GOLD VI

Case-Based Contribution to Chapter 6: Connecting
GOLD VI Report on Pathways to urban and territorial equality

Challenges and opportunities of regional connectivity and local accessibility in intermediary cities in the Global North and South

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Challenges and opportunities of regional connectivity and local accessibility in intermediary cities in the Global North and South

AUTHOR(S)

Borja M. Iglesias

CITIES/COUNTRIES IT COVERS:

21 Intermediary cities from the Global North and South according to UCLG regional sections: Europe (6 cases), Africa (5), Latin America and the Caribbean (4), Eurasia (3), Northern America (2), Asia-Pacific (1).

CHAPTER

6: Connecting

SUMMARY

In a globalized world where metropolitan areas are considered the main economic engines, intermediary cities emerge as the link between the local and global scale. For each metropolitan area, more than 20 intermediary cities contribute to dynamizing social, economic and environmental linkages between urban systems, their hinterlands and the rural areas.

This contribution aims to show challenges and opportunities related to regional connectivity and local accessibility in intermediary cities. To do so, the narrative will be structured through two scales: a regional one, analyzing the connectivity of intermediary cities in their urban systems and global trade flows; and a second one at the local scale, analyzing the benefits of sustainable mobility in human-scale cities through initiatives driven by local and regional governments (LRGs) from different regions of the world. Finally, the contribution provides brief lessons and issues arising from the impact of COVID-19 on intermediary cities.

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1. Territorial cohesion and local mobility. Key challenges to reduce inequality in intermediary cities

"Regional connectivity" and "local accessibility" are two vectors which, at different scales, have historically shaped the economic, social, cultural and environmental dynamics of intermediary cities. However, it is from the 1980s onwards that the study of these cities has made it possible to highlight their importance for metropolitan areas and their key role in the socio-economic sustainability of rural areas - mostly linked to the primary sector - and in the integration of the energetic, extractive and tourist industries in the natural environment of their hinterlands. Most of the actors – LRGs and the private sector – involved in the day-to-day management of the thousands of intermediary cities on the world share a multi-scale vision – regional and local – of their development that is generally conditioned by two issues: at the regional level, by the strong dependence on transfers and investments in infrastructure – mobility and energy – from their central governments. At the local level, by the capacity of the local economy, political leadership and budgets to contribute to the sustainability of public policies and the well-being of citizens. Therefore, intermediary cities also inherently face patterns of inequality in many cases derived from their competitiveness, and which have to be faced by their LRGs at a clear disadvantage, especially in relation to metropolitan growth engines.

At the regional level, and especially in the European Union (EU), the analysis of patterns of inequality between cities within the same or different urban systems has made it possible to identify common challenges and to strengthen structural policies of cohesion, integration and territorial balance.[1] Although the accessibility of these cities to the "physical connectivity" (hard infrastructure) has traditionally been considered as one of the key indicators to determine their importance in the territory, the progressive deployment of technology and "digital connectivity" is making it possible for many intermediary cities and rural areas[2] to generate economies of scale capable of competing at regional and global levels. Therefore reducing certain income gaps regarding the main functional polarities of their urban systems. However, this process is still at an embryonic stage, and for many of the intermediary cities in the Global North and South, direct participation in national and global trade flows[3] still represents an opportunity to improve the local economy and generate sustained revenues from which to improve the provision of basic urban services and increase the well-being of their populations.

Patterns of inequality at the local level, while largely derived from regional inequality,[4] need to be assessed according to the context of each city. By number, typologies and territorial location, intermediary cities may present similar challenges, although the way they cope with them may vary significantly from city to city depending on several factors: the specialization or diversity of the local economy, the level of socio-spatial cohesion and/or segregation[5] of their citizenship, and the quality of multi-level governance. However, the process of informal urbanization of many intermediary cities in the Global South has a negative impact on the loss of their human scale. In any case, it is essential to understand

1. The concept of territorial cohesion appeared in 2006 in the 'Green Paper on Territorial Cohesion' (EC 2008) developed by the EU in the implementation framework of its structural policies and the 'territorialization' of the European social model. In this document, issues such as concentration, connectivity, cooperation and territorial singularities are addressed in an embryonic way, highlighting the need to deal the challenges of (intermediary and small) cities that shape the territorial urban systems. In 2013, the project 'INTERCO, Indicators on Territorial Cohesion' (ESPON 2012) made a first attempt to develop a matrix of indicators to measure the degree of territorial cohesion and inequality in the framework of the EU Territorial Agenda 2020. INTERCO develops 32 indicators for 6 axes: i) Strong local economies ensuring global competitiveness; ii) Innovative territories; iii) Fair access to services, markets and Jobs; iv) Inclusion and quality of life; v) Attractive regions of high ecological values and strong territorial capital and vi) integrated polycentric territorial development (14-19). In terms of connectivity, indicators such as road, rail and airport accessibility stand out. The same document confirms the complexity and multidimensionality of this approach that makes it difficult to understand territorial cohesion, 59.

2. See the case of China's Taobao cities, towns and villages in Luo and Chiyu, 'E-commerce participation and household income growth in Taobao Villages', in http://documents1.worldbank.org/curated/en/839451555093213522/pdf/E-Commerce-Participation-and-Household-Income-Growth-in-Taobao-Villages.pdf.

3. However, there is also a growing number of voices warning about the negative impacts that trans-national corridors may have on the widening of inequality: "Cross-border corporate network-based organisation of production has contributed to both economic integration and to isolation: rising spatial (and individual) inequality due to the concentration of power and value creation in certain cities and regions in advanced economies in the Global North has been coupled with the widespread diffusion of low-tier activities (as well as increasingly higher-value-added ones) towards certain regions and cities in emerging and developing areas of the Global South". In Iammarino, Rodriguez-Pose and Storper, 'Why Regional Development matters for Europe's Economic Future', 24.

4. For example, through indicators that show disparities in regional GDP and income, employment and unemployment, employment structure, health, education, infrastructure, demographic structure, poverty, crime, and investment. See Appendix in RELOCAL, 'Mapping patterns of regional inequality and change in Europe: The evolution of regional inequalities in Europe', 26, in https://ec.europa.eu/research/participants/documents/.

5. For Europe, see: Cassiers and Kesteloot, 'Socio-spatial Inequalities and Social Cohesion in European Cities'. For Africa see: David et al. 'Social Cohesion and inequality in South Africa'. For Latin America, see: Sabatini, *La segregación social del espacio en las ciudades de América Latina.*

the spatial relationships between household structure and income, as well as the endowment and environmental quality of its urban fabric and accessibility to basic services, education and decent employment. Beyond their size and demographic relevance, intermediary cities are increasingly heterogeneous, and their functional specialization in some cases has accentuated inequality, and they have replicated, on a smaller scale than the metropolis, dynamics of socio-spatial exclusion: *urbanizaciones cerradas* in Latin America; sprawling in Europe; and the expansion of informal urbanization along the main roads connecting industrial areas in Africa. These examples, however, share a singular scenario of their own: the "human scale" of the city. This is one of the main strengths that are based on proximity relations and facilitates LRGs' implementation of ambitious and low-cost mobility policies.

In recent years, the hierarchical nature of metropolitan innovation and the way in which connectivity reinforces pre-existing differences in territorial attractiveness are contributing to further widening inequalities at the territorial level, thus accentuating deficits at the local level.[6] Initiatives such as the Trans-European Transport Network (TEN-T), the Chinese Government's Belt and Road Initiative (BRI) and many other large-scale trade routes take advantage of existing routes, but can contribute to territorial fragmentation when these infrastructures do not take advantage of existing urban systems.[7] Similarly, connectivity *per se* is not sufficient to reduce a city's inequality in its respective system and needs to be accompanied by differentiated economic policies that can generate competitive advantages. This is the case of technology clusters, for example, which are located in many intermediary cities. Although these do need robust digital connectivity and a good quality of life for their highly skilled workforce.

Below is a summary of 21 cases that illustrate the challenges faced by intermediary cities in Global North and South in terms of connectivity and accessibility. These examples cover the different regional sections of UCLG: Europe (6 cases), Africa (5), Latin America and the Caribbean (4), Eurasia (3), Northern America (2), and Asia-Pacific (1). In order to facilitate the comparison of challenges and initiatives, the cases will be shown according to each of the typologies derived from their location in a specific urban and territorial system:

- Regional historic nodes and isolated cities: **Cuenca** (Ecuador), **Odense** (Denmark), **Samarkand** (Uzbekistan); **Zinder** (Niger), **Yakutsk** (Russia) and **Burgos** (Spain).
- Metropolitan, regional and international clusters: **Thiès-Dakar** (Senegal), **Madrid Region** (Spain) and **Hézé** (Shāndōng, China); **Osogbo-Ibadan** (Nigeria), **Colón-Panama City** (Panama) and **RT Raleigh-Durham** (USA); **Chingola-Kitwe** (Zambia) and **Lumbumbasi** (DR Congo), **Copenhagen** (Denmark) and **Malmoe-Lund** (Sweden), **Reynosa** and **Heroica** (Mexico) and **McAllen-Harlingen** (USA).
- National and international corridors: **Menia** in the Nile Valley (Egypt), **Rimini** in the Via Emilia (Italy), **Modesto-Merced** in the Central Valley (USA); **Fribourg** in the Rhine-Alpine corridor (Germany), **Ganja** in the Trans-Caspian corridor (Azerbaijan), **Quetzaltenango** in the *Corredor Seco* (Guatemala).
- The figures illustrating these cases have been generated from the exploitation of available databases.[8] The coding of the figures is as follows: territorial road network (yellow), railway network (purple), airport (red dot), sea or river port (blue dot). The graphic scale is located on the left-hand side of the figure and the units are in kilometers. This scale is the same for each of the three cases shown in each figure.

