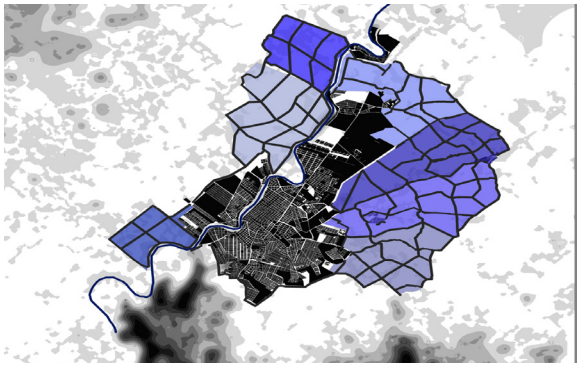

WORKING PAPER #34/ OCTOBER 2015

PREPARING RAPIDLY GROWING CITIES FOR THEIR EXPANSION: A REPORT ON VALLEDUPAR AND MONTERÍA, COLOMBIA

+ JAIME VÁSCONEZ, NICOLÁS GALARZA SÁNCHEZ, AND SHLOMO ANGEL,

WITH RICARDO MONTEZUMA AND SANTIAGO FONSECA

ABSTRACT

This paper reports on the experience gained so far at the NYU Urban Expansion Program in working with two intermediate-size, rapidly growing cities in Colombia, Valledupar and Monteria, in making preparations for their coming expansion. The municipalities of these two cities, with the support of NYU, have embarked on a simple four-point action program to make room for accommodating their growing populations. The action program focuses on making realistic 30-year projections of land needs, ensuring the administrative jurisdiction of projected areas of expansion, preparing an arterial road grid in these areas and securing the rights-of-way of the entire grid now, and creating an institutional framework for protecting public open spaces in the expansion area. Both cities have made significant progress in implementing their respective action programs. We report on the process they followed, the lessons learned, and the prospects for similar initiatives in other countries, both in Latin America and elsewhere.

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Preparing Rapidly Growing Cities for Their Expansion: A Report on Valledupar and Montería, Colombia[1] [2]

Jaime Vásconez[3], Nicolás Galarza Sanchez[4], and Shlomo Angel,[5]
with Ricardo Montezuma[6] and Santiago Fonseca[7]

Introduction

This paper summarizes the experience gained so far by the *NYU Urban Expansion Program*—a program of the *Urbanization Project*, situated at the Stern School of Business of New York University—in working with two intermediate-size, rapidly growing cities in Colombia in making preparations for their expansion: Valledupar, capital of the Cesar Department and Montería, capital of the Córdoba Department.

The paper recounts the sequence of actions taken by the NYU expert team in Colombia, describes the main activities undertaken by participating stakeholders, and enumerates the results achieved so far. It also incorporates a number of comments and analytical remarks that are needed for a better understanding of the content of the NYU Urban Expansion Program as a whole; makes reference to its conceptual and theoretical framework; and summarizes a number of key operational decisions that have been taken throughout its engagement with cities in Colombia and elsewhere.

The purpose of this paper is to articulate the experience accumulated since the initiation of the Program in 2012, and to list key lessons that could be helpful in addressing the issue of urban expansion in other cities in Colombia, in Latin America, and in other rapidly growing cities everywhere.

The Conceptual Framework

The scientific basis and the rationale of the *NYU Urban Expansion Program* was presented and developed extensively in *Planet of Cities*[8] and in its companion volume, the *Atlas of Urban Expansion.*[9]

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1 We are indebted to Mayors Carlos Correa of Montería and Fredys Socarrás of Valledupar, and their teams for their commitment to developing this work and to implement the expansion plans.

2 We would like to thank the Latinamerican Development Bank-CAF for partnering with the Urbanization Project on the 2nd phase of this project. The technical support of their team was instrumental for the development of the plans.

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7 Santiago Fonseca, urban designer at Fundación Ciudad Humana of Bogotá, Colombia.

8 Angel, Shlomo, 2012. *Planet of Cities, Cambridge MA: Lincoln Institute of Land Policy.* A digital version is available on *Amazon.com*. A translation into Spanish, *Planeta de Ciudades*, was published by Universidad del Rosario, Bogotá in 2014

More recently, the conceptual and methodological approach of the NYU Urban Expansion Program was summarized in a document titled "The NYU Urban Expansion Program—A Primer", published in December 2014. The Primer is an updated version of the original conclusions in *Planet of Cities.* It summarizes the theoretical foundations and the operational substance of the Program, as it has now emerged at NYU, and focuses on its implementation in Colombia and in other countries since 2013.[10]

The NYU Urban Expansion Program is focused on intermediate-size rapidly growing cities.[11] Its main objective is to provide support to their local governments, assisting them adopting minimal yet necessary plans of action to face their coming expansion during the coming decades as a result of their rapid population growth.

Like a number of other Latin American countries, Colombia is still urbanizing rapidly. According to the United Nations, between 2015 and 2050 the Colombian population living in cities will increase from 39 million (76.4% of the total population) to 53 million (84.3% of the total). Among all countries with cities of more than 100.000 inhabitants in the region, Colombia has the highest share of rapidly growing cities. In Brazil, out of the 156 cities with more than 100.000 inhabitants, 23 are growing rapidly (about 15%); in Mexico, out of 92 cities with more than 100.000 dwellers, 13 are growing rapidly (about 14%); and in Colombia out of 36 cities with more than 100.000, 12 are growing rapidly (33%). If these growth rates persist, the population of Colombia's rapidly growing cities could double in the next 20 years. If existing urban densities remain unchanged, the urban land covered by all the existing cities can be expected to double during the period as well; if densities decline 1% annually—as economic growth leads to increased land consumption—urban land cover will almost triple; and if the densities decline 2% per year, the urban cover will increase over 3-fold in the next 30 or 35 years.[12]

Urban expansion, massive as it may be, would not require our attention if we were ensured that it proceeds in an orderly manner and that lands converted from rural to urban use are properly laid out. Urban peripheries can be said to be well laid out when they possess a number of key attributes: To be part of the metropolitan labor market, residential areas on

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[9] Angel, Shlomo, Parent, Jason, Civco, Daniel L., and Blei, Alejandro M., 2012. *Atlas of Urban Expansion*, Cambridge MA: Lincoln Institute of Land Policy. Available online at: http://www.lincolninst.edu/subcenters/atlas-urban-expansion/

[10] In 2013, the NYU Urban Expansion Program began two country urban expansion initiatives, one in Colombia and one in Ethiopia. So far, it has explored new initiatives in Mexico, Ecuador, India, China, Myanmar, and Indonesia.

[11] The Program defines intermediate cities as cities with populations ranging from one hundred thousand to several million people, seeking to refrain from engaging both megacities and capital cities. These larger cities have drawn the attention of many urban planners and are typically better studied (while intermediate cities are typically ignored). Engagement with them at the policy making level is also more complex. The Program considers rapidly growing cities to be cities with annual population growth rates equal to or greater that 3%.

