

# La Linea Baja: Reimagining Puerto Plata as a Pedestrian-oriented, All-Inclusive City

“Game Changers for the Future City”  
Puerto Plata, Dominican Republic  
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## **Executive Summary**

The following report considers current development challenges facing the region of Puerto Plata in the Dominican Republic. Based on historical research, meetings with local and national stakeholders and site visits conducted during a week-long excursion in October 2011, the report summarizes the transportation challenges and opportunities for Puerto Plata and surrounding communities. It provides perspective on options for re-conceptualizing the urban grid to prepare the region for future growth.

The analysis supports development of alternative transportation systems that prioritize non-motorized transit in a medium density environment. The proposed plan, called La Linea Baja, increases access for residents and tourists, creates an authentic urban form that supports development of public space and locally-oriented industries and mitigates the environmental harms caused by the current pattern of development. In addition, it argues for the development of a formalized data collection process that monitors transportation patterns and a participatory planning process that empowers local residents to become involved with planning decisions that affect their lives. By considering this proposal and the philosophical urban form proposed, policymakers can leverage local assets to provide additional economic opportunity and sustainable development in the Puerto Plata region.

## Introduction

The region of Puerto Plata faces numerous challenges for cultivating sustainable growth in the coming decades. The existing economic, social and physical structures need to be reconfigured and re-conceptualized to better foster innovative solutions that will address a multitude of issues stemming from fast rates of urban growth and the changing global economy. Solutions to urbanization problems that have worked in European or other Western countries might not be the best options for addressing environmental and social concerns facing the Dominican Republic in general, or the Puerto Plata region more specifically.

This paper will address one of the key issues facing the Puerto Plata region in terms of *connectivity* - the ability to create viable partnerships between different nodes of economic activity, and residential populations that conserves limited natural resources while creating dynamic opportunities for growth. Connectivity is an economic concern that necessitates a critical evaluation of transportation infrastructure. By using connectivity as a frame for understanding the challenges facing Puerto Plata, this paper advocates for reconfiguring the current transportation system in Puerto Plata, reinvigorating the urban core and providing enhanced connections with key regional assets.

The first section of this paper discusses the historical development of the tourism sector in Puerto Plata – a sector that dominates the current economy. The second section defines the major issues with the current transportation system and highlights how the current system fails to serve the economic and social needs of residents and tourists. The third section evaluates the potential negative impacts that could result from expansion of the DR5 (the major thoroughfare connecting the region to Santiago) into a four-lane highway through the middle of Puerto Plata. The fourth section summarizes lessons from a city that has prioritized pedestrian movement as a means for creating economic development while the final section proposes a detailed plan for revitalizing the Puerto Plata urban core and increasing connectedness among regional assets.

Figure 1: Map of Puerto Plata Region with Major Towns and Roads



## *I. Brief History of Development in Puerto Plata*

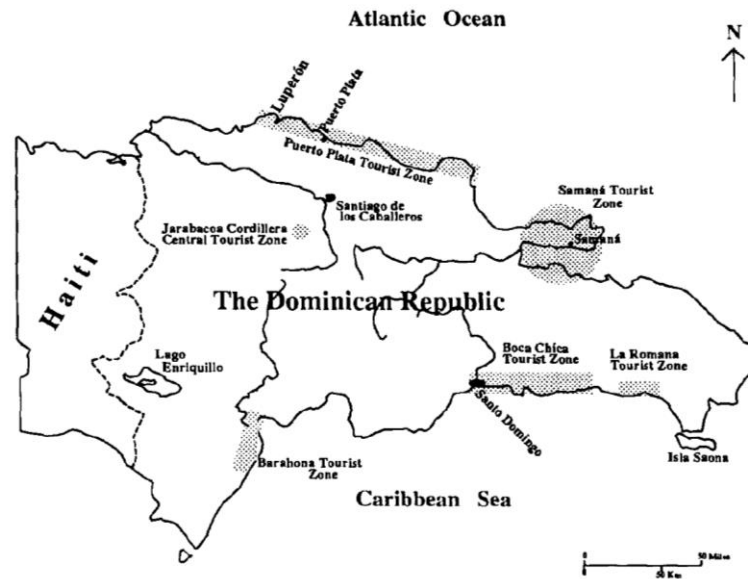
Major investment began in the Puerto Plata region in the early 1970s with plans for infrastructure that would support development of the tourism industry in the Dominican Republic. Through a partnership with the World Bank, the federal government (lead at the time by Joaquín Balaguer) began pursuing external funding for infrastructure investments such as roads and energy distribution systems that would attract additional private investment from domestic and foreign actors. During this same time period, the federal government established a Ministry of Tourism and INFRATUR, a government initiative to monitor and invest directly in tourism-related infrastructure projects. A key decision made by INFRATUR was to focus attention on specific tourism zones - a policy based on the idea that “bringing facilities up to the level demanded by international tourists was more economically feasible in a few zones than in many dispersed locations” (Freitag, 1994, p.541). As a result of this policy, the federal government invested more than \$76 million on infrastructure in the Puerto Plata region between 1974 and 1982 (Wiarda and Krysanek, 1982, p.85). Investment in road and other infrastructure also benefited Sosua and Cabarette – two ocean-front towns in the region that previously had undeveloped tourism appeal.

The initial investments made in the 1970s and through the 1980s proved very lucrative for tourism growth in the region. Notably, the beginnings of tourism in Puerto Plata were characterized by domestic ownership, a discernible difference from development in the agribusiness, mining and manufacturing industries whose development was financed largely by international investors. This is also a notable different from other Caribbean countries, whose tourism development is often made possible by large, multinational corporations not domestic investors. As late as 1987 only 21% of hotel rooms were estimated to be foreign owned, compared to 63% of hotel rooms in the Caribbean region in general (Economic Intelligence Unit 1990, pg. 28).

The success of domestically operated hotels, however, attracted international investors in the form of large-scale multinational hotel chains such as Radisson, Sheraton and Club Med. These international hotel chains adopted the all-inclusive hotel model already embraced by domestic investors. Government policies provided subsidies and tax breaks that supported the expansion of this model, often at the expense of small scale, locally owned tourism such as bed and breakfasts, guest houses and hostels (Freitag, 1994). The all-inclusive hotel model, which provides guests with accommodations, access to meals, on-site activities, and other amenities in exchange for one low price, became the standard for lodging accommodations in Puerto Plata. This all-inclusive model was not without its critics. In a study on enclave tourism conducted in 1994, Freitag examined the impact of all-inclusive resorts on Luperon, a small coastal town near Puerto Plata. He found that in an effort to maximize profit, the domestically owned, all-inclusive resort hotel made moves to restrict tourism outside of the resort by implementing policies that forbid non-hotel purchased food on premises, and opening retail locations that competed with gift shops and markets located in town. These moves, probably complimented by increased programming inside hotel compounds, prevented economic benefits of tourism from reaching outside the hotel compound and supporting local development.

The all-inclusive tourism model continued to flourish, capitalizing off American and European travelers in search of affordable foreign destinations. The weather conditions along with the affordability of the all-inclusive model and access to cheap flights brought visitors from abroad looking for a cheap vacation option. Based on initial success in the Puerto Plata region, the federal government and private investors began looking for other areas to expand the tourism trade on the island. Major efforts went into developing areas located on the eastern side of the island for tourism using the all-inclusive model. These areas benefitted from lack of previous investment because they were able to open new hotels with modern amenities in contrast to those built in the 1970s and 80s in Puerto Plata. Tourists, now more accustomed to high end amenities at a cheaper price, began to turn to areas like Punta Cana and Samana which offered newer facilities and additional amenities (like golf courses and grand resorts in Punta Cana and access to the Los Haitises National Park in Samana). Many of these additional amenities were available for the same or lower prices than competitors in Puerto Plata and as a result, they became more popular for international tourists. Domestic tourism to the area also increased when the federal government built a highway from Santa Domingo to Samana, drastically reducing travel time from the capitol to tourism outposts.

