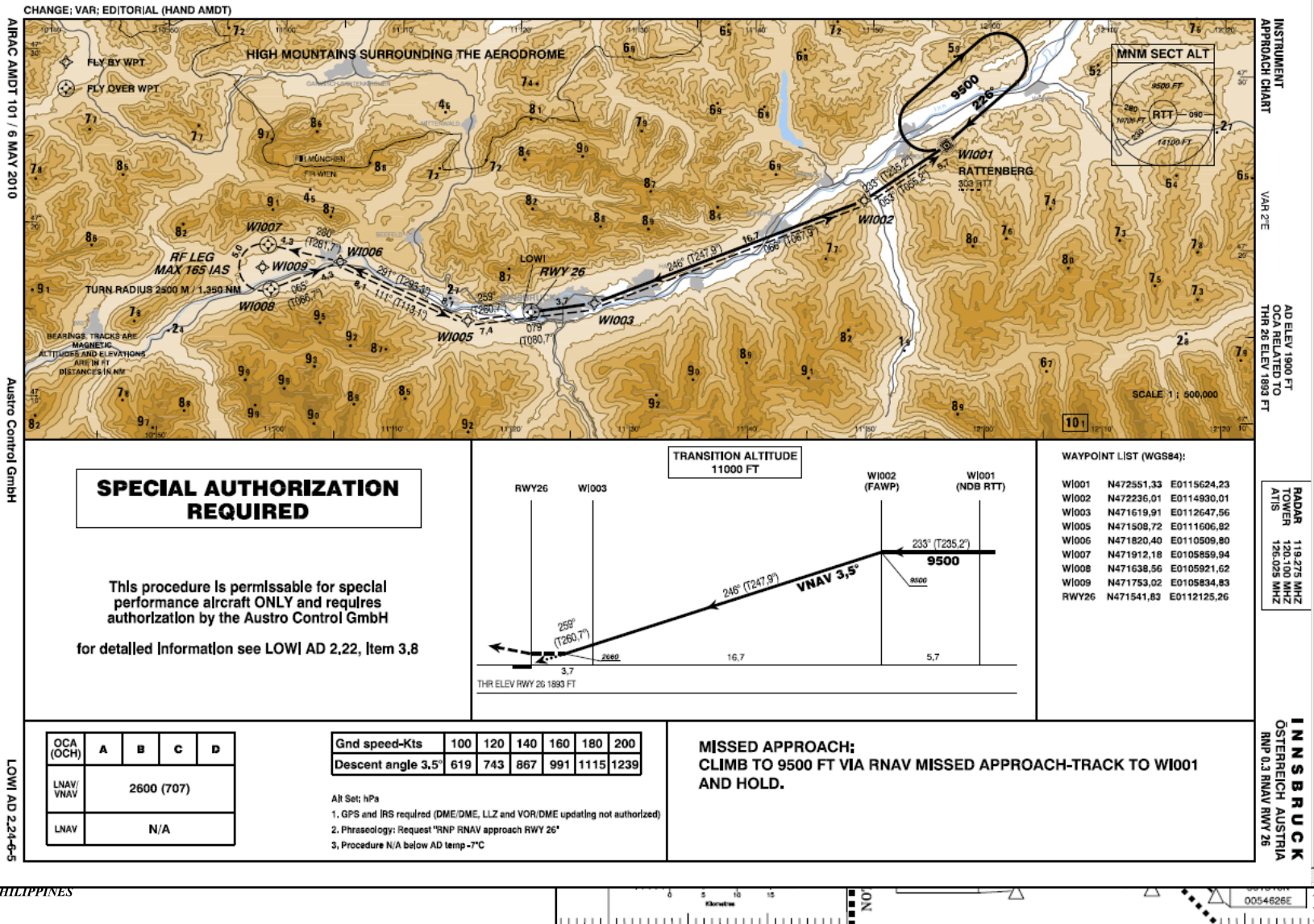
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Procedures (SID/STAR/IAP)