6. Iammarino, Rodriguez-Pose and Storper. 24-27.

7. See, Teo et al., 'Environmental Impacts of Infrastructure Development under the Belt and Road Initiative', available in: https://www.mdpi.com/2076-3298/6/6/72.

8. The following geospatial infrastructures have been used in the elaboration of the figures. To show the urban footprint for 1990 and 2014: GHSL - Global Human Settlement Layer: GHS_BUILT_LDS1990_GLOBE_R2018A_54009_250_V2_0 and GHS_BUILT_LDS2014_GLOBE_R2018A_54009_250_V2_0; railways and road infrastructure: Natural Earth Data. The database generated for the GOLD IV report (2017) was used as a reference for the search for representative intermediary cities cases. For Africa, the Africapolis database has been used.

2. Connectivity and accessibility in intermediary cities. Case studies

2.1 Regional historic nodes and isolated cities

Many intermediary cities articulate "regional nodes" and have played a key role as crossroads for centuries: **Samarkand** (Uzbekistan) at the core of the Silk Road, **Odense** (Denmark) a center of pilgrimage in Scandinavian culture and **Cuenca** (Ecuador) as a colonial city built on the Inca world (see figure 1). Many have evolved as centers of regional government and others have assumed a role as economic poles of some importance, although they also tend to function as administrative centers, agricultural, agro-industrial and extractive poles, tourist nodes and, those with relevant universities, as important cities linked to the knowledge economy.

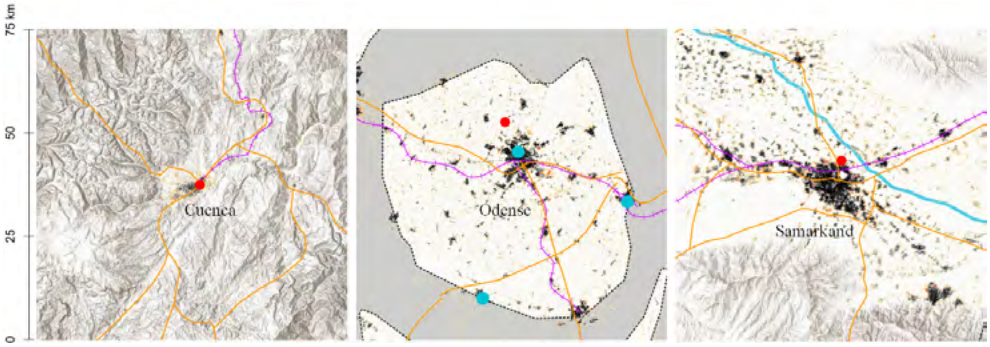

Figure 1. Regional historic nodes. From left to right: Cuenca (Ecuador, LAC), Odense (Denmark, Europe), Samarkand (Uzbekistan, Eurasia). Own elaboration.

For their part, there are also numerous "isolated" intermediary cities that are heavily dependent on territorial connectivity, as in the cases of **Zinder** (Niger), **Yakutsk** (Russia) and **Burgos** (Spain) (see figure 2). This isolation has encouraged a certain autonomy in the management of their extensive area of influence and many have specialized their local economies in extractive industries and agriculture. At the crossroads of history, these cities have an important cultural heritage and, depending on whether they belong to the Global North or the Global South, decentralized governance frameworks. Due to their position in the territory, these cities have absorbed rural population flows or have become transit cities for migration which, in many cases, have stimulated informal urbanization processes on their edges. The high availability of land has been the Achilles' heel for many of them and the processes of dispersion have affected their human scale and have favored patterns of exclusion and socio-spatial segregation that are very costly to address.[9]

Figure 2 Isolated cities. From left to right: Zinder (Niger, Africa), Yakutsk (Russia, Eurasia), Burgos (Spain, Europe). Own elaboration.

9. To have an idea of the scale of the challenges of sprawling in Europe, see, for example, the case of Catalonia. In 2009, the regional government promoted a law for 1,500 low-density settlements (urbanitzacions) with deficits in urban services - water, sanitation and mobility - comprising 300,000 parcels with an extension of 40,000 hectares. In 2021, diagnoses were still being initiated to assess the costs of implementing these infrastructures. The Author of this paper developed a diagnosis for a settlement with 1,700 parcels with the aim of sizing the costs of the sewerage network. The budget exceeded EUR 11 million, and showed the impossibility to implement this infrastructure by the municipality without the financial aid from provincial and regional government and the technical resources provided from the Water Catalan Agency (ACA). In the Global South, the situation is even more dramatic. The compactness of an urban settlement calls precisely for the need to avoid the consumption and extension of land that multiplies the costs of implementing and maintaining the network of urban basic services.

Challenges and opportunities

At the regional level, historic nodes have historically enjoyed a good level of accessibility to the territory and in many cases have been among the first to benefit from a railway line, a road or a port. However, improvements have not been continuous and the challenges vary significantly. While Odense benefits from its integration into the Oresund Region, and Samarkand maintains its cultural attractiveness and is integrated into the Eurasian energy corridor, Cuenca maintains a certain isolation due to orographic conditions. Dependence on the road network does not only affect isolated cities and can even limit the development of the national economy, as is the case in many African countries. This is the case, for example, of the stretch of road linking Agadez to Zinder, which is a vital infrastructure for Niger and the Sahel. In this case, it must also be borne in mind that, in this type of country, any type of climatic impact can affect the flow of trade.[10] In Yakutsk, one of the coldest cities in the world, isolation can last for weeks and months, and the airport and the railway become the only means of guaranteeing territorial connectivity. Burgos, on the other hand, faces opposite challenges: with high levels of ageing and depopulation, the central government's radial infrastructure policies have aimed to connect the city with the Madrid metropolitan region in just one hour at high speed.

At the local level, these cities have been particularly sensitive to the urbanization process generated by rural migration, although all of them have preserved a cultural and architectural heritage that they have been able to take advantage of as a tourist attraction to diversify the agricultural base of their local economy. Cuenca, Samarkand and Yakutsk have received important flows of rural population and indigenous communities from their area of influence that have extended the urban footprint of the city and generated patterns of socio-spatial exclusion. This hampers transport and infrastructure development, and the city of Yakutsk, for example, needs to align its strategies with the long-term development plans of the Republic and the Far Eastern Federal Region.[11] In Zinder, the refinery located 50 km to the north has boosted land occupation for informal logistics areas along the main urban arteries and boosted land consumption with regular, but yet unbuilt, plots of land. Odense and Burgos, with stagnant or declining demographic dynamics, are facing the decarbonization of their economies and the implementation of pedestrian-centered mobility strategies with a compact urban footprint and robust land governance policies and frameworks.

Strategies

The strategies followed at regional level are similar in the cases analyzed and have sought to integrate the city through railway infrastructures linked to transcontinental corridors such as the Trans-Caspian Corridor – Samarkand and Yakutsk –, airports – Cuenca –, high speed rail – Odense and Burgos – or improving the quality of the only existing track – Zinder – within a strong strategy to consolidate the Trans Saharan corridor linking Algiers and Lagos.

At the local level, mobility policies have been promoted mainly to articulate urban fabrics and bring cohesion to the population. Cuenca has implemented the *Cuatro Rios* tramway,[12] which will enable more than 39 million journeys/year to be made and reduce its high levels of pollution. This project is also an example of good city-to-city practice with the city of **Santa Cruz de Tenerife** (Spain), which had previously implemented a similar tramway.

10. P World Bank, 'Trans Saharan Corridor development project'.

11. See Yakutsk City profile in UN-Habitat Urban Resilience Hub, in: https://urbanresiliencehub.org/city-hazards/yakutsk/.

12. Banco Interamericano de Desarrollo, 'Cuenca. Ciudad sostenible / Plan de Acción'.

Odense, a city that has experienced the industrial crisis, is undertaking a profound transformation to become a low-energy city through the *Odense Letbane*[13] initiative. For Samarkand, the challenges are different, and local priorities have focused on strengthening the quality of urban and inter-urban roads, especially those that facilitate tourist accessibility to its natural wealth, and expanding local bus and taxi transport capacity. Yakutsk has focused part of its accessibility strategies on building bridges across the region's many rivers; Zinder has invested in improving the asphalting of the territorial road through the city, which is used by large trucks from the SORAZ refinery situated 50 kilometers to the north. Burgos, one of the oldest and most depopulated provinces in Southern Europe (285 of its 374 municipalities have a population density of less than 10 inhabitants/km^2)[14] and which has barely managed to maintain its population, has been promoting robust sustainable mobility strategies since 2005 through its mobility plan (SUMP), aligned with the 2030 Agenda and committed to the pedestrian, multimodality of public transport, the green economy, reducing road accidents and integrating citizen participation in decision-making.[15]

The role of LRGs

The role of local governments in these types of intermediary cities is usually very weak at the regional level and is often under the tutelage of central governments. However, given their strategic importance in the regional and national economy, they can have a certain prominence. In the examples of Samarkand, Zinder and Yakutsk, their significant natural wealth and geo-strategic position on energy and trade routes make them prone to central government investment. Conversely, they also often suffer from strong imbalances resulting from migration flows that widen inequality gaps, yet are not part of national priorities.[16]

On the other hand, in cities with decentralized governance frameworks, such as Burgos and Odense, or even Cuenca, the city government can play a role in attracting investment. In these cases, too, LRGs have resources and competencies in mobility management and can take on strategies adapted to their demographic and economic needs. Burgos has been able to generate a robust policy of connectivity with its agro-industrial and rural hinterland by undertaking important investments in improving local roads and reinforcing the public transport system,[17] in some cases taking advantage of European cohesion funds.

