

NASA FAA Upper Class E Traffic Management (ETM)

Cooperative Operating Practices

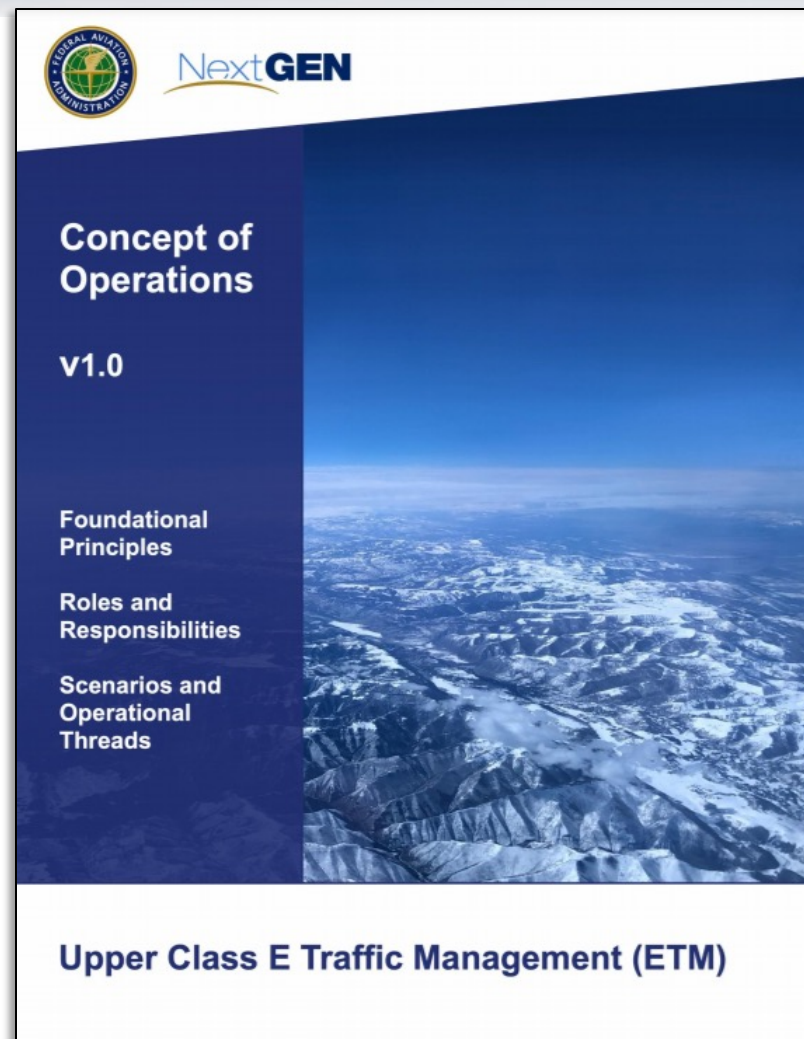
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The FAA ETM ConOps v1. states the following:

- “The future of upper Class E airspace operations presents opportunities for an alternative traffic management approach. To ensure safe and efficient service provision for current, and expanded operations, the Federal Aviation Administration (FAA) is exploring an upper Class E Traffic Management (ETM) concept.” (p.2)
- “An ETM construct must:
 - Scale beyond current NAS infrastructure and manpower resources to meet the needs of market forces
 - Support the management of operations where no air navigation service provider (ANSP) separation services are desired, appropriate, or available
 - Promote shared situation awareness among Operators” (p.3)

