

# **Bibliographie: Chancen und Risiken der zivilen Dronennutzung**

## **Vorwort**

Diese hier aufgeführte Bibliographie zeigt eine Auswahl an relevanten Publikationen für einen interdisziplinären Zugang zum Forschungsgegenstand der zivilen Dronennutzung. Die Literaturauswahl wurde themenspezifisch aufbereitet und umfasst Studien, die zwischen 2013 und März 2019 erschienen sind.

Leitender Gedanke dieses Überblick ist es, Wissenschaft und Fachöffentlichkeit nicht nur einen Einstieg in die Forschungsthematik der Luftraumerschließung durch unbemannte Flugsysteme zu bieten, sondern insbesondere auch das immanente Spannungsfeld zwischen erhofften Mehrwerten und zentralen Herausforderungen zu illustrieren.

Die Bibliographie ist im Rahmen des BMBF-geförderten Forschungsprojektes “Sky Limits” entstanden, das sich aus sozialwissenschaftlicher Perspektive mit Chancen und Risiken der Luftraumerschließung für den städtischen Liefer- und Personenverkehr befasst.

Dieses Verzeichnis bildete zudem die Datengrundlage einer umfangreichen Literaturauswertung, deren Ergebnisse in Kürze auf der Projektwebsite abgerufen werden können: [www.skylimits.info](http://www.skylimits.info).



## Einstellung und Nutzerakzeptanz

Boucher, P., 2016. 'You Wouldn't have Your Granny Using Them': Drawing Boundaries Between Acceptable and Unacceptable Applications of Civil Drones. *Science and Engineering Ethics* 22, 1391–1418. <https://doi.org/10.1007/s11948-015-9720-7>

Chang, V., Chundury, P., Chetty, M., 2017. Spiders in the Sky: User Perceptions of Drones, Privacy, and Security, in: Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17. Presented at the the 2017 CHI Conference, ACM Press, Denver, Colorado, USA, pp. 6765–6776. <https://doi.org/10.1145/3025453.3025632>

Chamata, J., Winterton, J., 2018. A Conceptual Framework for the Acceptance of Drones. *The International Technology Management Review* 7, 34. <https://doi.org/10.2991/itmr.7.1.4>

Clothier, R.A., Greer, D.A., Greer, D.G., Mehta, A.M., 2015. Risk Perception and the Public Acceptance of Drones: Risk Perception and the Public Acceptance of Drones. *Risk Analysis* 35, 1167–1183. <https://doi.org/10.1111/risa.12330>

Department for Transport, 2016. Public Dialogue on the Use of Drones in the UK.

Joerss, M., Neuhaus, F., Schröder, J., 2016. How customer demands are reshaping lastmile delivery.

Kornatowski, P.M., Bhaskaran, A., Heitz, G.M., Mintchev, S., Floreano, D., 2018. Last-Centimeter Personal Drone Delivery: Field Deployment and User Interaction. *IEEE Robotics and Automation Letters* 3, 3813–3820. <https://doi.org/10.1109/LRA.2018.2856282>

Lidynia, C., Philipsen, R., Ziefle, M., 2018. The Sky's (Not) the Limit - Influence of Expertise and Privacy Disposition on the Use of Multicopters, in: Chen, J. (Ed.), *Advances in Human Factors in Robots and Unmanned Systems*. Springer International Publishing, Cham, pp. 270–281. [https://doi.org/10.1007/978-3-319-60384-1\\_26](https://doi.org/10.1007/978-3-319-60384-1_26)

Lidynia, C., Philipsen, R., Ziefle, M., 2017. Droning on About Drones—Acceptance of and Perceived Barriers to Drones in Civil Usage Contexts, in: Savage-Knepshield, P., Chen, J. (Eds.), *Advances in Human Factors in Robots and Unmanned Systems*. Springer International Publishing, Cham, pp. 317–329. [https://doi.org/10.1007/978-3-319-41959-6\\_26](https://doi.org/10.1007/978-3-319-41959-6_26)

Nelson, J.R., Grubacic, T.H., Wallace, D., Chamberlain, A.W., 2019. The View from Above: A Survey of the Public's Perception of Unmanned Aerial Vehicles and Privacy. *Journal of Urban Technology* 26, 83–105. <https://doi.org/10.1080/10630732.2018.1551106>

Pauner, C., Viguri, J., 2015. A legal approach to civilian use of Drones in Europe. Privacy and personal data protection concerns. *Democracy and Security Review* 85–121.

