Autonomous Drone Engineer

A2 – Usage Models

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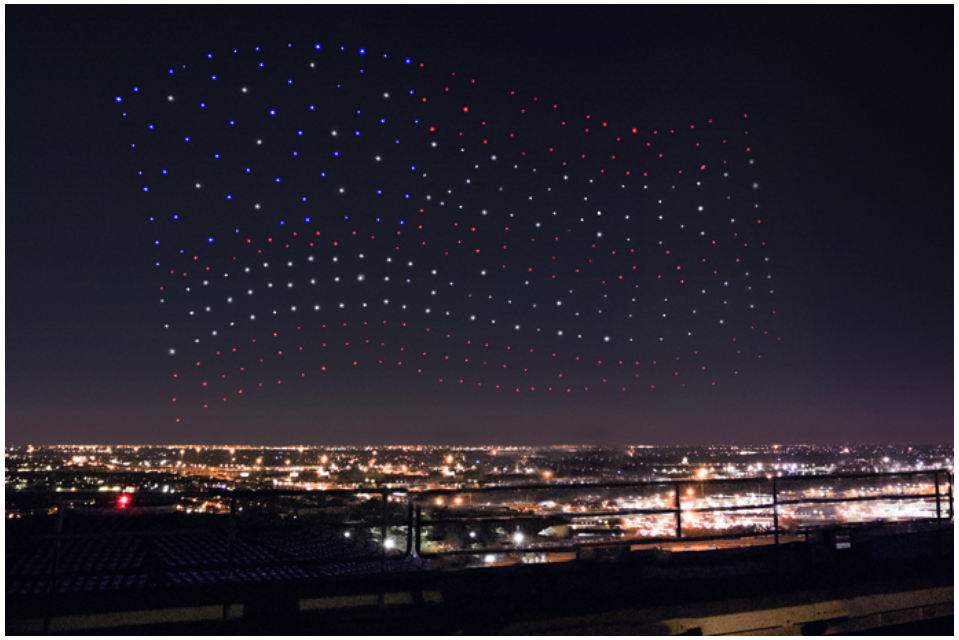
Why autonomous? Fleets!

Autonomous drones are required when you need a **very large fleet**.

- There's not enough pilots for the fleet
- Pilots can't synchronize their flight

Ex: last 10 miles logistics, precision agriculture, light shows

Photos: Intel's drone light show for the 2017 Super Bowl
Pest prevention for agriculture



https://newsroom.intel.com/news-releases/intel-drones-light-lady-gaga-performance-pepsi-zero-sugar-super-bowl-li-halftime/
https://agribird.com/produits/trichogrammes-trichospray/

Why autonomous? Precision!

Autonomous drones are required when you need to fly **precisely**.

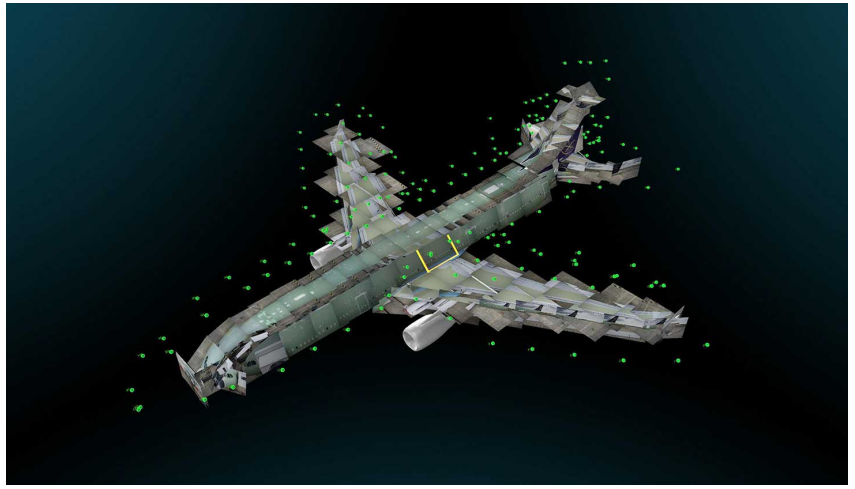
- Photos need to be taken from a precise point
- Successive flights need to follow the same path

Or when you need **predictability**.

- Flying on dangerous sites
- Or near highly valuable objects

Ex: precise infrastructure inspection, movie shooting (Skyfall's intro chase).