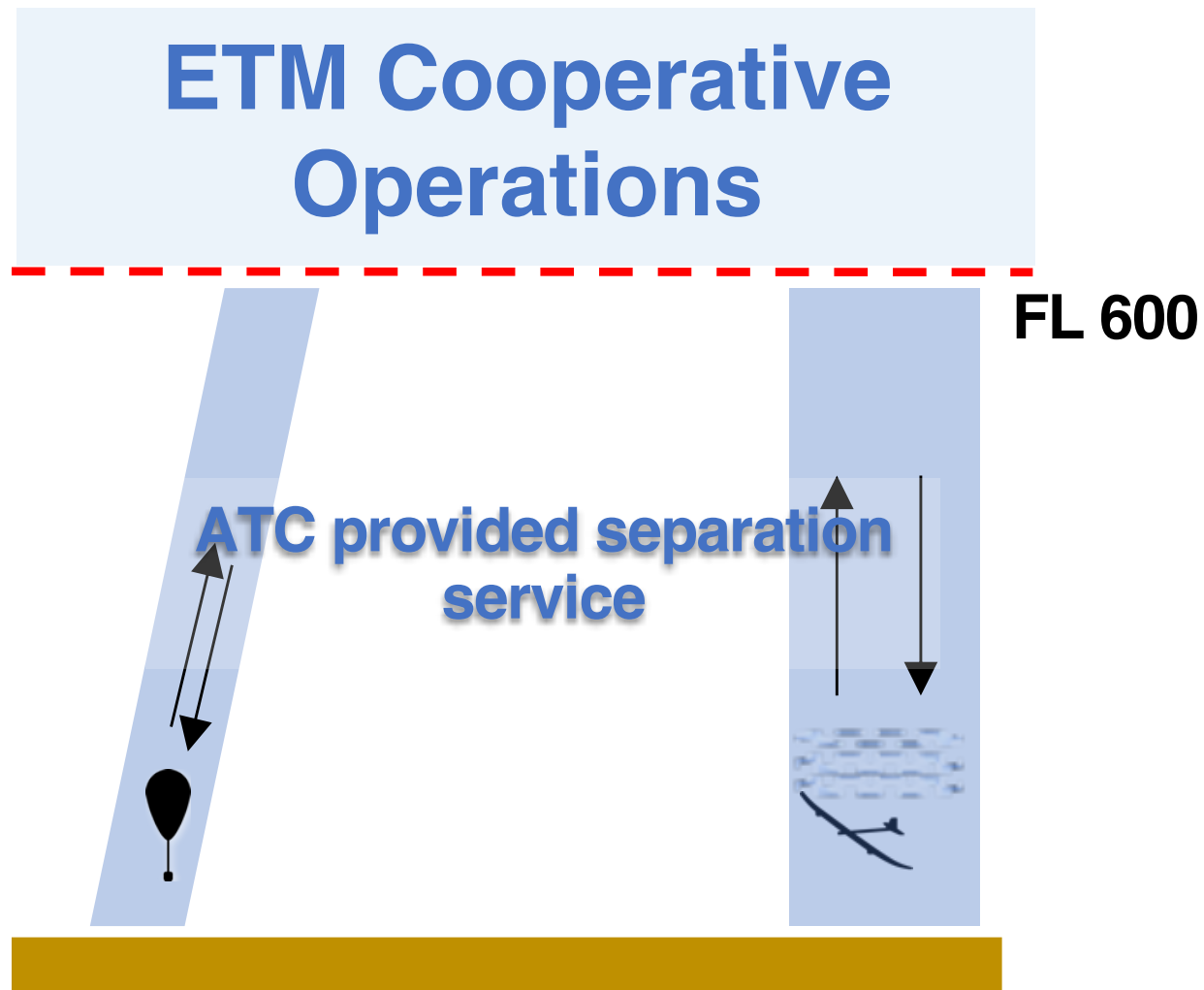
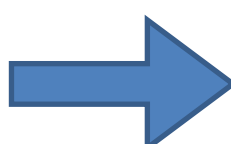


Cooperative operation through information exchange is a critical enabler of ETM



ETM Cooperative Operations

“Cooperative operations” are organized, coordinated, and managed by ETM participants through cooperative operating practices (COPs)

