Geofencing and Volumetric Separation Concepts

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Motivation and Overview

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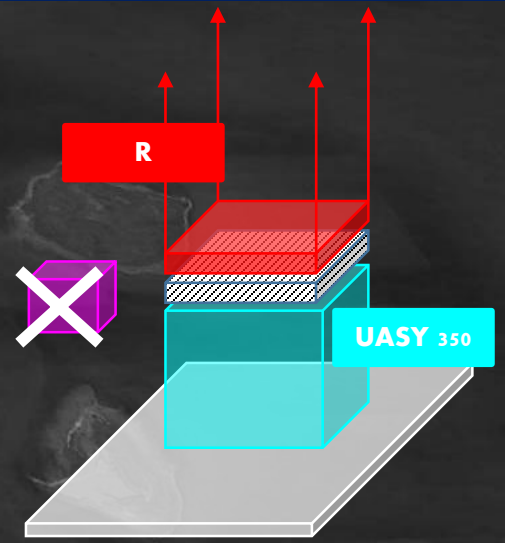
Qualitative, Rule-based
Single Operations
Semi-automated Approval and Allocation
Limited Operational Options
Static Allocation

5nm
3nm
3nm

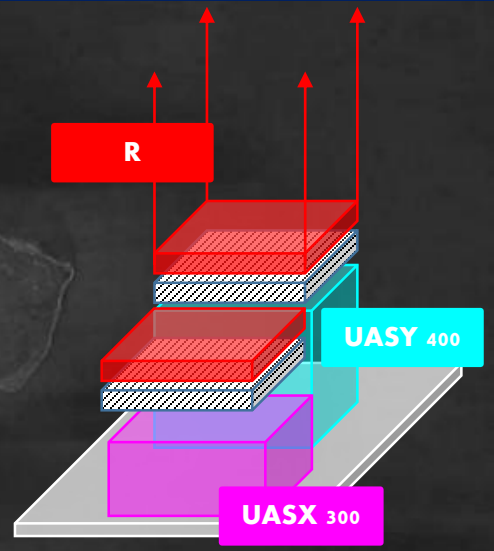


Current Approach

Motivation and Overview

Quantitative, Risk-based (TLS)
Single, Multiple Operations
Automated Approval and Allocation
Flexible Operational Options
Static and Dynamic Allocation

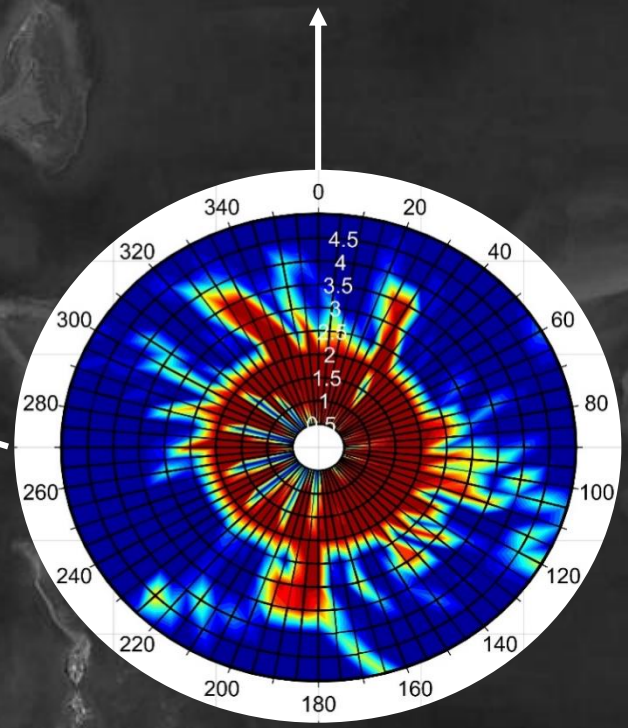
Aerodrome Analysis (and Exposure)



