Enabling Information Sharing thru Common Services

Textual Weather Product Decoding

Presented To: Air Transportation Information Exchange Conference

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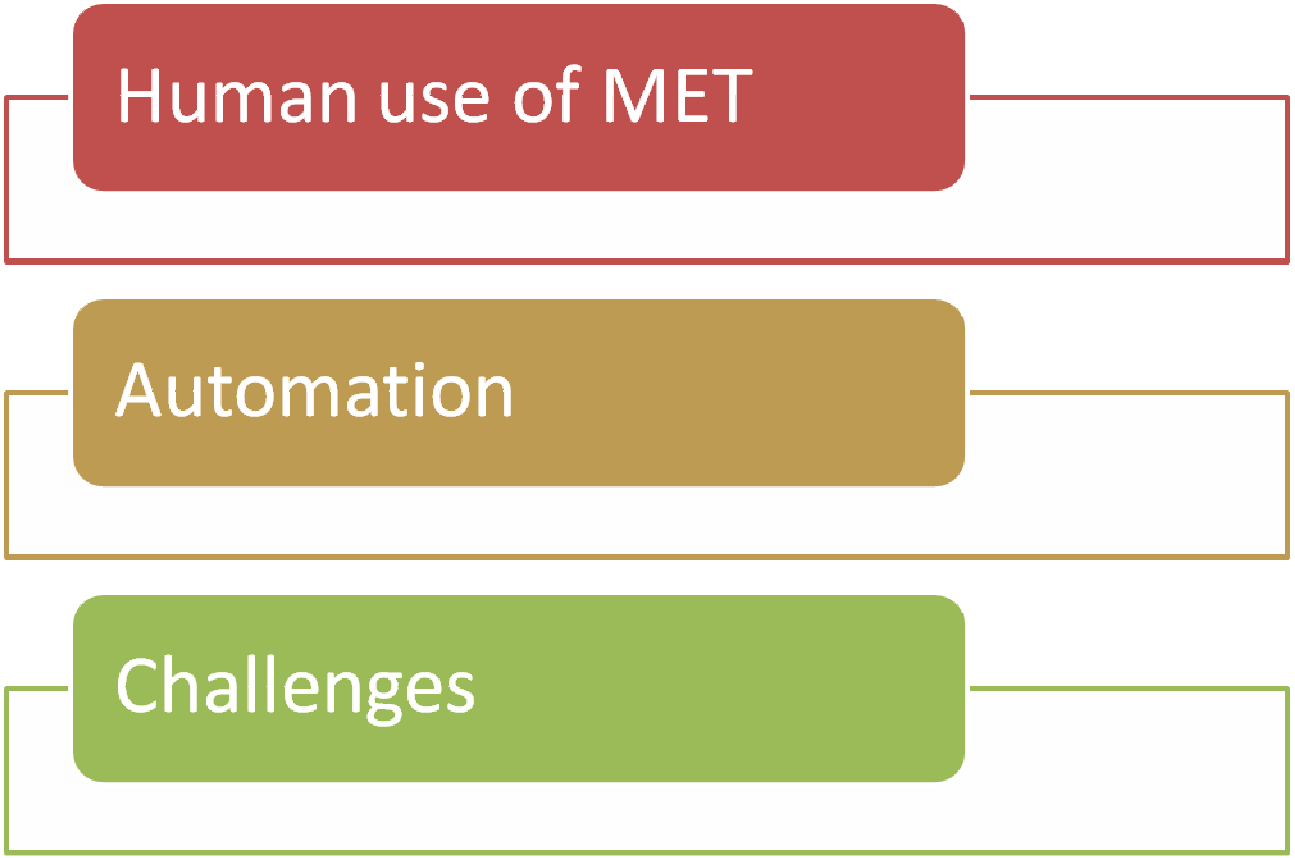
Date: Aug 30, 2011

Introduction



Agenda

- Background
- Decoding Issues
- Solutions

What are they?