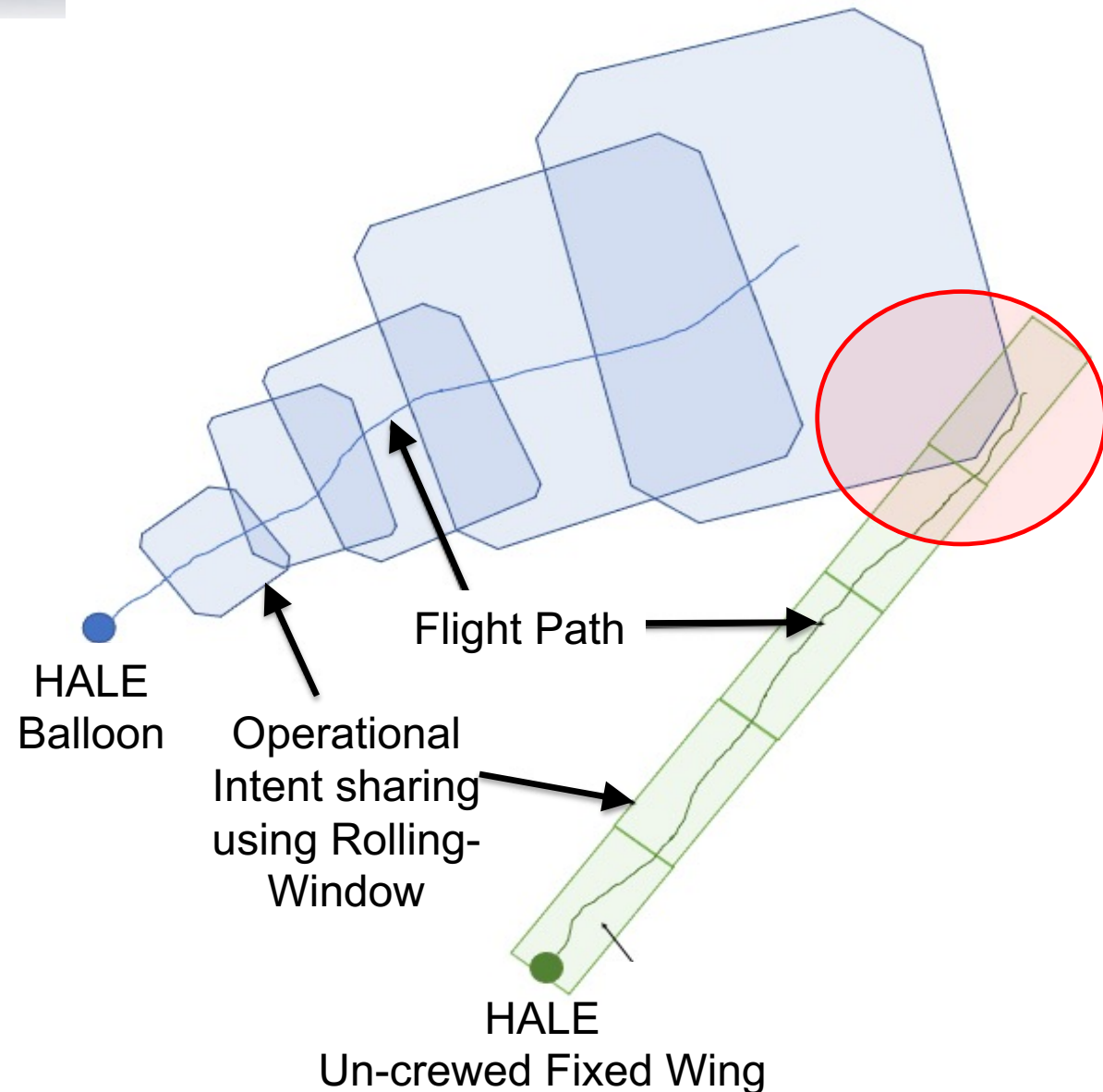




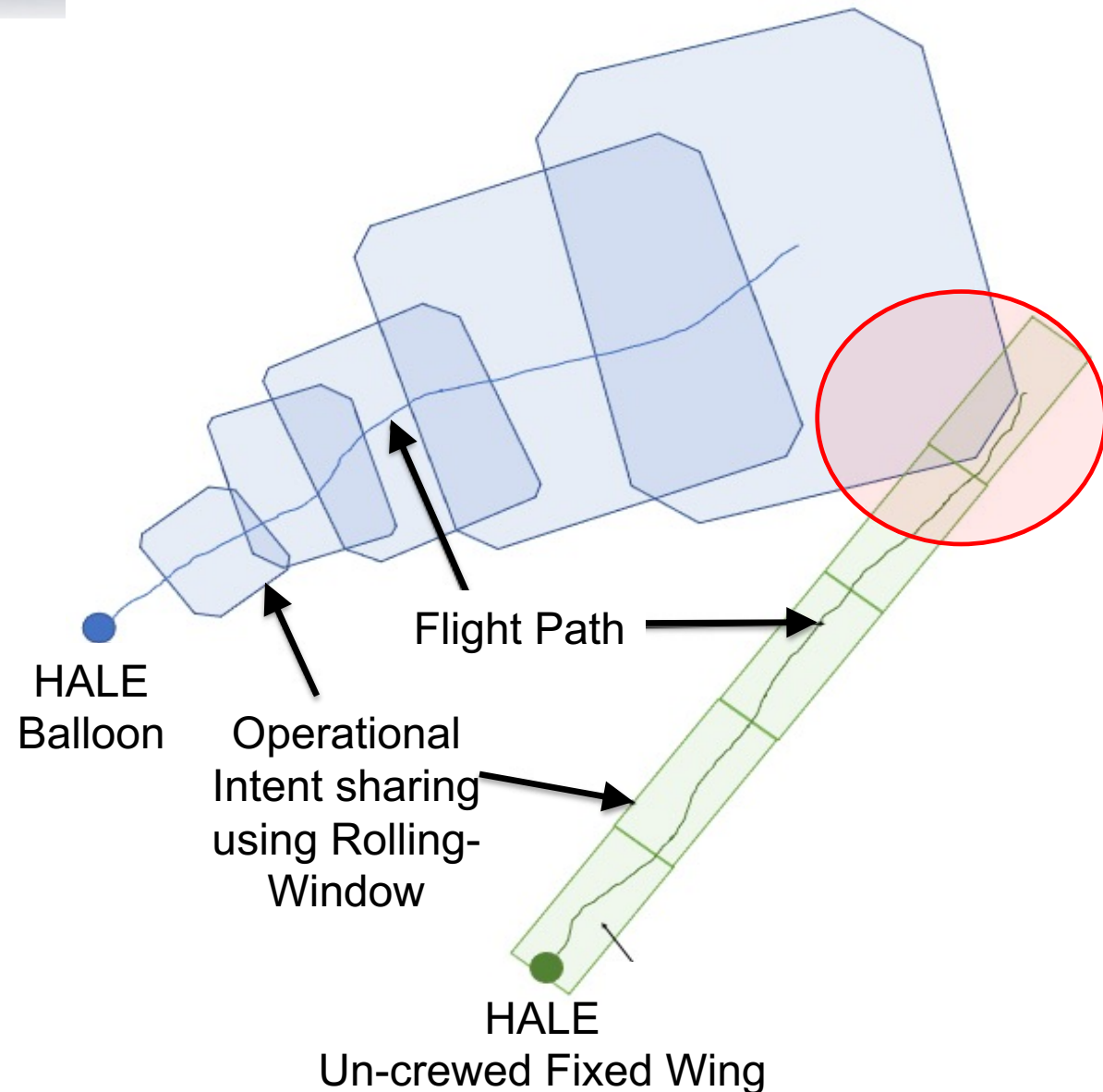
Cooperative Operating Practices (COPs)

- COPs are an agreement within the operator community about how they will interact.
- COPs may consist of various elements, such as procedures, processes, algorithms, and rules that operators have agreed to follow to effect safe, equitable, and efficient cooperative operations
- Operator interactions can occur across the life cycle of a flight- as such, COPs may address:
 - Pre-planning of scheduled operations
 - Support for efficient management of cooperative airspace (e.g. demand and capacity balancing, equitable use)
 - Strategic deconfliction
 - Tactical deconfliction

- A conservative approach, emphasizing safety
- Focuses on separation of operational intent (i.e., 4D intersections not accepted)
- First reserved, first served rule may apply (e.g., later submitted operational intent must change to avoid 4D intersection)



