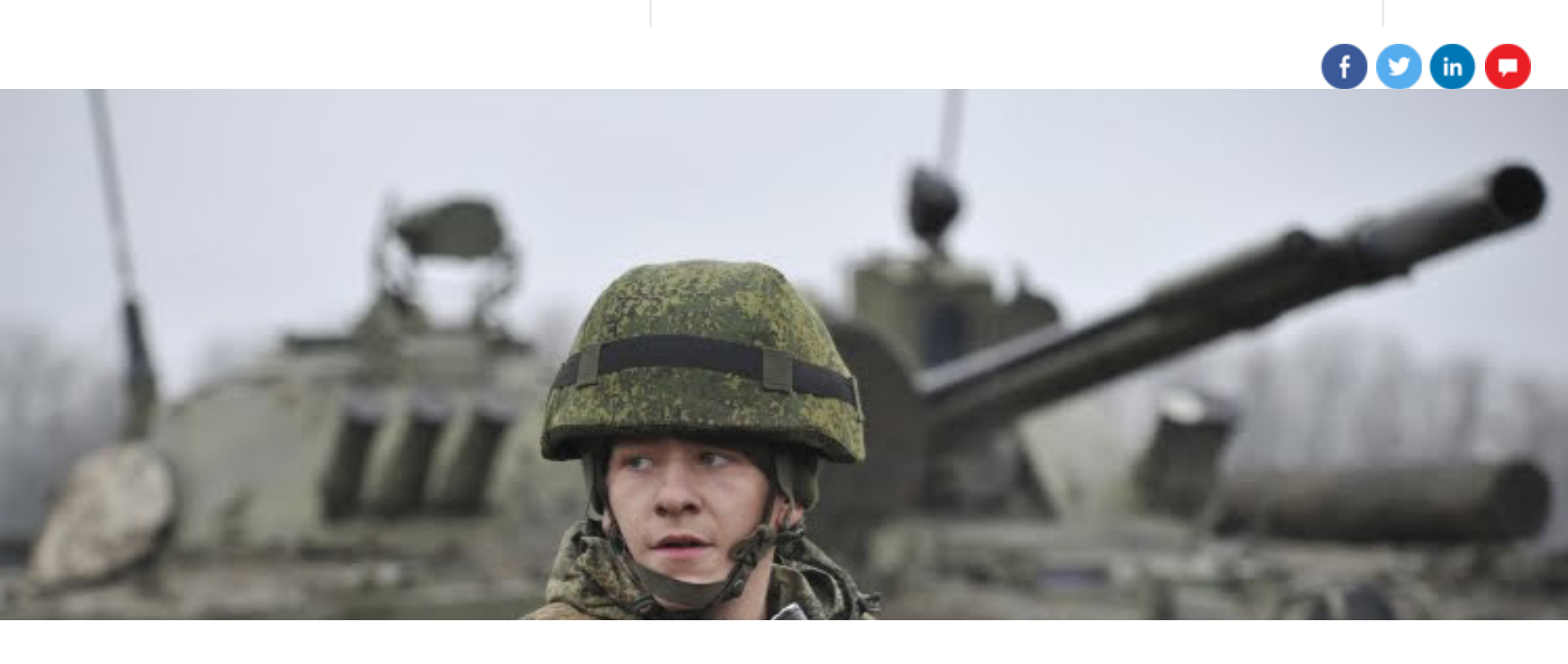

Troop-to-Task: A Russian Invasion of Ukraine

By Ben Connable
February 03, 2022

In this December 8, 2021, Real Clear Defense article, I argued that while Vladimir Putin could easily seize eastern Ukraine, he would regret his decision. Three military consequences of invasion—tied-down military power, an onerous occupation, and a NATO-backed insurgency—might be even more damaging to Russia than threatened Western sanctions. In this notional Ukraine invasion scenario, I examine likely Russian troop requirements and the many daunting challenges of a prospective post-invasion occupation. Bottom line: Even a moderate-risk invasion option intended to seize the eastern third of Ukraine will necessitate an exhausting occupation that will carry many (probably unforeseen) risks and costs for the Russian military.

On January 28th, senior U.S. military leaders warned that Putin appeared poised to significantly expand his 2014 invasion of Ukraine. As of late January 2022, Russia had positioned approximately 100,000 troops around Ukraine's northern and eastern borders. Given the disparity between the Russian and Ukrainian armed forces, Putin has good reason to believe he could succeed. Assuming he does choose to attack—many experts on Russia offer insights into this likelihood—he can then choose to take more or less risk by seizing more or less Ukrainian territory. As my analysis suggests, for every square kilometer of terrain seized and every linear kilometer to the west Putin chooses to push, the more post-invasion risk he incurs.

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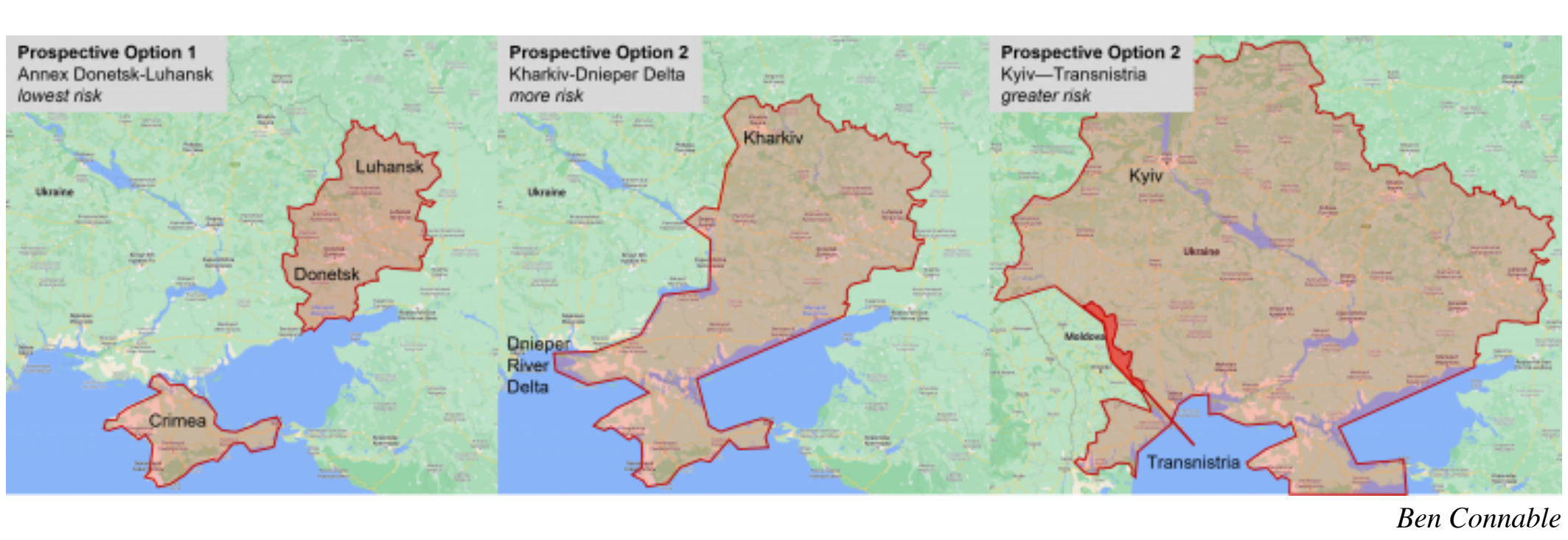
In order to reduce political and economic blowback, Putin may settle for limited military advances and annexation of large parts of the separatist-dominated Donetsk and Luhansk regions in southeastern Ukraine. Or, undeterred by Western threats, he may decide to seize most of Ukraine, including the capital Kyiv and the breakaway territory of Transnistria in eastern Moldova. A middle ground option presents a good starting point for analysis: Russia invades and seizes the eastern third of Ukraine, cementing its hold on Crimea, Donetsk, and Luhansk while creating a buffer against perceived Western encroachment on Russia's sphere of influence. This figure shows all three of these prospective approaches side by side.

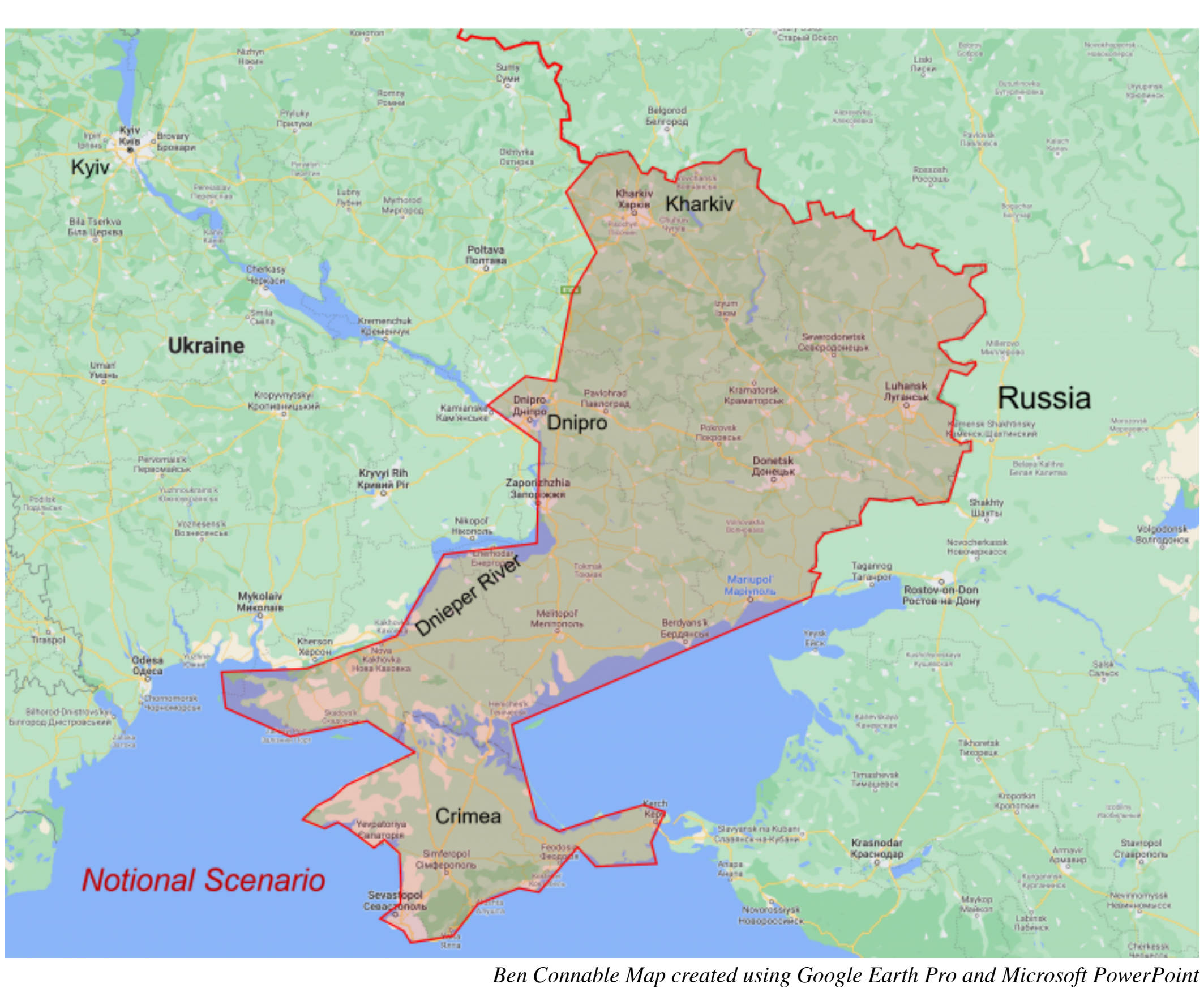
Figure 1: ***Three Prospective Invasion Options***



Ben Connable

My analysis centers on Prospective Option 2. In this notional scenario, Russian ground combat forces advance to a line running roughly from the northeastern city of Kharkiv, to the bend of the Dnieper River at the city of Dnipro, and then cutting southwest to the river's delta. At least, in theory, this limit of advance would allow annexation of the more pro-Russian population in Ukraine while avoiding a more costly and politically fraught attack on the Ukrainian capital, Kyiv. This line would also allow the Russians to use the Dnieper River as a natural boundary to help solidify the front line and defend against potential infiltration and raids. The annotated map below depicts the notional western limit, as well as the territory Russia would need to occupy and secure.

Figure 2: ***Notional Kharkiv—Dnieper Delta Invasion Option***



Ben Connable Map created using Google Earth Pro and Microsoft PowerPoint

The total area of this notional occupied space would be approximately 170,000 square kilometers. By comparison, that is equivalent in size to Florida and slightly smaller than all of Syria (183,000 square kilometers). The total perimeter, not including the land border with Russia but including Crimea—which would now be fair game for Ukrainian and NATO counteractions—would be approximately 1,750 kilometers. That is well over half the length of the U.S.-Mexico border (3,145 kilometers long) and two-thirds of the length of the entire Afghanistan-Pakistan border (the Durand Line, 2,640 kilometers long).

Building from existing order-of-battle estimates, terrain and population analysis, mission analysis, and task analysis for an occupation of eastern Ukraine, Russia would require approximately 83,000 ground and helicopter forces to secure terrain from Kharkiv city in the north to the Dnieper River delta in the south, and to the largely separatist-controlled regions of Donetsk and Luhansk in the east. This estimate assumes a modest threat from NATO-backed Ukrainian raids and infiltrations, insurgency, and civil disruption. It also assumes that Russia does not attempt to seize Ukraine's capital, Kyiv, a move that would sharply increase the burden of occupation.

This force of 83,000 troops represents approximately one quarter of Russia's ground combat power. In order to sustain this notional occupation, the Russians would also have to commit an equivalent force to continual troop rotation. This might tie down another 80,000 troops for a total of approximately 160,000 troops. This represents about half of all of Russia's ground forces.

