CERTIFICATION AND FINANCING PROPOSAL

COMPREHENSIVE PAVING PROJECT
TO IMPROVE URBAN MOBILITY
CIUDAD JUAREZ, CHIHUAHUA

Submitted: June 18, 2012

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INDEX

EXECUTIVE SUMMARY

COMPREHENSIVE PAVING PROJECT TO IMPROVE URBAN MOBILITY CIUDAD JUAREZ, CHIHUAHUA

Project:	The proposed project consists of the construction of new paving and roadway infrastructure, as well as the rehabilitation of existing paving and roadways, pursuant to a long-term, public-private partnership ("PPP") that includes the maintenance of such infrastructure in Ciudad Juarez, Chihuahua (the "Project").
Project Objective:	The purpose of the Project is to improve urban mobility by addressing the need for new paving and related road infrastructure, achieve better connectivity in the city's roadway system by interconnecting inner road circuits to the exterior loop, and thus improve the air quality of Ciudad Juarez.
Expected Project Outcomes:	Paving and roadway improvements are expected to generate environmental and human health benefits that include: the reduction of 677 metric tons/year of PM_{10}, while better mobility will help reduce vehicle emissions, including an estimated 412 metric tons/year of volatile organic compound (VOC) emissions, 1,551 metric tons/year of carbon monoxide (CO) emissions and 270 metric tons/year of nitrogen oxides (NOx) emissions.
Population Benefitted:	1,332,131 residents of Ciudad Juarez, Chihuahua.
Sponsor:	The Municipality of Juarez, Chihuahua (the "Municipality").
Borrower:	The special-purpose company created by the selected contractor to carry out the Project under a PPP contract (the "PPP Contractor").
Project Cost:	Up to $2,200.0 million pesos (US$ 156.36 million).[1]
Loan Amount:	Up to $1,870.0 million pesos (US$ 132.91 million).[2]

[1] Unless otherwise noted, all U.S. dollar figures are quoted at an exchange rate of $14.07 pesos per dollar, according to Bloomberg.com dated June 7, 2012.
[2] For the purpose of the single obligor limit (SOL) established in NADB's loan policies and procedures, given that the proposed loan payment mechanism is an irrevocable trust in which payment is funded by committed federal tax revenues ("*participaciones*"), the applicable SOL was US$175.3 million as of May 31, 2012.

Uses & Sources:
(Millions of pesos)

Uses	Amount	%
Construction and related activities	$2,200.0	100.0
TOTAL	$2,200.0	100.0
Sources	**Amount**	**%**
PPP Contractor equity	$ 330.0	15.0
NADB Loan	1,870.0	85.0
TOTAL	$2,200.0	100.0

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1. ELIGIBILITY

Project Type

The Project falls within the eligible category of air quality.

Project Location

The Project is located in the municipality of Juarez, Chihuahua, Mexico, adjacent to the U.S.-Mexico border.

Project Sponsor and Legal Authority

The **public-sector** Project sponsor is the Municipality of Juarez, Chihuahua (the "Municipality" or the "Sponsor"); by the authority granted under the Mexican Constitution, the State of Chihuahua Constitution, the Municipal Code, the Long-term Public Project Investment Act of the State of Chihuahua and its regulations (the "PPP Legislation"), the State of Chihuahua Procurement Law for public works and services and its regulations and to the extent applicable, the Law of Public Works and Related Services and its regulations. The Project has been approved by the Congress of the State of Chihuahua pursuant to the decree No. 785-2012-II P.O., officially published on April 28, 2012.

Public-Private Partnerships

Pursuant to recent PPP legislation in Chihuahua (see above), public entities may enter into service agreements with private sector entities to finance, construct, operate and maintain infrastructure for the delivery of public services (a "PPP Service Agreement") . Public entities appreciate this mechanism because payment obligations under it are not considered to be public debt, even though the payments are secured by pledges of *participaciones*.

This Project would be carried out pursuant to the PPP legislation, with the Municipality of Juarez conducting a competitive bidding process to select a service provider to implement the Project (the "PPP Contractor").

2. CERTIFICATION CRITERIA

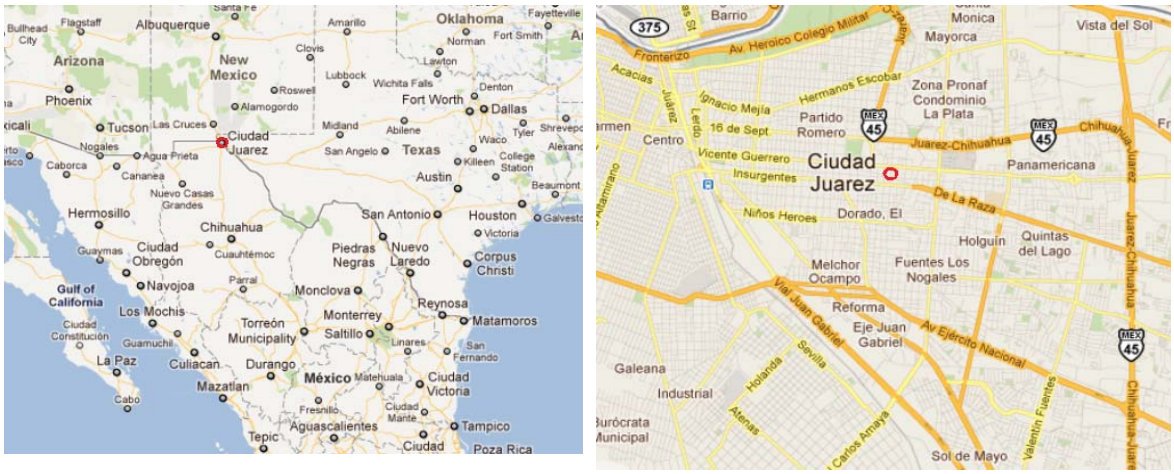
2.1 TECHNICAL CRITERIA

2.1.1. Project Description

Geographic Location

The Project is located in Ciudad Juarez in the north-central region of the state of Chihuahua, across the Rio Grande River from the city of El Paso, Texas. Figure 1, below, shows the geographical location of the Project.

Figure 1
PROJECT VICINITY MAP



General Community Profile

According to the 2010 census, the municipality of Juarez has a population of 1,332,131, which represents 39.1% of the total population of the state; making it the largest municipality in Chihuahua.[3] Its population grew at an average rate of ofmunicpality - censtoav municipality municipality of

transportation, freight and storage. In addition, it yields 41% of the State's GDP and employs 50% of its working population, making it the largest contributor to Chihuahua's economy.[4]

The current state of public services in Ciudad Juarez is summarized in Table 1.

