



UAS, RPV, UAV, FPV

... Abkürzungen mit Kollisionspotential

Neuartige Luftraumnutzer mit neuen rechtlichen
Rahmenbedingungen ...

und warum Piloten die Augen offen halten sollten

Agenda

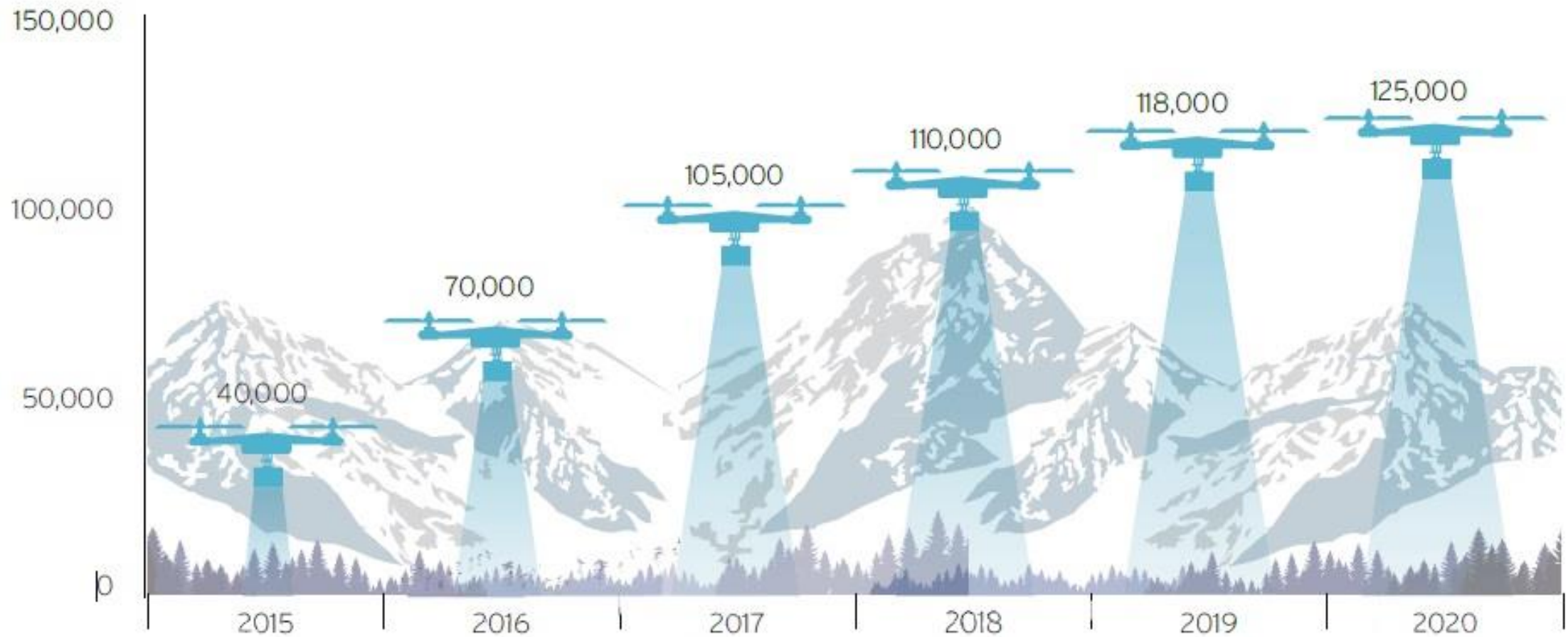
- Problemverortung
- Wovon sprechen wir?
 - Abkürzungen, Differenzierung
- rechtliche Grundlagen
 - EASA, ACG, Klassen
- Luftraumstruktur
- Ausblick

Quellen und Grundlagen

- Luftfahrtgesetz (LFG) 2014, § 24c. – g.
- EASA
- ACG
- www.austrianaaviation.net
- Vereinigung Cockpit (VC)
- Youtube
- AMAZON:
 - Revising the Airspace Model for the Safe Integration of Small Unmanned Aircraft Systems
 - Determining Safe Access with a Best-Equipped, Best-Served Model for Small Unmanned Aircraft Systems

