AIXM Procedure Seminar

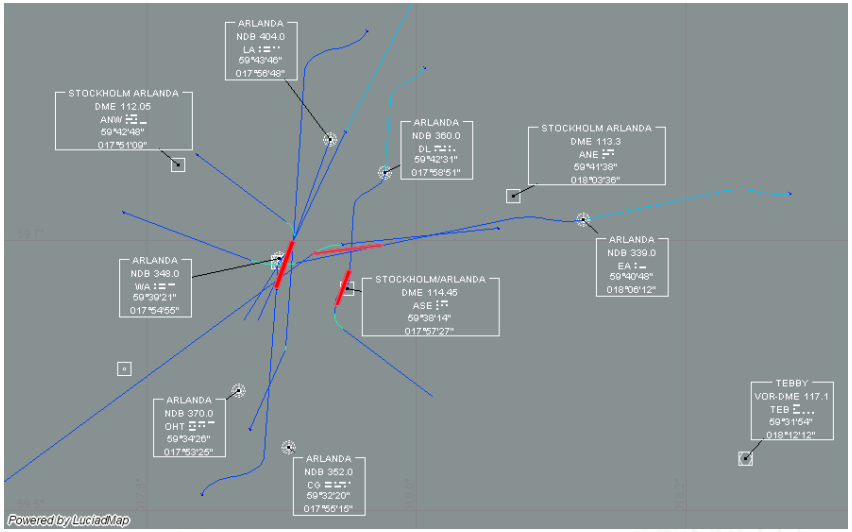
Luciad

Luciad introduction

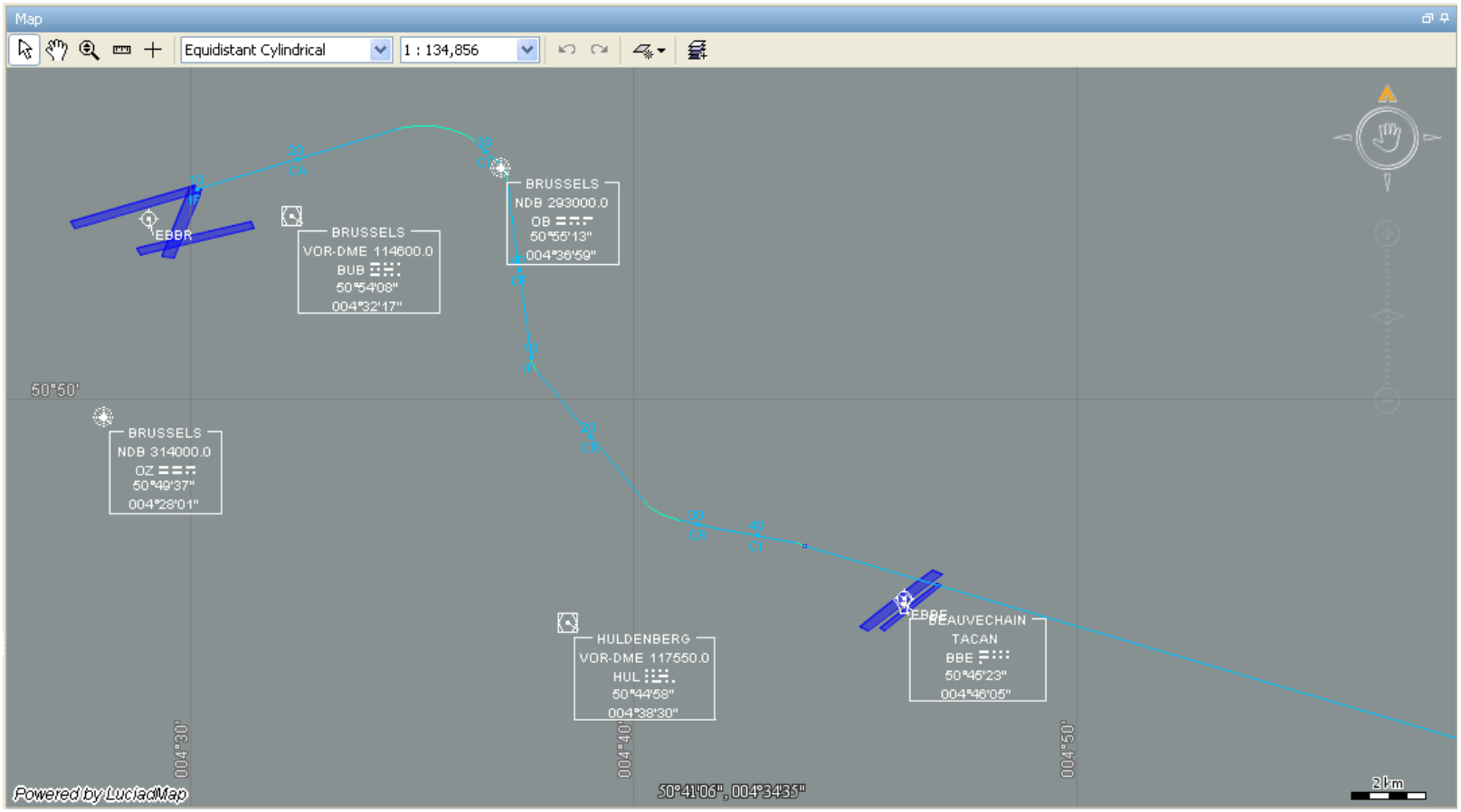
- **Software components for high performance visualization**
- **Key domains: Aviation, Defense and Security**
- **Adoption of aeronautical standards**
  - ARINC 424-13, 424-15, 424-18
  - AIXM 3.3, 4.0, 4.5, 5.0, 5.1
  - DAFIF Edition 7 and 8
  - ASTERIX
  - ASDI