Photos: Intel-Airbus collaboration.



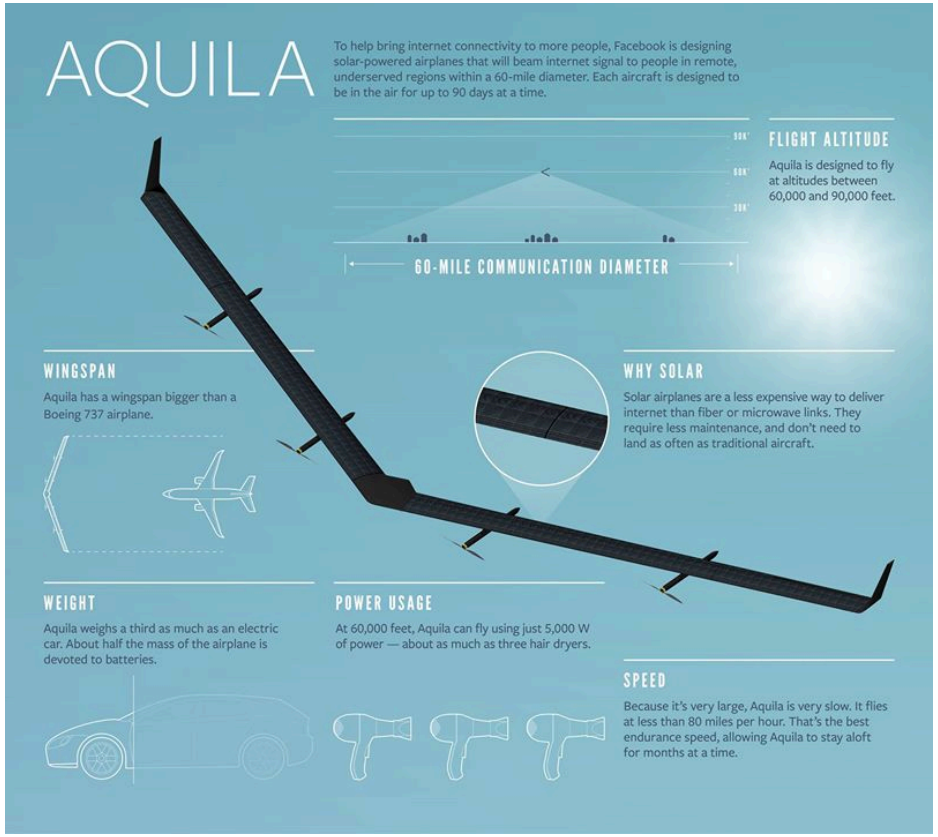
http://www.asctec.de/en/intel-airbus-demo-drone-visual-inspection-of-passenger-airliners/

Why autonomous? Infrastructure!

Autonomous drones are required when you need to **fly constantly or anytime**.

Ex: drone as an infrastructure in the sky.

Photos: X (Google) Loon, Facebook's Aquila

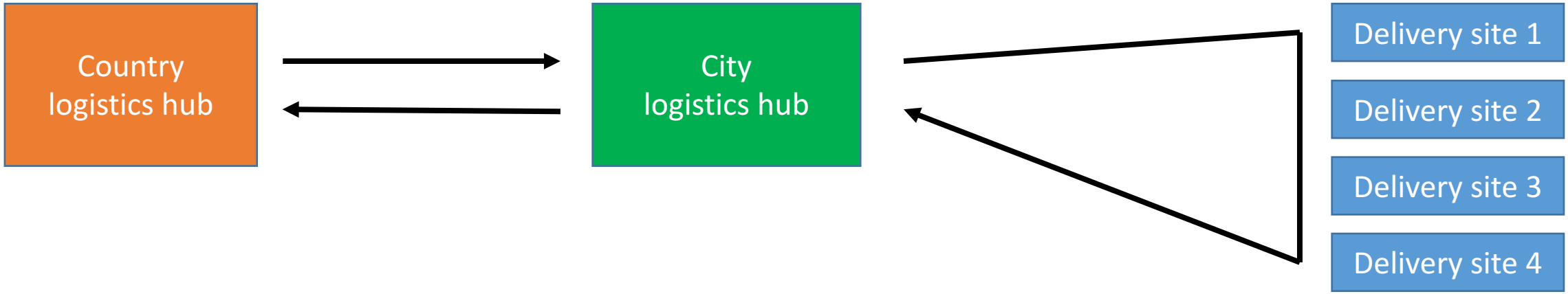


https://plus.google.com/+ProjectLoon/posts/SLfUxHfXEnP
https://www.facebook.com/notes/mark-zuckerberg/the-technology-behind-aquila/10153916136506634/

What’s different?

