

Looming & Lethal:

Assessing the Operational Implications of Drone Use by Mexican Organised Crime Groups

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Cover photo: Canva, Mexico City Outskirts Areal View in the Morning

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Key Takeaways

Since the early 2010s, Organised Crime Groups (OCGs) in Mexico have been steadily integrating Unmanned Aerial Vehicles (UAVs), known as drones, into their criminal operations. Drones present several strategic benefits to OCG members, especially with regards to the trafficking of illicit goods, the surveillance of rival territory, and the coercion of groups who attempt to resist OCG violence. This snapshot analyses how UAVs have impacted these three operational dimensions with varying degrees of intensity. In all three, OCGs have become more motivated to commit crime. At the same time, drones have increased the vulnerability of targets as well as the absence of guardians capable to defend them.

The dimension of trafficking appears as the least risk-prone in the future. On the other hand, the dimension of surveillance emerges as the most complex to counter and the one in which drones might catalyse an exponential increase of criminal activity. Finally, the dimension of coercion poses an intermediate risk, extremely elevated compared to trafficking but less ubiquitous than surveillance.

States and law enforcement can benefit from understanding the impact of UAVs on these three operational domains in order to appropriately counter the phenomenon of criminal UAVs, given the high prevalence of OCGs operating within the American continent. Aware of its differences compared to the United States, as well as its unique strengths, European law enforcement can benefit from this understanding to limit the potential dangers of drones in future criminal operations.

Introduction

On the 6th of January 2024, five charred corpses were found by government forces and a human rights group¹ in Buenavista de los Hurtado, a remote desert town of Guerrero, Mexico's second-poorest state.² The bodies, stacked on top of the roof of a burnt out car³, symbolized not only the competition existing between two of the region's most powerful cartels, *La Familia Michoacana* and *Los Tlacos*⁴, but also the first drone attack carried out by a Mexican organised crime group (OCG) this year.⁵ More recently, on August 2nd 2024, Defense Secretary Luis Crescencio Sandoval acknowledged for the first time that Mexican soldiers operating in the state of Michoacán had been killed by bomb-dropping drones manufactured by the *Cártel de Jalisco Nueva Generación* (CJNG).⁶

Occurrences like these are disconcertingly common in Mexico, a country currently experiencing one of the world's largest criminal insurgencies.⁷ More than 150 OCGs control about a third of its territory and, since 2018, have been responsible for the deaths of over 30,000 people every year.⁸ These increasingly decentralized criminal networks⁹ employ violence to consolidate their authority and garner immense profits through the trade of illicit goods.¹⁰

OCGs engage in a wide range of illegal and extremely profitable business activities, such as drug trafficking, human trafficking, arms smuggling, extortion, money laundering, and gambling.¹¹ Given the particularly lucrative, violent, and competitive markets in which Mexican OCGs operate, innovation for these groups is not simply a priority monetarily but a matter of survival. By continuously evolving their methods and adapting to new technologies, Mexican OCGs can contain rivals, ensure operational efficiency, exploit weaknesses in law enforcement, and exert more significant influence over land and people.¹²

An emerging technology which has been transforming the criminal operations of Mexican OCGs is that of Unmanned Aerial Vehicles (UAVs). UAVs, commonly known as drones, are a type of aircraft operated without a pilot and controlled either semi-autonomously by a human operator or autonomously through artificial intelligence. UAVs can be equipped with sensors, cameras, and payloads, enabling a vast array of applications in the civilian and military field.¹³

⁶ Associated Press, "Mexican Army Acknowledges Some of Its Soldiers Have Been Killed by Cartel Bomb-Dropping Drones," *Washington Post*, August 2, 2024, https://www.washingtonpost.com/world/2024/08/02/mexico-drug-cartel-drone-attacks-soldiers-killed/e369d330-50f4-11ef-9728-3037305a6b0f_story.html.

7 Grillo, El Narco.

https://data.worldbank.org/indicator/VC.IHR.PSRC.P5?locations=MX.

¹ Valeria Ordóñez Ghio, "Autoridades del estado mexicano de Guerrero investigan presunto ataque con drones en la comunidad de Buenavista de los Hurtado," *CNN* (blog), January 6, 2024, https://cnnespanol.cnn.com/2024/01/06/autoridades-guerrero-investigan-presunto-ataque-drones-buenavista-hurtado-orix/.