Involvement of other actors and institutions and funding

In Cuenca, the first line of the *Cuatro Rios* tramway cost USD 290 million, 80% of which has been financed by the central government through a USD 127 million loan with France, and the rest by the municipality.[18] However, the Interamerican Development Bank (IDB) has emerged as a powerful actor capable of making challenges visible through the diagnosis carried out through its *Emerging and Sustainable Cities Programme*, which integrates a network of approximately 200 cities, many of them intermediary cities.[19] The passing of the Odense Letbane Construction Act in spring 2015 enabled the creation of the Odense Letbane Construction Company, which is municipally owned but acts as an independent company. With a budget of approximately EUR 1.5 billion, the light rail operation has been funded by the municipality, the central government and the Region of Southern Denmark. For all other cases, the search for information is ongoing.

13. See Odense Letbane information in https://www.odenseletbane.dk/ and Jensen, 'Odense Letbane. A Life Cycle Assessment of Odense's Light Rail Project'.

14. See Diario de Burgos, *El 'desierto demográfico' asola a 8 de cada 10 municipios*, online edition, 25 February 2020, available online at this address: https://www.diariodeburgos.es/noticia/ZE6A1370F-B4F7-ADA5-045A4A0BC4B190F6/El-desierto-demografico-asola-a-8-de-cada-10-municipios.

15. Ayuntamiento de Burgos, *Sustainable Urban Mobility Plan in Burgos*. 17-20.

16. Yakutsk City profile in UN-Habitat Urban Resilience Hub. See also Ferris and Connolly, 'Networks and Links: Why Russia's Infrastructure is Holding Back its Pivot to Asia', online edition, 27 July 2020, in https://www.chathamhouse.org/sites/default/files/2020-07-27-networks-links-russias-infrastructure-ferris-connolly.pdf.

17. Burgos, like many isolated Spanish intermediary cities, has benefit from large investments from its provincial governments to improve rural road infrastructure, reduce concentration of farmland ownership and improve transport access to farms. Although there are no data available on the impact of these policies on demographics and labour market, these strategies must be analysed in the context of a decentralised country like Spain, with a strong public sector involved in the defence of the welfare state despite its high level of indebtedness. In this way, the improvement of the rural road network is key, for example, to increase the safety of travels between sparsely populated areas with a high density of truck transit and also to improving the competitiveness of the region's farming and livestock production centres. See Burgos Conecta, *1,16 millones para infraestructuras rurales en Quintanadueñas y Citores del Páramo*, online edition, 14 January 2017, available online at this address: https://www.burgosconecta.es/2016/12/30/116-millones-para-infraestructuras-rurales-en-quintanaduenas-y-citores-del-campo.html. In terms of public transport and connectivity among less populated towns and the city of Burgos, it is also necessary to contextualise them in a region with an ageing population that needs to travel from their small towns to the city for their daily business. However, in order to improve the efficiency of intra-urban mobility, on-demand transport is gradually being introduced, especially to meet the needs of the most dependent population and those with less access to private motorisation, particularly for access to health centres and other essential services located in cities. See Burgos Noticias, *17 ME para subvencionar el transporte público regular por carretera deficitario por la crisis sanitaria*, online edition, 21 May 2020, available online at this address: https://www.burgosnoticias.com/politica/castilla_y_leon/027182/17-me-para-subvencionar-el-transporte-publico-regular-por-carretera-deficitario-por-la-crisis-sanitaria.

18. For further financial information see 'Rendición de Cuentas 2019', in https://transparencia.cuenca.gob.ec/sites/default/files/2020-11/RC_2019.pdf. See also El Noticiero, Francia presta $ 127 millones a Ecuador para construir tranvía en Cuenca, online edition, 4 December 2012, available online at this address: https://www.eluniverso.com/2012/12/05/1/1447/francia-presta-127-millones-ecuador-construir-tranvia-cuenca.html/.

19. See the Emerging and Sustainable Cities Program in https://www.iadb.org/en/urban-development-and-housing/emerging-and-sustainable-cities-program.

2.2 Metropolitan, regional and cross-border clusters

A "metropolitan cluster" is a system that generates clusters of intermediary cities on the periphery of metropolitan areas that benefit from the agglomeration of economic activity and maintain diversified economies in an agricultural environment. The territorial connectivity of intermediary cities is mostly limited to a direct road or rail connection to the metropolis, although its quality may vary depending on whether the system is located in an economy of the Global North or South. Polycentrism is limited to the system of intermediary cities and not to the metropolis, which maintains a centrality and hierarchy in the territorial urban system. In these cases, the "shadow of agglomeration" effect can limit the opportunities for prosperity of smaller intermediary cities that participate in the cluster[20] and that suffer the effects of strong competition for hosting activities linked to the metropolis (see figure 3).

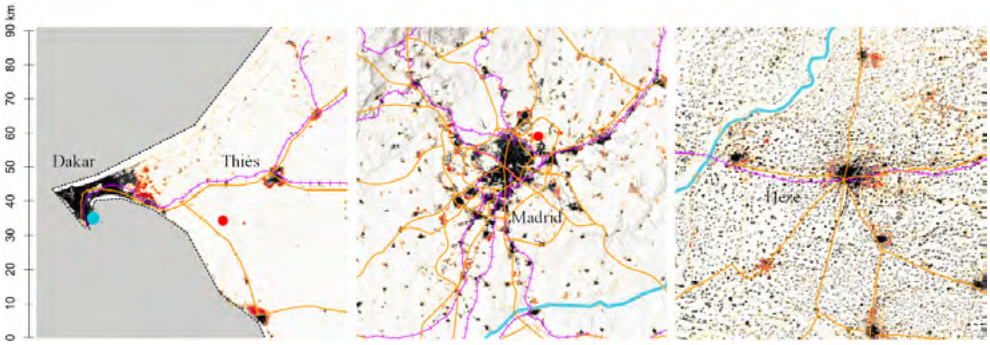

Figure 3. Metropolitan clusters. From left to right: Thiès-Mbour in the Dakar metropolitan cluster (Senegal, Africa), Madrid metropolitan cluster (Spain, Europe), cluster of intermediary cities and rural villages in Heze prefecture, Shāndōng province (China, Asia-Pacific). Own elaboration.

"Regional clusters" of intermediary cities generate "forms of territorial aggregation between companies operating in the same sector or branch".[21] These groupings, unlike metropolitan clusters, do benefit from the polycentrism of the urban system on a regional scale and extend their economic links over hundreds of kilometers. The cases analyzed correspond to **Osogbo** (Nigeria) within the industrial and agri-food cluster of Ibadan and the capitals of neighbouring provinces; the city of **Colón** (Panama) in the logistics cluster of the Panama Canal, and the system formed by **Raleigh-Durham** (USA) in the knowledge economy cluster of the Research Triangle (see figure 4).

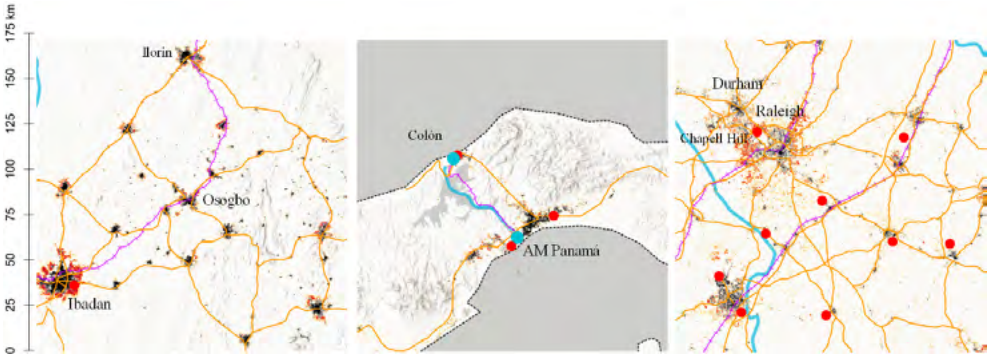

Figure 4. Regional clusters. From left to right: Osogbo (Osun state, Nigeria), Colon-Panama City (Panama), Raleigh-Durham RT (USA). Own elaboration.

20. Philip Alston. "Report A/HRC/35/26 of the Spe ITF, Connectivity and City Clusters, 26.

21. UCLG 2017, 139.

Finally, "cross-border clusters" form systems of intermediary cities located on national borders that have been able to benefit from economic cooperation to position themselves as important centers specializing in extractive industries such as **Lubumbashi** (DR Congo) and **Chingola-Kitwe** (Zambia); they have generated economies of scale such as the cities of **Malmoe-Lund** and **Helsingborg** (Sweden) together with **Copenhagen** in the Oresund Region, or have created important manufacturing and distribution nodes such as on the US-Mexico border, with **Reynosa-McAllen** and **Heroica Matamoros-Harlingen** system. In these cases, as important as territorial infrastructure is cross-border administrative integration to facilitate exchanges and flows of goods, services and people (see figure 5).

Figure 5 Cross-border clusters. From left to right: Kitwe-Chingola (Zambia) and Lumbumbasi (DR Congo) (Africa), Copenhagen (Denmark) and Malmoe-Lund (Sweden) (Europe), Reynosa-Heroica (Mexico) and McAllen-Harlingen (USA) (North America). Own elaboration.

