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Airport Mapping Data

AIXM 5.1 ⟷ DO-272
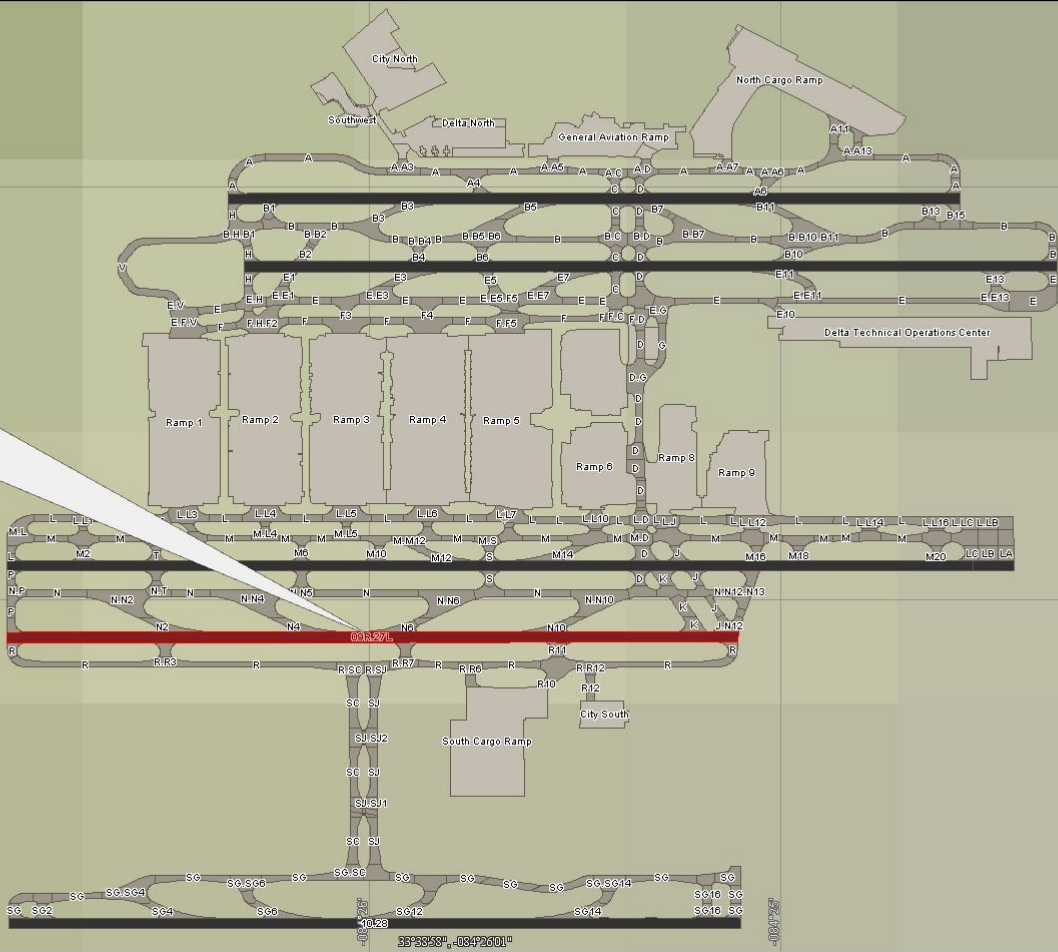
AIXM 5.1
Atlanta, GA (KATL)
Movement Areas