Table 1
PUBLIC SERVICES AND INFRASTRUCTURE

Water System*			
Coverage	98%		
Supply source	Ground water wells		
Number of connections	438,192		
Wastewater Collection*			
Coverage	93%		
Number of connections:	424,336		
Wastewater Treatment *			
Coverage	71%		
Treatment facilities	**Plant**	**Type**	**Capacity**
	North	Activated sludge	1,600 lps (36.5 MGD)
	South	Activated sludge	2,000 lps (45.6 MGD)
	Anapra	Activated sludge	93 lps (2.1 MGD)
Solid Waste			
Collection coverage	100%		
Final disposal	Landfill		
Street Paving**			
Street paving coverage	63%		

* Source: Ciudad Juarez water utility, JMAS, 2012
** Source: Ciudad Juarez Urban Development Plan (UDP)
lps = liters per second; MGD = millions of gallons per day

Roadway System and Mobility Profile

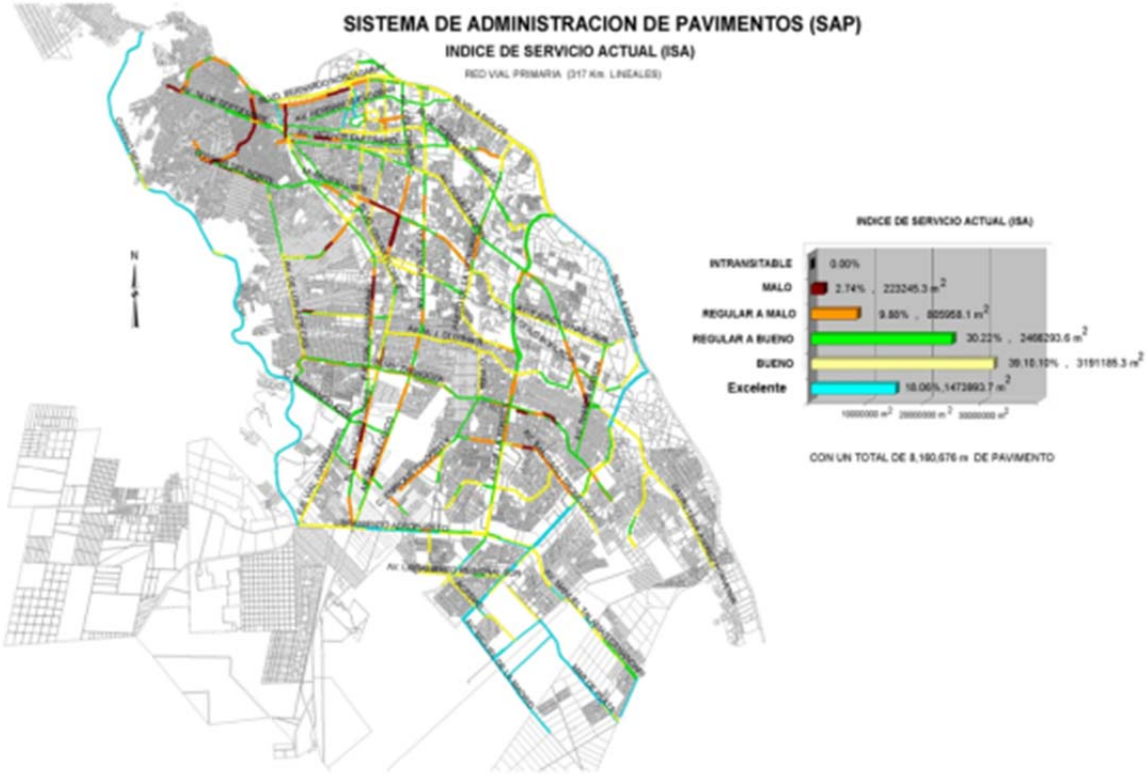
The city's roadway system consists of primary, secondary, and collector (distributor) roads. In the 2010 Ciudad Juarez Urban Development Plan (UDP), the Municipality established the need to relieve severe traffic congestion and to interconnect the regional system with major inter-city roadways in order to meet quality and mobility requirements.

The city's roadway infrastructure consists of 5,167 km (3,211 miles) of streets and roadways, which represent an area of 56,836,245 m^2 (611,780,249 ft^2). In the last seven years this area grew by 43%. Of the city's total roadway area, 63% has been stabilized with some type of

[4] Source: INEGI, 2009 economic census.

pavement (35,847,602 m^2 or 385,860,377 ft^2), while the remaining 37% are dirt roads. The current condition of the city's roadway system is shown below in Figure 2.

Figure 2
CURRENT STATUS OF ROADWAY PAVEMENT IN CIUDAD JUAREZ, CHIH



The Ciudad Juarez UDP indicates that a significant number of subdivisions lack paved roads, which affects the mobility of local residents in getting to work and school, constrains their interaction with the rest of the community, and impedes the access of public safety and service vehicles to these isolated areas. Moreover, Strategy No. 11 (roads and transportation) in the Juarez UDP establishes the need to interconnect regional roadways with the major intercity thoroughfares.

The Project is aimed at promoting the efficient and planned development of the city's transportation system by achieving a balance between mobility and accessibility, in addition to encouraging investments in areas that are already populated and/or have established work centers. The Project addresses the needs established in the UDP, as it consists of the construction and rehabilitation of roads by paving and resurfacing with hydraulic concrete to improve the city's urban mobility.

Project Scope and Design

The Project consists of the construction and/or reconstruction along 15 roadways and six vehicle overpasses, as well as the lining of a section of the 2-A drain with concrete. An area of approximately 1.42 million m^2 will be paved, with 25.9 km of new paving and 41.6 km of paving rehabilitation.

Below is a description of the proposed Project components:

Roadways:

1. C. Oro
2. C. Ignacio Altamirano
3. Av. Insurgentes
4. Av. División del Norte
5. Av. Adolfo López Mateos
6. Av. Plutarco Elías Calles
7. Av. Teófilo Borunda.
8. Av. Manuel J. Clouthier.
9. C. Ramón Rayón
10. C. Miguel de la Madrid
11. C. Zihuatanejo.
12. Av. Enrique Pinoncelli
13. Colonia Campesina
14. Av. Santiago Blancas-Santiago Troncoso
15. Viaducto Díaz Ordaz

Overpasses:

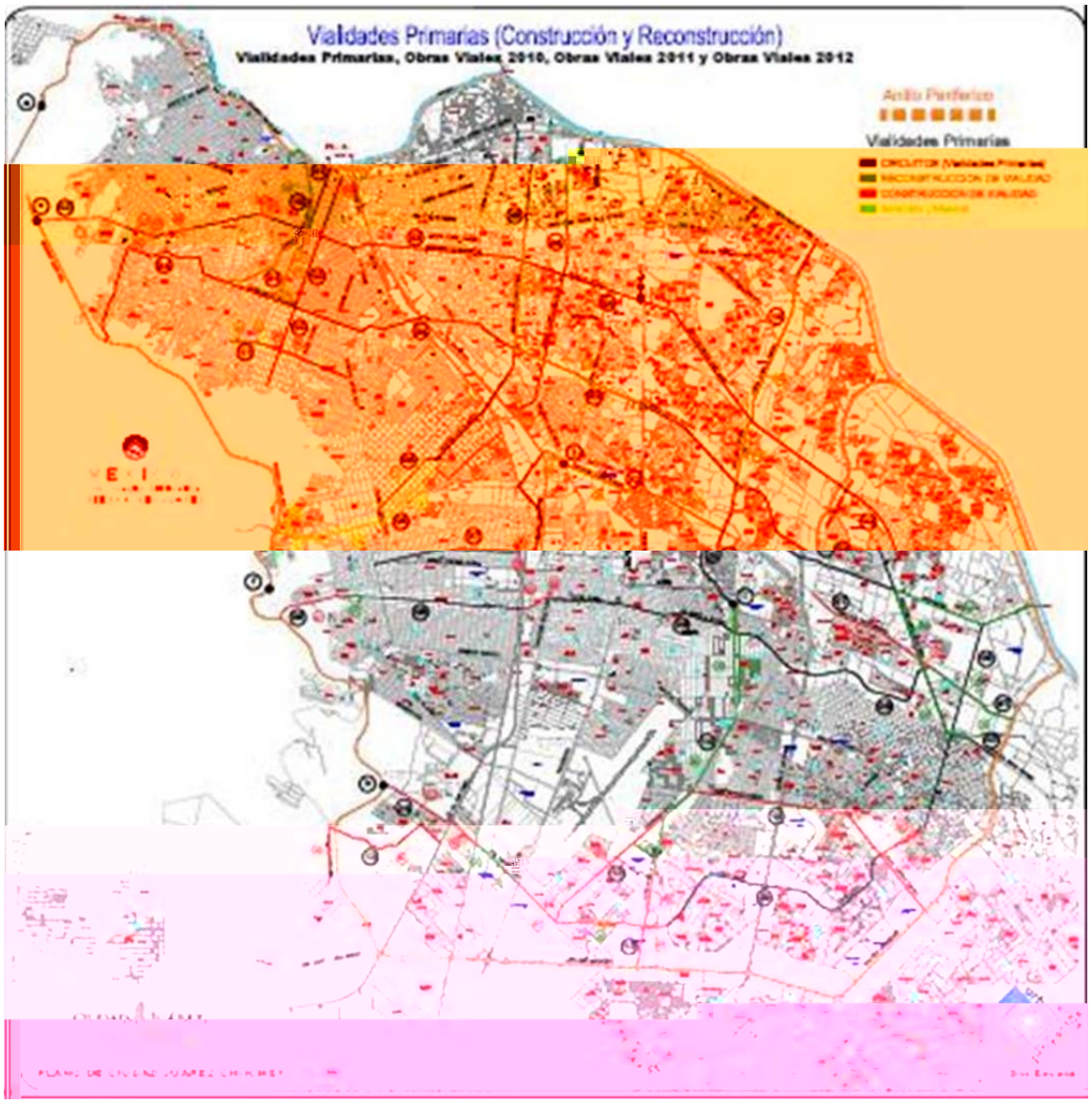
1. C. León Guzmán-– Camino Real
2. Blvd. Teófilo Borunda – Blvd. Oscar Flores
3. C. Granito – Camino Real
4. C. Lucha y Triunfo – Camino Real
5. Av. Miguel de la Madrid – Av. Paseo de la Victoria
6. Av. 16 de Septiembre – Camino Real

Storm water drainage

1. 2-A drain, between Av. Manuel J. Clouthier – Av. Francisco Villarreal Torres

The Project also includes complementary works such as the construction or replacement of sidewalks, waterlines, and street landscaping. Figure 3 shows the location of the roads included in the Project.

Figure 3
LOCATION OF PROJECT'S ROADS



The Municipality of Juarez, in coordination with the local water and wastewater utility, *Junta Municipal de Agua y Saneamiento (JMAS*), has identified the needs of the existing water and wastewater infrastructure that must be addressed during the proposed road construction activities. Investments in water-related infrastructure will be contracted by JMAS with its own resources or appropriated grants. The required works will be implemented in parallel with the proposed Project where water-related infrastructure needs to be rehabilitated or introduced for the first time to prevent public health risks and negative impacts to local mobility.

The Project will improve the city's mobility by addressing the current lack of connectivity between its main thoroughfares, mainly by diverting traffic to the exterior loop (Camino Real).

This is expected to minimize traffic congestion and will likely contribute to the reduction of traffic loads on the city's inner primary roadway system, thus creating a more fluid urban transportation system. The direct beneficiaries of the Project will be those adjacent to the areas of the roads that are going to be paved or resurfaced (382,324 residents). However, the Project is expected to benefit the entire population of Ciudad Juarez (1,332,131 residents) by improving the mobility in the city.

The Project was designed in conformance with standard engineering practices and is consistent with the guidelines established by the Mexican Ministry of Communications and Transportation (SCT) for geometric pavement design, the state water agency *Junta Central de Agua y Saneamiento* (JCAS) for relevant water and wastewater designs, and the technical guidelines for storm water design issued by the Mexican National Water Commission (CONAGUA). The Department of Public Works completed all final designs, which were approved by the State Congress on June 5, 2012. The bidding process was initiated on June 6, 2012. The Municipality expects to award the contract by early August 2012. Project construction is scheduled to be completed in July 2013. Table 2 presents the status of key project milestones.

Table 2
PROJECT MILESTONES

Key Milestones	Status
Approval by City Council	Completed
Approval by Congress	Completed
Approval of final designs by Congress	Completed
Procurement (bidding documents issued)	Initiated
Bidding Process	Estimated: June - August 2012
Signing of PPP Service Agreement	Estimated in September 2012
Construction period	Estimated: September 2012 - July 2013

2.1.2. Technical Feasibility

Selected Technology

The Project scope was defined based on studies conducted in the city in recent years (2003-2010) by the municipal research and planning institute, *Instituto Municipal de Investigación y Planeación* (IMIP), which implemented a Pavement Management System (*Sistema de Administración de Pavimentos*, SAP) to identify the overall status of the road system, rating the pavement conditions and the deterioration of the road surface. Additionally, IMIP created a Vehicle Traffic Monitoring System (*Monitoreo de Aforos de Tránsito Vehicular,* SIMATRA), which has been useful in developing vehicle traffic studies. For purposes of pavement design, the system has provided traffic volume and vehicle data, as well as information on the required load capacity of pavements

Roadways were selected for paving based on a viability and traffic volume study developed recently in the area and for strategic points of the city (2003-2010), pursuant to the following criteria:

- Roadways with highest vehicle traffic flows;
- Major city roadways;
- Roadways that provide access to strategic points in the city; and
- Roadways that interconnect the regional road system with major intercity roads.

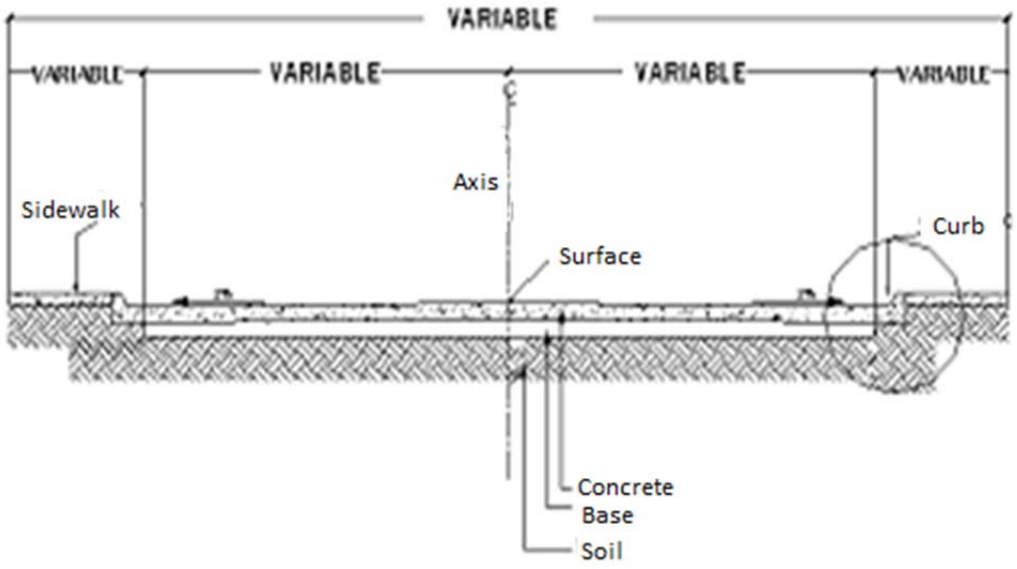
Infrastructure improvements related to the 2-A drain were determined necessary due to road investments adjacent to the existing unlined canal. The total length of the 2-A drain in the urban area is just over 12 km (approx. 7.5 miles), and is under the jurisdiction of CONAGUA. The segment of the drain included in the paving project is approximately 2.5 km (1.6 miles), while the construction of remaining segments is being undertaken by CONAGUA. In addition, the Department of Public Works, in coordination with JMAS, verified that streets selected for paving have the necessary water and sewer infrastructure or that implementation of water-related investments has been considered to ensure the appropriate operation of water and wastewater systems.