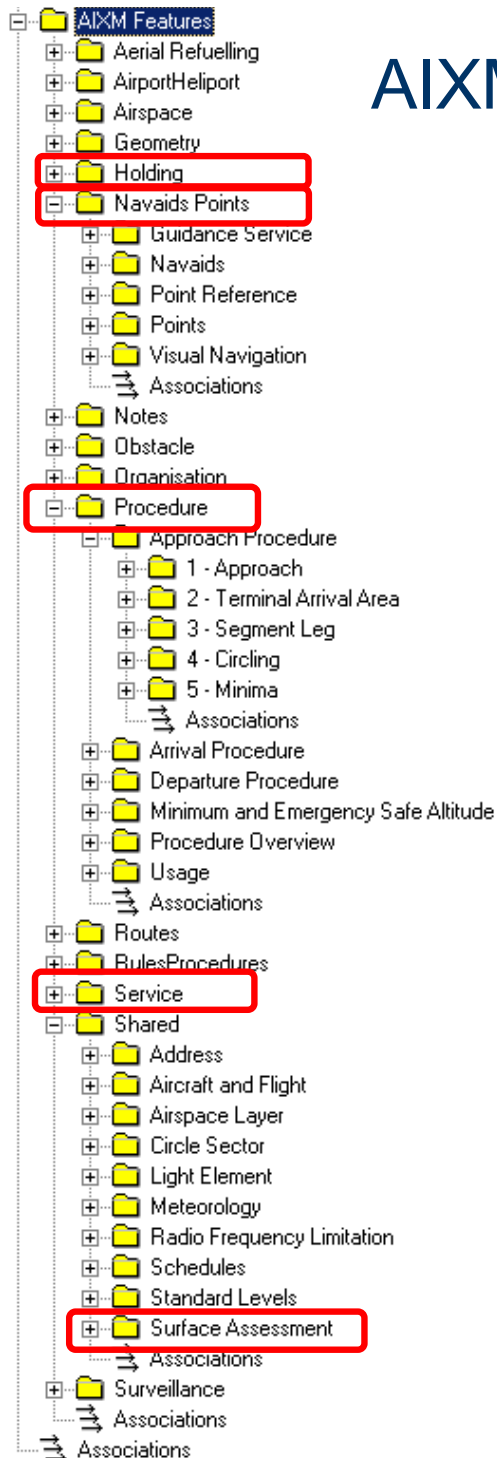


**CIVIL LAW
OF THE PHILIPPINES**



AIP BELGIUM AND G.D. OF LUXEMBOURG
 STANDARD DEPARTURE CHART - BRUSSELS/Brussels-National
 INSTRUMENT (SID) - ICAO
 LND 3F SPI 3F SOPOK 3F PITES 3F
 ROUST 3F CIV 6F KOK 1F DENUT 5F
 HELEN 5F NIK 2F ELISK 1F
 Rwy 02
 Effective: 21 DEC 2006

AIXM 5.1 Procedure Model - Overview



Procedure

The terminal area procedures and related concepts (MSA, TAA...)