Figure 2: Government Designated Tourist Zones, 1989 (taken from Freitag, 1994)



The government strategy establishing tourism as the main sector for economic growth in the country has allowed for increased spending on much needed infrastructure but has also had negative economic impacts on Puerto Plata. Tourism investments, particularly in developing countries, are often not the economic development impetus that many regions expect. Tourism growth brings employment but only in the form of low-paying service jobs that are often restricted to residents who can speak English. In exchange for these low-paying service jobs, residents often unknowingly privatize natural resources, such as waterfront land, which could better serve current residents as public access recreational areas or sites for industrial manufacturing. In many communities in developing nations that rely heavily on tourism for

economic prosperity, a steep division occurs between the residents of the community and tourists visiting for only brief periods. Such exclusivity in the tourism market prevents local residents from leveraging the asset to create economic opportunity and growth, and hinders development of an integrated, sustainable economic model of tourism.

These divisions are exacerbated by the all-inclusive tourism model. This model, common in Puerto Plata, does not provide the right incentives for hotel operators or tourists to participate in the local economy. Hotel operators are concerned about tourists having a positive experience so they will return to the area on future vacations and make recommendations to others. Often the best way to ensure tourists have an enjoyable experience is to maintain control over all aspects of their vacation experience – something that requires minimizing contact with non-employees and discouraging tourists from seeking experiences that might not meet the standards the hotel is working to maintain. From a tourist perspective, the model offered by the all-inclusive resorts caters to individuals looking for cheap experiences, not authentic vacations that highlight the local culture and customs. Tourists who participate in the model are entitled, expecting all aspects of their visit to be covered by a \$100 daily fee. The model attracts customers who are not interested in participating in the local amenities and are only looking for inexpensive vacations – made affordable by the relative poverty of an area.

In contrast to the all-inclusive hotel model, two towns in the Puerto Plata region, Sosua and Cabarette have developed locally-integrated tourism options that preserve the authenticity of the beachfront communities while providing economic opportunities for local investors. Both areas have thriving tourism industries when compared to the declining industry in Puerto Plata. Sosua remains one of the larger cities in the Puerto Plata region and benefits from abundant beaches. Tourism to this area mainly attracts domestic visitors from Santiago who bring their families for week long visits. Sosua is attractive for this purpose because, unlike Puerto Plata, there are few all-inclusive resorts. The area relies instead on rentals of single family dwellings in close proximity to the waterfront. These tourists tend to spend more time interacting with the local residents and contributing to the economy through the purchase of recreational amenities and experiences but also through the purchase of food and home goods for their week long stays.

Cabarette is another area in the Puerto Plata region that has developed an alternative to the all-inclusive tourism model. Unlike Sosua, Cabarette is a relatively new development (founded in 2003) that has marketed itself as a destination for wind and other adventure sports. The beaches of Cabarette are abundant and positioned to benefit from the wind that comes off the mountains. These winds have helped to establish Cabarette as one of the premiere global locations for kite surfing and other adventure sports. The town hosts an annual competition that is the third stop of the Professional Kiteboarders Riders Association world tour. In addition, Cabarette has become a popular destination for young tourists from Santiago. Many of these domestic tourists, attracted by the nightlife and waterfront scene - own condos or apartments in complexes located near the beach. A key appeal of Cabarette, compared to other destinations on the island, is the walkable nature of the community that situates most stores, restaurants and bars compactly along the road that runs parallel to the beach.

Both Sosua and Cabarette provide authentic tourism experiences that cannot easily be replicated. They offer a stark contrast to the corporate, all-inclusive hotel model more commonly found in

Puerto Plata. Both areas experience lower vacancy rates and unemployment than Puerto Plata and other cities in the region. They offer a wide array of employment opportunities, both in the hotel sector but also in locally based industries that have developed to support tourism, such as snorkeling businesses, equipment rental for water sports and restaurants and cafes. The pedestrian nature of Cabarete has made it one of the premier destinations for younger tourists and those wishing to experience the local culture while the development in Sosua offers independence for long-term vacations.

In summary, infrastructure and economic development in Puerto Plata has been heavily focused on facilitating growth of the tourism industry. This has been particularly true over the past 30 years as agriculture exports, once the main economic engine for the island, have drastically decreased. Although tourism was originally beneficial for the region in terms of investment dollars spent by the federal government and by private investors, the recent decline of the tourism industry has left local leaders and investors searching for ways to revitalize the region. Currently, the region of Puerto Plata is at a turning point, searching for ways to enhance existing infrastructure and other investments to provide better economic opportunities for the increasing number of people expected to relocate to the urban area in the coming decades. The following sections evaluate the current challenges and propose a solution for invigorating the local economy through strategic changes to existing and future transportation infrastructure.

## *II. Defining the Problem*

As with many developing regions facing patterns of rapid urbanization, increased economic competition from abroad, and fragile local ecosystems, the region of Puerto Plata faces numerous development challenges. One of the key elements for addressing these challenges is leveraging existing infrastructure and investment to connect established areas of economic activity with areas of residential population and natural resources. In order to accomplish this, it is important for community leaders and government officials to think regionally about development challenges. Regional thinking mandates a good understanding of the existing resources and capacities in an area and how the spatial configuration of a region allows for or prevents economic collaboration. One of the most important elements for leveraging these local resources is improving the infrastructure, both economic and physical, that connects people and goods in the region.

For this reason, it makes sense to look at this problems facing Puerto Plata in terms of how people and goods move throughout the region and to look for opportunities to make new connections or improve the efficiency of existing connections. This section will explore more closely the transportation challenges from an urban planning perspective. It will provide a detailed summary of the current issues affecting investment in the region, and document how these issues might affect future development and growth if they are not addressed. At the end of this section, the paper will look in detail at the proposed expansion of DR5 as a way to improve transportation to and from the region. The proposed expansion will be critiqued from an urban planning perspective, allowing views to be drawn on the potential benefits and disadvantages of the proposal.



The following sections provide an evaluation of the transportation infrastructure that currently serves the Puerto Plata region. Infrastructure and economic development remain intrinsically linked – much of the infrastructure was built to prepare the region for private investment in tourism and the current transportation system continues to influence the tourism sector today. While transportation is an important aspect to be addressed in order to revitalize tourism in the Puerto Plata region, quality transportation infrastructure is also important for local residents, who use the system to access educational and economic opportunities. Development of roads in the Puerto Plata region, undertaken as an investment in the tourism sector, have benefitted local residents in the past but may no longer serve their needs with regard to facilitating movement between regional opportunities and within the urban core of Puerto Plata. The following sections examine, in more detail, the impact of transportation investments and the current transportation system on both residential mobility and the regional tourism sector.

### *Urban Planning Process*

Before examining the transportation related concerns, a word must be said about the urban planning process in the Dominican Republic. Planning processes are closely linked to the development of sustainable transportation systems, since creating sustainable transport systems requires participation from local residents. Like many developing countries, the Dominican Republic has a reactionary approach to government investment in infrastructure. Historically, the government has not undertaken long range planning for infrastructure investments. Instead, many investments evolve in response to catastrophic situations that require instantaneous action to solve an immediate need. Roads or bridges are built in a response to congestion or structural damage - not as a means for preparing the region for future growth. One key exception is the long-ranging planning conducted during the 1970s in partnership with the World Bank. This could be viewed as an exception that proves the rule, however, since the impetus for such long-term vision were external actors, not officials in the federal or local governments.