Wang, Y., Xia, H., Yao, Y., Huang, Y., 2016. Flying Eyes and Hidden Controllers: A Qualitative Study of People's Privacy Perceptions of Civilian Drones in The US. Proceedings on Privacy Enhancing Technologies 2016, 172–190. <https://doi.org/10.1515/popets-2016-0022>

West, J.P., Klofstad, C.A., Uscinski, J.E., Connolly, J.M., 2019. Citizen Support for Domestic Drone Use and Regulation. American Politics Research 47, 119–151.  
<https://doi.org/10.1177/1532673X18782208>

Yao, Y., Xia, H., Huang, Y., Wang, Y., 2017. Free to Fly in Public Spaces: Drone Controllers' Privacy Perceptions and Practices, in: Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems - CHI '17. Presented at the the 2017 CHI Conference, ACM Press, Denver, Colorado, USA, pp. 6789–6793. <https://doi.org/10.1145/3025453.3026049>

Yoo, W., Yu, E., Jung, J., 2018. Drone delivery: Factors affecting the public's attitude and intention to adopt. Telematics and Informatics 35, 1687–1700.  
<https://doi.org/10.1016/j.tele.2018.04.014>

## Ethik und Technikfolgenabschätzung

Bendel, O., 2016. Private Drohnen aus ethischer Sicht: Chancen und Risiken für Benutzer und Betroffene. Informatik-Spektrum 39, 216–224. <https://doi.org/10.1007/s00287-015-0874-0>

Benöhr-Laqueur, S., 2018. 2018 – das Jahr, in dem die deutsche Polizei erstmals Drohnen gegen Gefährder einsetzte. TATuP Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis 27, 14–19. <https://doi.org/10.14512/tatup.27.3.14>.

Boucher, P., 2014. Civil drones in society: societal and ethics aspects of remotely piloted aircraft systems. Publications Office, Luxembourg.

Bogenstahl, C., Ferdinand, J.-P., Weide, S., 2017. Autonome Logistiksysteme für Ballungsräume. Büro für Technikfolgen-abschätzung beim Deutschen Bundestag (TAB).

Christen, M., Guillaume, M., Jablonowski, M., Lenhart, P., Moll, K., 2018b. Drohnen als Partner im Luftraum. TATuP Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis 27, 20–26. <https://doi.org/10.14512/tatup.27.3.20>

Crueger, J., 2018. Das Potenzial von Drohnen in der Archäologie. TATuP Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis 27, 27–31.  
<https://doi.org/10.14512/tatup.27.3.27>

Heesen, J., Schuster, S., Arzt, C., 2018. Ethische und rechtliche Bewertung von Maßnahmen der polizeilichen Drohnenabwehr. TATuP Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis 27, 32–37. <https://doi.org/10.14512/tatup.27.3.32>

Luppicini, R., So, A., 2016. A technoeethical review of commercial drone use in the context of governance, ethics, and privacy. *Technology in Society* 46, 109–119.

<https://doi.org/10.1016/j.techsoc.2016.03.003>

de Molina, M., Santamarina Campos, V. (Eds.), 2018. Ethics and Civil Drones. Springer International Publishing, Cham. <https://doi.org/10.1007/978-3-319-71087-7>

Nentwich, M., Horváth, D.M., 2018a. Delivery drones from a technology assessment perspective. Institute for Technology Assessment Vienna (ITA).

Novitzky, P., Kokkeler, B., Verbeek, P.-P., 2018. The Dual-use of Drones. *Tijdschrift voor Veiligheid* 17, 79–95. <https://doi.org/10.5553/TvV/187279482018017102007>

Philpott, R., Kwasa, B., Bloebaum, C., 2018. Use of a Value Model to Ethically Govern Various Applications of Small UAS. *Drones* 2, 24. <https://doi.org/10.3390/drones2030024>

Schlag, C., 2013. The New Privacy Battle: How the Expanding Use of Drones Continues to Erode Our Concept of Privacy and Privacy Rights. *Pittsburgh Journal of Technology Law and Policy* 13. <https://doi.org/10.5195/TLP.2013.123>

Schneider, S., Bookhagen, B., Eschbach, P., 2018. Forschung im Fluge. *TATuP Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis* 27, 45–50.