Challenges and opportunities

The intermediary cities of **Thiès** and **Mbour** (Senegal), in addition to being gateways to Dakar for continental trade flows, are also important agro-industrial centers.[22] The presence of the port, the airport and the main roads define the most dynamic area of Senegal and widen the imbalances with respect to the rest of the country's cities. **Madrid** (Spain), with a population of 6.6 million inhabitants (2018), is the third largest European metropolitan region after **Paris** (France) and **London** UK), followed by **Berlin** (Germany), **Milan** (Italy) and the *Ruhrgebiet*.[23] Connectivity has been reinforced through large investments in suburban trains and high-speed radial trains, which have helped to reduce travel times from neighbouring provinces and have favoured many of these cities to integrate industrial and residential land that, due to lack of land, cannot be developed in the core of the city of Madrid.[24] The city of **Heze** (China) illustrates the territorial hierarchy of the "rurban" system (rural and urban) promoted for decades by the Chinese government, which has made it possible to integrate farming areas with infrastructures and small rural villages which, despite their direct relationship with the city, concentrate a population with an average per capita income of less than 40% in relation to the urban population.[25]

The cities of **Osogbo**, **Colón** and **Raleigh** face similar challenges at the regional level related to their strategic position in regions of strong socio-economic dynamism. However, the contexts are very different. Osogbo is involved in strengthening its integration into the Ibadan-Lagos axis and modernizing the railway line introduced in 1907. Colón, for its part, has to channel the wealth generated by a key global transport infrastructure such as the Panama Canal into reducing the significant patterns of socio-spatial

22. Ngom et al., 'Les agro-industries de l'interface métropolitaine Dakar-Thiès-Mbour'.

23. See European Union, *Eurostat Regional Yearbook. 2019 Edition*, 184. For further information about Madrid see the website https://madridinvestmentattraction.com/economy/.

24. Ayuntamiento de Madrid, *Madrid Recupera*.

25. See *Stimulating jobs, growth, entrepreneurship, income in rural China through e-commerce*, in Result Briefs, The World Bank, 22 November 2019, available online at https://www.worldbank.org/en/results/2019/11/22/stimulating-jobs-growth-entrepreneurship-income-in-rural-china-through-e-commerce. For having an idea about the impact of Taobao model in rural areas, see different cases studies in Luo and Chiyu, 4.

inequality of its population. Raleigh, as a city linked to the knowledge economy, has a robust multimodal territorial infrastructure that makes the city very attractive to work and live in. The city is prioritizing an ambitious policy to reduce socio-spatial inequality by putting pedestrians and public transport at the core of development strategies for the coming decades.

The cities of **Lubumbashi** (DR Congo) and **Chingola-Kitwe** (Zambia) base their development on the intensive exploitation of copper reserves, which they export to Switzerland and China.[26] This cluster generates a high environmental impact and hard working conditions for its population and faces two distinct realities: on the one hand, the need to reinforce its international connectivity through roads and railways to the raw material markets and, on the other hand, the priority of reducing the heavy impact caused by foreign-owned mining companies which, despite the wealth generated, do not contribute to redistributing it among the population. The **Oresund Region** (Denmark and Sweden) is a good example of cross-border integration through connectivity. The bridge inaugurated in 2000 has contributed to the region jointly accounting for 27% of the GDP (2012) of Denmark and Sweden[27] and together with **Copenhagen** (Denmark)'s airport infrastructure has positioned important clusters such as the biomedical *Medicon Valley* [28] and a strong daily mobility between Malmoe (Sweden) and Copenhagen. One of the most paradigmatic cases takes place in cities located on the US-Mexico border between cities that form an urban continuum as in the case of **Reynosa-McAllen**, which forms the so-called *Borderplex*.[29] At the territorial level, they show the strong patterns of inequality that separate the North from the Global South. While the North accumulates the financial and power centers, the South concentrates *maquiladoras*, informal urbanization and weak governance. As a border crossing point, it has also consolidated itself as an obligatory passage for the most vulnerable migration from the south of the continent.

Strategies

At the regional level, strategies vary significantly. Thiès is relying on rail infrastructure to modernize its territorial connectivity with the port of **Dakar** (Senegal) and to act as a continental gateway for agricultural production. In turn, Dakar has developed the Regional Express Train (TER), a first high-speed rail section linking the city to its international airport, which in subsequent phases is to provide transport services to the metropolitan periphery through Bus Rapid Transit (BRT) systems.[30] Madrid, with a high radial connectivity to the rest of the country, develops green infrastructure to reinforce the connectivity of the central area with its peripheral municipalities and to reduce the strong socio-spatial inequality, especially in relation to the working-class neighbourhoods and municipalities in the south and east.[31] As in Heze, many small towns and rural villages in China, despite heavy investment in infrastructure that facilitates the flow of trade, are promoting the *"Taobao"* model supported by Alibaba to reduce income inequality between families in rural villages and the urban population.[32] "To be nominated as a Taobao Village, Alibaba requires total annual e-commerce transactions of over 10 million yuan (about USD 1.5 million) and more than 100 online stores located in the village".[33]

For its part, **Osogbo** has boosted its territorial positioning through the O-Hub[34] initiative with the intention of becoming a commercial and logistical hub connecting Osun State and its catchment area with Lagos by rail. At the local level, with a majority use of motorbikes, strategies focus on gradually

26. C-BRTA, *Country Profile for Zambia*, 15.

27. Nauwelaers, C., et al. 'The case of Oresund (Denmark-Sweden) – Regions and Innovation', 15.

28. See Medicon Valley Alliance in https://mva.org/.

29. McAllen, 'McAllen Economic Profile, 2019', 3.

30. AfDB, 'Dakar Regional Express Train (TER)', 2.

31. Ayuntamiento de Madrid. *Evaluación de la infraestructura verde de Madrid.*

32. For an overview about the implementation of this model: "The success of Taobao Villages derives from a 2016 guideline, passed and released by China's State Council Leading Group for Poverty Alleviation and Development with the aim of setting up 60,000 e-commerce poverty relief stations and boosting e-commerce sales for villages in underdeveloped areas. To facilitate the practice of the guideline, governments at all levels in China have invested in e-commerce training workshops, offered loans to people in impoverished areas who intend to run an e-business, and encouraged young graduates to return to their home villages and set up entreprises to promote e-commerce in rural China. Since then, Taobao Villages have generated approximately 10 million RMB ($1.4 million)", in China Development Brief, *Taobao Villages as a model for the development of E-commerce in Africa*, 4 September 2020, in https://chinadevelopmentbrief.cn/reports/taobao-villages-as-a-model-for-the-development-of-e-commerce-in-africa/. See also: "The development of Taobao Villages indicates the complex state-business relationship in China, where capable e-commerce giants are required to provide public goods in return for business opportunities, while the party-state not only provides supervision, but also participates in organizing e-commerce business at the grassroots level to achieve state objectives such as poverty reduction and economic growth in the rural areas, arguably for greater political legitimacy", in Li, 'E-commerce and Taobao Villages A Promise for China's Rural Development?', available online at https://journals.openedition.org/chinaperspectives/7423.

33. In China Daily, *Alibaba turns hundreds of poor villages into 'Taobao Villages'*, online edition, 13 January 2019, in https://www.chinadaily.com.cn/a/201901/13/WS5c3a220ea3106c65c34e4115.html.

34. UN-Habitat, *Structure Plan for Ede and Environs*, 44.

improving the quality of the main streets and making informal transport safe.[35] **Colon**, as a transit point for global trade flows, is developing new logistics infrastructure in the *Zona Libre* (free trade zone) in coordination with the Pacific Metropolitan Area to make the distribution of goods even more efficient and faster. At the local level, however, Colon shows the negative effects of logistics specialization, which requires a lot of land for storage and is almost twice the size of residential areas. This leads to the displacement of the most vulnerable population to the periphery through informal urbanization processes along the road linking it to Panama City. In North Carolina (USA) the cities of **Raleigh**, **Durham** and **Chapel Hill** define "The Research Triangle" and concentrate in this urban system three world-class universities and research centers just a few minutes apart, with a high level of road and airport infrastructure connectivity that benefits more than 350 companies dedicated to innovation and advanced technologies. Raleigh is nurtured by highly skilled professionals who enjoy a peaceful environment and a good level of well-being,[36] which has earned it recognition as an ideal city for young entrepreneurs. In this context, the city has developed its local mobility strategy by promoting BRT corridors with the aim of reducing socio-spatial inequality and implementing a robust public space policy.[37] As in the North American culture based on the indiscriminate use of private vehicles, Raleigh has proposed to place the pedestrian at the core of public policies and, to this end, it proposes transforming large car parks into intermodal stations with mixed uses, concentrating density around transit and creating dynamic public spaces.

Zambia, like Senegal and many of the sub-Saharan economies, is promoting rail infrastructure to facilitate regional integration; this is the case of the rail axis that will link Chingola with the Angolan border to access the port of Lobito.[38] In the case of cities such as Malmoe integrated in the Oresund Region, the strategy involves consolidating their integration into the Scandinavian-Mediterranean corridor. For the cities of Reynosa-McAllen, strategies include strengthening cross-border governance frameworks beyond economic integration.[39]

The role of LRGs

In contrast to the previous section where LRGs in regional historical nodes and isolated intermediary cities could play a greater role, in metropolitan, regional and cross-border clusters, the role of LRGs in intermediary cities starts to be diluted in a structure strongly hierarchized in the interests of the metropolitan agglomeration economy, which is often also the administrative and economic capital of the country. In the African cases of Thiès, Osogbo and Chingola, the decision on territorial connectivity infrastructures depends on the central government, while municipalities have few resources to allocate to improving the accessibility of their respective urban areas and rural areas of influence. The case of Colon is paradigmatic, and shows the disruption that a logistics macro-infrastructure (such as the SEZs) can bring to a small city if it is not accompanied by public policies that distribute the wealth generated, which the Panama Canal Authority concentrates mostly in the capital.