For this Project, the technical analysis considered asphalt and hydraulic concrete as alternatives for Project construction. Hydraulic concrete was preferred over asphalt because the Project life cycle and cost were higher for asphalt. The financial structure selected to build the Project also favors hydraulic concrete over asphalt due to the lower maintenance costs. Additionally, the more frequent maintenance required for asphalt affects vehicle mobility. Finally, hydraulic concrete brings additional benefits by being a cool paving technique.

The base will be constructed with material typically used for lining, as required by Cd. Juarez's Department of Public Works. The material will be piled up, mixed, homogenized, laid out, shaped, compacted, and brought to optimal humidity. The Soil Mechanics Laboratory will review the thickness and compaction rate to ensure a 95% maximum dry density (MDD) compaction rate. Where needed, contention walls or required support structures are being considered, as well as all easements, relocation of other infrastructure services and property rights and land requirements. Excavation and cutting will depend on the stage of construction. The excess of unusable material will be removed from the work area and hauled to a waste collection site outside of the work to an area designated by the Municipality.

The design includes the supply and installation of ready-mix concrete slabs with a tensile strength of MR=45 kg/cm^2, 19 mm Dmax and R.N of 8 cm +/- 2 to cast, built in two bands measuring 5.25 m wide each and reinforced with steel welded wire mesh. The Project also includes the construction of trapezoidal concrete curbs measuring 12 cm in height and 35 cm in depth (see Figure 4).

Figure 4
MODEL OF CONCRETE PAVING



The Project includes concrete curbs and gutters as well as the construction of storm water sewers and absorption wells when required. The geometric design of the roadways incorporates a grade line at the center of the street for runoff towards the curbs by means of a 2% minimum gradient, and the installation of elevated manholes above the runoff level to prevent water infiltration into the sewer system. Cd. Juarez and CONAGUA, using the "Ciudad Juárez Risk Atlas," have identified the areas at greatest risk for flooding. This information was the basis for the design of storm water drainage structures for all the roadways. Additionally, design of the 2-A drain component was provided by CONAGUA.

2.1.3. Land Acquisition and Right-of-way Requirements

The Project will be constructed primarily within existing rights-of-way. The Municipality has identified some private properties that need to be acquired. The Department of Public Works has advanced negotiations on all of these lots. Based on the latest communication with the Sponsor, there seems to be no problem with their acquisition. Land acquisition is expected to be paid as part of the Project costs. No further changes to the use of land are required for the implementation of the Project.

Regarding the 2-A drain, a permit is required from CONAGUA. According to information provided by CONAGUA, the permit is expected to be issued to the Municipality prior to initiation of construction.

2.1.4. Management and Operations

Cd. Juarez has different departments available to carry out Project procurement, supervision and management tasks, specifically:

- Department of Public Works
- Department of Urban Development
- Department of Ecology and Civil Preparedness
- Municipal Research and Planning Institute
- Treasury

The Municipality will require the PPP Contractor to provide services that include: Project financing, construction, maintenance, and operation for the roadways that are part of the proposed Project. It also will have to provide evidence that it has access to loan financing for the Project. Additionally, the PPP Contractor must purchase insurance bonds to ensure compliance with the Project timeframe and to guarantee against construction faults. The Department of Public Works will validate the bidding document and supervise the execution of the Project.

The PPP Contractor will also develop a specific operation and maintenance program prior to the completion of paving tasks. The program will include corrective and preventive maintenance required for concrete structures throughout their life cycle. The Department of Publics Works will be in charge of quality assurance/quality control of the roads over the term of the PPP Service Agreement.

2.2 ENVIRONMENTAL CRITERIA

2.2.1. Compliance with Applicable Environmental Laws and Regulations

Applicable Laws and Regulations

The Project will be implemented in areas subject to the jurisdiction of the Municipality, with the exception of the 2-A drain; therefore, neither formal federal environmental clearance authorizations nor a consultation with the National Anthropology and History Institute (*Instituto Nacional de Antropología e Historia*, INAH) are required for those components. For the 2-A drain, a federal environmental clearance ruling is applicable. Disturbances of cultural or historical resources are not anticipated; however, should any cultural resources be found, construction tasks will be deferred until an assessment is performed by the INAH. The Municipality's Department of Ecology and Civil Preparedness has established that an environmental impact assessment is not required for resurfacing tasks; however, a local environmental impact clearance is required for the construction of each new pavement component and the overpasses.

Environmental Studies and Compliance Activities

Under the framework provided by the PPP legislation, a cost-benefit analysis was performed. The study focuses on financing costs with a general reference to the anticipated environmental and human health benefits. This study was the basis for the approval of the Project by the governing authorities.

Due to the nature of the Project, no environmental studies were required to comply with applicable laws. Final designs for new construction were submitted to obtain environmental clearance authorization by the Department of Ecology and Civil Preparedness. Because the Project is located in a pre-disturbed urban area, only minimal impacts are anticipated, including primarily temporary impacts associated with construction. In accordance with practices recommended by federal environmental authorities, mitigation measures to address temporary environmental effects of construction are noted in the issued ruling. CONAGUA developed the environmental studies for consideration by SEMARNAT for environmental clearance of all the urban storm water infrastructure related to provided

carbon monoxide (CO) in the Ciudad Juarez-El Paso airshed by reducing the time required for travel by the average vehicle in the urban area.

Existing Conditions and Project Impact – Environment

In 2007, the Municipality commissioned the SAP, which reviewed the surface area of 690.5 km (429 miles) of the primary and secondary roadway system. The study focused primarily on pavement conditions and classified roads by the degree of deterioration visible on their surface, in order to establish a current and historical database of road system conditions. One of the study's main contributions was the prioritization of pavement maintenance and rehabilitation investment needs, as well as the development of historical records of each road section by comparing construction dates with the life cycle of each road. The study determined that: 57% of the roads are in acceptable conditions, 30% are in poor but still acceptable conditions, and 13% are in unacceptable operating conditions. In addition, the study revealed that paving activities have often been repeated on the same streets, for issues such as recurring pothole repairs, thereby diverting investment from other paving deficiencies in the city.

Due to the current state of pavement and the high traffic flow on damaged streets, the city suffers constrained conditions for general urban mobility, which promotes an air pollution problem that is exacerbated by the existence of old and polluting vehicles traveling on local roads.

Another problem observed is the frequent discontinuity of roads, either because of topographic conditions and/or unplanned urban settlements in the areas where future roadway connections are projected. This lack of continuity results in longer transportation times, impacting health and environmental conditions in the city.