3nm

5nm

Max Safe Altitude 0 200 300 400



Conflict Probability

Google earth MAP NOT TO SCALE – NOT FOR NAVIGATIONAL PURPOSES

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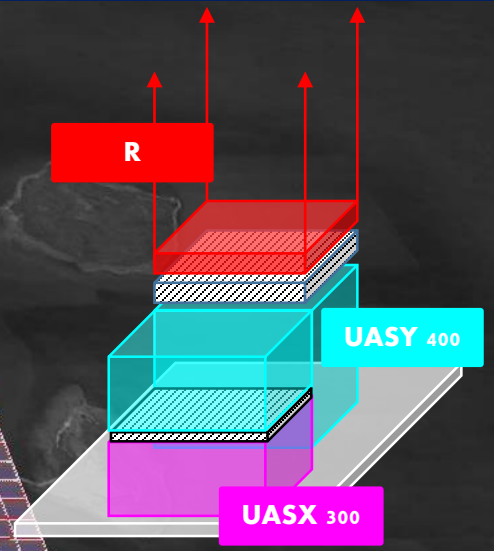
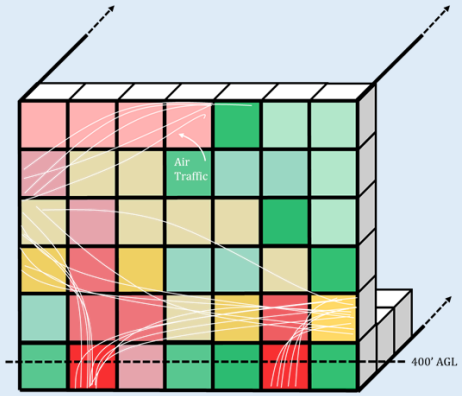
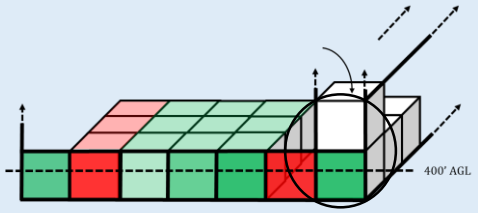
Quantitative, Risk-based (TLS)
Single, Multiple Operations
Automated Approval and Allocation
Flexible Operational Options
Static and Dynamic Allocation

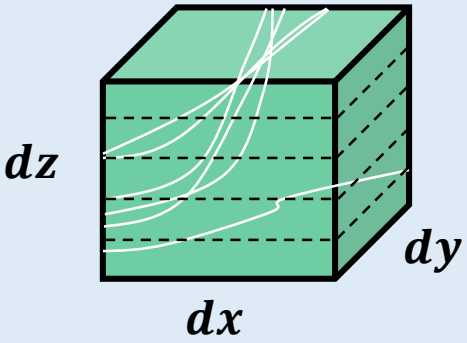


Proposed Approach

Airspace Modelling







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Geofencing and Volumetric Separation Concepts - Single Unmanned Aircraft

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Geofencing and Volumetric Separation Concepts - Single Unmanned Aircraft

$$z = f(p(c), \epsilon_{TLS}, \dots)$$

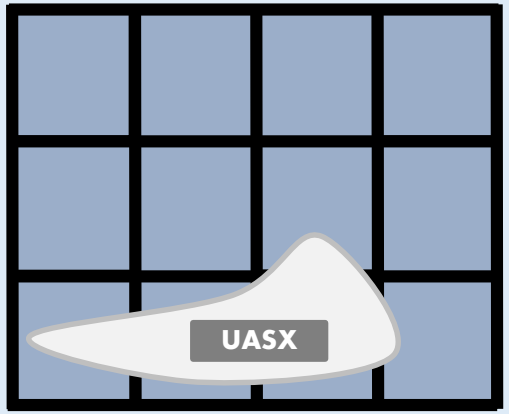
300

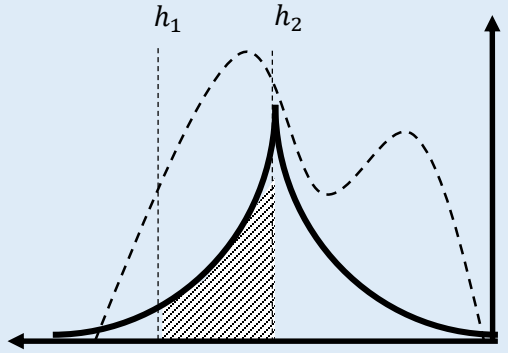
0

350

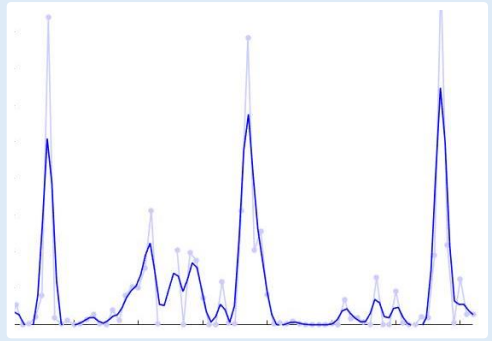
300

350





$$p(VOP) \times p(HOP)$$



Google earth

Data SIO, NOAA, U.S. Navy, NGA, GEBCO
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Geofencing and Volumetric Separation Concepts - Single Unmanned Aircraft