<https://doi.org/10.14512/tatup.27.3.45>

Thomasen, K., 2017. Beyond Airspace Safety: A Feminist Perspective on Drone Privacy Regulation. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3143655>

Weber, K., Rinke, B., Alwardt, C., 2018. Dr. Seltsam, oder wie ich lernte, die Drohne zu lieben. *TATuP Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis* 27, 11–13. <https://doi.org/10.14512/tatup.27.3.11>

Wilson, R.L., 2014. Ethical issues with use of drone aircraft, in: *Proceedings of the IEEE 2014 International Symposium on Ethics in Engineering, Science, and Technology*. IEEE Press, Chicago, p. Article No. 56.

## Logistik

Alwateer, M., Loke, S.W., Zuchowicz, A.M., 2019. Drone services: issues in drones for location-based services from human-drone interaction to information processing. *Journal of Location Based Services* 1–34. <https://doi.org/10.1080/17489725.2018.1564845>

Anbaroğlu, B., 2017. PARCEL DELIVERY IN AN URBAN ENVIRONMENT USING UNMANNED AERIAL SYSTEMS: A VISION PAPER. *ISPRS Annals of Photogrammetry, Remote Sensing and*

Spatial Information Sciences IV-4/W4, 73–79. <https://doi.org/10.5194/isprs-annals-IV-4-W4-73-2017>

Bambury, D., 2015. Drones: Designed for product delivery. *Design management review* 26, 40–48.

Brunner, G., Szebedy, B., Tanner, S., Wattenhofer, R., 2018. The Urban Last Mile Problem: Autonomous Drone Delivery to Your Balcony. arXiv:1809.08022 [cs].

Calvo, M., 2016. Uncertainty and Innovation: The Need for Effective Regulations to Foster Successful Integration of Personal and Commercial Drones. *Southwestern Journal of International Law* 22, 189–208.

Carlsson, J.G., Song, S., 2017. Coordinated logistics with a truck and a drone. *Management Science* 64, 4052–4069.

D'Andrea, R., 2014. Guest Editorial Can Drones Deliver? *IEEE Transactions on Automation Science and Engineering* 11, 647–648. <https://doi.org/10.1109/TASE.2014.2326952>

DHL, 2014. Unmanned aerial vehicle in logistics.

Dukkanci, O., Y. Kara, B., Bektas, T., 2019. The Drone Delivery Problem. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.3314556>

Fowler, V., Medlin, D.B., Vannoy, S.A., 2018. Business students' personal branding: An empirical investigation, in: Allison, L., Boutin, P.J., Cumiskey, K.J. (Eds.), *Business Students' Personal Branding: An Empirical Investigation.*" Refereed Proceedings of the Appalachian Research in Business Symposium. Johnson City, pp. 54–58.

Joerss, M., Neuhaus, F., Schröder, J., 2016. How customer demands are reshaping lastmile delivery.

Kunze, O., 2016. Replicators, Ground Drones and Crowd Logistics A Vision of Urban Logistics in the Year 2030. *Transportation Research Procedia* 19, 286–299.

<https://doi.org/10.1016/j.trpro.2016.12.088>

Lotz, A., 2015. Drones in Logistics: A Feasible Future or a waste of effort. *Honors Projects, Paper 204*.

Mathew, N., Smith, S.L., Waslander, S.L., 2015. Planning Paths for Package Delivery in Heterogeneous Multirobot Teams. *IEEE Transactions on Automation Science and Engineering* 12, 1298–1308. <https://doi.org/10.1109/TASE.2015.2461213>

Mazur, M., Wisniewski, A., McMillan, J., 2016. Clarity from above: PwC global report on the commercial applications of drone technology. *Drone Powered Solutions, Price Waterhouse Coopers*.