Nav aids Points

Guidance Service, Point Reference, and Segment Points

Holding

Holding Patterns

Service

For Information services (ATIS) and ATC services

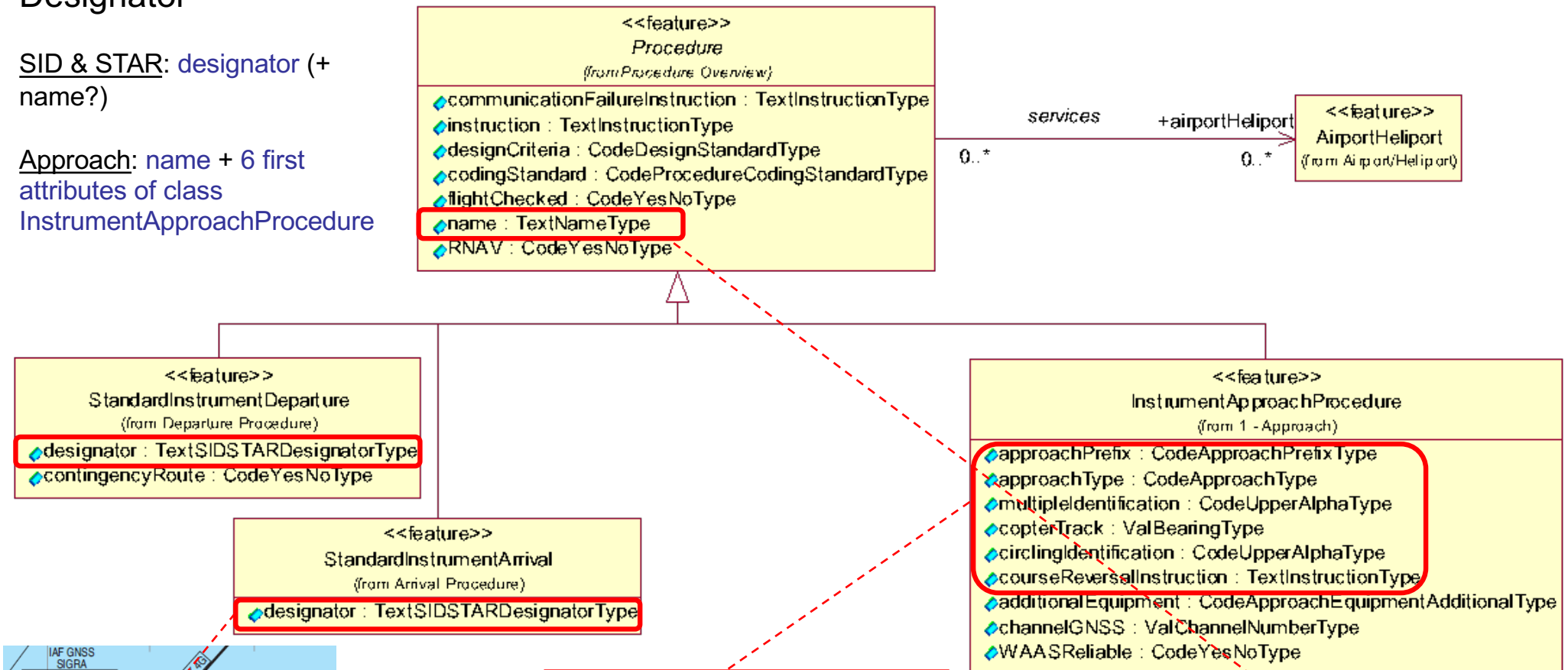
Shared.Surface Assessment

AIXM 5.1 Procedure Model - Overview

Designator

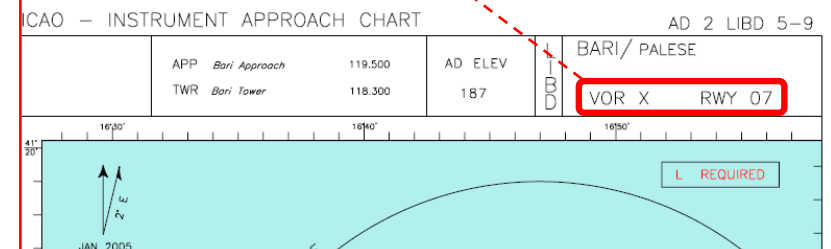
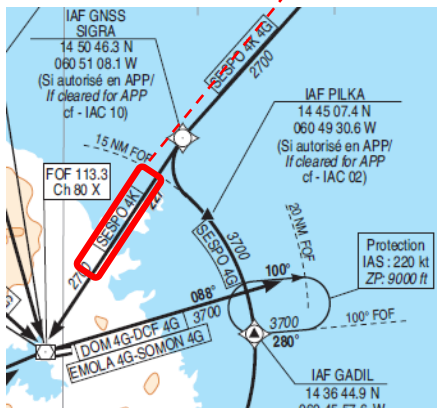