The laws listed below are applicable to national air quality standards, and the implementation of the proposed Project will contribute to complying with these standards:

- *Official Mexican Norm NOM-025-SSA1-1993. "Environmental Health. Criteria for evaluating ambient air quality with respect to total suspended particles (TSP), particles below 10 microns (PM_{10}), and particles below 2.5 microns ($PM_{2.5}$). Criteria for evaluating air quality." Permissible limit of 150 µg/m^3 in 24 hours, once a year.*

- *Official Mexican Norm NOM-020-SSA1-1993. "Environmental Health. Criteria for evaluating ambient air quality with respect to ozone (O_3). Regulated value for ozone (O_3) concentrations in ambient air, as a public health protection measure." Permissible limit of 0.11 ppm or what is equivalent to 216 mg /m^3 in one hour, once a year.*

- *Official Mexican Norm NOM-021-SSA1-1993. "Environmental Health. Criteria for evaluating ambient air quality with respect to carbon monoxide (CO). Permissible value for carbon monoxide (CO) concentrations in ambient air, as a public health protection measure." Permissible limit of 11.00 ppm or what is equivalent to 12.595 mg/m^3 averaged over eight hours, once a year.*

- *Official Mexican Norm NOM-022-SSA1-2010. "Environmental Health. Criteria for evaluating ambient air quality with respect to sulfur dioxide (SO_2). Regulated value for sulfur dioxide (SO_2) in ambient air, as a public health protection measure." Permissible limit of 0.110 ppm or 288 mg/m^3 averaged over 24 hours, once a year.*

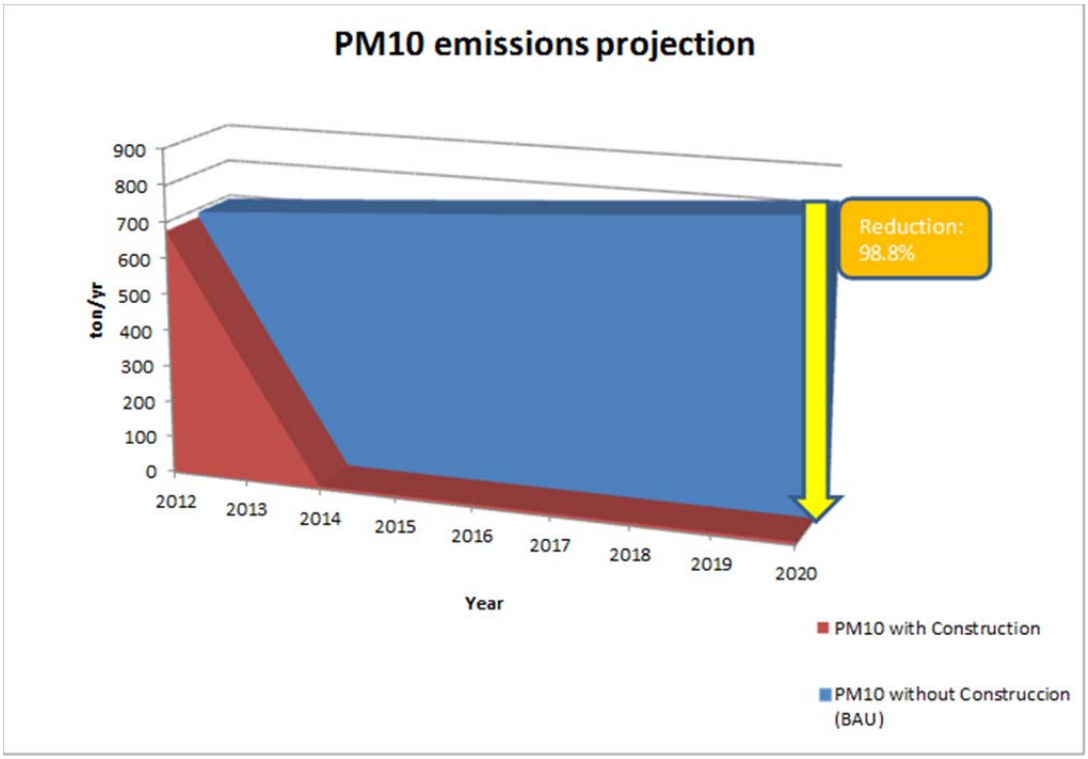
- *Official Mexican Norm NOM-023-SSA1-1993. "Environmental Health. Criteria for evaluating ambient air quality with respect to nitrogen dioxide (NO_2). Regulated value for nitrogen dioxide (NO_2) in ambient air, as a public health protection measure." Permissible limit of 0.21 ppm or what is equivalent to 395 mg/m^3 in one hour, once a year.*

The implementation of the Project will help to reduce environmental and health impacts in the city related to non-compliance with these norms. The specific air quality benefits anticipated for the Project include the reduction of PM_{10} emissions and motor vehicle combustion gases.

Reduction of PM_{10} emissions. Vehicle traffic on unpaved roads causes the suspension of particles that directly impact public health. Pursuant to the methodology recommended and approved by USEPA AP-42 to estimate PM_{10} emissions by vehicles traveling on unpaved roads, it has been estimated that newly paved roads will reduce emissions by 98.8%, which equates to 677 ton/yr. of PM_{10} (see Figure 5) and 96.7%, which equates to 67 ton/year of $PM_{2.5}$.

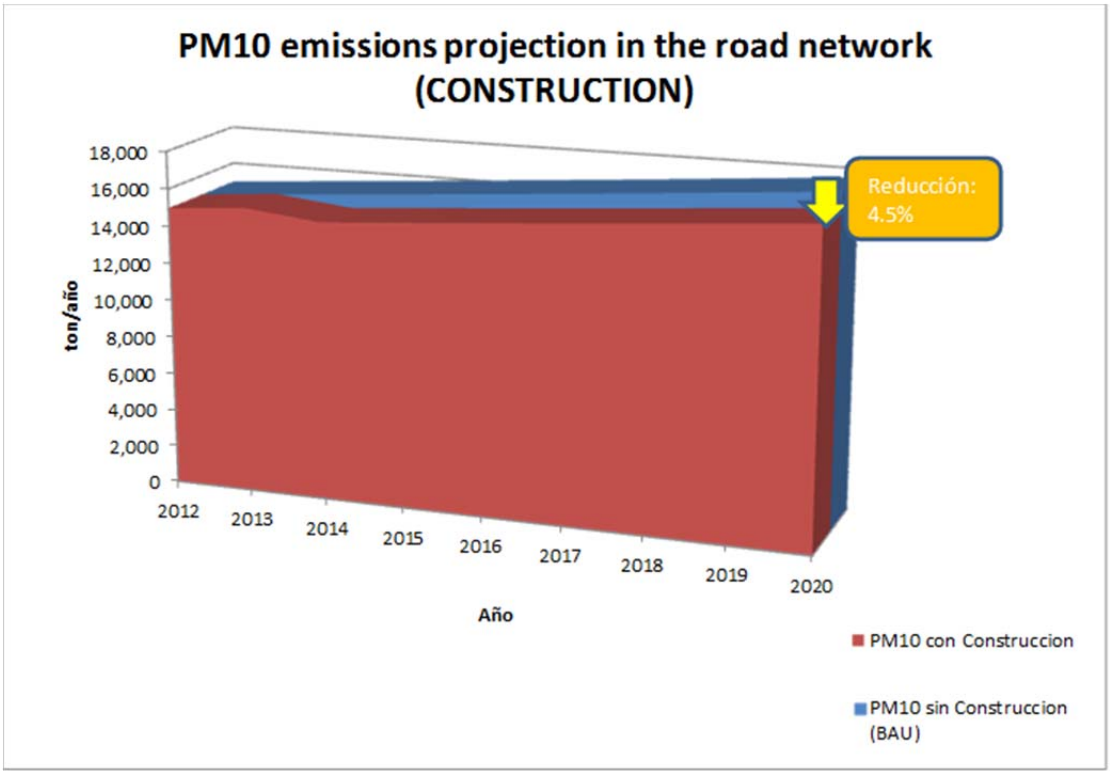
Figure 5

PM_{10} EMISSIONS REDUCTION RESULTING FROM THE CONSTRUCTION OF NEW PAVEMENT



Under a broader scope, the 2006-2012 Ciudad Juarez Air Quality Management Program (Proaire) estimates that PM_{10} emissions on unpaved roads are equal to 14,981.2 ton/year. A reduction of 677 ton/year (see Figure 6) represents a 4.5% reduction relative to emissions throughout the city.

