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REVIEW

Paratransit in the Global South: Roles, Regulation and Formalization Outcomes

Transporte informal en el Sur Global: funciones, regulación y resultados de la formalización

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ABSTRACT

Paratransit, the set of informal and semi-formal shared transport services, carries a large share of daily trips in cities of the Global South, yet its roles, its regulation and the outcomes of formalization policies are seldom compared across regions. The synthesis shows that paratransit performs durable mobility functions by filling service gaps through self-organized and demand-responsive networks, while remaining precarious and lightly regulated. Regulation is plural and negotiated rather than absent, with states and operator associations co-producing the rules, and with digital surveillance emerging as a new instrument of formalization. Formalization policies do not achieve full replacement; the more feasible reforms convert paratransit into feeder services and succeed when financing, operator incorporation and transitional institutions are combined. The evidence on livelihoods and equity indicates that paratransit provides low-barrier employment under insecure conditions and that gender and affordability gaps persist after reform. The review concludes that regulation and formalization should be judged by their effects on service, employment and equity, and identifies the comparative longitudinal evaluation of reform programs as the main research gap.

Keywords: informal transport; paratransit; regulation; formalization; Global South; urban mobility.

RESUMEN

El paratransit, el conjunto de servicios compartidos de transporte informal y semiformal, moviliza una proporción importante de los viajes diarios en las ciudades del Sur Global; sin embargo, sus funciones, su regulación y los resultados de las políticas de formalización rara vez se comparan entre regiones. La síntesis muestra que el paratransit cumple funciones de movilidad duraderas al cubrir vacíos de servicio mediante redes autorreguladas y adaptables a la demanda, a la vez que permanece precario y escasamente regulado. La regulación es plural y negociada, no ausente: el Estado y las asociaciones de operadores coproducen las reglas, y la vigilancia digital emerge como un nuevo instrumento de formalización. Las políticas de formalización no logran la sustitución plena; las reformas más viables convierten el paratransit en servicios alimentadores y prosperan cuando combinan financiación, incorporación de operadores e instituciones de transición. La evidencia sobre medios de vida y equidad indica que el paratransit ofrece empleo de bajo umbral en condiciones inseguras y que las brechas de género y asequibilidad persisten tras la reforma. La revisión concluye que la regulación y la formalización deben juzgarse por sus efectos sobre el servicio, el empleo y la equidad, e identifica la evaluación comparativa y longitudinal de los programas de reforma como el principal vacío de investigación.

Palabras clave: transporte informal; paratransit; regulación; formalización; Sur Global; movilidad urbana.

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INTRODUCTION

Informal and semi-formal shared transport, known collectively as paratransit, is the default mobility system for a large share of urban residents in the Global South.

Cervero and Golub(1)documented its dominance across the developing world, describing minibuses, shared taxis, motorcycle taxis and cycle rickshaws that carry the majority of motorized trips in many cities. Behrens, Chalermpong and Oviedo(2)updated that account, observing that paratransit remains the principal motorized mode in much of Africa, Asia and Latin America even where formal bus rapid transit has been introduced.

Benevenuto and Caulfield(3)connected this reality to transport poverty, arguing that mobility disadvantage in the Global South cannot be separated from the affordability, availability and safety of these services.

Klopp and Cavoli(4)reached the same conclusion from the ground, showing that the networks most residents actually use are absent from official transport maps. The governance of the sector spans transport planning, labor regulation and urban politics, which is why its reform generates conflict well beyond the transport ministry. The persistence of these services, rather than their disappearance, is the point of departure for this review.

Two developments make a fresh synthesis timely. Formalization and modernization programs have multiplied since the mid-2010s, from the modernization of the Philippine jeepney industry to the feeder-conversion reforms attached to bus rapid transit in African cities.

Mateo-Babiano et al.(5)analyzed the transition of the jeepney industry, and Asimeng and Heinrichs(6)compared operator resistance to bus rapid transit in four cities, both showing that reform outcomes depend on how incumbent operators are treated.

