Eleonoa Tchania

Transport Geography as Peace Infrastructure?!

According to the First Law of Geography, “everything is related to everything else, but near things are more related than distant things” (Tobler, 1970) (Gogsadze, 2022). This principle resonates strongly with the spatial dynamics of peace and conflict: proximity intensifies relationships, dependencies, and the frequency of contacts. Scholars in the field of peace and conflict studies emphasize that violence and cooperation are not randomly distributed but tend to cluster in specific geographic spaces (Buhaug & Gleditsch, 2008). Proximity creates opportunities for interaction, but it also generates zones of tension.

As Johan Galtung (1969) notes, social systems, including systems of conflict,are structures of interaction that are inherently spatial. Communities living in close proximity develop dense networks of economic, cultural, and political relations. These connections may foster cooperation; however, in times of tension, they can also become channels for escalation.

Tobler’s logic helps explain why violence often emerges in border regions, ethnically mixed areas, or contested territories, where groups interact most intensively. Research by Kalyvas (2006) demonstrates that conflict is a highly localized phenomenon: the closer groups live to one another, the higher the probability of both cooperation and confrontation. Interaction linking neighboring groups can trigger conflict when disagreements and competing claims arise. Shared infrastructure,such as roads, markets, and water resources,becomes a spatial arena in which both cooperation and conflict are enacted.

In this sense, spatial proximity increases the risk of both peaceful contact and violent escalation. Spaces where political and territorial orders are ambiguous or contested constitute flexible environments in which proximity may serve either as a foundation for peaceful connections or as a source of tension—depending critically on how mobility and accessibility are organized.

Transport geography offers an analytical framework that allows us to understand how mobility transforms spatial relationships. Hurst (1973) argues that transport represents relationships across distance, and that it is through these relationships that space becomes differentiated. In the absence of movement, territories become isolated; with the presence of movement, they are integrated into broader social and economic systems. Rodrigue (2018) conceptualizes transport as an infrastructural network that determines the directions of flows of people, resources, and information.

From a conflict studies perspective, transport infrastructure acquires critical significance. Roads, mountain passes, and intersections can become channels for the spread of violence, means of movement for military or separatist forces, or strategic targets whose control generates political advantage (Weidmann, 2009). When infrastructure functions, it creates interdependence and facilitates dialogue, trade, and the development of shared livelihood resources. When it is destroyed or militarized, proximity is transformed into a threat, reinforcing segregation and deepening mistrust.

At the same time, it is precisely roads, transit routes, markets, and everyday neighborhood mobility that create spaces of peaceful coexistence, where routine human interaction helps rebuild trust. According to Johan Galtung’s (1969) concept of structural violence, restrictions

on movement,checkpoints, closed roads, and military control, inflict direct harm on civilian populations and weaken social networks.

Foundational scholars of peace research, such as Lederach (1997) and Autesserre (2014), emphasize that peace is not created solely through political negotiations; it emerges in everyday spaces where people move, interact, trade, and restore relationships of interdependence. Consequently, transport infrastructures are not merely technical systems but social and spatial frameworks of peace. Within peacebuilding processes, the geography of transport and infrastructure becomes a critical instrument for shaping a stable future.

The rehabilitation of roads and transport nodes is therefore among the first priorities in post-conflict reconstruction, as it facilitates the return of displaced populations, revitalizes local economies, and strengthens the legitimacy of state institutions. As described by Büscher and Komujuni (2017), infrastructure plays a strategic role in peacebuilding: it signals the presence of state institutions, creates shared spaces, and enables cooperation among divided groups. Investments in cross-border transport corridors further enhance regional interdependence and reduce incentives for renewed violence.

However, infrastructure development does not automatically ensure peace. Large-scale projects can deepen inequalities when they disproportionately benefit privileged groups at the expense of others. For this reason, peace-oriented infrastructure planning requires a conflict-sensitive approach grounded in local participation and the equitable distribution of resources. The United Nations (2020) emphasizes that sustainable peace is achieved when infrastructure is designed not only for efficiency, but also with the goals of social cohesion, human security, and inclusive governance.

Tobler's law becomes even more visible in the context of post-conflict recovery. Peace scholars, including Lederach (1997) and Paffenholz (2015), argue that peace emerges from restored relationships—social, economic, and spatial. Reconnecting communities through transport and communication infrastructure is therefore not merely a technical task; it is a peacebuilding intervention. The reopening of roads, the reconstruction of bridges, and the restoration of inter-communal mobility return to post-conflict societies the everyday connections that, according to the logic of proximity, are both possible and necessary.

