



Emerging and Sustainable Cities Initiative: a platform for Urban Sustainability in LAC.

Gilberto Chona

Lead Specialist, Fiscal Policy and Urban Economics

gilbertoc@iadb.org

April 22, 2014



www.iadb.org/cities



 @BID_CIUDADES



Why ESCI?

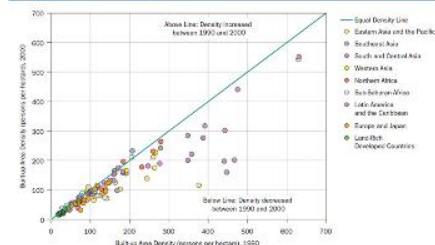
EMERGING and SUSTAINABLE CITIES Initiative

Rapid urbanization

Rapid urbanization



Density Decline in the Global Sample of 120 Cities, 1990-2000

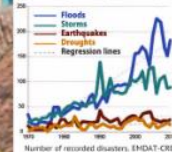


Climate change

Climate change

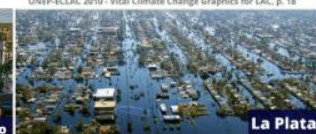
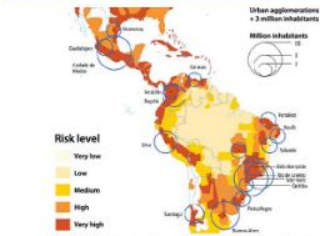


Coastal and/or off-river cities do not have the necessary infrastructure to minimize natural disaster damages. Vulnerability in these cities to the future effects of climate change has significant impacts in their local economies.



73% of urban population in Latin America and the Caribbean lives in low elevation coastal zones