Holding on to one-third of a country the size of Ukraine cannot be accomplished with Putin's famed little green men. This will not be a cakewalk repeat of the 2014 annexation of Crimea. Occupying tens of thousands of square kilometers of ground and controlling millions of civilians—in this notional case, 170,000 square kilometers and 17 million people—will require tens of thousands of regular Russian infantry soldiers. These troops are woefully unprepared to run a counterinsurgency operation of this scale. Even a small-scale insurgency will lay bare their many vulnerabilities. Russia will almost certainly be forced to deploy many of its one-year conscript troops, risking social blowback at home.

Putin may believe an invasion gives him an advantage over NATO. Given these estimated costs and the degree to which his regular military forces will be exposed, he is likely to be disappointed. For the first time in many years, NATO will have an advantage over Russia. The little-green-men mystique is likely to be replaced by the realities of a highly visible slog. With a modest, consistent effort, NATO and Ukrainian military and special operations forces can work with resistance fighters to tie down half the Russian Ground Force for years. In this scenario, Russian military equipment will be worn down, national cash reserves will be strained, and popular support for Putin will be put to the test.

This all assumes Putin makes the fateful decision to seize a significant portion of eastern Ukraine and that he commits sufficient forces to avoid the kind of disaster the United States experienced after ill-planned withdrawals from Iraq in 2014 and Afghanistan in 2021. Findings are based on the notional scenario and troop-to-task analysis that follows.

These are my informed assumptions and estimates, with sources provided in hyperlinks. My intent is to provide a detailed basis for alternative analyses. I used techniques and referred to graphics readily available in open-source manuals produced by the U.S. military. I have also drawn from research I conducted with my colleagues at the RAND Corporation from 2009-2021, including but not limited to this assessment of Russian ground combat deployment capabilities (with an order of battle analysis and notional Ukraine invasion); this analysis of insurgency cases, this assessment of freedom of movement challenges in counterinsurgency, and this analysis of Russian irregular warfare competition with NATO.

All troop-to-task assessments of prospective military operations—including those undertaken by the staff preparing to fight the war—are inherently flawed. This one is no exception. See the end of the article for important caveats.

I present this analysis in eight steps: (1) estimating the invasion force; (2) describing the challenges of troop-to-task analysis; (3) estimating perimeter security requirements; (4) estimating key node security requirements; (5) estimating line of communication security requirements; (6) describing Russia's challenges with counterinsurgency; (7) estimating population security and civil-military requirements; (8) totaling the estimated occupation force and providing caveats.

Invasion: Putting the Occupation Force in Place

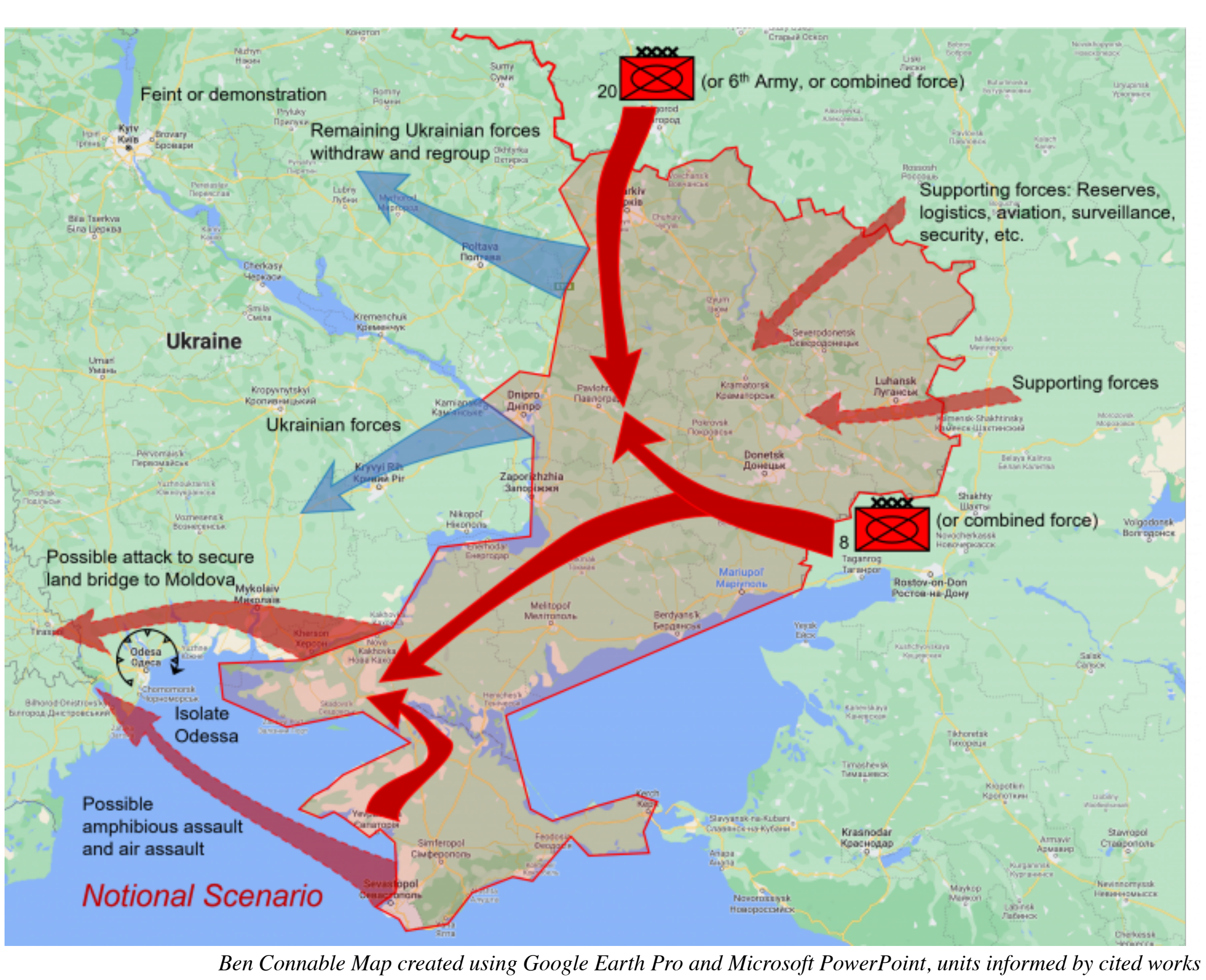
Estimating the size of Russia's invasion force is an exercise in informed guesswork, but it is necessary to help think through the challenges of occupation and possible counteractions. Starting with the existing order of battle estimates or the detailed lists of Russia's ground forces, it looks like the Russians might dedicate about 150,000 troops to seize Ukrainian territory. Some of these will be broken down into semi-independent battalion tactical groups (BTGs) of about 750 soldiers each. Others might remain in larger regimental-and division-sized units for easier command and control. For the purposes of occupation, motorized infantry battalions—many assembled ad hoc from other types of units like armor or logistics—will be needed to perform most tasks.

In this notional case, the invasion force centers on the reinforced 20th Guards Combined Arms Army moving into Ukraine from the north, and the 8th Guards Combined Arms Army looping in to meet them from the southeast. These units are well suited to offensive combined-arms warfare. They can field thousands of armored vehicles, rocket launchers, and artillery tubes to smash Ukrainian infantry and seize terrain. But these troops are in no way prepared for the kind of high-visibility occupation and counterinsurgency campaign that must follow; more on this below.

Special operations and airborne troops will probably be landed to secure key terrain ahead of the ground invasion, and many of these troops will remain to help secure the population and run counterintelligence and partner force advising operations. It is also safe to assume that Russia will deploy combat reserves and paramilitary forces from the new National Guard or Ministry of Interior to help mop up and hold down terrain, but it will want to limit these deployments to avoid weakening control at home.

This notional invasion is depicted on the map in Figure 3 below. In all likelihood, the invasion force will consist of a mashup of different armies, reserve forces, and independent regiments of all types. Russian forces would probably conduct a demonstration against Kyiv to keep the Ukrainians off balance and to support special operations efforts to undermine or replace the government. I include a broadly discussed possible ground, airborne, and amphibious attack to secure Transnistria, and perhaps all of Moldova. This would not be the first time Russians conducted amphibious operations in the Black Sea. The Moldova option would allow Russia to further isolate Kyiv, block another prospective European Union and NATO membership, and tie in its existing de facto occupation forces in Transnistria. Adding the Moldova corridor would significantly increase Russia's occupation requirements.

Figure 3: ***Notional Invasion Scenario***


Feint or demonstration
Remaining Ukrainian forces withdraw and regroup
20
(or 6th Army, or combined force)
Supporting forces: Reserves, logistics, aviation, surveillance, security, etc.
Ukraine
Ukrainian forces
Supporting forces
8
(or combined force)
Possible attack to secure land bridge to Moldova
Isolate Odessa
Possible amphibious assault and air assault
Notional Scenario

Ben Connable Map created using Google Earth Pro and Microsoft PowerPoint, units informed by cited works

Keep in mind that many (perhaps most) of these Russian troops will be non-combat logistics, intelligence, maintenance, communications specialists and will not be available for security operations. In fact, these troops and their equipment are likely to become key targets for NATO-backed Ukrainian resistance attacks.

Occupation Troop-to-Task: The Analytic Challenge

Understanding how many troops the Russians will need to occupy eastern Ukraine requires *troop-to-task* analysis. This is a notoriously difficult and fraught process in the kinds of irregular warfare scenarios the Russians are likely to face post-invasion. While it is relatively easy to estimate the number of troops needed to perform basic tasks like setting up a checkpoint, it is quite hard to estimate how many checkpoints might be needed, and where and for how long, etc.

Arguably, no military force can claim success estimating troop to task in irregular war. The United States failed to get it right in Vietnam, Iraq, and Afghanistan, and even in the conventional 1991 Persian Gulf War, when it deployed more troops than it actually needed to win. Like their American counterparts, the Russians are better at publicly rationalizing troop-to-task decisions than they are at finding the right number. All of these staff have discovered that there are no easy answers to troop-to-task analysis in irregular warfare.

Nonetheless, tempting shortcuts abound. Throughout the Iraq and Afghanistan campaigns, American analysts and military officials referred to a 20:1,000 (2%) troop-to-population ratio for successful counterinsurgency. These troop-to-population security ratios are notoriously unreliable and have weak empirical basis for planning. They should not be blindly applied for troop-to-task analysis for the Ukraine case or any other case. As a point of reference only, the 20:1,000 ratio would mandate the deployment of 340,000 troops (2% of 17 million people in the notional occupied territories in this scenario) or nearly 38 divisions of Russian soldiers with approximately 9,000 per division.

Another popular way to analyze troop requirements is through troop-to-insurgent ratios. Planners would count the number of insurgents and then assign sufficient troops to deter, capture, or kill those insurgents. This approach falls apart at step one: counting insurgents. Historic counterinsurgency cases show that counting insurgents with any accuracy is all but impossible. In some cases, the insurgents themselves are unsure of their own numbers. Even if insurgent numbers are known, figuring out how many troops are needed to defeat them generally leads back to the hard, detailed work of troop-to-task analysis.

Troop-to-task analysis is the least bad approach to occupation and counterinsurgency planning. The best of these least bad estimates require a dedicated team of analysts and operational planners, working together to think through the complex mix of threats and tasks at street level. In 2006 I provided red cell support to a detailed troop-to-task planning effort to determine necessary forces to secure Ramadi, the capital of Anbar Province, Iraq. Planners pored over maps and overhead imagery of every street corner, spoke with officers who knew the terrain, and built spreadsheets detailing requirements for every phase of the operation. It was knowingly imperfect, but it provided an excellent baseline for the adaptive operations that followed.

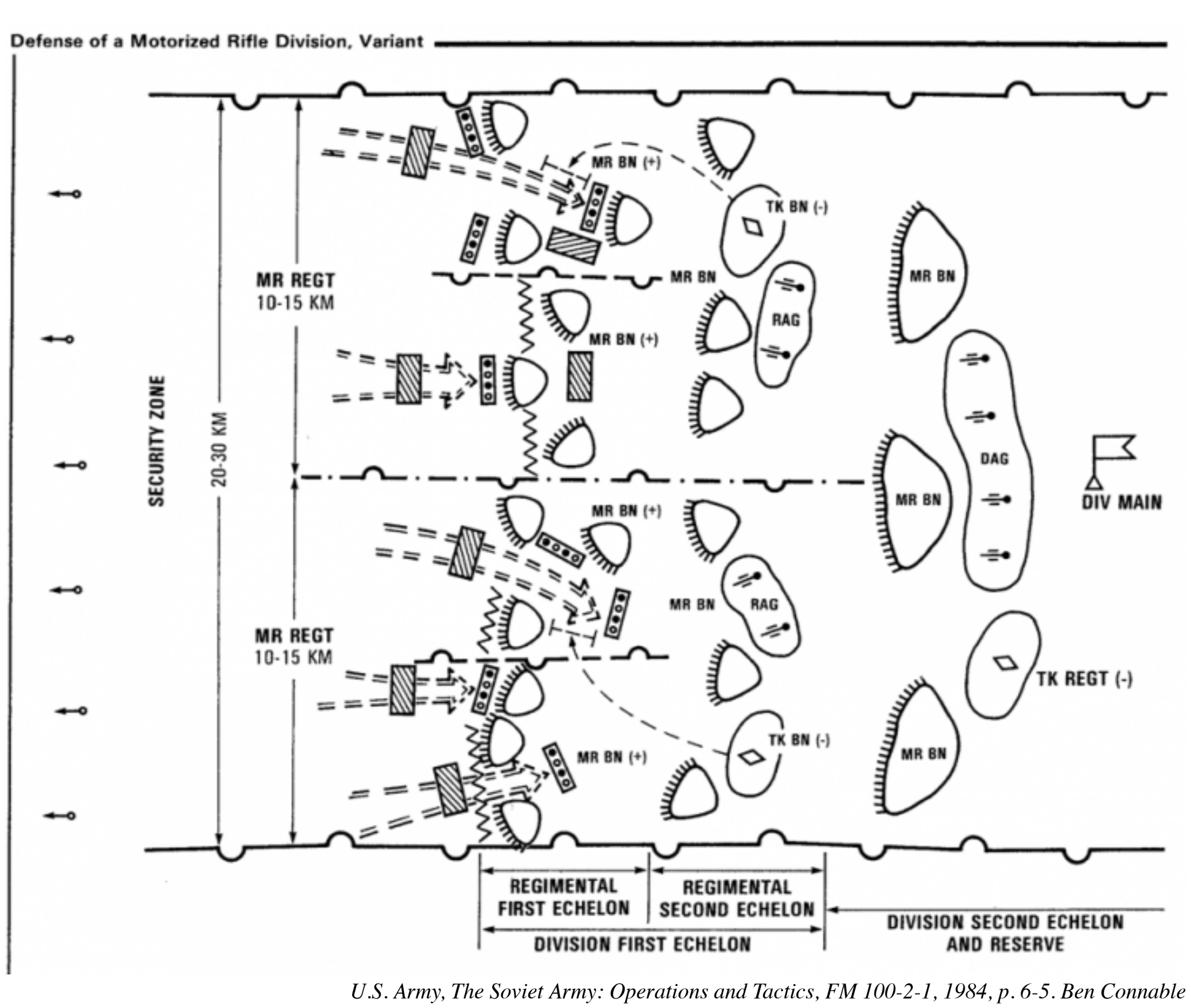
This starting-point analysis also relies on some hard work and informed subjective opinion. It will not be objectively predictive or correct. However, it is worth keeping in mind that nobody in the entirety of the Russian military staff, from battalions to the Ministry of Defense, has a magical formula to help them plan for occupation. They, too, will fail to be objectively predictive or correct.

