
Roads and Development: Plans, Impacts and Contestation into the 21st Century

Introduction to *Development and Change* Virtual Issue

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ABSTRACT

This article introduces a virtual issue of *Development and Change* on the foundational question of roads and development. While roads have been a mainstay of development policy, infrastructure projects are increasingly questioned and subject to contestation. This Introduction therefore begins by reviewing the debates over the economic benefits, social problems and ecological damage catalysed by roads. Those debates have motivated research to identify experiences where roads beget development that can be characterized as economically viable, environmentally sustainable and socially just. Within that context, the article turns to a review of previous publications on roads and development in *Development and Change*, underscoring their unique contributions as well as their points of contact. It also notes key contrasts among the articles reviewed, and argues that such differences constitute opportunities to learn more about road impacts and contestation. The Introduction concludes by drawing on those opportunities to outline future research priorities on roads and development.

INTRODUCTION

Roads and other infrastructure constitute a hallmark of development doctrine. Infrastructure has been a priority in development policy for decades, regardless of the fashions of the hour (Bourguignon and Pleskovic, 2007; World Bank, 1994). For governments and banks worldwide, roads, rails, bridges, ports, telecommunications and other infrastructure are routinely understood as necessary ingredients to impel economic growth and thereby foster social progress. That said, the specifics of infrastructure initiatives have exhibited significant changes over time. The locations, funding sources

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and goals of infrastructure have altered substantially from the onset of the post-war drive for development after World War II to the opening decades of the 21st century.

Infrastructure is a crucial ingredient for regional integration, as it provides the physical basis for trade and thus for economic growth, as well as the ability to secure national borders and frontier areas for geopolitical purposes. In terms of economic integration, roads link rural agricultural producers and resource extraction sites to export centres and urban markets. By extension, the articulation of various roads constitutes a distribution network that incorporates nodes from extraction to processing, manufacturing and eventually mass consumption. Infrastructure has long been crucial in discussions of economic policy with regard to siting decisions in light of comparative advantage and thus plays a central role in the spatial logic of development strategy.

Public investment in infrastructure has therefore been a priority in development policy. Earlier work on infrastructure showed that public investments could generate large, positive economic impacts (Aschauer, 1989). Subsequent studies made some econometric corrections that indicated smaller coefficients (Gramlich, 1994; Munnell, 1992). But the basic finding still holds: research from around the world indicates that infrastructure permits economic growth and poverty reduction (e.g., Calderón and Servén, 2004; Demurger, 2001; Gibson and Rozelle, 2003; Gunasekera et al., 2008; Straub, 2008). Of course, economic growth also generates demand for more infrastructure to sustain economic dynamism. These mutually reinforcing processes imply that states with sluggish economies seek to invest in infrastructure to stimulate growth, and states with dynamic economies will also invest in order to keep up the momentum. In a similar vein, in geopolitical terms, aggressive or at least confident states will also invest in infrastructure. In distinct historical contexts, this may be in order to secure national borders or to actively engage with neighbours via trade.

These priorities are hardly new, as Frankopan's (2016) recent history of the world shows. 'Silk roads' provide a useful optic for interpreting history via infrastructure as it influences trade relations and geopolitics. Leaders and militaries may be important, but focusing on who invests in roads and ports and trade also helps explain the rise and fall of civilizations. Furthermore, states respond to other states when they build roads, fortify mountain passes, invest in larger ships, and so on. Countries with trading partners as neighbours thrive due to comparative advantages and a reduced need to maintain large armies. All of this is facilitated by the provision of road and other transport and communications infrastructure.

In the opening years of the new millennium, several major new infrastructure initiatives have been advanced around the world. In particular, trans-boundary infrastructure has been the order of the day, as a means to advance global economic integration. There has been considerable attention devoted to IIRSA, the Initiative for Integration of Regional Infrastructure in

South America¹ (Wagner Tizón and Gadea Duarte, 2002). IIRSA projects were delineated by a dozen national governments and a funding programme created in tandem with multinational development banks. The programme has a budget of US\$ 38 billion for roughly 350 projects over approximately 30 years. The master logic behind IIRSA is to span national boundaries to promote trade among neighbours under a regime of ‘open regionalism’ (see Bulmer-Thomas, 2001). While debates have raged in the United States during the past decade over crumbling infrastructure and poor economic performance, South American countries have exhibited more rapid growth and pursued major integration programmes. In Central Asia, China has similarly embarked on a titanic infrastructure agenda to upgrade and renew long-standing overland trade routes to the West, including the original ‘Silk Road’. The ‘One Belt, One Road’ programme reportedly contemplates US\$ 1 trillion in investments by China for trade with various Central Asian neighbours.