Hurricanes, flood, earthquake and drought risks



Intersectoral problem

Rapid urbanization

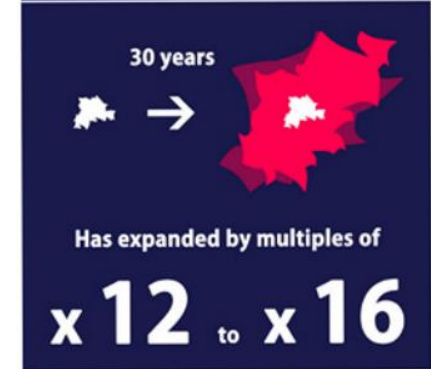
% of population living in urban areas



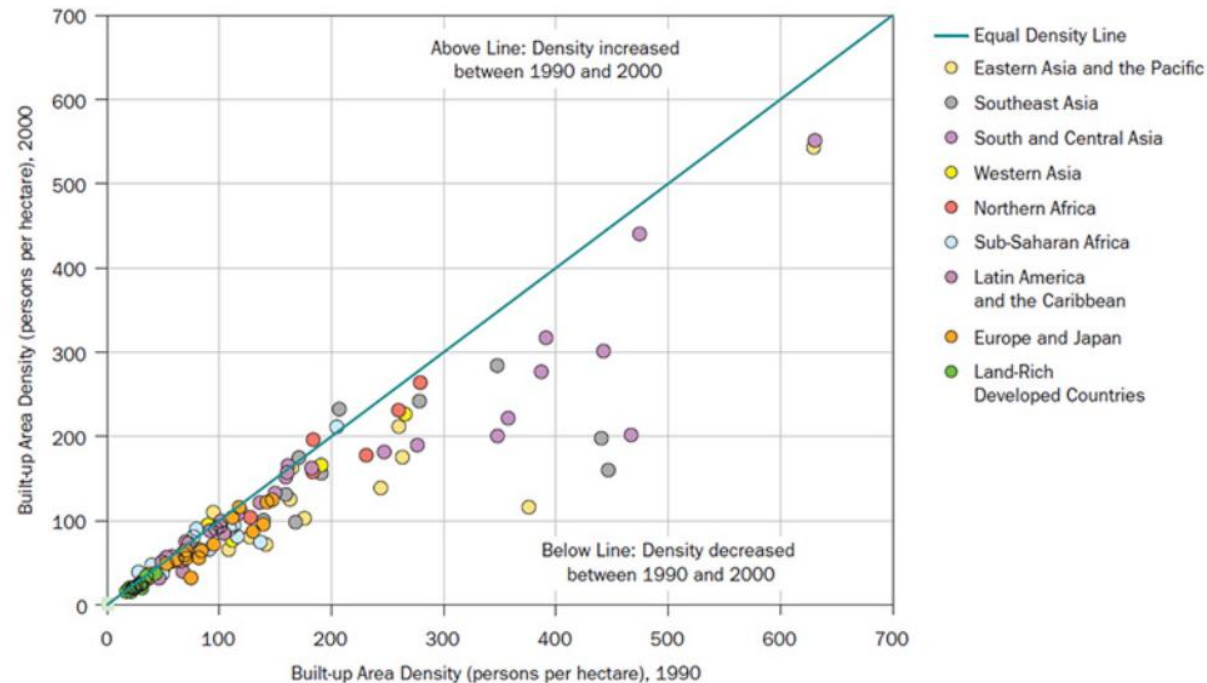
Population in urban areas



Size of the urban footprint



Density Decline in the Global Sample of 120 Cities, 1990–2000



Climate change



Mean temperatures will increase by between

+ 1°C / + 6°C *

*Climate and Development Challenge for LAC, Vergara et al. 2013



Investment on adaptation will reach approx

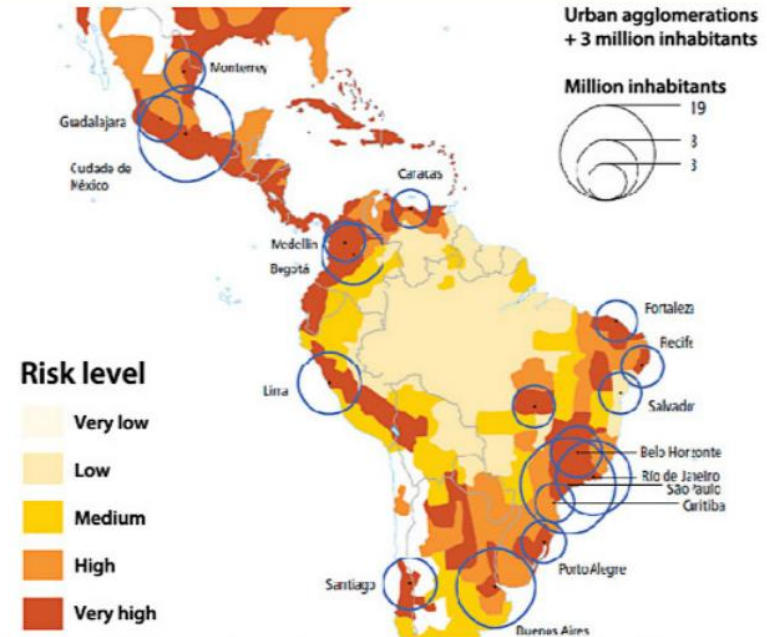
\$100 billion / year by 2050 *

*Economics of Climate Change in LAC, ECLAC-CEPAL 2010

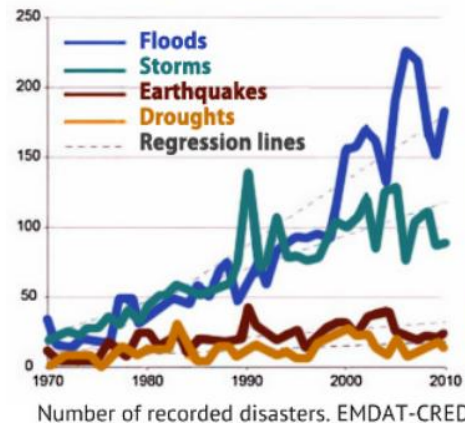
Coastal and/or off-river cities do not have the necessary infrastructure to minimize natural disaster damages. Vulnerability in these cities to the future effects of climate change has significant impacts in their local economies.

73% of urban population in Latin America and the Caribbean lives in low elevation coastal zones

Hurricanes, flood, earthquake and drought risks



UNEP-ECLAC 2010 - Vital Climate Change Graphics for LAC, p. 18



Tabasco's GDP hit by floods in 2007 and 2009. The cost of rehabilitation of damaged houses is estimated on \$ 753 million.



The flood in La Plata, Argentina in April 2013 was the result of extremely heavy rainfall.

2

RESPONSE



IDB



**EMERGING and
SUSTAINABLE
CITIES
Initiative**



Technical assistance program that provides direct support to local governments in their sustainable development plans and execution.



Multidisciplinary approach, 3 pillars of sustainability:



Environmental sustainability and climate change

Environmental management and local pollution control, climate change mitigation, vulnerability reduction and adaptation measures.



Urban sustainability

City's design and footprint, distribution of urban services, efficiency, transport network, economic competitiveness and public safety.



Fiscal sustainability and good governance

Ability of local governments to prioritize and finance investments, services, control expenditures and debt, make decisions in a transparent manner.

ESCI focuses on
intermediate size emerging cities



100.000 - 2 million



**EMERGING and
SUSTAINABLE
CITIES
Initiative**



Public policy instrument to identify, sort, organize and prioritize long term infrastructure and sustainability projects to improve the quality of life in the cities, employing a multidisciplinary and cross-sectional perspective.

