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Dynamics and effects of the port hinterland on mobility in Cartagena de Indias (Colombia)

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INTRODUCTION

This research attempts to identify problems and define public policies on the co-dependent relationship between urban and port development in a Colombian coastal city: Cartagena de Indias, the main Colombian port.

The growth of port flows and spatial concentration cause restrictions or blockages to the same flows of commercial and port mobility, while affecting the conditions of urban logistics in the city and urban agglomeration where it is located. The main purpose of this research is to verify these dynamics of agglomeration and congestion in the port area and corridor of Cartagena de Indias and its effects on road mobility.

RESEARCH METHODOLOGY AND APPROACH

The methodology used initially presents the description of the dimensions of geographical scope and territorial configuration, differentiating the spatial configuration linked to the logistical specialisation of the port, and then reviewing the statistics of flows of cargo vehicles and passengers accessing the port corridor located in the urban area of Cartagena.

In order to analyse the evolution of the hinterland or area of influence of the port, two findings are recognised that differ in the interpretation of the scope in terms of geographical extension: the hinterland-urban dynamics differentiation and the effects on an area of port influence, in particular on the use of road infrastructure and land flows of port cargo to and from neighbouring municipalities.

The road densification calculations and the progression of port operation flows will be indicators of the urban congestion trend and other mobility implications, in relation to the convergence of port flows with daily mobility flows in urban areas. With this information, recommendations are made on the governance of the city-port interface and the assessment of infrastructure interventions for urban mobility.

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CHARACTERISATION OF THE PORT OF CARTAGENA DE INDIAS ON A REGIONAL AND/OR METROPOLITAN LEVEL

Colombia has coastlines on both the Pacific Ocean and the Caribbean Sea. Since 1993, the maritime port enclaves have been managed by public-private organisations called Regional Port Societies (SRP). Of the 63 docks under concession in Colombia as of 2023, the most relevant PRSs in Colombia are located on the coastline towards the Caribbean Sea and the Atlantic Ocean: Barranquilla (Department of Atlántico,) Cartagena de Indias (Bolívar), Santa Marta (Magdalena), and, towards the Pacific Ocean: Buenaventura (Valle del Cauca) and Tumaco (Nariño).

Our case study is Cartagena de Indias, which has 44 docks in its inner bay and urban area, where two PRSs of great importance for Colombia's foreign trade operate: SRP Cartagena and CONTECAR. The urban corridor handles a significant volume of port operations and container traffic, the only alternative being the use of large trucks.

Given the relevance of port flows with respect to other urban logistics activities and mobility in general, a focus group on urban mobility carried out and systematised in 2022, within the framework of the revision of the District Development Plan, reviewed and validated the problems of local mobility and the population affected. In this way, the problems and causes of mobility were identified for the entire area of influence of Cartagena de Indias.

The resources to expand the city's intermodal infrastructure circuits and capacity have been the responsibility of a centralised state body (National Infrastructure Agency - ANI) which has committed and maintained a system based on awarding road concessions to private consortiums, which manage the maintenance of public roads under a toll scheme with investment made on existing roads, but without effectively expanding the city's road capacity. This institutional solution tends to curtail the opportunity and capacity for public management and long-term local investment based on a territorial planning of urban areas and their metropolitan expansion.

RESULTS OF THE ANALYSIS

The port statistics analysed highlight the pre-eminence of the port of Cartagena in the Colombian port system.

The main impacts of the performance of the logistics sector in the city of Cartagena are often related to increased environmental pollution, deterioration of road infrastructure, accidents and, above all, reduced road capacity.

Port cargo corridors and their tolls cause travel restrictions for the residents of Cartagena de Indias, segregating and excluding social groups and various urban areas, affecting territorial integration and articulation with neighbouring municipalities. This leads to an increase in travel times, increased accident rates and many daily difficulties in urban mobility.

DISCUSSION. PROPOSALS AND CHALLENGES OF PUBLIC INTERVENTION FOR PORT-CITY MOBILITY IN CARTAGENA DE INDIAS

The characterisation of the dynamics of the hinterland allows us to conclude that the intensity of the phenomenon of this agglomeration specialising in port activities is worsening the options for urban mobility, due to the confluence of the city's own urban logistics of passengers and goods and the flows of land cargo linked to port traffic and foreign trade which enter or leave Cartagena de Indias.

Considering the tensions and needs of the area of influence of the port enclaves, we distinguish two types of strategic challenges of a public nature which are expressed at different scales in order to influence the expansion of opportunities and capacities for local development. On the one hand, we have a saturated and congested urban area with a road infrastructure that is confined by the same consolidation



of the surrounding urbanism, so that some solutions must be sought in areas of expansion. On the other hand, we need to subtract flows from land routes, which implies exploring viable intermodal designs (river and rail) for Cartagena and its metropolitan area.

CONCLUSIONS

This research analyses the port area of Cartagena de Indias and the mobility problems with the urban area and its agglomeration. It is the main seaport in Colombia, which has been modernised in its dock technologies, but has restrictions between the port operations of its docks and the intermodal capacities by land.

Historical investment in road infrastructure has been insufficient to overcome a poorly organised road configuration. The governance scheme for the hinterland promoted by the Colombian State has concentrated on facilitating the concession of docks and managing road capacity through road concessions on the corridor to the port. On the contrary, it seems to ignore the potential of recovering maritime accesses of aquatic mobility systems of metropolitan scope, thus decreasing vulnerability and increasing the accessibility of the road network. Therefore, more public investment is needed to integrate the port with the city and its metropolitan area, in order to increase access options and to decongest saturated road nodes and points.

This research recommends improvements to the governance scheme of the city-port interface and to the logic of valuation of infrastructure interventions, as it is necessary to harmonise land use beyond strictly port areas.

The national administration, centralised in Bogota, continues to control the destination of port royalties. On the contrary, the income from the port of Cartagena de Indias, or other Colombian ports, hardly benefits the city and its area of influence or hinterland.

We believe that this research could be of interest for other Colombian and Latin American port enclaves, where the problems of road mobility are very different from those of Cartagena de Indias. There are territorial and urban planning solutions and actions which could favour both the port and the city and agglomeration of Cartagena de Indias and, with this, improve the social and environmental well-being of the citizens and the territory. The resource management of the Spanish Port Authorities could be a positive reference for the Colombian port administrations.