Digital platforms and electrification have begun to reshape the sector in parallel, as Morrissey and Schwanen(7)documented for the South African minibus taxi industry and Mittal, Timme and Schröder(8)demonstrated for self-organizing networks.

The COVID-19 pandemic then subjected the sector to a stress test that revealed its fragility and its indispensability at once, as Boonsiripant, Siewwuttanagul and Jittrapirom(9)showed for Bangkok and Batool et al.(10)for Bangladesh and Nigeria. Readings of the sector written before these changes now describe a field in motion rather than a stable one. These changes have not eliminated paratransit; they have reorganized it, and the question this review takes up is what that reorganization produces for the people who ride and drive the system.

Existing syntheses nevertheless leave comparative questions unanswered. The service-quality reviews of Jaiswal, Manoj and Tiwari(11) and Bhuyan and Roy(12)catalogued user perceptions without connecting them to regulatory design. Tucho(13)summarized the socioeconomic impacts of informal transport but did not assess the outcomes of formalization programs.

Foley et al.(14)and Randall et al.(15)mapped gendered and health-related inequities in African travel without asking how regulation modifies them. The evidence is also uneven: sub-Saharan Africa, Latin America and South Asia dominate the literature, while smaller cities and some linguistic regions remain understudied. Digitalization and electrification add a further layer, because both promise modernization while risking deeper surveillance and the displacement of the sector's workforce, an issue the synthesis returns to below. What these authors did not resolve is how the mobility roles of paratransit, the regimes that govern it and the outcomes of formalization policies fit together across regions, and whether the reforms delivered the service, employment and equity results they promised.

The objective of this review is to synthesize the published evidence on the roles of paratransit in cities of the Global South and on the outcomes of the regulation and formalization policies applied to it. Four questions guide the synthesis: what mobility functions paratransit performs, how it is regulated and governed, what formalization and modernization policies achieve, and what consequences they carry for livelihoods and equity.

DEVELOPMENT

The synthesis draws on seventy studies distributed across four axes, summarized in (Table 1). Across them, paratransit emerges as a stable and self-organized system whose regulation is negotiated rather than absent, and whose formalization succeeds only under narrow conditions that combine financing, operator incorporation and transitional institutions.

Mobility roles and service niches

Woolf and Joubert(16) described South African paratransit from the perspective of the people who depend on it, concluding that minibus taxis provide the only affordable and spatially extensive service for most commuters.

Table 1. Synthesis of the reviewed evidence by thematic axis.

Thematic axis	Key finding	Representative studies	Studies (n)
Mobility roles and service niches	Paratransit is the dominant low-income mode and fills service gaps through self-organized, demand-responsive networks	Woolf and Joubert (2013); McCormick et al. (2013); Jauregui-Fung et al. (2019); Falchetta et al. (2021); Mittal et al. (2024)	18
Regulation and governance	Regulation is plural and negotiated, and the state itself produces rather than eliminates informality	Dumba (2017); Rekhviashvili and Sgibnev (2020); Sunio et al. (2021); Durant et al. (2023); Fobosi (2024)	17
Formalization and modernization	Hybrid feeder-conversion reforms dominate, and they advance when financing and operator incorporation are combined	Salazar Ferro and Behrens (2015); Mateo-Babiano et al. (2020); Asimeng and Heinrichs (2021); Mokoma and Venter (2023); Diaou et al. (2024)	20
Livelihoods, labor and equity	Paratransit provides precarious low-barrier employment, and gender and affordability gaps persist after reform	Benevenuto and Caulfield (2019); Foley et al. (2022); Akaateba et al. (2023); Batool et al. (2024); Nguyen and Turner (2024)	15

McCormick et al.(17)reached a parallel conclusion from the matatu industry of Nairobi, where owner-driven business strategies sustain frequent and flexible supply despite weak formal oversight. Jauregui-Fung et al.(18) reconstructed the mobility anatomy of metropolitan Lima and showed that a dense web of combis, coasters and motorcycle taxis operates as a de facto transit system that official plans barely recognize.