- **Rapid assessment of the needs of the city**
- **Identification and prioritization of investments**
- **Inclusion of civil society**

Diagnostics + Action Plan



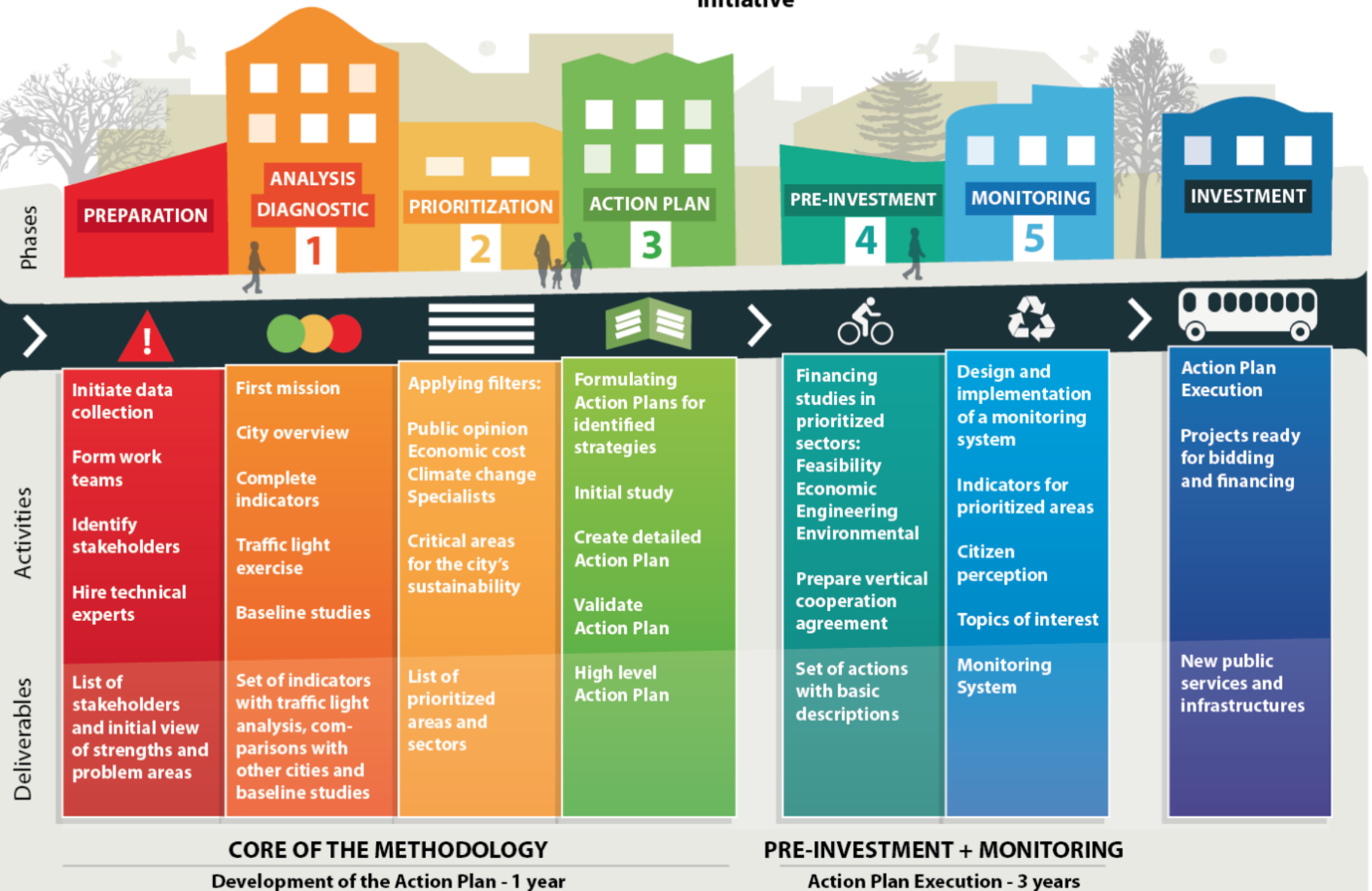
Pre-investment + Investment



Phases of a city

in the

**EMERGING and
SUSTAINABLE
CITIES**
Initiative

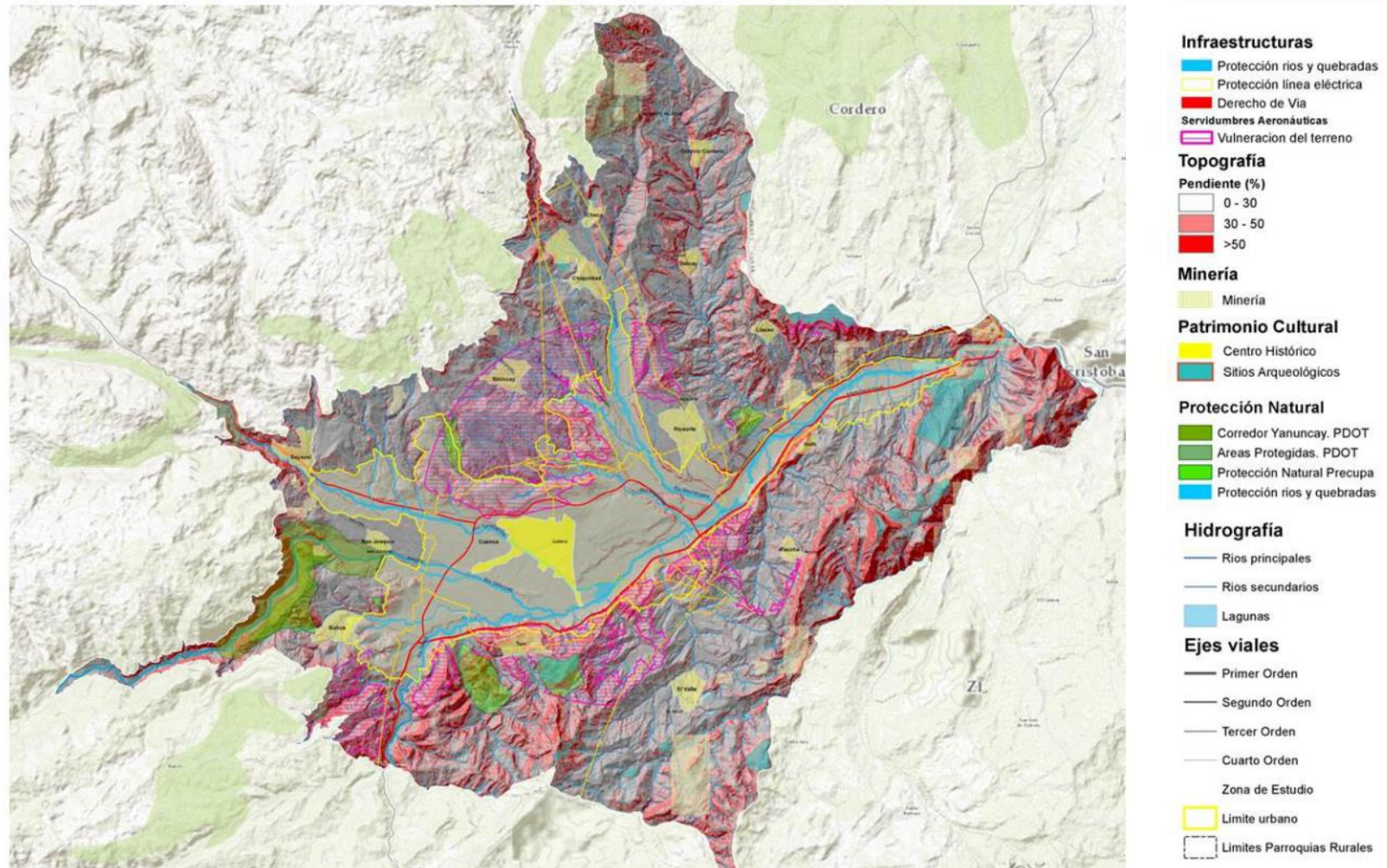


Baseline Studies

- **Mitigation of greenhouse gas emissions**
- **Disaster risk and climate change vulnerability reduction**
- **Sustainable urban Growth**

Baseline Studies

Vulnerability and Natural Risks



Cuenca, Ecuador

Baseline Studies

Urban growth

To understand the dynamics of urban expansion of the city, its growth from 1986 to date, and shape their future growth to 2030.



Infrastructure Costs in 20 years:

US\$ 565 million

4x

Intertial Growth

1.3x

US\$ 146 million

Smart Growth

Additional Baseline Studies

- **Urban Mobility Diagnostic**
- **Solid Waste Management System**