As it is hard to ignore the scale and potential impacts of such continental programmes, we do well to reflect on their implications. Khanna’s (2016) discussion of ‘connectography’ underscores the central importance of trans-boundary infrastructure initiatives as a key means of global integration. Against apocalyptic accounts that the world is ‘falling apart’ due to religious hatred or anti-immigrant sentiment, there is also the argument that integration or ‘coming together’ is in fact the main order of the day. Beyond IIRSA and One Belt are infrastructure initiatives such as the Mesoamerica Project in Central America and additional Chinese programmes in East Asia and Africa. While this hardly means that geopolitics and boundary tensions between countries have disappeared, there are numerous international agreements and trans-boundary projects for new roads, railways and pipelines advancing across most parts of the world.

All that said, triumphalist accounts of great integration initiatives, and analyses pointing to roads as explanations for seismic shifts in the global economy and polity, must confront the fact that large-scale infrastructure projects routinely face resistance and protest. If states and banks back new roads, and even if many interest groups cheer construction for the reduced isolation and market opportunities, roads are regularly contested. Whereas infrastructure is generally heavily developed and forms dense networks in highly industrialized and urbanized regions, most major road initiatives now seek to penetrate resource frontiers. Reaching such areas follows a rational logic of incorporating more extraction sites into commodity circuits to sustain economic growth. But remote regions are often biologically valuable and relatively intact ecologically, and encompass many protected areas.

New road projects consequently face increasing scrutiny for their environmental impacts. The case of the Inter-Oceanic Highway, a premier initial

1. IIRSA = Iniciativa para la Integración del a Infraestructura Regional de América del Sur. See the website: www.iirsa.org (accessed 20 January 2008).

project under IIRSA, is illustrative. The environmental impact assessments were limited in scope in terms of the types of impacts considered, the spatial extent to which impacts might be felt, and the duration of time over which impacts might become evident (Dourojeanni et al., 2010). It should therefore not be surprising that business-as-usual procedures in securing licences for road construction are criticized for being little more than rubber stamp exercises. Environmentalists work to expose elite preferences and the priority given by states to construction schedules as the true drivers behind approval processes for infrastructure projects. Evaluation criteria limited to direct impacts of construction and short time frames are no longer considered acceptable, when the indirect effects of a road may exhibit ripple effects extending outward over many years or decades. There is now an established literature on ‘road ecology’ that documents all manner of negative ecological impacts of roads in landscapes (e.g., Coffin, 2007; Forman et al., 2003; Trombulak and Frissell, 2000). Whether in terms of habitat fragmentation, degradation of watersheds, the introduction of exotic species, or the extinction of endemics, roads cause numerous environmental problems.

Roads to resource frontiers also penetrate territories of indigenous and other traditional peoples with pre-existing land claims. In the 21st century, new roads do not enter demographic vacuums, but instead arrive as the means for outsiders to engage in trespass upon local peoples. Such trespasses confront formal (state-based) tenure systems with informal (customary) land claims, leading to confrontations between outsiders and native groups. This reflects the top-down imposition of roads by governments with limited consultations or input by local peoples (Devres Inc., 1981; Robinson, 2001). Roads thus often meet social criticism due to injustices stemming from the lack of recognition of traditional land claims. Social tensions due to roads grow as the benefits are frequently captured by groups with more power, capital and political connections. This yields increasing social inequalities in areas impacted by new infrastructure. There is a significant though fragmented literature on various negative social impacts of roads, whether in terms of land conflicts, the unequal distribution of benefits, damage to sacred religious sites, and so on (e.g., Mahapa and Mashiri, 2001; Rudel and Richards, 1990; Shriar, 2009).

CONTRIBUTIONS OF *DEVELOPMENT AND CHANGE TO UNDERSTANDING ROADS AND DEVELOPMENT*

The upshot of the various literatures surrounding roads and development has been a suite of debates as to the wisdom of investments in infrastructure. Against the positive economic appraisals and thorough-going support of governments and banks, there is considerable documentation of negative ecological and social impacts of roads. That has motivated research to identify experiences of road building that yield outcomes which could

be characterized as economically viable, environmentally sustainable and socially just. In this ambit, publications in *Development and Change* have captured a key portion of the ongoing debate over the promise of roads, their actual impacts, and the resulting potential for contestation over the outcomes. Particularly since the turn of the millennium, *Development and Change* has published a spate of articles by scholars working in various parts of the world on the vagaries attending road construction and the contestation thereof. These publications highlight major turn-of-the-century road-building efforts, usually in resource frontiers, often at national borders. The articles take up major infrastructure programmes such as IIRSA. They focus on resource frontiers such as Amazonia and Siberia, which serve as major resource extraction sites for emerging industrial economies such as Brazil and Russia.

The articles underscore how the purpose and benefits of roads are understood very differently by distinct interest groups, and thus are frequently contested. The road literature in *Development and Change* emphasizes the various forms which critiques may take, as well as the outcomes of contestation in terms of the fate of major infrastructure projects. These articles thus feature the diverse bases for protest against roads, despite their substantial purported economic benefits.