 ² "Poverty Rate in Mexico by Region 2022," Statista, 2022, https://www.statista.com/statistics/1036147/poverty-rate-mexico-state/.
 ³ "Mexican Authorities Investigate Massacre after Rival Criminal Groups Clash in Remote Desert," *Reuters*, January 7, 2024, sec. Americas, https://www.reuters.com/world/americas/mexican-authorities-investigate-massacre-after-rival-criminal-groups-clash-2024-01-07/

⁴ "Mexican Authorities Investigate Massacre after Rival Criminal Groups Clash in Remote Desert."

⁵ Roger Vela, "Guerra de drones, una nueva fase de narcoviolencia en México," WIRED, January 25, 2024,

https://es.wired.com/articulos/guerra-de-drones-una-nueva-fase-de-narcoviolencia-en-mexico.

⁸ "Intentional Homicides per 100,000 People - Mexico," World Bank Open Data, 2022,

⁹ "Next Generation Organised Crime: Systemic Change and the Evolving Character of Modern Transnational Organised Crime," HCSS, May 15, 2023, https://hcss.nl/report/next-generation-organised-crime/.

¹⁰ Lessing, "Conceptualizing Criminal Governance."

¹¹ UNODČ, "Organised Crime Module 1 Key Issues: Activities, Organization, Composition," 2024, //www.unodc.org.

¹² Krame, Vivoda, and Davies, "Narco Drones."

¹³ Laghari et al., "Unmanned Aerial Vehicles."

Mexican OCGs have been using drones for cross-border trafficking purposes since 2010 but it was only in 2015 that the media increasingly began covering stories about 'narco-drones'. By 2016, Mexico accounted for approximately 5% of the global market for legal drones and in 2019, 2,140 drones were registered in the country, representing an increase of over 2,000% compared to 2016.¹⁴

The use of drones in Mexican OCG operations is more than a domestic threat. Rather, this phenomenon represents a transnational issue affecting one of Europe's most important allies, the United States. The US is the largest drug market in the world¹⁵, with 6% of its population consuming illegal drugs in 2024, the highest rate internationally.¹⁶ Mexico also shares one of the largest land borders in the world with its northern neighbour, an uninterrupted stretch of 3,155 kilometres¹⁷ running from the Pacific Ocean in California to the Gulf of Mexico in Texas.¹⁸

Given the extensive networks existing between many Mexican and European OCGs¹⁹, the criminal landscape in Europe may also be influenced by this emerging trend. Already, the war in Ukraine is contributing to an expanded and lethal use of UAV technology in the continent.²⁰ Therefore, the exchange of tactics, techniques, and procedures (TTP) between transnational criminal networks and the adoption of a 'watch and learn' approach will potentially enable the proliferation of UAVs across criminal operations in Europe.²¹

The phenomenon of UAV use in organised crime represents a broader trend towards the increasing automation of criminal activities. By minimizing physical contact and divesting criminals from carrying out any heinous act directly, the adoption of drones could be responsible for an increase of violence by part of OCGs. The real danger lies in the overlap between the lawless social spaces where OCGs thrive in²² and the highly volatile, largely deregulated domain of semi-autonomous weapons, which might increase apathy and impunity among criminals.²³

This snapshot will analyse three distinct and illustrative case studies from Mexico, showing how UAVs will transform the operational dimensions of: trafficking, surveillance and coercion. Firstly, the case study will be described. Secondly, the episode will be analysed through the theoretical framework of Routine Activity Theory. This paradigm suggests that all crime results from the convergence of three necessary elements: (1) motivated offenders, (2) suitable targets, and (3) the absence of capable guardians who can prevent the crime. Through the case studies, the snapshot will show how the involvement of UAVs in OCG operations increases the chances of a crime occurring through the use of drones. Finally, the snapshot will look at the inherent risks of this emerging phenomenon in a European context.

²³ Cawley, "Drone Use in Latin America."

¹⁴ Krame, Vivoda, and Davies, "Narco Drones."

¹⁵ "Criminal Drone Evolution: Cartel Weaponization of Aerial IEDS - Google Books."

¹⁶ "Drug Use by Country 2024."

¹⁷ "Longest Land Borders Worldwide."

¹⁸ Grillo, El Narco.