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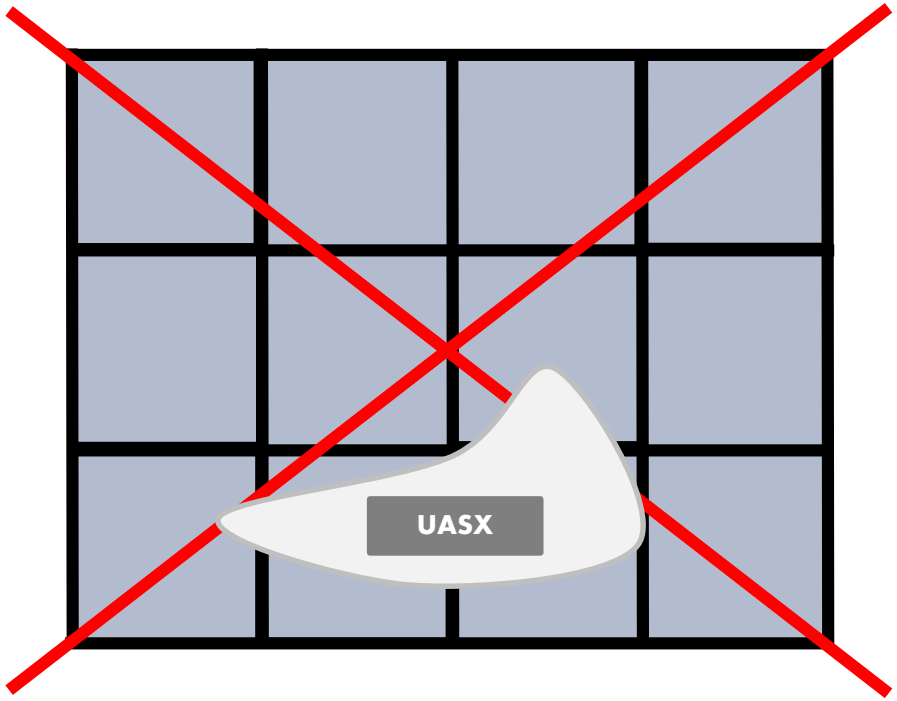