This virtual issue draws attention to the contributions of *Development and Change* to our understanding of the complexities of roads in developing regions as of the opening decades of the 21st century. The remainder of this introductory article will provide brief reviews of the roads literature in *Development and Change*, offering contextual and comparative comments on the contributions of the articles that follow. It will conclude with a discussion of a research agenda going forward for work on roads and development, stemming from the contributions of the roads articles in *Development and Change*.

Nine articles from previous volumes of *Development and Change* focus on various aspects of roads and development. An early contribution, by Chand (1989), focuses on the politics of funding road upgrades, using the case of the World Bank in Fiji. Chand (1989) takes up several central issues in infrastructure planning, notably the funding sources, master logics and the official as opposed to the actual beneficiaries. He provides a critical analysis of the World Bank's planning process vis-à-vis the Government of Fiji for a key highway, arguing that the Bank acted on behalf of international capital rather than Fiji itself. The analysis focuses on the bidding process for the construction contract. The World Bank favoured international firms with established track records over the Public Works Department (PWD) of the Government of Fiji, but Chand (1989) shows that mobilization costs for the foreign firms were far greater than for the PWD, resulting in cost overruns. The article then turns to the World Bank's economic analysis, which produced rosy predictions, indicating growth far above Chand's (1989) estimates. The cost overruns of construction, and the greater cost of construction

by international contractors compared to the PWD's lower bid, become the basis for arguing that public agencies are more efficient in implementing infrastructure and yield a greater net economic benefit in affected regions. Then follows a political economic analysis of the distribution of benefits of the road, noting that foreign firms tied to the tourist economy were the primary beneficiaries. Many small landholders lost their land, and tax breaks went to foreign investors rather than citizens. Chand (1989) concludes that the road was not justified in economic terms, particularly due to the lack of spread in the distribution of the benefits.

Chand's analysis thus reflects many long-standing criticisms of large-scale infrastructure projects. The priorities of multilateral banks and foreign capital often do not align with those of national governments, which in turn have interests that may not incorporate input from stakeholder groups. The Fiji road is thus a clear example of top-down planning; the extent of bottom-up participation is too limited to merit any claim that the input offered has affected implementation. Chand (1989) foreshadows other work on infrastructure that highlights political economy as a useful approach.

On that note, Wilson's (2004) analysis of the political economy of roads is a singular contribution. This is the article that introduced the concept of the developmentalist state that implements a 'territorializing regime' by building roads in order to integrate and secure territory. Rather than follow the standard economic logic of roads as obvious ingredients in development agendas, Wilson (2004) interrogates the underlying political logic of roads. She explicitly identifies political and economic trade-offs stemming from roads as they affect local communities. Whereas Chand's (1989) analysis incorporates the political by observing the narrow distribution of economic benefits from infrastructure, Wilson (2004) examines issues of power via the loss of autonomy and unexpected consequences of integration. More to the point, she highlights state-society relations and calls into question whether they are beneficial for local peoples when roads are involved. This goes beyond the economic debate over benefits, which is important, and focuses on the political issues of relations between local peoples and the state and other outsiders.

Wilson (2004) takes up the case of Peru, an excellent choice since the state is centred in the coastal metropole of Lima but a significant portion of the population resides in the Andean highlands in relative isolation and autonomy. That is changing through new infrastructure projects, but those projects have unfolded in the aftermath of the Sendero Luminoso (Shining Path) insurrection, which pitted the state against Maoist insurgents and put communities in the middle of the conflict. In that context, the concept of a 'territorializing regime' becomes eminently political as the state used infrastructure to secure spaces against political insurgency. Given the historical context, state initiatives for integration in Peru may elicit mixed reactions by local communities that cheer the economic opportunities and improved accessibility, but are wary of increased vulnerability to outside interests.

Wilson's specific case of a highland community illustrates these tensions by noting community fears of both the state and insurgents. Violence by insurgents and corruption involving state contracts for infrastructure left community members leery of any proposals for integration. Under such conditions, it is hard to see how roads promote economic development or foster social justice or local security. By incorporating history and political questions of autonomy and conflict, Wilson (2004) offers a richer approach to understanding roads as viewed by states and local communities.

Perz et al. (2007) take up issues of unofficial road building in another context characterized by relative state absence, a frontier community in the Brazilian Amazon. In the 1970s, the Brazilian military prioritized the integration of the Amazon via the construction of the Transamazon Highway and other official road corridors. This served the geopolitical imperative of protecting frontier areas from foreign incursions and the political economic priority of avoiding land reform in settled regions by instead promoting colonization of the 'empty' Amazon. The unexpected eventuality was the economic crisis of the 1980s, which led to state withdrawal, leaving colonists to their own devices. Local groups thus built upon the official road network begun by the state, constituting the local manifestation of a territorializing regime. Such informal construction creates unofficial roads. Colonists and loggers colluded to build roads to locations with resources they desired. Unofficial roads thus manifested a spatial logic that followed the interests of loggers in reaching valuable timber stands as they coincided with the attractions of relatively flat lands for crops and pastures for colonists. Following the biophysical contours of the landscape to minimize road-building costs (especially bridges over creeks), as well as the socioeconomic priorities of gleaning incomes from key natural resources, unofficial roads proliferated around the Transamazon Highway, as elsewhere across the Amazon.