The general lack of long range planning initiatives implemented at the local or regional level poses several problems for conducting a full-scale needs analysis for infrastructure. There is a great lack of data on traffic patterns or estimations of ridership for public transit systems. This prevents government planners and private sector investors from developing a deep understanding of how and why residents travel within regions. Before the government can propose or approve changes to the infrastructure that will make life better for residents and improve economic opportunity, it is necessary to understand what the challenges are in the system and how people use the infrastructure on a daily basis. Without these data, investor and government officials will have difficulty devising solutions that actually work to address the issues of greatest concern to residents.

The necessary data could be collected relatively easily and inexpensively through the installation of monitoring equipment (powered by solar energy) at major intersections. In addition, through a series of outreach initiatives and traveler surveys, the government could compile a data set that provides better perspective on people's daily travel patterns and the challenges they face with the existing system. This could also be done affordably by engaging local university students to assist with the outreach and involving them in the data collection process as part of their formal education. The data collected should be locally based and analyzed so that the leaders and policy

makers have firsthand knowledge of travel patterns in their region and can devise locally-based solutions. Developing a system for regularly collecting this data and having it available for researchers and policymakers would better prepare different regions to address the long-term needs of community residents and make investments that best serve the population.

In addition to establishing methods for better data collection, any solutions need to be developed in partnership with the local population and other stakeholders. Although top down approaches may have worked sufficiently in the past, the increasing number of urban dwelling residents makes buy-in for government projects more important than ever. Solutions that will revitalize areas and change future development trajectories must be developed in partnership with local residents. This can be done through public education and a participatory planning process. Participatory planning would not only help in creating sustainable solutions and obtaining buy-in from residents, it would also begin to instill the importance of formal planning and civic engagement into the community culture. For a more thorough discussion of participatory planning frameworks, please see work by Bjorn Sletto, professor of urban planning at University of Texas.

### *Current Transportation Issues*

There are several key transportation issues that are hindering existing and future investment in the Puerto Plata region. Private automobile is the main form of transportation in the region but limited options are also available for common carrier transport in the form of Intercity Bus Service (Between Puerto Plata and Santiago, and Puerto Plata and Cabarete/Sosua), Guaguas (mostly for local and inter-regional transport) and Motortaxis (local transport). In the current configuration, vehicles share the road space with pedestrians, although the amount of interaction varies greatly between highway portions and the local in-town areas. In few areas outside of the historic downtown are there sidewalks or grade separation between pedestrians and motorized traffic. Motorized traffic regularly invades pedestrian space, as Guaguas and Motortaxis pick-up passengers along the road, not at designated, sheltered stops.

Figure 3: Road conditions and Mototaxis in Puerto Plata, DR



Vehicle ownership in the Dominican Republic has been increasing rapidly in recent decades, as residents find it necessary to travel further distances to find affordable housing options, or to connect to educational or economic opportunities. Despite more people moving into urban areas,

the rate of vehicle ownership has not declined with urbanization. This is partially attributable to the increasing low-density form of most urban areas, including Puerto Plata. Residents who relocate from rural areas are often forced to find housing in informal communities (located close to the urban core) or seek housing in more affordable areas on the southern periphery of the city. The lack of viable public transit and concerns about pedestrian transit are also contributors to increases in vehicle ownership because when people have limited transportation options they are forced to invest in private automobiles. In addition, like many developing countries, residents in the Dominican Republic are probably socialized to believe that car ownership is a sign of economic and social success. As residents have access to more capital, they will choose to invest in private vehicles as a means of expressing their economic success to other residents. The main issues that this conglomeration of forces causes are related to safety, environmental degradation and increasing lack of connectivity.

### Safety

Like many developing countries, the Dominican Republic has experienced increasing rates of car ownership in tandem with increases in economic prosperity. As people obtain access to additional resources, they purchase private vehicles both as a functional acquisition and as a status symbol. Unfortunately, the research has shown that in developing countries such trends in car ownership rates cause drastic increases in the number of deaths caused by vehicle accidents (Wells, 2006). Even more worrisome is that many of the accidents involve children.

In the Dominican Republic, the current death rate is about 41.1/100,000 people while the car ownership rates are 44/1000. This is drastically different than developed countries like the US where 6.1 deaths per 100,000 people correspond to a car ownership rate of 499/1000. “The worst-case scenario is that emerging markets retain their high accident rates with resultant deaths and injuries, but also rapidly expand car ownership rates” (Wells, 2006). Concerns about accidents are further pushed by road space that is shared by pedestrians and vehicular traffic and the existing system of roadside pick-up for common carrier passengers. This sharing of road space, without grade separation, increases the chances of accidents (both between vehicles and between vehicles and pedestrians) due to the unpredictable stopping behavior of the common carrier transportation modes.

### Environmental Degradation

Safety issues are not the only concerns that come from increasing rates of car ownership. Increasing rates of car ownership mean that there are more personal vehicles being used for transportation. If these vehicles were hybrids or ran on biofuels there might be less of a reason for environmental concern but since many of the vehicles in developing countries are older and rely on heavy polluting forms of energy, increasing car ownership produces disproportional harm on the environment (Faiz, 1993). This is an issue of particular concern for the Dominican Republic for two reasons.

First, the Dominican Republic is an island nation that relies heavily on the importation of oil for both vehicles and energy. Importation of oil is expensive and requires a large amount of both environmental and economic resources. Transportation of oil from the exporting country to the

Dominican Republic requires large amounts of energy, as does the transfer of oil from ports to distribution centers located inland. Resources required include natural resources (in the form of organic fuels) and economic resources in the form of government subsidies, which amount to about 3% of national GDP.

Second, the Dominican Republic relies heavily on its existing natural resources for economic prosperity. The natural areas of the country are important for the tourism trade and for agricultural production, an area of potential growth for the country. Use of personal vehicles as the main mode for transport can have substantial negative impacts on these existing natural resources. Air and noise pollution from vehicles threaten the fragile ecosystem while by-products from oil processing and disposal of used oil present a great problem for the island nation which has limited room to store waste and faces steep costs to export waste products to other countries.

Environmental degradation caused by increasing car ownership is only made worse when vehicles experience congestion. Vehicles waiting in traffic or idling at lights and intersections for long periods of time result in higher levels of particulate matter and pollution that negatively affect local residents and the environment (Boriboonsomsin, 2008). The poor quality of roads - lack of pavement, inefficient street design and unsophisticated traffic flow management - in the Dominican Republic make congestion more likely to be a growing concern in the coming years. Traffic is a particular problem in urban areas, where many people are relocating to obtain access to jobs and education in order to better their life.

### Lack of Connectivity

A final key transportation concern relates to the lack of connectivity between rural and urban areas in the Puerto Plata region and within the city of Puerto Plata. A lack of quality road infrastructure prevents economic nodes of activity within the Puerto Plata region from functioning as a whole. Low quality road infrastructure within Puerto Plata, particularly in high growth areas located south of the downtown, also serves to separate residents from conveniently accessing the urban core – a condition that can lead to increases in sprawling, low-density, auto-centric development.