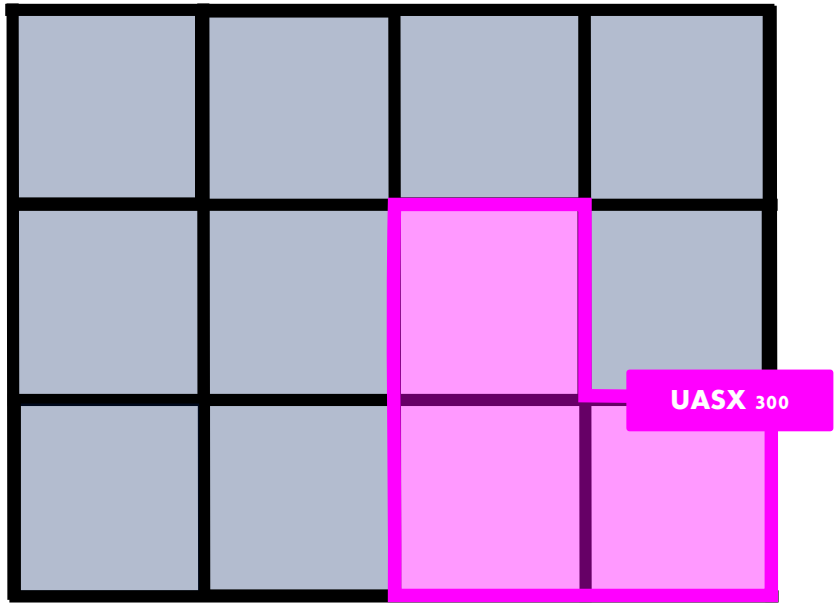

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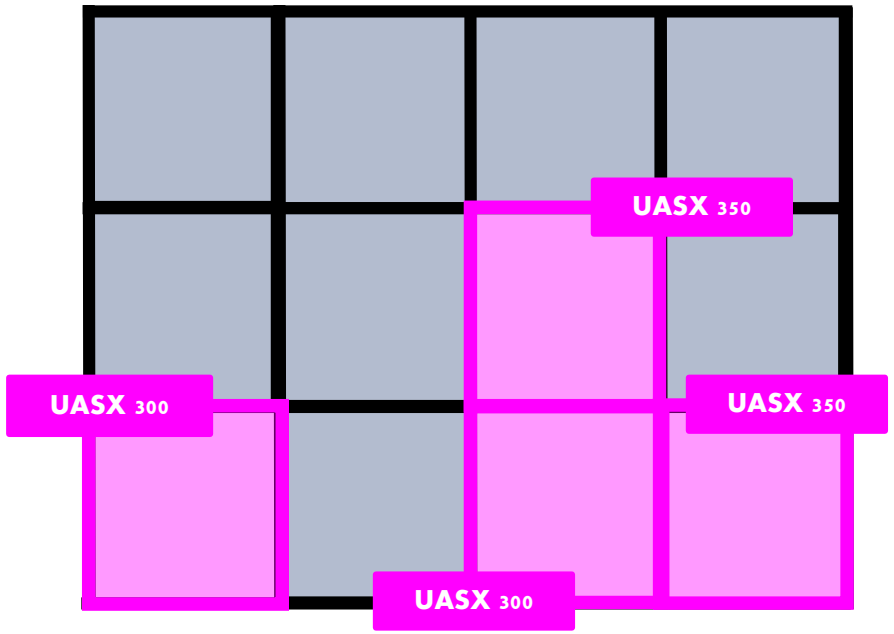

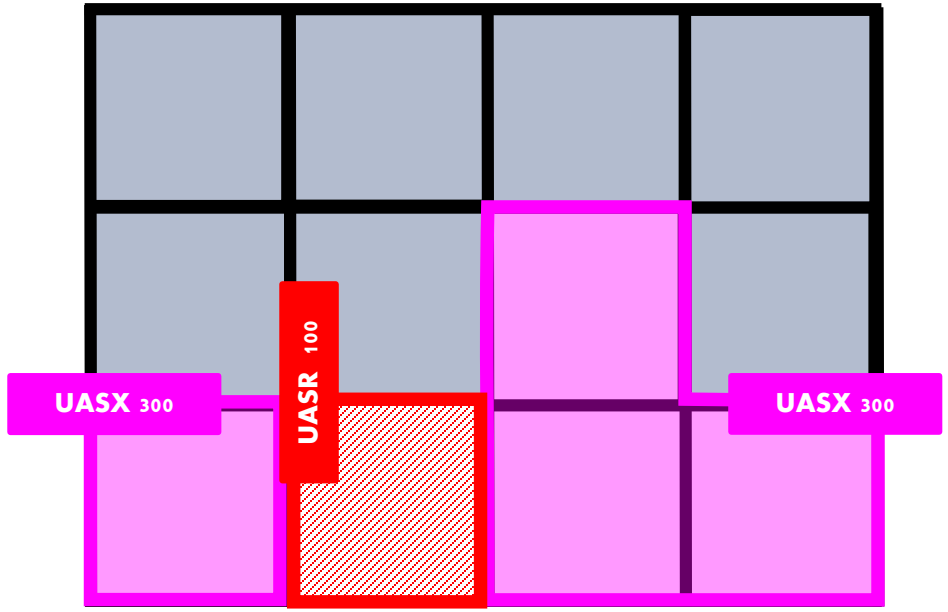

Geofencing and Volumetric Separation Concepts – Multiple Unmanned Aircraft

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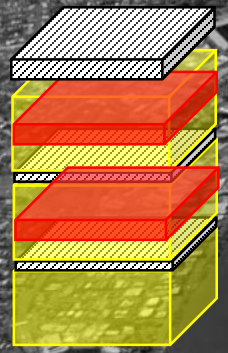
$$z_n = f(p_1(c), p_1(c), \ldots, p_n(c), \epsilon_{TLS}, \ldots)$$

TLS 2

TLS 3

TLS 1



Separation Buffer (manned – unmanned)

Unmanned Flight Layers (TLS 1)

Separation Buffer (unmanned – unmanned)

Unmanned Flight Layers (TLS 2)