Unofficial roads now form dense networks, with significant environmental consequences. Unofficial roads fragment forests of exceptional biological value, undermine various ecosystem functions and reduce habitat, especially for species that require large home ranges. By distance, the length of unofficial roads in the Brazilian Amazon exceeds that of official roads by an order of magnitude. Understanding what is happening in the Amazon increasingly requires an understanding of unofficial roads and their particular territorializing regimes. Road building by non-state social actors thus presents an important twist to Wilson's (2004) emphasis on the state in territorializing regimes.

More recent research increasingly features trans-boundary roads. Nyiri and Breidenbach (2008) provide a case in point with the Altai Road at the multi-national frontier where China, Russia, Mongolia and Kazakhstan meet. Central to their analysis is the proposal for a trans-boundary Altai Road between China and Russia. Whereas roads within one national space generally follow the dictates of a territorializing regime defined by a sovereign state, trans-boundary roads require coordination among multiple states.

The example of the Altai Road offers a case of contrasts between the Chinese and Russian sides, which exhibit very different approaches to trans-boundary integration. The Chinese have actively advanced with infrastructure investments and regional development. The proposed Altai Road was endorsed by both national governments, and the road was constructed on the Chinese side. However, although the Altai Republic in Russia requested a road to connect to China, no such road has yet materialized on the Russian side. There, opposition remained. The contrast with the Chinese approach to development reveals ironies that Nyíri and Breidenbach (2008) take some pains to point out, due to their larger significance for debates about roads and development.

On the Chinese side, the investments are impressive. The authors note US\$ 241 billion in spending on infrastructure in China from 1990 to 2003, especially in the north-western parts of the country, as part of the ‘Great North-western Development Strategy’. In the Altai Mountains, infrastructure development focuses on Lake Khanas, which receives some 600,000 tourists each year. Nyíri and Breidenbach (2008) underscore the concerted, sustained infrastructure investments by the Chinese state as an explicitly understood means of impelling development and thus modernization. Lake Khanas is held out as an example of ‘green development’ — albeit development with many bars, shopping areas and resort hotels.

Russia has also developed its part of the Altai region, but in a very different manner. Instead of resort hotels, there are log cabins. Rather than bars and shops, the emphasis is on hiking and experiencing ‘pure nature’. Here then is another version of ‘green development’, one that stands in stark contrast with that seen across the border. Whereas Chinese ‘green development’ exemplifies the classic trappings of modernization as the quantitative increment of material economy, Russian understandings of the same term highlight the experience of wild nature, even on a spiritual level. As Nyíri and Breidenbach (2008) report, many Russians in the Altai view Chinese developments as tacky and unsustainable. At the same time, informants also emphasized how rigorous Chinese development policy was compared to the incoherence of equivalent policy in Russia.

Nyíri and Breidenbach (2008) also use the contrast between the two countries to reflect on the implications of infrastructure development. In China, the other side of the coin of strong state leadership is a weak NGO sector; there is limited space for alternative visions, much less critique. On the Russian side, various NGOs with a wide array of perspectives are at work in the Altai. The result is debate and revisionism as to the content of ‘development’, including the purpose of building roads.

Resistance to road building has thus become another theme in the development literature. However, examples of resistance actually overcoming state or elite preferences and stopping unpopular infrastructure projects remain rare, for reasons noted by Chand (1989) among many others. The proposed Altai road in Russia, noted by Nyíri and Breidenbach (2008), constitutes one

example. Perz (2012) offers another, in a two-case comparison of the Inter-Oceanic Highway and the Trans-Texas Corridor. The focus of this analysis is on implementation outcomes: the first project went forward but the second was stopped. Perz (2012) offers a framework for comparisons between the two cases, organized around the similar political contexts, funding models and proposed benefits, along with the contrasting political responses and implementation outcomes. Both infrastructure projects were proposed in the context of other such initiatives, and both were advanced in moments of economic downturn as a means of stimulating new economic growth. In both cases, advocates made economic arguments to justify the spending necessary for the highway upgrades, following the classic justifications typically offered by states for infrastructure. And in each instance, proponents pursued funding based on public-private partnerships to help defray the costs of construction to taxpayers and thereby make the projects more politically acceptable.