[12] These estimates of expected density decline are consistent with the findings reported in *Planet of Cities.* The book reported that the average decline in built-up area densities in a global sample of 120 cities between 1990 and 2000 was of the order of 2%. In a representative sample of 30 cities, average densities declines from peak densities at the rate of 1.5% annually between 1800 and 2000.

the urban periphery need to be well connected to the metropolitan area, preferably by arterial roads that can carry public transport located within walking distance of homes. To facilitate the provision of infrastructure services, arterial roads and streets must to be laid out *before* plots revert from a rural to an urban use. New street layouts must not discriminate between rich and poor. An adequate share of the land needs to be dedicated to streets, and streets have to be wide enough. To serve low-income households, plot sizes in residential subdivisions must be small enough to be affordable. To make neighborhoods walkable, blocks must be small enough or the density of 4-way intersections must be high enough.

The NYU Urban Expansion Program is currently assembling data on the quality of urban layouts on the peripheries of a sample of 200 cities the world over, and Valledupar is one of these cities. We were therefore able to examine the quality of urban layouts in areas developed between 1990 and 2014 there. We can say with a 95% level of confidence that the share of the residential area occupied by informal land subdivisions in the expansion area of Valledupar is 57±15%. We can also say with a 95% level of confidence that the share of the built-up area devoted to roads and boulevards in the expansion area of Valledupar is 26±2%, clearly a satisfactory share. Arterial roads—with a width exceeding 16 meters—occupy only 1% of the land in the expansion area. Given the density of arterial roads, 0.15 km/km^2, we can estimate that, on average, arterial roads are spaced some 13 kilometers part. Still, because Valledupar is relatively small, the average distance to an arterial road is 640 meters, still a walking distance. Finally, we can also say with a 95% level of confidence that the average block size in the expansion area, 2.3±1.2 hectares, is reasonably small, ensuring a good degree of walkability. On the whole, urban expansion in Valledupar is reasonably well organized, except for the fact that a major share of the area is organized informally (see figure 1).

Figure 1: Informal land subdivision on the northwestern periphery of Valledupar, developed during the 1990-2014 expansion period

Disorderly urban expansion is the principal reason for confronting the challenge of urban expansion now, especially in cities that have weaker capacities and in which urban expansion is more rapid. The plans of action for urban expansion that are proposed for those cities by the NYU Urban Expansion Program are structured as four simple interventions that include (1) the adoption of realistic maps that contain expansion areas wide enough to accommodate a 30-year population growth; (2) the definition of new city limits that encompass these areas; (3) planning a network of arterial roads and securing the rights-of-ways of these roads; and (4) creating an institutional framework for protecting a hierarchy of pubic open spaces in the expansion areas of cities. These four basic interventions have to be immediately and comprehensively planned now, with the perspective of executing road construction and public open space provision progressively over time. Their chief aim is to provide sense and structure to the proposed urban expansion area as a whole from the very beginning.

While the execution of the arterial road network and the hierarchy of public open spaces can be implemented progressively—in accordance with demand and with the availability of resources—it is essential that the legal and administrative actions required to secure the lands for these works should be undertaken now, to guarantee the public ownership of open spaces and the rights-of-way of arterial roads in the entire future expansion area of the city, within the existing legal and institutional framework available in each country.

Therefore, a plan of action to manage urban expansion is both an urban planning assignment to design the physical structure that the expansion of a city will have in the future, and a political program that can ensure its practical feasibility over time. It therefore requires both the technical, financial, legal and managerial resources and capacities, and the political will of the authorities. The Colombia Urban Expansion Initiative has sought to provide or obtain both components during its engagement with participating cities.

The Urban Expansion Initiative in Colombia

Early in 2013, the NYU Urban Initiative for Latin America identified about 10 Intermediate size rapidly growing cities in Colombia. In an initial, exploratory phase, its expert team contacted the local governments of five of those cities[13] and obtained from their city governments commitments to formally participate and develop plans of action for the expansion of their cities. Under those agreements, Colombian experts joined the process and took part—with the Mayors and teams of their municipal officials—in a National Workshop on Urban Expansion, held in Cartagena, Colombia, in September of 2013.[14]

In this workshop, which was also attended by several representatives of international financial organizations,[15] the local teams—with the advice of participating experts—made preliminary drafts of their plans of action for a 30-year urban expansion. At the end of the workshop, it was agreed that more advanced versions of those plans would be prepared with

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13 The selected cities were: Montería (Cordoba); Tunja (Boyaca); Yopal (Casanare); Valledupar (Cesar) and Santa Marta (Magdalena).

14 During the Workshop among the issues discussed were: Municipal Engineering, Mobility and Transport, Urban Ecology, Territorial Planning and Urban Law and Regulations.

15 The Latin American Development Bank (CAF), and the National Territorial Development Financial Entity (FINDETER) of Colombia.

the objective of presenting them at the VIII World Urban Forum, organized by UN-Habitat, to be held in Medellin, Colombia, in April 2014.

At the end of this initial exploratory phase, the progress made by each city was assessed and those more advanced were prioritized. The Mayors of Montería and Valledupar were invited to present their proposals at the VIII World Urban Forum. That event was also the initial milestone for establishing a cooperation agreement between the NYU Stern Urbanization Project and the Latin American Development Bank (CAF)[16].

In the other cities initially involved in the Colombia initiative—Tunja, Santa Marta, and Yopal—work progress was less impressive. The Municipality of Tunja has a very small territory, which is already more than 80% built-up, so that any future urban expansion projected for that city must necessarily occur in the jurisdictions of surrounding municipalities. Unfortunately, Colombian law does not consider regional territorial administration among adjoining jurisdictions, so the action plan for urban expansion for that city will require a complex process of negotiations and possibly some changes in Colombian legislation that, realistically, will require a considerable time. In Santa Marta and Yopal, the Initiative encountered some difficulties related to access to information and to the limited technical capacities of the local planning teams, making difficult for the NYU expert team to to collaborate with local officials. For these reasons, the NYU expert team decided to suspend the work with those three cities, at least temporarily.

Following the Cartagena workshop, the NYU expert team, CAF and the municipal authorities of Montería and Valledupar jointly decided to enlist the services of a Colombian consulting firm with experience in implementation of Plans of Action: The *Fundación Ciudad Humana* of Bogota, Colombia. It was determined that at least three areas required intervention in order to formalize the action plans in practical terms. Those were: (1) issues related to the technical and engineering aspects of the plan; (2) legal and administrative issues; and (3) issues concerning the negotiation and facilitation of the processes within each local context. Because of the absence of precedent in dealing with these issues in Colombia, progress towards their resolution faced many obstacles along the way.

For instance, the links between the plans for urban expansion and other urban plans and programs available in each city had to be addressed and resolved. Under Colombian law (*Ley Orgánica de Ordenamiento Territorial*), any city with 100.000 inhabitants or more must develop, adopt and implement a Spatial Organization Plan—*Plan de Ordenamiento Territorial* (*POT)*—which is usually a broad and efficient planning tool. It was envisioned that the 30-year Expansion Plan should be included in the POT, so as to give them the official status that POT possesses. But the development of those plans tends to be asynchronous, with each plan having its own date of initiation and its own planning horizon. The potential problems and objections were avoided by proposing a flexible approach: (1) When the POT is going to be formulated or updated in the near future, the Expansion Plan should be considered as a background study; (2) when the POT is being elaborated simultaneously, the Expansion Plan should be a component of the required studies; and finally, (3) when the POT has already been developed and approved, the Expansion Plan should be incorporated as an addendum in the any future updated version of the approved POT.

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16 Thanks to this agreement, CAF agreed to finance the Urban Expansion Plans of Montería and Valledupar, through a non-refundable technical cooperation Grant.