¹⁹ Felbab-Brown, "The Foreign Policies of the Sinaloa Cartel and CJNG — Part IV."

²⁰ "How the Drone War in Ukraine Is Transforming Conflict | Council on Foreign Relations."

²¹ Felbab-Brown, "The Foreign Policies of the Sinaloa Cartel and CJNG — Part IV."

²² Lessing, "Conceptualizing Criminal Governance."

Operational Dimension 1: Trafficking

CASE STUDY

The first drug seizure involving a drone occurred on the night of April 24th 2015, along California's border with Mexico. Two young men drove about 20 kilometres away from El Centro, their hometown, towards a farm field in the proximity of Calexico, a city on the Mexican border.²⁴ One of them had reached out to a business associate of his uncle, a drug connection, to purchase marijuana. In exchange for the marijuana, the associate asked him to help smuggle drugs over the U.S.-Mexico border via drone.²⁵ He accepted the offer, recruiting a friend, to drive him to and from the drop-off point. The drug smugglers provided them with a cell phone to coordinate the transaction via encrypted messaging, as well as a remote control which enabled them to release the drugs from the drone's claw upon arrival.²⁶

As the two teenagers waited, a commercial-grade, multirotor aircraft (a DJI Spreading Wings S900²⁷) emerged from the Mexican side of the border. The UAV dropped a 3-kilogram bundle, flew back to Mexico, and repeated the operation three different times over the course of several hours.²⁸ Unbeknownst to both, U.S. Customs and Border Protection (CBP) agents had picked up their movements on a remote camera. The CBP agents then stopped and searched the car, retrieving around 13 kilograms of heroin with a value of around 1.5 million dollars (\leq 1.35 million). Although the teenagers wound up in prison for possession of drugs with intent to distribute, the drone and its pilot on the Mexican side were never found.²⁹

LESSONS LEARNED

The case study offers several insights into the operational implications of drone use for trafficking. By applying Routine Activity Theory, it can be observed how UAVs increase the chances of a trafficking crime being committed across three dimensions: (1) motivated offenders, (2) suitable targets, and (3) absence of guardians. The fact that the drone employed in the Calexico case was commercial grade indicates the wide availability of, as well as easy access to, this technology. The \$3,800 price tag of the S900 model³⁰ may appear much higher than the median pay for a human 'drug mule' (human trafficker) in the early 2010s, which averaged at about \$1300-1600.³¹

However, drones offer several important advantages that human operators lack. They possess night vision, thermal cameras, and GPS-based flights, which enhance their precision and therefore increase the potential success of trafficking missions. Moreover, they are able to bypass physical checkpoints and reach into hazardous or exposed territories by air, facilitating the distribution of goods in previously inaccessible areas. Thirdly, they are controlled

²⁴ "How Many Drones Are Smuggling Drugs Across the U.S. Southern Border? | Smithsonian."

²⁵ Davis, "Man Gets 3 Years in Prison for an Attempt to Smuggle Drugs via Drone."

²⁶ Davis.

²⁷ Sophie Jane Evans, "Two Teenagers Admit Smuggling 30lbs of Heroin from Mexico by DRONE," Mail Online, August 13, 2015, https://www.dailymail.co.uk/news/article-3196501/Two-men-ages-18-19-facing-20-years-prison-admitting-smuggling-30lbs-heroin-Mexico-DRONE.html.

²⁸ "How Many Drones Are Smuggling Drugs Across the U.S. Southern Border? | Smithsonian."

²⁹ "How Many Drones Are Smuggling Drugs Across the U.S. Southern Border? | Smithsonian."

³⁰ Alan Phillips, "DJI Introduces the Spreading Wings S900," DRONELIFE, August 4, 2014, https://dronelife.com/2014/08/04/introducingdji-spreading-wings-s900/.