From a regional perspective, the lack of connectivity between economic nodes that are relatively close in proximity precludes leveraging local resources in a manner that produces economies of scale. Many mayors in the Puerto Plata region expressed frustration that finished goods are supplied from Santiago or even Santa Domingo instead of being produced in the region, where many of the raw materials are harvested. Almost all mayors agreed that a lack of regional cooperation prevented disparate locations from pooling resources and forced many businesses to opt for cheaper non-local options. A better regional transportation system could help facilitate cooperation by reducing the costs of transporting goods throughout the region while bringing jobs to residents. By developing a local system of production and distribution, Puerto Plata could realize a more sustainable future. The current situation is particularly discouraging since many towns in Puerto Plata have an area of expertise or a natural resource that is desirable and could compliment other resources in the region. For example, Imbert has over 20 industrial sites that are underutilized or vacant (mostly left from sugar cultivation) while Altimira and Luperon have high agricultural yields that are shipped to Santiago or Santa Domingo for processing. By

providing better infrastructure to move raw products and finished goods around the region, the area could realize its potential for locally cultivated and processed goods.

In addition to regional economic issues, a lack of connectedness and viable options for traveling between towns reduces opportunities for local residents to gain skills and expand their potential employment prospects. Without a personal vehicle, it is difficult for students to pursue higher education and for non-traditional students to access training opportunities that complement their work schedules. In many developing countries and in poorer households in developed countries, women bear the burden of underdeveloped transportation systems and are inconvenienced to a greater extent by lack of transport options because they are often responsible for doing the chores, shopping and childcare which involve multiple stop trips throughout the day (UN Centre for Human Settlements, 2001). The current lack of transportation alternatives to private vehicles may prevent women from seeking employment outside of their immediate residence since the cost and resources required for transportation outweigh the economic benefits of joining the workforce. Improvements to alternative transportation options may help increase gender equality in the country and provide additional opportunities for women to contribute outside of the household.

Connectedness is also a local issue. Within Puerto Plata, residential developments in the southern portion of the municipality are cut off from access to quality transportation and hence, economic opportunity. While the divide in urban areas is not as strong as rural communities, the lack of quality roads and transportation options can serve to reduce opportunities for education and employment opportunities. Current areas of high growth (on the southern portion of Puerto Plata) lack access to quality roads, and design that allows pedestrian access to the main artery where limited common carrier transportation is available. Patterns of low density development push residences farther from major roads and infrastructure that government has already built and necessitates higher spending on infrastructure than would be needed in a denser environment.

Safety, environmental degradation and lack of connectivity are three areas of concern stemming from the current transportation system. To better understand how these three factors may constrain future growth in the areas, the next section looks at the potential impacts that result from these areas of concern.

#### *Potential Impacts on Future Growth*

There are several negative effects that these transportation issues could have on future growth in the region. Most of the impacts currently exist in the region to some extent; their effects would be exacerbated by future growth. They include uneven economic growth in the region, seclusion of tourism from urban areas and local residents, decreasing appeal of Sosua/Cabarrette as vacation destinations, and an increase in the number and size of informal settlements in Puerto Plata. Each of these will be discussed in more detail below.

#### Uneven Growth

The current transportation infrastructure in the Puerto Plata region overwhelmingly benefits residents living in urbanized areas and does not provide amenities for rural residents or residents

living just outside the urban core. If not addressed with infrastructure upgrades and strategic design, the divide between urban prosperity and rural poverty will continue to grow. This uneven growth prevents rural residents from accessing opportunities and concentrates investment in areas that have higher levels of capital. More importantly, the uneven growth and lack of connectivity prevents regional assets from being leveraged in an efficient manner. By making investments in multiple areas through the region, and paying particular attention to how key regional assets are connected with common carrier transportation modes, investments can connect areas with raw products to areas with manufacturing facilities, thus providing additional opportunities for employment and economic growth.

### Seclusion of Tourism

The current transportation infrastructure in the region does not facilitate tourism outside of the all-inclusive resort compounds. The decline of tourism in the region may be partially attributable to a change in the demand for tourism products. There is some recognition that people are less inclined to visit all-inclusive resorts than they were in the 1970s, when the resorts were originally constructed. Modern tourists, particularly baby boomers from the United States and European tourists, are increasingly interested in visiting localities that provide them with an “authentic” experience. This authenticity requires participating in the local culture and developing a better understanding of how different people live.

The current transportation infrastructure does not provide an option for tourists to visit the city center or explore the local culture. This is a key difference between the Puerto Plata and more successful tourism areas such as Cabarette. As mentioned earlier, Cabarette has an urban form that can be easily accessed by pedestrians and encourages the exploration of locally owned retail and restaurant venues – an alternative that is attractive to both international and domestic tourists. As tourism demand continues in this direction, a different model from the all-inclusive hotel option is required. Developing strategic infrastructure, such as pedestrian oriented access ways or a viable public transportation system can provide opportunities for tourists to explore outside their hotel compound and interact with residents. By increasing pedestrian access between downtown and the hotel compounds, a new tourism model can emerge that may also allow for the development of boutique hotels that provide an additional option for tourists and begin to attract a different type of tourist to the area.

### Threats to Tourism in Sosua and Cabarette

A key area of concern for future growth is how conditions in the Puerto Plata region might negatively impact the thriving tourism industries in Sosua and Cabarette. As urbanization continues to bring more residents into Puerto Plata, the existing road infrastructure will face additional congestion. Since the DR5 that runs through Puerto Plata is the main thoroughfare between Santiago and the towns of Sosua/Cabarette, congestion in Puerto Plata will add substantially to travel times. An increase in travel time and congestion may reduce the appeal of Sosua and Cabarette as tourism destinations for domestic tourists. In comparison, finding ways to leverage the existing infrastructure and create appealing attractions for tourists may increase the amount of visitors who stop in Puerto Plata on their way to other resort areas on the northern coast.

## Informal Settlements

One of the key elements driving urban relocation is the lack of economic and educational opportunities in rural areas in the region. Although located only a short distance from the urban core, the difficulties created by a subpar transportation system and reliance upon private automobile travel makes it difficult for people living in rural areas to commute regularly to the urban core, where more opportunities exist. As a result, many people from rural areas decide to relocate to the urban core, instead of commuting from rural locations.

Many people relocating to Puerto Plata find few options for affordable, conveniently located housing. This is partially due to restrictions on building heights (currently capped at two or three stories) and partially the result of many areas in Puerto Plata having poor access to transportation outside of private vehicle ownership. By making changes to the current zoning code to allow for greater density in specific areas and building transportation infrastructure that serves a greater portion of the population, city officials can expand the housing opportunities for people relocating to the area. Expanding housing options can help insure that new residents participate in the formal housing sector instead of moving into informal communities that are often located on flood plains.

In summary, the current transportation issues facing the Puerto Plata region have a negative impact on current development and serve to limit opportunities for future investment in the region. Many of these issues can be addressed by reconfiguring the current transportation infrastructure to include elements that facilitate pedestrian access, provide transport opportunities for residents who do not own private vehicles and allow for denser development that compliments sustainable transportation options.

### ***III. Proposed Solution: Expansion of the DR5***

The federal government of the Dominican Republic is aware of the impact that transportation has on economic development. Indeed, a detailed analysis of transportation infrastructure was launched by the federal government to determine which areas of the country were most in need of infrastructure enhancement. The solution proposed by the government, however, is less focused on reducing the harms discussed above and more focused on expanding existing roadways to reduce congestion. For Puerto Plata, this requires expansion and enhancement of the DR5. The following section examines the proposed expansion of the DR5 and seeks to provide perspective on the impacts that could result from the expansion. By examining the proposal from a critical perspective, the section hopes to encourage policy makers to think creatively about alternative options for improving transportation infrastructure and using planning infrastructure upgrades to reposition Puerto Plata as a livable community for residents and a renewed tourism destination.