According to Colombian legislation, the POT has a time horizon of 12 years, which does not correspond with the medium and long-term perspective (25-30 years) required for the Urban Expansion Plan. Therefore, since this has a very significant implication for the implementation of Expansion Plans, it was necessary to differentiate the nature and specificity of the two planning instruments. As with other municipal plans—such as those for water, sewerage, or transport—the POT's narrow horizon of 12 years does not mean that other plans for urban development should be limited to the short POT time horizon.

Those concerns raise another issue, which is crucial for the feasibility of urban expansion plans. As noted above, although actual implementation—i.e. the construction of roads or public parks—can be deferred in time, preserving both the rights of way for the arterial roads network and the rights of use for the hierarchy of open public spaces is something that has to be done immediately, in order to ensure that the orderly spatial organization of the expansion area of the city can be preserved for the future. But in Colombia the immediate expropriation of the required land for those purposes is not feasible. From a financial perspective, it would require budgets that are not available at the present time; and from a legal, administrative and political perspective, it would lead to problems and conflicts both within municipal administrations and between municipal administrations and landowners.

To resolve those difficulties, the NYU expert team proposed to establish negotiation and agreement processes, processes that utilize planning, legal and administrative instruments already developed and successfully applied in the national context of Colombia. The customization of those instruments for the two cities is now underway, creating a detailed strategy for all plots on the expansion area. The instruments[17] would grant the municipalities compulsory powers to carry out the project; however, they will be required to contemplate alternatives in cases where compensation agreements cannot be negotiated successfully with landowners. In these cases, existing Colombian regulations have developed mechanisms to grant the government the capability of expropriating land from property owners in order to carry out large infrastructure plans of public interest[18]. Expropriation is always the last resort, undertaken only when it is impossible to reach an agreement regarding satisfactory compensation with landowners[19]. As will note later, only a small percentage of the plots affected by the arterial road will require taking a share greater than half the pot for the arterial road. These plots are typically those that will require expropriation and compensation using the power of eminent domain.

The Plans of Action for Urban Expansion in Valledupar and Montería will adopt those instruments. They convey the concurrence of all the public and private stakeholders directly involved in the expansion processes in each city to formulate agreements, agreements based on the premise that all of them can benefit from the process if they agree to share the burdens and the benefits derived from implementing an orderly urbanization process on the urban periphery over the coming decades.

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[17] Those instruments are, among others, the Urban Macro-projects (*Macro Proyectos Urbanos)* and the Urban Partial Plans (*Planes Parciales de Urbanismo)*.

[18] Those mechanisms cannot be used for assembling land for private projects.

[19] Once the negotiation has failed, the process of expropriation is set to be settled within a period of less than two months. In all such cases, the landowner receives compensation. The compensation rate is settled by a judge.

The feasibility of the proposed action plans depends, to a large extent, on the quality, precision, accuracy, comprehensiveness and up-to-dateness of information. A large part of the work of the NYU expert team in Colombia has been directed towards obtaining and combining high quality data from multiple databases—demographic, geographic, environmental, cadastral, legal, and administrative—to provide the information required to identify and quantify key magnitudes and to qualify the nature and character of all the steps required to implement the action plans.[20]

The plans of action for the urban expansion of the two cities are now fully developed. They are detailed in digital and numerical databases that precisely identify and quantify the lands within the new urban limits adopted for the future growth of each city in which the rights of use of public open spaces and the rights-of-way of arterial roads must be preserved for future public use. Furthermore, the legal and administrative procedures and instruments required to conduct the negotiations and agreements with the owners of the affected lands have been determined. We can now expect that—for a timeframe of no less than 30 years—all the lands required for the arterial road grid and for the hierarchy of open public spaces needed by the cities for their orderly future expansion, will be available, when needed.[21]

Creating arterial road grids in the expansion areas of cities

This section describes both the path that was followed to produce the urban expansion plans of Valledupar and Montería and the main results obtained during their elaboration process.

As described in the book *Planet of Cities* (S. Angel, 2010), the expansion plans contain four main components: (1) Realistic demographic and urban expansion projections; (2) Generous administrative boundaries defined by the same administrative authority; (3) Securing the rights-of-way for a 1-km-by-1-km arterial road network in the entire proposed expansion area; and (4) Securing land for a hierarchy of open public spaces in the expansion area.

At the workshop held in Cartagena in 2013, the municipal technical teams developed a preliminary draft version of those plans. The transition from those initial 'academic' exercises toward fully developed planning instruments, capable of undergoing technical assessments and advancing all the way towards their implementation, was the result of deeper studies, conducted with a higher degree of detail. These studies allowed a much more precise analysis of local realities than was available at the start of the process.

Population projections, for example, had to be redone. Information regarding the official demographic projections was collected from the National Bureau of Statistics, (DANE). In addition, demographic projections were also obtained from the National Planning Department (DNP)—the governmental entity responsible for formulating national public

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[20] The databases included are those from the National Statistical Administrative Department (*Departamento Administrativo Nacional de Estadística, DANE*); from the National Geographic Institute (*Instituto Geográfico Agustín Codazzy, IGAC*); and from the Property Registry. They also include various legal documents and selective data from Municipal Offices.

[21] According to the present timetable, the negotiations and agreements with the owners of all plots that contain rights-of-way of the arterial grids of both Montería and Valledupar will be completed by the end of 2015.

policies. One of their programs, the Mission Cities System,—produced long-term demographic projections for all Colombian cities.

The methodology used to measure the built-up areas of each city was developed in the *Atlas of Urban Expansion* (Angel et al, 2010). It is important to note here that the projections of the built-up area into the future were based on the actual built-up area in 2010 rather than on the administrative areas of cities. The vacant open spaces within the existing urban perimeters established by the POT in each city were considered as future expansion areas as well.

With more accurate information regarding future population growth, it was possible to calculate the areas that will be required for urban expansion in both Montería and Valledupar with greater accuracy, under three different scenarios: (1) that average residential densities (inhabitants per hectare) would remain unchanged; (b) that they would decrease an a rate of 1% per year; and (3) that they would decrease an a rate of 2% per year. The expansion areas required under these three different scenarios are presented in Table 1.

City	**Projected urban area (Hectares), 2010-2040**						
	2010	**2020**		**2030**		**2040**	
	Total	Total	As Multiple of 2010	Total	As Multiple of 2010	Total	As Multiple of 2010
Montería	3,598	5,660	1.6	7,641	2.1	10,314	2.9
Valledupar	2,474	4,374	1.8	5,905	2.4	7,696	3.2

Table 1: Projected urban areas in Montería and Valledupar, 2010-2040

With these inputs, the land available at the urban periphery of both cities was analyzed, so as to identify their receptive capacity for urban activities. The expansion areas were projected using the ArcGIS software. The areas occupied by water bodies, such as rivers and wetlands, were identified. All the lands considered at risk, unsuitable for residential uses, or otherwise protected by the Colombian Law, were also identified. Subsequently, polygons of the remaining areas were traced to estimate the expansion areas needed in each city: 6,716 hectares in the case of Montería; 5,222 hectares in Valledupar.

Preliminary maps identifying the lands that would be required and suitable for urban expansion during the next 30 years are presented in figure 2 for Montería and in figure 3 for Valledupar.