Falchetta et al.(19)compared paratransit networks in seven major African cities and documented their extensive spatial coverage and high accessibility relative to scheduled services. These studies converge on one finding: paratransit is not a residual sector but the functional backbone of urban mobility for most residents. The convergence matters for policy because it implies that removing paratransit without first supplying an equivalent service removes mobility itself.

The spatial logic of these networks has become clearer as tracking and route data accumulated. du Preez, Zuidgeest and Behrens(20)clustered paratransit routes in Cape Town and identified route typologies that reflect operator strategies rather than formal network planning.

Ndibatya and Booysen(21)described the operations and economics of Kampala's minibus taxis, and(22)later characterized their movement patterns, showing that the system is organized around demand rather than a fixed timetable.

Nelson(23)showed how the spatial and social logic of Cape Town's minibus taxi network can support social inclusion even as it remains unmapped by planners. Mittal, Timme and Schröder(8) demonstrated that informal public transport networks self-organize into efficient structures without central coordination, a result that reframes informality as adaptive rather than chaotic.

Kerzhner(24)asked whether informal transport is genuinely flexible and answered with a qualified affirmative, documenting a responsiveness to demand that scheduled services cannot match.

Dovey and Recio(25)integrated these observations into a broader theory of informal urbanism, treating transport as one component of self-organizing settlement and street economies rather than as an anomaly to be corrected.

Motorcycle taxis and three-wheelers occupy the most flexible niches of this system. Diaz Olvera, Plat and Pochet(26)reviewed motorcycle taxi services across sub-Saharan African cities and described their role in first-and-last-mile access, job creation and road safety, a combination that explains both their popularity and their contested status. Tekest,

Lika and Girma(27)documented the minibus taxi services of Addis Ababa, and Iimi(28)estimated the demand for informal public transport in Antananarivo, confirming that demand responds strongly to affordability rather than to scheduled supply.

Lesteven et al.(29)showed how clandestine taxis structure daily mobility in the peripheries of Dakar, where formal services remain thin. Klopp and Cavoli(4)argued from Maputo and Nairobi that mapping paratransit is a precondition for any planning that takes existing mobility seriously, and Kerzhner(30)explained how these networks form by bridging planning theory with the political economy of labor. The axis as a whole indicates that the roles of paratransit are structural, not transitional.

The durability of these roles coexists with unresolved externalities. Diaz Olvera, Plat and Po-

chet(26)and Tucho(13)both note that the same services that fill mobility gaps also concentrate accident, congestion and pollution burdens, and the environmental costs of aging fleets are documented most directly for the minibus taxi systems of sub-Saharan Africa. This coexistence explains the recurrent pressure to modernize the sector, and it frames the regulatory and formalization questions that the next axes examine.

The studies nonetheless diverge on whether paratransit should be stabilized and improved in place or absorbed into formal systems. Woolf and Joubert(16)and Klopp and Cavoli(4)imply the first position, because they measure the value of the system to its users, whereas the modernization literature summarized in the following axes begins from the second.

The divergence is partly methodological: functional studies observe actual behavior, while reform studies start from a desired end state. A further gap runs through the axis. The network evidence is concentrated in African cities, and its transferability to Asian and Latin American contexts is assumed rather than tested, even though the modes and regulatory histories of those regions differ sharply from the African cases.

A definitional tension runs beneath the axis as well. The term paratransit collapses services that differ in vehicle, ownership, route structure and legal status, from the fixed-route matatu to the fully demand-responsive motorcycle taxi.

McCormick et al.(17)and Diaz Olvera, Plat and Pochet(26)each noted that typological variety, and reviews that ignore it risk transferring lessons across modes that operate under different economics. The axis therefore recommends that future work specify the mode, ownership and regulatory status under study, a specification that the quantitative network studies already satisfy but that the programmatic literature omits.