Troop-to-Task: Threats to Russian Occupation

Once Russia destroys, captures, or forces into hiding or retreat the defending Ukrainians, it will have to secure the north-south Kharkiv-Dnieper delta line, reinforce security in Crimea, and hold the coastline along the Black Sea and the Sea of Azov. Russian forces in the occupied territory will have to defend against at least three threats: (1) limited NATO-backed Ukrainian conventional force raids; (2) NATO and Ukrainian unconventional warfare operations from land, sea, and air; and (3) civil disturbances and insurgency.

A fourth threat—conventional counteroffensive by NATO forces—is highly unlikely but necessary to consider. Ukraine is not a member of the alliance, and there is little Western appetite for a ground war in Europe. In any event, NATO would be hard pressed to come up with the combat power to mount such an attack. Anyone wishing to understand the troop-to-task cost of an integrated Russian defense in depth of the notional occupied territories can review these sources. Figure 4, below, shows a Soviet Army division-level defense. In the defense, the Soviets would assign a front about 25 kilometers long (depending on the terrain) to a division. A modern Russian defense in depth would be similar.

Figure 4: ***Soviet Motorized Rifle Division Defense***



U.S. Army, The Soviet Army: Operations and Tactics, FM 100-2-1, 1984, p. 6-5. Ben Connable

Given advances in sensors and weapons systems, I'm assuming a modern Russian division might comfortably defend 40 kilometers of front in this generally flat terrain. In my notional case, Russia would have to field 18 combined arms divisions just to secure the line between Kharkiv and the Dnieper delta (18 x 40 = 720 kilometers) while holding a bare minimum of three maneuver divisions in reserve. This mission would consume over 50% of the entire Russian Ground Forces (21 x 9,000 troops per division + ~3,000 army headquarters and attachments = 192,000 troops out of ~350,000 total) and still require thousands of more troops to secure the coastline, interior, and all of Crimea. It also would not account for conventional defense in the urban terrain in cities like Kharkiv (about 1.4 million people) and Dnipro (just under 1 million people). Nor would it account for the necessity to dedicate tens of thousands of additional troops to rotate in and out of the occupied territories, a point I address towards the end of this article.

Since a NATO counteroffensive would be unlikely, this notional scenario assumes the Russians will not set up a conventional defense in depth along the Kharkiv-Dnieper delta line or the entire 1,750 kilometer perimeter of occupied Ukraine. Troop-to-task in this notional case centers on defense against raids and unconventional warfare, civil-military operations and counterinsurgency.

Notional occupied Ukraine falls well within Russia's Western Military District integrated air defense system (IADS). There will be no need to forward base fixed wing aircraft or set up extensive air defense capabilities. Organic division- and army-level electronic warfare units will be able to handle NATO and Ukrainian electronic attack and surveillance with little difficulty.

Defending the Perimeter Against Raids and Unconventional Warfare

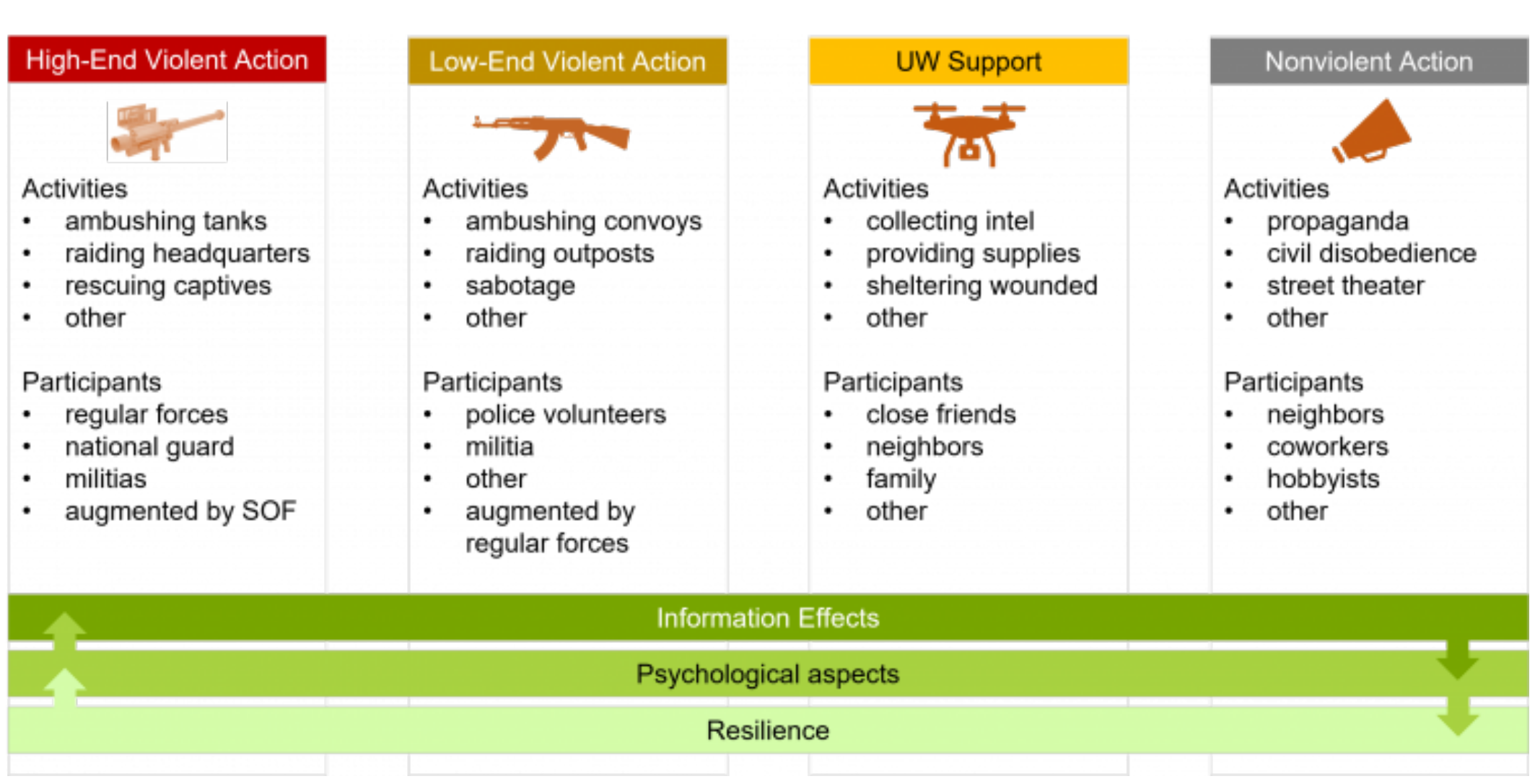
While the Russians may not have to seal the perimeter of the occupied territory with massed conventional forces, they will have to protect it against raids and unconventional warfare activities. Raids are limited military operations with pre-planned withdrawals usually designed to destroy enemy equipment, kill enemy soldiers, or capture prisoners. Unconventional warfare operations enable resistance forces to overthrow (in this case) an occupying power.

Raids can be conducted by regular or special operations ground forces or by air or naval forces. In this notional case, we can expect NATO to back Ukrainian military raids into the occupied territories in order to support unconventional warfare objectives, to undermine Russian military will to fight and bolster Ukrainian national will to fight and to help generate war weariness amongst the Russian population. A Ukrainian Army unit might drive quickly into a seam in Russian defenses, attack supply depots or perhaps vulnerable electronic warfare assets, and quickly withdraw. In 2014, Ukrainian soldiers reportedly conducted a successful armored raid against separatist forces and, possibly, some Russian units. A raid might also be undertaken by armed drones flying explosives into soft Russian targets like refueling sites or communications arrays. Artillery and air raids can deliver fires over the Russian front lines.

Occupation of Ukraine presents a range of opportunities for unconventional warfare. NATO can choose to support Ukrainian special operations inside the occupied territories, send its own special operators behind Russian lines, or both. Special operations teams can conduct their own sabotage and ambush operations against key Russian targets, but according to an unclassified U.S. special operations document, they will most likely provide advice and supplies to the resistance.

A 2019 RAND report describes a prospective resistance operation in the Baltic states against a similar Russian invasion. This table, from page 16 of the report, shows the types and ranges of activities a NATO- and Ukrainian-backed resistance force might undertake against Russian occupation, including unconventional warfare (UW) support. Different elements of the population support different types of resistance activities, ranging from high-intensity combat operations to nonviolent protests. Figure 5 below is adapted from an image in that report.

Figure 5: ***RAND Resistance Action in the Baltic States***



Adapted from Stephen J. Flanagan, et al., Deterring Russian Aggression in the Baltic States Through Resilience and Resistance, Santa Monica, Calif.: RAND Corporation, 2019, p. 16. Ben Connable

In the notional Ukraine case, both the Ukrainians and NATO have laid ample groundwork for a resistance campaign against the Russians. They have cached weapons and communications equipment, trained partisans, and set up networks of stay-behind agents to disrupt Russia's occupation. While these Ukrainian agents can conduct some independent operations, they will need allied special operators to cross Russian lines to provide them with support.

Technology Is Not Enough

If conventional defense requires one combined arms division to cover every 40 kilometers of front, how much linear space can one division protect against ground and low-flying air raids and special operations infiltration? Advanced technology can help the Russians identify movement and cue response forces to stop them. Ground and aerial radars can spot vehicles and even individuals on foot. For example, a Russian military equipment distributor claims the Credo-1E (also see the Credo-M1) moving ground target locating radar is able to detect individual people at ranges of up to 15 kilometers along a 40-kilometer-wide arc. Russia's Beriev A-100 and other airborne surveillance planes might be able to provide ground detection capabilities similar to the U.S. Air Force E-8C Joint Stars radar aircraft. The E-8C can detect moving ground targets from over 250 miles away. Ground forces can flesh out a network of sensors with long-range thermal imagers, cameras, aerostats, and remote detection systems.

Russia's electronic detection and warfare capabilities are impressive. But military analysts are too often inclined to oversell adversary strengths. In practice, securing even short borders is a costly, manpower-intensive, and almost always imperfect activity. The United States military and law enforcement agencies have ample experience failing to seal the border with Mexico, the border between Syria and Iraq, and the border between Afghanistan and Pakistan.

In all of these cases (and others), America's best technologies and people have proven insufficient to stop infiltration. Even with advanced technology, some movement is spotted while some movement goes undetected. Sometimes infiltrators are stopped, and other times they elude interception. NATO and Ukrainian forces will continuously seek out even the smallest gaps in Russian sensors and the narrowest seams of terrain that provide concealment. At least in this notional scenario, they would also use electronic disruption to reduce the efficacy of Russian sensors.

One of the biggest challenges to Russian perimeter security is physical response. It is one thing to detect movement and cross-cue multiple sensors to confirm that movement. It is another thing entirely to mobilize a quick reaction force, move that force to the interdiction site, identify the target, and stop the target. Every refugee, smuggler, fisherman, and even herd of sheep detected by advanced sensors can trigger a new interdiction operation, distracting and exhausting security forces.