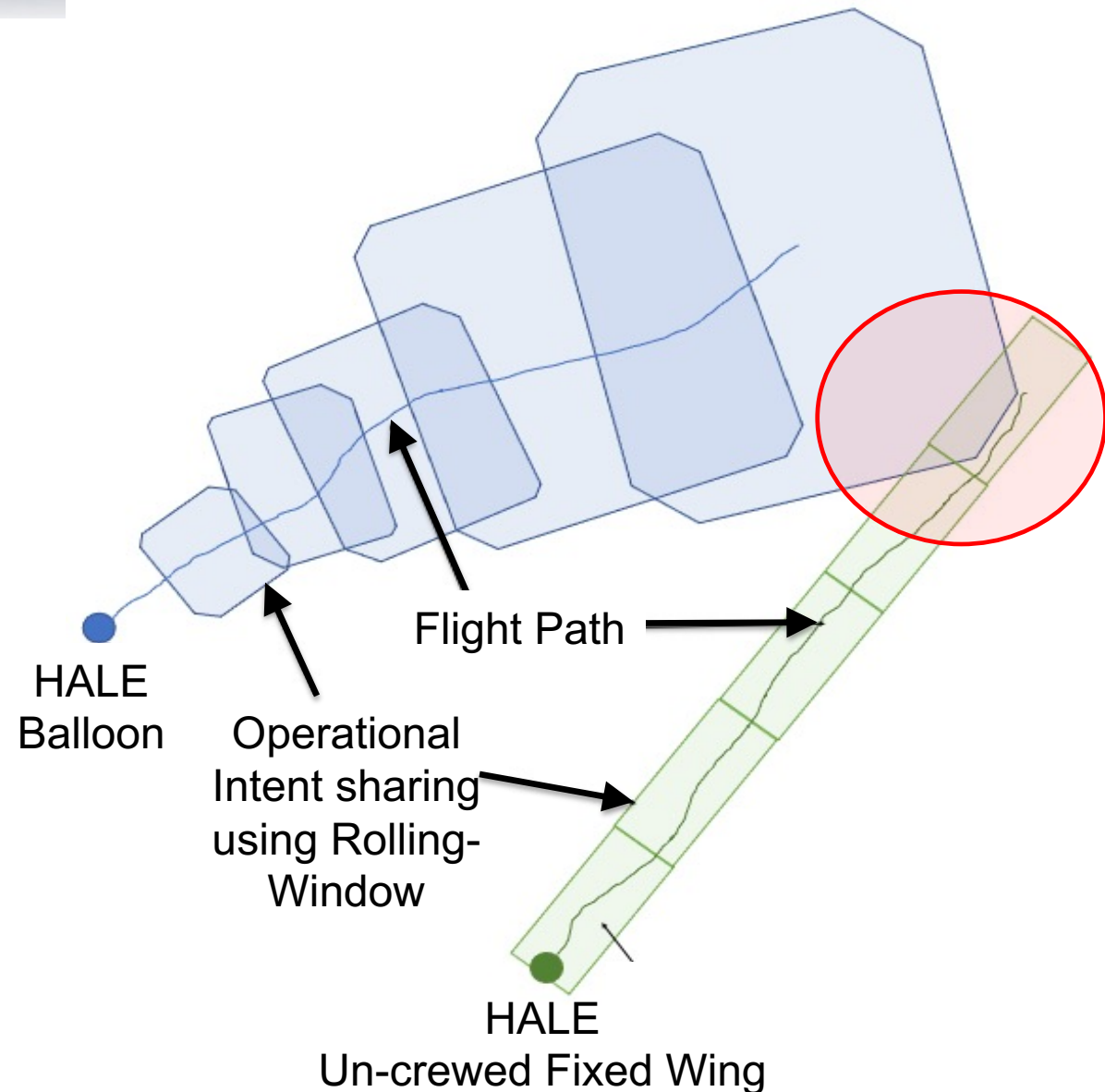
- A practice where operators accept 4D intersection of operational intents
- Operators **agree in advance** how a conflict will be resolved when it is identified (e.g., an agreement made before operations commence)