➢ Shown as displayed in FAA official AIXM 5 Viewer
➢ XML validated against AIXM 5.1 schema
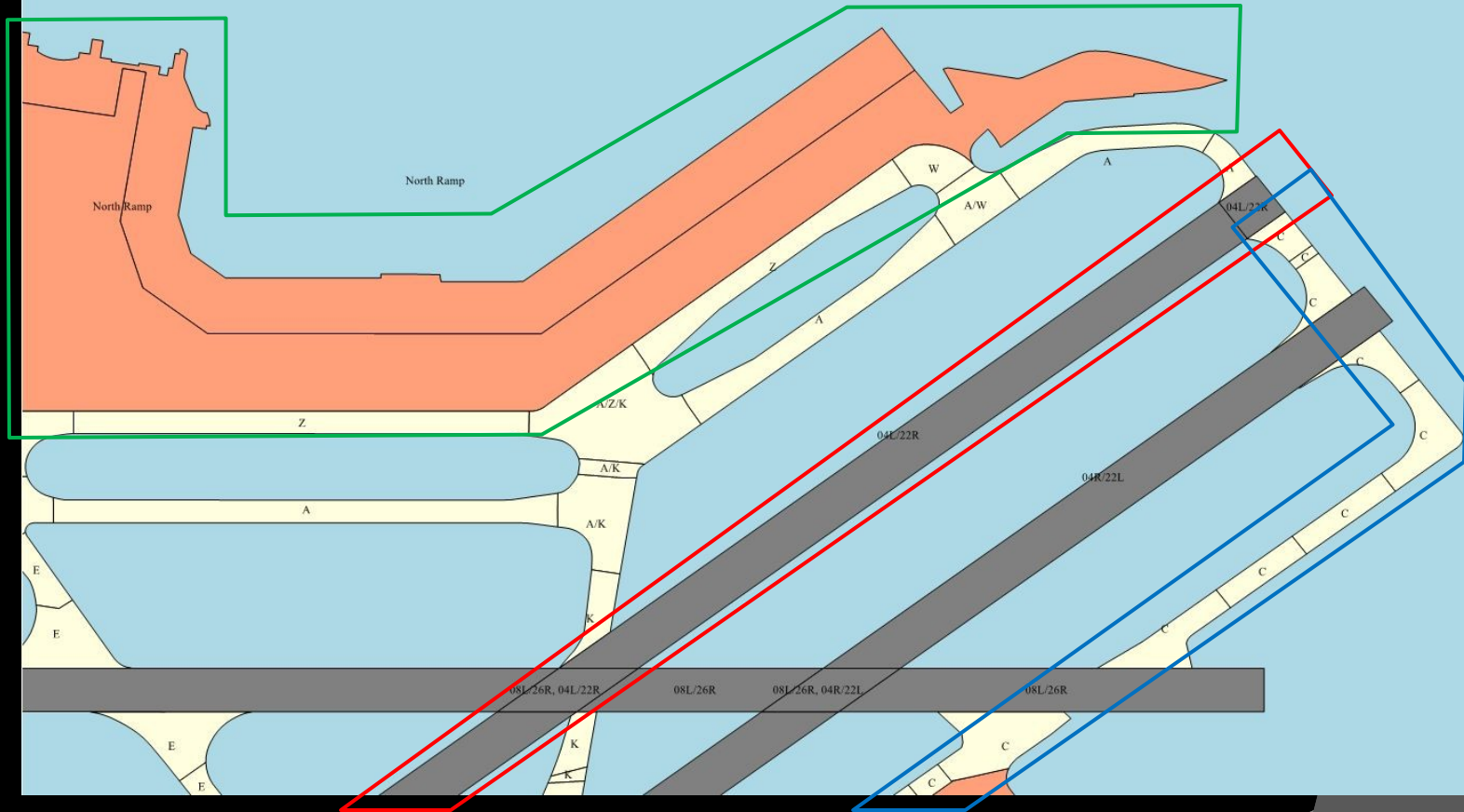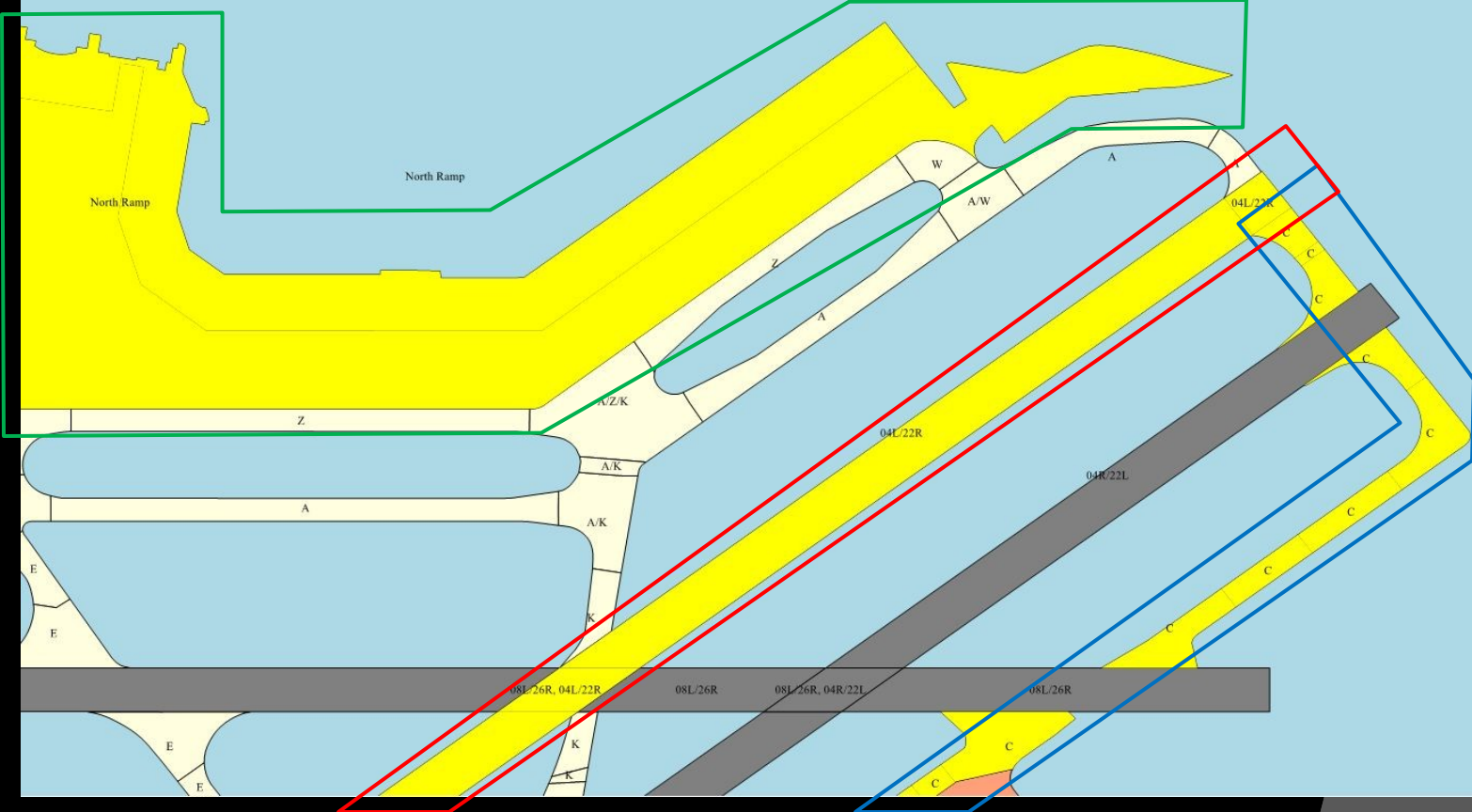➢ Each feature assigned a unique ID

9/10/2012

DO-272
Honolulu, HI
PHNL
Movement
Areas

➤ AIXM parent-child relationships maintain continuity even when feature polygons are separated by surface type, pavement weight capacity, or other attributes

- Runway segments tied together; intersections associated to each intersecting runway
- Taxiways associated by designator
- Aprons associated operationally