If you try to replace 1 delivery truck with 20 drones,
you may save time and reduce costs
but it’s not the only difference.

Here is a typical logistics chain for an online shop:



What's different? Latency! Granularity!

Trucks:

- are big: they load a maximum of packages to make it worthwhile.
- depot is far: they have a minimum of deliveries each day.
- to minimize distance, they specialize in 1 area of the city.
- result: can achieve same day delivery with optimization, but can't scale to 30mn-1hr deliveries.

Drones:

- are variable in size: no minimal payload capacity
- can work from smaller local logistics hubs
- have a predictable flight time
- result: can propose short latency delivery of small packages

If you can deliver 1 doughnut on demand, what else is possible?

Photos: X (Google) Wing, Amazon Prime Air

https://x.company/projects/wing/
https://www.amazon.com/Amazon-Prime-Air

What's different? Logistics centers!

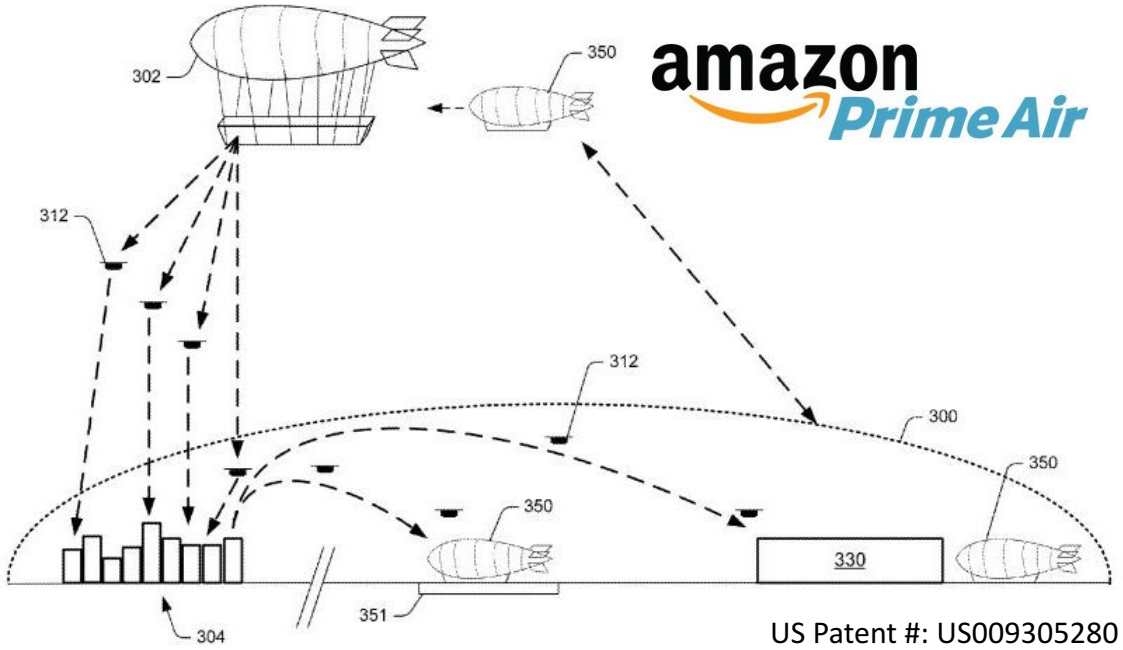
Trucks: Currently large buildings, far from city centers.

Drones: Autonomous Drones come with automated logistics centers.

The large central centers could be replaced by several smaller automated logistics buffers.

Ex:

- *Flying warehouses?*
- *Ships sailing in front of cities?*
- *Direct delivery from trains, trucks?*
- *Underground with an access shaft?*



US Patent #: US009305280

Conclusion

Autonomous Drones are not only a way
to make **marketing stunts**.

There’s a need and market **today.**

Drones are not just automating **existing tasks**.

They have specific requirements
but enable **new usages.**

Thanks

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