Google earth

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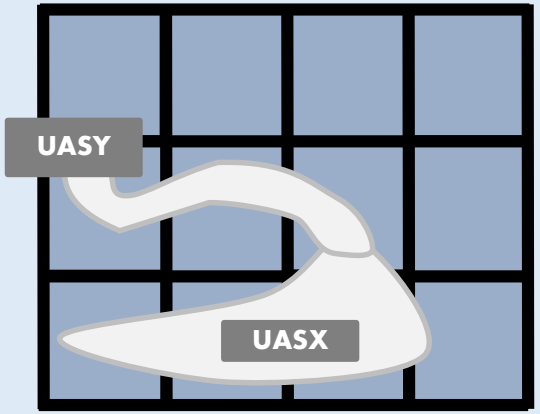
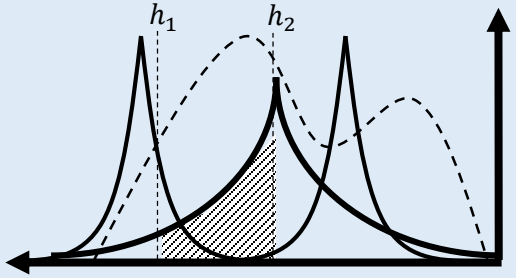
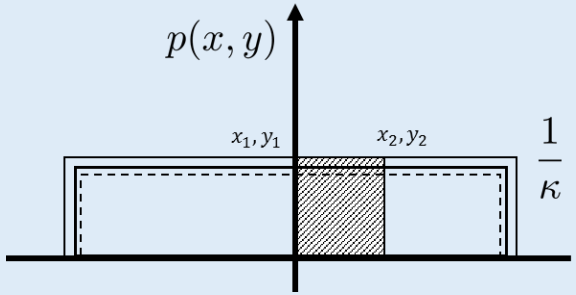




$$p_n(VOP) \times p_n(HOP)$$



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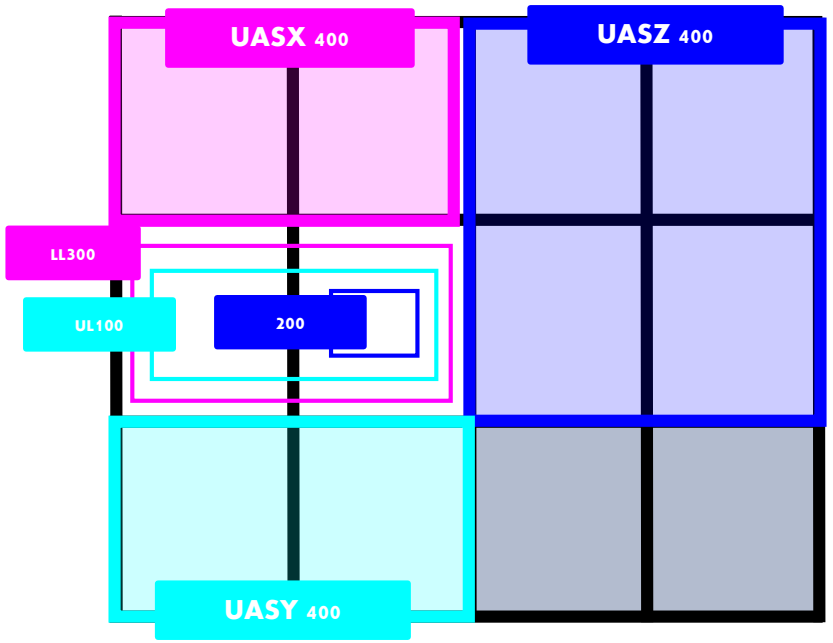