These similarities cannot account for the contrasting implementation outcomes. Rather, the explanation comes from responses by arrays of stakeholders. Whereas there were groups in both cases who made objections, there only emerged a broad consensus against the Trans-Texas Corridor. In the case of the Inter-Oceanic Highway, some NGOs levelled environmental critiques, and a few politicians pointed out cost overruns. But such complaints failed to carry the day against local governments and populations of numerous towns along the route who felt they would benefit from improved access and new economic opportunities, to say nothing of the priorities of the Government of Peru or the banks funding the construction. In the case of the Trans-Texas Corridor, however, numerous interest groups who usually had political differences all came out against the proposed infrastructure project. Political conservatives of various stripes made accusations that the Trans-Texas Corridor would undermine national sovereignty; property rights advocates issued dire warnings about the state taking people's land, and threatened armed resistance; political liberals used the project to criticize conservatives; environmentalists identified oversights in the environmental impact assessments; and so on. Advocates were thus beset on multiple sides, including by significant elements of their own political constituencies.

Such political resistance may not have been enough in itself. In the midst of the political contention, however, the lead planner of the Trans-Texas Corridor died suddenly of a heart attack, and the Texas Department of Transport admitted an accounting mistake that added US\$ 1.1 billion to the cost of the project. The loss of a key advocate and the sudden jump in the price tag drove the Texas legislature to vote down funding for the project. The case of the Trans-Texas Corridor thus illustrates the exceptional circumstances required to kill an infrastructure project.

If Perz's (2012) analysis shows what is necessary to stop investments in roads, Grandia (2013), like Chand (1989) and others, offers a case of the

injustices that can result when such investments do go forward. As IIRSA advanced in South America, the Mesoamerican Plan has proceeded in a similar fashion by pursuing infrastructure projects to integrate Central America. Both originated around 2000 and focus on trans-boundary infrastructure projects to foster increased trade as a means of impelling new economic growth. Grandia (2013) focuses on the planning process in the Petén of northern Guatemala, especially its ramifications for land acquisition and the consequent injustices.

The parallels between Chand (1989) for Fiji and Grandia (2013) for Guatemala are numerous and striking. In both cases, the World Bank oversaw investments for new infrastructure. While the Bank also made investments in land regularization in Guatemala, familiar outcomes nonetheless ensued: many smallholders sold their land or were forced out due to threats of violence by land grabbers. Grandia (2013) offers a detailed analysis of the many perpetrators; they include foreign capitalist firms, domestic elites, military personnel and drug traffickers, among others. The result of such land grabs was to transfer a key resource from many poor landholding families to relatively rich and powerful groups, thus increasing the concentration of wealth. For the World Bank, such land grabs are not a consequence of infrastructure itself or the top-down imposition of development priorities or other forms of neo-colonialism, but a consequence of weak states. But Grandia (2013) highlights that the World Bank land tenure projects focused on the technical aspects of surveying and clarifying property boundaries with little attention to the broader social context of inequalities or the political history of violence, especially against indigenous people, in Guatemala.

Because the Petén remained largely forested as a designated Biosphere Reserve, building a highway across it under the Mesoamerican Plan also had a significant environmental dimension. However, this was sidelined throughout the process as domestic elites preferred to gain access to lands of rising value. The involvement of domestic elites and military personnel in land grabs in the Petén gives some credence to World Bank arguments about weak states, for as Grandia (2013) observes, this reflects state capture. In particular, in Guatemala, the military has a history of using road projects to secure territories, especially against perceived indigenous resistance. The case of the Petén thus provides another example of Wilson's (2004) territorializing regimes under state control.

Since the peace process in Guatemala in the 1990s, the territorializing regime has shifted somewhat, as indigenous peoples have increasingly used roadblocks to protest abuses and dispossession. In the context of the ongoing land grabs, protest has intensified contention over indigenous rights to land. Grandia (2013) comments that domestic elites in the Guatemalan congress have therefore passed laws to permit the state to invoke eminent domain in order to seize lands along roads for investors, and have considered laws making roadblocks acts of terrorism. She thus echoes Wilson (2004) in noting that under the Mesoamerican Plan, as in Peru, roads do not facilitate access

to markets so much as render local peoples vulnerable to dispossession. Both in turn resonate with Chand (1989) in their critiques of the assumption that roads beget anything resembling social development, especially when states and banks advance infrastructure projects without accounting for histories of social injustices.

Pieck (2013) picks up a closely related theme: citizenship as related to road projects. For her analysis we return to Peru and the case of the Inter-Oceanic Highway under IIRSA. While the highway went forward, as noted by Perz (2012), this was not without criticism, especially on environmental grounds. Pieck (2013) elaborates on the historical context in Peru for criticism of the Inter-Oceanic Highway, bringing together the key concepts of governance and citizenship. Both have become pre-eminent terms in recent development literature, and both are exceedingly relevant in the Peruvian context. As Pieck (2013) notes, Peru in the 2000s was emerging from a decade of authoritarianism and insurgency, with the consequence that civil society was becoming more organized and seeking a greater voice in planning for development initiatives. In that context, IIRSA and the Inter-Oceanic Highway became a focus for criticism over the usual sins of infrastructure planning: lack of public input, limited environmental impact analysis, and little transparency about funding and implementation.