Traditional Alphanumeric Codes

METAR
- Routine surface observation

PIREP (North America)
- Pilot report

Most broadly-used MET products worldwide

TAF
- Surface point forecast

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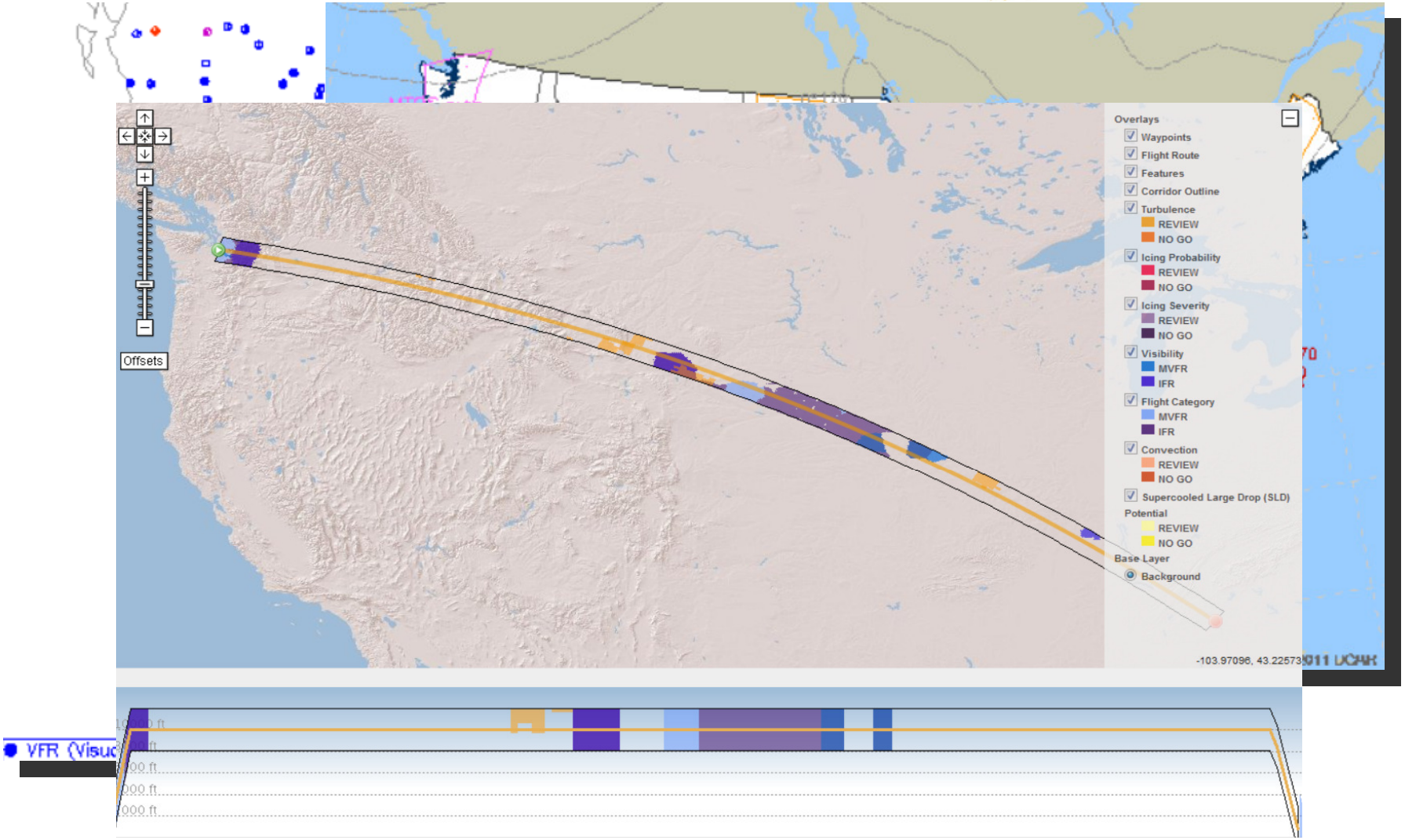
Automation