Projected Annual Sales of Unmanned Vehicles

Statistik



Source: Association of Unmanned Vehicle Systems International.⁴



70 Drone Companies

— To Watch in 2016 —

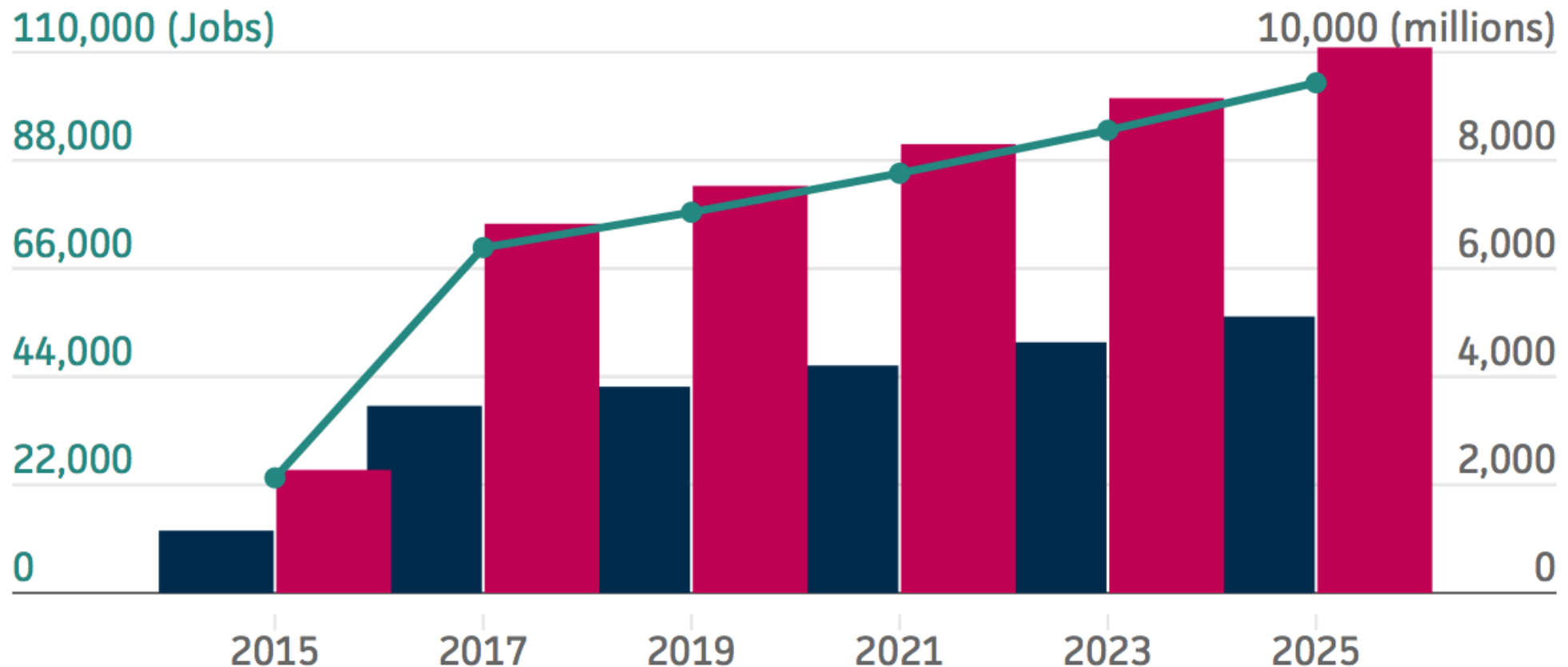
UAV Coach



Statistik

Economic and Job Impact for US Drone Market to 2025

■ Total Direct Spending ■ Total Econ Impact ■ Total Employment Impact