Pieck (2013) therefore invokes governance and citizenship to characterize the politicization of debate over the environmental impacts of the Inter-Oceanic Highway. Whereas governance approaches to development seek greater civil society input in planning conducted by the state, critics of the state invoke governance to decry the lack of transparency and collusion between the state and multilateral banks in setting the terms for road building in contracts. Pieck (2013) reports on the strategies and discourse of the Civil Society Working Group on the Inter-Oceanic Highway (GTIOS). The GTIOS sought to improve public access to information about the highway and other large projects on which the public otherwise had little input during the planning stages. A central contention of the GTIOS was that if the state is spending public funds on large projects, the public should have input prior to implementation.

In particular, as seen in other contributions reviewed here, the GTIOS questioned the assumption that highway paving equals development. As a counter, the GTIOS advanced the practice that governance requires social mobilization. This resonates with Wilson (2004), Grandia (2013) and others in asserting that managing the impacts of infrastructure requires attention to its political context. Similarly, the normative dimension of new infrastructure requires recognition of public and not just elite preferences in planning decisions. Pieck (2013) thus notes how the GTIOS's advocacy via public information campaigns got the group invited to later planning meetings for the highway. In that sense, the GTIOS became something of an interlocutor between the state and the public. This, however, raises issues of representation, for the GTIOS is itself another elite group, albeit one composed of

scientists and professionals in NGOs, with limited grassroots ties, which relies on media campaigns to advance its arguments.

If the large majority of the literature on roads and development is highly critical, it is also framed in the context of capitalist development. Even the Chinese case invokes ‘socialist market development’ to justify road building for commercial enterprise (Nyíri and Breidenbach, 2008). Argounova-Low and Prisyazhnyi (2016) therefore offer a useful complementary case from eastern Siberia — the Lena Road — highlighting its history during the years of the Soviet Union. In the process, these authors complement much prior work on roads and development, often by leveraging critiques of infrastructure offered by the researchers discussed above. In particular, Argounova-Low and Prisyazhnyi (2016) highlight the biography of the Lena Road, as understood by local residents. The Soviet state does not disappear from the panorama, however, which provides an interesting point of contact with Wilson’s (2004) territorializing regime concept.

The Lena Road was opened in the 1920s to link the Trans-Siberian Railroad to regional gold mines. Under the Soviets, the road was extended to Sakha, and justified with a flourish of communist and nationalist rhetoric. This is the official history; Argounova-Low and Prisyazhnyi (2016) focus on the understandings of the road by local peoples based on their lived experiences. As the authors show, those experiences are heroic and need no embellishments or propaganda. Many long-time residents literally walked the road to reach the sites of their residences. Culturally, walking the road became an experience that commanded respect and was associated with deep regional knowledge. Not just anyone walked the Lena Road. Indeed, in the post-World War II period, the Soviet state used the area as ‘punitive camps’ for prisoners forced to mine uranium as part of the Soviet drive for a nuclear weapon. Hence two key groups of people living along the Lena Road in the 1950s were those who chose to go there willingly, despite the hardships involved, to try their luck, and those who were imprisoned there to mine radioactive minerals. Towns (and prisons) emerged and were then abandoned. Biographies of the road thus highlight the intermittent nature of development and the compression of time as evident in various roadside relics and museums. This deeper temporal perspective stands in stark contrast to most work on roads and development, which tends to focus on relatively short-term changes in the wake of large projects.

It is not surprising that Argounova-Low and Prisyazhnyi (2016) cite Wilson (2004) and her concept of the territorializing regime. In both of these cases, states invested in roads to control territory, even if the economic argument was dubious. Here the perspective offered by Argounova-Low and Prisyazhnyi (2016) vis-à-vis Nyíri and Breidenbach (2008) is important, since both work on cases in Russia near the border with China. Whereas Nyíri and Breidenbach (2008) underscore limited interest by the Russian state in trans-boundary infrastructure to China in the Altai Mountains,

Argounova-Low and Prisyazhnyi (2016) note that the contemporary Russian state does prioritize national integration, not only for control over territory, but also to increase resource extraction and trade. In contrast to the lack of progress on the Altai Road, the Lena Road is considered a strategic priority due to its proximity to mines and the Chinese border.

One final case is provided by Pathammavong et al.'s (2017) account of why the '450 Year Road' outside Vientiane, Laos, failed to generate economic development. These authors situate their study in the broader literature on land grabbing, and outline a state development policy to finance infrastructure investments. Whereas Grandia (2013) and others have noted land speculation by powerful groups for private gain, Pathammavong et al. (2017) note how the Government of Laos followed the example of other Asian states in invoking eminent domain of a planned road corridor to buy land at below-market prices, followed by land sales or leases at large mark-ups to generate revenue for infrastructure projects, which would then generate economic growth. In Laos, such governmental land speculation was dubbed 'turning land into capital'.