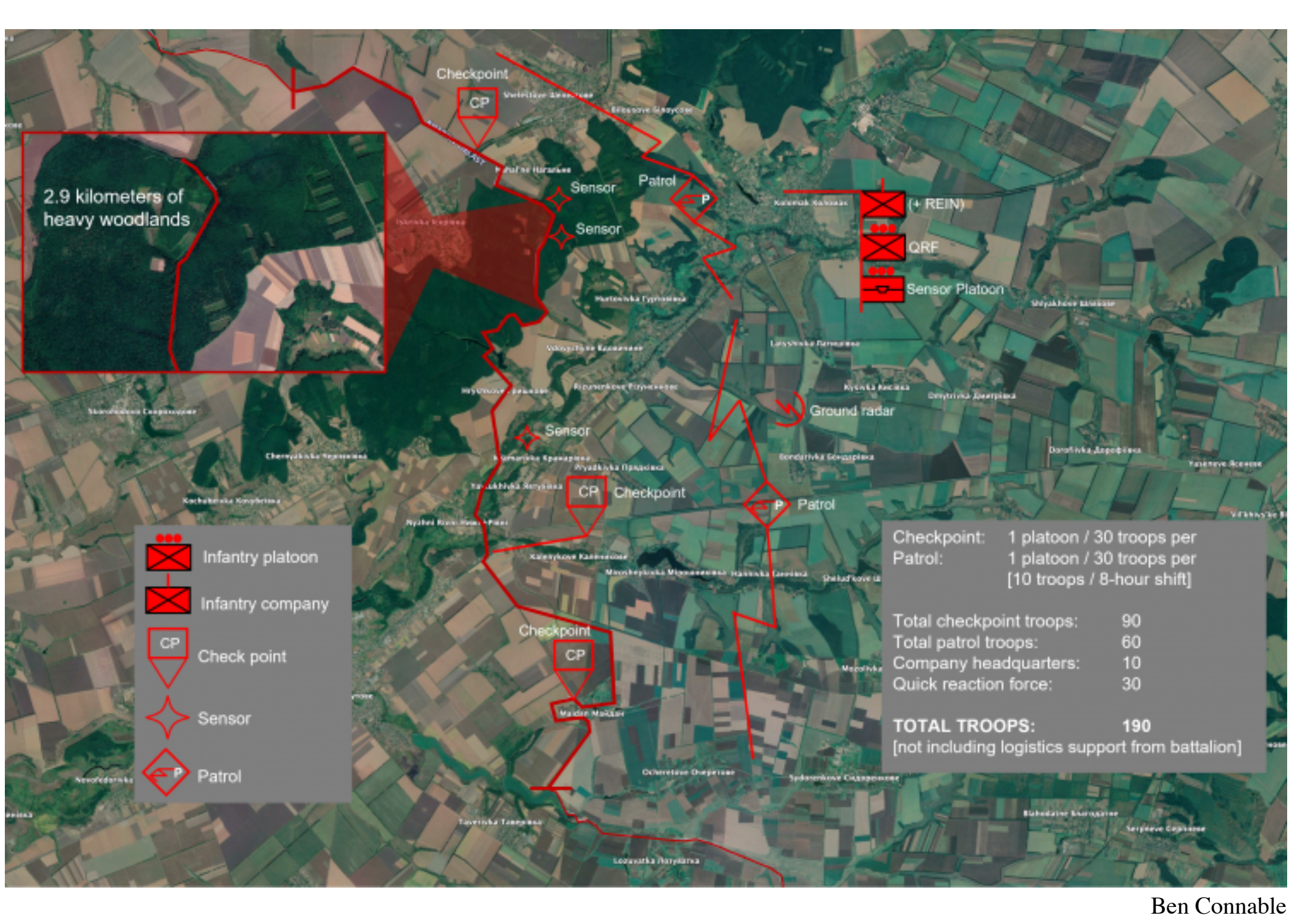
Border checkpoints and posts will have to be permanently manned. Russian troops will find themselves continually negotiating civilian movement over their new, artificial boundary as people try to visit relatives and sell goods. Securing the perimeter of the occupied territories will consume Russian manpower until a large, dependable occupied-force militia can be established. This might take many months or years.

Troop-to-Task: Defending the Perimeter

The figure below depicts a detailed view of a 40-kilometer length of the notional Kharkiv-Dnieper delta line. This perimeter section lies 75 kilometers directly west of the city of Kharkiv, near the town of Kolomak. It shows what is probably a minimal troop presence to deter and help prevent low-flying air raids, ground raids, and infiltration. Russian units are presented using modified U.S. military operational graphics.

In Figure 6, below, a reinforced Russian infantry company located in Kolomak maintains three checkpoints, one each along the generally east-west roadways along the line. Each checkpoint requires one platoon of about 30 soldiers, with about 8-10 soldiers on duty at any one time for 8-hour shifts. Posting fewer soldiers on the forward-most Russian line of troops would significantly increase risk. Similarly, the two patrol areas require one platoon each for 24-hour coverage. A reinforced sensor section monitors unmanned ground sensors in the densely forested area and in the gaps between checkpoints, as well as a ground radar system like the Credo-1E.

Figure 6: ***Securing a 40-Kilometer Linear Boundary***



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This notional 40-kilometer perimeter security operation requires 190 Russian troops upfront. Different terrain around the entire 1,750 kilometer perimeter might necessitate more or fewer troops in different areas. The Kharkiv-Dnieper delta line would require the most forces, while the coastal areas on the Aral Sea, well within a Russian security envelope, would probably require the least attention. Assuming differences will average out, securing only the outermost perimeter of the occupied territory will require approximately 8,400 full-time frontline soldiers (1,750 kilometers / 40 kilometer sections = 44 sections, 44 x 190 troops = 8,360 rounded up).

Perimeter security troop-to-task analysis does not account for the command, logistics, supply, maintenance, communication, aviation, medical, administrative, electronic, engineering, and other support these troops will need. These assets are provided at battalion, regimental, and division levels. According to one U.S. Army source, a Russian motorized rifle battalion contains approximately 540 troops, of which 339 are infantry.

Of these, removing lower echelon command elements (e.g., company commanders, radio operators), I estimate 300 soldiers would be available to patrol and stand checkpoint duty. Grenade launcher, mortar, and anti-tank troops would be repurposed for security duties, adding another estimated 100 security troops (300 + 100). The remaining troops (140 of 540) would perform command, medical, and support duties. All battalion estimates are based on the availability of **400 troops per battalion** for security duties. Given the need for what is effectively two companies per 40 kilometers, it is safe to say a battalion could reorganize those troops into two companies and be assigned an 80 kilometer length of territory for perimeter security.

Battalion depth—the point from the perimeter front to the battalion rear area—with so many forces pushed forward would be about 10 kilometers from front to rear area. If a battalion of three infantry companies and its organic support units of approximately 540 soldiers covers 80 kilometers of perimeter length, covering the whole perimeter would require 11,900 battalion level troops (1,750 kilometers / 80 kilometers = ~22 battalion-sized perimeter sections, 22 sections x 540 troops = 11,880, rounded up).

Since all of these battalions will need divisions and an army to report to, and because the physical distance between battalions will require additional command and control, it is safe to assume that the perimeter security troop-to-task would require two reinforced brigade or division-level headquarters.

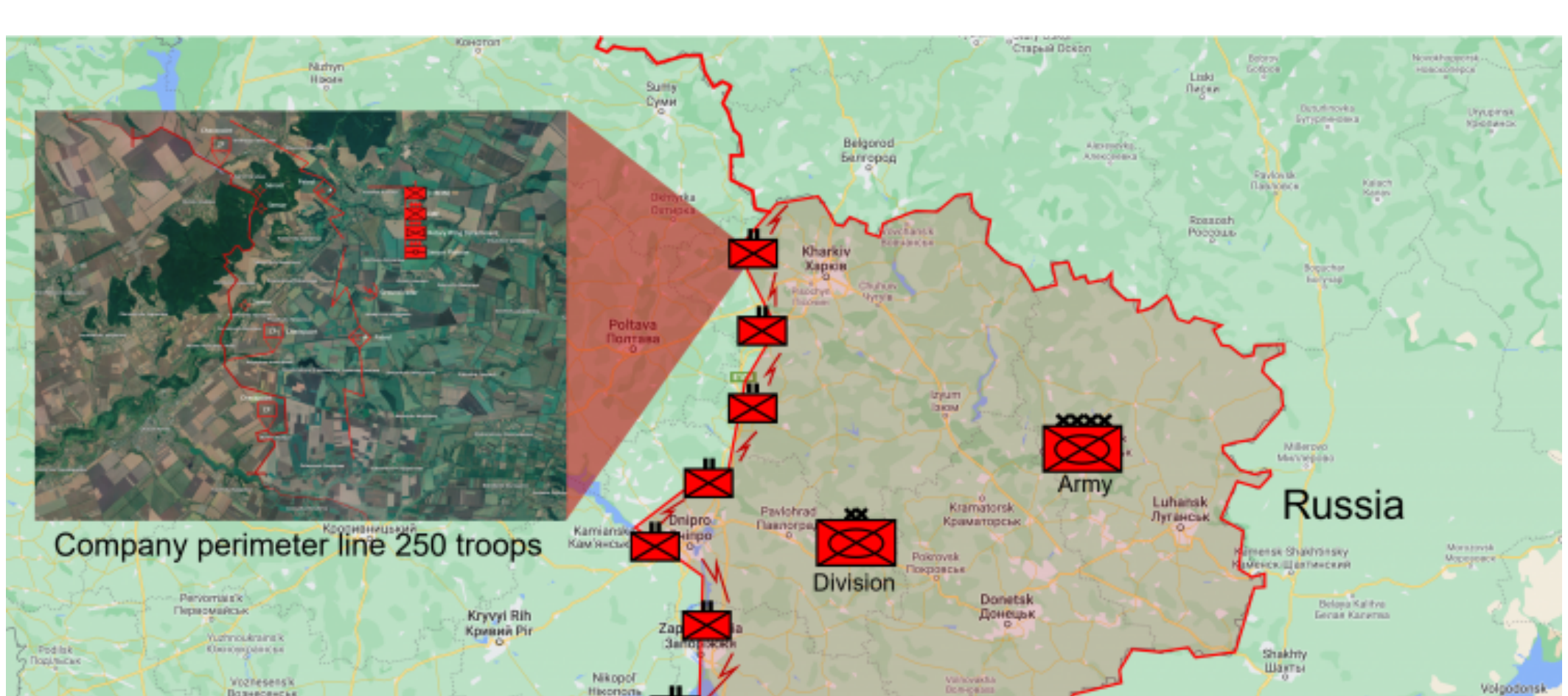
Estimating the total troop numbers of Russian brigade, independent regiment, and division headquarters and support is tricky. This Bellingcat report on the 200th Motorized Infantry Brigade is helpful to understand brigade-level equipment. Russian divisions are smaller than Western counterparts, with more dispersed resources. Order of battle estimates of headquarters units vary. Some brigades have extensive independent capabilities.

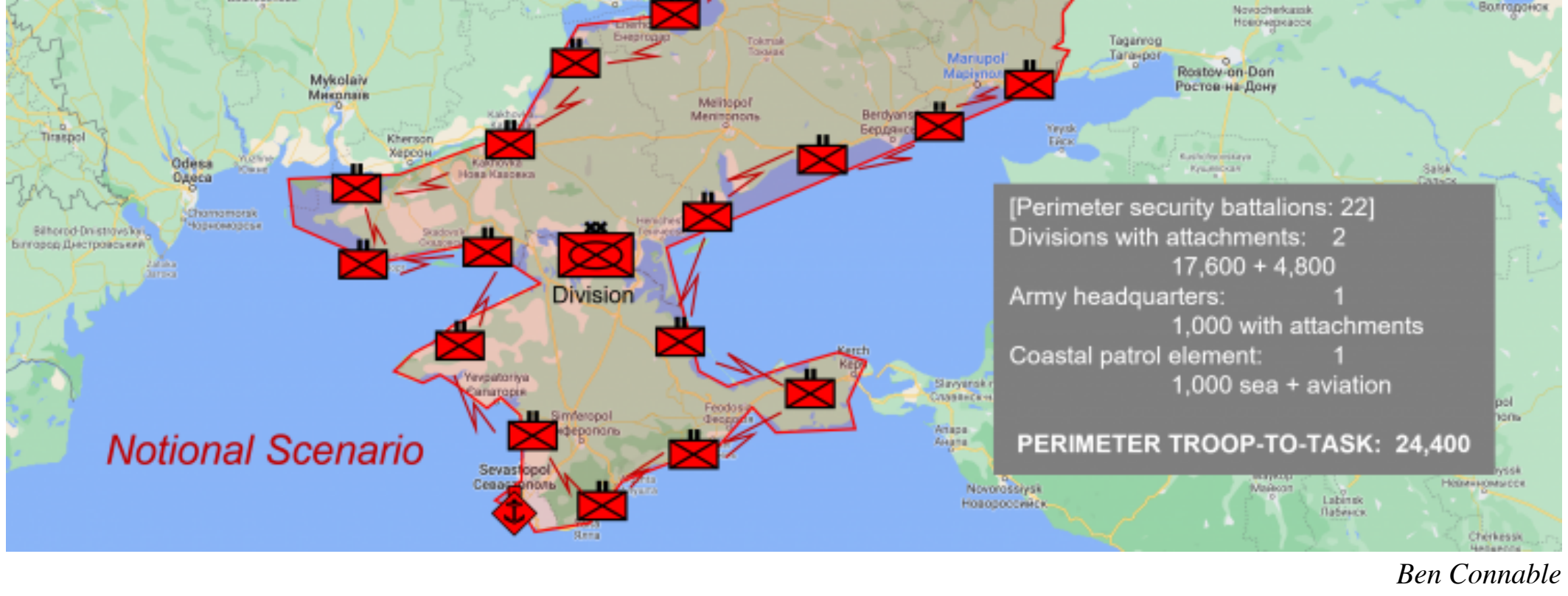
Given the disparities in estimates, ad hoc reorganization needed for occupation duties, and reduced need for brigade-level headquarters, all division-level troop counts in this notional scenario are estimates. They roll together a rough estimate of brigade, regimental, and division support assets.

Order-of-battle sources cited above suggest some brigades, and probably division troops include, at least, a signal battalion of 220 troops, a reconnaissance battalion of 130 troops, an electronic warfare company of 120 troops, an engineer battalion of 300 troops, a chemical-biological-nuclear defense company of 70 troops, and logistics and maintenance battalions that may have approximately 300 troops. Each division would also receive a rotary-wing (helicopter) independent regiment in support. Given the lack of good order-of-battle information on helicopter regiment troop numbers, adding this regiment's pilots, crews, staff, fuel, ammunition, and maintenance troops adds an estimated 1,000 troops. Command elements at the division level, expanded with intelligence and logistics support, might add 250 additional troops. Given these estimates, division echelons add 2,400 troops.