DO-272 Honolulu, HI PHNL Movement Areas

North Ramp

North Ramp

W

A/W

A

04L/22R

Z

A

C

C

A/Z/K

04L/22R

C

A/K

04R/22L

A

A/K

C

E

K

C

E

C

08L/26R, 04L/22R | 08L/26R | 08L/26R, 04R/22L | 08L/26R

E

K

C

K

E

C

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DO-272
Chicago, IL
KORD
Movement
Areas
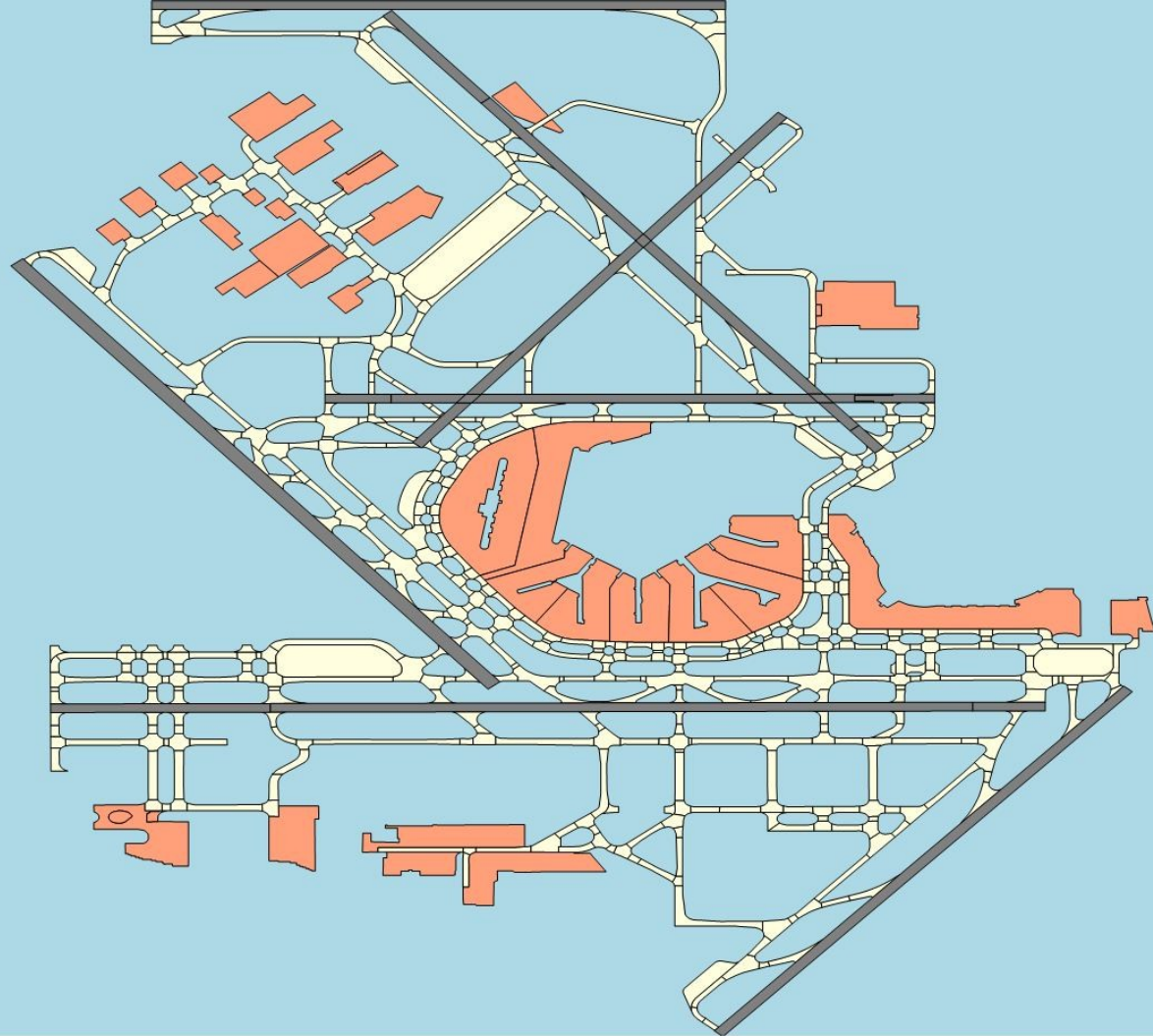
- ➢ DO-272 provides visuals for onboard moving map displays after ARINC 816 conversion
- ➢ Topology maintained between features: shared edges and geometric connectivity enable spatial analysis and reduces errors
- ➢ Three quality levels of data, depending on intended use and survey availability
- ➢ Rule-based geometry and data checks used in QC process, defined accuracy and resolution