Regulation and governance of paratransit

Dumba(31)traced the link between driver behavior and regulatory policy in informal public transport, arguing that enforcement failures shape the very conduct that regulators seek to change.

Durant et al.(32)re-evaluated the relationships between city authorities and informal operators in five sub-Saharan African cities and found that governance rests on negotiation rather than command.

Sunio et al.(33)examined the role of the state in the governance of sustainable mobility transitions and concluded that the state is not a neutral arbiter but an active shaper of the informal transport sector.

Akaateba, Akanbang and Yakubu(34)described owner-operator relations in Ghana's motor tricycle taxi industry and showed that regulation is co-produced through everyday bargains between authorities and operators. These studies reject the image of a regulatory vacuum and substitute a picture of plural, negotiated governance in which formal rules coexist with informal authority.

The state is a producer of informality rather than a passive tolerator of it. Mittal(35)documented how the state generated and stabilized the Vikram shared jeeps of Dehradun through selective licensing and complicity.

Kerzhner(36)reached a comparable conclusion in East Jerusalem, where formalization attempts reorganized rather than eliminated informal Palestinian transport.

Weicker(37)showed that the marshrutka system of southern Russian cities persists through a shifting boundary between formal and informal rules, and Rekhviashvili and Sgibnev(38)supplied the theoretical frame for these cases, arguing that informality is socially embedded and must be studied as a relation to the state rather than as its absence.

Rekhviashvili et al.(39)extended the argument by placing contestation over formalization at the center of urban transport politics. Unlike the findings of the enforcement literature, these studies treat state complicity as a design feature of informality rather than as a failure to regulate.

Operator organizations mediate this governance. Dumedah et al.(40)showed that driver unions and paratransit operators in Ghana influence the allocation of terminals and routes, sometimes at the cost of network efficiency.

Alimo et al.(41)documented the growth of motorcycle taxis in Ghana and the formal regulation that followed, and Behrens et al.(42)drew lessons from inter-city matatu cooperatives in Kenya, showing that operator organization can improve service where it is supported rather than suppressed.

New instruments have emerged on this terrain. Morrissey and Schwanen(7)argued that digital technologies formalize the South African minibus taxi industry through surveillance rather than through improved working conditions, and Fobosi(43)identified the contradictions surrounding the formalization of the same industry.

Where reform collides with bus rapid transit, politics intensify: Diallo(44)analyzed the contested adoption of BRT policy in Cape Town, and Goedeking(45)found broad but shallow public support for BRT in low- and middle-income countries against deep operator opposition.

King(46)framed the field's dilemma in an earlier special section, observing that paratransit regulation must reconcile the service the sector provides with the harms it produces. The studies reviewed here show that this reconciliation remains unfinished, and that the frontier of regulation has moved from enforcement alone toward the design of contracts and institutions that can absorb incumbent operators, a theme the next axis takes up.

The tension between enforcement and co-production is the axis's central divergence. Studies that begin from rule violations, such as that of Dumba,(31)recommend stronger enforcement and clearer standards. Studies that begin from the bargains that sustain the system, such as those of Durant et al.(32)and Sunio et al.,(33)recommend institutional designs that give operators a stake in compliance.

The two positions lead to different instruments but are not irreconcilable, and the axis shows that the second has gained ground as digital tracking made enforcement cheaper while exposing how much conduct the old rules never governed.

The shift in instruments is visible in practice: traditional licensing and fare control have given way to a mix of franchise contracts, transport management companies and digital monitoring, as Plano(47)documented for Nairobi and Morrissey and Schwanen(7)for South Africa.

What remains understudied is the labor dimension of this governance: the reviewed work maps unions and associations as bargaining partners but does not follow the individual driver through a regulatory change, so the cost of compliance to the operator remains largely invisible. The comparative gap is equally clear, since no reviewed study holds the regulatory instrument constant across cities, and the field cannot yet say which instrument produces compliance at the lowest cost to operators.