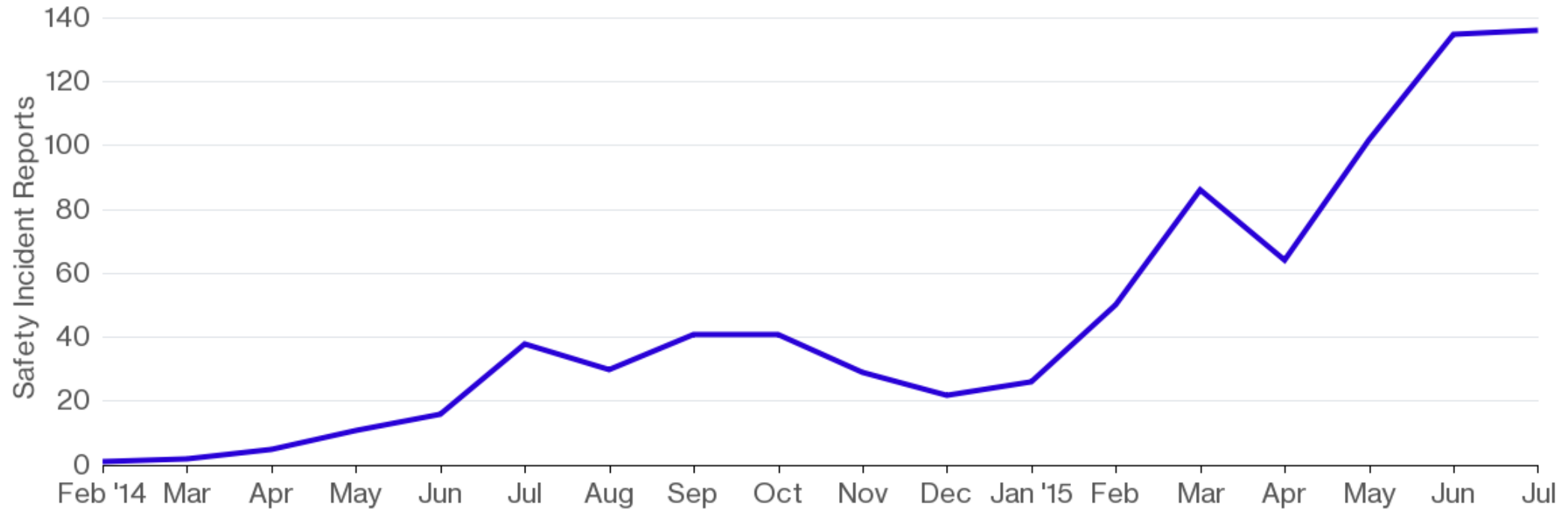


Made by BRINK

Data: AUVSI Economic Report 2013

Drone Safety Incidents Soar

Monthly reports to FAA of drones flying in prohibited areas or too close to other aircraft



Source: Federal Aviation Administration

Note: Monthly totals adjusted to remove duplicate records; there were 115 incidents from Aug. 1 through Aug. 20.