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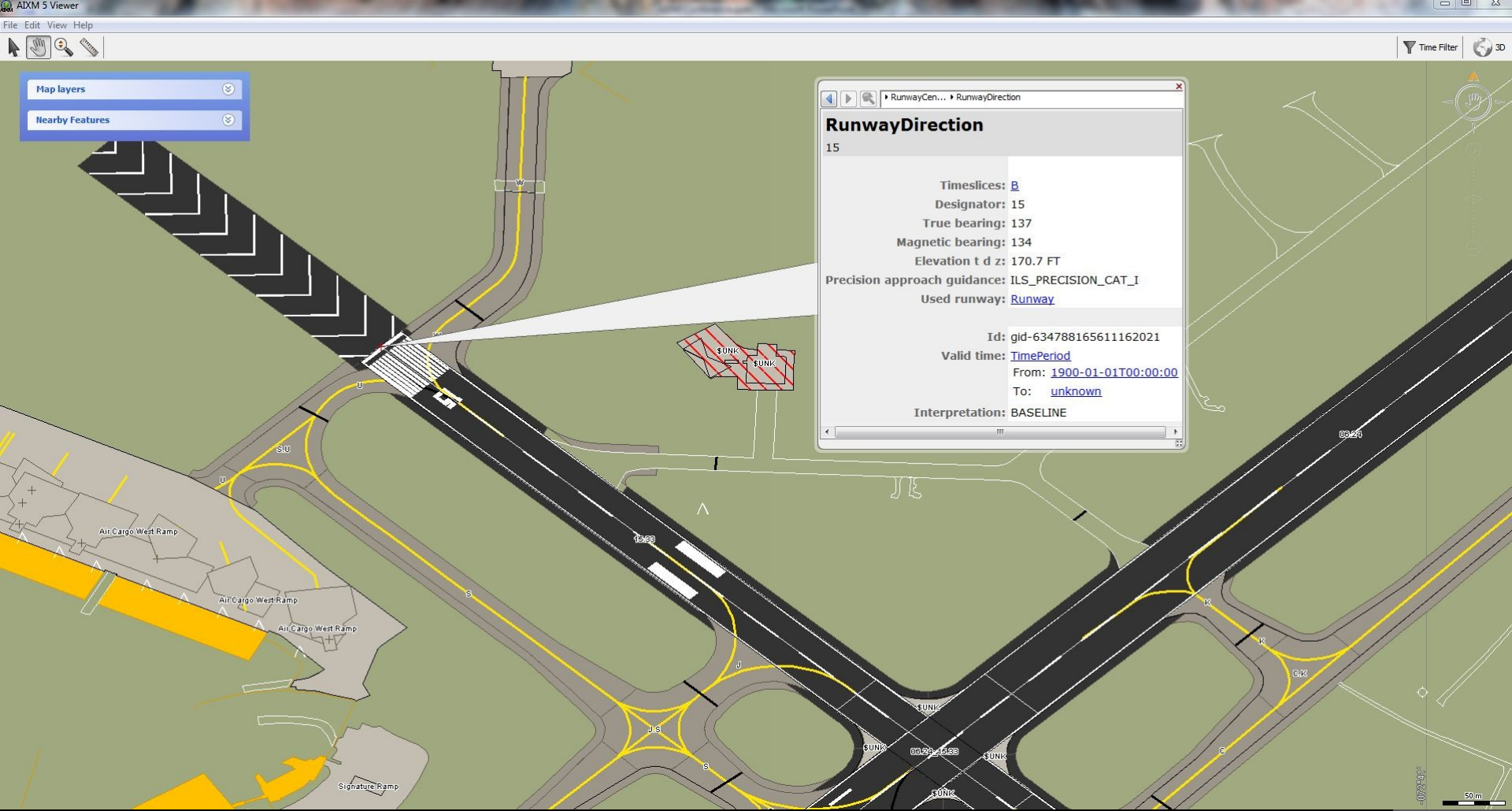
AIXM 5.1
Windsor Locks, CT (KBDL)
Runway 15 Detail

➢ DO-272 offers a rich list of runway features:

- Runway Element, Intersection, Displaced Area, Marking, Centerline, Threshold, Shoulder, Exit Line, LAHSO Location, Arresting Gear Location, Stopway, Blastpad

➢ Runway attributes fulfill many usage requirements:

- Length, width, identifier, surface composition, slope, available takeoff and landing distances, elevation, surface weight limit, magnetic and true bearing, guidance system, threshold position, geoidal undulation, usage restriction
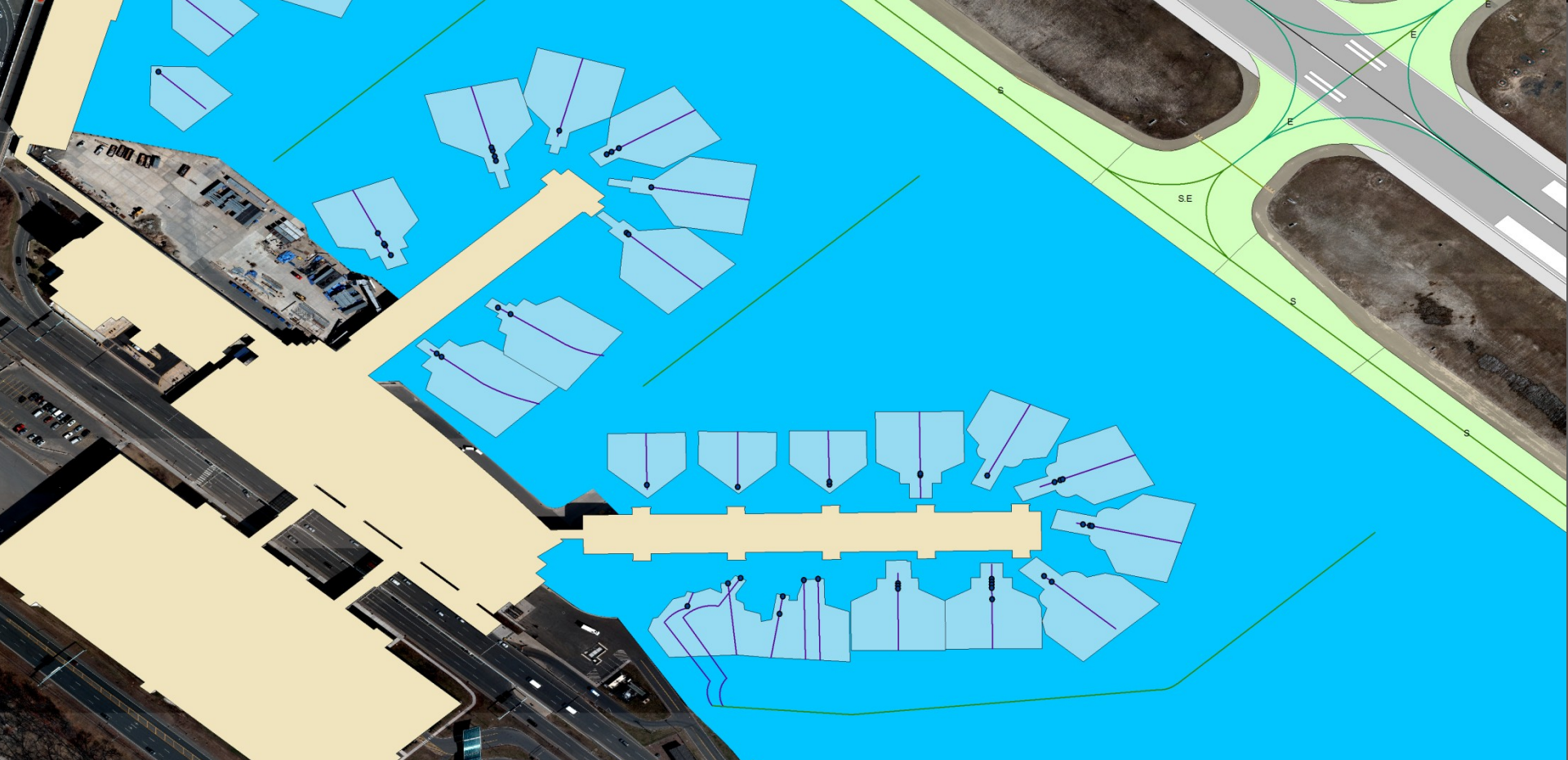
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DO-272
Windsor Locks, CT (KBDL)
Terminal Detail