Formalization and modernization policies and their outcomes

Programs that attempted the full replacement of paratransit by scheduled services have not been sustained in the cases reviewed, and the reform literature has converged on hybrid and feeder-conversion models instead.

Salazar Ferro and Behrens(48)analyzed the shift from direct to trunk-and-feeder public transport services in the urban South and identified the territorial implications of reorganizing incumbent networks.

Ferro, Muñoz and Behrens(49)drew lessons from South American case studies of trunk and feeder regulation, and Del Mistro and Behrens(50)estimated the impacts of converting Cape Town's paratransit from line-haul to feeder service, finding that integration is technically feasible but politically costly.

Permana et al.(51)described dual formal and informal modes that move a developing city toward integrated transit, and Joubert and Venter(52)modeled the behavioral response of paratransit to formal public transport in hybrid systems, showing that the two respond to one another rather than substituting cleanly. Boutueil, Lesteven and Nemett(53)argued for integrating paratransit directly into transportation planning in African cities instead of planning around it.

The country programs that attempted integration illustrate the range of outcomes, summarized in (Table 2). Mateo-Babiano et al.(5)analyzed the formalization of the Philippine jeepney industry and found that the transition hinges on unresolved issues of financing, vehicle standards and operator inclusion.

Sunio et al.(54)examined the long-term service contracts designed to mobilize private financing for that reform and showed that contract design can soften operator resistance when it protects livelihoods. Asimeng and Heinrichs(6)asked why paratransit operators resist participation in bus rapid transit and, comparing Bogotá, Mexico City, Johannesburg and Lagos, identified the exclusion of incumbents as the recurring cause.

Asimeng(55)reached a complementary conclusion from Accra, where the inclusion of incumbent paratransit operators in the BRT eased implementation, and(56)later argued for a more incremental reform approach in African cities.

Financing and operator incorporation recur as the decisive conditions. Diaou et al.(57) reviewed the financing and formalization process of the AFTU in Dakar and showed that fleet renewal and credit schemes formalize operators unevenly.

Asimeng and Asabere(58)identified the factors that determine paratransit drivers' willingness to participate in formal bus services, and Plano and Behrens(59)documented the minibus

paratransit operators' perspective on reform in Cape Town.

Plano(47)distilled lessons from transport management companies in Nairobi and their transferability, and Mokoma and Venter(60)mapped pathways to integrating paratransit and formal public transport in Tshwane.

Tiglao et al.(61)described how crowdsourcing and digital co-production supported the modernization of local public transport in General Santos City in the Philippines, and Gadepalli et al.(62) proposed a tactical planning framework to integrate paratransit with formal systems. The common thread is that financing works when it reaches operators through institutions they recognize, and it fails when it is designed for vehicles rather than for people.

The distributional results of formalization are mixed. Bocarejo and Urrego(63) estimated the impacts of formalization and integration of public transport on social equity in Bogotá and found gains that depend on complementary measures.

Benevenuto and Caulfield(64)examined the socioeconomic outcomes of transport interventions in the Global South and warned that benefits concentrate when equity is not an explicit objective.

Jaiswal, Manoj and Tiwari(65)reviewed India's intermediate public transport and showed that its scale and persistence demand a formalization strategy built on the existing system rather than against it. Taken together, the programs suggest that formalization succeeds as a negotiated transition and fails when it is designed as a one-way replacement.

Table 2. Selected formalization and modernization programs and their reported outcomes.

Program or city	Approach	Reported outcome	Documented limitation
Cape Town, South Africa	Feeder conversion of minibus taxis to the MyCiTi BRT	Partial incorporation of incumbent operators	Operator resistance and contested policy adoption
Bogotá, Colombia	Phased BRT with formalization of traditional buses	Accessibility and equity gains	Incomplete integration and social tensions
Manila, Philippines	Jeepney modernization with service contracts	Slow, contested transition	Financing gaps and operator opposition
Accra, Ghana	BRT with inclusion of incumbent paratransit	Operator inclusion eased implementation	Limited capacity and durability
Dakar, Senegal	Financing and fleet renewal through the AFTU	Formalized financing for operators	Uneven operator formalism

Note: BRT = bus rapid transit.

