

Ancient India's lessons on rebuilding post-conflict

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Ancient India's greatest engineering achievement wasn't a monument but a metamorphosis. When Emperor Ashoka, who ruled most of the Indian subcontinent in the third century BCE, saw the carnage he wrought in the Kalinga war -- over 100,000 dead -- he redirected his empire's technical prowess from combat to community. Modern conflict zones everywhere, from Sudan to Myanmar, Gaza to Ukraine, await a similar transformation.

Ashoka's infrastructure once forged dominance over an area that spanned Afghanistan and Bangladesh. Siege engines demolished defences, roads propelled armies, fortifications constrained movement and ports dictated trade. After his moral awakening, however, military roads became pilgrimage paths dotted with wells and

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rest houses; barriers transformed into trading posts. His edicts, carved into mountainsides, proclaimed a radical vision: infrastructure should be a tool for social cohesion rather than control.

This vision resonates in modern history. The postwar reconstruction Marshall Plan rewove western Europe's fractured landscape through roads, power grids and industries, fostering social recovery. Japan's bullet train Shinkansen was more than a railway -- it marked a shift from wartime priorities to economic integration and national connectivity. Post-cold war Germany turned former checkpoints like Berlin's Potsdamer Platz into social hubs of reunification. Northern Ireland's Peace Bridge spanned decades of sectarian divide, symbolising reconciliation. In Rwanda and Sri Lanka, community centres and reopened highways like the A-9 mended societies torn apart by genocide and civil war. These examples affirm Ashoka's insight: infrastructure can unite or divide, depending on its design.

But centring peace in engineering also confronts stark realities. Billions of dollars flow into military machinery while peace-building efforts scrape by. Businesses prioritise proxies of power -- price and speed -- over

reducing conflict risks. Harmony and stability can feel like unaffordable luxuries.

Reconstruction is sometimes less about materials available than about power -- who controls, who benefits, and whose version of history prevails. Technical neutrality is a profitable -- and pernicious -- myth. These constraints expose a deeper predicament. Defence contracts offer clean metrics and measurable outcomes but peace resists such quantification. Like public health or preventive maintenance, its benefits can be hard to evaluate. Without ways to review and reward it, even visionary engineers may find it difficult to justify spending money.

There is also the need to find agreed upon standards -- each tied to clear metrics and mandates. Safety engineering progressed through structural load limits and fire codes, giving tangible form to abstract risks. Environmental engineering advanced through emissions standards and related safeguards, making invisible threats visible. Peace engineering requires similar discipline -- methods to gauge the results of infrastructure choices.

In Iraq's 2003 reconstruction, standard technical metrics showed restored infrastructure exceeding prewar electrical capacity. But this masked a more complicated reality. Years of conflict and sanctions had cultivated decentralised networks. Unreliable central grids had taught Baghdad's residents to rely on local generators -- adaptive solutions that persisted even after centralised systems returned. This divergence between technical success and lived experience underscores a critical insight: successful infrastructure requires an understanding of those who will use it. Designing infrastructure like transportation networks isn't simply solving technical puzzles -- it determines how communities interact long into the future. This requires evaluation conducted with the same rigour as structural integrity or environmental protection.

In peacetime, engineering firms already balance complex risks and competing priorities. Analysing infrastructure's social effects as well isn't mission creep -- it's essential wisdom. This is an important lesson to remember as Ukraine works to rebuild its power grids and Gaza reconstructs its water systems.

Engineering shaped Ashoka's empire twice: first as an instrument of conquest, then as a foundation for peace. Two millennia later, his transformation highlights an elemental truth: peace isn't an ideal to contemplate but a structure to make and maintain.

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