SID & STAR: **designator** (+ name?)

Approach: **name** + 6 first attributes of class
InstrumentApproachProcedure



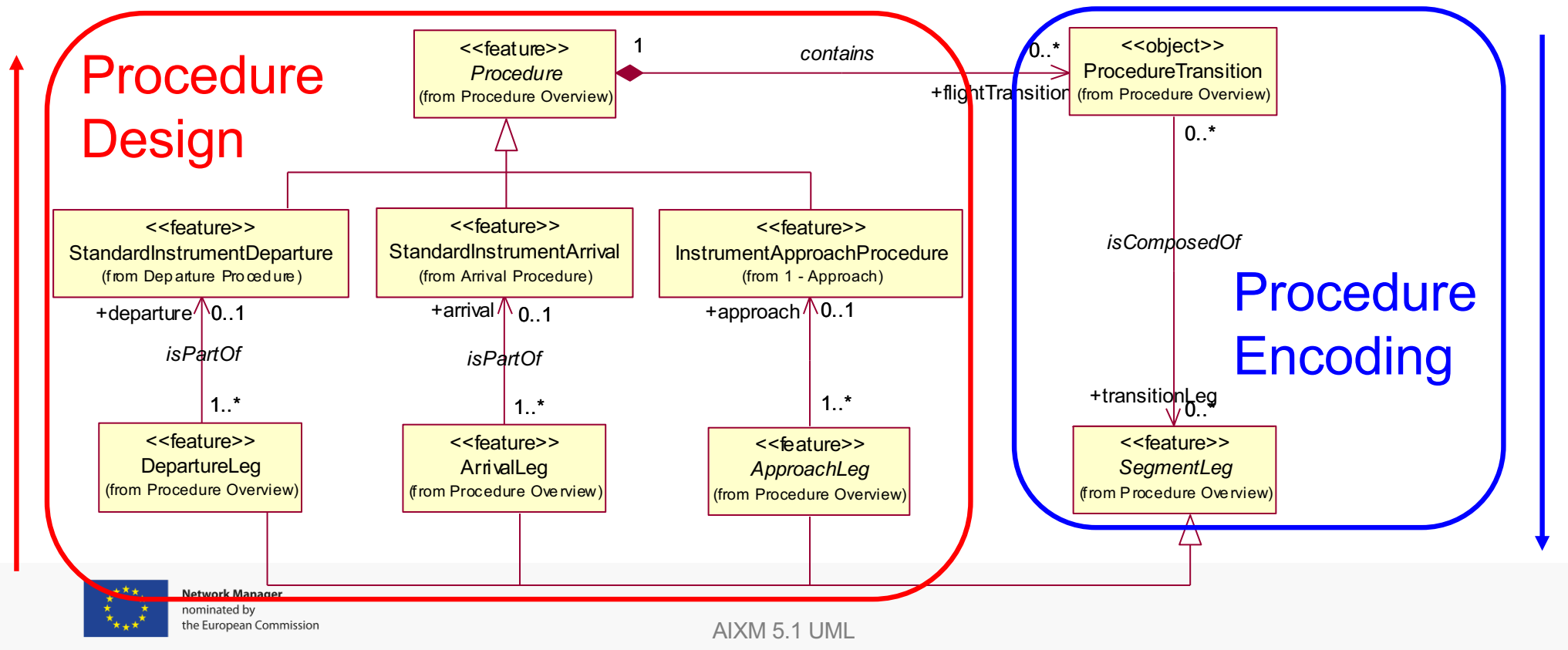
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 approachType = VOR
 multipleIdentification = X
 copterTrack = Blank
 circlingIdentification = Blank
 courseReversalInstruction = Blank