As for Madrid, the Oresund Region and Raleigh, the role of the LRGs of the intermediary cities in their area of influence is concentrated at the local level and, according to their budgetary strength, they can promote robust public transport policies. In any case, in these cases, the presence of a Metropolitan Authority is essential to solve the specific needs that may arise.[40]

35. Adedotun, S. B. 'A Study of Urban Transportation System in Osogbo'.

36. See rankings in https://www.researchtrianglecleantech.org/why_the_triangle.

37. City of Raleigh, *Equitable Transit-Oriented Development Guidebook*, 58-59.

38. C-BRTA, 56.

39. Nava, K. and Córdova, G, 'Paradiplomacia y desarrollo económico en la región transfronteriza de Reynosa-McAllen'.

40. The 3 examples shown present different models of metropolitan governance, although none of them has formalised an authority with full responsibility in the management of supra-municipal infrastructures, an issue that should be analysed in relation to the multilevel governance of each country. For example, the city of Madrid, - unlike Barcelona which has a formal metropolitan authority -, develops its mobility strategies at the provincial level in coordination with the Regional Transport Consortium and the Federation of Municipalities. However, in 2019, the former mayoress, called precisely for the creation of "Madrid Area Metropolitana" to plan infrastructures at regional level in a more efficient way. See Europa Press, *Carmena propone crear 'Madrid Área Metropolitana' para planificar la movilidad entre Ayuntamiento y Comunidad*, online edition, 13 May 2019, in https://www.europapress.es/madrid/noticia-carmena-propone-crear-madrid-area-metropolitana-planificar-movilidad-ayuntamiento-comunidad-20190513112315.html. For the Oresund Region, the complexity is even greater, involving two different countries in the co-governance of communication networks. However, the region has the Oresund Committee that leads decision-making process: It consists of seven Danish members and five Swedish members. The Danish members are Region Zealand, Capital Region of Denmark, City of Copenhagen, Bornholm Regional Municipality, Local Government Regional Councils for the Capital Region of Denmark and Zealand and the City of Frederiksberg. The Swedish members are the City of Helsingborg, Landskrona Municipality, Region Skane, Lund Municipality and the City of Malmo. More information available online at https://www.oresundskomiteen.org/about-the-oresund-committee/.For Raleigh and "The Research Triangle" urban system the Triangle J Council of Governments (TJCOG) serves as the regional government for its 43 municipalities, developing interesting initiatives for rural mobility like TARPO (Regional Bicycle and Pedestrian Planning Framework, 2015), see in https://www.tjcog.org/focus-areas/transportation.

Finally, in Heze and its rural villages, the complexity of territorial administration is significant, and attention must be paid to the role of citizenship and digital connectivity in reducing income inequality income between rural and urban populations.[41]

Involvement of other actors and institutions and financing

The Dakar Regional Express Train (TER) has had an investment of EUR 1 billion financed by the African Development Bank, the Islamic Development Bank, the French Agency for Development, the French Treasury, and the Government of Senegal.[42] The line linking **Lagos** to **Kano** (Nigeria) and passing through Osogbo, the financing is mostly Chinese and amounts to EUR 6 billion.[43] The Ibadan-Kaduna standard gauge line is designed to pass through the southwest region to the north, linking Osogbo-Ilorin-Minna to Kaduna, with a single track branch line from Osogbo to Ado-Ekiti, another southwestern city. For all other cases, the search for information is ongoing.

2.3 National and international corridors

Many intermediary cities have evolved on linear infrastructures usually adapted to the geography and watercourses that often extend for hundreds of kilometers within the same country. Over time, territorial connectivity infrastructure has been instrumental in bringing regions together and fostering polycentric structures that are less hierarchical than in the case of clusters. In many cases, national corridors generate important economic and mobility relations between intermediary cities, small cities and their rural hinterland, to the point of becoming important agro-industrial centralities, as in the case of **Modesto** and **Merced** (USA), industrial and tourist platforms such as the *Via Emilia* linking **Milan** with **Rimini** (Italy), or making the rural past sustainable through the tourism such as **Menia** (Egypt) in the Nile Valley (see figure 6).

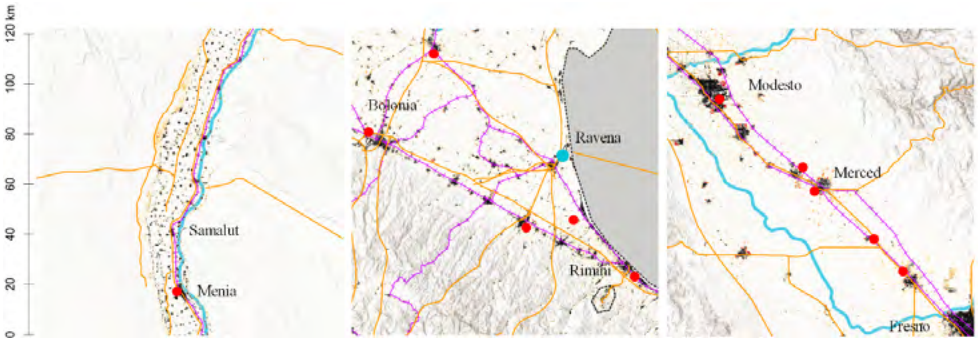

Figure 6 National corridors. From left to right: Menia in the Nile Valley (Egypt, Africa), Bologna-Rimini on the Via Emilia (Italy, Europe), Modesto-Merced in the Central Valley (USA, North America). Own elaboration.

When the above corridors extend across several countries, the international corridors assume a global relevance and the most important trade flows circulate through them. On a continental scale, the relationships of the intermediary cities integrated in these systems can be very different and can vary from being a simple transit point for goods (as in the Global South) to being a powerful driver of the mobility of goods, services and people between different countries (as in Europe). International corridors are a common phenomenon in Europe, and are increasingly common in the more dynamic regions of Africa, Latin America and Asia. However, the density

41. "More than 90 percent of people in Taobao Villages perceived their social status as equal to or higher than it was with five years ago, and they believe they will have equal or even higher social status two years in the future", in Luo and Chiyu, 8. See also the interesting conclusions of this report on page 24.

42. See https://www.railway-technology.com/projects/dakar-regional-express-train/.

43. See http://www.xinhuanet.com/english/2018-05/16/c_137181714.htm.

of the network varies significantly. While the Rhine-Alpine corridor, concentrating a constellation of metropolises contributing 19% of EU GDP (2010),[44] linking **Genoa** with **London**, as well as intermediary cities such as **Fribourg** (Germany) and rural areas in its hinterland in a paradigm of cross-border integration, intermediary cities such as **Ganja** (Azerbaijan) or **Quetzaltenango** (Guatemala) integrated in the Trans-Caspian and Central American corridor, connectivity is limited to the passage of goods and very low accessibility to the rest of the surrounding territory (see figure 7).

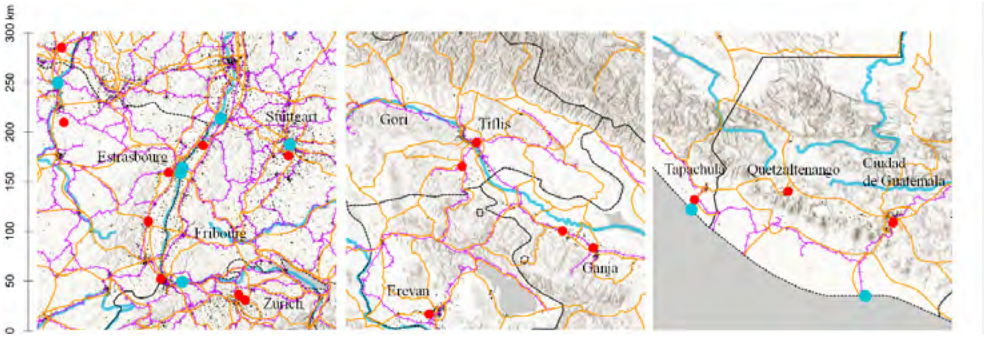

Figure 7 International corridors. From left to right: Fribourg in the Rhine corridor (Germany, Europe), Ganja in the Trans-Caspian corridor (Azerbaijan, Eurasia), Quetzaltenango in the *Corredor Seco* (Guatemala, Latin America). Own elaboration.

Challenges and opportunities

At the regional level, the city of **Menia** has the potential[45] to position itself preferentially in the territorial corridor of the Nile Valley as one of the cities to be connected to the future industrial corridor that would link **Cape Town** (South Africa) to **Alexandria** (Egypt)[46] and cross the continent. The presence of the road and rail infrastructure currently linking Cairo to the Sudanese border has made it possible to link trade flows through the Nile Valley. The city of **Rimini** is located at one end of the *Via Emilia*, a Roman road, which after two millennia has become one of the most important logistical corridors in Europe and home to multinationals such as Ferrari, Lamborghini, Maserati and the Barilla food empire. Its agri-food sector includes Parmigiano Reggiano cheese, balsamic vinegar and prosciutto di Parma. It also has a well-developed innovation ecosystem, a large university sector[47] and a dense road, rail, airport and port infrastructure. However, Rimini is one of the lagging cities in the corridor with high unemployment, a tourism-focused economy and a high degree of urban sprawl. The corridor is currently facing integration into the TEN-T policy as a branch of the Scandinavian and Rhine-Alpine corridors. The Central Valley (California) is articulated through a linear corridor connecting to the ports of the San Francisco Bay Area. The cities of **Modesto** and **Merced** have specialized in agribusiness development and have experienced strong economic and population growth. At the regional level, the system faces the impact of water stress and the introduction of new mobility habits beyond the indiscriminate use of private vehicles – cycling in particular –, [48] while at the local level they face challenges related to the reduction of socio-spatial exclusion among the agricultural working population, mainly migrant Latino population. Modesto is currently seeking to strengthen its territorial positioning through high-speed rail and through local cohesion policies to reduce the patterns of socio-spatial exclusion experienced by migrants who have tended to live segregated lives to the south of the city.