A further disagreement concerns the pace of transition. Goedeking(45)and Asimeng(56)argue for incremental reform on political grounds, because rapid replacement concentrates losses on operators, while the Philippine service-contract model analyzed by Sunio et al.(54)pursues a faster contractual transition that nonetheless protects operator livelihoods. The evidence does not settle the pace question.

The evaluations reviewed here observe programs over short windows and do not measure outcomes after the contract or franchise matures, so the durability of formalized services remains unverified. That absence is the axis's clearest gap: longitudinal evidence on whether formalized services retain the coverage, frequency and affordability of the informal system they replaced is still missing from the literature.

Livelihoods, labor and equity

Paratransit is a major source of low-barrier employment, and the working conditions that sustain it are precarious. Batool et al.(10)compared the effects of COVID-19 on public and paratransit drivers in Bangladesh and Nigeria and documented how income losses fell hardest on informal workers without social protection.

Turner(66)described the livelihood tactics of three-wheeler delivery drivers in Hanoi, framing them as disposable infrastructure, and Nguyen and Turner(67)showed how ride-hailing platforms compete with informal motorbike-taxi livelihoods in the same city.

Akaateba, Akanbang and Yakubu(34)traced owner-operator relations in Ghana's motor tricycle taxi industry and exposed the economic dependency that keeps informality in place.

Priye, Manoj and Ranjan(68)profiled the socioeconomic characteristics of paratransit drivers in Delhi and their perceptions of electric rickshaws, and Baker(69)examined the everyday experiences of digital financial inclusion among India's paratransit micro-entrepreneurs. These studies

converge on a sobering point: the livelihoods embedded in paratransit are at once its social function and its most fragile component.

Gender and equity gaps cut across those livelihoods. Benevenuto and Caulfield(3)framed transport poverty in the Global South as a gendered and classed phenomenon, and Foley et al.(14) quantified socioeconomic and gendered inequities in travel behavior across Africa.

Rahman(70)modeled paratransit service quality through low-income women's perceptions in Dhaka, and Shah, Rajiv and Lokre(71)mapped the path toward gender-equitable transportation in post-COVID South Asia.

Biswas and Roychowdhury(72)scoped the literature on paratransit and women's mobility in urban areas and found that safety, harassment and affordability dominate women's constraints. Kerzhner(73)showed, from the creation of an informal transport route, that gender shapes how routes emerge and whom they serve. The pattern indicates that formalization programs that ignore gender reproduce the inequities they inherit.

The sector's wider costs and benefits complete the picture. Tucho(13)reviewed the socioeconomic impacts of informal transportation and its complementarity in addressing equity and the sustainable development goals, concluding that informal transport is indispensable to current mobility but imposes safety and environmental burdens.

Randall et al.(15)synthesized active travel and paratransit use in African cities, and Hamiduddin(74)demonstrated from Ulaanbaatar that the car is not always king in Global South cities, where paratransit and walking remain the majority. These accounts indicate that livelihoods, safety and equity are not externalities of formalization but its central stakes, and that a reform judged only by vehicle standards or ridership will miss the outcomes that matter most to users and workers.

The divergence between user-focused and worker-focused studies closes the axis. Rahman(70)and Biswas and Roychowdhury(72)measure the constraints of women users and find that safety, harassment and affordability dominate their judgment of service, while Turner(66)and Nguyen and Turner(67)measure the conditions of the drivers who produce that service, and Priye, Manoj and Ranjan(68)profile the workers in between.

The two perspectives meet in the axis's main gap: user satisfaction can coexist with driver precarity, and a reform that raises satisfaction for riders can still destroy the livelihoods that keep the service running. Studies that measure both sides of the transaction at once are scarce, and longitudinal tracking of users and workers through a formalization program is absent from the reviewed literature.