- **Energy Efficiency/Consumption**
- **Public Safety**
- **Public Finances**
- **Water and Wastewater**
- **Connectivity**
- **Walkability/Bikeability**

Citizen security

Violence and insecurity

Murder rate

LAC is the region with the highest murder rate in the world: 25 per 100,000 inhabitants. World: 7 per 100,000

Insecurity

41 of the 50 most dangerous cities in the world are located in Latin America and the Caribbean.

Crime and violence: an expensive problem

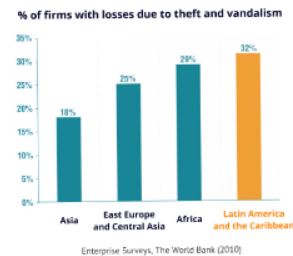
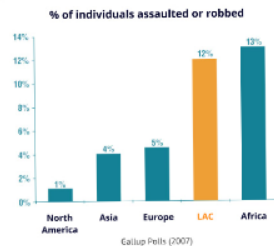
Uruguay: Costs associated with crime make up 3.1% of GDP.

Mexico: Violence rises unemployment and leads to businesses closure.

Brazil: Crime decreases homes value.

Inter-American Development Bank

Victims



Public opinion: Prioritized sectors in 11 ESCI cities (average)

Montevideo, Mar del Plata, Salta, La Paz (Baja California), Montego Bay, Managua, Barranquilla, Bucaramanga, Manizales, Pereira and Cochabamba.