Path and Terminator support (ARINC)

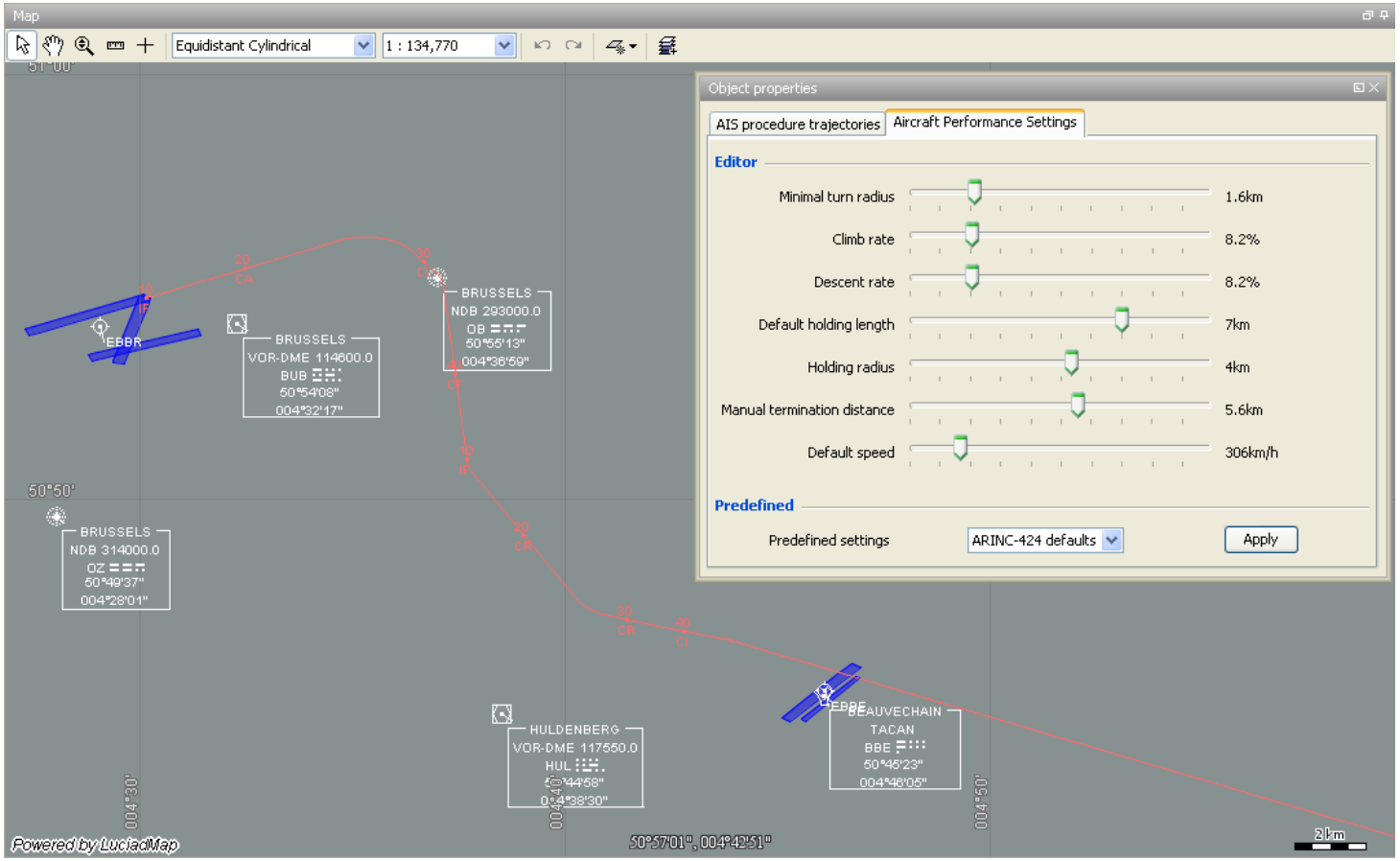
- **Adopted by ARINC 424, AIXM, DAFIF**
- **Software implementation**
  - Domain model to represent decoded procedure / procedure leg data
  - Algorithm to calculate the actual aircraft trajectory
    - Based upon procedure leg information
    - Taking into account aircraft performance settings