Cederman, Gleditsch, and Buhaug (2013) further argue that peace is more sustainable when spatial inequalities and fragmented territories are reconnected, reinforcing the importance of mobility and relational geography for long-term stability.

Mobility and Territorial Fragmentation in Georgian–Ossetian Relations

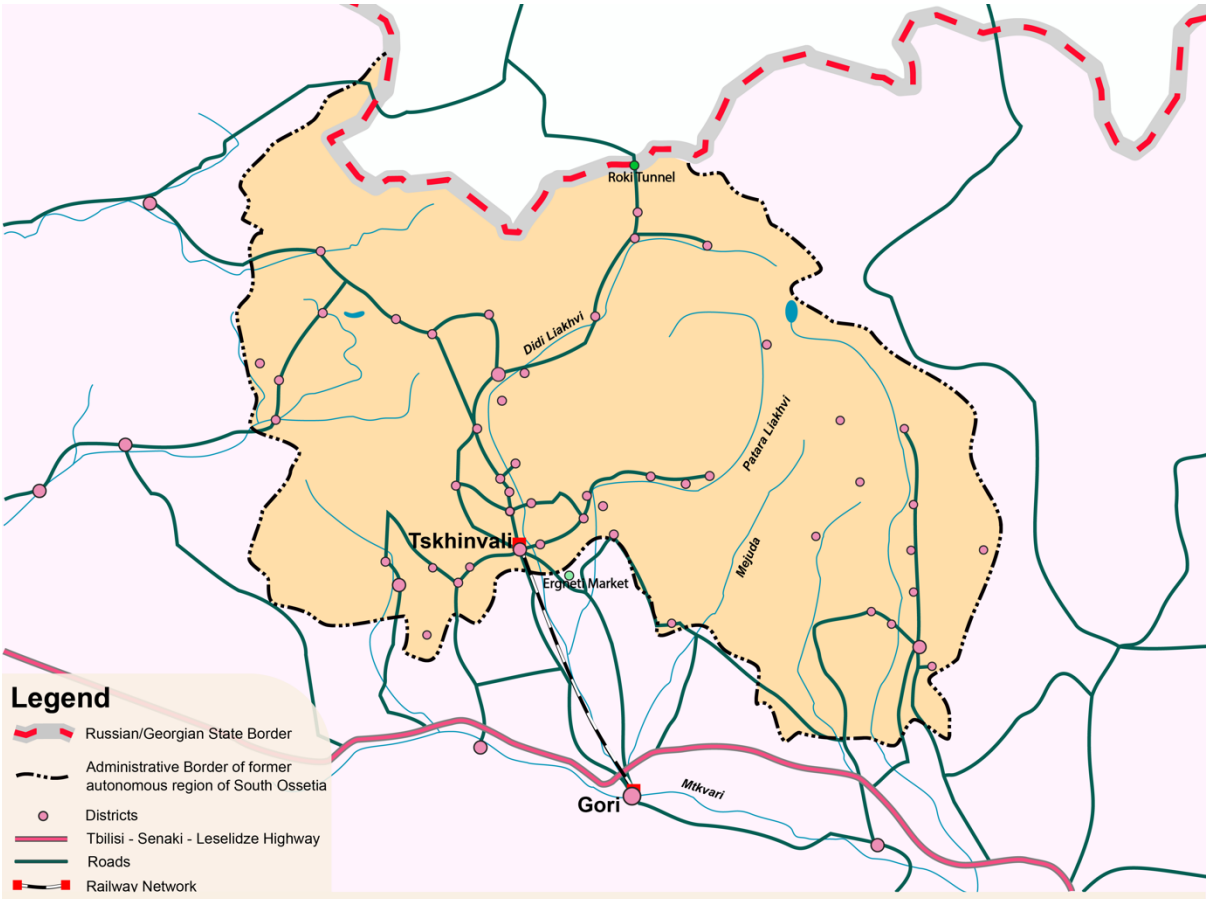
The theoretical framework outlined above enables us to examine how the significance of transport location and infrastructure evolved and transformed in parallel with the Georgian–Ossetian conflict. Georgia's transport system was historically shaped under a spatial order imposed by external powers. During the Soviet period, Georgia effectively remained a periphery within the Moscow-centered economic system (Bokeria, 2002). The main transport corridors were designed to serve the needs of this centralized system, which prevented Georgia from fully realizing its natural function as a corridor linking Europe and Asia (Kverenckhiladze, 1986).