Figure 6
PM_{10} EMISSIONS REDUCTION RESULTING FROM PROJECT IMPLEMENTATION RELATIVE TO EMISSIONS THROUGHOUT THE CITY



Reduction of motor vehicle combustion gases. The Project was evaluated with vehicle speeds observed throughout the road system, to identify its environmental and urban mobility benefits. It can be expected that higher vehicle speeds on local roadways will reduce combustion gas emissions, including nitrogen oxides (NOx), sulfur oxides (SOx), volatile organic compounds (VOC), and carbon monoxide (CO). According to information provided by IMIP, the average speed across the city is 37 km/h (23 mph); 45 km/h (28 mph) on primary roads; and 35 km/h (22 mph) on secondary roads and in residential areas. Scenarios were analyzed, taking into consideration improved traffic efficiency resulting from the increased speed of circulation in the road network. Under these assumptions and with the available information, mobility improvements were modeled according to the road type (primary, secondary and residential). An increase in speed to the maximum limit allowed was considered in the roadways included in the Project.[6] For primary roads, an increase of 45 km/h (28 mph) to 60 km/h (37 mph) was

[6] IMIP.

utilized, while 35 km/h (22 mph) to 40 km/h (25 mph) was estimated for secondary and residential roads. Thus, the general scenario evaluated the average speed of the road network as being increased by 8 km/h. The analyses performed using the Mobile 6.2 Mexico model indicate that a 8 km/h increase in speed will reduce NOx emissions by 3.8% (270.5 ton/yr), VOC by 8.6% (412.7 ton/year), and CO by 3.7% (1551.9 ton/year). A slight 0.1% (0.4 ton/year) increase is expected in SOx emissions, inasmuch as higher vehicle traffic speeds also cause an increase in fuel consumption.

Mitigation of Risks

During the implementation of the Project, measures will be taken to mitigate temporary effects of construction by introducing the preventive actions recommended by the environmental federal authorities, such as:

- *Site preparation of areas to be paved*
    - Minimize the emission of dust generated by vehicle traffic by irrigating the areas where work will be performed.
    - With regard to air emissions caused by motor vehicles, all vehicles used in the Project must have emission control systems.
- *Noise emission caused by the circulation of motor vehicles and the use of heavy machinery*
    - All operating vehicles must close their exhaust and operate at low speed around the work areas.
    - All vehicles must comply with Mexican standard NOM-080-ECOL-1994, which establishes the maximum permissible levels of noise from motor vehicles, motorcycles, and 3-wheel motor vehicles, as well as noise measuring methods.
- Site preparation and construction
    - Wastewater collected in portable containers will be disposed of by an authorized company.
    - The use of water should be optimized during construction of the Project. Potable water will be obtained in containers from local suppliers.
    - Only treated water will be used for the Project's different construction activities.
    - The water required during the construction phase should be obtained from a water tap provided by the local utility JMAS or from an alternative source authorized by CONAGUA.
    - Stone materials required for construction should be obtained from local quarries.
    - Excavations will only be performed in areas previously identified by the Project.
    - In-fill activities will be performed, preferably, with the material from the excavations whenever appropriate.

- *Waste management*
    - All non-recyclable solid wastes must be disposed of according to applicable procedures and in facilities designated by the authorities for this purpose.
    - The work area will be cleaned periodically.
    - Backfill and compacting materials should be free of hazardous and non-hazardous waste, ensuring that such materials are moved to authorized confinement or treatment sites.
    - In order to avoid ground contamination generated by vehicle, machinery and equipment maintenance and oil changes, these activities will be carried out in authorized service shops.

Natural Resource Conservation

The Project's objective is to improve urban mobility and adequate access to residential areas within the urban transportation system, resulting in improved air quality in the Ciudad Juarez airshed and increased health benefits for border residents. The Project does not interfere with natural resource conservation at the local level, as it will be developed on existing roadways within the urban area, and no land use changes will be required. Additionally, it contributes to reduce air quality deterioration by improving traffic flow in the city's road system.

No Action Alternative

The no action alternative was dismissed because the ongoing deterioration of roadways increases maintenance costs and poses risks to mobility in key arteries throughout the city. The issue of the emission of pollutants into the atmosphere would be exacerbated in the common binational airshed. There would be an increased risk for water service interruptions and dangerous road conditions as a result of collector collapses or unmanaged storm water.

It is expected that the natural growth of the vehicle fleet, population and commercial activity will result in the increased emission of pollutants. In order to evaluate the environmental benefits of the Project, two scenarios tagged as "Without Project" and "With Project" were analyzed in a midterm scope as shown in Table 3 below.

Table 3
PROJECTED EMISSIONS "WITH" AND "WITHOUT" THE PROJECT

Year	VOC (ton/year)		CO (ton/year)		Nox (ton/year)		Sox (ton/year)	
	Without Project	With Project	Without Project	With Project	Without Project	With Project	Without Project	With Project
2,011	4,274.6	4,274.6	36,910.5	36,910.5	6,693.5	6,693.5	361.8	361.8
2,012	4,440.1	4,440.1	38,392.9	38,392.9	6,810.0	6,810.0	371.4	371.4
2,013	4,612.4	4,612.4	39,936.8	39,936.8	6,931.3	6,931.3	381.3	381.3
2,014	4,791.8	4,379.1	41,544.6	39,992.7	7,057.6	6,787.1	391.6	392.0
2,015	4,978.7	4,551.7	43,218.9	41,613.5	7,189.2	6,917.9	402.3	402.7
2,016	5,173.3	4,731.5	44,962.7	43,301.5	7,326.2	7,054.1	413.5	413.9
2,017	5,376.0	4,918.7	46,778.6	45,059.4	7,468.9	7,196.0	425.1	425.6
2,018	5,587.0	5,113.6	48,669.8	46,890.2	7,617.5	7,343.7	437.3	437.7
2,019	5,806.9	5,316.6	50,639.3	48,796.7	7,772.2	7,497.6	449.9	450.3
2,020	6,035.8	5,528.1	52,690.4	50,782.3	7,933.4	7,657.8	463.0	463.5

Additionally, the Project is necessary to meet the existing and future urban development needs of Ciudad Juarez. Affordable Project financing is important to support the implementation and ongoing investment in adequate urban infrastructure. Without access to affordable financing, the pending works and future investments by the Municipality may be delayed or postponed, creating a threat to the environment and health.

Existing Conditions and Project Impact – Health

According to the Municipal Development Plan (MDP), the lack of paving significantly degrades the quality of the air that Juarez residents breathe. "It is estimated that nearly 60% of airborne particles are those known as PM_{10}. These particles can cause a significant increase in the rate of respiratory, gastrointestinal, and eye diseases."[7]

The latest morbidity statistics for Ciudad Juarez show that during 2010 there were 291,192 cases of acute respiratory infections (ARIs), representing a rate of 1,995 cases per 10,000 residents.[8] Consequently, any project that improves air quality will help to reduce the incidence of ARIs in Ciudad Juarez.