³¹ David Bjerk and Caleb Mason, "The Market for Mules: Risk and Compensation of Cross-Border Drug Couriers," *International Review of Law and Economics* 39 (August 1, 2014): 58–72, https://doi.org/10.1016/j.irle.2014.05.005.

remotely, meaning they cannot be easily detected or traced back to an OCG, thus providing complete anonymity to its members.³²

Drones require less money, time, and technological investments than air-conditioned subterranean tunnels or semi-submersible boats, which are frequently used means for smuggling goods from Mexico to the US.³³ As a one-time investment, they also do not demand an increase in payment if a mission is successful or must be repeated, like a human operator would. Furthermore, they are able to make several trips in a relatively short amount of time.³⁴ Most importantly, UAVs are unable to share confidential information regarding shipment routes, timetables or OCG tactics and procedures. They therefore do not carry the risk of testifying to authorities in case they are caught.³⁵

The only disadvantages which the Calexico case exemplifies are that drones are not capable of traveling long distances or carrying large-scale shipments, as well as being visually exposed in rural environments compared to urban ones.³⁶ The meeting point of the case study was, in fact, a farming field only 1.5 kilometres away from the Mexican border, while the bundles the drone carried weighed only 3kg each. This is why the drone was forced to make more than one journey. It can be stated that, among the 10 advantages that drones confer to trafficking operations, 10 increase the motivation of criminals, 3 increase suitability of targets, and 5 increase the absence of guardians.



Figure 1. Operational Dimension 1

Motivated Offenders
Suitable Targets
Absence of Guardians

Trafficking

- Widely accessible
- Cheaper than a human
- Streamlining of operations
- Lower visibility
- Lower risk of betrayal .
- Bypassing physical checkpoints
- GPS-based flights
- Access to previously inaccessible territories

³² Krame, Vivoda, and Davies, "Narco Drones."

³³ "How Many Drones Are Smuggling Drugs Across the U.S. Southern Border? | Smithsonian."

³⁴ Bjerk and Mason, "The Market for Mules."

³⁵ Krame, Vivoda, and Davies, "Narco Drones."

³⁶ Krame, Vivoda, and Davies.

Operational Dimension 2: Surveillance

CASE STUDY

The first time a drone was used for surveillance purposes by a Mexican OCG was on the night of the 17th of April 2019. A U.S. border patrol agent stationed in the El Paso Sector, Texas, was able to identify a small airborne object traveling north across the U.S. border through an infrared camera. The UAV travelled at an altitude of about 100 meters above ground and flew back towards the Mexican side shortly after, repeating the operation three times. Approximately two minutes after its last trip to Mexico, a group of 10 subjects was observed attempting to illegally enter U.S. territory, in the same area where the drone had been hovering over. Border Patrol Agents captured and detained all 10 subjects, releasing an official statement in which they confirmed that this episode was the first known time that a drone had been utilized as a 'look-out' to aid immigrants illegally entering the United States.³⁷

LESSONS LEARNED

By applying Routine Activity Theory, it can be observed how UAVs used as scouting and intelligence-gathering tools may increase the chances of a crime being committed across three distinct levels: (1) motivated offenders, (2) suitable targets and (3) absence of guardians. The case study reveals that, when drones are used as surveillance tools, they can provide aerial support for more complex, on-the-ground human trafficking operations, by accessing highly restricted areas unavailable to human observation. In fact, the primary utility of modern commercial UAVs across civilian, military, and government industries is frequently associated with the drone's camera. Aerial photography accounts for about 34% percent of all major commercial drone applications, with UAVs most often being used for remote observation and video monitoring.³⁸

Translating this capability into the criminal dimension entails significant risks. For law enforcement officials in the U.S., UAV surveillance implies a capacity by part of Mexican OCGs to monitor, track and target drug enforcement and border patrol agents on both sides of the border. By providing real-time visual intelligence to OCG members, drones can identify critical infrastructure, monitor areas around and between border points of entry, map strategic terrain and conduct pre-operational planning of smuggling routes in urban and rural regions alike.³⁹

Given that Mexican OCGs are estimated to possess around 17 times more drones than the U.S. Border Patrol Sectors, as well as twice the amount of flight hours and unlimited funding to grow their operations⁴⁰, this phenomenon could lead to a loss of the US state's monopoly over aerial surveillance in the long term.⁴¹ In 2023, the Chief Patrol Agent of the Rio Grande Valley Sector in southeastern Texas testified before the House Oversight and Reform Committee in Washington D.C., stating that Border Patrol in the area had faced over 10,000 drone incursions and 25,000 drone sightings in just a single year. This clearly reveals how surveillance UAVs represent a

³⁷ "El Paso Sector Border Patrol Encounters New Tactics as Smugglers Keep Sending in Families and Felons | U.S. Customs and Border Protection."

