



AERONAUTICAL INFORMATION DIGITAL DATABASES INTERGATION AND QUALITY-MANAGED MIGRATION

● Presentation contents :

1. NG Aviation company overview
2. New documentation for AIM
3. Data publication according to new Amendment 40 – Integrated database
4. Quality management in AIM
5. AIXM 5.1 Data demonstration

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NG AVIATION INTRODUCTION

NG AVIATION OF PRAGUE, SPECIALIZED :

- Focusing on aeronautical software development and data service
- Expert on AIS to AIM transition implementation

NG AVIATION CERTIFICATIONS INCLUDE :

- Aeronautical Data Quality Implementation
- Software development for aeronautical systems certification
- Future ATM Systems
- ICAO lecturers on electronic Terrain and Obstacles Data (eTOD)





New

Digital data sets

- **Digital data-set updates:**
provisions developed for **permanent changes** and **temporary changes**.
- **Permanent changes/temporary changes**
to be provided as Full data set
and/or « Delta data set »
- **Current AIRAC provisions apply to data set**

Old (remains)

- Aeronautical information in a standardized presentation
 - AIP
 - AIP Amendments and AIP Supplements
 - AICs
 - NOTAMs
 - Aeronautical Charts



● Chapter 2.3.10

Globally interoperable aeronautical data and information exchange models shall be used for the provision of data sets.

Digital data sets in AIXM 5.1

- AIP data set
- Terrain data set*
- Obstacle data sets
- Aerodrome mapping data sets
- Instrument flight procedure data sets



● GEN 3.1.6 Digital data sets

1) Description of the available data sets, including:

- a) data set title
- b) short description
- c) data catalogue features included
- d) geographical scope
- e) if applicable, limitations related to its usage

2) Contact details of how data sets may be obtained, containing:

- a) name of the individual, service or organization responsible;
- b) street address and e-mail address of the individual, service or organization responsible;
- c) telefax number of the individual, service or organization responsible;
- d) contact telephone number of the individual, service or organization responsible;
- e) hours of service (time period including time zone when contact can be made);
- f) online information that can be used to contact the individual, service or organization; and
- g) supplemental information, if necessary, on how and when to contact the individual, service or organization.



Apart from the minimum and conditional properties, the PANS-AIM Appendix 1 "Aeronautical Data Catalogue" contains additional properties for the different subjects listed above. These are considered "optional" and are marked as such, but are currently not included in the mapping.

AERONAUTICAL DATA CATALOGUE

Note – The Data Catalogue is a reference of the aeronautical data subjects, properties and sub-properties organized in:

- Table A1-1 Aerodrome data;
- Table A1-2 Airspace data;
- Table A1-3 ATS routes data;
- Table A1-4 Instrument flight procedure data;
- Table A1-5 Radio navigation aids/systems data;
- Table A1-6 Obstacle data;
- Table A1-7 Geographic data; and
- Table A1-8 Terrain data.

Table A1-1 Aerodrome data

Subject (1)	Property (2)	Sub-Property (3)	Type (4)	Description (5)	Note (6)	Accuracy (7)	Integrity (8)	Orig Type (9)	Pub. Res. (10)	Chart Res. (11)
Runway				A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft. (Annex 14)						
	Designator		Text	The full textual designator of the runway, used to uniquely identify it at an aerodrome/heliport which has more than one. E.g. 09/27, 02R/20L, RWY 1.						
	Nominal length		Distance	The declared longitudinal extent of the runway for operational (performance) calculations.		1m	critical	surveyed	1 m or 1 ft	1 m
	Nominal width		Distance	The declared transversal extent of the runway for operational (performance) calculations.		1m	essential	surveyed	1 m or 1 ft	1 m
	Geometry		Polygon	Geometries of RunwayElement, RunwayDisplacedArea and RunwayIntersection						
	Centre line points									
		Position	Point	The geographical location of runway centre line at each end of the runway, at the stopway and at the origin of each take-off flight path area, and at each significant change in slope of runway and stopway		1m	critical	surveyed		
		Elevation	Elevation	The elevation of the corresponding centre line point.		0.25m	critical	surveyed		
		Geoid undulation	Height	The geoid undulation at the corresponding centre line point						
	RWY exit line									
		Exit guidance line	Line	The geographical location of the runway exit line		0.5m	essential	surveyed	1/100 sec	1 sec
		Colour	Text	Colour of runway exit line						
		Style	Text	Style of runway exit line						
		Directionality	Code List	Directionality of RWY exit line (one-way or two-way)						
	Surface type		Text	The surface type of the runway defined as specified in Annex 14 Volume I						