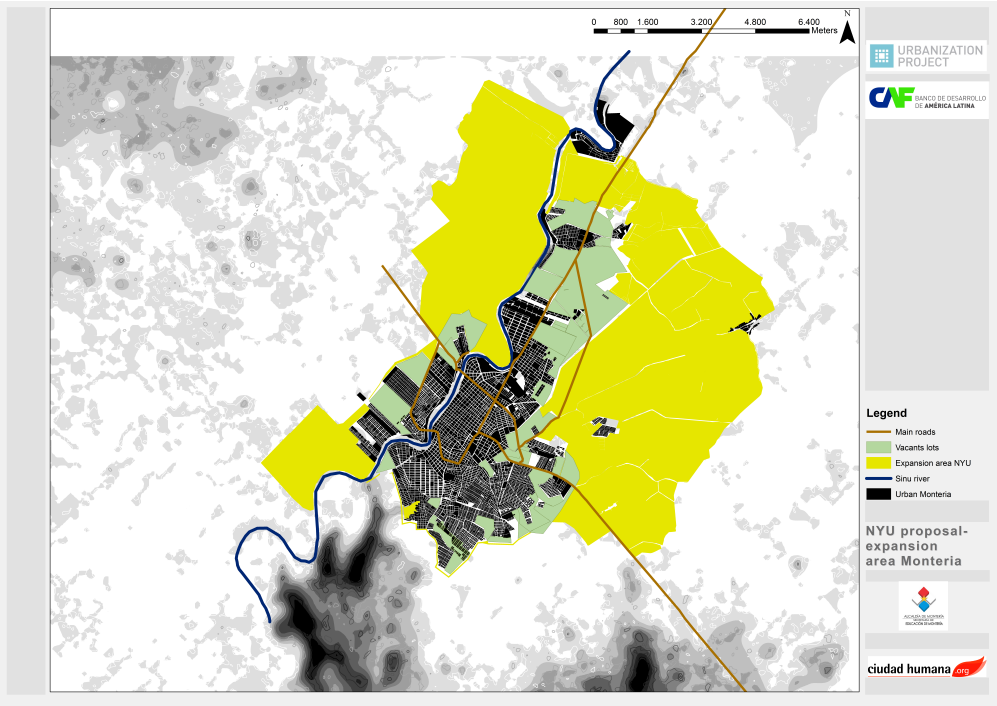

Figure2: Proposed areas of expansion in Montería, 2010-2040

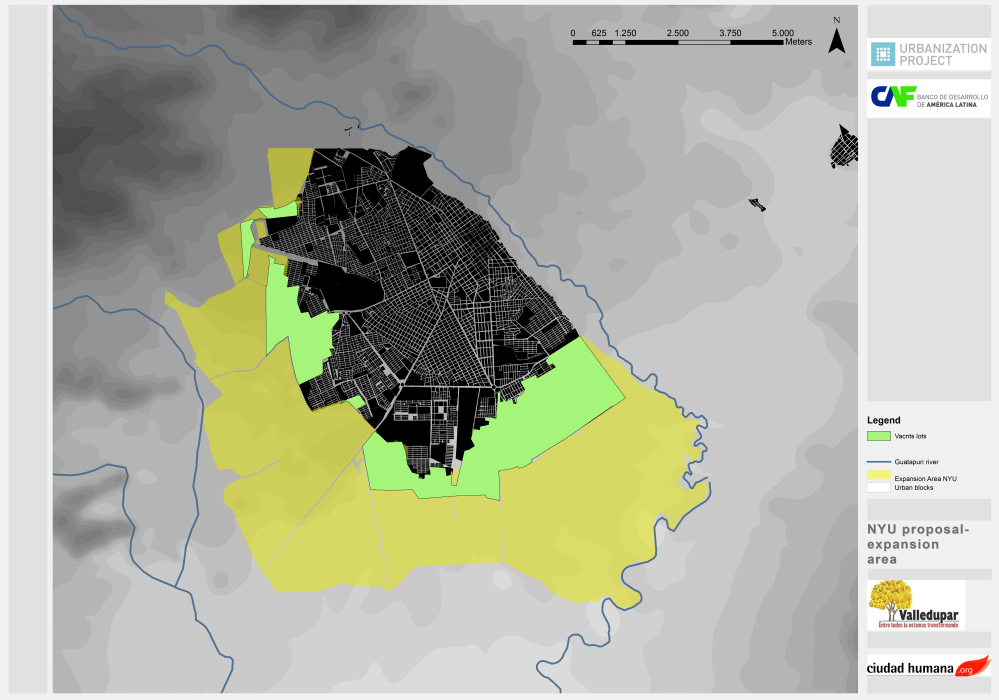

Figure 3: Proposed areas of expansion in Valledupar, 2010-2040

Figure 2 shows the land selected on the city of Montería. The main constraint on the expansion for the city is the risk of flooding. Most areas to the south and a small share of the western part of the city are highly susceptible of flooding, at least twice a year as pointed out

by local officials. The natural area for expansion is, therefore, to the southeast, to the east and to the northwest. Those areas are relatively flat and do not have high environmental or farming value.

Figure 3 shows the land selected for expansion in Valledupar. Here the main constraints on urban expansion are of two kinds. First, the east and northeast of the city has traditionally been in intensive agricultural use and land there is highly productive. Secondly, the land to the northwest has steep slopes that inhibit urbanization. The city's expansion was thus projected to the southern, the southwestern and the western parts of the city. The two shades of color in the figure correspond to the two phases in which the land was projected to be developed. As the city of Valledupar recently approved a new POT, the total expansion area was split in two: (1) the expansion land contemplated on the POT with a 12-year horizon; and (2) the expansion area in the remaining 18 years in the 30-year expansion plan.

Once the areas that are planned to accommodate expansion in each city were identified, it became necessary to review the land ownership pattern in these areas. This required a review of the rural cadaster, using a geo-referenced analysis of the location of each of the properties that could be potentially affected by the urban expansion plans. Landowners will eventually be affected, first and foremost, by the grid of arterial roads—the grid of 30-meter wide roads, spaced one-kilometer apart—passing through or along the edges of their properties.

The rural cadasters[22] of Montería and Valledupar revealed substantial differences between them. While in Montería the 6,710 hectares selected for urban expansion had 2,712 plots, in Valledupar the 4,472 hectares selected for that purpose had only 348. Maps of the rural property distribution in Montería and Valledupar can be seen in figure 4 and 5 respectively. The number of properties affected by the arterial road grid in both cities is shown in Table 2.

City	Plots in the expansion area	Plots affected by the arterial road grid	Share of the plots affected by the grid
Montería	2,712	984	36.3%
Valledupar	348	138	39.7%

Table 2: The share of plots in the expansion areas of Montería and Valledupar that will have arterial roads through or along them

The maps showing property boundaries were used to reshape initial layouts of the arterial road grids in these cities, while at the same time minimizing the number of 3-way intersections, intersections that are less efficient for through traffic. Taking into account the plot distribution identified in these maps, topographical and geological constraints, and existing land use regulations, it was possible to refine the layouts of the arterial road grids. A number of considerations guided the final layouts of the arterial grids: (1) plot boundaries; (2) connection to and extension of existing arterial roads; (3) using existing intercity roads, as well as rural roads as parts of the arterial grid; and (4) avoiding the location of roads on steep slopes.