44. European Commission, *CEF support to Rhine - Alpine Corridor*, 3.

45. AbouKorin, Antar A, 'Spatial analysis of the urban system in the Nile Valley of Egypt'.

46. See *Transportation Corridor for Sustainable Development in Egypt: Enhancing Science-Based, Fast-Track Economic Growth* (25 January 2016) in https://www.saentrepreneurs.ch/index.php/2015-02-19-20-55-54/item/118-transportation-corridor-for-sustainable-development-in-egypt-enhancing-science-based-fast-track-economic-growth.

47. See *How do small regions in Europe achieve growth?* Future Development Blog. Brookings (January 28, 2021) in https://www.brookings.edu/blog/future-development/2021/01/28/how-do-small-regions-in-europe-achieve-growth/.

48. See, for example, the efforts of Modesto to implement non-motorised policies since 2006, in https://www.modestogov.com/900/Bikeways. In this address it is possible to access to the GIS Map of Modesto Area Bikeways.

Intermediary cities such as **Fribourg** along the Rhine corridor have one of the highest levels of rail accessibility in the world[49] and have benefited from European regional cohesion strategies such as Interreg EUROPE, INTERACT, URBACT and ESPON. Fribourg is part of the Karlsruhe-Basel corridor and has set itself the priority of doubling existing rail and road sections and building new tunnels by 2041. The city of **Ganja** (Azerbaijan) is one of the many intermediary cities that are integrated into one of the emerging international corridors: The Trans-Caspian Corridor through the Caucasus. This corridor focuses on energy transport and is part of the geopolitical strategy of the Belt and Road Initiative (BRI) that will allow China to take control of much of the world's trade flow. However, Ganja faces several challenges: at the regional level, to position itself as an agro-industrial cluster in a highly hierarchical corridor, and at the local level, to resolve the strong dispersion of its urban fabric through public transport. **Quetzaltenango** is located in the area of influence of the Central American *Corredor Seco* (Dry Corridor) and demonstrates the extent to which poor territorial connectivity (1.2 kilometers/1,000 inhabitants) conditions the development of a rural country like Guatemala and stimulates the macrocephaly of its capital. To these issues must also be added the low economic integration of the Central American region, and in particular Guatemala's borders, which constitute one of the main challenges of the *Corredor Seco*.

Strategies

Some of the locally driven strategies have focused on improving accessibility between different parts of the city. In recent years, Menia's urban footprint has expanded along the Nile basin and the irrigation canals that run parallel to it. However, this growth has not affected the compactness of the fabric, nor has it led to the loss of arable land, a fact that underlines the importance of the agricultural economy. Aware of the tourist value that the Nile represents for its economy, the city has reinforced its waterfront to transform it into a tourist axis[50] from which to generate perpendicular connections with its interior neighbourhoods. As in the case of Yakutsk, the investment in bridges has been very significant. A total of 14 bridges over a little more than 6 kilometers span a wide canal with the rural hinterland. Rimini, as a tourist city on the Adriatic, has experienced a strong urban sprawl and does not have the strength of other neighbouring industrial municipalities. Through its Urban Plan for Sustainable Mobility,[51] the city is committed to multimodality of transport, cycling mobility at regional level, the electrification of its public transport, the opening of new lines that structure the mountain with the coast, and the development of a green ring. The strategies of Modesto and Merced vary significantly between them and show how difficult it is to implement ambitious accessibility policies when the city loses its "human scale". Modesto is committed to strengthening its territorial connectivity through high-speed rail, but at the local level it barely reduces the role of motorized mobility and does not reduce the patterns of socio-spatial exclusion of ethnic minorities that are concentrated in the south of the city, linked to the main territorial road axes and industrial areas.[52] The city of Merced, on the other hand, much smaller in population and size, has been able to push for a more ambitious mobility plan for 2030.[53] Among the main strategies are the systematic use of bicycles and pedestrian mobility.

Fribourg has been one of the world's most committed cities to sustainable mobility since the 1960s.[54] With an urban footprint that has remained unchanged in recent years, and with a commitment to maintaining its compactness, social cohesion and the high well-being of its population, the city has promoted various eco-mobility initiatives that put the pedestrian at the

49. ESPON and KIT, *Ulysses*.

50. Shaker, R. et al. 'Socio-cultural divisions and urban waterfront activities: the case of El-Minya city, Egypt', 6.

51. See *Piano Urbano della Mobilità Sostenibile* (PUMS) in https://www.comune.rimini.it/documenti/documenti-tecnici-di-supporto/pums-piano-urbano-della-mobilita-sostenibile-adozione.

52. Marsh *et al*, 'Institutionalization of Racial Inequality in Local Political Geographies', 702.

53. City of Merced, *Merced Vision 2030 General Plan*.

54. Buehler, Ralph and John Pucher. 'Sustainable Transport in Freiburg: Lessons from Germany's Environmental Capital', 52.

core of urban policies[55] and complement the federal government's strategies to improve the connectivity of the *Rheintalbahn* on the Rhine-Alpine rail corridor. The city of Ganja has been strengthening territorial connectivity through the rail corridor linking Baku-Tbilisi-Kars since 2017. With a length of 826 kilometers, this corridor constitutes the backbone of commercial transport policy in Eurasia.[56] At the local level, the city has shown interest in participating in the European Bank for Reconstruction and Development of Green Cities[57] initiative with the aim of implementing low-cost public transport systems that facilitate mobility through a fabric characterized by its strong dispersion. The strategies promoted by Quetzaltenango are rather limited due to the important weight of informal urbanization, the current deficits of the rural road network and the local budgetary weakness. Despite this, it is the younger people who are generating traction for cycling and have proposed connecting the city to the capital with a bicycle lane. The neighbouring intermediate town of Salcajá, like the much smaller Merced, has been able to promote an ambitious policy of accessibility of its public space and social cohesion that received the Queen Letizia award in 2018.[58]

The role of LRGs

As in the case of intermediary city clusters, the role of LRGs in regional infrastructure decision-making is rather limited. In fact, in the international corridors where cities such as Menia, Ganja and Queztaltenango would a priori benefit, it could even be said that it is anecdotal and remains in the hands of the world's major economic powers which, as is the case of China on the African continent or Russia in Eurasia, are often directly involved in investments. As for the examples of Rimini, Modesto and Fribourg, although the decentralization of the state may favour their inclusion in decision-making on territorial connectivity, the reality is that the projects are to improve an already robust infrastructure that has proven its importance over decades and therefore pose less risk in terms of investment.

At the local level, strategies to reduce socio-spatial inequality through accessibility policies depend on several factors: the extent of the urban footprint, the degree of dependence of the economy on the private car, and budgetary strength. In any case, in some of the examples shown, it is much easier to implement low-cost policies in small cities than in large ones, and in compact cities than in dispersed ones. These two factors, moreover, amplify the challenges when the city belongs to a low and middle-income economy subject to rapid informal urbanization processes (as in the case of Sub-Saharan Africa)[59] with a lack of political leadership and resources to manage ambitious sustainable mobility policies; or when the city is located in an advanced economy in demographic decline (as in Europe) but with a mobility governance consolidated for decades through continued public investments and awareness policies. Nevertheless, we have also seen the driving role that young people can play in demanding more sustainable mobility policies from their LRGs.

Involvement of other actors and institutions and funding

Modesto and Merced are integrated into the California High-Speed Rail track linking San Diego to Sacramento; Merced is covered in the first phase, which is budgeted at USD 77 billion, and Modesto in a second phase. The operation is led by the California High-Speed Rail Authority, which will be in charge of planning, designing, building and managing the first high-speed rail line in the United States.[60] Fribourg is part of the Karlsruhe-Offenburg-Basel corridor, which has been budgeted at EUR 6.6 billion and should be completed by 2041.[61] It is financed by Germany and Switzerland, which also receive EU funds. For all other cases, the search for information is ongoing.

55. See Freiburg City profile in ICLEI: https://sustainablemobility.iclei.org/ecomobility-alliance/freiburg-germany/.

56. Miholjcic, Nina. 'Trans-Caspian International Transportation Route', 136.

57. See *EBRD and Azerbaijan's city of Ganja agree to develop urban projects* (4 March 2020), https://www.ebrd.com/news/2020/ebrd-and-azerbaijans-city-of-ganja-agree-to-develop-urban-projects-.html

58. More information available online at http://www.salcaja.gob.gt/premio-reina-letizia/.

59. See for example some interesting recommendations in Stucki, *Policies for Sustainable Accessibility and Mobility in Urban Areas of Africa*, 45.