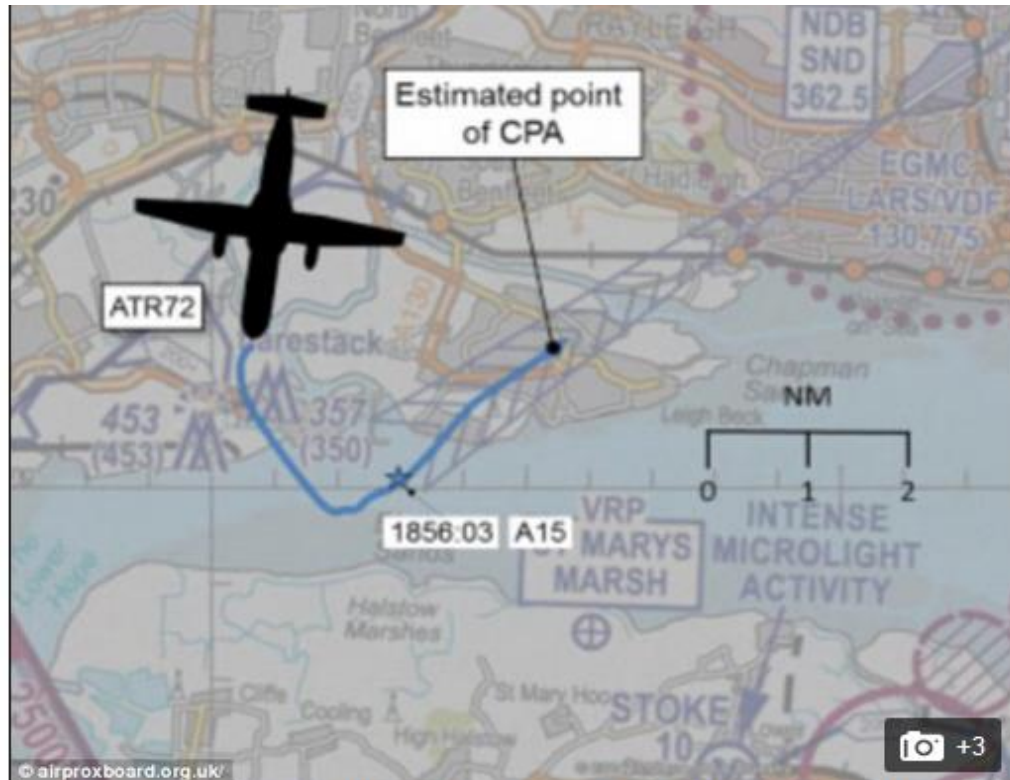


Quadcopter drone 'deliberately flown at passenger airliner' over Essex

- Plane came within 80ft of colliding with drone as it went to land at Southend
- Pilot of 74-seater airliner said quadcopter was 'very close' to right wing-tip
- Co-pilot told investigation drone was deliberately flown at aircraft at 1,500ft
- UK Airprox Board incident report concluded there was 'high risk of collision'

By EMMA GLANFIELD FOR MAILONLINE

PUBLISHED: 09:43 GMT, 26 October 2014 | UPDATED: 16:24 GMT, 27 October 2014



This diagram, which was provided for the UK Airprox Board's investigation, shows the passenger plane (ATR72) on its flight path (blue line) over Southend in Essex and the estimated closest point of approach (CPA)

TRANSCRIPT REVEALS PILOT REPORTING DRONE NEAR-MISS TO OPERATOR

The following transcript, as revealed in the UK Airprox Board report, reveals the conversation between the airliner's pilot (AT72) and the control tower at Southend Airport (ATC) during the incident.

AT72: '...for information when we were on the glide just about to intercept the glide er seen on the right side kind of er you know remote control helicopter er very small engine flying on the right side same altitude'

ATC: 'That's understood roughly what range when you saw that was it'

AT72: 'Just before we intercept the glide was black and red'

ATC: 'That's understood er I'll make a note of that'

AT72: 'Was not sure it was you know a helicopter it looks like it's a brand new thing that are flying around now on remote control'

ATC: 'Oh a quadcopter type thing maybe'

AT72: 'Say again sorry'

ATC: 'Perhaps something like a quadcopter er we've had a couple of those around here er been reported'

AT72: 'Yes exactly that'

ATC: 'Understood'

ATC: '(AT72)c/s do you know roughly how far away the erm model was from you'

AT72: 'er from my point of view it was too close'

ATC: 'Understood'



mögliche Bezeichnungen

- | | |
|---------------|---|
| • Drohne | Überbegriff für autonom fliegende uLflz |
| • uLflz | unbemanntes Luftfahrzeug |
| • Multicopter | „3 oder mehr Rotoren“ |
| • RPV | Remotely Piloted Vehicle |
| • RPAS | Remotely Piloted Aircraft Systems |
| • U(C)AV | Unmanned (Combat) Aerial Vehicle |
| • U(C)AS | Unmanned (Combat) Aerial System |
| • MAV | Micro Aerial Vehicle |
| • FPV | First Person View |