AIXM 5.1 UML



Procedure design vs Procedure encoding

- The AIXM model defines the class **SegmentLeg** which represents an elementary portion of a **Procedure**
- A **SegmentLeg** is associated to a **Procedure**. A procedure is designed by attaching several SegmentLeg to the procedure
- A **Procedure** can be divided into a series of **Procedure Transitions**
- More optimised for Procedure Encoding



-
- INSTRUMENT APPROACH CHART - ICAO**
- AD ELEV 24**
HEIGHTS RELATED
THR RWY 28 - ELEV 18
- APP 119.400**
TWR 120.750
- FARO / LPFR**
ILS
RWY 28
CAT A-B-C-D
- FARO**
DVOR/DME 112.80
VFA CH 75X
N37 00 49 W007 58 30
- LOC 109.50 IIF**
- FARO**
IIF DME CH 32X
N37 00 47 W007 57 45
- GEBTI**
N36 59 06
W007 41 09
- GIMAL**
N36 45 52
W008 00 21
- NOTE - IIF distances related to THR RWY 28**
- TRANSITION ALTITUDE 4000**
- MSA 25 NM FARO DVOR/DME**
- SCALE 1:450 000**

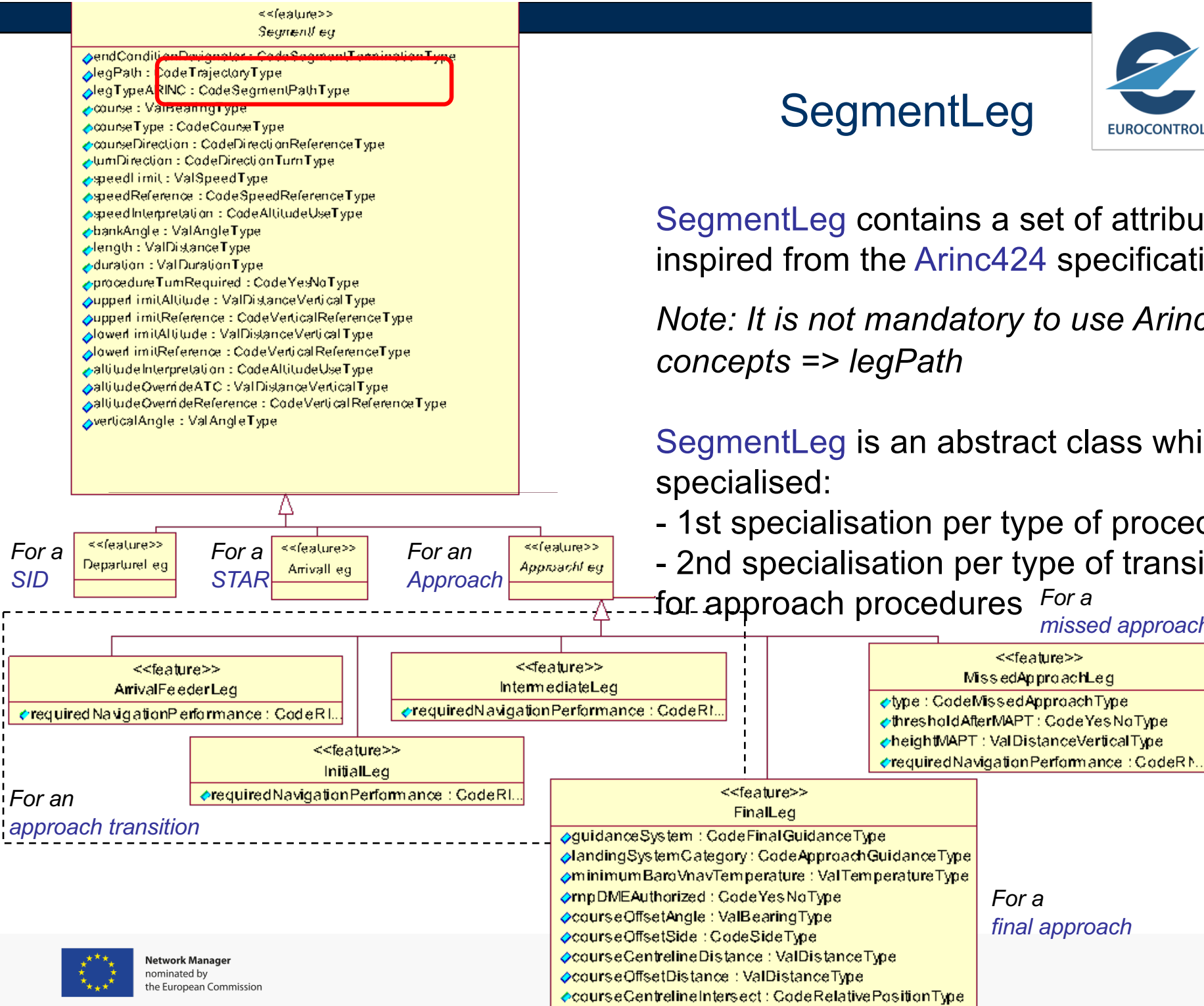
SegmentLeg