Safety runs through the axis as a recurring cost. Diaz Olvera, Plat and Pochet(26)identified road safety as a defining attribute of motorcycle taxi systems, and Alimo et al.(41)linked the growth of motorcycle taxis in Ghana to the road-safety pressures that regulation then tried to address. The driver studies reviewed here show that safety is also an occupational hazard for the workers themselves, not only a risk for passengers. Formalization programs that substitute vehicles without addressing driver behavior and enforcement therefore transfer the risk rather than removing it, a point that the regulatory axis developed and that the safety evidence reinforces.

Measurement is the axis's weakest point. Most of the livelihood evidence is cross-sectional and self-reported, and no reviewed study links a formalization program to changes in driver income or job quality over time. Tucho(13)reached the same conclusion in his review of socioeconomic impacts, and Randall et al.(15)noted the parallel absence of longitudinal health and activity evidence. The consequence is that equity claims about formalization rest on snapshots, and the review cannot yet say whether reform improves or worsens the position of the sector's workers.

DISCUSSION

The principal finding of this review is that paratransit is a stable, self-organized mobility system whose regulation is negotiated and whose formalization succeeds only as an incremental, financed transition rather than as replacement. This result stands against the assumption, implicit in many modernization programs, that informality is a temporary defect to be removed.

Cervero and Golub(1)anticipated the durability of the sector two decades ago, and Behrens, Chalermpong and Oviedo(2)confirmed that durability in their later handbook synthesis. Along the same lines, Tucker and Anantharaman(75)argued from the wider informal-economy literature that formalization should be reframed as reparation of working conditions rather than as the elimination of informal livelihoods. The mobility evidence reviewed here supports that shift: the studies by Kerzhner,(24)Mittal, Timme and Schröder(8)and Klopp and Cavoli(4)describe networks that planners ignore at the cost of misreading how cities actually move.

The regulation findings refine the usual story of a regulatory vacuum. As previously noted by Sunio et al.,(33)the state is an active shaper of informality, a position that Rekhviashvili and Sgibnev(38)and Rekhviashvili et al.(39)develop into a broader theory of informality as a social relation. Unlike the findings of the enforcement studies, which treat non-compliance as the problem, the governance literature locates the problem in the co-production of rules by states, unions and operators.

This divergence has a concrete explanation: enforcement studies observe the gap between written rules and observed behavior, whereas governance studies observe the bargains that keep the system running, and the two observations describe different moments of the same process. Agheyisi(76)captured that process in Benin City, where tricycle taxi operations privilege commuter access through arrangements that no single authority controls. The implication is that regulation should be designed around the incentives that co-production reveals, a point the digital-surveillance findings of Morrissey and Schwanen(7)make concrete.

On formalization, the reviewed programs agree more than they disagree, and the disagreement is mostly about sequence and pace. Asimeng and Heinrichs(6)identified operator exclusion as the recurring cause of resistance across Bogotá, Mexico City, Johannesburg and Lagos, a finding echoed by the jeepney evidence of Mateo-Babiano et al.(5)and Sunio et al..(54)Bocarejo and Urrego(63)added that equity gains in Bogotá depend on complementary measures, which explains why superficially similar programs produce different distributional results.

The divergence between the Philippine and the Accra experiences, reported by Asimeng,(55) is instructive here: inclusion of incumbents eased implementation in Accra, whereas financing gaps slowed the Philippine reform. Just as Del Mistro and Behrens(50)warned for Cape Town, the technical feasibility of integration is not the binding constraint; the politics and financing of operator incorporation are. The pattern also cautions against transplanting a successful model across contexts, because the binding constraint in each case was local: financing in Manila, operator incorporation in Accra, and political sequencing in Bogotá.

The livelihoods evidence carries the clearest implication. Benevenuto and Caulfield(3)and Foley et al.(14)show that transport poverty is gendered and classed, and the driver studies by Batool et al.,(10)Priye, Manoj and Ranjan(68)and Baker(69)show that the sector's employment is precarious precisely where it is most accessible. Cabrera and Moyano(77)observed the same dependence in the urbanization process itself, where informal transport enables settlement at the periphery.