➢ Terminal parking areas are distinct and identifiable:
- Visual navigation to complex parking areas
- Features include apron, deicing area, building, service road, guidance line, stand location
- Attributes include parking identification, parking location, surface weight limit, jetway, fuel, towing, docking, ground power, building name, building height

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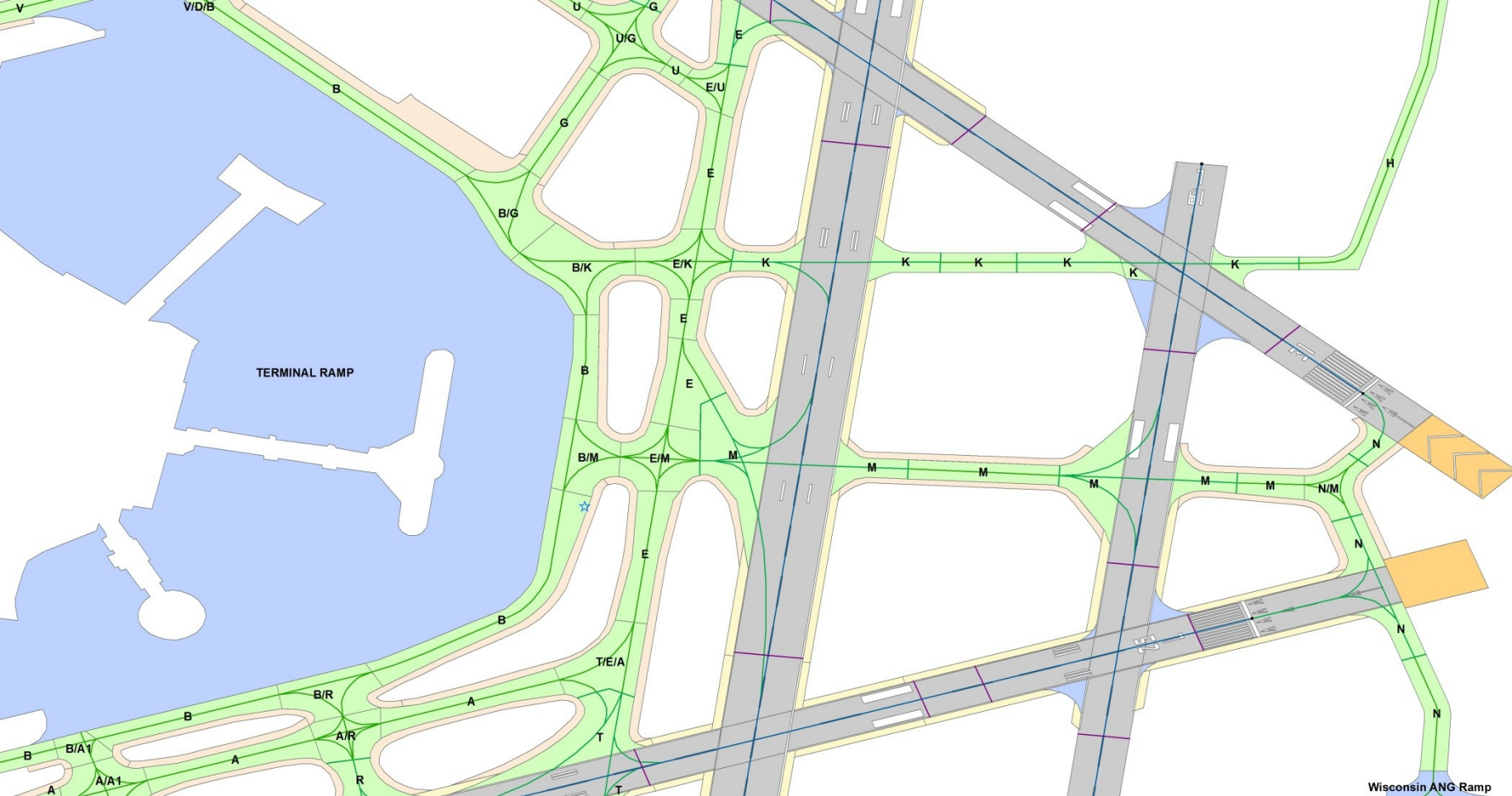
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DO-272
Milwaukee, WI (KMKE)
Taxiway/Apron Detail

➢ Taxiways are represented as an interconnected network:

- Navigation features: taxiways, guidance lines, intersections, hold lines, deicing area, frequency area
- Situational awareness features: construction, shoulder, hotspot, service road

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Applications for Airport Mapping

➤ Aircraft onboard moving map displays

- Situational awareness
- Display taxi assignment route, position of other aircraft/vehicles

➤ Advanced Surface Movement Guidance Systems

- Automate runway assignment and taxi route
- Data communication
- Conflict detection and resolution
- Reduce traffic and radio communication congestion/confusion

➤ Digital charts/Electronic Flight Bag

- Reduce clutter, weight, workload
- Immediate electronic transfer

➤ D-NOTAM delivery

- Updates from datalink can be applied visually to mapping data

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ASDE-X with airport mapping data, Milwaukee, WI