Differenzierung:

- | | | |
|----------------------------------|-----|--------------------------------|
| • Sichtverbindung | vs. | außerhalb Sichtverbindung |
| • manuelle Steuerung | vs. | autonome Steuerung |
| • mit Kamera | vs. | ohne Kamera |
| • Zweck: Flug an sich
„Hobby“ | vs. | Zweck: anderer
„gewerblich“ |

EASA-Regulations

- **31. 08. 15: Consultation Process Launched with A-NPA 2015/10 (40 p.)**
- **18. 12. 15: Technical Opinion on Operation of Drones (50 p.)**
- **2016/2017: Adaptionen auf Basis der Technical Opinion**

Safety

Security

Privacy

Data Protection

Insurance

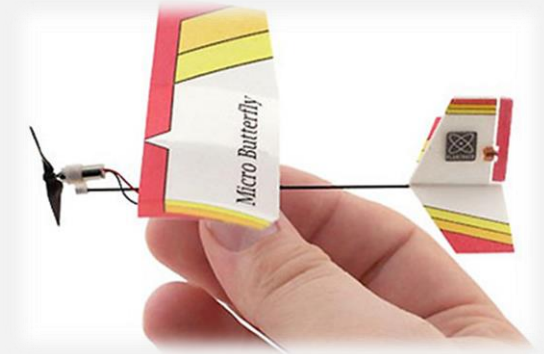
Liability

EASA-Kategorien

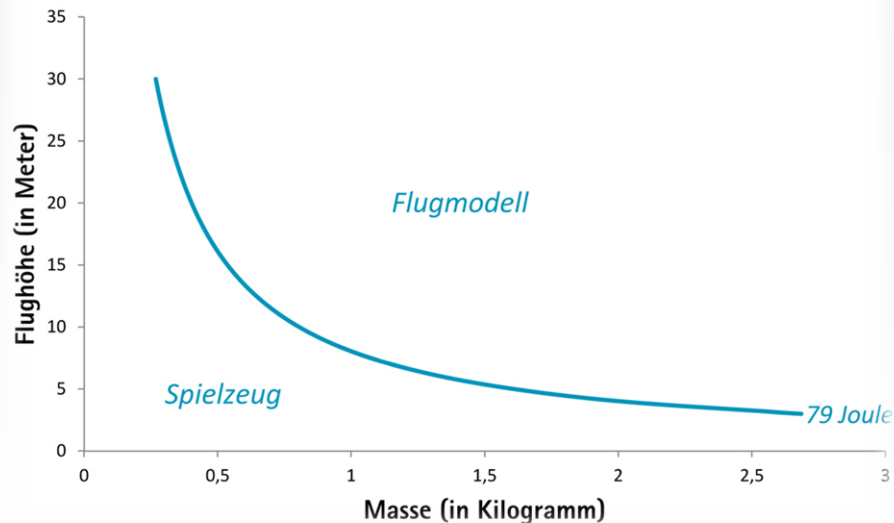
- OPEN Category (**Low Risk**)
 - <25kg, max. 150m, visual contact, **geo-fencing**
 - CAT A0: Toys and Mini Drones <1kg
 - CAT A1: Very Small Drones <4kg
 - CAT A2: Small Drones <25kg
- SPECIFIC Category (**Medium Risk**)
- CERTIFIED Category (**Higher Risk**)
 - comparable to manned aircraft

„Spielzeug“ gem. LFG §24d.