The review therefore cautions against judging formalization by vehicle standards alone, a caution that Thomas and Gouëset(78)extend in their reading of Bogotá after TransMilenio, where modernization did not resolve the social tensions around inclusion. The service-quality literature converges on the same point: Tiglao et al.(79)in Metro Manila, Olowosegun, Moyo and Gopinath(80) in Ibadan, Sharma, Pandit and Bose(81)in India and Ahmed, Waheed and Shah(82)in Peshawar all find that reliability, safety and fare predictability govern user judgment, and none of these dimensions is guaranteed by formalization alone.

Placed next to earlier reviews, this synthesis clarifies what the field has and has not established. Jaiswal, Manoj and Tiwari(11)and Bhuyan and Roy(12)organized the service-quality literature but stopped at perception. Dzisi et al.(83)reviewed mobility-as-a-service for paratransit minibus taxis and treated digitalization as a modernization pathway rather than as an instrument of governance, a distinction that Morrissey and Schwanen(7)later sharpened.

Brugulat-Panés et al.(84)synthesized evidence on healthy, sustainable and equitable transport in Africa and the Caribbean and reached a compatible conclusion about equity gaps without linking them to formalization design. The present review adds the regulatory and formalization axes that these syntheses left separate, and in doing so shows that service, governance and livelihood outcomes move together rather than independently.

The practical implication is that reform should be sequenced around three commitments: protect operator livelihoods, finance the transition, and measure equity outcomes. The BRT accessibility evidence supports the third commitment.

Oviedo et al.(85)found that BRT improved access to job opportunities for the poor in Lima, and Mwesigwa, Yin and Farber(86)reported equity gains in Dar es Salaam, whereas Malik et al.(87) documented the barriers women still face on Lahore's BRT.

Dumedah, Adams and Ojo(88)added the spatial dimension by showing that accessibility depends on where paratransit interchanges are placed.

Chen and Beard(89)framed the wider agenda of supporting informal workers for more equal and productive cities, and Wood(90)showed in Johannesburg that transport formalization is inseparable from racialized planning politics. Future work should pair these equity metrics with the livelihood metrics identified here and track both across a complete reform cycle.

The review has compensating strengths. It draws on a verified library dominated by Scopus-indexed journals, covers four regions of the Global South, and organizes the evidence by axis so that findings can be traced to their sources. Because the synthesis privileges primary studies over reviews, the claims advanced here rest on case-level evidence rather than on inherited summaries.

This review has limitations that follow from its narrative design. The search was not exhaustive, was limited to English and Spanish terms, and excluded a Spanish query that returned no records, so relevant work in Portuguese, French and Asian languages is under-represented. The synthesis privileges sub-Saharan Africa, Latin America and South Asia because the literature is concentrated there, and findings from smaller or less-studied cities may differ.

Several of the cited program evaluations rely on stakeholder perceptions or short observation windows, so the long-run effects of formalization remain uncertain, and publication bias toward reform failures or successes cannot be ruled out. Part of the synthesis also rests on database abstracts rather than full texts, so some attributions may understate the nuance of the original studies. Each of these limitations suggests a remedy: multilingual search, explicit regional stratification, longitudinal designs that measure service, employment and equity outcomes before and after reform rather than satisfaction at a single point.

CONCLUSIONS

Paratransit in the Global South performs structural mobility roles that no existing formal system replaces, and it does so through networks that are self-organized and demand-responsive. Its regulation is plural and negotiated, and the state itself produces rather than eliminates informality. Formalization policies achieve durable change only when they are financed, incremental and built around the incorporation of incumbent operators, whereas replacement programs stall on resistance and financing gaps. The livelihoods, safety and equity stakes of the sector are central to any defensible reform, and gender and affordability gaps persist where they are ignored. Future research should therefore evaluate reform programs comparatively and longitudinally, using service, employment and equity outcomes as the criterion of success.

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