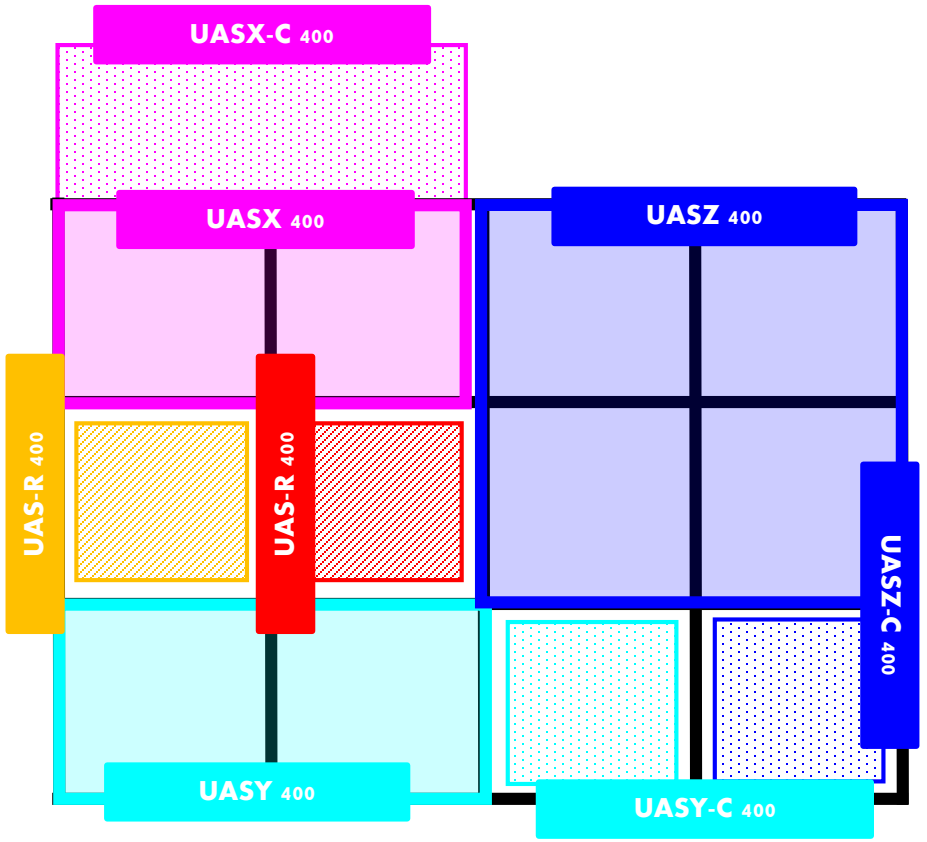

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