One of the invading army headquarters would stay in Ukraine to run the occupation. A rough estimate adds 1,000 staff and support troops for this headquarters and logistics element. A coastal security unit of approximately 1,000 troops (naval units, maintenance, supply, communications, etc.) would help protect the expanded coastline running east and west out of Sevastopol, Crimea. In total, perimeter security would require approximately **24,400 soldiers** (17,600 + 2x reinforced brigade or division staffs at 4,800 = 22,400 + army staff at 1,000 = 23,400 + coastal security 1,000 = 24,400). Figure 7, below, depicts the battalions, divisions, and army headquarters, as well as the 40-kilometer company level inset for scale comparison.

Figure 7: ***Perimeter Security Disposition and Troop Requirements***





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Perimeter security troops will have to contend with all of the challenges associated with establishing the new boundary, including NATO-backed Ukrainian raids, infiltrations, deception operations. Russian infantry troops will have to adjust from a combat role to an occupation role for which they most likely have not been trained. But these frontline forces may have an easier job than those tasked with securing the interior of the occupied territory.

Securing Vulnerable Nodes and Lines of Communication

Assuming some Ukrainian and NATO raids and infiltrations will succeed and that Ukrainian resistance fighters will conduct acts of sabotage, ambushes, and raids against rear-area Russian forces, additional troops will be needed to secure key nodes and lines of communication. Key nodes include rail yards, airports, communications arrays, supply depots, command centers, ammunition storage sites, and refueling points for the Russian Army's thousands of tactical vehicles. Lines of communication include main and secondary roadways used to move and resupply troops, rail lines used to move supplies and heavy vehicles, and air corridors and sea lanes like the one from the Black Sea to the Sea of Azov east of Crimea.

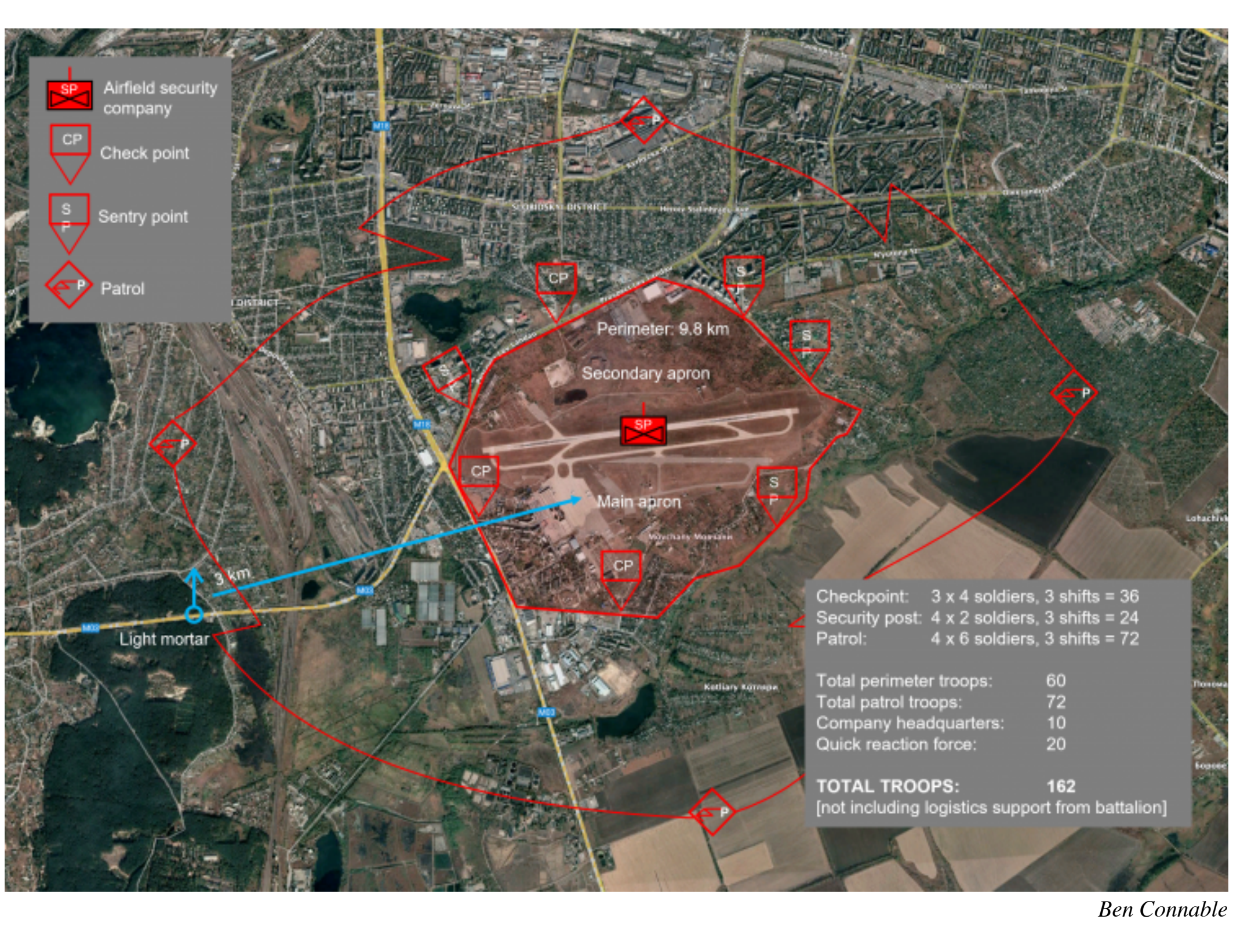
Given the large security area—approximately 170,000 square kilometers, generally equivalent to Florida or Syria—this could be a daunting task. For example, the most direct route from Dnipro (western edge of the territory) east to the Russian border requires traveling along approximately 440 kilometers of road. By comparison, that is just shy of the Freeway 1 route from the Kuwaiti border to Baghdad, Iraq, and equivalent to the Kandahar-to-Kabul route in Afghanistan, or the drive from St. Louis to Chicago in the United States.

There are many thousands of kilometers of roads and rail lines in the notional occupied territories. It would be all but impossible for the Russians to secure every node and every inch of road and rail. But it would also be safe to assume that resistance attacks would focus on the least secure areas, forcing the Russians to reactively move and add security forces just as insurgents forced the American-led coalition forces to do in Vietnam, Iraq, and Afghanistan.

Figures 8-11 below show what key node and line of communication security might require. The first figure shows a notional example of key node security at the Kharkiv International Airport, located at the southern edge of Kharkiv city. This civilian airport is not designed for physical protection and would require significant Russian engineering efforts to build up a fence line, add security towers, improved fuel and ammunition storage, billeting for troops, etc. Similar engineering operations were applied by American troops in Iraq and Afghanistan, and the Russians have put extensive work into protecting their airfields and seaports in northwestern Syria.

In Figure 8, Russians have established a perimeter with three checkpoints for ingress and egress, four sentry posts to help protect against saboteurs, and four active vehicle or foot patrols to help deter and prevent light mortar or drone attacks on the parked Russian military aircraft or facilities. Securing this airfield would require a full company of soldiers, approximately a quarter of one battalion strength. Like the units on border duty, this Russian security company and the aviation unit stationed on the airfield would require fuel, food, medical, administrative, maintenance, ammunition, and other support. Troops from the supporting independent helicopter regiments might provide security forces to help out.

Figure 8: ***Example Securing a Key Node, Kharkiv Airport***


SP Airfield security company
CP Check point
S P Sentry point
P Patrol
Perimeter: 9.8 km
Secondary apron
Main apron
3 km
Light mortar
Checkpoint: 3 x 4 soldiers, 3 shifts = 36
Security post: 4 x 2 soldiers, 3 shifts = 24
Patrol: 4 x 6 soldiers, 3 shifts = 72
Total perimeter troops: 60
Total patrol troops: 72
Company headquarters: 10
Quick reaction force: 20
TOTAL TROOPS: 162
[not including logistics support from battalion]

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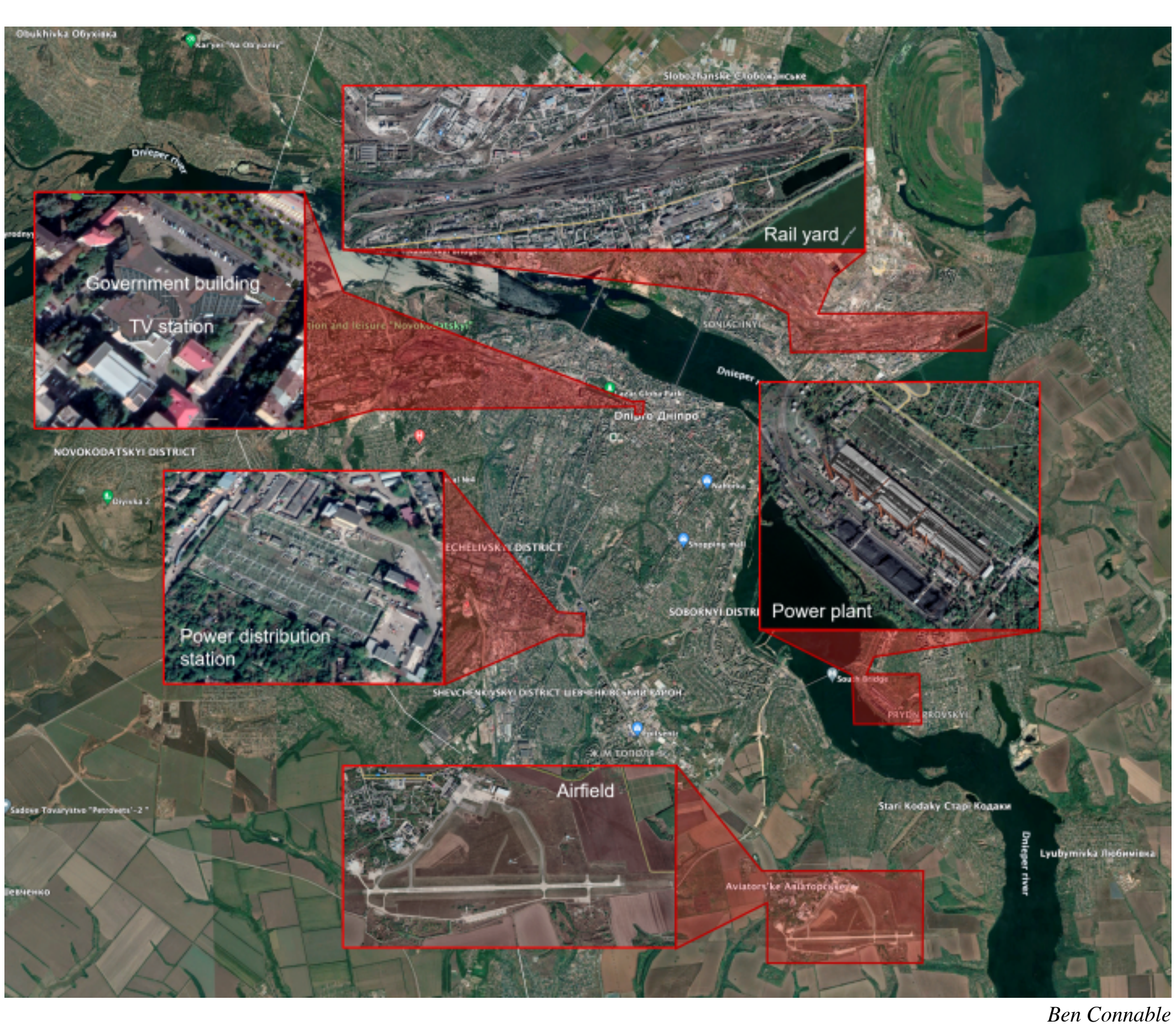
Assuming Russian military units would provide their own security for key military nodes like unit command posts and refueling sites, troop-to-task analysis requires an estimate of key civilian nodes the Russians will need to protect in order to sustain their military operations and support the population. The most important targets in this notional scenario are those most likely to be targeted by resistance forces. Ukrainian resistance fighters would probably not target hospitals or food storage depots, but they might target airfields with dual military and civilian use, rail yards where military equipment would be stored alongside civil equipment, power generation stations used to support Russian military units and keep the population happy, civilian fuel storage sites Russian units draw from, television and radio stations, and, if the Russians coopt the local government and government centers.

The city of Dnipro, on the western edge of the Russian occupied zone, has at least five key nodes. Each of these is identified in Figure 9, below: (1) the government center and adjacent television station; (2) the rail yard; (3) the power plant; (4) the central city power distribution station; and (5) the airport.

Figure 9: ***Notional Key Nodes in Dnipro***



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Definitions of key node vary depending on the situation, on the objectives of the resistance, on the degree to which the Russians seek to win over the population. For the purposes of this notional scenario, each urban area in the occupied territory has five key nodes like the ones identified in Dnipro. At a minimum, there are thirteen urban areas in the notional occupied territories: Kharkiv, Dnipro, Zaporizhzhia, Kakhovka-Nova Kakhovka, Sevastopol, Simferopol, Kerch, Melitopol, Mariupol, Donetsk, Luhansk, Severodonetsk, and Kup'yans'k.

With five key nodes per urban area, Russians would be pressed to secure approximately 65 key nodes. While they would certainly put more effort into securing western nodes over eastern nodes, security requirements would effectively average out (e.g., more than average needed in Dnipro, less in Luhansk). Assuming local Russian units could provide quick reaction forces, the physical security of the key nodes would still require ~140 troops or a reinforced company of soldiers rotating through checkpoint and patrol duties.

Key node security in the occupied territories would therefore require 9,100 troops (65 nodes x 140 troops). Assuming 400 troops per battalion are available for node security, individual battalions could be reinforced to 420 security troops. Every three nodes would require a battalion staff of 140 troops, so the total battalion-level cost for this task would be ~3,100 troops (65 / 3 = 21.6 rounded up, 22 x 140 = 3,080, rounded up). Total battalion cost would be 12,180 troops (9,100 security troops + 3,080 battalion-level). This equates to a reinforced division, adding division-level 2,400 troops for a total of 14,600 key node security troops. Adding this to the perimeter security force of 24,400, the running total for perimeter security and key node security is 39,000 troops.