60. More information available online at https://hsr.ca.gov/about/high-speed_rail_authority/.

61. EC, 2018, 45.

3. Key issues. Connectivity, accessibility and post-COVID-19 intermediary cities

Connectivity at the regional level and accessibility at the local level play a crucial role for most intermediary cities, and their local governments' ability to respond to challenges related to socio-spatial inequality depends on them. **Key issues are summarized below:**

- At the regional level, intermediary cities are prioritizing rail corridors as infrastructure that can support the integration of the local economy into national and international trade flows. While in the Global South, the priority is commercial transport, in the cities of the Global North the focus is on the daily mobility of the population. This is a costly infrastructure in terms of investment and implementation, and implies robust governance frameworks between national governments, agencies, banks and multilateral organizations.
- At the local level, intermediary cities are tackling their policies to reduce inequality through accessibility at different speeds. Cities in the Global North have maintained their compactness and density with declining demographic dynamics and an ageing population, and are putting pedestrians at the center and facing the modernization of public transport. Cities in the Global South are facing metropolitanization processes that widen distances and make it difficult to implement sustainable mobility policies, also in a context of structural budgetary weakness.
- At the local level, this type of world heritage city, when it has resources, skills and low population pressure, as in many parts of the Global North, is often at the forefront of piloting sustainable mobility and public transport enhancement that can be replicated by other cities. In cities in the Global South, however, mobility is not high on the list of priorities, with more pressing issues such as housing and jobs. In addition, private motorization levels will increase in the coming years in line with possible increases in household incomes. In this regard, it is necessary to consider the impact that China, as the world's leading producer of electric vehicles, may have on an emerging market such as Africa. In any case, local governments must prioritize in their mobility strategies the modernization of road infrastructures, as well as the regulation of informal transport to make it more efficient and safer.[62] In any case, the main challenge is to establish a more exhaustive control over the growth of the urban footprint that may be generated in the coming years. For example, Osogbo and Zinder have extended the radius of the urban footprint they had in 1984 by 5 and 3 kilometres respectively through low-density models (informal in the case of Osogbo and formal in the case of Zinder). These strategies hinder attempts to articulate the different urban fabrics with public transport.
- Despite the difficulties in addressing all the challenges inherent to connectivity and mobility, many intermediary cities have scaled up their progress, often with improvements starting in the central and most densely populated areas, which are also home to a large part of their historic built heritage. Once the improvements in the living conditions of citizenship and the local economy have been verified (as has happened in many European cities that were initially reluctant to pedestrianize, introduce cycle lanes or segregated public transport

62. See for example ITF-OECD (2019), 'Embracing the informal: How to modernise transport networks', 45, in *Transport Innovations from the Global South Case Studies, Insights, Recommendations*, available online at https://www.itf-oecd.org/sites/default/files/docs/transport-innovations-global-south.pdf.

routes), everything becomes easier, and with the sufficient resources and leadership, more ambitious challenges can be tackled that, for example, contribute to reducing the socio-spatial segregation between different neighborhoods and fabrics of the city.

The COVID-19 pandemic[63] raises many questions for intermediary cities:

- The commitment to logistics associated with e-commerce can have negative effects on intermediary cities. As a sector of activity that does not generate added value for the territory and employs a scarce and low-skilled workforce, it requires important land reserves for its development, which can be an important disruptive element.
- The push for digital connectivity opens the door for many intermediary cities and their rural hinterland. Lockdown in the big cities of the Global North has encouraged many families to think about moving their residence towards smaller cities and rural areas. Although maybe anecdotal and often linked to the existence of second homes, actual context has encouraged many LRGs in these municipalities to push forward ambitious policies that had been put on the back burner. Municipalities of a few thousand inhabitants in high mountain enclaves have accelerated the implementation of the 5G network with the aim of at least making life away from the city attractive. In this context, the regional government of Catalonia has launched a programme to ease the occupancy of uninhabited rural dwellings in municipalities of between 500 and 3,000 inhabitants.[64] In this framework, the drafting of a Rural Agenda that prioritizes, for example, distance learning and working, together with the implementation of Local Urban Agendas in intermediary cities, that put in the core of their strategies the improvement of physical and digital communications networks, will be key.
- Some technical recommendations[65] for LRGs in intermediary cities on reducing inequality through connectivity planning frameworks.

At the territorial level:

- Define supra-municipal bodies according to the typologies of existing urban systems (isolated, clusters and corridors) and provide them with powers and competences on mobility planning and management.
- Engage LRGs to actively participate in territorial planning frameworks for physical and digital connectivity. Planning will require robust analysis to identify patterns of inequality through social, economic and environmental indicators that can be easily obtained and updated over time.
- Ensure the participation of LRGs in decision-making related to the routes of territorial connectivity infrastructures crossing through their municipal boundaries, based on responsibility, cooperation and balance criteria.
- Ensure transparency in the planning-implementation-management-monitoring process of territorial connectivity infrastructures, minimising negative externalities in the territorial and environmental governance.
- Pressure central governments to make a rational use of public financial resources for efficient infrastructures that contribute to the progress of the territory as a whole. In this sense, it is essential that transcontinental infrastructures contribute to generating wealth along the cities located on their routes, and prevent these infrastructures becoming physical barriers and source of geopolitical conflicts in the most vulnerable regions.

63. Cities Alliance, *Post COVID-19 Sustainable and Regenerative Development of Secondary Cities in Emerging Economies.*

64. See https://territori.gencat.cat/ca/06_territori_i_urbanisme/politica_de_muntanya/programa-promocio-habitatge-mon-rural/.

65. These technical recommendations are supported, in equal parts, by the Author's academic and professional activity, especially in the management and coordination of town and regional planning tools since 2003.

- Take advantage of road, rail, port and airport infrastructures that have become obsolete and give them new uses at supra-municipal scale so that they can promote imaginative solutions for territorial cohesion through sustainable and inclusive tourism models (e.g. greenways on old railway lines, etc.).

At the local level:

- Assume mobility planning and its implementation and monitoring as a driver to designing socio-spatial cohesion policies between different urban fabrics and to strengthen rural-urban linkages.
- Recognise the role that the human scale of the city can play in reducing social segregation and promote non-motorized mobility and an efficient public transport adapted to working hours and social dynamics, and to the different typologies and densities of the (formal-informal) urban fabric.
- Integrate into urban development planning with brave design criteria aimed to reduce the space for private vehicles in favour of a vibrant, green and inclusive public space.
- Identify rural roads networks that depend on the municipality and address progressive improvements in parallel to the implementation of scalable on-demand public transport services for the most dependent population.
- Strengthen the implementation of digital networks to ensure that work and distance learning can be carried out with guarantees.
- Finally, to place at the core of decision-making on local connectivity those actors who can generate greater traction towards more sustainable, rational and inclusive changes in daily mobility habits. A special focus on the next generations of the Global North and South. While urban youth in the Global North do not have motorized private vehicle ownership among their priorities as they did decades ago, in the Global South, youth and LRGs will have to make their own self-learning journey based on making their desires for motorized consumption compatible with a drastic reduction of the complex – social, economic and environmental - challenges that their urban and rural areas will accumulate in the coming years.

References

AbouKorin, Antar A. 'Spatial analysis of the urban system in the Nile Valley of Egypt'. *Ain Shams Engineering Journal 9* (2018) 1819–1829. http://dx.doi.org/10.1016/j.asej.2017.01.011.

Adedotun, S. B. 'A Study of Urban Transportation System in Osogbo, Osun State, Nigeria'. *European Journal of Sustainable Development* (2015), 4, 3, 93-101. https://doi.org/10.14207/ejsd.2015.v4n3p93.

African Development Bank / AfDB. 'Dakar Regional Express Train (TER)'. Summary of the Strategic Environmental and Social Assessment (SESA). 2017. https://www.afdb.org/fileadmin/uploads/afdb/Documents/Environmental-and-Social-Assessments/Senegal-Dakar-Regional-Express-Train-Project-summary-SESA-November_2016.pdf.

Angel, Shlomo. *Planet of Cities*. Cambridge, Mass: Lincoln Institute of Land Policy, 2012.

Ayuntamiento de Burgos. *Sustainable Urban Mobility Plan in Burgos*. Executive summary. May 2018. https://urbact.eu/sites/default/files/es_burgos.pdf.

Ayuntamiento de Madrid. *Madrid Recupera. Estrategia de Regeneración Urbana. Memoria*. Dirección General de Planificación Estratégica, 2018. http://www.observatorio2030.com/sites/default/files/2019-11/BP_20_2018_ES_19_Plan%20Madrid%20Recupera.pdf.

Ayuntamiento de Madrid. *Evaluación de la infraestructura verde de Madrid hacia una mejora de las políticas municipales para la resiliencia socio-ecológica*. 2020. https://www.madrid.es/UnidadesDescentralizadas/FondosEuropeos/madrid_es/Contenidos%20mapa%20interactivo/Especiales_Proyectos/Investigaci%C3%B3n/Transitando%202018/Capitulos/trabajo%20completo.pdf.

Banco Interamericano de Desarrollo. *Cuenca. Ciudad sostenible / Plan de Acción*. Programa Ciudades Emergentes y Sostenibles (CES). 2015: 70. https://issuu.com/ciudadesemergentesysostenibles/docs/cuenca_sostenible.

Bellet, Carme, and Josep M. Llop, eds. *Ciudades intermedias: urbanización y sostenibilidad*. 1. ed. Colección Actas. Lleida: Editorial Milenio, 2000.

Buehler, Ralph and John Pucher. 'Sustainable Transport in Freiburg: Lessons from Germany's Environmental Capital'. *International Journal of Sustainable Transportation*, 5:43–70, 2011. https://www.researchgate.net/publication/228675356_Sustainable_Transport_in_Freiburg_Lessons_from_Germany%27s_Environmental_Capital.

Cassiers, Tim and Christian Kesteloot. 'Socio-spatial Inequalities and Social Cohesion in European Cities'. *Urban Studies* 49 (July 2012): 1909. https://journals.sagepub.com/doi/abs/10.1177/0042098012444888.

Cities Alliance / UNOPS. *Post COVID-19 Sustainable and Regenerative Development of Secondary Cities in Emerging Economies*. Brian H. Roberts and Joshua Drake (eds). https://www.citiesalliance.org/resources/publications/cities-alliance-knowledge/secondary-cities-post-%E2%80%AFcovid-19%E2%80%AF.

City of Merced. *Merced Vision 2030 General Plan*. Chapter 4. Transportation and Circulation. 2012. https://www.cityofmerced.org/Home/ShowDocument?id=4652.

City of Raleigh. *Equitable Transit-Oriented Development Guidebook*. 2020. https://cityofraleigh0drupal.blob.core.usgovcloudapi.net/drupal-prod/COR22/EDATGuidebook.pdf.

Cross-Border Road Transport Agency / C-BRTA. *Country Profile for Zambia*. Pretoria, 2018. https://www.cbrta.co.za/uploads/files/Zambia-Country-Profile-Report.pdf.