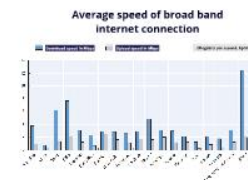
Sectors

Score: 1 to 5

1	Citizen Security	4.6
2	Employment	3.8
3	Poverty / Inequality	3.7
4	Public management	3.5
5	Land use / Public Spaces	3.3
6	Climate Change	3.2
7	Transparency	3.2
8	Noise	3.0

Smart Cities

Connectivity



Basic requirement of ICT infrastructure for Smart Cities Applications (Diagnosis)



Telefonica

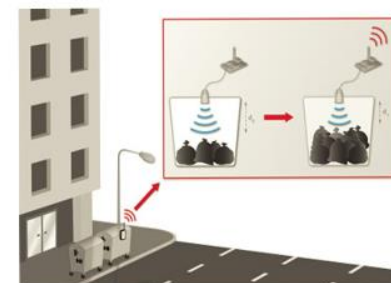
IBM



Integrated Operating Control Center (IOCC)



Smart Parking System



Smart Waste Management System



Public Safety

Example for Port of Spain: Our diagnostic exercise revealed significant challenges across all three dimensions

Sustainability dimensions

Environment

- Infrastructure and pricing failures **wasting valuable water resources**. 50% lost in the distribution system
- Abundant energy resources, but fuel subsidies mean **artificially low electricity pricing, leading to inefficiency**
- ~100% access to solid waste collection, but **local landfill nearing capacity and low recycling** despite 83% recyclable content
- **Inadequate infrastructure maintenance exacerbating flooding problems**
- **Disaster planning inadequate for low-frequency, high-severity events** (i.e., tsunamis, hurricanes, earthquakes)
- **Most vulnerable areas are least prepared (East PoS)**

Urban

- **Very high murder rate** (118 per 100k), **exacerbated by weak enforcement** (14-19% detection, <5% conviction)
- **Congestion a major challenge; avg. 1-2 hrs commutes, minimal parking enforcement, excessive reliance on single-occupancy vehicles. Situation exacerbated by importation laws and fuel subsidies**
- **Strain on infrastructure from non-resident population** - 5x as many commuters (>250K) as residents (50K)
- Moderate growth (3% p.a.) but **limited land use planning implementation** or zoning enforcement
- **Significant disparity in terms of economic opportunity** (e.g. much higher poverty and unemployment, worse service provision and higher crime in East PoS)

Fiscal/ governance

- **City lacks financial and administrative autonomy (97% of PoS' budget from central government), and MOLG lacks mandate to 'single out' any one corporation**
- **Institutional overlap and confusion over responsibility and accountability** of POSC vs. central govt' and within central government
- **Insufficient tax base maximization**—.08% property tax-GDP ratio vs. 1% in developed countries, and underutilized sources of fee revenue
- **Lack of end-to-end performance management** to evaluate spending quality or personnel performance
- **Public utilities operating at a loss** (e.g. WASA operating at a TT \$391 Mn deficit)

Environmental sustainability challenges

Manages its environment and consumption of natural resources

- Fortunate to have large natural water supplies; however, current systemic waste is not sustainable
 - Virtually free water supply dis-incentivizes efficiency
 - 50% water system leakage from poor maintenance
- Ample energy supplies but poor grid planning causes frequent brown/black outs
- Adequate wastewater (WW) treatment capacity, though 50% WW system infiltration
- ~100% access to solid waste collection, but no recycling despite 83% recyclable content

Mitigates pollution and promotes renewable energy sources

- Air quality is generally good due to prevailing trade winds
 - Burning trash, traffic congestion raise PM10
 - No air quality regulations or monitoring
- **Although GHG emissions are high (28 tons per capita), this is driven by and consistent with other major oil/gas exporters**
- Energy subsidies dis-incentivize efficiency (e.g. doors open with a/c on)
- **0% energy generated from renewable energy sources**

Reduces its vulnerability to natural disasters and adapts to climate change

- Hazard maps focuses on high frequency, low severity events
 - Flood, landslide mapped
 - Earthquake, hurricane, and tsunami not fully assessed
- “Severe to catastrophic” (40-60%) damage expected to infrastructure
- Early warning systems are not adequately tested
- Egress plan is in place but execution is questionable (e.g., April ERP drill)
- Compound risks exists (i.e. most vulnerable are least prepared) in the East
- DRM and CCA are in development

Urban sustainability challenges

Controls city growth and improves human habitat

- Growth rate **medium** at 3% - but growth largely **unplanned**, particularly in E. PoS
 - **Hillside building led to ecological degradation, exacerbates city flooding**
 - Multiple master plans exist across city; minimal implementation
- **~64K** people live in informal settlements around PoS – **more than in city itself**
- Population density is low - **5x as many commuters (250K) as residents (50K)**

Promotes sustainable urban transportation

- **Commute into and out of city ~1-2 hours each way**
 - **108 minute avg.**
- **Narrow city streets not designed to receive large influx of cars**
- **Illegal parking common; minimal enforcement of tickets**
- **Law allows importation of used cars, led to spike in single-occupancy vehicles**
- **Fuel heavily subsidized, further increasing traffic**