Murray, C.C., Chu, A.G., 2015. The flying sidekick traveling salesman problem: Optimization of drone-assisted parcel delivery. *Transportation Research Part C: Emerging Technologies* 54, 86–109.

Nentwich, M., Horváth, D.M., 2018b. The vision of delivery drones. *TATuP Zeitschrift für Technikfolgenabschätzung in Theorie und Praxis* 27, 46–52.

<https://doi.org/10.14512/tatup.27.2.46>

Pandit, V., Poojari, A., 2014. A study on amazon prime air for feasibility and profitability: A graphical data analysis. *IOSR Journal of Business and Management* 16, 6–11.

Scott, J., Scott, C., 2017. Drone Delivery Models for Healthcare. Presented at the Hawaii International Conference on System Sciences. <https://doi.org/10.24251/HICSS.2017.399>

Shavarani, S.M., Nejad, M.G., Rismanchian, F., Izbirak, G., 2018. Application of hierarchical facility location problem for optimization of a drone delivery system: a case study of Amazon prime air in the city of San Francisco. *The International Journal of Advanced Manufacturing Technology* 95, 3141–3153. <https://doi.org/10.1007/s00170-017-1363-1>

Wrycza, P., Rotgeri, M., ten Hompel, M., 2017. Spielzeitreduktion autonomer Drohnen für den Transport eiliger Güter durch den Einsatz automatisierter Lastaufnahmemittel im Kontext eines ganzheitlich automatisierten Gesamtsystems. *Logistics Journal: Proceedings*. [https://doi.org/10.2195/lj\\_proc\\_wrycza\\_de\\_201710\\_01](https://doi.org/10.2195/lj_proc_wrycza_de_201710_01)

## **Logistik (speziell: Humanitärer Einsatz)**

Scott, J., Scott, C., 2017. Drone Delivery Models for Healthcare. Presented at the Hawaii International Conference on System Sciences. <https://doi.org/10.24251/HICSS.2017.399>

Haidari, L.A., Brown, S.T., Ferguson, M., Bancroft, E., Spiker, M., Wilcox, A., Ambikapathi, R., Sampath, V., Connor, D.L., Lee, B.Y., 2016. The economic and operational value of using drones to transport vaccines. *Vaccine* 34, 4062–4067.

<https://doi.org/10.1016/j.vaccine.2016.06.022>

Rosser, J.C., Vignesh, V., Terwilliger, B.A., Parker, B.C., 2018. Surgical and Medical Applications of Drones: A Comprehensive Review. *Journal of the Society of Laparoendoscopic Surgeons* 22. <https://doi.org/10.4293/JSL.2018.00018>

## **Nachhaltigkeit**

Coelho, B.N., Coelho, V.N., Coelho, I.M., Ochi, L.S., Haghnazari K., R., Zuidema, D., Lima, M.S.F., da Costa, A.R., 2017. A multi-objective green UAV routing problem. *Computers & Operations Research* 88, 306–315. <https://doi.org/10.1016/j.cor.2017.04.011>

Figliozzi, M.A., 2017. Lifecycle modeling and assessment of unmanned aerial vehicles (Drones) CO<sub>2</sub> e emissions. *Transportation Research Part D: Transport and Environment* 57, 251–261. <https://doi.org/10.1016/j.trd.2017.09.011>

Goodchild, A., Toy, J., 2018. Delivery by drone: An evaluation of unmanned aerial vehicle technology in reducing CO<sub>2</sub> emissions in the delivery service industry. *Transportation Research Part D: Transport and Environment* 61, 58–67.

<https://doi.org/10.1016/j.trd.2017.02.017>

Gulden, T.R., 2017. The Energy Implications of Drones for Package Delivery: A Geographic Information System Comparison. RAND Corporation, Santa Monica.

Kitonsa, H., Kruglikov, S.V., 2018. Significance of drone technology for achievement of the United Nations sustainable development goals. *R-Economy* 4, 115–120.

Koiwanit, J., 2018. Analysis of environmental impacts of drone delivery on an online shopping system. *Advances in Climate Change Research* 9, 201–207.