[22] The rural cadasters for the two municipalities were obtained through the Colombian Central Agency in charge of administering geographic information, the *Instituto Geográfico Agustín Codazzi*. All metrics for plot areas, land prices, and locations were computed using GIS software.

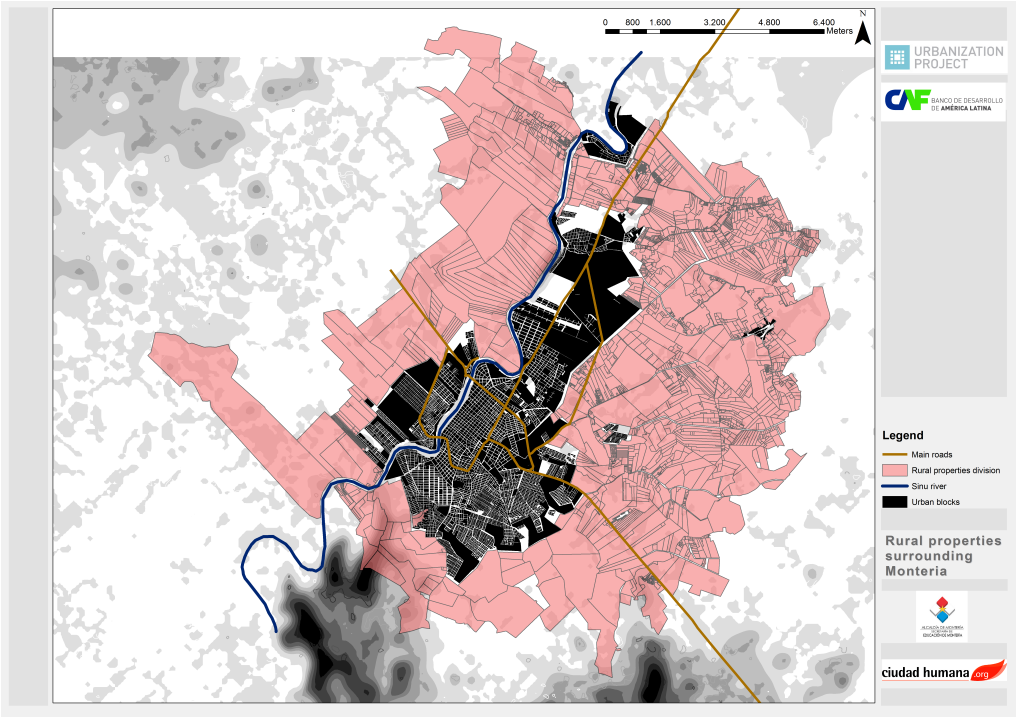

Figure 4: The boundaries of 2,712 plots on the periphery of Montería, 2015

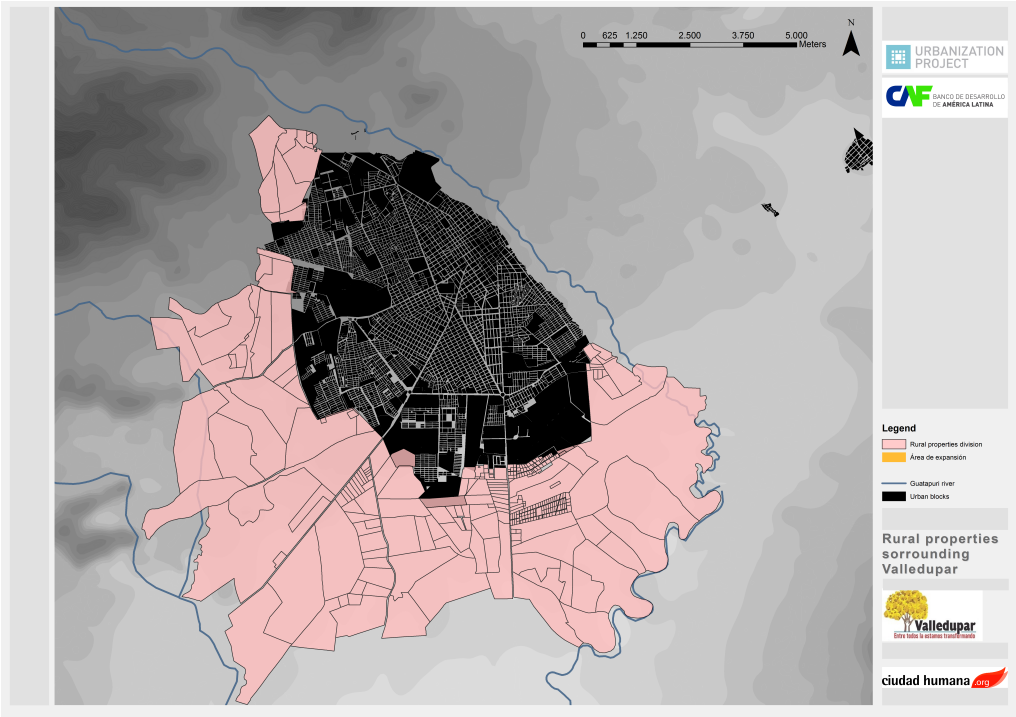

Figure 5: The boundaries of 348 plots on the periphery of Valledupar, 2015

Modifying the location of arterial roads slightly, so that—to the extent possible—they pass along plot boundaries, made it possible to reduce the number of plots that would be broken in

two or more parts by arterial roads, as well as to increase the number of plots that would have direct access to arterial roads. Incorporating the existing inter-city roads into the arterial grid further reduced the number of plots affected, as well as the total amount of land required for the arterial grid. These roads are already functional and the municipality already owns their rights-of-way. Likewise, locating sections of the arterial road network on existing rural roads and pedestrian paths allowed for the same kind of optimization. In the case of rural roads, although it was possible that their rights-of-way are not officially assigned to the municipality, their land use is recognized and accepted by people as public and registered as public in land property records.

The inclusion of existing inter-city roads in the arterial grid in the expansion area of Valledupar, is shown in Figure 6. A rural road in the expansion area of Montería that has been incorporated into the planned arterial grid of the city is shown in Figure 7.

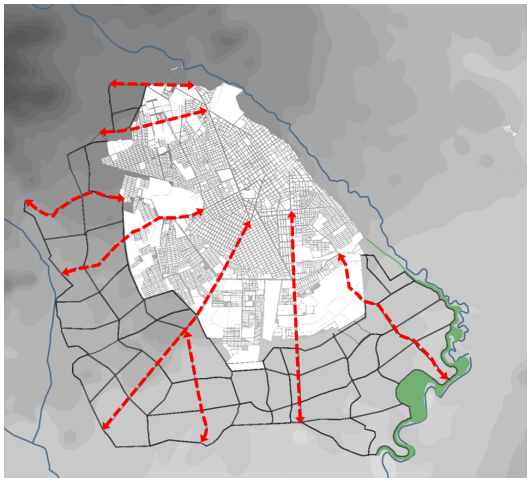

Figure 6: Inter-city roads in Valledupar that were integrated into the arterial road grid in the expansion area

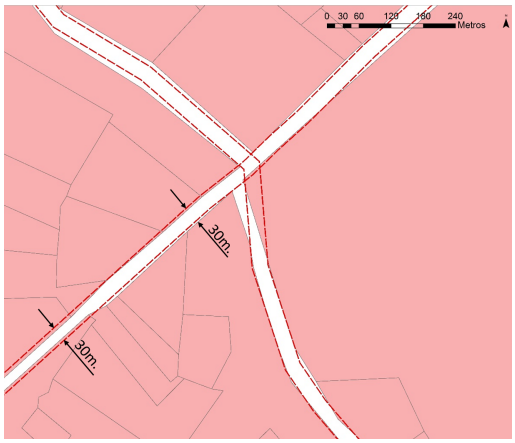

Figure 7: A rural road in the expansion area of Montería that was incorporated into the arterial road grid in its expansion area

The arterial road grid in the expansion areas of cities also facilitates the division of the expansion areas into more manageable units for planning and administration. The expansion areas can be divided into a two-tier spatial hierarchy, the first tier constituting communes and

the second tier constituting macro-blocks. Figures 8 and 9 show the spatial structure of communes and macro-blocks for both cities.