³⁸ "Fifty Feet Above The Wall: Cartel Drones in the U.S.-Mexico Border Zone Airspace, and What to Do About Them."

³⁹ "Fifty Feet Above The Wall: Cartel Drones in the U.S. Mexico Border Zone Airspace, and What to Do About Them."
⁴⁰ "Border Agent Describes How Cartels Are Using Drones," accessed August 17, 2024, https://www.newsnationnow.com/us-news/immigration/border-coverage/border-agent-cartels-using-drones/.

⁴¹ "Fifty Feet Above The Wall: Cartel Drones in the U.S.-Mexico Border Zone Airspace, and What to Do About Them."

national threat for the United States, making it a complex phenomenon to counter in terms of drone quantities and available anti-drone technology.⁴²

The surveillance capabilities of UAVs are dangerous for the U.S. but at the same time domestically perilous for Mexico. Drones inside the latter country are employed by OCGs as scouts and spotters against rival groups, with criminals vying for strategic territory and valuable smuggling routes. UAVs have been used by OCGs to gather information to support their own combined arms operations, which tend to involve mounted infantry forces deployed in improvised armoured fighting vehicle-based commando units.⁴³ If aerial support is integrated into combined arms operations, it follows that potential targets such as rival criminals or civilians will become significantly more vulnerable and exposed to airborne violence perpetrated by OCGs.

Lastly, surveillance drones are gradually replacing human lookouts, known as *halcones* or 'falcons', along the border. These intelligence gatherers traditionally help monitor upticks in border patrol activity and receive an average salary of \$100 a month. *Halcones* are usually stationed in buildings with clear views over ports of entry or can be found standing on top of hills with direct visibility across the border. However, since the advent of commercial UAV use in organised crime, *halcones* are being gradually but quickly replaced with fleets of drones, which provide the enormous advantage of being difficult to detect, given their smaller size and low flying altitudes.⁴⁴ Thus, among the 10 advantages that drones confer to surveillance operations, 10 increase the motivation of criminals, 7 increase the suitability of targets, and 6 increase the absence of guardians.



Figure 2. Operational Dimension 2

Motivated Offenders
Suitable Targets
Absence of Guardians

Surveillance

- Support for combined arms operations
- Support for human trafficking operations
- Pre-operational planning
- Tracking/monitoring law enforcement
- Disruption of the monopoly of aerial surveillance
- Provision of real-time tactical intelligence
- Complicated detection ●●

⁴² "Border Agent Describes How Cartels Are Using Drones."

⁴³ "Mexican Cartels Are Embracing Aerial Drones and They're Spreading."

⁴⁴ Rey Koslowski and Marcus Schulzke, "Drones Along Borders: Border Security UAVs in the United States and the European Union," *International Studies Perspectives* 19, no. 4 (November 1, 2018): 305–24, https://doi.org/10.1093/isp/eky002.

Operational Dimension 3: Coercion

CASE STUDY

Weaponized UAVs were emerging in Mexico ever since 2017 but had been restricted to police seizures of bombstrapped drones⁴⁵ or non-lethal threats by cartels blackmailing police officers and high-profile politicians with grenade-equipped aircraft.⁴⁶ It was not until the 20th of April 2021 that, for the first time, a drone operated by a Mexican OCG was directly responsible for the physical injury of two law enforcement officials. Police personnel from the *Secretaría de Seguridad Pública* (SPP) had been operating in the western state of Michoacán, on the highway between the cities of Apatzingán and Aguililla. They were attempting to dismantle an extensive blockade of stones, excavations and armoured vehicles which had been erected by the *Cártel Jalisco de Nueva Generación* (CJNG) to keep the town of Aguililla, a CJNG stronghold, isolated from incoming security forces. The CJNG was at the time violently contending the territory known as 'Tierra Caliente' in a feud war with a rival coalition of cartels known as *Cárteles Unidos* or *La Resistencia*.⁴⁷

In the early hours of Monday 19th of April 2021, SSP personnel thus began their operation by freeing the roads to allow the reopening of lines of communication for the transport of medicines, fuels, and merchandise to besieged citizens. 40 km away from Aguililla, two police officers were suddenly attacked by a pair of weaponized UAVs in the township of El Aguaje, at approximately 1:00 A.M. in the morning. Conflicting reports exist on the exact material utilized for the explosion, but given trends in insurgent warfare, it is speculated that a C-4 based IED (Improvised Explosive Device), presumably loaded with shrapnel, was used for the detonation. It remains unclear which OCG perpetrated the attack exactly but police forces agree on the likely involvement of the CJNG.48



⁴⁵ Krame, Vivoda, and Davies, "Narco Drones."