The proposed Project is anticipated to reduce the emission of particulate matter and combustion gases by reducing the amount of time required by average vehicles to travel in the urban area. These improvements will help reduce respiratory illnesses and allergies aggravated by these conditions.

PM_{10}. Environmental health benefits that will result from the Project's implementation are expected to be influenced by a reduction in pollutant emissions and the concentration of PM_{10}

[7] Municipal Development Plan (MDP), p. 52
[8] *Secretaria de Salud del Gobierno del Estado de Chihuahua* (Chihuahua State Ministry of Health), 2011.

particles. Several studies have been conducted in Mexico to assess the mortality associated with PM_{10} exposure. These studies showed a 1.4% increase in mortality for every 10 $\mu g/m^3$ increase in concentration. According to estimates developed by Mario Molina, a reduction of 10 $\mu g/m^3$ in PM_{10} concentrations can reduce premature deaths by up to 1,000/year, considering a population the size of Mexico City.[9]

Vehicular Combustion Gases. Improved traffic flow will help reduce the concentration of pollutants released into the atmosphere, such as volatile organic compounds (VOC), nitrogen oxides (NOx), and carbon monoxide (CO). Some of the short-term effects of exposure include eye, nose, and throat irritation, as well as upper respiratory tract infections such as bronchitis and pneumonia. Long-term effects may include chronic respiratory diseases, lung cancer, heart disease, and even brain, nervous, liver, or kidney damage. Morbidity and mortality associated with air pollution episodes have also been observed.[10]

Transboundary Effects

A positive transboundary impact is expected from the Project through the improvement of air quality in the Ciudad Juarez-El Paso airshed. El Paso County is designated as a Non-Attainment area by EPA for PM_{10} and the reduction of particulate matter may result in an improvement to this condition.

In addition, a consultation was conducted with the Mexican Section of the International Boundary and Water Commission (CILA) to review the Project and identify potential transboundary impacts, including those related to storm water management influenced by new paving and other roadway improvements. Relevant road designs to evaluate the potential effects of transboundary drainage influenced by the proposed Project were provided to CILA. The results of the final review will be taken into account by BECC/NADB prior to execution of the loan agreement.

Additionally, CILA commented on the broader issue of storm water management related to the 2-A drain and the capacity of the receiving interceptor. The need for storm water management improvements is neither directly created nor solved by the proposed Project. Accordingly, follow-up meetings were conducted with CONAGUA and CILA to clarify additional measures outside of the scope of this Project to mitigate potential transboundary impacts.

Other Local Project Benefits

The Project will strengthen the Municipality of Juarez by increasing its capacity to manage its road system and reduce inefficient maintenance requirements. In addition, the PPP Contractor will provide supplemental support to city staff in maintaining the long-term investment required to implement this Project, as well as establish important experience for future projects developed under similar investment mechanisms. The infrastructure investments in the 2-A drain will improve the storm water management by collecting and directing these water flows away from the urban area, protecting the community from flood conditions.

[9] Molina, L.T and Molina, M., 2002.
[10] Shen, et al, 2002; Nemmar, et al, 2004; Desantes, et al, 2005; Peters, 2006; Wilson, et al, 2006.

As for the public transportation system, the Project will promote an optimal evolution of the city's system by achieving a balance between mobility and accessibility, in addition to encouraging investments in areas that are already populated and/or have work centers. The roads included in the Project would connect with the trunk network of the new mass transit system (BRT) proposed for the city (Routes 1 and 2).

Finally, other direct benefits to the community are expected to include an improved quality of life of the population by reducing travel times, promoting quick access by emergency and public safety vehicles; fostering economic development in the region, and increasing property values in areas adjacent to the Project.

2.3 FINANCIAL CRITERIA

2.3.1. Sources and Uses of Funds

The total cost of the Project is $2,200 million pesos. This figure includes all construction costs, as well as supervision, and taxes and other indirect costs such as land acquisition. NADB estimates that the PPP Contractor may require loan financing for up to 85% of Project costs. Based on this estimate, Table 4 presents the sources of funds.

Table 4
SOURCES OF FUNDS
(Million pesos)

Uses	Amount	%
Construction and related activities	$2,200.0	100.0
TOTAL	2,200.0	100.0
Sources	**Amount**	**%**
PPP Contractor Equity	330.0	15.0
NADB Loan	1,870.0	85.0
TOTAL	$2,200.0	100.0

Because the sources of funding for the Project will be secured by the PPP Contractor, NADB must have advance approval for the terms and conditions of a NADB loan in order to present them to the winner of the competitive public procurement process. NADB's financial terms and conditions will likely provide the most attractive financing for the Project.

3. PUBLIC ACCESS TO INFORMATION

3.1. PUBLIC CONSULTATION

BECC released the Project Certification Document (PCD) for a 30-day public comment period beginning February 15, 2012. The following Project documentation was made available for public access:

- *Proyecto de Construcción y Reconstrucción de Vialidades elaborado por Dirección de Obras Públicas* (Roadway Construction and Reconstruction Project developed by the Department of Public Works), 2012.
- Environmental Impact Rulings by the Department of Ecology and Civil Preparedness and a federal environmental clearance by SEMARNAT for 2-A drain.
- *Sistema de Administración de Pavimentos* (SAP) (Pavement Management System)
- *Monitoreo de Aforos de Tránsito Vehicular* (SIMATRA) (Vehicle Traffic Monitoring System)
- *Ley de Proyectos de Inversión Pública a Largo Plazo del Estado de Chihuahua (Long-term Public Project Investment Act of the State of Chihuahua or PPP legislation)*
- *The Ciudad Juarez 2010-2013 Municipal Development Plan (MDP)*
- *Ciudad Juarez Urban Development Plan (UDP).*
- *City Council approval resolution of the Project, dated December 12, 2011*

As a result of the public consulation period, BECC received a total of 358 comments related to the Project. After an analysis of the comments conducted by BECC staff, with support from an independent consultant experienced in communication and media analysis, 78 were found to be duplicative of other transmittals and disregarded for further consideration. Of the revised total of 280, 133 were issued via the non-governmental organization "*Pacto por Juárez*"[11] and 147 comments were received from the general public. Also, of the 280 comments, 238 were not related to the Project's compliance with the certification criteria and posed, almost equally, both positive and negative opinions. For those comments that expressed concern, the themes referred to: conflict of interest, contradicting priorities, reputation of past performance, and the autocracy of the current administration. Positive comments recognized improvements to air quality, urban image, job generation, quality of life and competitiveness of the city.
The remaining 42 comments posed questions relevant to elements of the certification criteria, distributed as follows:

Table 8
PUBLIC COMMENT ANALYSIS

[11] Comments received through this group were transmitted via a common group server, although each was individualized by sender name. The group's website presented the Project Certification Document as well as a video, which presented information not developed in accordance with the public information supported by the Project Sponsor or contained in the certification document. The opinions submitted through the group server were more generally focused on overarching governance concerns or political views.

Classification	Amount	%
Opinion (non-criteria related)	238	85.00%
Technical Criteria	14	5.00%
Environmental Criteria	2	0.71%
Financial Criteria	24	8.58%
Public Access to Information	2	0.71%
TOTAL	**280**	**100.00%**

The 42 criteria-related questions were further considered in the completion of the Project proposal and recommendation for certification. A summary of these comments and related responses are provided below.