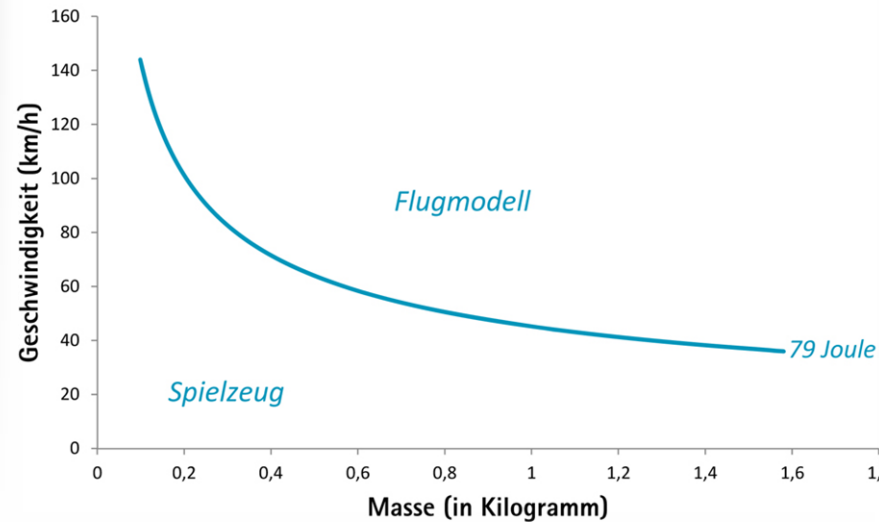
- max. Bewegungsenergie von 79 Joule
 - ca. 250 Gramm
- max. Flughöhe 30m
- keine Gefährdung von Personen oder Sachen



Bewegungsenergie einer Drohne
beim Aufprall



Bewegungsenergie einer Drohne
im Flug



Flugmodell im Hobbybereich

- max. Flughöhe 150m GND
- max. Reichweite 500m um den Piloten = Sichtverbindung
- ausschließlich privater Gebrauch
 - unentgeltlich
 - nicht gewerblich
 - im Freizeitbereich
 - ausschließlich zum Zwecke des Fluges selbst
- keine Gefährdung von Personen oder Sachen
- > 25,00kg: Genehmigungsverfahren
- FPV: nur mit Spotter
- ~~• Fotoflüge?~~

DATENSCHUTZ



uLflz „Klasse 1“ (LFG §24f.)

- auch gewerblich bzw. zu einem anderen Zweck als Flug selbst
- max. Reichweite 500m um den Piloten = Sichtverbindung
- Genehmigung durch ACG & Kennzeichnung
 - max. 150kg
 - max. 150m Flughöhe
- Klasse A-D
- für Klasse C & D: Pilotenschein/Flugrechtsprüfung
- Lufttüchtigkeitsanforderungen

DATENSCHUTZ



uLfz „Klasse 2“ (LFG §24g.)

- Flug OHNE Sichtverbindung = autonomer Flug
- Bewilligung und Zulassung wie bemanntes Lfz (Lufttüchtigkeitszeugnis) gem. EASA (EC) 216/2008
- Pilotenschein
- dzt. nur innerhalb reserviertem Luftraum (Temporary Restricted Area)
 - Fa. SCHIEBEL – im Zulassungsverfahren
 - ÖBH, „TRACKER“ – mil. Zulassung