Following the collapse of the Soviet space, attitudes toward transport were modified, and after Georgia regained independence, these dynamics changed significantly. Conflict in Abkhazia

and the Tskhinvali region destroyed the country's internal transport cohesion. At the same time, however, new opportunities emerged for Georgia to integrate into global transit networks. The objective of the new transport policy became the country's integration into European and Asian spaces. Projects such as the East–West Highway, the Baku–Tbilisi–Kars railway, and the modernization of Black Sea ports contributed not only to economic activation but also to political and security consolidation.

After the collapse of the Soviet Union, perceptions of transport shifted; however, the conflicts of the 1990s fragmented Georgia's transport space. Roads that once connected mountainous regions with lowlands and plains effectively turned into dividing lines. The greatest impact of transport disruption was felt in Georgia's mountainous regions, where road construction had always carried strategic importance. As a result, Georgia became dependent on a single critical artery—the East–West corridor, specifically the Tbilisi–Senaki–Leselidze highway—thereby increasing the country's strategic vulnerability.

Georgia's unified transport system had been formed as early as the 1950s and encompassed nearly all major modes of transportation: railways, roads, maritime routes, aviation, pipelines, and passenger cableways. However, a significant portion of this infrastructure was damaged or politicized immediately following the collapse of the Soviet Union, particularly during the Georgian–Ossetian and Georgian–Abkhaz conflicts. Roads that once connected regions were transformed into dividing lines; highways that served everyday mobility became burdened with controls and checkpoints; and transit corridors that facilitated economic exchange were converted into contested spaces.



Transport infrastructure- former South Ossetian Autonomous Region

The territory of the Tskhinvali region clearly illustrates how transport infrastructure reshapes the economic, social, and spatial configuration of mountainous regions. Prior to the Soviet period, mobility within the region occurred primarily along footpaths following river valleys and slopes. Economic isolation and territorial fragmentation were the natural outcomes of such limited mobility. A profound transformation took place following the establishment of Soviet rule. In 1940, the construction of the Gori–Tskhinvali railway, followed by the development of road infrastructure, significantly increased the region's integration into Georgia's internal economic and administrative systems. Reduced transportation costs and intensified connectivity incorporated many mountain villages into a shared economic space. Freight transport costs declined sharply, links with urban centers were strengthened, and previously inaccessible highland settlements were gradually integrated into economic life.

Even at the peak of transport development, physical geography remained both a constraint and a structuring force. The region is located on the southern slopes of the Greater Caucasus, characterized by deep gorges and meridionally oriented ridges. This configuration made movement predominantly possible toward the south. Consequently, Shida Kartli—rather than the North Caucasus—constituted the region's natural economic hinterland. Major routes such as the Gori–Tskhinvali–Oni transport axis and the Java–Roki corridor functioned as key spatial nodes, linking mountainous districts to Georgia's industrial centers, markets, and cultural spaces. Road transport, which could more easily adapt to difficult terrain, became the fundament of regional connectivity.

The significance of these routes becomes especially evident when analyzing the consequences of their functional disruption following the Georgian–Ossetian conflict and Russia's annexationist actions on Georgian territory. The closure of the Gori–Tskhinvali–Oni road—previously a strategic East–West connection along the slopes of the Central Caucasus—triggered a series of cascading economic and social effects. This route had facilitated movement between Racha and Shida Kartli, as well as along the Liakhvi Gorge; it served as a circulation axis for agricultural products, construction materials, mining cargo, and seasonal labor. Its closure pushed Racha into even deeper territorial isolation. What had once been a critical interregional corridor was transformed into a geopolitical boundary, severing decades-long mobility and trade connections.

In line with Hurst's theory, transport reflects relationships across distance and thereby determines territorial integration (Hurst, 1973). When such arteries are disrupted, the entire relational system collapses. For Racha, already geographically isolated, the loss of its most direct connection to eastern Georgia further entrenched its peripheral status.