<https://doi.org/10.1016/j.accre.2018.09.001>

Park, J., Kim, S., Suh, K., 2018. A Comparative Analysis of the Environmental Benefits of Drone-Based Delivery Services in Urban and Rural Areas. *Sustainability* 10, 888.

<https://doi.org/10.3390/su10030888>

Stolaroff, J.K., Samaras, C., O'Neill, E.R., Lubers, A., Mitchell, A.S., Ceperley, D., 2018. Energy use and life cycle greenhouse gas emissions of drones for commercial package delivery. *Nature Communications* 9. <https://doi.org/10.1038/s41467-017-02411-5>

Stolaroff, J., 2014. The Need for a Life Cycle Assessment of Drone-Based Commercial Package Delivery. Lawrence Livermore National Laboratory.

<https://doi.org/10.2172/1129145>

## **Personentransport**

Airbus, 2018. Blueprint: The roadmap for the safe integration of autonomous aircraft.

Horwáth & Partners, 2019. Urban Air Mobility Study Report 2019. Stuttgart.

Uber, 2016. Fast-Forwarding to a Future of On-Demand Urban Air Transportation.

## Recht und Regulierung

Allianz Global Corporate & Specialty SE, 2016. Rise of the Drones: Managing the Unique Risks Associated with Unmanned Aircraft Systems. Munich.

Bischof, C., 2017. Drohnen im rechtlichen Praxistest. Datenschutz und Datensicherheit - DuD 41, 142–146. <https://doi.org/10.1007/s11623-017-0745-8>

Clarke, R., 2014. The regulation of civilian drones' impacts on behavioural privacy. Computer Law & Security Review 30, 286–305. <https://doi.org/10.1016/j.clsr.2014.03.005>

Clarke, R., Bennett Moses, L., 2014. The regulation of civilian drones' impacts on public safety. Computer Law & Security Review 30, 263–285.

<https://doi.org/10.1016/j.clsr.2014.03.007>

Du, H., Heldeweg, M.A., 2017. Responsible Design of Drones and Drone Services - A Synthetic Report. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3096573>

Düsseldorfer Kreis, 2015. Nutzung von Kameradrohnen durch Private.

Hänsenberger, S., Wildhaber, I., 2016. Risiko im Anflug? Die Regulierung ziviler Drohnen. sui generis 3, 82–88. <https://doi.org/10.21257/sg.26>

Jones, T., 2017. International Commercial Drone Regulation and Drone Delivery Services. RAND Corporation, Santa Monica.

Kitonsa, H., 2018. Drone technology for last-mile delivery in Russia: a tool to develop local markets. R-Economy 4, 49–57. <https://doi.org/10.15826/recon.2018.4.2.008>

Nader, N., Reichert, G., 2016. Drohnen im europäischen Luftraum: Erste Regulierungsschritte der EU. cep | Centrum für Europäische Politik, Freiburg.

Skorup, B., 2018. Auctioning Airspace. SSRN Electronic Journal. <https://doi.org/10.2139/ssrn.3284704>

Stöcker, C., Bennett, R., Nex, F., Gerke, M., Zevenbergen, J., 2017. Review of the Current State of UAV Regulations. Remote Sensing 9, 459. <https://doi.org/10.3390/rs9050459>

Storr, P., Storr, C., 2018. The Rise and Regulation of Drones: Are We Embracing Minority Report or WALL-E?, in: Corrales, M., Fenwick, M., Forgó, N. (Eds.), Robotics, AI and the Future of Law. Springer Singapore, Singapore, pp. 105–122. [https://doi.org/10.1007/978-981-13-2874-9\\_5](https://doi.org/10.1007/978-981-13-2874-9_5)

Zwickle, A., Farber, H.B., Hamm, J.A., 2019. Comparing public concern and support for drone regulation to the current legal framework. *Behavioral Sciences & the Law* 37, 109–124.  
<https://doi.org/10.1002/bl.2357>

## **Regierungs- und Kommissionspapiere**

Europäische Kommission, 2014. Ein neues Zeitalter der Luftfahrt: Öffnung des Luftverkehrsmarktes für eine sichere und nachhaltige zivile Nutzung pilotenferngesteuerter Luftfahrtsysteme. Brüssel.