Promotes competitive, sustainable local economic development

- **National economy concentrated in oil and gas** (40% GDP, vs 45% for Saudi Arabia)
- **Public sector employment important for PoS** (over 83K total, concentrated in city)
- Some areas. e.g., E. PoS remain excluded from development
- Although official unemployment low (6-7%; up to 13% in Sealots), underemployment is significant
 - **>20% in E. PoS**

Provides high standard of social services, promotes social cohesiveness

- **Murder rate for PoS Police District 118 per 100K compared to:**
 - **29 in Newark**
 - **19 in Bogota**
- Murder rate varies by police station, e.g., 293 at Besson St, 202 at Central, 30 at Belmont
- Total serious crime over 2K per 100K
- **Weak judiciary / penitentiary**
 - 0% murders convicted
- Education and health services meet basic standards

Fiscal and governance challenges

Has adequate governance mechanisms

- **Transparency challenges** with regard to government activities
 - T&T ranked 73 of 178 by Transparency International
 - 3rd party auditing, but not typically by a independent, non-local firm
- **Widely varying capabilities**, both between and within ministries and corporations responsible for key city services

Adequately manages its revenues

- **City lacks financial and administrative autonomy** (97% of PoS' budget from central government), and **MOLG does not have the mandate single out any one single city corporation**
- **Insufficient tax base maximization**—.08% property tax-GDP ratio vs. 1% in developed countries
- **Underutilized sources of fee revenue** (e.g. POSC could be charging up to 10x current rent in some areas)

Adequately manages its expenditures

- **Lack of end-to-end performance management** to evaluate spending quality or personnel performance
- **POSC receives only ~50% of approved budget** due to administrative process
 - Lack of training in PoS and central government
 - Low financial threshold to send projects to central government for approval

Adequately manages its debt and fiscal obligations

- No tracking of future pension liabilities
- **Public utilities operating at a loss** (e.g. WASA operating at a TT 391 mn deficit)



ACTION PLAN: MAR DEL PLATA

The Action Plan identifies the needs of public and private investment to be made in each city to improve the quality of life through a replicable and consistent plan among cities.

5 years

Action Plan Execution

Pre-Investment

(project preparation)

US\$ 2 million

Public and private

Investment

US\$ 823 million

6 Prioritized Areas



Water and
Sanitation



Comprehensive
Strategic Actions



Mobility - BRT



Urban Renewal
Interventions



Energy



Public
Management



Mexico

Special Program 2012



population 215,000



La Paz, BCS

WATER AND ENERGY



Action Plan

URBAN FOOTPRINT +

VULNERABILITY ANALYSIS

General Hospital Medical Center Clinic



Just in health infrastructure, in this scenario the losses can reach US\$55.71 million, which represents 86% of La Paz's annual budget.

Fluvial flooding - Sea Level Change (+1/2 & +1 m)



La Paz, BCS

Prioritized Studies	MM US\$ *	Prioritized Projects	MM US\$ *
<ul style="list-style-type: none"> Analysis of potential water sources, potential options for water treatment and improvement of local water utility management. 	0.4	<ul style="list-style-type: none"> Construction of new water supply plant to mitigate the effects of water source deterioration, potential options for water treatment and improvement of local water utility management. 	116
<ul style="list-style-type: none"> Technical, legal and financial study for the construction of a 3 MW solar energy plant. 	0.3	<ul style="list-style-type: none"> Construction of a 3 MW solar energy plant for La Paz's public buildings to reduce protection and local government expenses. 	5
<ul style="list-style-type: none"> Urban mobility study (including urban transport, walkability and bicycle). 	0.65	<ul style="list-style-type: none"> Construction of a 30 MW solar energy plant. 	114
<ul style="list-style-type: none"> Executive project for risk mitigation options in local rivers. 	0.1	<ul style="list-style-type: none"> Construction of an integrated transport project. 	83.5
<ul style="list-style-type: none"> Study for the management of the urban growth. 	0.15	<ul style="list-style-type: none"> Development of BRT system around the city, promote walkability and the use of bicycles. 	50
<ul style="list-style-type: none"> Solid waste management - Study to improve health. 	0.4	<ul style="list-style-type: none"> Construction of water towers in vulnerable areas of the city to increase resilience in case of flooding. 	7.5
		<ul style="list-style-type: none"> Catalytic modernization - Implementation of strategic urban development programs in these areas of the city. 	30
		<ul style="list-style-type: none"> Construction of an efficient waste management system and landfill. 	
TOTAL	2 MM	TOTAL	406 MM

* Cost estimates based on available information at the time of the Action Plan (November 2012), and estimates from local sector specialists and local government officials.

Renewable Energy Solar Plant 1 MW La Paz, BCS

Total investment: **US\$ 4 million**
 No. of solar panels: **4,731**
 Total output: **1.34 MW**
 Selling price per kWh (CPE): **US\$ 0.15**
 Expected annual income (earnings): **US\$ 631,660**
 IRR: **13.5 - 15.25 %**















During the life cycle of the project, total CO2 emissions will decrease by 40,000 tons.
 Mitigates the adverse effects caused by climate change.
 Diversifies the local energy and reduces dependence on fossil fuels.
 Energy production costs are lower, which impact on consumer costs.
 Enhances the sustainability of La Paz and the living standards of its inhabitants.