SegmentLeg contains a set of attributes inspired from the [Arinc424](#) specification

Note: It is not mandatory to use Arinc424 concepts => legPath

SegmentLeg is an abstract class which is specialised:

- 1st specialisation per type of procedure
- 2nd specialisation per type of transition for approach procedures



Path Terminators 14 RNAV Types

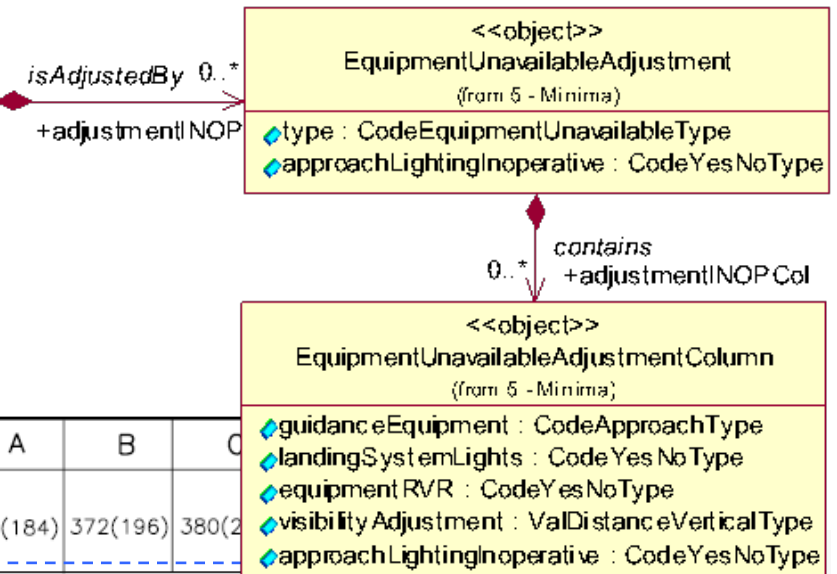
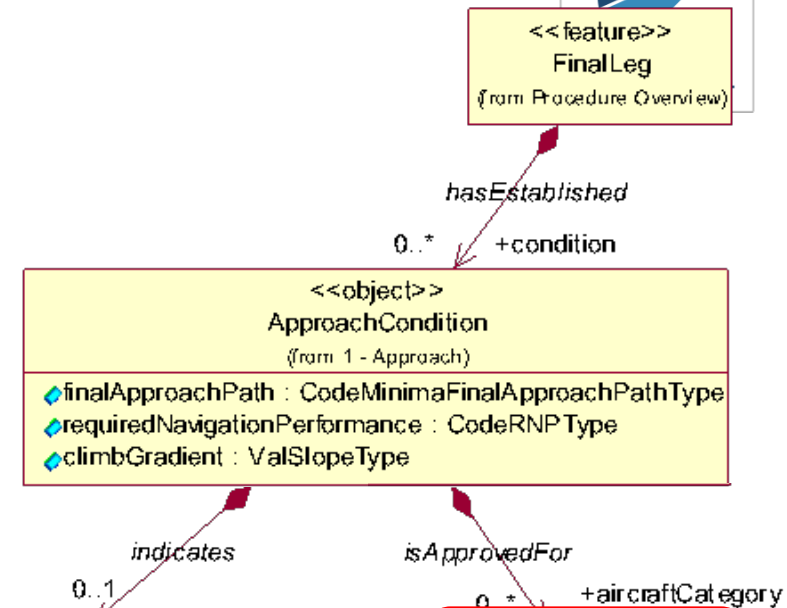
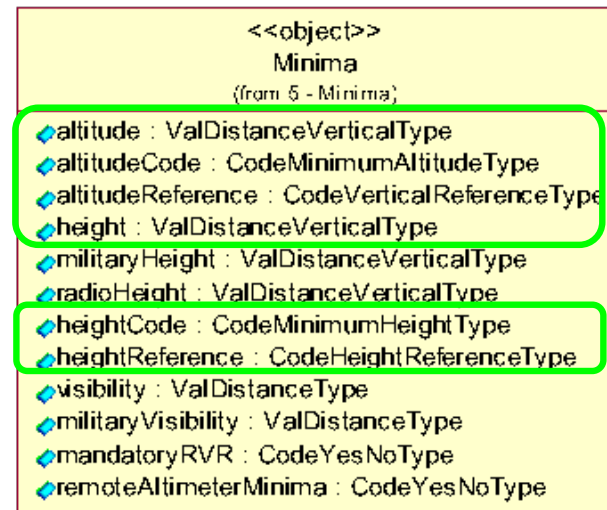
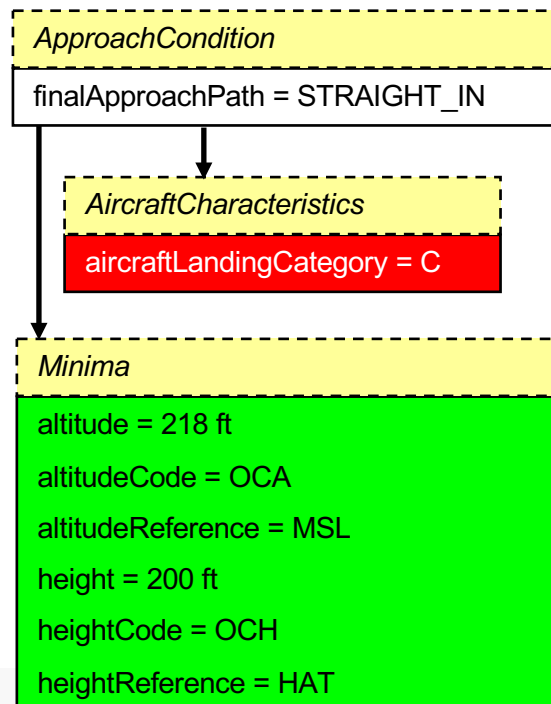
■ Course to an Altitude	-	CA
■ Course to a Fix	-	CF
■ Direct to a Fix	-	DF
■ Fix to an Altitude	-	FA
■ Fix to a Manual Termination	-	FM
■ Racetrack Course Reversal (Alt Term)	-	HA
■ Racetrack (Single Circuit - Fix Term)	-	HF
■ Racetrack (Manual Termination)	-	HM
■ Initial Fix	-	IF
■ Track to a Fix	-	TF
■ Constant Radius Arc	-	RF
■ Heading to an Altitude	-	VA
■ Heading to an Intercept	-	VI
■ Heading to a Manual Termination	-	VM