#### *Summary of Proposed Project Scope*

In 2007, the federal government of the Dominican Republic launched an effort to make major improvements to key transportation infrastructure. This effort was called VIADOM (Road

Design Project Construction, Rehabilitation and Maintenance) and aimed to enhance 283 kilometers of existing roadway. Specifically, VIADOM has the

“aim of improving current surface conditions and allow users to move to a higher level of service, increasing the operating speed and reducing operating costs, the number of accident and environmental impacts caused by noise and pollution. In addition, roads will adapt to the requirements of current traffic flow and future, and provide a fast and secure connection to the areas covered by the scope of the project”. (Resumen Ejecutivo, 2007)

The initiative is divided into five separate phases or stages. Stage III and Stage V of VIADOM have requirements for improving the Duarte Highway (Highway Dr. Joaquin Balaguer) that connects Santiago with the Puerto Plata region. Specifically, Stage III requires:

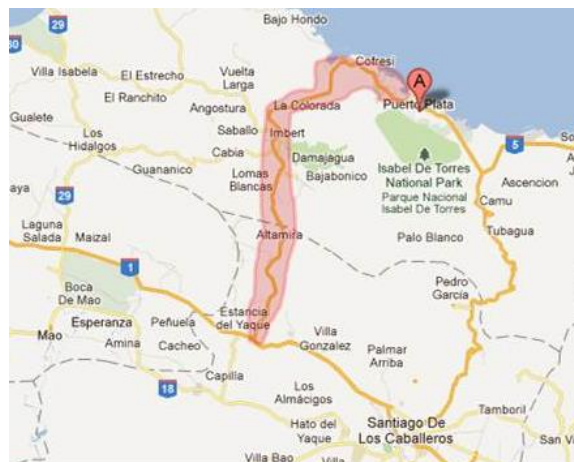
“Detailed engineering and rehabilitation of the road between Navarrete and Puerto Plata. Rehabilitation from Navarrete at KM 00+00 to the city of Puerto Plata in the KM 44+00 to the path between these two locations, with an approximate length of 44 km.”

Stage V requires:

“Detailed Engineering and Extension to 4-lane road to Puerto Plata Navarrete. Construction of the second road pavement Navarrete-Puerto Plata, and rehabilitation of existing roadway”

In summary, stages III and V expand and enhance the Duarte Highway (DR5) between Puerto Plata and Navarrete, a distance of about 45 km. The project scope requires repaving and enhancement of the existing road (Phase III) and expansion of the road from a 2 lane to a four lane roadway (Phase V). Additional stages of the initiative provide support for improving the DR-5 roadway between Navarrete and Santiago. Figure 4 shows the geographic location of both these improvements and their location within the province.

Figure 4: Proposed areas of road improvements for Stage III and V



The DR5 that currently connects Puerto Plata with Santiago is a two lane winding road that is not conducive to heavy traffic or the movement of large amounts of freight. In order to provide



residents with better access to areas outside of Puerto Plata and domestic tourists with better access to Puerto Plata beachfront and natural amenities, the government is improving the existing infrastructure. The project scope for the DR-5 segment between Puerto Plata and Navarrete also includes provisions for the construction of two pedestrian walkways in the town of Altamira and Palmar Grande. It is unclear from the project specifications provided if the plan intends to continue expansion of the DR5 through the urban core of Puerto Plata or if scheduled work will terminate at the urban edge. The assessment of impacts in the following sections, assumes that the DR5 expansion will continue through Puerto Plata. However, even if such improvements do not happen as part of the VIADOM initiative, pressure from continued urbanization will probably force expansion into the future. If the road improvements terminate at the city edge, creative ideas will need to be brought to the fore to address the capacity change from a four to a two lane road that will happen at the cities edge.

### *Potential Positive Impacts*

The benefits that are intended to result from the proposed expansion of the DR5 are relatively clear and straightforward. By expanding the road width and adding additional lanes to a two-lane thoroughfare, the project hopes to reduce congestion and facilitate the movement of people and goods to and from the region. The project also hopes to provide better connection between Puerto Plata and Santiago with the intention of facilitating the flow of domestic tourists to destinations east of Puerto Plata. Finally, the project may also increase the appeal of Puerto Plata's port facilities for merchants located in Santiago and between Santiago and Puerto Plata. Additional road capacity and the inclusion of two pedestrian walkways in Altamira and Palmar Grande will also potentially increase the ease of travel between residents in these communities and economic opportunities in Puerto Plata and Santiago, although without enhancements to the common carrier transportation system these benefits will be limited. By improving the quality of the road structures, the government also hopes to better prepare the region for environmental disasters, including hurricanes and flooding.

While these goals are admirable and necessary, the proposed expansion does not address many of the concerns inherent in the political rhetoric of transportation infrastructure investment. There are several flaws with the logic summarized above. First, the general consensus is that building more roads is not a way to minimize congestion. Indeed the empirical evidence shows that building more roads only encourages more people to drive. "Traffic is thought to behave more like a gas than a liquid – it expands to fill available space" (Cervero, 2003).

Second, the proposed plan does little to address concerns about safety, except in Altamira and Palmar Grande where the plan includes construction of pedestrian walkways. Indeed, an increase in the width of a road without inclusion of strategic design elements that protect pedestrians will only result in increasing accident rates. Third, expansion of the DR5 without pedestrian oriented elements will only serve to isolate further certain parts of the urban fabric. These misassumptions in tandem with the negative impacts caused by the proposed expansion may only exacerbate the current transportation issues and result in additional issues that cause more harm to the built environment. The following pages will explore these negative consequences in additional detail.

### *Potential Negative Impacts*

Many of the expected negative impacts from expansion of the DR5 through Puerto Plata are discussed in section II as a summary of negative impacts that result from the current transportation system. These concerns would only be magnified if the road expansion continues as planned. An additional concern, however, relates to the road hierarchy created by the original system and its usefulness for Puerto Plata's modern concerns and growth patterns. To better understand this issue, we need to review the original planning documents from the 1970s to understand the perspective and vision of government planners and contrast those perspectives to the challenges faced by the region today.

The proposed expansion of the DR5 through Puerto Plata is one approach to facilitating investment in the region. Indeed, it is following the logical pattern of expansion articulated in the 1970s planning document related to Puerto Plata. In this document, created to guide infrastructure development as part of the World Bank effort to develop tourism in the Puerto Plata region, a vision of expansion that relies heavily on facilitating the movement of goods to and from the region is paramount. The "southern bypass" is identified as a key element that will divert traffic from the Malecon and facilitate movement along the horizontal access now referred to as DR5. "The by-pass provides a direct link between the new highway to Santiago to the west and the main coast to the east, providing an effective route for through traffic... These two parallel roads [DR5 and the Malecon] contain between them the existing town's grid pattern of roads with north-south connections that are restricted on to the by-pass but with no restriction on to the Malecon. (World Bank, 1974)" The planners at the time recognized the need to "establish a rationalized road hierarchy that will reflect the various functions of both the town itself and the region".

This road hierarchy realized three major elements: "East-West movements, mainly between Santiago and the eastern resort areas; Movements from outside the town with destinations within Puerto Plata, the majority of these being divided between the town centre and the port and industrial complex and Internal movement within Puerto Plata itself". Although the road hierarchy as it currently functions serves the first and second purposes to a certain extent, it poorly serves the third purpose. In addition, the second function may have decreased in importance as the economic base of Puerto Plata has changed overtime.