⁴⁶ "Con drones envían granadas a casa de Sosa Olachea," Semanario ZETA, July 10, 2018, https://zetatijuana.com/2018/07/condrones-envian-granadas-a-casa-de-sosa-olachea/.

⁴⁷ "Liberan Policías de Michoacán Bloqueo Carretero Entre Aguililla y Apatzingán; Los Atacan Con Drones | Aristegui Noticias," accessed September 3, 2024, https://aristeguinoticias.com/2004/mexico/libera-ssp-michoacan-bloqueo-de-carretera-entre-aguililla-yapatzingan/.

⁴⁸ "Mexican Cartel Tactical Note #49: Alleged CJNG Drone Attack in Aguililla, Michoacan Injures Two Police Officers" Small Wars Journal (April 28, 2021), https://smallwarsjournal.com/jrnl/art/mexican-cartel-tactical-note-49-alleged-cjng-drone-attack-aguilillamichoacan-injures-two.

LESSONS LEARNED

Through the application of Routine Activity Theory, the likelihood of future crimes being committed through the weaponization of drones can be understood as increasing across three different levels: (1) motivated offenders, (2) suitable targets and (3) absence of guardians. According to figures from the Mexican Ministry of National Defence, in 2020 there were only 5 drone bombings. In 2021, these increased to 107. In 2022, 233 were counted; while in the first half of 2023, attacks totalled 260.⁴⁹

UAVs are becoming popular weapons among OCG members because they are easily customizable, have the ability to deliver lethal munitions like gunfire, grenades, or deadly chemical or biological substances and often manage to hit on target with extreme accuracy. Indeed, the amount of professional knowledge needed to modify a drone is minimal compared to other high-end technologies, while drug cartels possess enough capital to either invest in and experiment with drones themselves or hire knowledgeable experts to do it for them. The drones used by Mexican OCGs range from basic models, such as the DJI Mini 3, with an average price of \$760, to more advanced and expensive options like the DJI Agras T40, typically employed in agriculture for pest-control fumigation and valued at around \$25,000.⁵⁰ These drones are manually repurposed to carry explosive liquids or modified with galvanized 10cm-long tubes containing gunpowder, pellets, and metal fragments to create makeshift explosive devices.⁵¹

Weaponized UAVs can be further enhanced with the integration of C-4 (Composition-4): a light, easily cuttable and highly malleable plastic explosive which allows its users to change the intensity and direction of the explosion according to the shape it is moulded in.⁵² Criminal innovations in chemistry have also led to findings of weaponized drones strapped with Furadan, one of the most toxic pesticides used in large-scale crop cultivations. A self-defence group in Michoacán which reported this finding confirmed that the highly toxic substance is employed by OCGs to attack their members as well as innocent civilians which these groups attempt to protect.⁵³

As the case study shows, weaponized UAVs could be used to target U.S. Border Patrol agents or critical infrastructure along the border. Because of their surveillance abilities and payload capacity, drones could easily penetrate into the fabric of civil society and harass innocent civilians, threaten them in exchange for ransom, or target high-profile politicians who do not comply with threats. There is thus a heavy psychological component to the use of weaponized UAVs.

Drone air offensives in Mexico's OCG-operated territories can last overnight or even several days. Most of these occur in economically disadvantaged and remote areas where government power is weakened, basic services are lacking, and affected communities are difficult to reach. UAVs enter these territories and damage poles or electricity cables, leaving residents in the dark for days. This instils severe psychological damage in the minds of locals but it is the precise objective of OCGs who consider the population to be a target with the capacity to resist and organize against them.⁵⁴ The risk of weaponized UAVs in civil society is then compounded by the fact that cartels' use of drones as weapons is shifting from single-use to multi-use platforms, employed in combined attacks with armoured vehicles and in sabotage operations.⁵⁵

Thus, out of the 10 advantages UAVs provide to coercion operations, 10 increase the motivation of offenders, 7 increase the suitability of targets, and 5 increase the absence of guardians.