Applications for Airport Mapping

- ➤ Synthetic vision systems
  - • Navigation during low visibility conditions
  - • Guidance during landing, roll-out and runway exit
- ➤ Airport or airline resource management
  - • Terminal ramp control (parking assignment/status), ground ops
- ➤ Training, simulations, research and development
  - • Real-world data for evaluations, recreated scenarios
- ➤ Airport planning
  - • Design, construction, environmental, decision-making
- ➤ Emergency response
  - • Improved response times in adverse conditions
- ➤ Security management
  - • Core data used with incident/equipment tracking overlays

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Format Conversions

➤ Imports

- FAA 18B Survey →
- NGA SAC →
- AIXM →
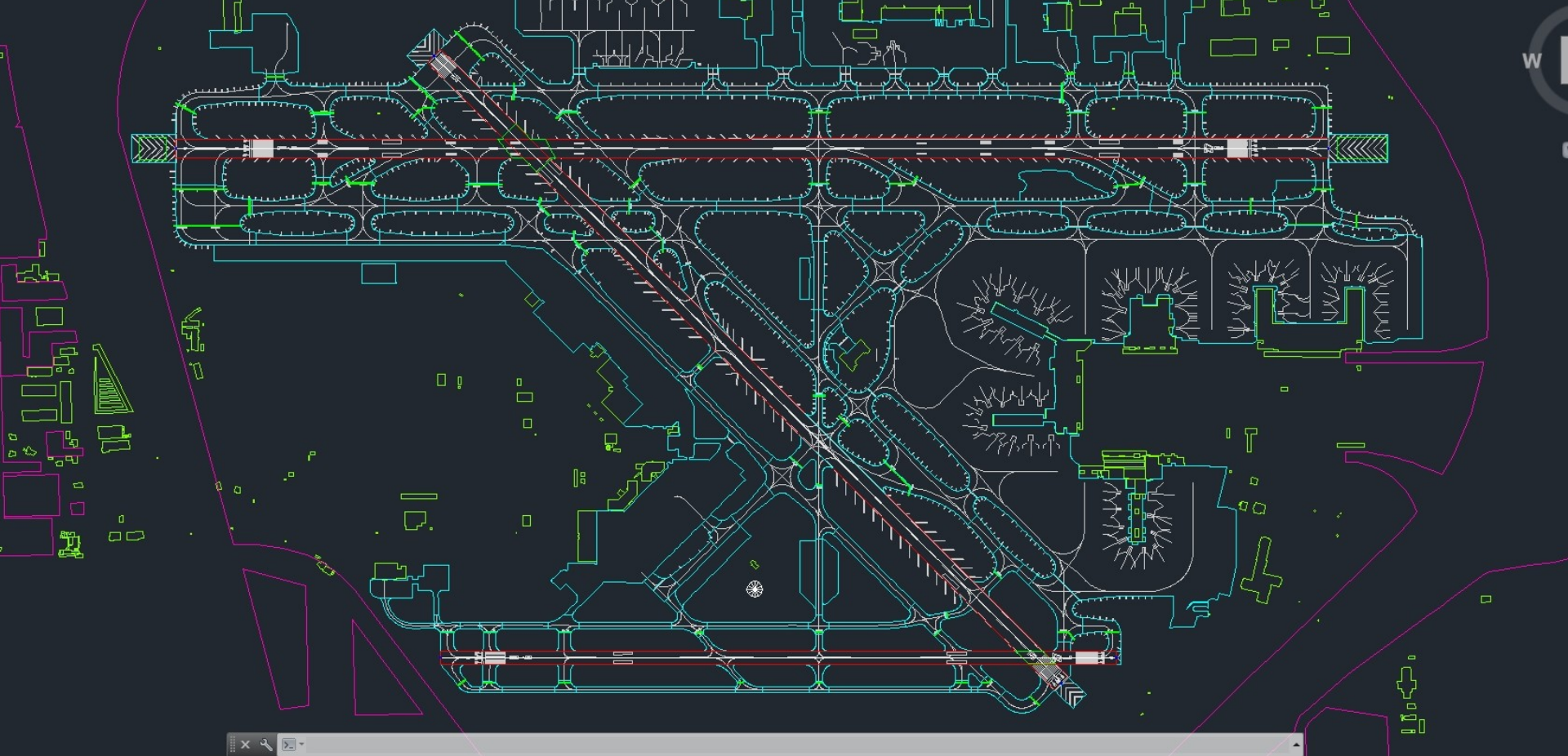- AutoCAD DWG →
- Microstation DGN →
- Airport Layout Plan →
- Geodatabase →
- GeoPDF →

AMDB

➤ Exports

- AIXM 5.1
- Shapefiles
- Geodatabase
- GeoTIFF
- PDF

Selected Features from Feature List

Custom Output

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CAD import
Ft. Lauderdale, FL (KFLL)