The road network proposed at the time was articulated as follows:

"The southern bypass will assume the role of a regional primary distributor carrying all movements of through traffic and the majority of external traffic with destinations in Puerto Plata. It is important for the efficient operating of this road and the maintenance of its high design speed that there is limited access from the area of town through which it passes" (World Bank, 1974)

While this premise may have worked well when the DR5 ran along the southern periphery of the city, existing development now occupies land north and south of the main thoroughfare. This new development pattern makes expansion of the DR5 for bypass purposes no longer feasible. The DR5 now bisects the town of Puerto Plata and is no longer optimally situated to perform a bypass function. Increases to density in the mid-1970s may have reduced development south of

the DR5 and lead to the creation of more compact community space. Instead, in an unregulated building environment, low density housing has seeped south of the DR5 to occupy space between the DR5 and national forest. In its current form, expansion of the DR5 would serve to isolate residents living in the southern portion of the city from amenities and resources located in the central city area and force people living in the southern region (the area of highest recent growth) to lead auto-dependent lifestyles.

In the 1970s planning document, officials acknowledge that congestion may become a larger problem once the DR5 is built out and the expected increase in tourism activity comes to the region. However, they also state that “in the future a more southerly by-pass could only be constructed as great cost due to major topographical constraints”. Despite their warnings, no efforts were made to strategically sculpt the urban form. By failing to increase the density north of the DR5 and restricting development in the previously unsettled areas, policy makers have constructed an outcome that requires development of a second by-pass road but also necessitates an increase in density throughout the city.

The empirical logic inherent in the 1970s planning document is based on the belief that traditional infrastructure enhancements will foster private sector investment and growth. This empirical claim, popular through most of the 20<sup>th</sup> century, has become suspect in recent years. There is a strong economic threat posed by road expansion that is unaccompanied by improvements to the regional transport network. In a study conducted in Petén, Guatemala, the authors evaluated the impacts of road enhancement that greatly reduced travel times between Petén and more developed regions. Their findings showed that enhancement to the road network that resulted in reduced travel times between Petén and more developed areas resulted in more non-localized domestic products being sold in Petén, hence increasing external competition for local farmers and the local agriculture business (Shriar, 2003). To mitigate these harms regional efforts must support local investment and resources and provide viability for a local goods market.

In conclusion, there are several threats to economic and social conditions from expansion of the DR5 through the urban core of Puerto Plata. Expansion of the road, without attention to strategic street design and pedestrian concerns, will exacerbate issues of safety, environmental degradation and connectivity that already exist. Road expansion will not address many of the concerns cited as reasons for the VIADOM project and may cause greater harm to the local economy by providing infrastructure that facilitates movement of goods from Santiago and Santa Domingo into the Puerto Plata region – threatening local industries and opportunities for capacity building. There are solutions to these problems that could be created by strategically approaching efforts to enhance transportation investments. These solutions, however, require a reframing of the traditional solutions to address pedestrian access and development of options for common carrier transport.

#### **IV. Proposed Solution: Creating a Pedestrian-oriented city**

The United States and many western countries have responded to growth pressures in urban areas by adopting policies that facilitate low-density expansion out of the city center and into suburban communities. With regard to transportation, these policies prioritized the private automobile over other forms of transportation, forcing many people to adopt auto-centric

lifestyles. While car ownership and suburban living may have been appealing in the post-war period, the current trend in affluent communities is to create walkable downtown areas that provide alternative transportation options.

In response to the overtly auto-dependent culture that has developed in the Western world, particularly in the United States, movements focusing on ways to enhance non-motorized transportation have taken hold over the past decade. These movements - sometimes referred to as “new urbanism” or “smart growth” – emphasize creation of an urban fabric that prioritizes non-motorized traffic and higher density development in order to provide varied options for urban dwellers and to minimize impacts on the environment. In many ways, the movement seeks to develop urban typologies that existed before the dominance of the automobile.

The new urbanism perspective provides an interesting framework to view potential solutions for Puerto Plata. In many American cities, development has moved toward support of auto-dependence and has encouraged urban sprawl and low density development. While these are not elements that cause harm by themselves, the amount of resources required to support low density, auto-dependent societies is much greater than new urbanism or smart growth principles would produce. This is why new urbanism or smart growth might be the best framework for understanding solutions for areas that have fragile ecosystems, limited access to natural fuel resources or that are thinking strategically about future growth. All of these apply to Puerto Plata. Instead of building auto-dependent cities that mimic developments in the United States, the Dominican Republic should consider smart growth principles to guide regional development in Puerto Plata and other regions facing patterns of rapid urbanization.

The following sections will focus on how new urbanism principles could be adopted into the Puerto Plata urban fabric through the enhancement of transportation investments. It will provide a summary of new urbanism principles, discuss the urban forms that support these principles and provide suggestions on how these principles could be implemented in Puerto Plata in tandem with plans to expand the DR5.

### *New Urbanism*

The new urbanism movement took hold in the United States in the 1980s but really saw its prominence increase with the creation of the Congress for New Urbanism (CNU) in 1993. The Congress for New Urbanism is a non-profit organization that conducts research and advocacy efforts that promote: “Livable streets arranged in compact, walkable blocks; a range of housing choices to serve people of diverse ages and income levels; schools, stores and other nearby destinations reachable by walking, bicycling or transit service; and an affirming, human-scaled public realm where appropriately designed buildings define and enliven streets and other public spaces” (CNU, 2011).

With regard to transportation, new urbanism values the “connectivity” of areas as a key element for creating sustainable solutions to urban development. Connectivity has four aspects: compact street networks, multiple ways to get to one place, few dead end streets and direct routing. “Compact street network” refers to the principle that a network of smaller streets has greater capacity than a disconnected hierarchy of large streets. “Street Sewer” is a term used to describe

road networks that do not follow the compact street form. These “sewers” have the following elements:

- All trips include travel on arterial roads
- through traffic mixes with local traffic (exacerbating traffic congestion)
- lack of alternative pathways for traffic when there are accidents, construction or other street closures

Systems categorized by “Street Sewers” also show a modal bias in that they benefit auto-centric use at the expense of non-motorized traffic. Arterials that dominate these systems have less capacity than a comprehensive system of connected streets but allow traffic to operate at higher speeds. A higher speed differential between arterial traffic and non-motorized traffic, specifically pedestrian and bikes, results in an unpleasant experience for non-motorized travelers. Both non-motorized and motorized traffic operating at high speeds on arterials produce a greater chance of collision and are more likely to result in a higher level of injury. Such a system also encourages less dense development and pushes residents and businesses farther from the urban core – a phenomenon that requires the use of additional resources to sustain the population and discourages bike and pedestrian modes of transport.

The current street system in Puerto Plata would fit the qualities for categorization as a “street sewer” system. The transportation grid is dominated and bisected by the DR5 – a two lane road used by both local and through traffic. Most roads from the northern historic district and the southern residential district drop traffic onto the DR5. The DR5 remains the only way to get into and out of the urban core. Priority is given to motorized traffic, which occurs mostly in the form of private vehicles and motorcycle taxis. There are few options besides private vehicle available for people to move around and through the urban space.