Such a model makes assumptions about the key steps in the process, and Pathammavong et al. (2017) review known instances in which the outcomes were underwhelming. The contribution here is to offer an explanation and, as with several of the previous articles, the authors turn to political factors. In particular, they document how private land speculators entered into informal land purchases with farmers, who agreed since the prices being offered were higher than those on offer by the state. Thus ensued an illegal land market with rising land prices, which undermined the state's plan to speculate. Crucially, the informal agreements between poor farmers and urban elites, including businesspeople and military officers, led to an alliance of resistance wherein people refused to sell their land to the state. Meanwhile, the road project went forward, the state incurred the costs of road building, and little economic investment ensued as buyers awaited real estate appreciation. Resistance and contention thus emerged again in the case of Vientiane, this time from a surprising alliance of rich and poor against the state over land prices along the road.

In the case of Vientiane, Laos, the power of political explanations is again evident. As with Perz (2012), Pathammavong et al. (2017) show that a determined alliance among stakeholder groups can undermine infrastructure projects and/or their proposed economic impacts. And as with Grandia (2013), Pathammavong et al. (2017) show how important land politics are in determining the spread of benefits of roads, though in very different ways. Whereas in Guatemala there were concentrated benefits, in Vientiane the benefits were arguably spread more broadly by the illegal land economy than by government speculation. The Vientiane experience also puts a twist on Wilson's (2004) concept of territorializing regimes, since the illegal land market undermined state control over the economic outcomes. At the same time, the action of non-state actors focused on land in Vientiane, in contrast

to the other case of informality recounted by Perz et al. (2007) concerning unofficial roads.

DISCUSSION: THE CONTRIBUTIONS AND A FUTURE RESEARCH AGENDA

Taken together, the contributions to understanding roads and development in *Development and Change* present a remarkably coherent body of work in light of their parallels and commonalities. Political economy approaches prevail, explicitly in Chand (1989) and Wilson (2004), who are cited by some of the subsequent authors discussed here. Also clear throughout this literature is the shared conclusion that building or improving a road has manifold impacts that go far beyond the promised economic benefits. There are significant negative ecological and social impacts; what is more, there are often negative economic outcomes, whether unanticipated or as a reflection of pre-existing political arrangements involving social injustices. In similar fashion, official infrastructure projects often generate informal responses, whether via unofficial road building or informal (not to say illegal) economic activity. Also featured in many contributions is contestation over roads, whether about the roads themselves or about land and other resources made more valuable along road corridors. Beyond cryptic informal or illegal activity are various forms of open protest, either during construction when land 'acquisition' meets resistance or after construction when the inequalities in the benefits become obvious. The *Development and Change* literature on roads and development highlights contention as a requisite for social justice in development, in contrast to more orthodox treatments of infrastructure as a necessary ingredient for economic progress.

At the same time, there are contrasts in the foregoing contributions. As one of the contributors, I gained numerous insights from reading the other publications. I therefore suggest that the differences among the contributions constitute learning opportunities, not only for the other authors, but more broadly for future work on roads and development.

One contrast concerns the treatment of time, and therefore the time-depth of research on roads and development. Most of the contributions focus on high-profile projects and change processes over a period of at most a decade. However, a relatively few contributions situate specific projects and responses thereto in a much deeper historical context, as in Wilson (2004) and Argounova-Low and Prisyazhnyi (2016). Greater depth of context facilitates interpretation of recent processes, most notably in cases of protest and other forms of resistance to infrastructure projects, but also in grasping local cultural understandings of roads themselves. This is also evident in other historical work on roads like Frankopan (2016), where reconfigurations of resource extraction sites, seats of administrative power, and thus nodes in trade networks change over long stretches of time. All the same, long-standing dreams

to build roads as a means to finally impel development may or may not be wise when an opportunity arises to fund a road, as shown by Chand (1989) in Fiji and Perz (2012) and Pieck (2013) for the Inter-Oceanic Highway in Peru.

A second contrast in the foregoing contributions concerns the roles of the state in road building. States often lead road building because of assumptions about their necessity for the development enterprise, as featured by Nyiri and Breidenbach (2008) for the case of China and by Pathammavong et al. (2017) in Laos. But states may be absent, as in Perz et al. (2007), or pose threats to local peoples, as in Wilson (2004), or operate in active collusion to prevent broadly shared economic benefits, as in Chand (1989) and Grandia (2013). In all cases, the roles of the state are presented as too narrowly conceived, albeit for different reasons including elite capture or social conflict. The proposed outlet from this problematic circumstance, as Pieck (2013) emphasizes, is for civil society to organize and demand citizenship rights to participate in infrastructure planning and thereby enact shared governance of roads. This not only implies greater state transparency in planning, but also a broader suite of considerations by the state as to the necessary ingredients for adequate planning of roads, as evident in Pathammavong et al. (2017). Far beyond the technical details of construction or land tenure, there is a need for more focus on pre-existing social inequalities and thus assessment of prospective social impacts, particularly those likely to hurt vulnerable groups and increase social inequalities. Pieck (2013) points out the limitations of such efforts; there is a need for more research on road governance, particularly on how civil society groups learn from their limitations, and how states respond to increased societal demands for better road planning. There is also more to be learned about the conditions under which states desist with road projects in light of social protest, to better grasp the necessities of protest in order to stop poorly conceived infrastructure projects in the first place (Perz, 2012).