Approach Conditions

(THR RWY 28)

ILS RDH 49

CATEGORY		A	B	C	D
OCA (H)	ILS CAT. I	218(200)	218(200)	218(200)	218(200)
LOC ONLY		390(380)	390(380)	390(380)	390(380)
CIRCLING	NORTH OF RWY	NOT AUTHORIZED			
	SOUTH OF RWY	570	570	620	620



OCA (OCH)	A	B	C
ILS CAT I	360(184)	372(196)	380(200)
GP INOP	VEDERE/SEE LOC RWY 07		



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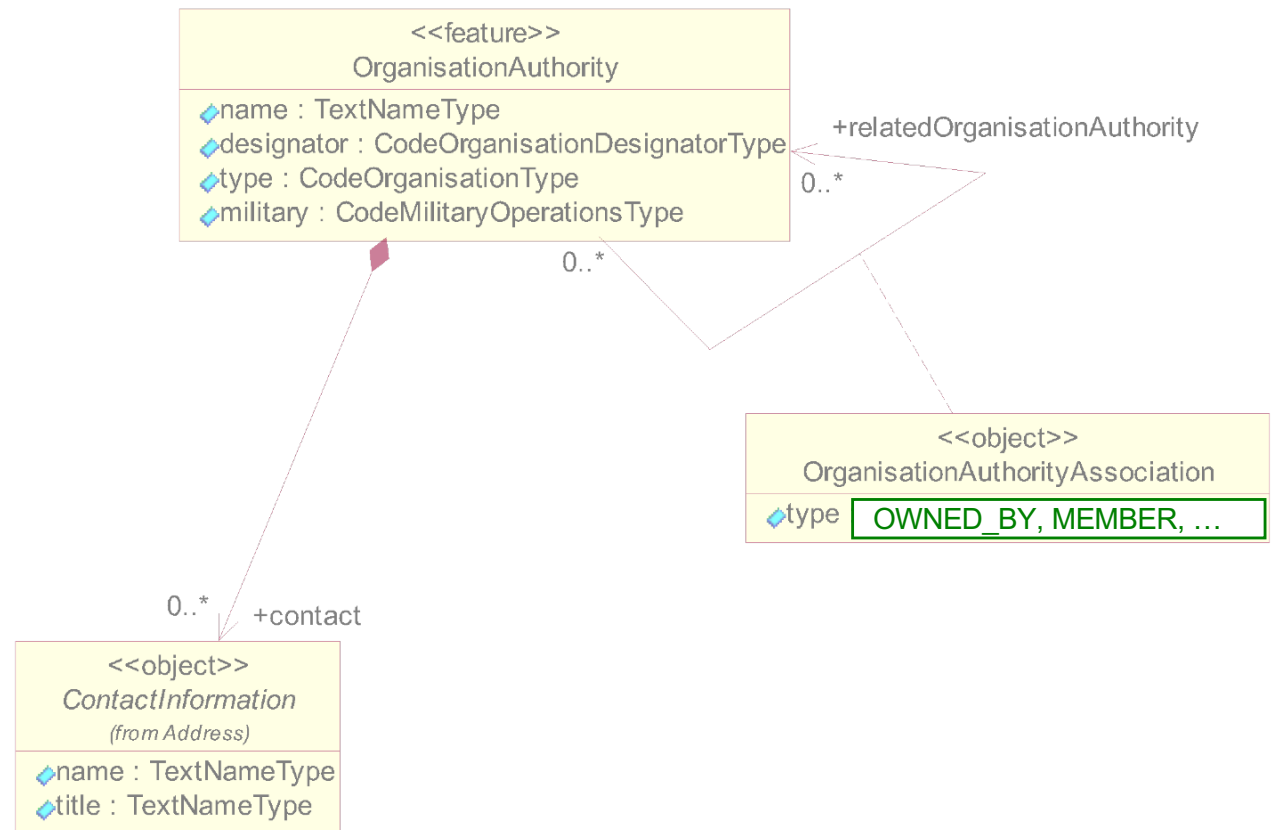
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Organisation Authority / Unit / Service