Despite the restrictions posed by the current transportation system, the urban space of Puerto Plata is perfectly oriented for pedestrian and non-motorized movement. Puerto Plata’s history as an urban space dates from the 1500s. Only in recent years has automobile ownership changed the nature of the urban core. This core is limited in size, spanning only about 1.5 miles in width and 3 miles in length. Until 15 years ago almost all of the population lived in the space border by the DR5 on the south and the waterfront on the north. Due to a lack of housing and facilitated by automobile ownership, the population has expanded south of the DR5. These new areas necessitate automobile ownership, as private vehicles remain the safest way to access the historical urban core and amenities located north of the DR5.

If officials in Puerto Plata focused on prioritizing pedestrian access and not solely designing for the private automobile, the environmental impacts of growth would be much less harmful to the fragile ecosystem that dominates the region. In addition, the pedestrian nature of the community and the inclusion of greenways and other paths for pedestrian movement could serve as a model for other cities and regions in the Dominican Republic. A re-conceptualizing of the urban space could create more opportunities for residents to advance both economically and educationally by increasing the density and the agglomeration effects that result from increases in density.

An increase in density allows areas to benefit from the economies of scale caused by agglomeration effects. In these scenarios, increased density allows firms to save on costs of

production and distribution, allows for the creation of varied types of educational facilities and retail ventures and reduces the amount of resources necessary to produce the same output in less dense areas. In addition to benefitting the current residents and businesses, an increase in density could serve to create a revitalized tourism industry in Puerto Plata by enhancing the urban space in a way that encourages visitors to leave their all-inclusive hotels and experience a vibrant urban space with important cultural and historical elements. Indeed, an increase in density and a reconfiguration of the urban fabric to prioritize non-motorized transportation may open up new opportunities to develop boutique hotels located throughout the city center and connected by a greenway.

### *Walkable Communities*

“Although nearly every human environment can accommodate some degree of walking, walkable communities give additional value and support to make walking an enjoyable experience” (Institute of Transportation Engineers, 2010). Walkable communities typically include elements that improve the non-motorized experience and provide traffic calming (reducing the speed at which motorized vehicles operate in areas where they interact with non-motorized transportation). Traffic calming is an important element for addressing safety while complete streets non-motorized use by making the experience more enjoyable. Each of these items will be discussed in more detail below.





### Complete Streets

An important element of walkable communities is the creation of “complete streets”. Complete streets refer to transport thoroughfares that accommodate a wide variety of users but that put a “particular emphasis on pedestrians, cyclists, and transit users, as well as people of all ages and physical abilities” (Los Angeles County, 2011). The focus on non-motorized transit is based on the idea that non-automobile travelers are more exposed and affected by the street environment than motorized travelers. The comfort of these users has traditionally been ignored by conventional automobile-oriented design.

Complete street systems pay attention to pedestrian features adjacent to motorized thoroughfares such as sidewalk development, street crossings, and bike lanes. More advanced systems include a development of non-motorized access ways placed strategically throughout an urban area to allow for comfortable access for bicyclists, pedestrians, joggers and others along a linear parkway free from motor vehicles. These pedestrian areas, if done in partnership with community residents, can grow into centers for community gathering or economic development. They can create opportunities for socialization or shopping that do not require auto-mobile transport, offering additional, localized opportunities for investment and invigoration.

Pedestrian-oriented parkways, when mixed into the urban grid, also provide areas for green space. This green space can combat negative aspects of urban development by dealing with water management, reducing the impact of carbon dioxide emissions from vehicles and providing recreational areas for residents.

Figure 5: Traffic Calming Matrix

Traffic Calming Element	Best Location	Picture
Turn Lanes	Framework Streets	
Roundabouts	Non-framework streets in Residential Areas	
Traffic Circles	Connections between Framework and Non-framework streets	
Raised Intersections	Connections between Motorized and Non-Motorized Transport	

*Photo Credits (from top):*

Traffic Calming

Traffic calming uses physical measures to produce a reduction in vehicle speeds, a reduction in energy consumption and pollution, and reduction in sprawl, and automobile dependence. These measures also serve to alter driver behavior in a way that improves conditions for non-motorized street users (Los Angeles County, 2011). Figure 5 above shows some common physical elements used for traffic calming. When deciding which traffic calming elements are most appropriate for

different areas in the urban fabric, it is useful to think of two types of streets: Framework Streets and Non-framework Streets.

*Framework streets* are streets that (i) connect places, neighborhoods, and districts (usually most boulevards and avenues) and/or (ii) serve as emergency vehicle routes. The DR5 would be an example of a framework street in Puerto Plata. The traffic calming measures that are appropriate for framework streets include “cross-section measures” because emergency response times are generally unaffected by cross-section changes.

*Non-framework streets* are all the other streets in the network. The majority of streets in Puerto Plata, like in most cities, are non-framework streets. Non-framework streets provide access to houses, businesses, offices, and parks, and are rarely used by emergency vehicles except for local calls. The traffic calming measures that are most appropriate for non-framework streets include cross-section measures and “periodic measures.” Periodic measures are spaced intermittently, rather than continuously. They are very popular on non-framework streets because they are inexpensive when compared to cross-section measures, which typically require construction along the entire length of the street.

Instead of implementing a solution that only addresses capacity on framework infrastructure (i.e. expansion of the DR5), policymakers should utilize the street typology discussed above and look for opportunities to increase pedestrian elements while calming the local and through traffic.

## **V. Cartagena de Indias, Colombia**

To better understand what pedestrian oriented design can bring to the Puerto Plata community it is useful to look at examples from comparative urban areas. While pedestrian schemes have worked in large urban areas, notably Times Square in New York City and the historic center in Curitiba, Brazil, it is more useful to examine communities that have a similar size, economic structure and urban orientation as Puerto Plata. One comparative example is Cartagena de Indias, Colombia. This city has undergone transformation in recent years by prioritizing pedestrian access and enhancing existing amenities in the urban core.

Located on the northern coast of Colombia in the Caribbean Coast Region, Cartagena is a resort town with a population of about 800,000. A Spanish colonial town, founded in 1553, Cartagena’s walled city and fortress were designated a UNESCO World Heritage site in 1984. Since that time, tourism has continued to dominate the local economy. Much like Puerto Plata, transportation infrastructure priorities have historically focused on road development.

In recognition of the pedestrian amenities inherent in the colonial city form and amid growing concerns about environmental and social degradation that result from auto-dependence, Cartagena launched an effort in 2004 to build a viable public transportation system that serves local residents and tourists. This project, called Transcaribe, sought to reduce greenhouse emissions by provided high-capacity bus systems (BRT) and non-motorized transportation options. It is estimated that the 15-kilometer BRT system created 5,260 jobs and brought \$150 million in investments to the city. The project also integrated non-motorized transport, such as pedestrian and bike access, into the BRT network. Supported by the Institute for Transportation



and Development Policy, Cartagena is pioneering a new urban form – one that mimics the historical orientation of the city while prioritizing alternative transportation.

Figure 6: Photo of Cartagena, Colombia waterfront and downtown



Development in Cartagena should be closely examined by officials working to improve Puerto Plata. Although Cartagena is larger in population and has traditionally embraced higher density development than Puerto Plata, the similarities between the two cities with regard to tourism and a compact urban form make this city a worthwhile comparison for Puerto Plata. The World Bank and UNEP have sited this project as one of the most innovative approaches to fostering sustainable development in Latin America.

Development in Cartagena preserves the authentic city while providing mobility options for an increasing urban population. By prioritizing alternative transportation and facilitating movement around the urban core, civic leaders have found ways to provide authentic experiences for residents and tourists. In comparison to the all-inclusive tourism model embraced by Puerto Plata, authentic travel experiences connect the tourism economy with local residents while showcasing the uniqueness of the city and highlighting historical aspects, from city design to architecture, that attract a different type of tourist and diversifies the tourism industry.