European RPAS Steering Group, 2013a. Roadmap for the integration of civil Remotely-Piloted Aircraft Systems into the European Aviation System: Final report from the European RPAS Steering Group.

European RPAS Steering Group, 2013b. Roadmap for the integration of civil Remotely-Piloted Aircraft Systems into the European Aviation System: Final report from the European RPAS Steering Group: ANNEX 1 - A Regulatory Approach for the integration of civil RPAS into the European Aviation System.

European RPAS Steering Group, 2013c. Roadmap for the integration of civil Remotely-Piloted Aircraft Systems into the European Aviation System: Final report from the European RPAS Steering Group: ANNEX 2 - A Strategic R&D Plan for the integration of civil RPAS into the European Aviation System.

European RPAS Steering Group, 2013d. Roadmap for the integration of civil Remotely-Piloted Aircraft Systems into the European Aviation System: Final report from the European RPAS Steering Group: ANNEX 3 - A study on the societal impact of the integration of civil RPAS into the European Aviation System.

SESAR Joint Undertaking, 2018. EUROPEAN ATM MASTER PLAN - ROADMAP FOR THE SAFE INTEGRATION OF DRONES INTO ALL CLASSES OF AIRSPACE.

SESAR Joint Undertaking, 2016. European Drones Outlook Study Unlocking the value for Europe.

## **Stadt- und Verkehrsplanung**

DLR, 2017. DLR Blueprint: Concept for Urban Airspace Integration. German Aerospace Center (DLR).

Doole, M., Ellerbroek, J., Hoekstra, J., 2018a. Drone Delivery: Urban airspace traffic density estimation. Presented at the Eight SESAR Innovation Days Conference, Brussels.

Doole, M., Mennella, A., Onate, M., Ellerbroek, J., 2018b. Drone Information Service Requirements for U-Space. Presented at the Eight SESAR Innovation Days Conference, Brussels.

Jensen, O.B., 2016. Drone city – power, design and aerial mobility in the age of “smart cities.” *Geographica Helvetica* 71, 67–75. <https://doi.org/10.5194/gh-71-67-2016>

Otto-Zimmermann, K., Roeßiger, F., 2017a. Drohnen – Ihre Invasion in den städtischen Raum hat begonnen. *PLANERIN* 1, 58–60.

Otto-Zimmermann, K., Roeßiger, F., 2017b. Es droht die Drohnen-Dröhnung. *mobilogisch!* 1.

Thipphavong, D.P., Apaza, R., Barmore, B., Battiste, V., Burian, B., Dao, Q., Feary, M., Go, S., Goodrich, K.H., Homola, J., Idris, H.R., Kopardekar, P.H., Lachter, J.B., Neogi, N.A., Ng, H.K., Oseguera-Lohr, R.M., Patterson, M.D., Verma, S.A., 2018. Urban Air Mobility Airspace Integration Concepts and Considerations, in: 2018 Aviation Technology, Integration, and Operations Conference. Presented at the 2018 Aviation Technology, Integration, and Operations Conference, American Institute of Aeronautics and Astronautics, Atlanta, Georgia. <https://doi.org/10.2514/6.2018-3676>

Vetrella, A.R., Axhausen, K.W., Balac, M., 2018. Towards the integration of aerial transportation in urban settings. ETH Zurich. <https://doi.org/10.3929/ethz-b-000193150>

## **Überblicksstudien**

Allen, R., Pavone, M., Schwager, M., 2016. Flying Smartphones: When Portable Computing Sprouts Wings. *IEEE Pervasive Computing* 15, 83–88.

<https://doi.org/10.1109/MPRV.2016.43>

Applin, S.A., 2016. Deliveries by Drone: Obstacles and Sociability, in: Custers, B. (Ed.), *The Future of Drone Use*. T.M.C. Asser Press, The Hague, pp. 71–91.

[https://doi.org/10.1007/978-94-6265-132-6\\_4](https://doi.org/10.1007/978-94-6265-132-6_4)

Boucher, P., 2015. Domesticating the Drone: The Demilitarisation of Unmanned Aircraft for Civil Markets. *Science and Engineering Ethics* 21, 1393–1412.