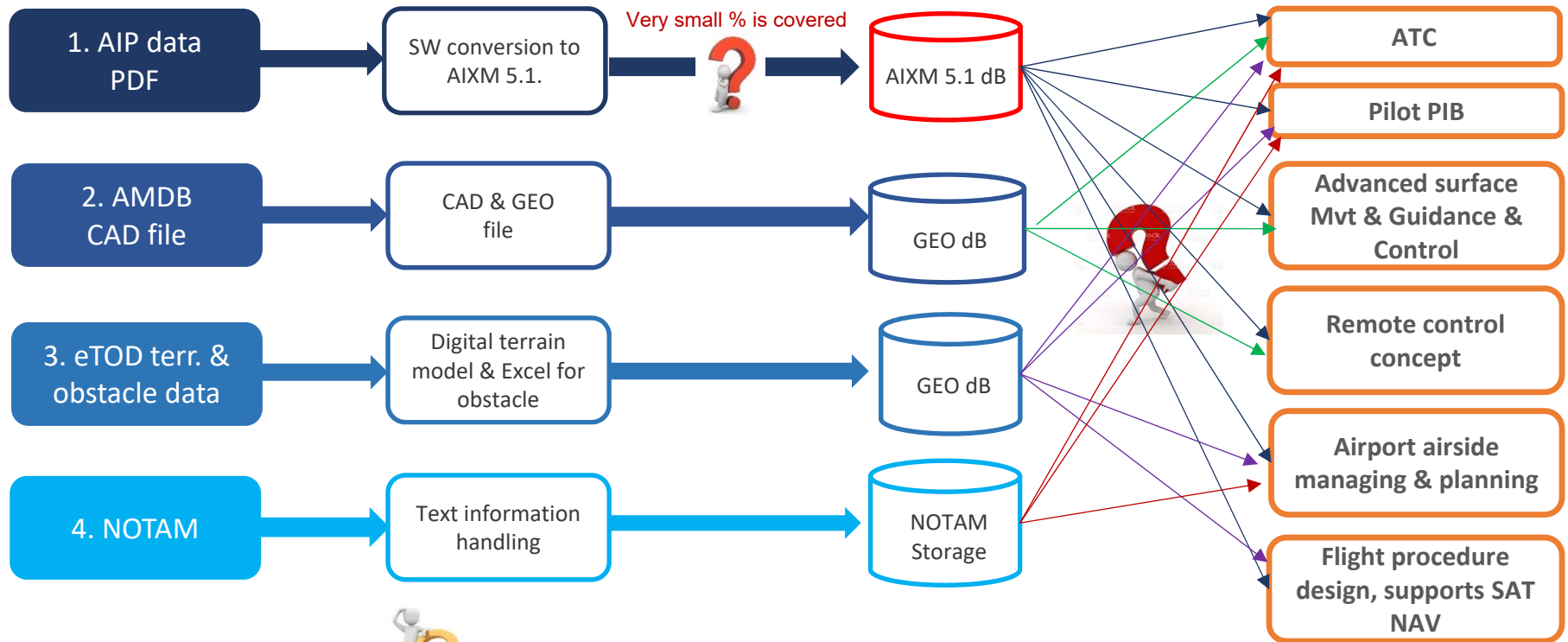


A. AIS Publications

B. Information Media

C. Data Storage

D. CNS Application

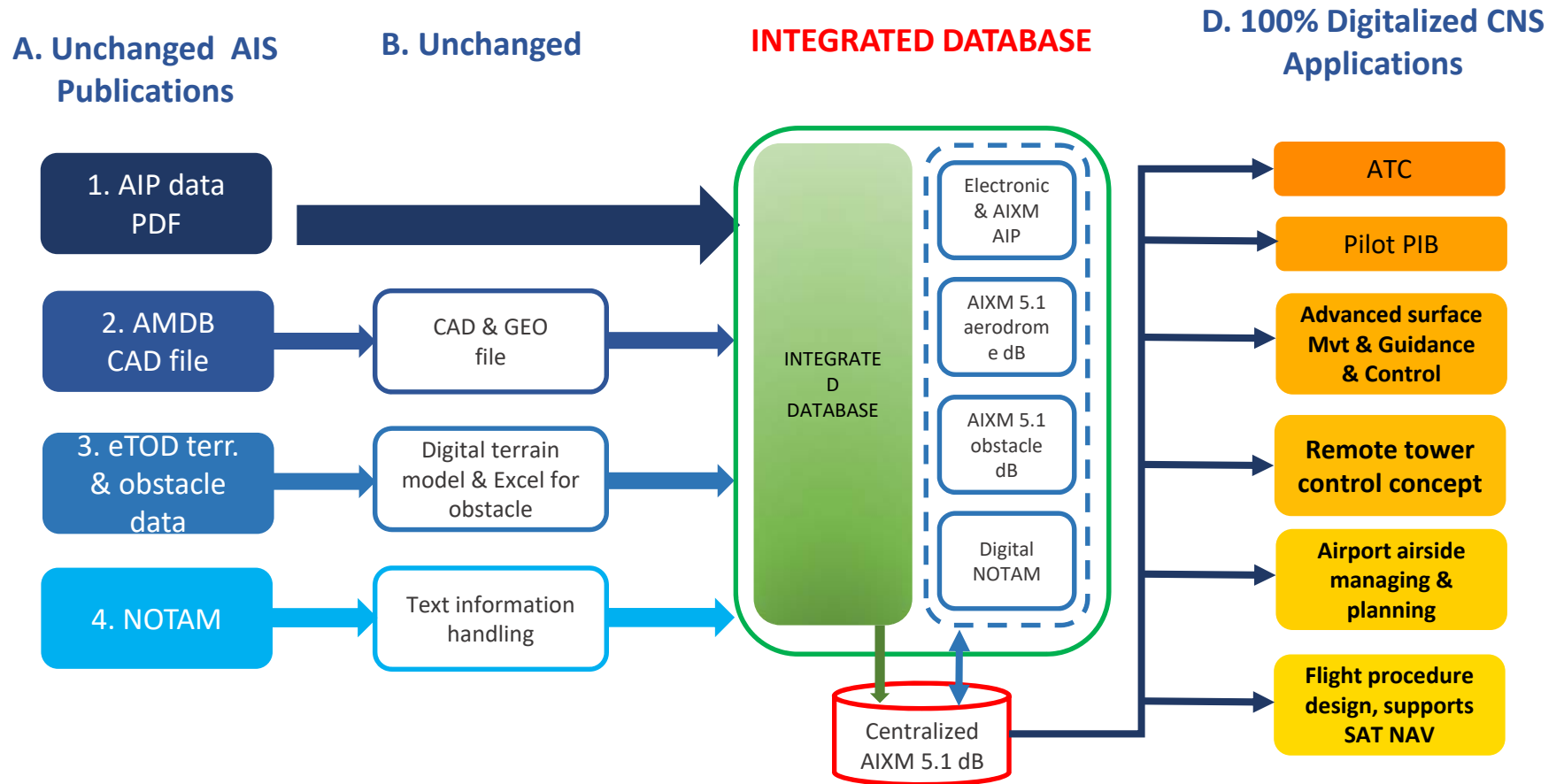


No QMS.



Manual handling processes which Annex 15 is to address



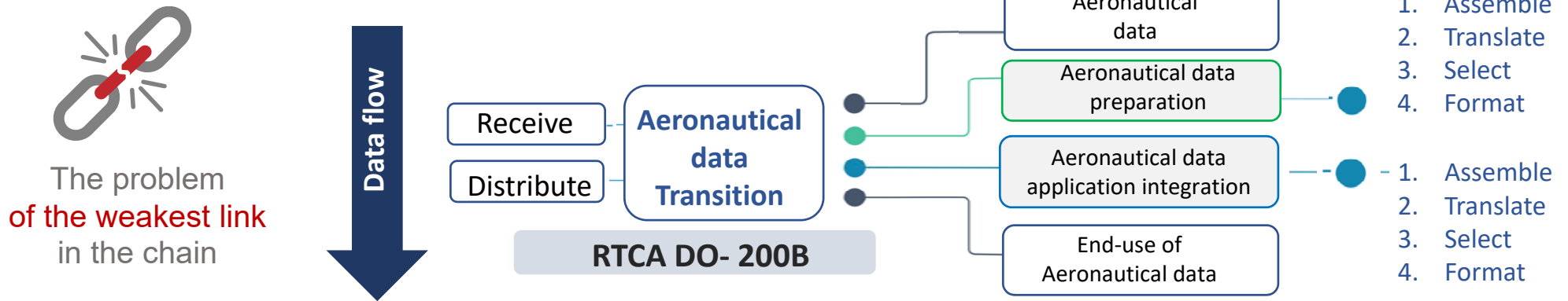


✓ Approved ICAO Annex data quality management process



● Chapter 3.7.2

Quality management should be applicable to the whole aeronautical information data chain **from data origination to distribution to the next intended user**, taking into consideration the intended use of data.