The consequences of the disruption of these roads extend far beyond the regional economy. The transport system of the Tskhinvali region has undergone a complete transformation. Instead of a south-oriented network connected to Tbilisi and Georgia's internal space, it has been converted into a one-directional corridor serving exclusively Russian military and administrative needs via the Roki Tunnel. All Georgian roads entering the region have been closed. A transport-geographical position that once functioned as a mountain–lowland passage has become a militarized dead end. The Roki Tunnel, originally constructed for internal Soviet mobility, has turned into the sole artery linking the region to Russia. Rather than serving as a node connecting the North and South Caucasus, it has been transformed into a channel of military and administrative control.

In transport geography, the disruption of a main corridor is understood not merely as a technical problem but as a transformation of systems of spatial interaction (Rodrigue, 2018). This rupture—both material and symbolic, clearly demonstrates how transport infrastructure can simultaneously sustain territorial integrity and, when damaged, accelerate fragmentation.

This transformation has also affected national-level mobility. The loss of the Tskhinvali axis has rendered Georgia critically dependent on a single East–West artery—the Tbilisi–Senaki–Leselidze highway. The gradual advance of the Russian occupation line toward this motorway highlights the vulnerability of the country's internal connectivity when it relies on only one central corridor (Sidamonidze, 2020). Any disruption would place not only domestic mobility but also Georgia's regional trade, energy transit, and tourism functions under severe strain.

Notably, along the vicinity of the Tbilisi–Gori central highway, between 2008 and 29 September 2025, Russian occupation forces illegally detained 1,575 Georgian citizens in the direction of the Tskhinvali region, including minors and elderly individuals. In several cases, these detentions ended tragically. The occupation line extends over more than 350 kilometers, of which 56 kilometers,toward the Tskhinvali direction, are fortified with barbed wire and other artificial barriers. Villages where so-called "border barriers" have been erected, and from which Georgian citizens are abducted, are located in close proximity to the Tbilisi–Gori central highway. For example, the village of Tsitelubani in Gori Municipality lies only 650 meters from the main road (approximately a five-minute drive). This circumstance further underscores the significance of transport geography and its vulnerability in border areas.

According to peace and conflict scholars, border zones are associated with paradoxical perceptions. They are often imagined as exposed peripheries—spaces of vulnerability, tension, and limited opportunity (Bigo & Guild, 2005; Newman, 2006). At the same time, they are areas of unique potential, where life continues even under conditions of structural violence. Borderlands are not empty "buffer zones"; they are sites of everyday adaptation, social ties, informal economies, and continuous negotiation (Autesserre, 2014; Korostelina, 2012).

This paradox is particularly visible in the Georgian–Ossetian conflict space. The dividing line represents a deep scar of a protracted conflict, yet thousands of people continue to live in its immediate vicinity. Families resist uncertainty on a daily basis, cultivate land next to barbed wire, and take long detours to reach doctors or markets. Such mobility is directly linked to the functioning—or dysfunction—of transport routes. On the one hand, the existence of transport routes enabled the emergence of the Ergneti market, an informal economic space that also functioned as a mechanism of informal peacebuilding. It was a rare platform where interaction persisted between communities divided by conflict.

Despite the negative implications for the state,particularly the market's role in fostering the shadow economy—border markets are viewed in peace research as "relational infrastructures": spaces where trust, familiarity, and everyday coexistence are formed (Massey, 1994; Scott, 2009). Ergneti was precisely such an infrastructure. Its closure further deepened economic fragmentation and dismantled the social networks that had sustained cross-ethnic connections.

Despite these challenges, border communities demonstrate resilience. Scholars emphasize that such places embody not only fear and vulnerability, but also creativity, adaptation, and cooperation (Baud & van Schendel, 1997; Wilson & Donnan, 2012). Georgian villages located along the occupation line continue to maintain social ties, cultural practices, and agricultural activity even under the constant surveillance of Russian military forces.

Conclusion:

Transport infrastructure functions as far more than a technical resource. It is an architecture of knowledge, power, and spatial coexistence that shapes how people interact, how opportunities are distributed, and how political order is produced. Transport functions simultaneously as an instrument of integration and fragmentation. As a result of the Georgian–Ossetian conflict and the Russia–Georgia war, roads and transport corridors that once served as channels of economic and socio-cultural exchange were gradually transformed into dividing lines. With the deepening of conflict, mobility, civic connections, and access to broader public space became severely restricted.