<https://doi.org/10.1007/s11948-014-9603-3>

Boyle, M.J., 2015. The Race for Drones. *Orbis* 59, 76–94.

<https://doi.org/10.1016/j.orbis.2014.11.007>

Bujak, A., Śliwa, Z., 2017. Increasing role of drones within commercial airspace. *Archives of Transport System Telematics* 10, 3–9.

Chamata, J., 2017. Factors Delaying the Adoption of Civil Drones: A Primitive Framework.

*The International Technology Management Review* 6, 125–132.

<https://doi.org/10.2991/itmrv.2017.6.4.1>

Christen, M., Guillaume, M., Jablonowski, M., Lenhart, P., Moll, K., 2018a. Zivile Drohnen - Herausforderungen und Perspektiven, TA-SWISS. vdf, Bern.

Christen, Markus, Michel Guillaume, Maximilian Jablonowski, Peter Lenhart, und Kurt Moll. „Ferngelenkte fliegende Kisten: Kurzfassung der Studie «Zivile Drohnen – Herausforderungen und Perspektiven» von TA-SWISS“. Bern: TA-SWISS, Stiftung für Technologiefolgen-Abschätzung, 2018c.

[https://www.ta-swiss.ch/?redirect=getfile.php&cmd\[getfile\]\[uid\]=3390](https://www.ta-swiss.ch/?redirect=getfile.php&cmd[getfile][uid]=3390).

DFS, 2016. transmission - Guardian of safety (special issue on drones). transmission (DFS magazine).

Floreano, D., Wood, R.J., 2015. Science, technology and the future of small autonomous drones. *Nature* 521, 460–466. <https://doi.org/10.1038/nature14542>

González-Jorge, H., Martínez-Sánchez, J., Bueno, M., Arias, and P., 2017. Unmanned Aerial Systems for Civil Applications: A Review. *Drones* 1, 2.

<https://doi.org/10.3390/drones1010002>

Hoekstra, J., Kern, S., Schneider, O., Knabe, F., Lamiscarre, B., 2014. METROPOLIS–Urban Airspace Design (Societal Demand & Technology Review (D1.). Delft.

Kramar, V., 2018. Smart Living - Personal and Service Drones, in: Proceedings of the 23rd Conference of Open Innovations Association FRUCT (FRUCT'23). Bologna.

Landrock, H., Baumgärtel, A., 2018. Die Industriedrohne – der fliegende Roboter. Springer Fachmedien Wiesbaden, Wiesbaden. <https://doi.org/10.1007/978-3-658-21355-8>

Lohn, A., 2017. What's the Buzz? The City-Scale Impacts of Drone Delivery. RAND Corporation, Santa Monica. <https://doi.org/10.7249/RR1718>

Otto, A., Agatz, N., Campbell, J., Golden, B., Pesch, E., 2018. Optimization approaches for civil applications of unmanned aerial vehicles (UAVs) or aerial drones: A survey. Networks 72, 411–458. <https://doi.org/10.1002/net.21818>

Rao, B., Gopi, A.G., Maione, R., 2016. The societal impact of commercial drones. Technology in Society 45, 83–90. <https://doi.org/10.1016/j.techsoc.2016.02.009>

Smith, K.W., 2015. Drone Technology: Benefits, Risks, and Legal Considerations. Seattle Journal of Environmental Law 5, Article 12.

Shakhatreh, H., Sawalmeh, A., Al-Fuqaha, A., Dou, Z., Almaita, E., Khalil, I., Othman, N.S., Khreishah, A., Guizani, M., 2018. Unmanned Aerial Vehicles: A Survey on Civil Applications and Key Research Challenges. arXiv:1805.00881.

Singhal, G., Bansod, B., Mathew, L., 2018. Unmanned Aerial Vehicle Classification, Applications and Challenges: A Review. Preprints.

<https://doi.org/10.20944/preprints201811.0601.v1>

van Wynsberghe, A., Soesilo, D., Thomasen, K., Sharkey, N., 2018. Report: Drones in the Service of Society. Responsible Robotics.