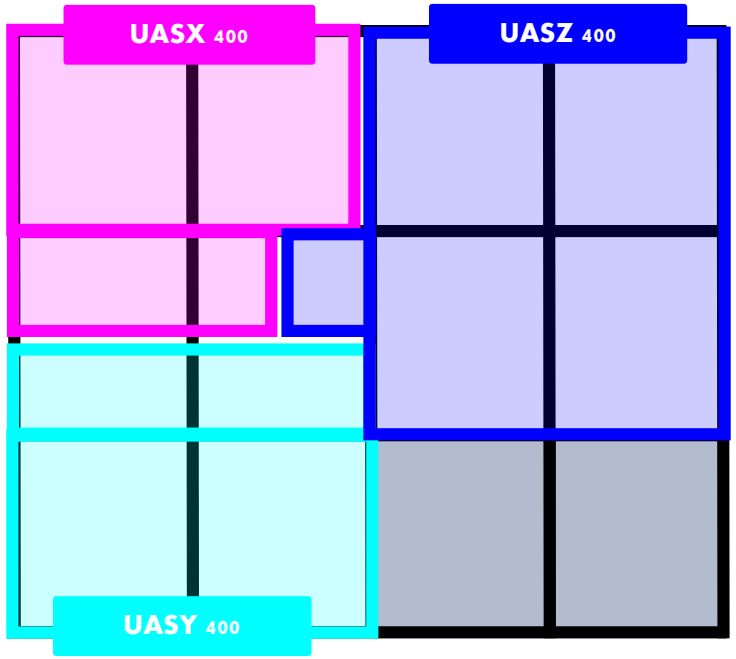
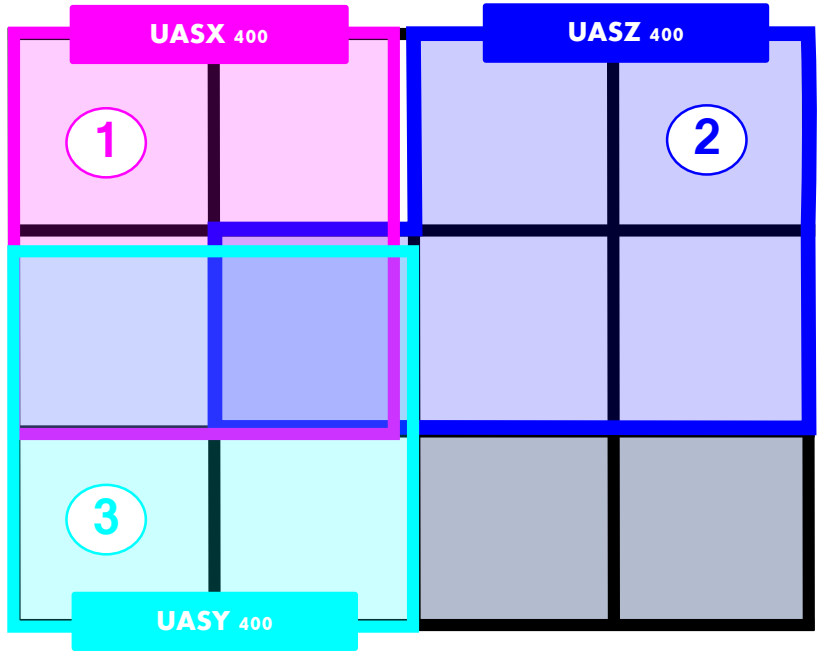
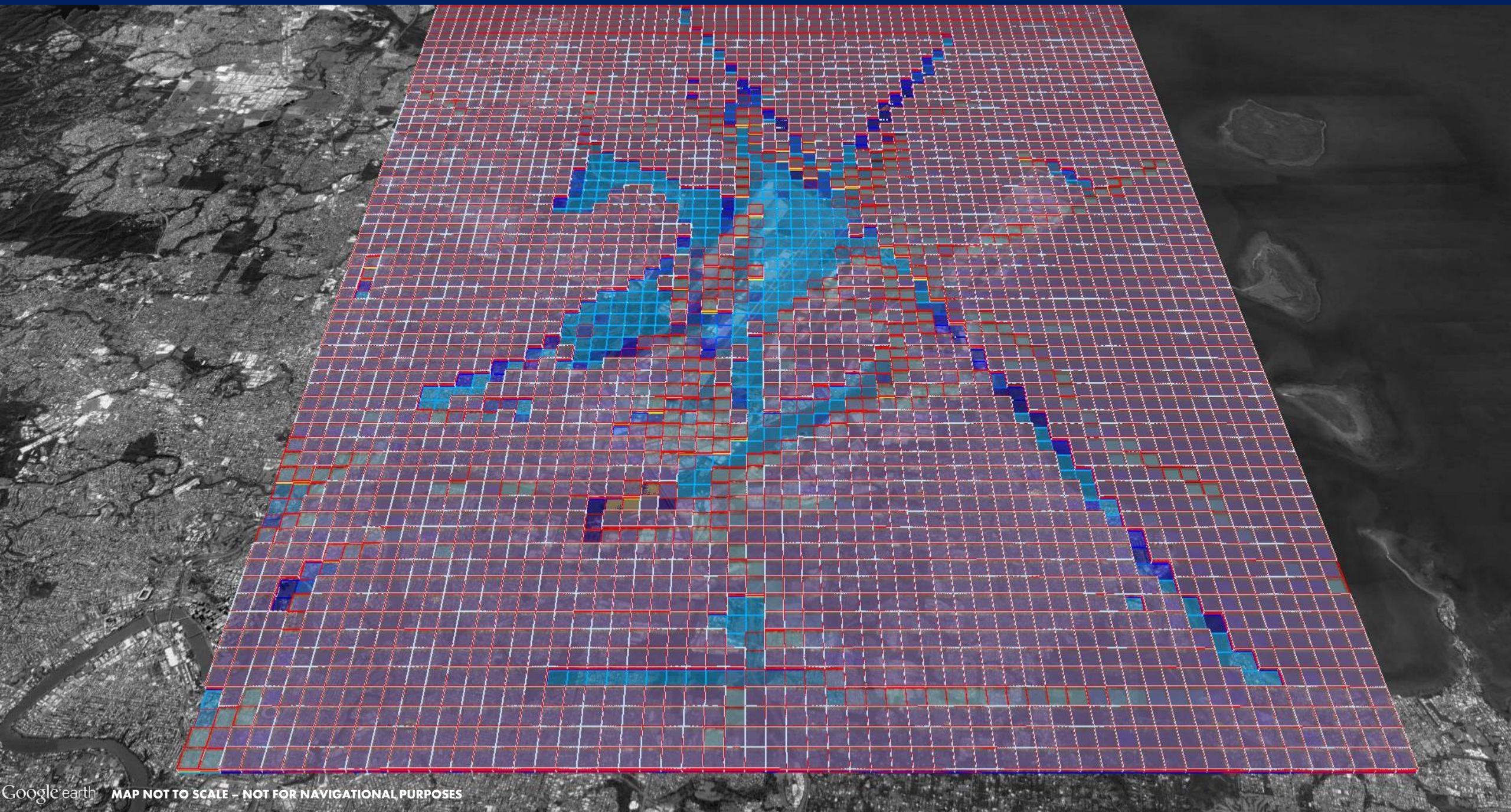