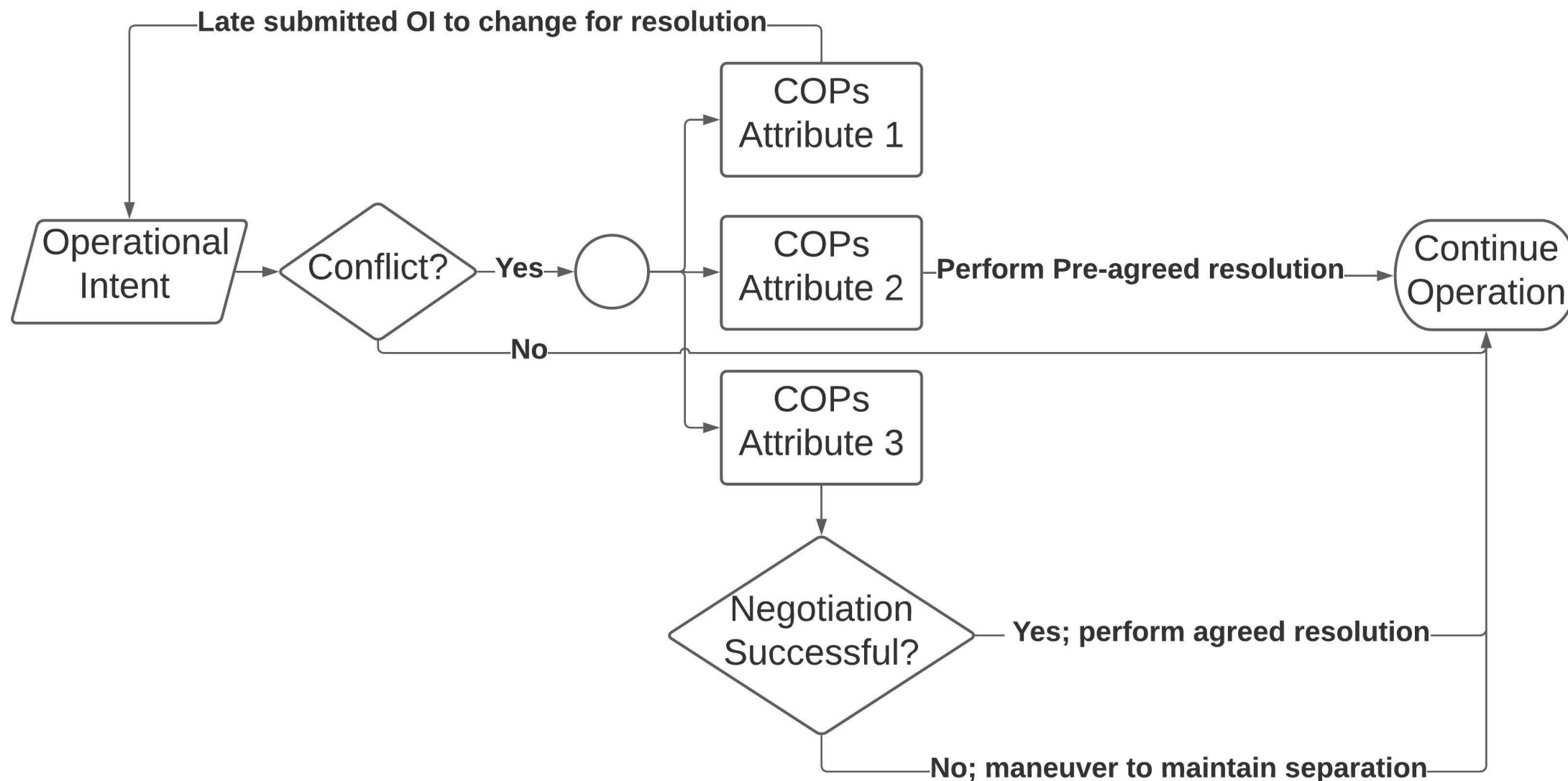


COPs Attribute 3: Tactical Deconfliction through Dynamic Agreement via negotiations

- A practice where operators accept 4D intersection of operational intent
- Operators **build an agreement during operation** for resolving a conflict
- Conflict to be resolved as negotiated
- Must be able to maintain separation even if the negotiation fails



Cooperative Separation Management with COPs





Next Steps



- Model and simulate COPs
- Engage with the ETM community to understand negotiation approach
- Further develop Cooperative Separation Management as a potential ETM service