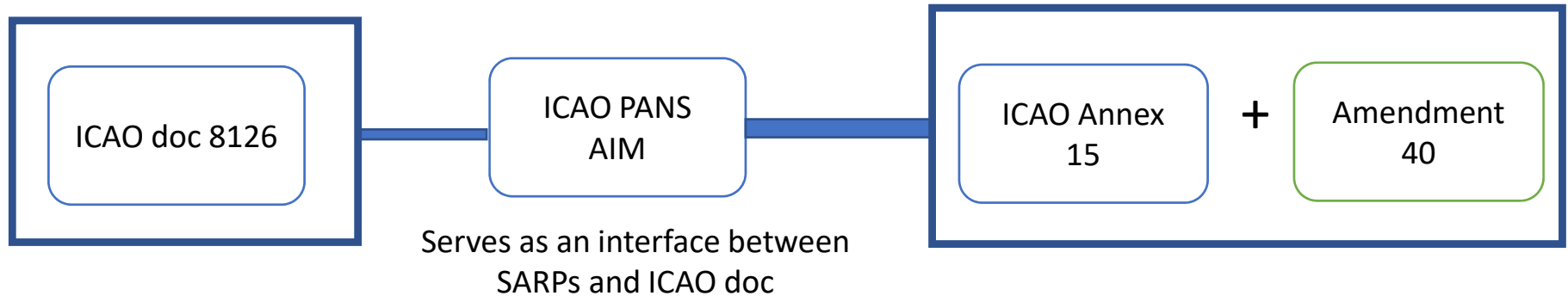


Active participation of data originators is must

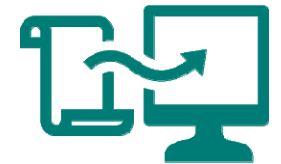
Problem Facing :

- Multiple data formats
- Data validation & verification
- Accuracy & resolution
- Few direct electronic connection
- Data error detection in received/input
- Complications in technical data handling etc
- Error reporting & measurements
- Traceability, original & change history for each data is recorded





- Completing the transition from product-centric and paper-based AIS legacy processes, to **data centric AIM**
- Aeronautical information is **globally harmonized**
- Defines the minimum data scope for interoperable **digital data exchanges**
- Support the integration of aeronautical information product and allow for **automatic validations and verifications procedures**
- Strengths **quality control** on aeronautical data processes





QMS ISO 9001:2015 IN DYNAMIC AIM



Request management



Airport

1. Request of the change, Data Quality Definition Required.



Validation and Verification



AIS Office

2. Change of the property (AIXM Data Change; AIXM Business Rules)



3. Validation of the Changes; AIXM Business Rules



AIXM 5.1 Database



Stakeholders

4. Change submitted to the database



MAJOR CHALLENGES - VALIDATION AND VERIFICATION OF DATA



- There are more than **3000 features** attributes and datatypes; automation is highly recommended to meeting the quality management plan challenge.
- An AI System shall have **established verification and validation procedures**, meeting data quality requirements for accuracy, resolution, integrity and traceability etc.
- Ensuring **aeronautical data are traceable** throughout the aeronautical information data chain for detection of errors.
- Material issued as part of an aeronautical information package are checked before it is submitted to the AIS; inclusive of all information and correct in details
- **System automation** shall be introduced and applied to deliver **the quality, efficiency, timeliness, and cost-effectiveness** of aeronautical information services. Automation shall be introduced and applied



Recommendation.— When temporary changes of short duration are made available as digital data (**Digital NOTAM**), they should use **the same aeronautical information model** as the complete data set.

- NOTAM information is provided as **fully structured data set** through digital data services.
- **AIXM version 5.1** support the provision of truly Digital NOTAM.