PPP Projects Funding La Paz BCS, Mexico



La Paz, BCS

Special
Program
2012

Prioritized Studies	MM US\$ *	Prioritized Projects	MM US\$ *
 Water and Sanitation <ul style="list-style-type: none"> Analysis of potential water sources, potential options for water treatment and improvement of local water utility management. 	0.4	 Water and Sanitation <ul style="list-style-type: none"> Construction of new desal water supply plant to mitigate the effects of water source depletion. Treatment plant rehabilitation, construction of new pipeline (Carrizal-La Paz) and 18 hydraulic sectors, overall improvement of the management. 	116
 Energy <ul style="list-style-type: none"> Technical, legal and financial study for the construction of a 1 MW solar energy plant. 	0.3	 Energy <ul style="list-style-type: none"> Construction of a 1MW solar energy plant for La Paz's public buildings to reduce pollution and local government expenses. Construction of a 30MW solar energy plant. 	5 114
 Mobility <ul style="list-style-type: none"> Urban mobility study (including urban transport, walkability and bicycle). 	0.65	 Mobility <ul style="list-style-type: none"> Construction of an integrated transport project. Development of BRT system around the city, promote walkability and the use of bicycles. 	83.5
 Vulnerability to Climate Change <ul style="list-style-type: none"> Executive project for risk mitigation options in local rivers. 	0.1	 Vulnerability to Climate Change <ul style="list-style-type: none"> Construction of water levees in vulnerable areas of the city to increase resilience in case of flooding. 	50
 Urban Planning <ul style="list-style-type: none"> Study for the management of the urban growth. 	0.15	 Urban Planning <ul style="list-style-type: none"> Cadastral modernization. Implementation of strategic urban development programs in three areas of the city. 	7.5
 Solid Waste <ul style="list-style-type: none"> Solid waste management + Study to improve landfill. 	0.4	 Solid Waste <ul style="list-style-type: none"> Construction of an efficient waste management system and landfill. 	30
TOTAL	2 MM	TOTAL	406 MM

* Cost estimates based on available information at the time of the Action Plan (November 2012), and estimates from Bank's sector specialists and local government officials.

Renewable Energy Solar Plant 1 MW

La Paz, BCS



Total investment **US\$ 4 million**

No. of solar panels **4,731**

Total output **1.34 MW**

Selling price per kW/h (CFE) **US\$ 0.15**

Expected Annual Income
(savings) **US\$ 631,660**

IRR **13.5 - 15.25 %**

- During the life cycle of the project, local CO2 emissions will decrease by 40,000 tons.
- Mitigates the adverse effects caused by climate change.
- Diversifies the local energy and reduces dependence on fossil fuels.
- Energy production costs are lower, which impact on consumer costs.
- Enhances the sustainability of La Paz and the living standards of its inhabitants.

PPP Projects Funding

La Paz BCS, Mexico



Guarantee

NAFIN AAA-MX



The private company
builds and finances the
solar power plant



Solar Power Plant



Electricity



Municipality of La Paz

BB-MX

Revenues from the
private enterprise come
from the payments of
the municipality for the
service provided

(Off-take contract)

Para dar certidumbre al privado, el Gobierno Federal, a través de la Banca de Desarrollo Local NAFIN le otorga una garantía. Con esto se elimina el riesgo crediticio BB-MX de La Paz y se sustituye por el AAA-MX del Gobierno Federal, volviendo más atractivo el proyecto.

14

cities in the
execution phase

Investment needs

Pre-investment
in million \$US

Investment
in million \$US

 Trujillo
 Port of Spain . .
 Santa Ana . . .
 Montevideo . .
 Goiânia
 La Paz
 Mar del Plata .
 Barranquilla . .
 Bucaramanga .
 Manizales
 Pereira
 Cochabamba . .
 Managua
 Montego Bay .

1.5
NA
2
2
4.6
2
9.4
3.5
1.2
2.7
1.95
3.7
3.5
2.5
40.55 MM

131
245
103
123
451
406
827
822
310
315
295
695
550
375
5,648 MM

Total

Cost estimates based on available information at the time of the Action Plan (November 2012)
Estimates from Bank's sector specialists and Local Government Officials.