David, Anda, Guilbert, N., Hino, H., Leibbrandt, M., Potgieter, E. And M. Shifa. 'Social cohesion and inequality in South Africa'. *Afd Research Papers Series*, no. 63 (January 2018). https://www.afd.fr/en/ressources/social-cohesion-and-inequality-south-africa.

ESPON and University of Geneve. *INTERCO. Indicators on Territorial Cohesion. Final Report* (Part B report). 2012. https://www.espon.eu/sites/default/files/attachments/INTERCO_Final-Report_Part-B_Main-Report.pdf .

ESPON and Karlsruhe Institute of Technology / KIT. *Ulysses. Using applied research results from ESPON as a yardstick for cross-border spatial development planning*. Upper Rhine Trinational Metropolitan Region. 2012. https://www.espon.eu/sites/default/files/attachments/ULYSSES_Final_Report_-_Scientific_Report_-_CS1_Upper-Rhine_MTA.pdf.

European Commission / EC. *Green Paper on Territorial Cohesion. Turning territorial diversity into strength*. 6 October 2008. https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0616:FIN:EN:PDF.

European Commission / EC. *Rhine-Alpine TEN-T Core Network Corridor, Work Plan of the Coordinator*. February 2018. https://ec.europa.eu/transport/sites/transport/files/3rd_workplan_ralp.pdf.

European Commission / EC. *CEF support to Rhine - Alpine Corridor*. May 2020. https://ec.europa.eu/inea/sites/inea/files/cefpub/cef_transport_2020-corridor-f-rhine-alpine_metadata.pdf

European Union / EU. *Eurostat Regional Yearbook. 2019 Edition*. June 2019. https://ec.europa.eu/eurostat/documents/3217494/10095393/KS-HA-19-001-EN-N.pdf/d434affa-99cd-4ebf-a3e3-6d4a5f10bb07?t=1574339587000

Iammarino, Simona, Andrés Rodríguez-Pose and Michael Storper. *Why Regional Development matters for Europe's Economic Future*. Luxembourg: Publications Office of the European Union, 2017: 24. https://ec.europa.eu/regional_policy/sources/docgener/work/201707_regional_development_matters.pdf

International Transport Forum / ITF. *Connectivity and City Clusters*. Paris: OECD Publishing, 2018. https://www.itf-oecd.org/sites/default/files/docs/connectivity-city-clusters.pdf.

International Transport Forum / ITF and OECD. *Transport Innovations from the Global South Case Studies, Insights, Recommendations*. 2019. https://www.itf-oecd.org/sites/default/files/docs/transport-innovations-global-south.pdf.

Jensen, Lars Bo. 'Odense Letbane. A Life Cycle Assessment of Odense's Light Rail Project'. Syddansk Universitet, 2018. https://www.sdu.dk/en/forskning/lifecycleengineering/education/msc/18m70.

Li, Anthony H. F. 'E-commerce and Taobao Villages A Promise for China's Rural Development?'. 2017. https://doi.org/10.4000/chinaperspectives.7423.

Luo, Xubei and Chiyu Niu. 'E-commerce participation and household income growth in Taobao Villages'. *Poverty & Equity Global Practice Working Paper* 198, (April 2019). http://documents1.worldbank.org/curated/en/839451555093213522/pdf/E-Commerce-Participation-and-Household-Income-Growth-in-Taobao-Villages.pdf.

Marsh, Ben, Allan M. Parnell and Ann Moss Joyner. 'Institutionalization of Racial Inequality in Local Political Geographies'. *Urban Geography*, 2010, 31, 5, pp. 691–709. https://www.tandfonline.com/doi/abs/10.2747/0272-3638.31.5.691.

McAllen Chamber of Commerce, 'McAllen Economic Profile, 2019'. https://mcallen.org/wp-content/uploads/2019/02/city-of-mcallen-report-1.pdf.

Miholjcic, Nina. 'Trans-Caspian International Transportation Route: a way to steadfast economic development and connectivity in the South Caucasus and Central Asia'. *Journal of the Ministry of Foreign Affairs of the Republic of Azerbaijan*. 2018. https://www.researchgate.net/publication/332876821_Trans-Caspian_International_Transportation_Route_A_Way_to_Steadfast_Economic_Development_and_Connectivity_in_the_South_Caucasus_and_Central_Asia

Nauwelaers, C., K. Maguire and G. Ajmone Marsan. 'The case of Oresund (Denmark-Sweden) – Regions and Innovation: Collaborating Across Borders'. *OECD Regional Development Working Papers*, No. 2013/21, Paris: OECD Publishing. https://doi.org/10.1787/5k3xv0lk8knn-en.

Nava, Karla and Gustavo Córdova. 'Paradiplomacia y desarrollo económico en la región transfronteriza de Reynosa-McAllen'. *Estudios Fronterizos*, 19, e004. https://www.redalyc.org/journal/530/53054753002/html/.

Ngom, M. C., Badiane, S. D., Diongue, M. and Mbaye, E. 'Les agro-industries de l'interface métropolitaine Dakar-Thiès-Mbour : enjeux fonciers et développement territorial'. *Cahiers de géographie du Québec*. 61(172) (April 2017): 33–53. https://doi.org/10.7202/1042714ar.

Parkinson, Michael, Richard Meegan, Jay Karecha, Richard Evans, Gerwyn Jones, Iván Tosics, Antal Gertheis, et al. *Second Tier Cities in Europe: In an Age of Austerity Why Invest beyond the Capitals?* Liverpool: ESPON & European Institute of Urban Affairs, 2012.

RELOCAL. *Mapping patterns of regional inequality and change in Europe: The evolution of regional inequalities in Europe*. Nordregio. September 2018. https://ec.europa.eu/research/participants/documents/downloadPublic?documentIds=080166e5be048779&appId=PPGMS.

Roberts, Brian H. *Managing Systems of Secondary Cities*. Brussels: Cities Alliance, 2014.

Rondinelli, Dennis A. *Secondary Cities in Developing Countries: Policies for Diffusing Urbanization*. Sage Library of Social Research, v. 145. Beverly Hills: Sage Publications, 1983.

Sabatini, Francisco. *La segregación social del espacio en las ciudades de América Latina*. BID Desarrollo Social. Documento de Estrategia. 2003. https://publications.iadb.org/publications/spanish/document/La-segregaci%C3%B3n-social-del-espacio-en-las-ciudades-de-Am%C3%A9rica-Latina.pdf.

Shaker, R., O. Tolba, and A. Fahmy. 'Socio-cultural divisions and urban waterfront activities: the case of El-Minya city, Egypt'. *Journal of Engineering and Applied Science*. (November 2019). https://www.researchgate.net/publication/338677097_SOCIO-CULTURAL_DIVISIONS_AND_URBAN_WATERFRONTACTIVITIES_THE_CASE_OF_EL-MINYA_CITY_EGYPT.

Stucki, Marti. *Policies for Sustainable Accessibility and Mobility in Urban Areas of Africa*. The International Bank for Reconstruction and Development / The World Bank Group. January 2015. https://documents1.worldbank.org/curated/en/467541468191641974/pdf/95606-REVISED-PUBLIC-SSATP-WP106-Urban-Mobility-IO.pdf

Teo, Hoong C., Lechner, Alex M., Walton, Grant W., Chan, Faith K.S., Cheshmehzangi, Ali, Tan-Mullins, May, Chan, Hing K., Sternberg, Troy, Campos-Arceiz, Ahimsa. 'Environmental Impacts of Infrastructure Development under the Belt and Road Initiative'. *Environments* no. 6 (2019):72. https://doi.org/10.3390/environments6060072.

United Cities and Local Governments / UCLG. *Co-creating the Urban Future: The Agenda of Metropolises, Cities and territories*. Fourth Global Report on Decentralization and Local Democracy, GOLD IV. 2017.

UN-Habitat. *Structure Plan for Ede and Environs (2014 – 2033). State of Osun Structure Plans Project*. 2014. https://unhabitat.org/sites/default/files/2020/09/structure_plans_for_ede_and_environs_state_of_osun_structure_plans_project.pdf.

Wood, William B. 'Intermediate Cities on a STRUCTURE PLAN FOR EDE AND ENVIRONS (2014 – 2033) Resource Frontier'. *Geographical Review* 76, no. 2 (April 1986): 149. https://www.jstor.org/stable/i210864.

World Bank. 'Trans Saharan Corridor development project (P171793)', *Project Information Document (PID)*, Date Prepared/Updated: 20-Sep-2019 | Report No: ISDSC27691. http://documents1.worldbank.org/curated/en/472661570048934860/pdf/Concept-Project-Information-Document-PID-TRANS-SAHARAN-CORRIDOR-DEVELOPMENT-PROJECT-P171793.pdf

CONNECTING

This paper has been produced as a Case-Based Contribution to the sixth Global Report on Local Democracy and Decentralization (GOLD VI): the flagship publication of the organized constituency of local and regional governments represented in United Cities and Local Governments. The GOLD VI report has been produced in partnership with the Development Planning Unit (University College London), through the programme Knowledge in Action for Urban Equality (KNOW). GOLD VI focuses on how local and regional governments can address the local manifestations of growing inequalities and contribute to create "Pathways to urban and territorial equality". The GOLD VI report has been produced through a large-scale international co-production process, bringing together over a hundred representatives of local and regional governments, academics and civil society organizations. This paper is an outcome of this process and is part of the *Pathways to Equality Cases Repository*, which collects the over 60 Case-Based Contributions produced as part of the GOLD VI report.

In particular, the present paper has contributed to Chapter 6 on "Connecting", which focuses on the role of local and regional governments in increasing urban and territorial equality through improving connectivity between and within cities and citizens through more equitable transport, infrastructure and digital connectivity planning and interventions.

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