The contributions pay variable amounts of attention to issues of roads in the context of economic globalization. Some articles focus on local roads or roads within a country, whereas other contributions take up trans-boundary infrastructure and thus international relations and trade. But in both cases, the growing articulation of locations around the globe via roads that lead to ports and thus the global economy means that, whether directly or indirectly, globalization affects the outcomes of new or improved roads. Here work on road governance must confront the larger political economy of roads in the global economy. This is because a key justification by multilateral bank economists for investments in infrastructure is the relative deficit in infrastructure of one region compared to another (see Calderon and Servén, 2004). A key justification for IIRSA was Latin America's infrastructure deficit compared to East Asia.² Pieck's (2013) observations of the limitations of road governance are thus compounded by pressure on governments

2. See the website: www.iirsa.org (accessed 20 January 2008).

by banks to build more in order to keep up in the global economy. Research articulating local efforts at road governance must therefore confront global pressure to build and improve infrastructure. Cross-scale analyses, whether in the political ecology tradition or other approaches as they inform multi-scale governance, are needed for the case of roads. Here work on multi-level environmental governance offers a template, since it emphasizes multi-stakeholder processes including the local level and social learning among participating interest groups (see Armitage et al., 2010; Pahl-Wostl, 2009).

A final point of difference among the contributions concerns the design of studies in terms of case selection. Most of the articles focused on one case, though some took up historical comparisons over time. Only Nyíri and Breidenbach (2008) and Perz (2012) offer multi-case comparisons. Context clearly matters for understanding roads and development, and learning from multiple cases thus becomes very valuable. As the articles featured here emphasize, the presence and roles of the state vary profoundly across contexts. The fundamentally different roles of the state with respect to roads and development therefore merit further inquiry. So too do the outcomes of new or improved roads. In particular, there is a need for more research to identify instances in which roads can yield economic benefits and avoid social problems and ecological damage. Recent work by Laurance et al. (2014) and Perz et al. (2012) offer distinct approaches to confronting different road impacts, but this remains an area in which more needs to be done.

The nine *Development and Change* articles included in this virtual issue (in order of appearance)

1. Chand, G. (1989) 'The World Bank in Fiji: The Case of the Suva–Nadi Highway Reconstruction Project', *Development and Change* 20(2): 235–67. <https://doi.org/10.1111/j.1467-7660.1989.tb00347.x>
2. Wilson, F. (2004) 'Towards a Political Economy of Roads: Experiences from Peru', *Development and Change* 35(3): 525–46. <https://doi.org/10.1111/j.1467-7660.2004.00364.x>
3. Perz, S.G., M.M. Caldas, E. Arima and R.T. Walker (2007) 'Unofficial Road Building in the Amazon: Socioeconomic and Biophysical Explanations', *Development and Change* 38(3): 529–51. <https://doi.org/10.1111/j.1467-7660.2007.00422.x>
4. Nyíri, P. and J. Breidenbach (2008) 'The Altai Road: Visions of Development across the Russian–Chinese Border', *Development and Change* 39(1): 123–45. <https://doi.org/10.1111/j.1467-7660.2008.00471.x>
5. Perz, S.G. (2012) 'Social Mobilization in Protest of Transboundary Highway Projects: Explaining Contrasting Implementation Outcomes', *Development and Change* 43(3): 797–821. <https://doi.org/10.1111/j.1467-7660.2012.01773.x>

6. Grandia, L. (2013) 'Road Mapping: Mega-Projects and Land Grabs in the Northern Guatemalan Highlands', *Development and Change* 44(2): 233–59. <https://doi.org/10.1111/dech.12020>
7. Pieck, S. (2013) 'Asphalt Dreams: Road Construction and Environmental Citizenship in Peru', *Development and Change* 44(5): 1039–63. <https://doi.org/10.1111/dech.12056>
8. Argounova-Low, T. and M. Prisyazhnyi (2016) 'Biography of a Road: Past and Present of the Siberian Doroga Lena', *Development and Change* 47(2): 367–87. <https://doi.org/10.1111/dech.12220>
9. Pathammavong, B., M. Kenney-Lazar and E.V. Sayaraj (2017) 'Financing the 450 Year Road: Land Expropriation and Politics "All the Way Down" in Vientiane, Laos', *Development and Change* 48(6): 1417–38. <https://doi.org/10.1111/dech.12339>

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