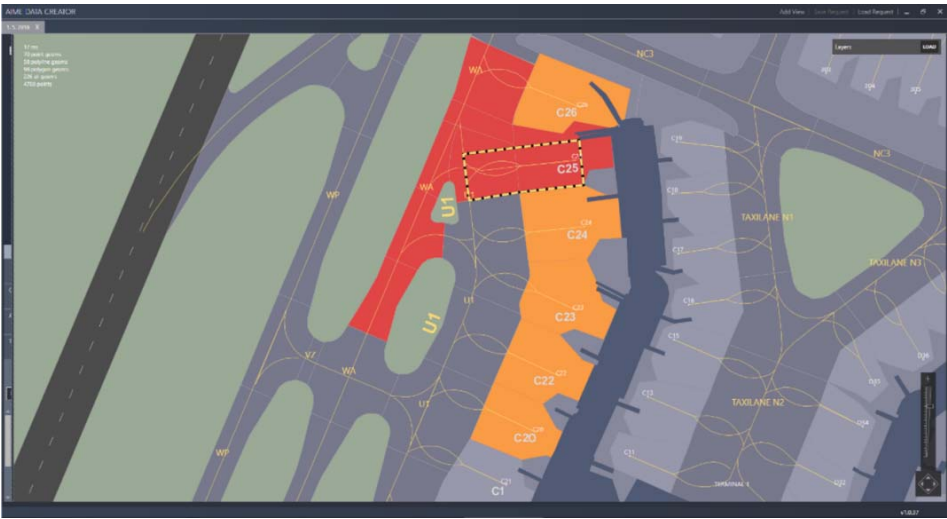
Q) WSJC/QMXLC/TV/NBO/A/000/999/0122N10359E005
 A) WSSS
 B) 1708211730
 C) 1710112130
 E) TWY U1 BTN ACFT STAND C25 AND TWY WA CLSD DUE WIP

Q) WSJC/QMXLC/TV/NBO/A/000/999/0122N10359E005
 A) WSSS
 B) 1708211730
 C) 1710112130
 E) TWY U1 BTN ACFT STAND C25 AND TWY WA CLSD DUE WIP

Q) WSJC/QMXLC/TV/NBO/A/000/999/0122N10359E005
 A) WSSS
 B) 1708211730
 C) 1710112130
 E) ACFT STAND C25 CLSD DUE WIP

Q) WSJC/QMXLC/TV/NBO/A/000/999/0122N10359E005
 A) WSSS
 B) 1708211730
 C) 1710112130
 E) ACFT STANDS C22 C23 C24 AND C26 AVLB LAYOVER ACFT

Q) WSJC/QMXLC/TV/NBO/A/000/999/0122N10359E005
 A) WSSS B) 1708211730 C) 1710112130
 E) ACFT STAND C20 LTD PUSHBACK FACE SOUTH NOT PERMITTED
 THE ACFT (ON IDLE THRUST) SHALL BE PUSHED BACK ONTO TWY U1 TO FACE NORTH UNTIL THE NOSE OF THE ACFT IS BEHIND THE STOPBAR BEHIND ACFT STAND C1. THE ACFT MAY BREAKAWAY FROM THERE AND TURN INTO TWY VZ. PHRASEOLOGY USED BY SINGAPORE GROUND: PUSHBACK APPROVED, TO FACE NORTH



DEMONSTRATION OF THE DATA



AIME DATA CREATOR

14/04/2018 X

Effective date 4/14/2018 11:17:54 AM

Viewer

Organisation Authority
WSSS

Airport Heliport
WSSS

Taxiway
WP

Filter by Name or Type X Create Request

Designator WP

Type GND

Width 35 M

Surface Properties

Composition BITUM

Surface Condition GOOD

Class PCN 72

Pavement PCN FLEXIBLE

Pavement Subgrade PCN B

Max Tyre Pressure PCN W

0 ms
0 point geomets
0 polyline geomets
9 polygon geomets
9 all geomets
176 points

Layers LOAD

SIN HUB 1

W4 WP NC1 WA NC1

NC2 WA NC2 N1

WP NC3 WA NC3

300 301 302 N1 NC2

303 304 305 30

W5 WP WA NC3

C26 C19

C25 C18

C24 C16

C23 C15

C22 C13

U1 U1 U1

VZ WA U1

TAXILANE N1 TAXILAN 3

TAXILANE N2 D35

W

B

FLEXIBLE

35

72

B

W

W

B

FLEXIBLE

35

72

B

W