⁴⁹ "Guerra de Drones, Una Nueva Fase de Narcoviolencia En México | WIRED," accessed September 3, 2024,

https://es.wired.com/articulos/guerra-de-drones-una-nueva-fase-de-narcoviolencia-en-mexico.

⁵⁰ "Guerra de Drones, Una Nueva Fase de Narcoviolencia En México | WIRED.

⁵¹ "Fifty Feet Above The Wall: Cartel Drones in the U.S. -Mexico Border Zone Airspace, and What to Do About Them."

⁵² Tom Harris, "How C-4 Works," HowStuffWorks, January 1, 1970, https://science.howstuffworks.com/c-4.htm.

^{53 &}quot;Guerra de Drones, Una Nueva Fase de Narcoviolencia En México | WIRED."

⁵⁴ "Guerra de Drones, Una Nueva Fase de Narcoviolencia En México | WIRED."

⁵⁵ "Mexican Cartels Are Embracing Aerial Drones and They're Spreading."

Figure 4. Operational Dimension 3

Motivated Offenders

Suitable Targets

Absence of Guardians

Coercion

- Sudden nature of attack ●●●●
- Easily modifiable ●
- Versatility of appliable weapons
- Precision strike ●●●
- Anonymity ●●
- Increased access to restricted and remote areas & high-profile individuals
- Psychological intimidation
- Propaganda

 Image: Propaganda
- Multi-use employment ●●

Adapting Lessons to a European Context

Out of all criminal dimensions, trafficking appears as the least risk-prone in the future. This is because the disadvantages of drones currently outweigh their benefits with regards to the transport of illicit goods. Given their size and limited payload capacity, drones can only transport negligible amounts of narcotics across a border per flight, especially compared to other high-volume smuggling conveyances such as tunnels, trucks and boats.⁵⁶ Drones can also only traffic in several, repeated trips, which risks exposing them to security forces. Arms and human trafficking are also not feasible through UAVs, further restricting their potential benefits for such operations. However, an important lesson which can be drawn from the Mexican case study is that drones might be more successful in trafficking if they operate over long borders characterized by rural and/or prevalently uninhabited areas, such as the ones dotting the U.S.-Mexico border.

In a European context, this means that the EU should largely invest in (1) borders exposed to non-EU countries where known OCGs operate in and (2) borders along protracted territorial lines. For example, the extensive land borders existing between: Finland-Russia (1,340kms), Lithuania-Belarus (651km), Poland-Ukraine (535km), Romania-Ukraine (649km), Romania-Serbia (546km) and Romania-Moldova (681 km)⁵⁷ are all more vulnerable to UAV use by organised crime for trafficking. This is because OCGs in the non-EU countries that EU member states border with have extensive land that does not fall under the Schengen Area at their disposal, making cross-border detection legally more complex than in other parts of the EU.

On the other hand, the dimension of surveillance emerges as the most dangerous and complex to counter and the one in which the use of drones might catalyse the greatest exponential increase of criminal activity. This is because drones possess the ability to covertly gather copious amounts of detailed intelligence over vast areas, with minimal physical interference as well as lower chances of detection. The small size, manoeuvrability, and advanced camera technology of many drones allows for continuous, real-time surveillance, making it difficult for authorities to counteract these activities. Contrary to trafficking and coercion, drones do not have to land anywhere or attack anyone physically, making this dimension less visible, less detectable, and more insidious. Lastly, these operations provide a risk in the long-term because they provide OCG members with strategic information which might empower them in future operations. Surveillance is, in fact, not a one-time event but a long-term process of knowledge accumulation, which can build up and present dangerous strategic outcomes for law enforcement.⁵⁸

An important thing to consider when analysing this phenomenon in a European context is the legal and policy harmonization across EU member states with regards to anti-drone surveillance capabilities and airspace regulations. In the US, the airspace is a space of jurisdiction convergence for an extremely large number of government organizations: the Northern Command, Federal Aviation Administration, Immigration and Customs Enforcement, Customs and Border Protection, Federal Bureau of Investigations, Drug Enforcement Agency, local police departments, and their Mexican government counterparts. There is, quite evidently, an overlap and redundancy among agencies, making it difficult to discern a leading organization which can provide clear guidelines and enforce them.⁵⁹ Transposed to a European context, this problem multiplies, making it a hurdle that must be efficiently streamlined if the EU is ever going to face the threat of surveillance drones. European law enforcement

⁵⁷ Great Britain: Parliament: House of Lords: European Union Committee, *FRONTEX: The EU External Borders Agency, 9th Report of Session 2007-08, Report with Evidence* (The Stationery Office, 2008).