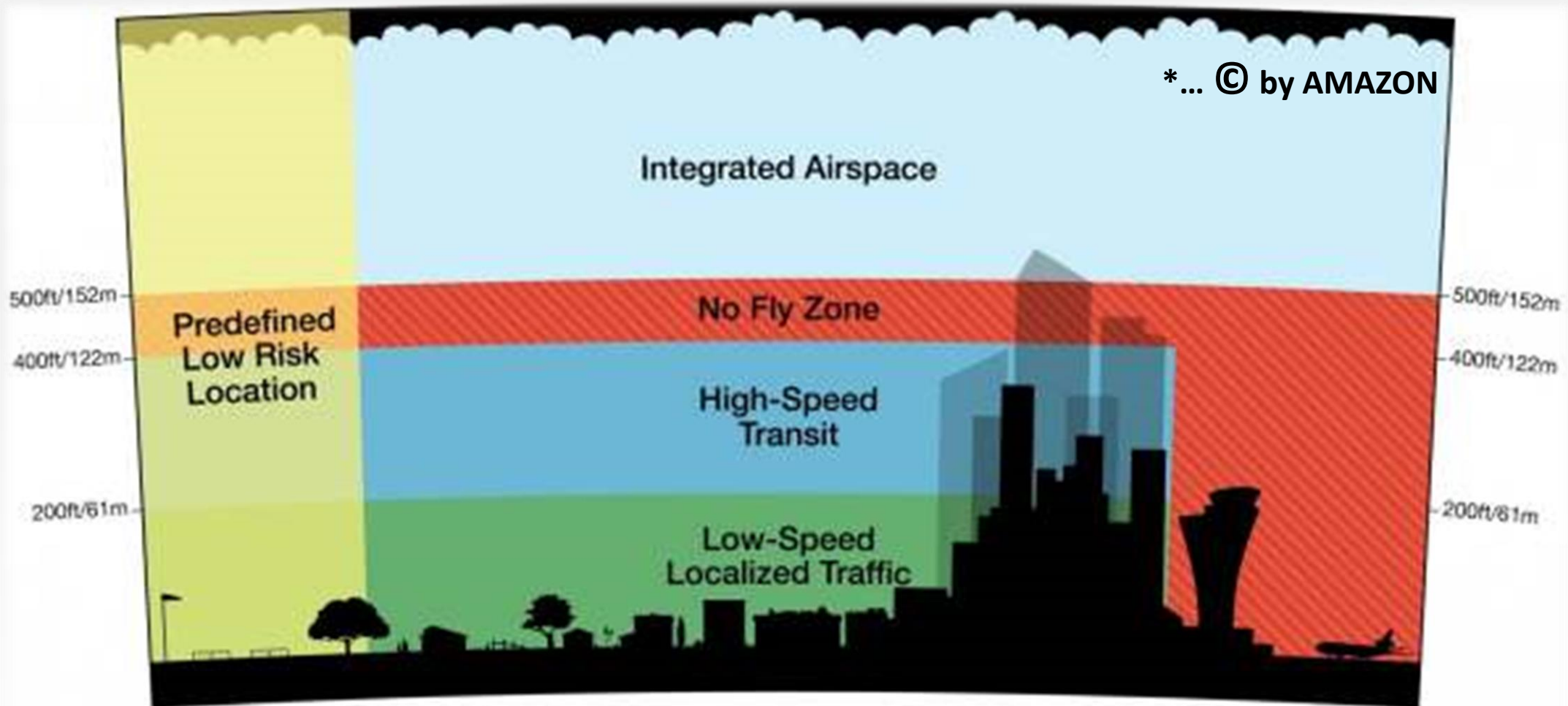
DATENSCHUTZ

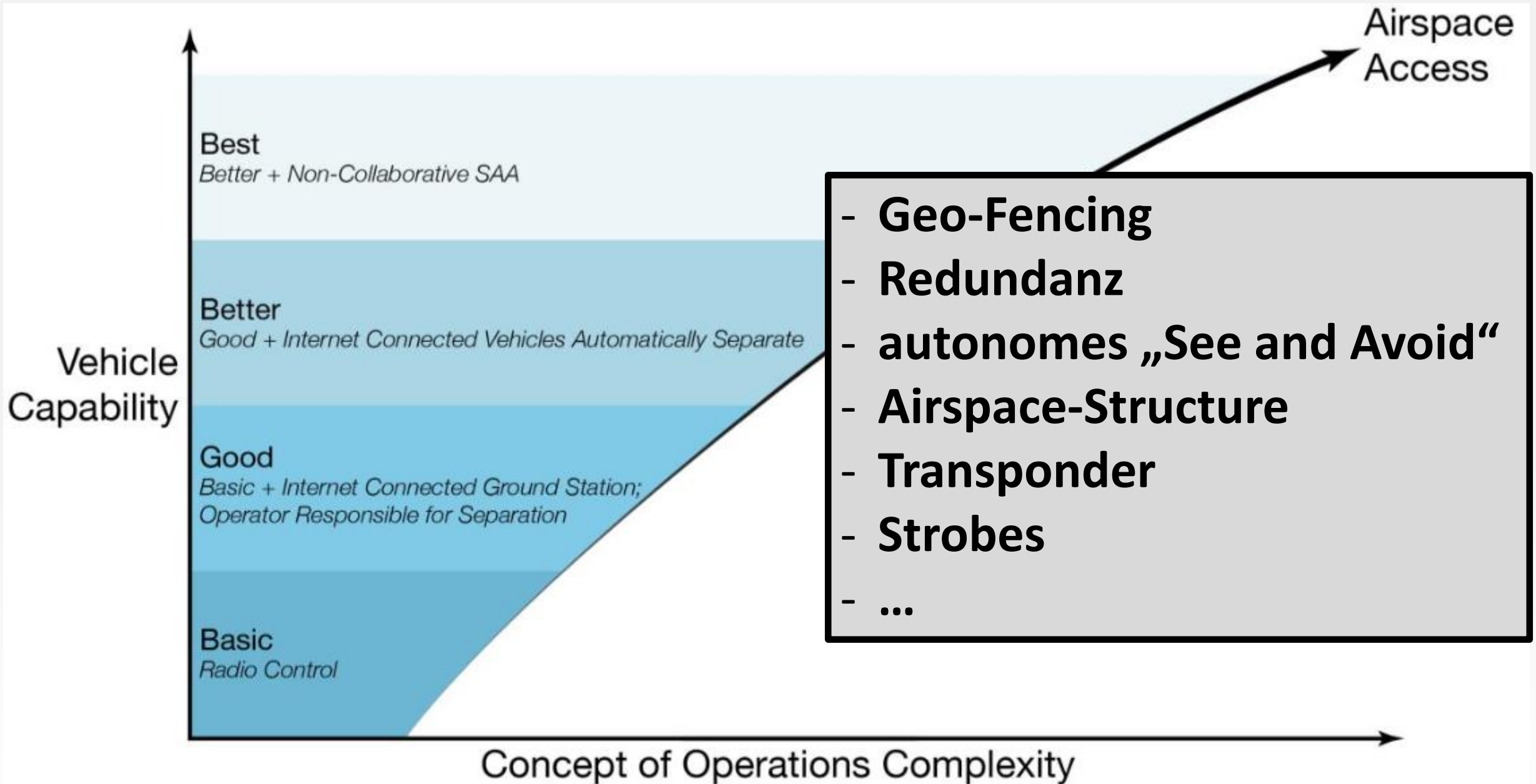
	<i>Spielzeug</i>	<i>Modell klein</i>	<i>Modell groß</i>	<i>uLfz Cat. 1</i>	<i>uLfz Cat.2</i>
<i>Gefährdung</i>	79 Joule	bis 25kg	>25kg	150kg	---
<i>Höhe</i>	30m	150m	150m VFR	150m	lt. Luftraum
<i>Reichweite</i>	---	500m	500m	500m	lt. Luftraum
<i>Kamera, Zweck</i>	---	Sicht*, Hobby	Sicht, Hobby	Sicht & gewerblich	ex. Sicht & gewerblich
<i>Genehmigung</i>	---	---	Ja	Ja	analog manntragend

Einteilung/Zulassung von uLfz – Cat.1

(ACG, 23.12.2015)	Einsatzgebiet			
	I Unbebaut (22)	II Unbesiedelt (149)	III Besiedelt (49)	IV dicht besiedelt (41)
bis 5kg	A	A (147)	B (10)	C (41)
bis 25kg	A	B (2)	C (39)	D (0)
>25kg – einschl. 150kg	B (1)	C	D	D (0)

zukünftige Luftraumstruktur??*





Danke

für die
Aufmerksamkeit