➢ Original file in drawing format

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"Where information takes flight"
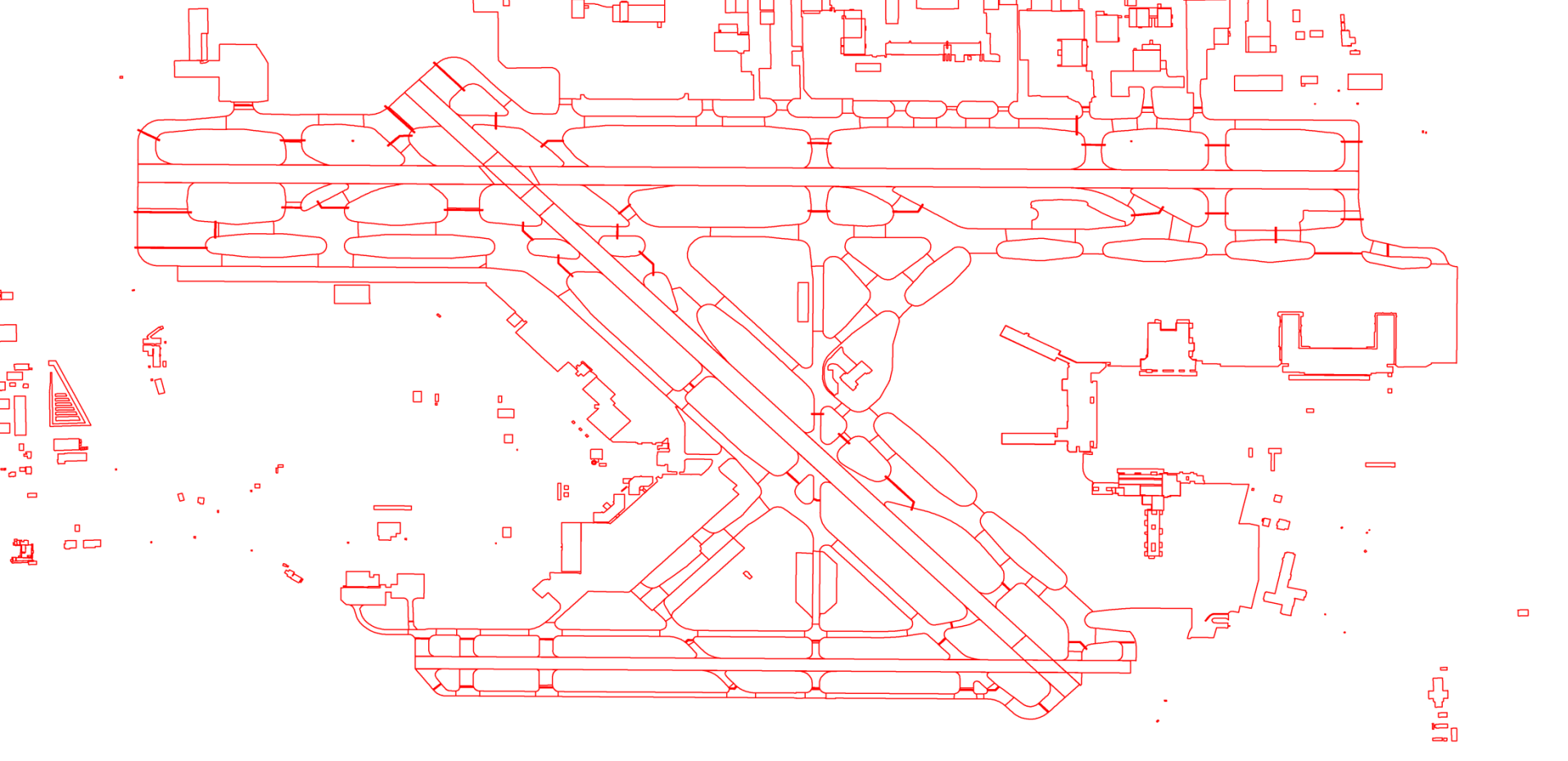
CAD import
Ft. Lauderdale, FL (KFLL)

➢ Converted to geospatial format

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CAD import
Ft. Lauderdale, FL (KFLL)

➢ KFLL before georeferencing by analyst

CAD import
Ft. Lauderdale, FL (KFLL)