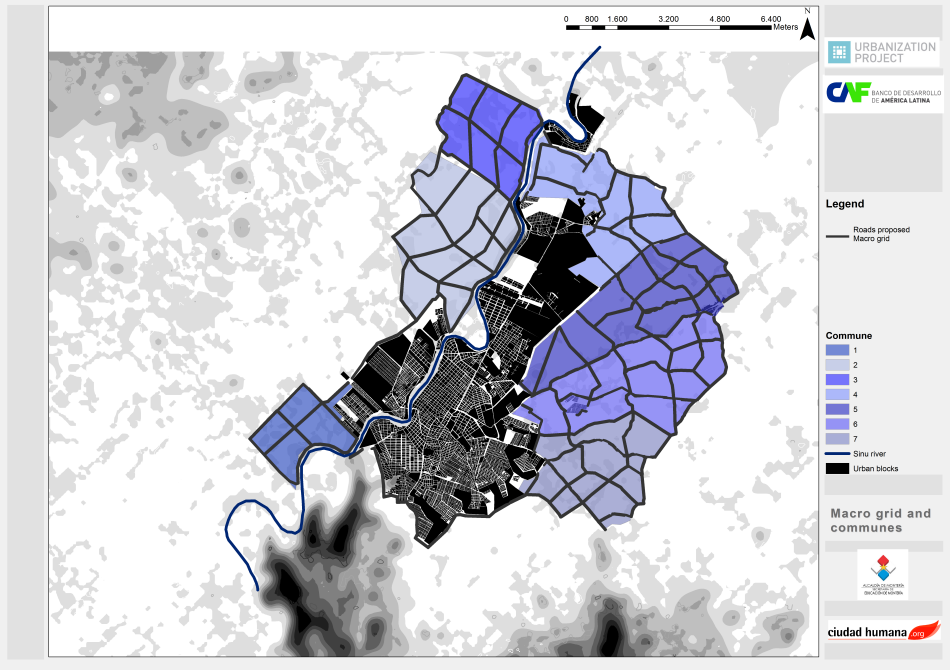

Figure 8: The division of the expansion area of Montería into communes, macro-blocks and the final arterial grid

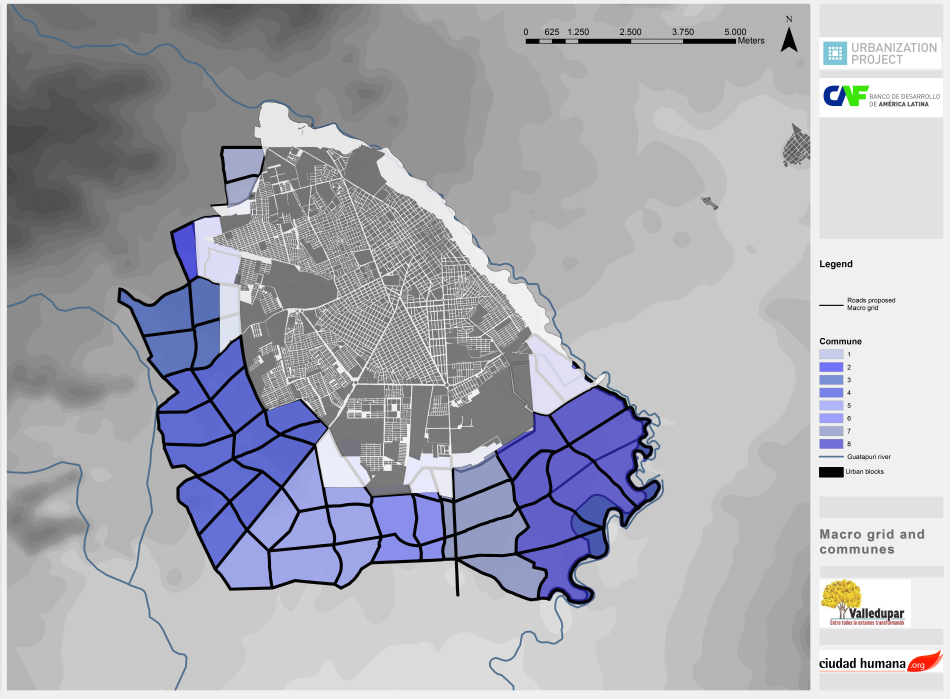

Figure 9: The division of the expansion area of Valledupar into communes, macro-blocks and the final arterial grid

We know, for example, that a perfectly regular arterial grid of 30-meter roads spaced 1-kilometer apart would require 6% of the total expansion area. After the arterial road grid was traced and adjusted, the amount of land required for the rights- of-way of the arterial grid in the expansion areas of both cities was estimated in a more precise manner. In both cases, the land share of the land required for the arterial grids—6.3% in Montería and 7.2% in Valledupar—was only slightly higher than expected (see table 3).

Cities	Expansion area (Hectares)	Area occupied by the road network (Hectares)	Share of area required for roads
Montería	7.100	445	6.3%
Valledupar	4,772	342	7.2%

Table 3: The share of land in the expansion areas of Montería and Valledupar required for the rights-of-way of arterial roads

In effect, 74% of the affected plots in Valledupar would need to give up less than 10% of the total area of their plots; 23.2% would give up 10-30% and only 1.4% would have to give up more than 30% of the areas of their plots. In Montería the situation is similar. About 60% of the landowners of affected plots would have to give up less than 10 % of the land area of their plots for the arterial road grid, 25% would have to give up 10-30 %, and 16% would need to give up more than 30% (see table 4).

City		Share of land area of plots to be taken for arterial road grid					
		0-10%	11-20%	21-30%	31-50%	51-100%	Total
Montería	No. of plots	579	189	57	84	75	984
	Share	58.8%	19.2%	5.8%	8.5%	7.6%	100.0%
Valledupar	No. of plots	104	23	9	0	2	138
	Share	74.4 %	16.7%	6.5%	0 %	1.4%	100.0%

Table 4: The number and share of affected plots in Montería and Valledupar that would need to give up a share of their lands for the arterial road grid

In addition, cadastral information was used to estimate the officially appraised value of the land required for the arterial roads grid (In Colombia, at the present time, appraised value amounts to some 60% of actual market value). Table 5 shows the appraised value and the market value of the lands required for the arterial road grids of both cities at the time of writing, $6.5 million in Montería and $ 1.5 million in Valledupar. These are clearly miniscule amounts of money, compared, for example, to the cost of acquiring rights-of-way once lands have been subdivided into residential plots or once construction has taken place, when running a road through a neighborhood would require demolitions.