The disruption of transport networks alters the hierarchy of spaces, redirects economic flows, and reshapes patterns of interdependence. The loss of a road signifies not only the restriction of physical movement but also the collapse of social networks that once sustained everyday cooperation, peaceful coexistence, and shared economic stability. Consequently, isolated mountainous regions become even more peripheral, while growing dependence on central corridors increases the country's strategic vulnerability.

At the same time, the process of borderization along central highways and the restrictions associated with the occupation line have sharply reduced the spaces in which everyday interaction between Georgian and Ossetian communities was possible. These processes have fundamentally transformed the region's social map: territorial divisions have hardened, militarized mechanisms have intensified, and the "micro-geography" of relations has either been severed or rendered highly risky.

Despite these conditions, border communities demonstrate that space should not be understood solely as a product of political power. Their daily practices reveal that adaptation and resilience coexist with fear and uncertainty in borderland realities. These everyday practices remind us that transport and mobility are not simply infrastructure; they represent people's capacity to reclaim and sustain their own space.

From a peace and conflict perspective, transport geography operates as a "motor structure" that simultaneously reflects and shapes relationships—it is a process of political, social, and geographical transformation. Concepts developed by the United Nations, the World Bank, and other institutions indicate that peace is constructed when infrastructure becomes inclusive, equitable, and conflict-sensitive.

For Georgia, this implies the restoration of fragmented roads, the development of multi-directional transport networks, the economic and social reorganization and strengthening of border regions, the refunctionalization of closed corridors, and the diversification of both internal and external mobility. Tobler's law reminds us that proximity makes interaction inevitable. Interaction, in turn, depends on the spatial structures created through roads, connections, markets, and movement. Peacebuilding does not emerge solely from political agreements—it takes shape when people are able to move safely, cooperate, work, and create shared spaces. For this reason, transport development in Georgia constitutes not only an economic strategy, but an essential foundation for territorial integrity, social resilience, and long-term peacebuilding.

References:

Autesserre, S. (2014). *Peaceland: Conflict resolution and the everyday politics of international intervention*. Cambridge University Press.
Baud, M., & van Schendel, W. (1997). Toward a comparative history of borderlands. *Journal of World History, 8*(2), 211–242.
Bigo, D., & Guild, E. (2005). *Controlling frontiers: Free movement into and within Europe*. Ashgate.
Brzeziński, Z. (1997). *The grand chessboard: American primacy and its geostrategic imperatives*. Basic Books.
Buhaug, H., & Gleditsch, K. S. (2008). Contagion or confusion? Why conflicts cluster in space. *International Studies Quarterly, 52*(2), 215–233.
Büscher, K., & Komujuni, G. (2017). The politics of infrastructure and peacebuilding. *Journal of Intervention and Statebuilding, 11*(4), 1–18.
Cederman, L.-E., Gleditsch, K. S., & Buhaug, H. (2013). *Inequality, grievances, and civil war*. Cambridge University Press.
Cowen, D. (2014). *The deadly life of logistics: Mapping violence in global trade*. University of Minnesota Press.
Donnan, H., & Wilson, T. M. (2010). *Borders: Frontiers of identity, nation and state*. Berg.
ESPON. (2017). *Shrinking Rural Regions in Europe*. ESPON EGTC. https://www.espon.eu
Economic Geography of Georgia. L. Kabelashvili 1973.
Economic Geography of Georgia. M. Bokeria 2002.
Flint, C., & Taylor, P. J. (2018). *Political geography: World-economy, nation-state and locality* (7th ed.). Routledge.
Galtung, J. (1969). Violence, peace, and peace research. *Journal of Peace Research, 6*(3).
Gegeshidze, A. (2002). Georgia: In Quest of a Niche Strategy. The Quarterly Journal, Volume 1, Issue 3, p.3-12
Gogsadze, G. (2024). [Space and Politics]. Tbilisi: Tbilisi State University Press.
Graham, S., & Marvin, S. (2001). *Splintering urbanism: Networked infrastructures, technological mobilities and the urban condition*. Routledge.
Government of Georgia & State Security Service. (2025). *Official statistics on illegal detentions and borderization along the occupation line with the Tskhinvali region/South Ossetia*. Tbilisi.
Hall, P. V., & Hesse, M. (2013). *Cities, regions and flows*. Routledge.
Hansen, N. M. (1959). Regional economic change and regional policy: A review. *Southern Economic Journal, 26*(1), 3–16.
Hoyle, B. S., & Knowles, R. D. (Eds.). (1992). *Modern transport geography*. Wiley.
Hurst, M. E. (1973). *Transportation geography: Comments and readings*. McGraw-Hill.
International Crisis Group. (2018). *Abkhazia and South Ossetia: Time to talk trade* (Europe Report No. 249).
Ismailzade, F. (2019). Connectivity and geopolitics in the South Caucasus. *Caucasus Analytical Digest, 113*, 2–5.
Kaczmarski, M. (2020). *China–EU relations in a changing world: A new geopolitical landscape?* Routledge.
Kalyvas, S. N. (2006). *The logic of violence in civil war*. Cambridge University Press.
Kapanadze, S. (2014). Georgia's conflicts: What next? *EUISS Brief, 12*, 1–4.
Korostelina, K. (2012). *Conflict resolution in divided societies: Managing power asymmetries*. Routledge.
Kühn, M. (2015). Peripheralization: Theoretical concepts explaining socio-spatial inequalities. *European Planning Studies, 23*(2), 367–378.