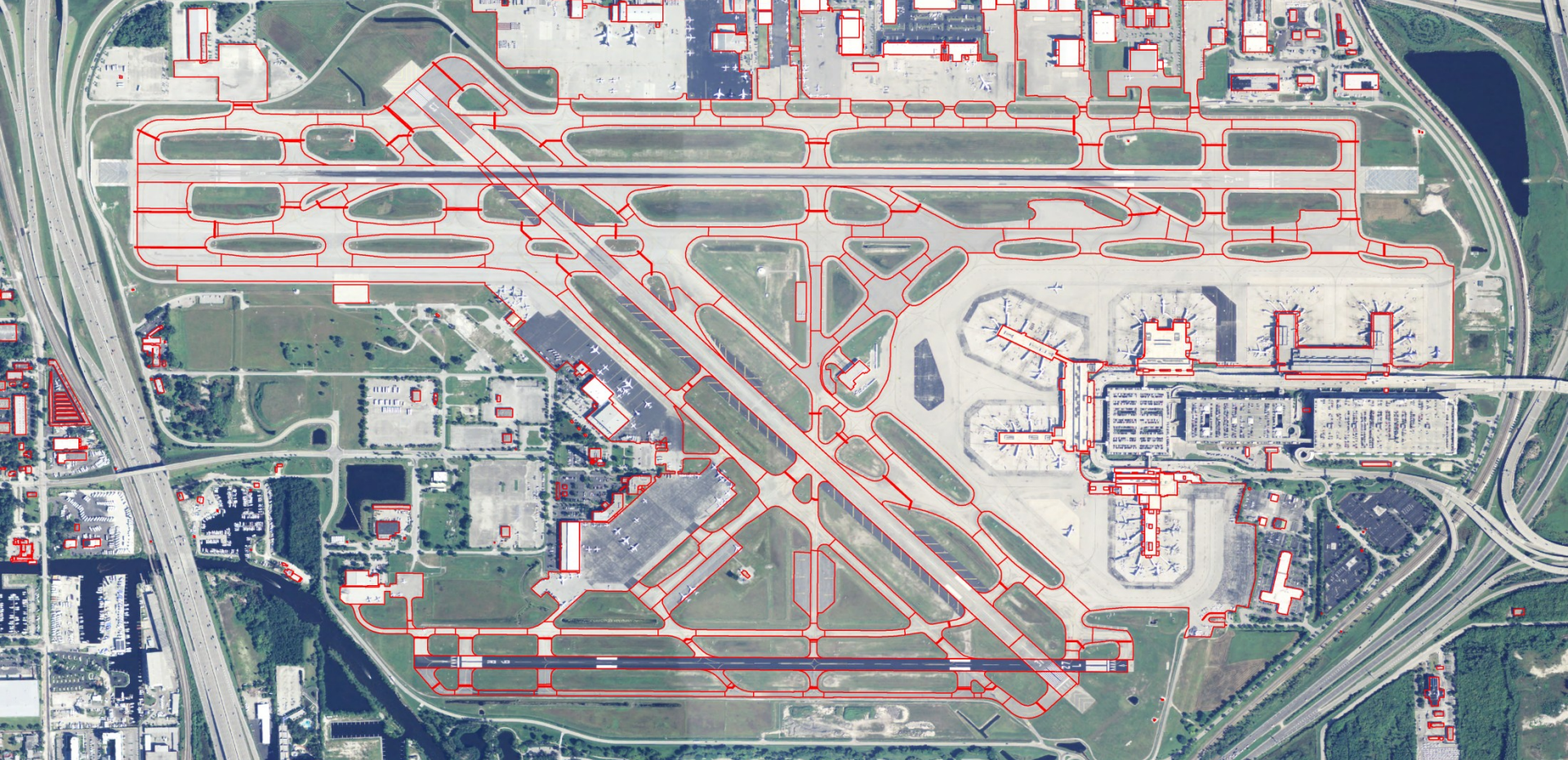➢Drawing file georeferenced to airport

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Image Analysis

- Typical high-resolution orthoimagery formats used by analysts:
  - GeoTIFF, MRSID, NITF, JPEG2000
- Horizontal accuracy and resolution established for each digitization
- Coordinate systems for source imagery transformed into WGS84

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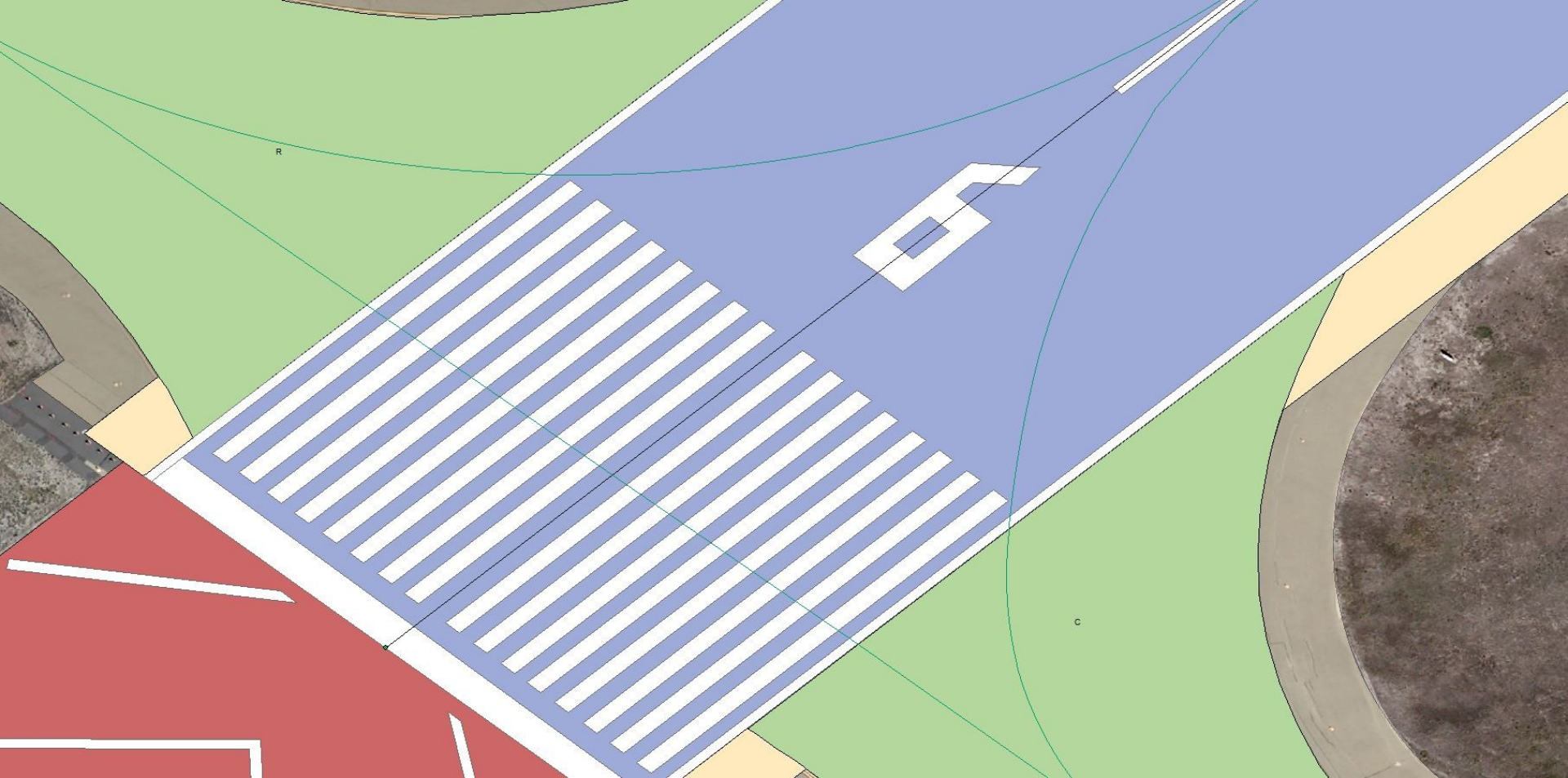
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Aero/GIS Work Process

Data quality management

Initial data acquisition → Build workspace → Data cross-check → Track changes → Data extraction → Topology checks → Rule-based checks → Data validation → Accuracy assessment → Quality control → Initial data acquisition

Current AIXM capabilities

- ➢ Reusable API classes supporting entire AIXM 5/5.1 core models
  - Microsoft .Net based (C#)
  - Strict Adherence to AIXM Schema files
  - Ability to both Read/Write Compliant AIXM from same code base
  - Additional class files supporting Extensions (many to date)
- ➢ Conformance with existing and forthcoming AIXM encoding guidelines
  - "Feature Identification and Reference" – xlink:href and UUID
  - "EUROCAE ED-99 (DO-272) airport mapping requirements in AIXM 5.1" (draft)
    - Contributor

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Questions?

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