Offsets
Overlays
Waypoints
Flight Route
Features
Corridor Outline
Turbulence
REVIEW
NO GO
Icing Probability
REVIEW
NO GO
Icing Severity
REVIEW
NO GO
Visibility
MVFR
IFR
Flight Category
MVFR
IFR
Convection
REVIEW
NO GO
Supercooled Large Drop (SLD)
Potential
REVIEW
NO GO
Base Layer
Background
-103.97096, 43.22573
VFR (Visuc

METAR Production

Automated

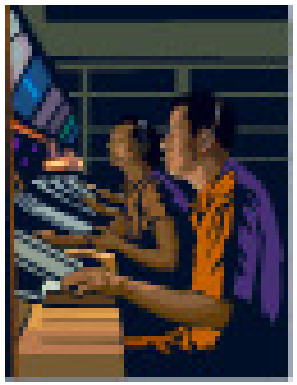
METAR KTTN 051853Z 04011KT 1/2SM VCTS SN FZFG BKN003 OVC010 M02/M02 A3006 RMK AO2 TSB40 SLP176 P0002 T10171017=

Human-generated

METAR ZGKL 080600Z 19006MPS 160V230 9999 SCT026 30/24 Q1004 NOSIG

PIREP Production

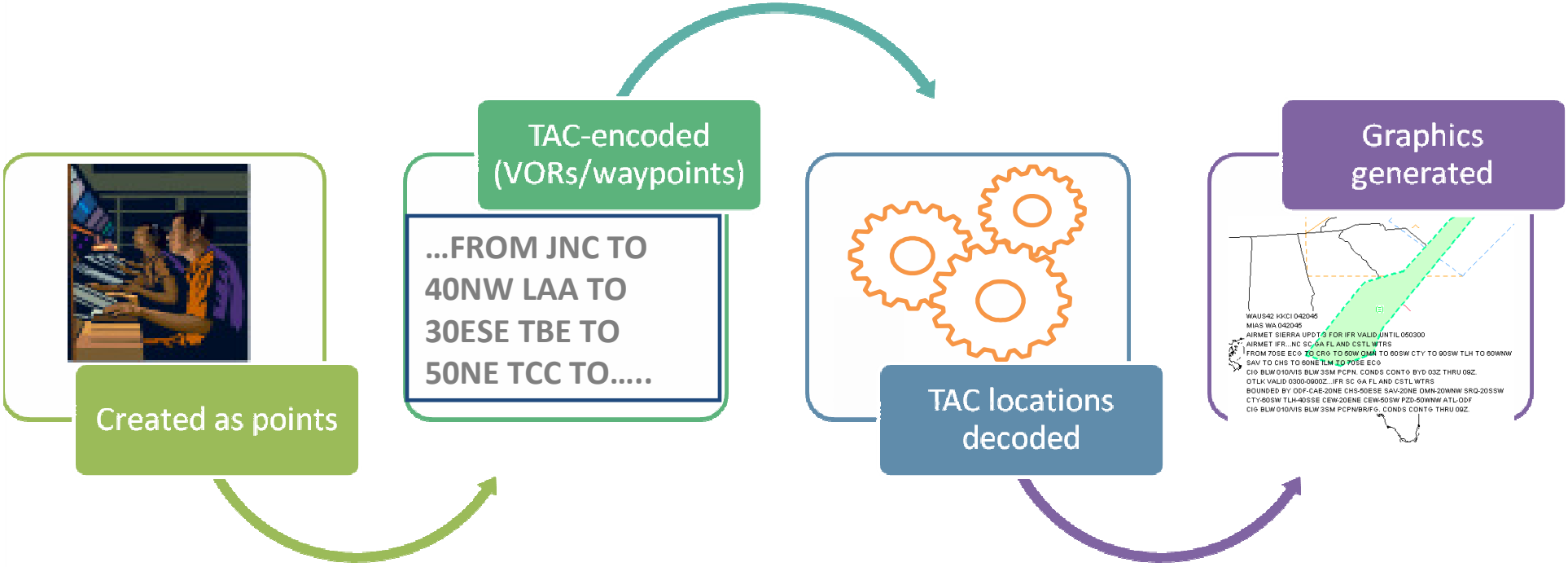
voice



TAC

TMB UA /OV DHP270030 /TM 1649 /FL240 /TP A320
/TB CONT LGT OCNL MOD CHOP