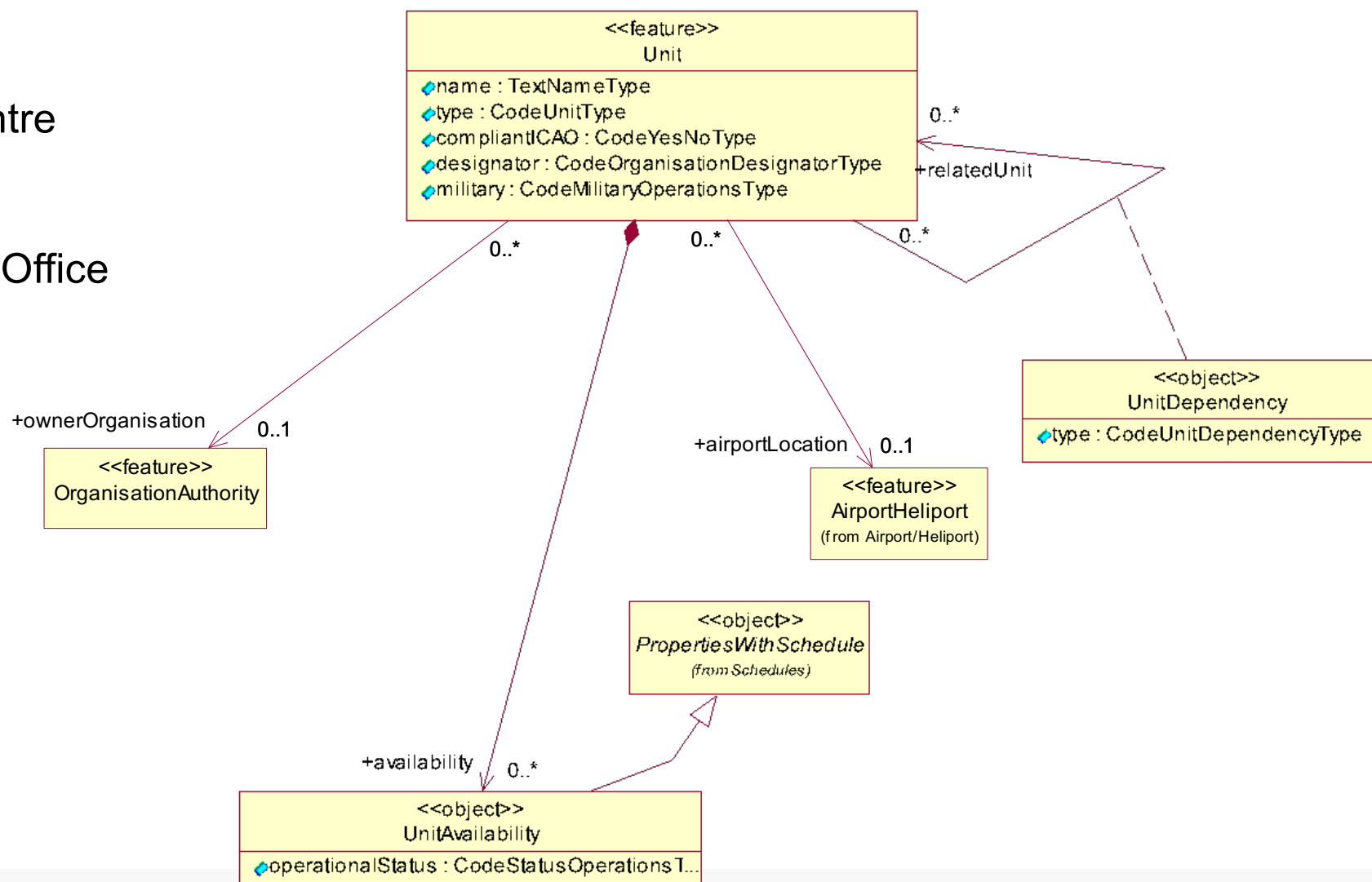
Organisation/Authority

- States
- ANSP
- Civil Aviation Authority
- Ministry of Transportation
- Airport Authority
- Military Authority
- Airline
- Eurocontrol
- Etc.

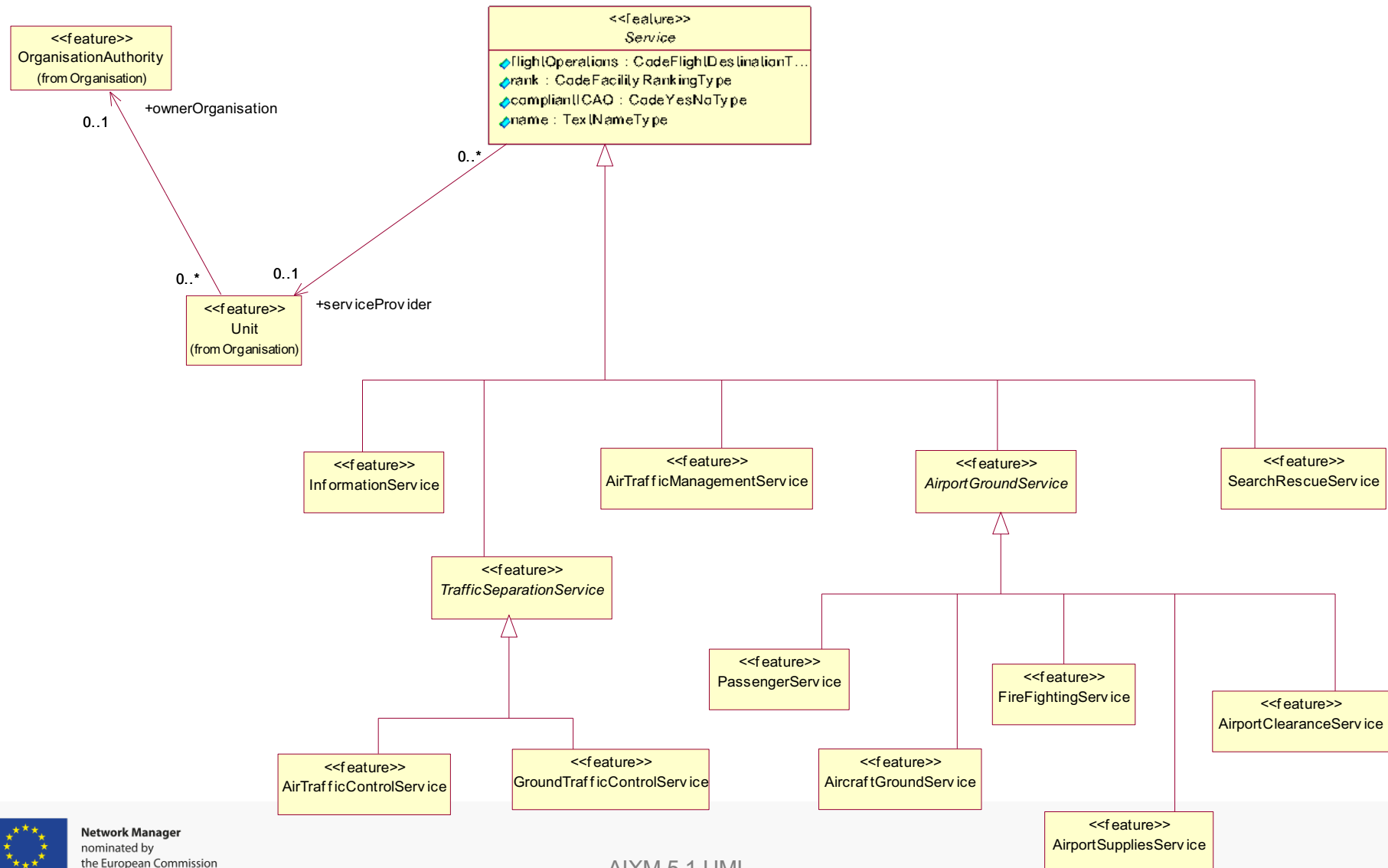


Unit

- ATC Centre
- TWR
- NOTAM Office
- Etc.



Service





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Questions?