Cities	Appraised Value		Market Value	
	Colombian Pesos (millions)	US$[23]	Colombian Pesos (millions)	US$
Montería	11,641	4,036,000	19,401	6,467,000
Valledupar	5,505	895,000	4,479	1,493,000

Table 5: The appraised values and market values of the lands required for the arterial grids in Montería and Valledupar, 2015

One simple way of paying affected landowners for the parts of their lands required for the arterial grids is through property tax relief. In Valledupar, for example, many landowners of affected plots are in arrears and an estimated 10%[24] of the cost of obtaining the rights of way (505 million Colombia pesos or USD$200,000 approx.) could be covered at the present time by writing it up against these debts.

Once the cadastral analysis and the collection of the necessary data regarding the traditional land ownership[25] for all potentially affected plots in both cities was complete, a study exploring the legal options for implementing the action plans was launched. There are a few legal instruments that, under Colombian law, can be used to secure the rights-of-way for the arterial road grid or the lands necessary for the hierarchy of open public spaces in the expansion areas. These instruments, designed to build consensus and agreement among diverse stakeholders, are (1) the Partial Urbanization Plans (*Planes Parciales o de Renovación Urbana*) and (2) the Urban Macro Projects (*Macro Proyectos de Interés Social Nacional*). The Partial Urbanization Plans are designed to address the requests of developers to build real state projects in lands assigned for new development or for urban renewal, always on land within the urban perimeter established by the POT, and therefore within its short timeframe. The Urban Macro Projects don't have this short term limitation nor are they tied to land that is already considered urban. Available records indicate that this instrument has not yet been used in long term planning schemes such as the envisioned 30-year Expansion Plans.

In addition, there are more traditional mechanisms for the acquisition of land by the municipalities, including (3) Road Reserves (*Zonas de Reserva Vial*) and (4) Allocations (*Afectaciones Viales*). Both instruments are used to limit construction on land that has been selected for projects related to infrastructure at the national or subnational level. Road Reserves are a prior step of Allocations. Its use appears to be of limited value: it is difficult to enforce and rarely ensures compliance. The allocations instrument, on the other hand, has a longer legal tradition. It allows municipalities to obtain private lands for public use, but requires that they present clear evidence regarding the availability of financial resources for

[23] At the time of writing 1 US Dollar was equivalent to $3,000 Colombian pesos.

[24] The information of plots whose owners are in arrears was obtained through the Treasury Secretariat of Valledupar.

[25] Certificate of Liberty and *Tradition* is the name used in Colombia for the official document issued by the National Property Registry, to attest the property status and legal background of plots for trade and development purposes.

compensating affected landowners, and mandating them to pay that compensation within a period not exceeding nine years from the date annotations are make on property deeds.

When it comes to acquiring lands for arterial roads with a 30-year planning horizon, it is evident that there is a gap in Colombian law that prevents municipalities from preparing long-term plans, plans that can envision urban development beyond the 12-year horizon established officially as the timeframe of the Spatial Organization Plans (POTs). The legal study now under way, will design an action strategy for securing the required public lands in advance of the urbanization of expansion areas that avoids requiring municipalities to make large payments to compensate landowners for the rights of way, and will provide legal tools for negotiations seeking to benefit all stakeholders, including landowners, developers, real estate firms, prospective residents, local governments, the public entities that provide urban services and the city population as a whole.

Creating a hierarchy of open spaces in expansion areas

Securing land for parks can oftentimes be more difficult than securing the rights-of-way for roads. The arterial road grid allows for different types of compensation that can ease the negotiation process, creating additional incentives for landowners to give up a small share of their plots, over and above the increase in the value of their lands because of their adjacency to future arterial roads. This is not the case with the acquisition of lands for public open spaces. As we saw earlier, the share of land required to secure the rights-of- way for the arterial road grid is of the order of 6.8%. Public spaces may require a larger share of the area of expansion of cities.

There are numerous examples of cities, e.g. Sao Paulo, Brazil, where virtually no land was left for parks and where built-up areas extend uninterrupted in all directions. There are also a number of examples where land intended for parks was later squatted on or whose use was later changed by influential developers. This suggests that expansion plans aiming at securing lands for public parks before development takes place have to have realistic strategies both for procuring them and for protecting them from incursion by developers, squatters, or informal developers that choose to ignore zoning, land use, and land subdivision regulations.

At present, public space per person in Valledupar is estimated at 3.3 square meters. Colombian regulations establish a requirement for cities to take actions to increase the minimum to 10- 15m^2. As it stands, both cities do not have sufficient lands dedicated to public open spaces. At prevailing City Footprint[26] densities in Valledupar, estimated at 69 persons per hectare in 2001 (Angel et al, *Atlas of Urban Expansion*, table 1), attaining this goal would require that as much as 690-1,035 m^2 per hectare (7-10% of the total expansion area) be devoted to public open space.[27] This would require that a slightly larger share of the expansion area be devoted to public open space than to arterial roads (6-8%).

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[26] The City Footprint is composed of the built-up area of the city, fringe open space within 100 meters of built-up areas, and open spaces that are less than 200 hectares in area.

[27] This is a gross estimate. Densities may be lower in expansion areas and overall densities may decline over time, as stated earlier. At the same time, additional public open spaces in the expansion areas will be needed to compensate for the lack of pubic open spaces in already built-up area. In that sense, the estimate may only be taken as a ballpark estimate.

With a built up area of 2,474 hectares and a population of 346,000 people in 2010, 3.3 m^2 of public open space per person would amount to some 114 hectares of public open space in the city as a whole. The population of Valledupar is expected to increase to 604,000 by 2040. If the goal is to increase the public open space per person *in the city as a whole* to, say, 12 m^2 by 2040, this would require adding some 610 hectares of public open space in the expansion area, an area of some 5,222 hectares. That would amount to some 12% of the expansion area, a share that—because of the need to compensate for the shortage of open space in areas already built—would be considerably higher than the 7-10% estimated earlier.

According to our recent calculations, a share of 26±2% of the area of expansion of Valledupar during the last two decades (1991-2014) was devoted to streets and boulevards. Considering that local streets may take up 20-22% of the land in residential areas, this implies that as much as 33-40% of the land in expansion areas may be needed for public works and public lands, land that would have to be identified in advance of development if development is to be orderly, efficient, equitable, and sustainable. These estimates may seem to be on the high side, but it is not uncommon for public lands for arterial roads, streets, and public open spaces to take up as much as 40% of the land in urban areas.

To begin to examine a novel approach to the acquisition of lands for public open space in Colombian cities, the Colombia Urban Expansion Initiative in Colombia fostered the creation of a citizen-based initiative to advocate for public space in the city, bringing stakeholders from different interest groups together with the aim of giving more legitimacy to the initiative, monitoring government activity in this field, and advocating for an increase in available open public spaces. The process of creating the citizen-based initiative in Valledupar involved (1) the identification of best practices of citizen engagement for public open spaces both in developed and developing countries; (2) the assessment of the current situation of public open space management in the city of Valledupar; and (3) the creation of a business plan and a matrix of indicators for the initiative to monitor the state of the public open spaces, particularly in the expansion area of the city, which is where the biggest potential exists for increasing the amount of public spaces in the city.