Technical Criteria

Fourteen public comments were focused on the technical criteria and represent 5% of the overall comments received. The following table summarizes the concerns raised and the response to those concerns.

Table 9
PUBLIC COMMENTS CONCERNING TECHNICAL CRITERIA

Concern	Response
The technical capacity of the Municipality given the reputation of performance on previous projects, especially related to patching and paving.	- In accordance with the Chihuahua PPP legislation, the Municipality will sign a PPP Service Agreement awarded to a private company through a competitive public procurement process and will be responsible for review and acceptance of the constructed infrastructure. The Municipality is also responsible for supervising the operation of the infrastructure under the PPP Service Agreement for the term of 20 years. - The PPP legislation establishes multiple layers of management and supervision responsibilities required for this financing scheme. The Municipality has appointed an administrator of the Project, a municipal inter-departmental committee and a technical task force to review technical and financial aspects and progress of the Project. - Additionally, the works will be supervised during the implementation of the Project by a third party who will ensure compliance with design specifications and quality standards. - The SPC will be responsible for the long-term (20-year) maintenance of the constructed roadways through the PPP Service Agreement. Therefore, the quality of construction is expected to be high.
The lack of preliminary engineering.	The final designs have been completed and included in the bidding documents published in June 2012. Additionally, these were reviewed and approved by the State Congress.
The commitment of the water utility (JMAS) and other	- JMAS has identified the necessary water-related infrastructure investments and will contract these works directly using the utility's

Concern	Response
companies such as natural gas and electricity for underground utility works within the Project.	resources or other appropriated funds. The required works will be implemented in parallel with the paving works. Disbursements related to the paving works will depend on the installation of appropriate hydraulic infrastructure. - For other underground utilities, an inter-sectorial committee was established that includes natural gas, electricity (CFE), and other utilities to ensure coordination with the Municipality. These agencies reviewed the Project works and appropriate relocations or other actions to be taken.

Environmental Criteria

Two comments were received related to the environmental criteria, which represent less than 1% of the total comments received. The concerns presented refer to potential environmental impacts and the level of air quality improvements to be achieved by this Project in comparison with other possible investments. The following points respond to these concerns:

- The certification criteria require that a project comply with existing environmental laws in the project location. In this case, the environmental clearance authorization for paving projects is the responsibility of the local government. The potential environmental impacts related to the implementation of the Project have been reviewed by the municipal authority and an authorization has been issued for each new paving work. For the 2-A drain, a federal environmental authorization was obtained.
- Regarding the level of air quality improvements anticipated for the Project, several strategies could be undertaken to achieve varying levels of air quality benefits in a community. The local governing body has the authority to determine priorities related to capital improvement projects and to consider the expectations of benefits to be achieved in relation to the cost of these improvements. In this case, the Project has been considered and approved by the governing body of the Municipality, as well as by the State Congress.
- The certification process documents a project's compliance with domestic law and facilitates the actions required to achieve compliance. It also estimates potential environmental benefits of a project; however, the criteria do not require a justification of the priority of one investment compared to another in consideration of the level of environmental benefit that may be achieved.

Financial Criteria

For the financial criteria, 24 comments were received, representing 8.5% of all comments received. In general, the issues raised include:

- Concerns related to debt: size, term, and existing financial capacity to pay the debt;
- Long-term impact on municipal operations; and
- Funding through existing cash flow and/or implementation in multiple phases.

The following points respond to the overall concerns expressed in these comments:

- An analysis was performed to consider three financing alternatives for the $2,000 million pesos investment, including: budget financing; direct credit under existing debt requirements; and a long-term PPP scheme. Although this is the first time to implement this scheme, alternative 3 was considered most favorable as it allows the Municipality to execute a large-scale project that would otherwise take much longer to implement due to budgetary and legal limitations, without incurring public debt. Likewise, it provides a commitment from the SPC that the construction works will be adequately implemented and maintained through a long-term (20-year) PPP Service Agreement.
- The PPP legislation contemplates a long-term investment under this mechanism only when the total municipal commitment does not exceed 20% of the municipal budget, unless for a specific reason the State Congress increases this proportional allowance. In this case, the contracted obligation is expected to be well within this requirement.
- The legislation also provides a legal structure to guarantee the continuity of a contract over multiple governing administrations, supporting full implementation of a project and full realization of anticipated benefits. Utilizing only available budget resources and/or a short-term municipal debt mechanism poses the risk that the Project will not be completed and potential benefits will not be achieved. Additionally, the delay in implementation may result in increased costs to address current deficiencies or worsened infrastructure conditions.

Public Access to Information

Finally, three comments, or less than 1% of the total, related to concepts of transparency or public access to information. Comments expressed concerns for a lack of broad citizen participation in the decision-making process. However, several actions were conducted to ensure adequate access to Project information, including the 30-day public comment period and activities conducted by the Project Sponsor during Project development and approval. The outreach activities are described in Section 3.2, below. Additionally, as a public-sector Project, requests for review of Project documents such as final design, which were not available during the public comment period, can be made to the Sponsor through existing regulations to access public information.

3.2. OUTREACH ACTIVITIES

As a voluntary effort of the Sponsor to encourage public participation in the Project, a steering committee was formally established on January 16, 2012, during a meeting held at the *Instituto Municipal de Investigación y Planeación* (IMIP). The committee includes a broad representation of community groups, including chambers and associations related to construction, commerce and services, environmental health, media, and academia. Organizations represented in the group include:

- Ciudad Juarez Chapter of the Mexican Chamber of the Construction Industry
- Ciudad Juarez Association of Civil Engineers
- Northern Border College (COLEF)
- Association of Journalists
- Joint Advisor Committee, Paso del Norte Group
- Ciudad Juarez Association of Architects
- Association of Engineers and Architects
- Municipal Council members and related planning committees
- Municipal Auditor

Regular meetings were held every Monday, from January 13 through February 13, to present the Project's technical and financial information to the public. Four public information meetings were held with 25 to 30 attendees at each meeting. In addition to the organizations represented on the steering committee, the following local organizations were contacted to present to them the Project and related benefits, including:

- Ciudad Juarez Association of Architects
- Association of Engineers and Architects
- Ciudad Juarez University
- Ciudad Juarez Chamber of Commerce
- CEHLIDER (non-governmental leadership organization)
- Ciudad Juarez Association of Business Chambers (CCE)

The steering committee delivered a final public participation report summarizing the actions and results of the process. As a result of this process, the committee will continue to oversee the Project.

Additionally, the Project was reviewed at formal meetings of the City Council and State Congress in accordance with the PPP legislation, including the following:

- Between September and November 2011, the Municipality formed the necessary authoritative bodies (a Municipal Committee and Task Force) and appointed a Project Manager.
- In October 2011, the Municipal Committee approved the Project.
- In December 2011, the Project was approved by the City Council and submitted for approval to the State Congress.
- The Project scope was approved by the State Congress in April 2012, which added a requirement for a special commission to be established to approve final designs prior to procurement.
- In June 2012, the final designs were unanimously approved by the Congressional special commission and by the full State Congress.

Finally, coordination efforts were conducted by BECC and NADB with Council members and State Congress representatives, and Project information was provided to media and other interested parties as requested. Project information was identified in more than 170 press articles and television news coverage and other media. Within these publications, more than 70 participations by local stakeholders such as the Mayor, Council members, and State Congress representatives provided comments related to the Project.