AIRMET Flow


Created as points
TAC-encoded (VORs/waypoints)
…FROM JNC TO 40NW LAA TO 30ESE TBE TO 50NE TCC TO…..
TAC locations decoded
Graphics generated
WAUS42 KKCI 042045
MIAS WA 042045
AIRMET SIERRA UPDT 3 FOR IFR VALID UNTIL 050300
AIRMET IFR...NC SC GA FL AND CSTL WTRS
FROM 70SE ECG TO CRG TO 50W GMN TO 60SW CTY TO 90SW TLH TO 60WNW
SAV TO CHS TO 60NE TLH TO 70SE ECG
CIG BLW 010/VIS BLW 3SM PCPN. CONDS CONTG BYD 03Z THRU 09Z.
OTLK VALID 0300-0900Z...IFR SC GA FL AND CSTL WTRS
BOUNDED BY ODF-CAE-20NE CHS-50ESE SAV-20NE OMN-20WNW SRQ-20SSW
CTY-60SW TLH-40SSE CEW-20ENE CEW-50SW PZD-50WNW ATL-ODF
CIG BLW 010/VIS BLW 3SM PCPN/BR/FG. CONDS CONTG THRU 09Z.

Metadata

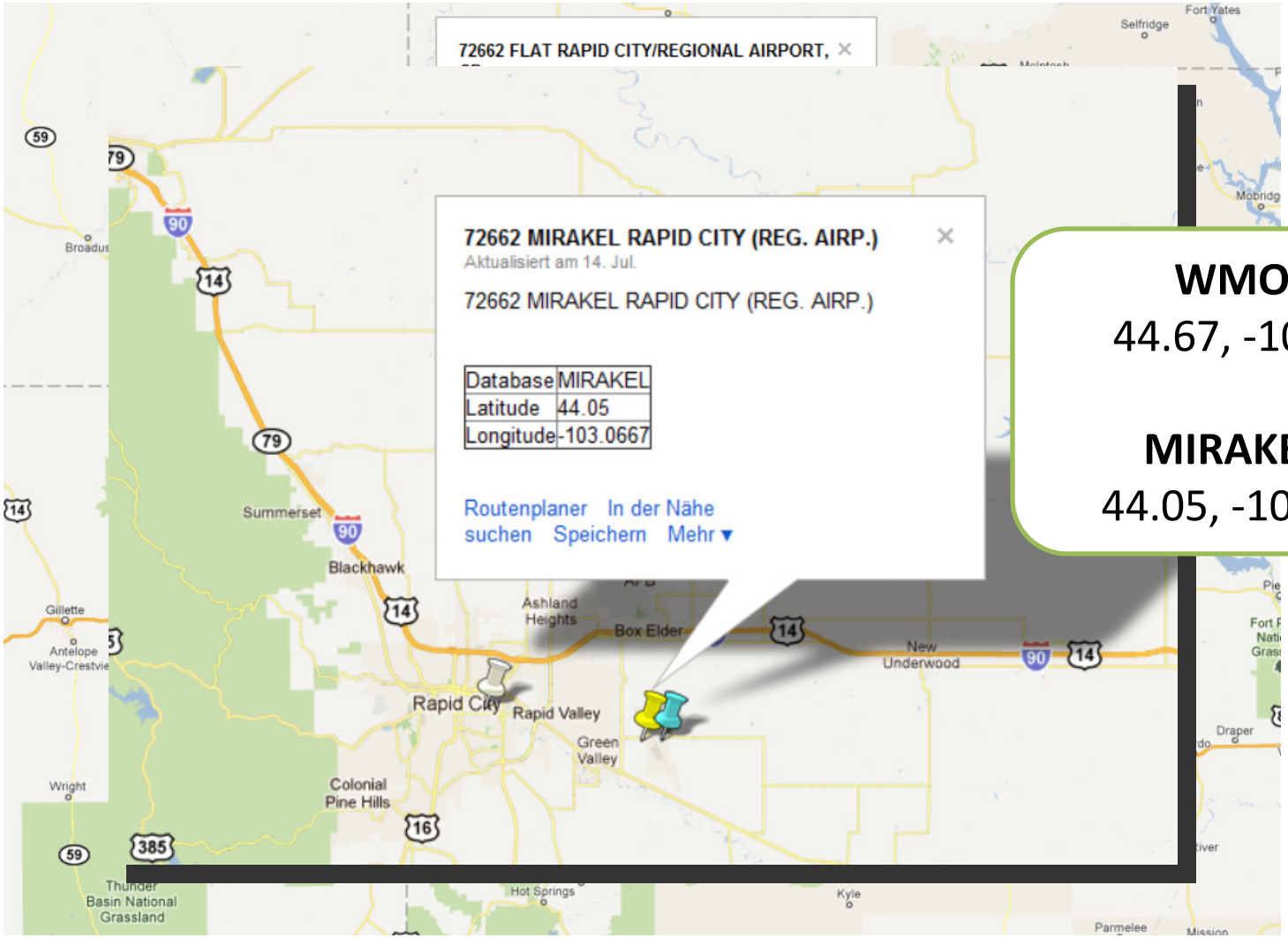
Example:

METAR ZGKL 080600Z 19006MPS 160V230 9999 SCT026 30/24 Q1004 NOSIG

Known by producer!

UA /OV YSP 090025 /TM 2120 /FL050 /TP BE99 /SK 020BKN040 110OVC /TA -14 /WV 030045 /TB MDT CAT 060-080 /IC LGT RIME 020-040 /RM LGT FZRA INC

Station Locations



WMO:
44.67, -103.2

MIRAKEL:
44.05, -103.07

Human-Readable Text

Various human languages

SIGMET 1 VALIDO 140019/140600 UTC - FIR SCCI - POR JET STREAM ENTRE
LAT 49/54S CON NUCLEO A LOS 35MFT, TURB FCST MOD/FTE 20/30MFT
TURB FCST MOD OCNL BTN 30/35MFT, TURB FCST MOD/FTE 35/40MFT=

"Other" cases

PIREP: /TB MDT WIFE SAYS SVR

Typographic

Extra whitespace

- "F CST“ instead of “FCST”
- "VER AS“ instead of "VERAS"

Transposed text

- “AU” instead of “UA”

Capital “O” instead of 0

“N23 E1175”

- 11.75 or 117.5?

Among others…

Non-standard usage

ICAO Annex 3

US – units of measurements

Lightning

Solutions

Challenge	Solutions for automation
Missing metadata	Explicitly publish information needed for downstream use (can be ignored)
Weakly machine-readable information	~~NLP~~, form-based data entry, complete standardization coverage
Human-readable text	Improved parsers, no complete solution
Typographic	Form-based data entry and strong validation
Non-standard usage	Validation (system-wide), political/standardization solutions

Form Entry

METAR Entry:

ICAO id: ZGKL

Obs time: 080600Z

Wind direction: 190

Wind speed: 6 MPS

Variability: 160-230

Visibility: 9999m

Air temperature: 30

Dewpoint: 24

Clouds: SCT	**Height: 26FL**	**Clouds: -**	**Height: -**
Clouds: -	**Height: -**	**Clouds: -**	**Height: -**

ZGKL 080600Z 19006MPS 160V230 9999 SCT026 30/24 Q1004 NOSIG

Summary / Conclusion

Human-readability and machine-readability both critical

- Machine-readable formats can meet both needs

Produce data in strictly validated, machine-readable formats

- From original sensor/producer
- TACs may be generated
- Human-readable text should still be allowed

Retain all information (metadata, etc.) throughout data stream

Favor form-based generation tools