## **VI. Solutions for Puerto Plata: La Linea Baja**

This section outlines a proposed redevelopment scheme for Puerto Plata that prioritizes alternative forms of transportation in order to improve quality of life for residents while enhancing the tourism sector. This project was conceptualized in Fall 2011 in partnership with Darryl Zuk, a third-year M.Arch student at Columbia University.

The project is called La Linea Baja, “the low line”, in recognition of the need to bring Puerto Plata back to its traditional urban form positioned around non-motorized transport. In comparison to the High Line, in New York City, La Linea Baja creates urban space that brings people into the urban fabric instead of carrying them above or past it – as the current tourism system does. The project specifically addresses four aspects of development:

*Prioritizing Pedestrians.* This project conceives of Puerto Plata as a pedestrian oriented urban area. Leaving behind the conventional auto-mobile centric urban design focused on roadways and vehicles, the project creates a new urban form that prioritizes non-motorized traffic and re-conceptualizes urban space to encourage walking, biking and use of a newly formalized bus system. Leveraging existing infrastructure in a new manner, the plan creates a compact street network that provides multiple ways for residents and tourists to navigate the space and explore the historical, cultural and natural amenities in the region.

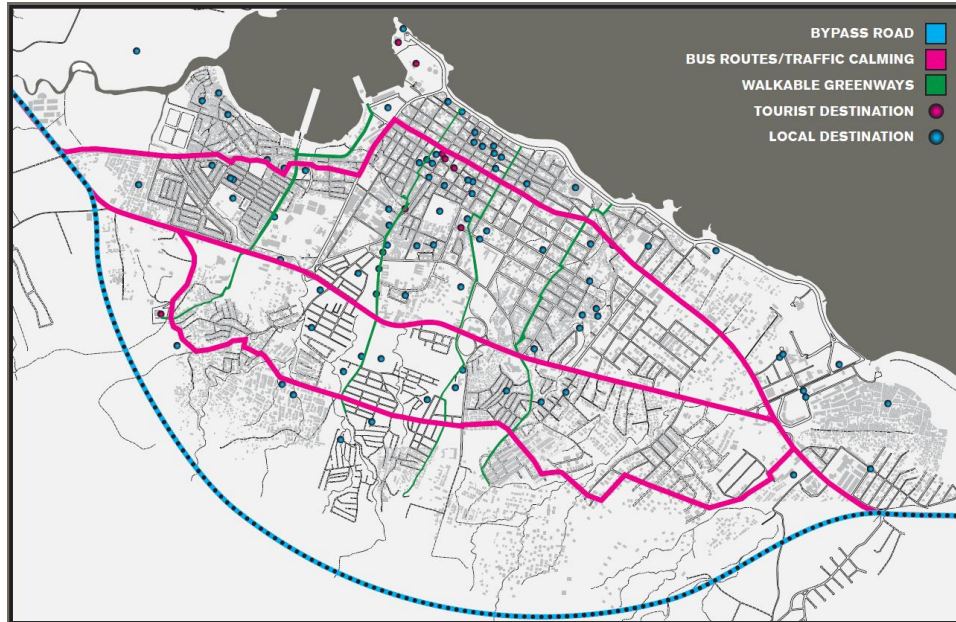
*Green Development.* Focus shifts from the negative impacts imposed by traffic and congestion to an urban area permeated by greenways and pedestrian friendly amenities. This opens new space for retail development, discourages vehicular modes of transit for areas within close proximity and creates a unique opening for a tourism product that caters to foreign and domestic visitors looking for a break from their daily patterns and new ways to explore the natural and cultural heritage of the Dominican Republic. It also provides residents with public space they can mold to fit the needs of their communities.

*Future Growth.* With high rates of urban growth anticipated in the coming decades, the plan also increases opportunities for additional high density housing and creates an urban core that does not necessitate automobile ownership. By enhancing bus service connections both within the city and to communities in the region, the plan also increases connectivity between residents living in the region and economic opportunities in Puerto Plata. Re-conceptualizing the space opens new areas for retail and business development while protecting fragile natural resources and minimizing low density development.

*New Tourism Model.* In contrast to the “all-inclusive” hotels that permeate the waterfront - a network of locally owned, small hotels dot the urban space. Cooperative agreements between hotel operators allow visitors to access traditional hotel amenities at a variety of locations scattered throughout the urban area and encourage tourists to leave their traditional hotel enclaves to appreciate the unique culture of the Puerto Plata region. The locally-owned hotel model encourages investment by diaspora while supporting local capacity building and a more sustainable approach to tourism.

To achieve success related to these four aspects, the project requires creating pedestrian corridors, complimented by a bus system that transports people around the urban space and provides connections to other communities in the region. Figure 7 below shows in more detail where the greenways and bus system could be located.

Figure 7: Proposed Redesign of the Urban Grid



The bus system (in pink) provides circular access for residents living in the currently underserved areas south of the DR5 while also providing tourists an opportunity to travel from hotel locations in the east to the center city. The pedestrian walkways open new opportunities for economic development, while providing amenities that service local residents and tourists.

The project also creates opportunities for the development of boutique hotels. Located along pedestrian walkways, these small establishments would be locally owned and operated, catering to tourists interested in the authentic experience. The boutique hotel system also leverages the continued interest of the diaspora to support development in the Puerto Plata region by providing opportunities for investment and economic opportunity that creates sustainable employment.

To return to earlier discussion, the solutions devised for Puerto Plata should be developed in partnership with residents and community leaders. A solution that attempts to so drastically transform the urban space requires the buy-in and support of local residents in order to be successful in achieving its aims. In addition, viable solutions cannot be developed unless planners understand the current use of the transportation system (which requires improved data collection processes) and implement policies that improve the user experience.

## Conclusion

The region of Puerto Plata faces numerous challenges for cultivating sustainable growth in the coming decades. The existing economic, social and physical structures need to be reconfigured and re-conceptualized to better foster innovative solutions that will address a multitude of issues stemming from fast rates of urban growth and the changing global economy. The urban transport configuration provides a mechanism by which to revitalize and invigorate the existing urban form while also providing an opportunity to implement data collection systems and involve residents in a participatory planning process.

By creating an urban form that allows for non-motorized transportation and developing a regional public transportation system, Puerto Plata could become a new model for urban development in the Caribbean. Moving away from the all-inclusive resort model of tourism, this new urban form provides amenities that serve local residents while providing authentic tourism options for domestic and foreign travelers. La Linea Baja provides one version of how this transformation could be implemented on the existing grid. With better data and a participatory visioning process, a system could be developed that achieves the same outcome while supporting local needs.

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Figure 1 Google Maps, landmarks created by authors

Figure 3 Motoforms. Holiday Heidi website, accessed at <http://holiday-heidi.blogspot.com/2011/04/puerto-plata-beyond-gates-of-playa.html>

Figure 4 Google Maps, highlighted portions added by authors

Figure 5 Traffic Calming Matrix (from top):

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Neighborhood Roundabout, Chicago Department of Transportation Website, Accessed at [http://www.cityofchicago.org/city/en/depts/cdot/supp\\_info/traffic\\_calming.html](http://www.cityofchicago.org/city/en/depts/cdot/supp_info/traffic_calming.html)

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Raised Intersections, StreetsWiki Website, Accessed at <http://streetswiki.wikispaces.com/Lane+Width>

Figure 6 Cartagena Old City, Accessed at <http://medicaltourismsolutions.files.wordpress.com/2008/11/cartagena-old-city1.jpg>