**Private
companies**

GOVERNMENTAL



Austria MOF



SECO



China



Japan



Korea



NDF



Peru MH

PRIVATE FOUNDATIONS

ICF

International Community
Foundation

FEMSA

MoU



Banamex

YPF

LOCAL DEVELOPMENT BANKS



FINDETER



CAIXA ECONOMICA



BANAMEX



Donors

ETH zürich



ETH Zurich
MoU

New York
University

Harvard
University

MIT

The Paulson
Institute Chicago



TU WIEN



SAIS John
Hopkins



Universität
Wien



KRIHS
MoU



SPRI BILBAO



The Brookings
Institution



Arizona
University



Univ. San Simón
Cochabamba



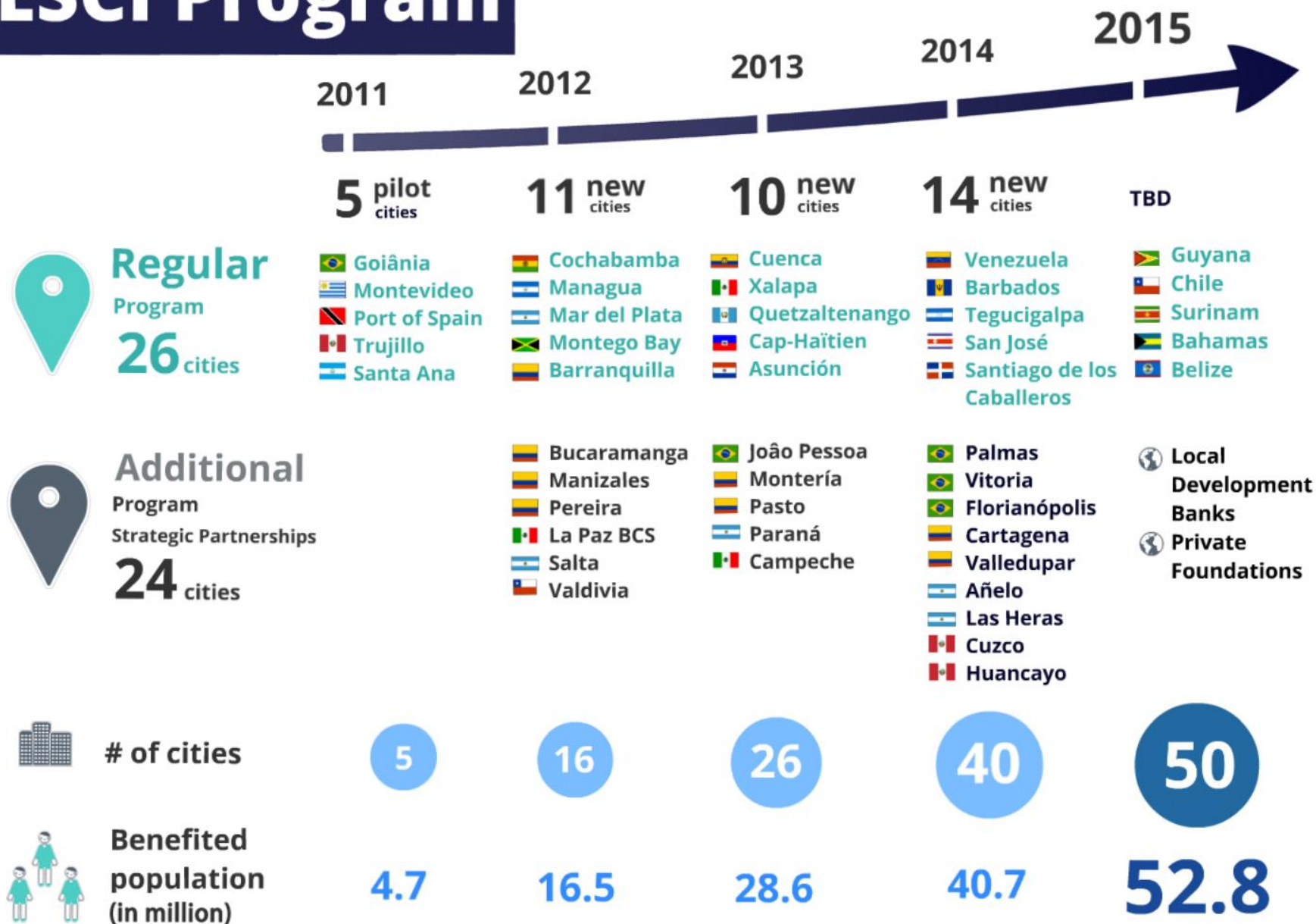
Universidad
Baja California



University of
the West Indies

Academic institutions

ESCI Program



Challenges of the Execution

Access to Pre-Investment Funds

Weak credit quality of municipalities

Difficult independent access to financial markets

Weak partners in a P.P.P. structure

Expectations



Water Treatment



Renewal Energy and Energy Efficiency



Public Transportation



Solid Waste Management

Some Preliminary Lessons

- **Prioritization is not a straightforward exercise**
- **Informing about solutions is not the same as communicating with stakeholders**
- **Institutional capacity for urban management is proportional to country size**
- **Need to build human capital with multi-sectorial vision for urban planning**

Inter-American Development Bank

Emerging and Sustainable Cities Initiative (ESCI)



Methodological Guide and Indicators available at:

www.iadb.org/cities

Institutions for People



IDB

Thank You!

Inter-American Development Bank/ www.iadb.org