The best practices reviewed were Curitiba, Brazil; Medellin, Colombia; Rosario, Argentina; Quito, Ecuador; Toronto, Canada; and New York and Chicago, USA. The reviews of the case studies produced three main lessons. First, successful public space initiatives do not always share the same methods and conditions. Second, in some cases successful initiatives were sparked by strong leadership from public officials; in others they were community driven; and in others they were the result of a crisis. Third, in all cases studied at least one of the following three components was present: (1) A strong proactive leadership from the public sector (New York and Curitiba); (2) A community-based organization and effective citizen engagement (Chicago, Curitiba, Medellin, New York, Quito, Rosario); and (3) Sources of sustainable financing were made available (Curitiba, Medellin, New York and Rosario) (Sanghi, Lee, Toro, 2014. Unpublished paper).

After documenting best practices and identifying alternative management structures for public open spaces, recommendations were presented to the Major of Valledupar, his municipal team and other stakeholders. The first recommendation was to unify the management of parks in a single municipal body headed by a Public Open Space Commissioner. The second recommendation was to accelerate the creation of a citizen-based initiative to advocate, oversee, acquire, monitor and in some cases manage the public open spaces of Valledupar. The third and final recommendation was to explore ways to develop

sustainable financing mechanisms through the use of public spaces to generate revenues and through mandated contributions from developers.

Interviews and meetings with municipal officials showed that only recently did the management of public spaces became regulated by a Municipal Decree. Before that, there was no clear procedure established by the municipality to make it mandatory for developers to transfer the areas designated as public parks to the municipality. Although the decree is a step in the right direction, transferring parklands to the municipality did not necessarily ensure that they would be properly maintained. A key reason for this lack of maintenance is the fact that the responsibility for public open spaces in Valledupar was split between three different government bodies: The Planning Secretary, responsible for overseeing the transfer of designated parklands from developers to the municipality; the General Secretariat, responsible for maintenance and housekeeping the parks; and the Secretary of Government, that attends to policing and security in public open spaces. The recommendation to the Mayor was to unify the management of public spaces in one single office that would be in charge of inventory, management, maintenance and security of the public spaces. The Mayor accepted the recommendation. An administrative reform is currently under way to create the Office for the Management of Public Spaces.

It was also proposed that a citizen-based organization should be created to foster citizen engagement with public open spaces. This proposal was presented to a meeting of stakeholders in Valledupar, including real state developers, the Chamber of Commerce, non-profit organizations promoting citizen engagement and government oversight, media outlets, Family Compensation Funds (Cajas de Compensación Familiar), the police department, and the planning office of the municipality. The presentation sparked stakeholders' interest in the creation of such an organization, and most members present stated their commitment to its creation. The Alliance for Parks of Valledupar (Alianza por los Parques de Valledupar) was born. The NYU Urban Expansion Initiative in Colombia presented the Alianza with a draft business plan for discussion. An advisory committee will soon be launched by the Planning Office of the Municipality, to start discussing the plans of the Alianza and the next steps. Additionally, a matrix of metrics that measure the amount of land needed and its cost is being constructed, an essential element for both monitoring and increasing the supply of public open spaces.

The city already has a plan to fund and acquire a linear park along the shore of the Guatapurí river, the main body of water in the city. This plan was included in the recently approved POT by the City Council and consists of an arrangement whereby developers would be granted additional building rights in exchange for financing the purchase of 198 hectares of land for the public park along the river. The existing public space in the city (114 Hectares) plus the land allocated for the completion of the linear park (198 Ha) will leave a balance of 412 hectares to complete the goal of 610 hectares stated earlier (12 m^2 per person). This would reduce the share of open space in the expansion area to 7.9% (412 out of a total of 5,222 hectares), a more realistic goal for the coming decades.

As an additional recommendation to the city, a three-tier hierarchy of public spaces was proposed. Tier I public spaces would be the new Metropolitan Parks, the biggest public spaces in the expansion area. In principle, the Linear Park of the Guatapurí river would be the only Tier 1 proposed public open space. Since one of the desired outcomes of the expansion plan is to have an even distribution of spaces to increase public accessibility to open space, each of the proposed communes will be allocated a share of public space based on its area. Colombian

land subdivision and development regulations mandate that 20% of all commercial developments should be for public open spaces. It is proposed that half of the allocation would be for Tier III open spaces within projects and that the other half would entail a contribution by developers for larger public open spaces within communes.[28]

With the advocacy and leadership of the Alianza, as well as that of the Municipality of Valledupar, it is expected that the plans to secure the land for public spaces will quickly come to fruition. A recent initial contribution from a private donor should signal the beginning of the acquisition of the land for parks. It is also expected that agreements will be reached to foster generation of revenue from public spaces, be it from renting spaces for public events or from promoting retail activities.

Future prospects

The National Planning Department (DNP)—the governmental entity in charge of territorial and urban planning in Colombia—has requested support from NYU Stern Urbanization Project in preparing Colombian cities for urban expansion, considered a key factor and an integrating component in its new national policy for urban planning and development. Such a request is perfectly aligned with the main goal of the NYU Urban Expansion Program: to scale-up the existing pilot experiences in a small number of cities, transforming them into a national, well-funded and well-executed urban expansion initiative. A draft proposal has already been formulated and is being discussed, with the prospects of establishing a cooperation agreement between the Government of Colombia and NYU that would facilitate the timely adoption of a national urban agenda.

Currently, there are 36 cities or urban agglomerations of more than 100,000 inhabitants in Colombia. These cities had a total population of 26.3 million in 2010, comprising 76% of its urban population of 34.9 million and 57% of its total population of 46.4 million in that year. Of these, 12 are intermediate-size fast-growing cities, now growing at 3% of more per year. Those cities, with populations ranging from 100,000 to 500,000 inhabitants, are Apartadó, Buenaventura, Florence, Fusagasugá, Quibdo, Riohacha, Santa Marta, Tunja, Valledupar, Villavicencio, Yopal, and Zipaquirá. Together, these account for 10% of the population of Colombian cities with 100,000 inhabitants or more. They are now growing at an average rate of 3.8% per year. At this rate, the population of these cities will double in 18 years.

There are 13 more cities in Colombia that are now growing at 2-3% per annum, including Bogotá, Medellin, Cali and Bucaramanga. Together they account for 73% of the population of Colombian cities with 100,000 inhabitants or more. They are now growing at an average rate of 2.6% per year. At this rate, the population of these cities will double in 26 years. Finally, There are 11 more cities in Colombia that are now growing at 1-2% per annum. Together they account for 17% of the population of Colombian cities with 100,000 inhabitants or more. They are now growing at an average rate of 1.6% per year. At this rate, the population of these cities will only double in 44 years. By 2025, it is estimated that about 60 municipalities in Colombia will have more than 100,000. All these cities could significantly benefit from a national policy oriented towards an orderly, efficient, equitable, and sustainable process of

[28] This proposal is analogous to having developers provide parking within their buildings or, alternatively, contributing funds for the construction of parking spaces in municipal parking garages, a common practice in several countries.

urban expansion, a process that would be an integral part of the national development strategy.

Habitat III, the United Nations Conference on Housing and Sustainable Urban Development, will be held in Quito, Ecuador in October 2016. By that time, the Colombia Urban Expansion Initiative expects not only to complete the action plans for urban expansion in Montería and Valledupar, but to make substantial progress in implementing Colombia's national strategy for urban expansion.

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