Troop-to-Task for Line of Communication Security

Key nodes cannot be protected in isolation. Line of communication security is a separate task requiring additional forces. In the figure below, the Russians notionally attempt to secure a key segment of the M03 highway generally running from Kharkiv southeast towards Crimea, the Russian border, and the generally (but inconsistently) pro-Russian Donetsk and Luhansk oblasts. Points suitable for resistance ambushes and mine attacks are highlighted with inset images. Russian forces could choose to avoid using the M03 highway and support Kharkiv from the much closer northern border. But taking too many security risks along interior lines of communication would undermine their control of the occupied territories and effectively create an interior haven for the resistance.

In Figure 10, below, the Russians choose to secure this 36 kilometer segment of the M03 from Chuhiv to Volokhiv with a reinforced motorized infantry platoon. Soldiers stand rotating 8-hour shifts on checkpoints and in patrol vehicles. These shifts could be stretched to 12 hours each at the cost of speeding troop exhaustion and increasing vulnerability to infiltration and attack.

Figure 10: ***Securing Interior Lines of Communication, Tactical***

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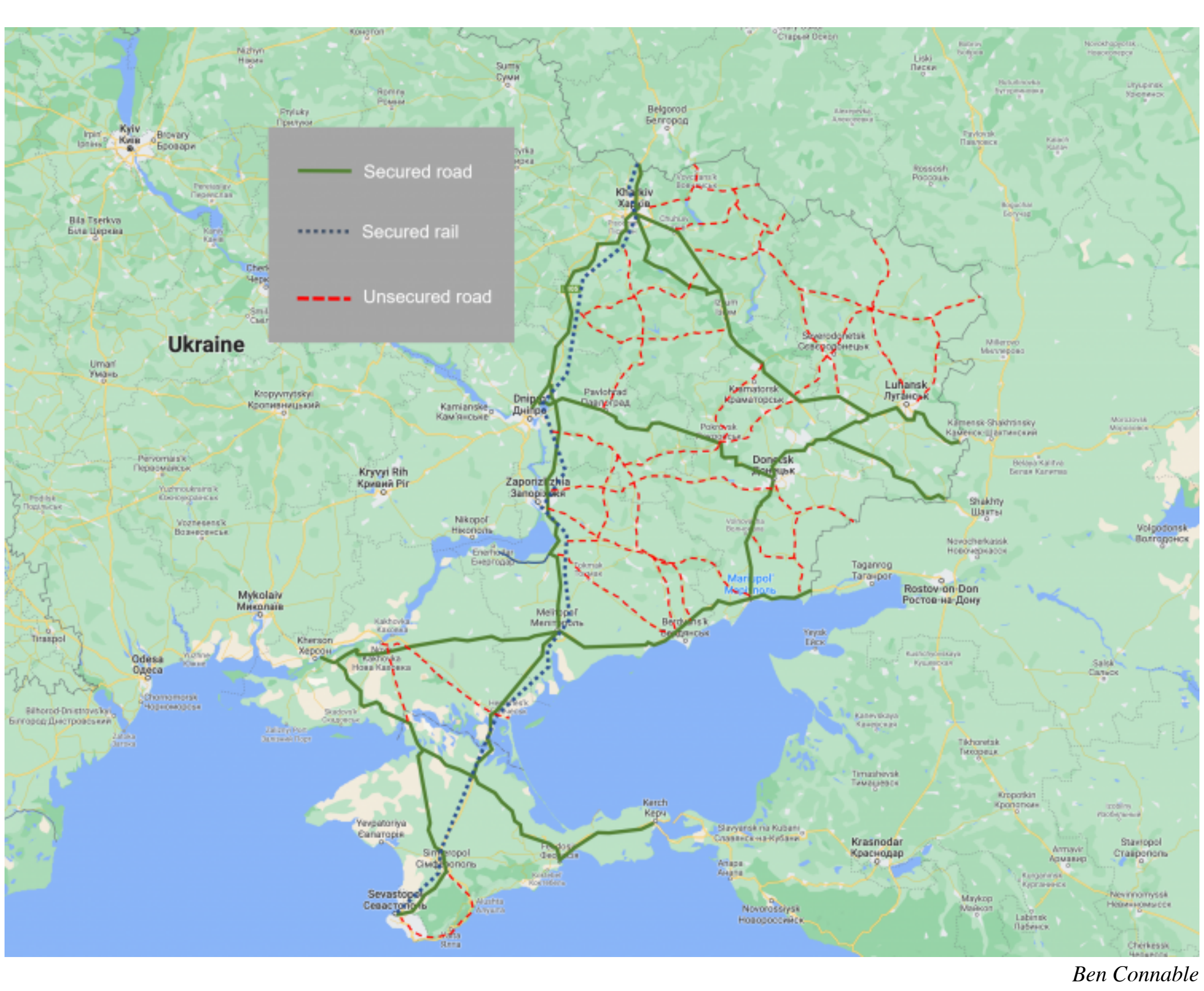
Extrapolating from this road section, every ~40 kilometers of secured roadway will require two checkpoints and one mobile patrol manned by a reinforced platoon of 63 Russian soldiers. Risks will be taken on other routes, and troops will have to be shifted (or increased) according to the need for freedom of movement and threats.

Figure 11, below, shows the routes the Russians choose to secure, providing basic lines of communication between the front line and the Russian border, as well as between key cities likely to require high concentrations of Russian forces (see below). There are approximately 2,635 kilometers of secured roadway in this scenario. This equates to sixty-six 40-kilometer sections requiring the attention of approximately 4,160 Russian security troops. Dotted red lines indicate the most important primary and secondary roads that would be left unsecured, or periodically patrolled, or patrolled only by surveillance drones or aircraft.

Figure 11: ***Lines of Communication Estimate***



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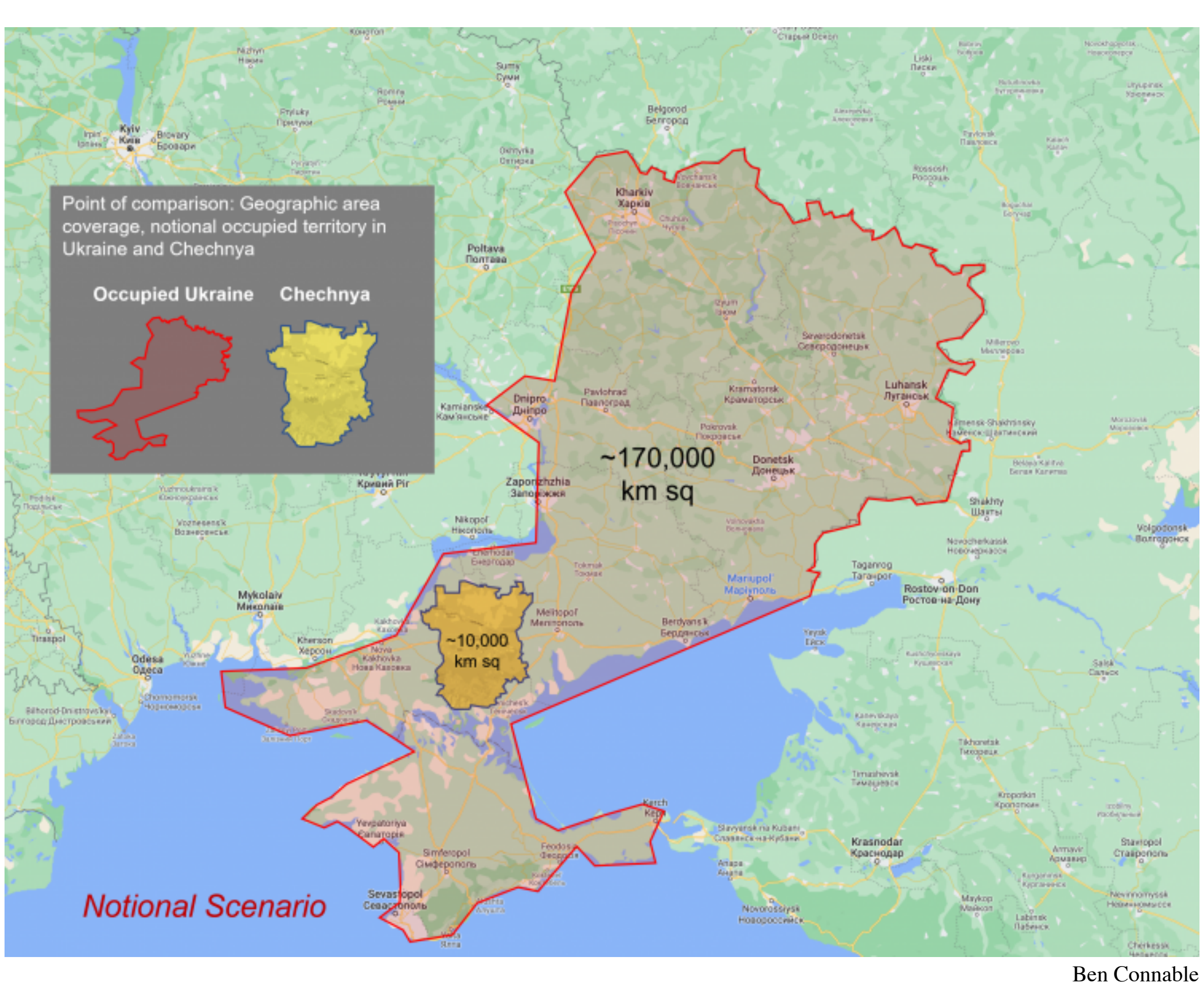
Some rail lines parallel major roads, so in some cases, these troops could do double duty protecting both road and rail. But the westernmost rail lines—easiest for Ukrainian interdiction—would need separate protection. At the very least, the Russians would want to keep open the approximately 650 kilometer rail line from the Russian border north of Kharkiv to Sevastopol in Crimea to help supply the entire front line. Using the same calculations for roadways (63 troops / 40 kilometers), this adds another ~1,010 troops, setting the rail and road lines of communication cost for the Russians at ~5,100 security troops. At 400 troops per battalion, this equates to 13 battalions totaling 6,900 troops (5,100 / 400 = 12.75 rounded up, 13 x 140 battalion-level headquarters troops = 1,820, 1,820 + 5,100 = 6,920 rounded down = 6,900). This equates to a division totaling **9,300 troops** (6,900 + 2,400 division and attachments = 9,300).

Adding these 9,300 troops to the running total (perimeter security 24,400 + key node security 14,600 + lines of communication security 9,300) the running notional occupation subtotal is **48,300** troops.

Securing the Population: Russia's Mixed History and Likely Approach

In theory, and in many recorded cases, successful counterinsurgency by an external or occupying force requires a capable and willing partner force, thoughtful cultural training, restrained use of force, and the careful development of government legitimacy over time. Brute force can be used to break insurgent forces. Sri Lankan operations against the Tamil Tigers of Elam and the Russian 1999-2000 operation in Chechnya are sometimes cited as examples of successful brute force operations. But in both of these cases, the terrain and relatively small scale of the problem gave the government advantages the Russians would not have in notionally occupied Ukraine. Crushing resistance in Chechnya (~10,000 square kilometers, equivalent to the island of Jamaica) is not the same as defeating a NATO-backed insurgency in an occupied space the size of Syria. Figure 12, below, shows an area comparison between the notional occupied territory and Chechnya.

Figure 12: ***Comparison Chechnya to Notional Occupied Ukraine***


Point of comparison: Geographic area coverage, notional occupied territory in Ukraine and Chechnya
Occupied Ukraine
Chechnya
~170,000 km sq
~10,000 km sq
Notional Scenario

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Russia's performance in counterinsurgency and peacekeeping is poor. The occupation of Afghanistan from 1979-to 1989 killed approximately 15,000 Soviet soldiers and contributed to the collapse of the Soviet Union. Abusive behavior by Soviet troops, including wanton killing of civilians, murder, and rape, alienated the Afghan population and fed the ranks of the opposing mujaheddin. Russia's first incursion into Chechnya in 1994 was disastrous. Troops were ill-prepared to fight an irregular war in urban terrain, and they were effectively defeated.

Russia's tactical performance against Chechen fighters was much improved in the successful 1999-2000 campaign. Under Ramzan Kadyrov, the Russians have also successfully pacified Chechnya. Pacification has been primarily achieved through killing and oppression, an approach that would be unacceptable to many Americans but is sufficient to meet Vladimir Putin's need for stability. The absence of chaos, however, does not necessarily denote strategic success. Anti-Russian sentiment and outright violence have been partially and temporarily displaced, not fully quelled.

Russian troops nominally took part in peacekeeping operations in Kosovo in 1999 but played only a minor role. In the wake of the 2020 Armenia-Azerbaijan armistice, Russia stationed approximately 2,000 peacekeepers in Upper (Nagorno) Karabakh. At least one report suggests they have performed basic checkpoint and patrol tasks well. They have also provided some limited civil-military support. This official Russian website provides photos of checkpoint operations and describes some technical capabilities. Despite this reportedly successful performance of basic security duties, not much can be extrapolated from this generally peaceful and relatively minuscule operation amongst a population of approximately 120,000 people.

In Syria (2015-), Russians have mostly stayed out of the direct ground fighting and worked through proxy Syrian Arab Army and militia forces. Russian warplanes appear to have used unguided munitions to attack insurgent positions in populated areas, reportedly killing thousands of civilians. Ambassador Jim Jeffries recently called this approach Russia's "Syria rules," a reflection of their decidedly nonhumanitarian behavior in irregular warfare.

But while Russia's airpower has been on display in Syria, its regular ground forces have mostly stuck to defending port and airfield facilities along the northwestern coast. Russia has relied primarily on special operators, advisors, and mercenaries to do its counterinsurgency work in Syria. They have taken the same approach to irregular warfare in conflicts across Africa, mimicking the U.S. "by, with, and through" approach to counterinsurgency. Like the Americans, the Russians have relied heavily upon special operations forces and private military companies. Increasingly, the Russians appear to prefer outsourcing their military operations.