Procedure trajectory calculation example (1)



Procedure trajectory calculation example (2)



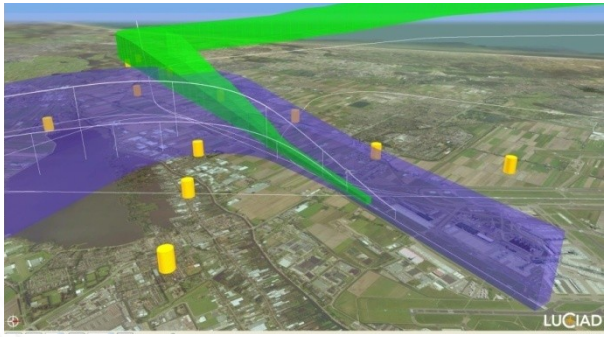
Path and Terminator support (ARINC)

- **Advantages**
  - Reduced number of waypoints
  - Close match with procedure charts
  - Decoupling of aircraft performance settings (e.g., convenient for simulation)

- **Disadvantages**
  - Calculation of the aircraft trajectory on a map (e.g., for simulation) is complex and costly
    - >> 20 procedure leg types
    - Complex procedures are easy to misinterpret
  - No performance model in most data formats

AIXM 5.x procedure support

- **New procedure model**
  - Procedure leg (path and terminator) modeling
  - Procedure trajectory (geometry) encoding
  - Performance model
- **More flexibility to support procedures**
  - Direct visualization of procedure trajectory
    - Useful for simple web clients or a quick preview
  - More advanced operations (analysis, simulation, …) possible through procedure leg/performance model information



AIXM 5.x procedure support

- **Experiments**
  - Data conversions from ARINC to AIXM 5.1
    - No real-world testdata yet
  - Procedure generation using both ARINC leg type information and calculated trajectory
- **Demonstrations in OGC OWS-6 and OWS-7**

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Conclusions

- **How to ensure data quality?**
  - XML schema allows too many degrees of freedom.
  - What data should always be available?
  - How to avoid ambiguities, conflicts?
    - e.g. not all leg types can occur everywhere.

- **Extensive model increases readability**
  - Compared with record data formats like ARINC
  - Equally extensive documentation can influence data quality