Kupatadze, A. (2014). Informal economies and post-Soviet conflicts: The case of Ergneti. *Caucasus Analytical Digest, 62*, 2–6.
Kverenchkhiladze, G. (1986). *Economic geography of Georgia* (in Georgian). Tbilisi University Press.
Lederach, J. P. (1997). *Building peace: Sustainable reconciliation in divided societies*. United States Institute of Peace Press.
Lemke, C., & Rauscher, S. (2017). Transport infrastructure vulnerability: A critical review. *Journal of Transport Geography, 62*, 96–104.
Massey, D. (1994). *Space, place and gender*. University of Minnesota Press.
Newman, D. (2006). The lines that continue to separate us: Borders in our 'borderless' world. *Progress in Human Geography, 30*(2), 143–161.
Nodia, G., & Scholtbach, Á. P. (2006). *The political landscape of Georgia*. Eburon Academic Publishers.
OECD. (2020). *Regions and cities at a glance 2020*. OECD Publishing. https://doi.org/10.1787/9591f3c0-en
Paffenholz, T. (2015). Unpacking the local turn in peacebuilding. *Third World Quarterly, 36*(5), 857–874.
Ramsbotham, O., Woodhouse, T., & Miall, H. (2016). *Contemporary conflict resolution* (4th ed.). Polity Press.
Rodrigue, J.-P. (2018). *The geography of transport systems* (4th ed.). Routledge.
Rodrigue, J.-P. (2020). *The geography of transport systems* (5th ed.). Routledge.
Scott, J. C. (1998). *Seeing like a state: How certain schemes to improve the human condition have failed*. Yale University Press.
Scott, J. C. (2009). *The art of not being governed: An anarchist history of upland Southeast Asia*. Yale University Press.
Serrano, S. (2013). Informal exchanges across ethnopolitical borders in the South Caucasus. *Caucasus Survey, 1*(1), 50–68.
Sidamonidze, D. (2020). *Geographical Regularities of the Functioning and Development of Georgia's Land Transport*. Tbilisi: National Library of Georgia.
Sidaway, J. D. (1998). Geopolitics, geography and 'terrorism' in the Middle East. *Environment and Planning D: Society and Space, 16*(4), 435–457.
Tobler, W. (1970). A computer movie simulating urban growth in the Detroit region. *Economic Geography, 46*(Suppl.), 234–240.
United Nations. (2020). *Infrastructure for peace: Conflict-sensitive development*. UNDP.
Vance, J. E. (1970). *The merchant's world: The geography of wholesaling*. Prentice-Hall.
Varnavskiy, V. G. (1980). *Transportnaya sistema gornykh rayonov SSSR* [Transport systems of mountain regions of the USSR]. Nauka.
Walker, C. (2013). *Georgia: The struggle for statehood*. Routledge.
Weidmann, N. B. (2009). Geography as motivation and opportunity: The spatial logic of insurgent violence. *Political Geography, 28*(4), 239–249.
Wilson, T. M., & Donnan, H. (2012). *A companion to border studies*. Wiley-Blackwell.
World Bank. (2017). *Pathways for peace: Inclusive approaches to preventing violent conflict*. World Bank Publications.
World Bank. (2018). *Georgia: Spatial and transport strategy — Constraints and opportunities in mountainous regions*. World Bank Publications.
Zartman, I. W. (1995). *Elusive peace: Negotiating an end to civil wars*. Brookings Institution.