Russian occupation of Crimea and its de facto control over the southeastern corner of Ukraine demonstrates the combination of these two approaches. In Crimea, Russian special operations troops and mercenaries seized territory of approximately 2.7 million people (based on dated official census data) and later occupied it with several thousand troops. In the Donetsk and Luhansk oblast operations, the Russians helped build a partner force of tens of thousands of troops, allowing them to hold approximately half of both regions without committing significant ground forces.

But in both of these cases—Crimea and Donetsk-Luhansk—the Russians have had significant advantages with both terrain and popular support. Crimea is an isolated peninsula. Donetsk and Luhansk are adjacent to the Russian border, much of the fighting has taken place within range of Russian long-range rocket and artillery forces, and some of the population might be favorable to annexation (though support for Russia is not as clear cut as some may assume). While some pro-Russian sentiment exists in other parts of eastern Ukraine, these isolated, almost entirely favorable conditions will not exist in places like Dnipro or Kharkiv.

A by, with, and through approach led by a few thousand special operations troops would almost certainly be insufficient to control the notional occupied territory. Little green men can be effective in small-scale cases, but their chances of success would almost certainly decrease at larger scales and in areas with less popular support. Population control and counterinsurgency in the notional occupied territory will require the presence and direct interaction of thousands of regular Russian troops.

Regular Russian Ground Force troops have rarely conducted hands-on civil-military operations. It is highly unlikely that any of the regular officers and enlisted soldiers in the units threatening eastern Ukraine have counterinsurgency training. Acknowledging this reality and hoping to reset conventional military power for other conflicts, Russian planners would probably seek to defeat the Ukrainian military using regular forces then quickly withdraw them to allow specialized troops and local militias to handle the occupation. At least in this notional scenario, this would be wishful thinking due to the scale of the occupation and uneven support for Russia. Regular troops will become occupying troops.

Troop-to-Task Requirements for Securing the Population

Regular force counterinsurgency in occupied Ukraine will be a large-scale activity requiring the occupying troops to provide physical security (perimeter, key nodes, and lines of communication) *and* population security (protection of the population from attack) *and* partner force recruiting and training (build a local force so Russian troops can go home, or "as we stand up, they stand down") *and* civil-military operations to build government legitimacy in the occupied territories (construction projects, humanitarian operations, institution building).

Russian occupation leaders could dedicate some of the 46,000 security troops to support population control and civil-military activities. However, every platoon withdrawn from perimeter security, key node security, or line of communication security creates a gap for resistance exploitation and increased stress on remaining security units (longer shifts, etc.). Therefore, in this notional scenario, additional forces will be needed for population security, partner force recruiting and training, and civil-military operations.

Population security missions center on checkpoints and patrols in populated areas, with additional forces needed for advising and civil-military operations. These activities will help isolate and deter resistance forces, increase confidence in the Russian-backed occupation government, generate human intelligence, and deter civilians from joining the insurgency by presenting an image of control and strength. Troop-to-task analysis for population security missions is heavily subjective. Troop requirements depend on local popular support for the insurgency, the availability of reliable local police, and a range of other factors.

Partner force recruiting and training focuses on building paramilitary police units to relieve Russian troops from security duties and to increase the legitimacy of the occupied territory government. Russian special operations and airborne forces will probably be required to assist in these missions, and some training operations could be carried out by mercenaries. Tasks include recruiting in urban areas, building and running training centers, equipping and paying partner forces, and building security institutions.

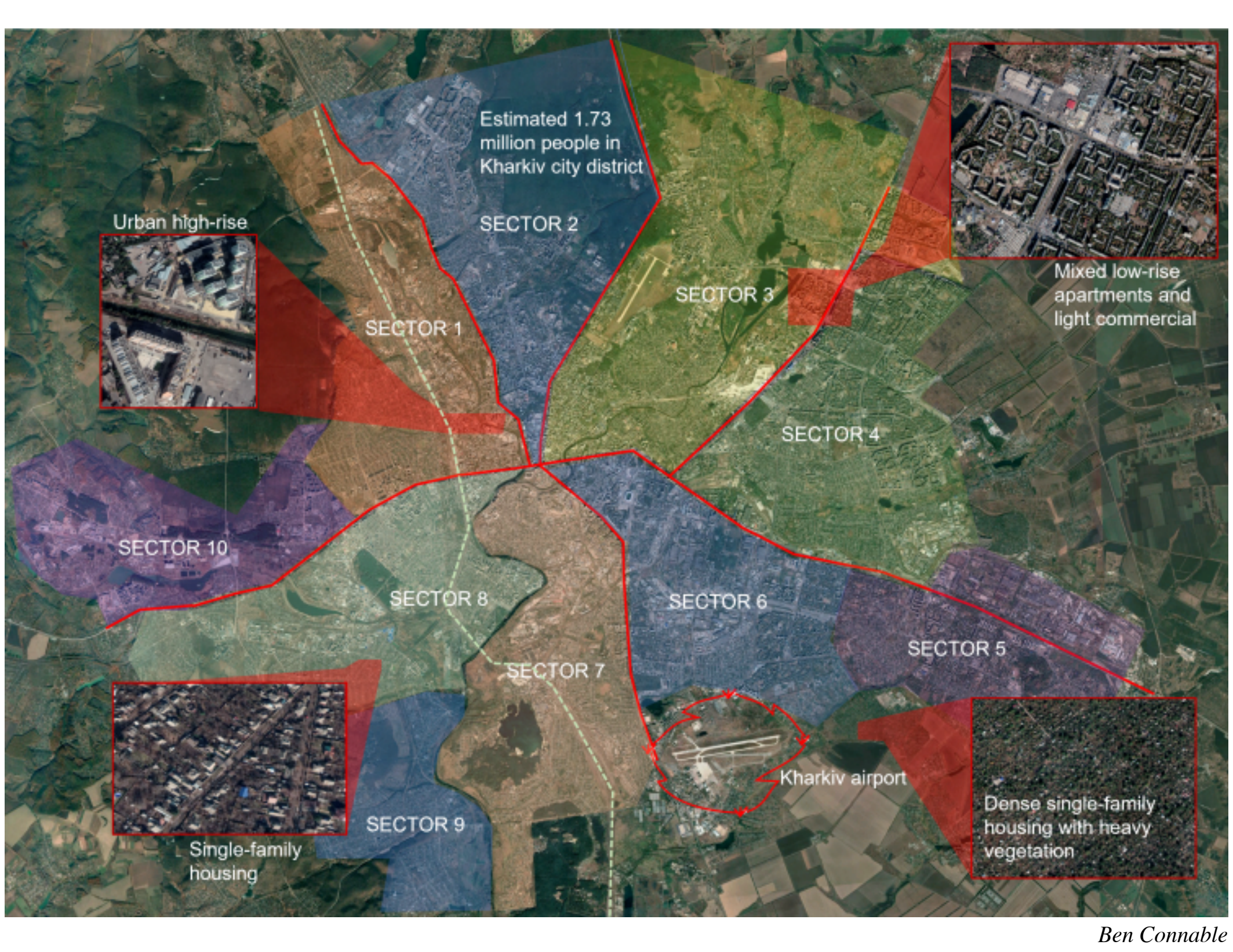
Civil-military operations center on engaging with the population, providing humanitarian support for internally-displaced persons, repairing war-damaged infrastructure, issuing recompense for war-related suffering, and contracting development projects to help build infrastructure and improve government service provision. All of these activities are intended to help build confidence in the Russian occupation and, primarily, in the occupied territory government the Russians would erect in the absence of Ukrainian government control.

Kharkiv City Troop-to-Task Baseline

Kharkiv city presents a good baseline case for securing the population troop-to-task analysis. The population estimate for 2021 is 1.73m people in Kharkiv district, in and directly adjacent to the city. By comparison, Kharkiv district alone has approximately five times the estimated population of all of Chechnya (~350,000) in 1999, when the Russians began their successful invasion and immediate post-conflict occupation with approximately 23,000 soldiers. It is also approximately five times the probable population of Ramadi, Iraq, in early 2006 when U.S. military forces found themselves hard-pressed to secure the city with approximately 4,000 troops.

Figure 13, below, shows the notional occupation of Kharkiv city, assuming few civilians have an opportunity to leave during or just after the initial invasion. Russian planners have divided the city into ten sectors, generally running along the lines of existing neighborhoods, major roads, and water features. Kharkiv security forces will have to provide separate security measures for 20 kilometers of the north-south rail line (dashed light green line) and approximately 80 kilometers of key intracity roadway (red lines). Callout boxes show the different types of urban terrain the Russian forces will have to secure.

Figure 13: ***Notional Occupation of Occupied Kharkiv***


Estimated 1.73 million people in Kharkiv city district
SECTOR 2
Urban high-rise
SECTOR 1
SECTOR 3
Mixed low-rise apartments and light commercial
SECTOR 4
SECTOR 10
SECTOR 8
SECTOR 6
SECTOR 5
SECTOR 7
Kharkiv airport
SECTOR 9
Single-family housing
Dense single-family housing with heavy vegetation

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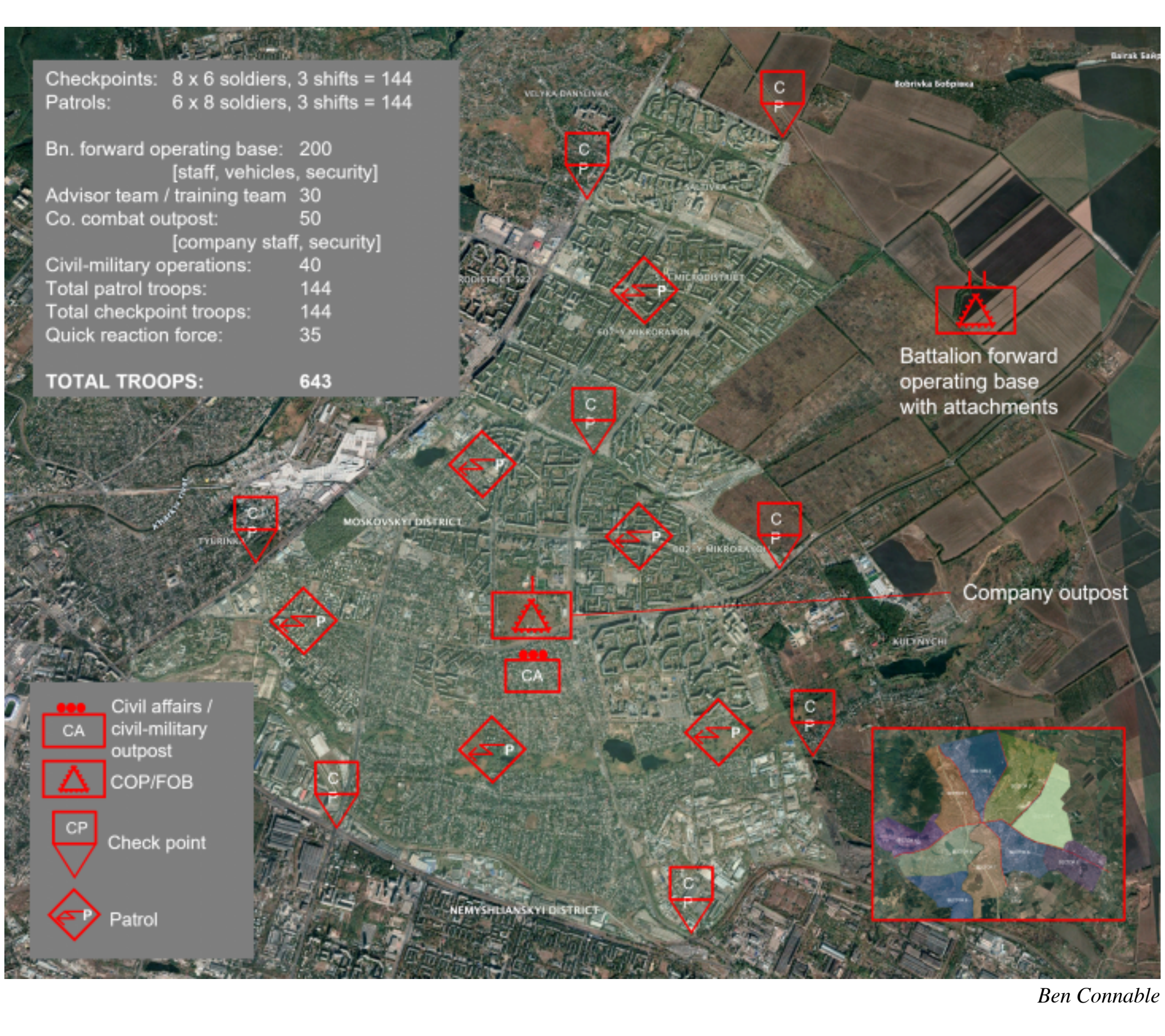
Each sector has a different population density, different terrain features, different types of infrastructure (e.g., light industrial or high-rise apartments). Some sectors, like Sector 3 in the north, will require more troops, while other sectors, like Sector 10 in the west, will require fewer troops. Breaking the population of 1.73 million into ten sectors while accepting the uneven population distribution across sectors—and the need to balance forces accordingly—troop-to-task analysis can be generally broken down into population control of 173,000 people. This is roughly equivalent to the population of the Iraqi city of Fallujah in 2003, or Sar-e-Pol in Afghanistan, Huntsville, Alabama, or Kansas City, Kansas.

A review of historical cases suggests that a competent light or motorized infantry battalion reinforced with additional vehicles, civil-military experts, advisors, and intelligence support could secure a city of approximately 173,000 people. *However*, this assumes a relatively small insurgency with limited ability to seize and hold terrain. A Russian motorized infantry battalion probably would not be sufficient to hold down dense urban terrain at this scale against hundreds of insurgents armed with heavy weapons and explosives.