⁵⁶ "Fifty Feet Above The Wall: Cartel Drones in the U.S.-Mexico Border Zone Airspace, and What to Do About Them."

 ⁵⁸ "Fifty Feet Above The Wall: Cartel Drones in the U.S.-Mexico Border Zone Airspace, and What to Do About Them."
 ⁵⁹ "Fifty Feet Above The Wall: Cartel Drones in the U.S.-Mexico Border Zone Airspace, and What to Do About Them."

must be aware of the amounts of drones operating in the continent, as well as their predicted increase. Data from 2018 shows that the use of drones in Europe amounts to around 1000 military drones, 1–1.5 million consumer drones, and 10,000 commercial drones. However, the Single European Sky ATM Research (SESAR) forecasts an addition of 200,000 units in 2025 and 395,000 in 2035 for the commercial domain alone.⁶⁰



⁶⁰ de Miguel Molina, Blanca, and Marival Segarra Oña. "The drone sector in Europe." *Ethics and Civil Drones: European Policies and Proposals for the Industry* (2018): 7-33.

Finally, the dimension of coercion poses an intermediate risk, elevated compared to trafficking but less ubiquitous than surveillance. This is because the sudden nature and sharp precision of weaponized UAV attacks does present a significant challenge for the future. The true danger of drones being used in coercion operations comes less from their size, lethality, and impact than from their nimble and stealthy attacks. The element of surprise, coupled with the ability to reach previously inaccessible or heavily guarded areas, poses more of an individual-level threat than a collective one.⁶¹ An explicit and concrete vulnerability is the widely accessible nature of UAVs, which can be easily bought and be repurposed into weapons. European states could leverage their significant role in the commercial drone industry by investing in and developing advanced anti-drone/drone detection technologies, such as radio frequency or radar systems. EU-wide subsidies could be provided to drone manufacturers such as France's *Parrot SA*, Germany's *Ascending Technologies* and the Dutch *Aerialtronics*, which would strengthen European industry, identify an area of specialization within the UAV market for Europe, and offset any inherent risks of over-dependence on Chinese firms, such as DJI, for similar technologies.⁶²

Figure 6. Application of Routine Activity Theory to Operational Dimensions



⁶¹ U. S. Government Accountability Office, "Science & Tech Spotlight: Drone Swarm Technologies | U.S. GAO," accessed September 3, 2024, https://www.gao.gov/products/gao-23-106930.

⁶² de Miguel Molina, Blanca, and Marival Segarra Oña.

Conclusion

This snapshot has measured the likelihood of crime increasing across trafficking, surveillance, and coercion operations by applying Routine Activity Theory to three Mexican case studies. It has identified the advantages and increased motivation which drones bring to criminal offenders in the country, as well the way in which UAVs increase vulnerabilities to which law enforcement and civil society are exposed. As has been exemplified by their prevalent and versatile use in Mexico, drones can have a significant impact on the criminal operations of OCGs which choose to adopt them, and present operational and financial incentives to OCG members. However, the three dimensions will be differently impacted, with varying degrees of severity.

In conclusion, addressing the outlined challenges which the criminal use of UAVs will entail is essential for ensuring the safety of European airspace, as well as to limit the potential harm which European OCGs can inflict in the future. The proposed measures of this research not only enhance Europe's known strategic advantages – a strong rule of law, effective border control and technological innovation – but also prepare governmental agencies, businesses, and civil society to effectively navigate the future complexities of criminal UAVs.

European states and law enforcement can benefit from understanding the impact of UAVs on these three operational domains in order to appropriately counter the phenomenon of criminal UAVs, given the high prevalence of OCGs operating on the continent. Aware of its differences compared to the United States, as well as its unique strengths, European law enforcement can benefit from this understanding to mitigate risks, capitalize on emerging opportunities, and lay the foundations for a more resilient future in the face of advanced criminal technologies.