Geofencing and Volumetric Separation Concepts - Brisbane



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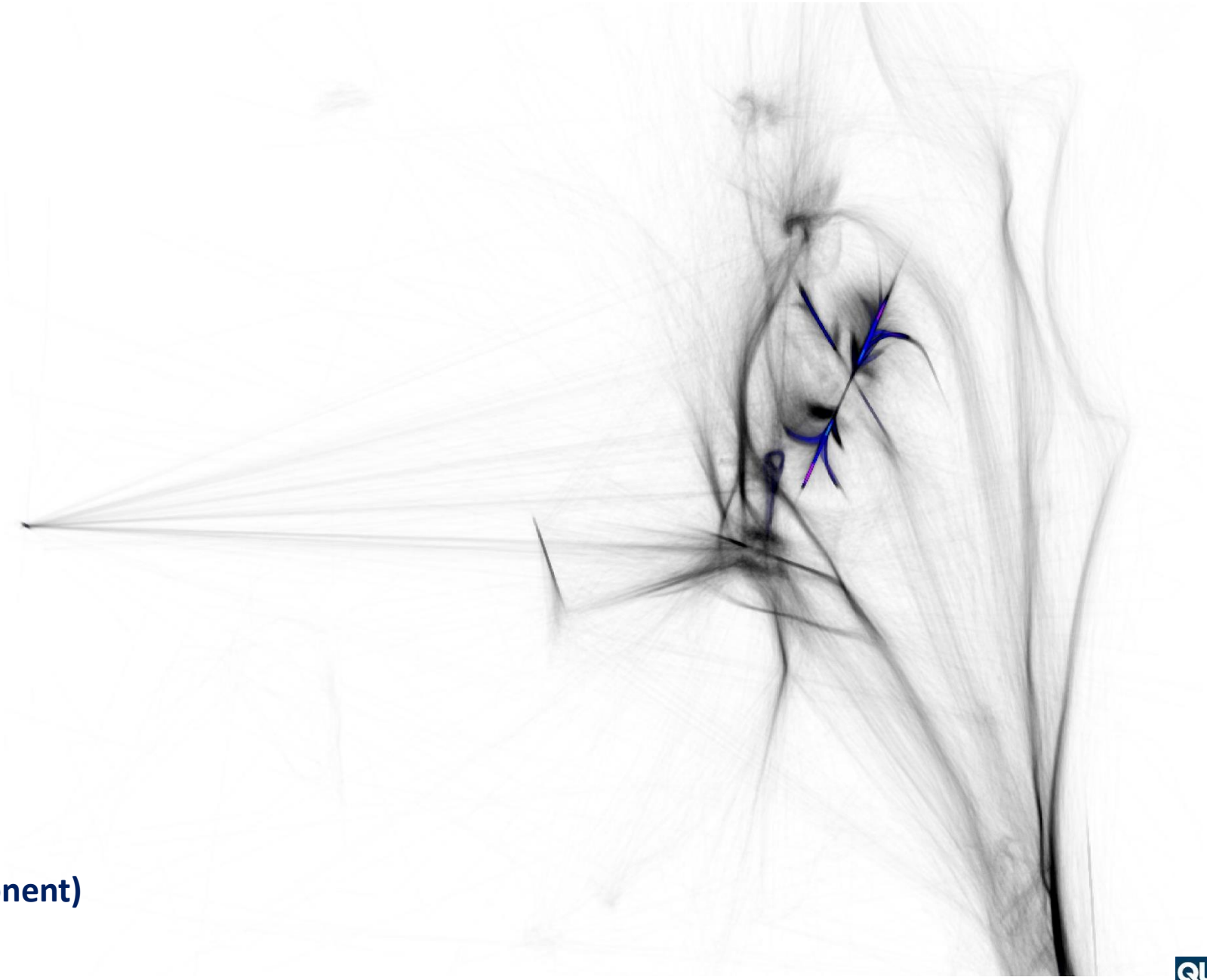
Geofencing and Volumetric Separation Concepts - Brisbane

Thanks



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