This estimate also assumes that other Russian troops—those dedicated to securing the perimeter, key nodes, and lines of communication throughout the occupied territory—would help prevent the development of a hybrid urban-rural insurgency. Hybrid insurgencies are particularly difficult to eradicate. Starting at the battalion level to secure 173,000 people also assumes that standard Russian Ground Force motorized rifle battalion of (according to one U.S. government source) 540 personnel would be increased to approximately 650 soldiers for the population security mission. Additional troops would be detailed primarily to civil-military, advisory, checkpoint and patrol duties.

Figure 14, below, shows troop-to-task analysis for Sector 4. Assuming an active but relatively small insurgency armed with light weapons and some improvised explosives, a reinforced Russian Ground Force motorized rifle battalion with civil-military and advisory attachments is assigned to secure this sector. The battalion establishes a forward operating base in a field to the northeast of the urban area, as well as a smaller combat outpost in the center of the urban area to increase presence, improve intelligence collection, and reduce reaction time to support patrols or checkpoints that might be attacked. Adjacent to the combat outpost, the Russians have established a civil-military operations center to engage the population and deal with humanitarian issues. A training advisory team works out of both the base and outpost to recruit and train local militia and police to help improve security. Checkpoints are established at entryways into the sector, with the assumption that adjacent battalions will help secure some of the roadway boundaries to the northwest and south.

Figure 14: ***Detail of Notional Kharkiv Occupation, Sector 4***


Checkpoints: 8 x 6 soldiers, 3 shifts = 144
Patrols: 6 x 8 soldiers, 3 shifts = 144
Bn. forward operating base: 200
[staff, vehicles, security]
Advisor team / training team 30
Co. combat outpost: 50
[company staff, security]
Civil-military operations: 40
Total patrol troops: 144
Total checkpoint troops: 144
Quick reaction force: 35
TOTAL TROOPS: 643
Battalion forward operating base with attachments
Company outpost
CA Civil affairs / civil-military outpost
COP/FOB
CP Check point
P Patrol
MOSKOVSKYI DISTRICT
NEMYSHLIANSKYI DISTRICT

Ben Connable

The ideal approach to determine troop-to-task numbers for the entire occupied territory would be to conduct a similar analysis on every populated area. Extrapolating from the Kharkiv city Sector 4 baseline necessarily adds subjective judgment to the overall total. This analysis is driven by extrapolation, but the Kharkiv baseline offers a good starting point for a more detailed analysis.

Extrapolating Troop-to-Task for Population Security

According to the State Statistics Committee of Ukraine 2001 census data, the occupied territories would be home to approximately 17 million people (Kharkiv *oblast*, or region, 2.9 million; Luhansk oblast 2.5; Donetsk oblast 4.8; Zaporizhzhia oblast 1.9; Kherson oblast 1.1; Crimea 2.0; and approximately half of the Dnipropetrovs'k oblast, 1.75 of 3.5, not accounting for population growth since 2001 or displacement from Crimea, Donetsk and Luhansk, or refugee displacement from the Russian invasion). By comparison, the state of New York has approximately 20 million people and Florida has approximately 21 million. Syria may have approximately 17 million people, making it the best point of comparison for both land mass and population.

Some segments of this population will support the Russian invasion. There is already at least mixed support for annexation in the eastern sections of Donetsk and Luhansk. Russia has already effectively annexed Crimea. It would be safe to assume that after seizing the remaining portions of Donetsk and Luhansk, population control in these three areas can be handled with existing police and militia forces and key node security. Removing these three oblasts from the population security troop-to-task burden leaves 7.7 million people in the remaining regions. Many of these people live in urban areas, some do not. Security requirements will differ for battalions working in cities like Kharkiv and those working in small farming towns like Rhavchyk, located about 70 kilometers south of Kharkiv city.

Given the necessary uncertainty included by these variations, securing 7.7 million people would require approximately 45 infantry battalions of 650 soldiers each, for a total of approximately 30,000 soldiers (7.7m / 173,000 = 44.5 rounded up, 45 x 650 = 29,250). These do not all need to be trained infantrymen. The United States and its allies demonstrated adaptability in Iraq and Afghanistan by repurposing artillery, armor, air, and support personnel for infantry and advisor tasks.

This troop-to-task requirement—45 battalions to secure the population—equates to three (3.25) reinforced Russian divisions. Adding division headquarters elements and deployed attachments generates a total requirement for 37,000 troops (30,000 + 3 division headquarters and attachments 2,400 each, rounded down). Assuming a low-intensity insurgency and the need to constantly defend against NATO-backed raids and infiltration, the running total for occupation is **83,000** ground and rotary-wing air forces (38,000 for perimeter security + 8,000 for key node security + 37,000 for population security = 83,000).

A Vast Hidden Cost: Troop Rotations

In this notional case, the Russians will need to maintain 83,000 troops on the ground in the occupied territories. There will also be thousands of troops and civilians in Russia who will be required to support these troops with supplies, air support, and a range of other services. I do not include these in my calculations, but they should be considered. More importantly, Russia cannot simply station the same 83,000 troops in perpetuity. It will have to come up with a rotation plan to insert fresh units, allowing deployed forces to return home, visit families, rest, retrain, and then later redeploy.

American military forces discovered how quickly large occupations can eat up available troops. A 2011 RAND report showed that the U.S. armed forces deployed a total of two million troop years to Afghanistan (2001-2011) and Iraq (2003-2011). A snapshot analysis found that over 70% of U.S. Army soldiers had deployed to one or both theaters. These deployments effectively consumed the U.S. armed forces for a decade. They generated thousands of casualties and wore down expensive gear, including high-end jet aircraft. Ground units in the Army and Marine Corps were, in some years, on a 1:1 dwell time between deployments and recovery.

Russian combat troops deployed to the notional occupied territories would have to be quickly reorganized or replaced to increase available foot soldiers for patrol and checkpoint duties and to repair equipment worn or damaged in combat. Russia might be able to keep its invasion force in place for about a year before requiring a rotation. But they will have to prepare replacement forces, tying down perhaps an equal number of troops—another 80,000 or so—for ongoing occupation.

This would tie down approximately 160,000 Russian Ground Force troops, which equates to approximately half of the force (taking into account the independent helicopter regiment support units). It would also require the sensitive deployment of Russian conscripts, a challenge I have written about in previous articles and reports.

Social and political pressures at home might lead President Putin to draw down forces too quickly, leaving the occupied territory exposed to raids, infiltration, and insurgency. American drawdown in Iraq in 2003 contributed to disastrous security conditions from 2004-2007, requiring a surge in forces. Its next premature drawdown in 2011 contributed to the collapse of the Iraqi Army in 2014, and another surge. Drawdowns in Afghanistan forced a surge there in 2010, and the final 2021 withdrawal led to enemy victory. Russia, too, has made errant withdrawal announcements, most recently in Syria in 2017. Rotational military occupation is onerous, costly, and politically dangerous.

Caveats

All troop-to-task estimates are imperfect and will be proven wrong to some extent. In this notional scenario, I have done my best to point out assumptions and data that are less certain and which require more subjective estimation (e.g., total key nodes needing protection). Unclassified order-of-battle information on Russian Ground Force units is too often insufficiently detailed, dated, and contradictory. Census data I was able to find (better data may exist) is over 20 years old, and recent estimates add additional uncertainty to population counts. Other data challenges should be apparent in the narrative above.

Perhaps more importantly, this is my interpretation of Russian tasks in the given scenario. Russian planners may see things differently. For example, they may be far less concerned about infiltration and raids and, therefore, more willing to take risk along the perimeter. Or they may be more concerned about securing the population in Donetsk and Luhansk and feel the need to station thousands of troops there to cement their gains. Russian planners may also be more concerned with NATO or Ukrainian counteroffensives and feel the need to sustain conventional combined arms forces indefinitely along the occupied border.

Population security requirements assume a *low-threat insurgency*. This term is subjective and adds considerable uncertainty to the population security troop-to-task assessment. For the Russians, a low-threat insurgency might be quite violent compared to American experiences. This term is important because it reflects my subject-matter expert opinion on insurgency intensity. Troop-to-task estimates for securing the population are low compared to comparable cases cited above.

Russia may be able to reduce the use of its own troops by substituting local police and militia forces. It would certainly do so in Donetsk, Luhansk, and Crimea. Russian special operations advisors and mercenaries would work to build up these local forces to help reduce the burden on, particularly, the Russian Ground Forces.

Measurements and calculations are necessarily inaccurate to some extent. Google Earth Pro is tied to the WGS 84 Earth-centered references and geodetic datum, but its inherent imperfections are exacerbated by the use of a computer mouse cursor to trace lines and areas for these troop-to-task calculations. I used a range of hyperlinked official U.S. and Ukrainian government land mass and population estimates, all of which have inherent inaccuracies and margins of error.

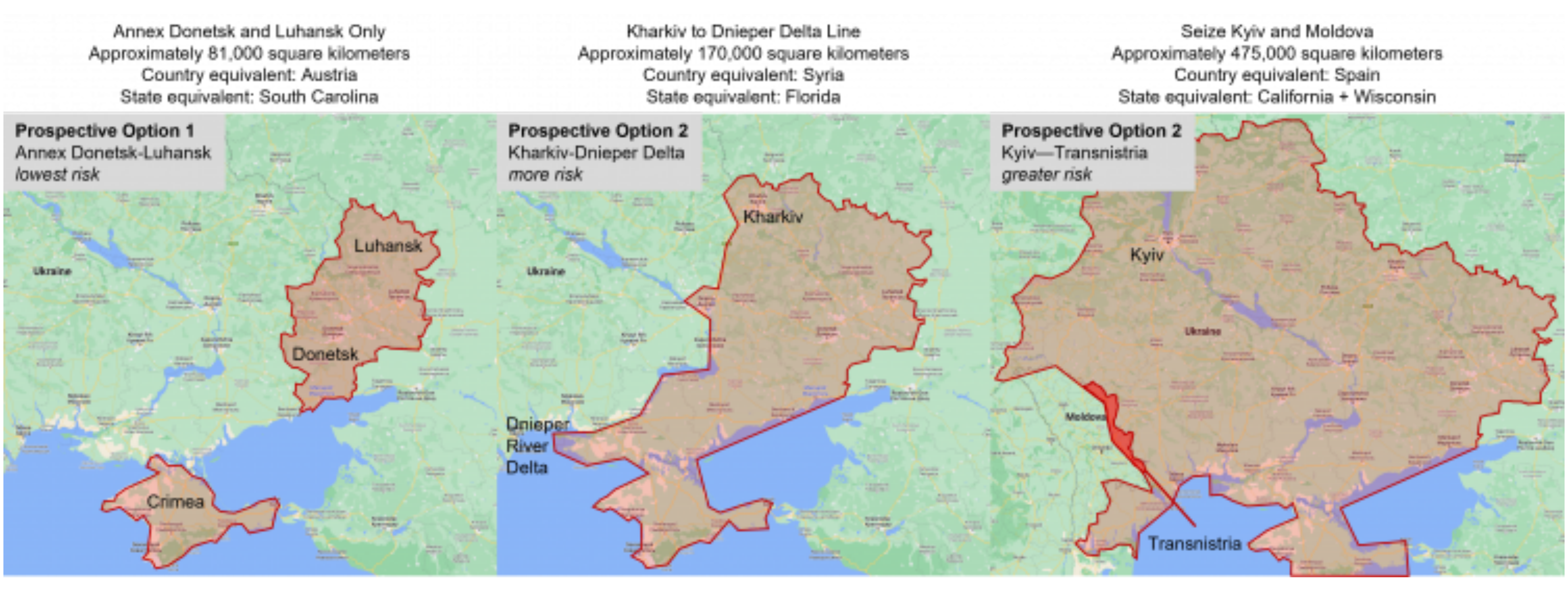
Normally, a troop-to-task estimate of this scale would be conducted by a team of analysts working together for weeks or months, using advanced mapping tools and building from the best available (and perhaps classified) information. This estimate was conducted by one person in one week using publicly-available desktop tools and information.

Modifying the Estimate

Occupied territory along the Kharkiv-Dnieper delta line is notional. If the invasion goes forward, Russian planners may select a completely different limit of advance. They may bite off less territory or more. While it is unlikely they would try to seize the capital, Kyiv, they might take that risk as well. This notional scenario provides a baseline case from which adjustments can be made. Changes in perimeter length may add or reduce 40-kilometer sections. Taking more or fewer urban areas will increase or decrease key node security requirements. And assuming control of more or fewer civilians will increase or decrease population security requirements.

Anyone with different or better order-of-battle data, different assessments of security tasks, and different interpretations of low-intensity insurgency can change the baseline troop data (e.g., number of soldiers in a motorized infantry battalion) and task calculations (e.g., number of troops to secure a 40-kilometer line), match these up with adjusted population data and generate their own assessment. Figure 15, below, shows the prospective options from Figure 1, above, along with geographic area and population comparisons to help readers compare the scale of these challenges. Country and state size comparisons are drawn from these sources.

Figure 15: ***Prospective Invasion Options with Scale Comparisons***


Annex Donetsk and Luhansk Only
Approximately 81,000 square kilometers
Country equivalent: Austria
State equivalent: South Carolina
Prospective Option 1
Annex Donetsk-Luhansk
lowest risk
Ukraine
Luhansk
Donetsk
Crimea
Kharkiv to Dnieper Delta Line
Approximately 170,000 square kilometers
Country equivalent: Syria
State equivalent: Florida
Prospective Option 2
Kharkiv-Dnieper Delta
more risk
Ukraine
Kharkiv
Dnieper River Delta
Seize Kyiv and Moldova
Approximately 475,000 square kilometers
Country equivalent: Spain
State equivalent: California + Wisconsin
Prospective Option 2
Kyiv—Transnistria
greater risk
Kyiv
Ukraine
Moldova
Transnistria

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