Border Environment Cooperation Commission
Comprehensive Paving Project in Hermosillo, Sonora

1. General Criteria

1.a Project Type

Project Name: Comprehensive Paving Project in Hermosillo, Sonora

Project Sector: Air Quality

1.b Project Category

Category: Community environmental infrastructure project – Community-wide impact

1.c Project Location and Community Profile

Communities: Hermosillo

Location: Located in the center part of the State of Sonora.

Location within the border: Within the 300 km border area

Figure 1 shows the location of Hermosillo, in the central part of the State of Sonora.

Figure 1. Location of the City of Hermosillo in the State of Sonora.

Demographics	
Current population:	785,082 (estimated CONAPO 2006)
Growth rate:	2.20%
Reference:	INEGI Year: 2010/CONAPO
Economically active population:	238,018
Reference:	National Municipal Information System (*Sistema Nacional de Información Municipal*, SNIM)
Median per capita income:	$ 15,310 USD /year
Reference:	BECC estimations based on statistics by INEGI and the National Commission on Minimum Wages
Primary economic activities:	Manufacturing industry, trade, and construction
Marginalization Rate:	Very low (CONAPO)

Services	
Water System	
Water coverage:	98 %
Water supply source:	Deep wells
Wastewater Collection System	
Wastewater coverage:	96.9%
Domestic hookups:	166,710
Wastewater Treatment	
Wastewater treatment coverage:	11 %
Solid Waste	
Solid waste collection coverage:	100%
Street Paving	
Street paving coverage:	72%
Source:	City of Hermosillo 2010

1.d Legal Authority

Project applicant:	City of Hermosillo, through the Directorate of Public Works
Legal representative:	Javier Gandara Magaña
Legal instrument to demonstrate legal authority:	Municipal Code for the State of Sonora.
Date of instrument:	State of Sonora Official Daily No. 1, September 16, 2009

Compliance with Agreements:	• 1983 La Paz Agreement, or Border Environment Agreement • 1990 Integrated Border Environmental Plan (IBEP) • 1994 North American Free Trade Agreement (NAFTA) • Border 2012 Program

1.e. Project Summary

Project Description and Scope:	The project consists of paving roadways in Hermosillo, Sonora, using hydraulic or asphalt pavement.
Components:	The scope of the project is as follows: • Paving 1,548,668 m^2 of roadways, equivalent to increasing street paving coverage from 77% to 87% in the city limits. • The proposal includes construction tasks required for the implementation of the project, including: rehabilitation of water and wastewater collection lines, construction of storm sewers as required, and other tasks related to the project purpose. • The proposed paving layout will be: 20% hydraulic concrete and 80% asphalt pavement. • The project will be executed over a period of Thirty Six months, with construction tasks initiated in 2009. The road paving study identified 160 roads with the most pressing road paving needs. The sectors with more significant street paving issues are located primarily in peripheral areas, which are located to the south of the city where approximately 50 percent of the streets are unpaved roadways.
Population Benefited:	154,400 residents
Project Cost:	$827.9 million pesos
Project Map:	The following figure shows the main streets of the city that have been included in the street paving program.

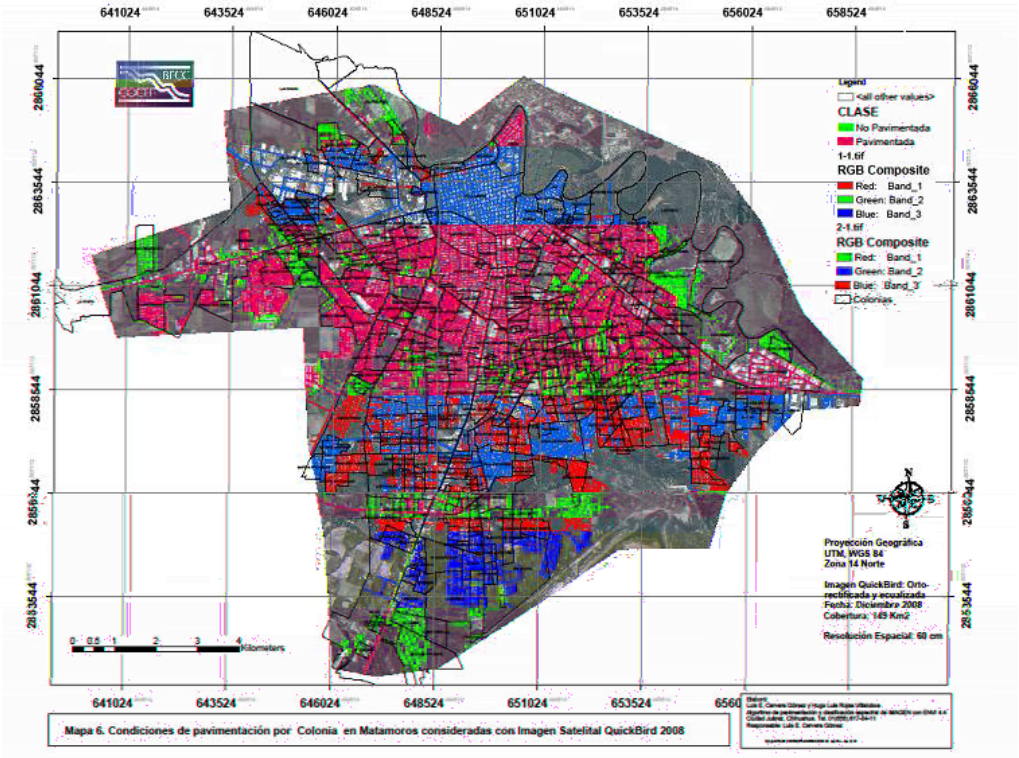


Figure 1. Location of streets in Hermosillo, State of Sonora

Project Justification:

- The project is needed to reduce the concentration of PM_{10} particles in Hermosillo.

- The proposed tasks will immediately reduce the amount of suspended particles released by vehicular traffic traveling on unpaved surfaces and disturbed by the gusty winds that frequently batter the city. These improvements, without a doubt, will help reduce respiratory system illnesses and allergies, which are rather common in the region.

- During the rainy season, the lack of pavement results in rain water pools forming on the surface of local roadways, which also become sources of illness, primarily due to direct human contact with contaminated water.

- The project will also have a secondary effect by reducing the time required for travel by the average vehicle in the urban area, which will reduce the emission of combustion particles.

Project Need or Consequences of the No Action Alternative:	• The City of Hermosillo, Sonora, faces an air pollution problem caused by suspended particles associated to the use of vehicles on unpaved roadways, a condition that is exacerbated by the action of prevailing winds. • The no-action alternative means that the problem associated with dispersion of PM_{10} into the atmosphere will be aggravated, a situation that pose respiratory health problems to area residents. This is due to the fact that sustained exposure to particulate matter that originates from vehicular fuel combustion and vehicular traffic circulating on unpaved roadways may cause eye and nose irritation and an increase in respiratory problems. Street paving is the only proven and viable alternative to reduce particulate matter produced by vehicle traffic.
Prioritization Process Category:	N/A

Pending Issues:

None.

Criterion Summary:

The project consists of paving roadways in Hermosillo, Sonora using hydraulic or asphalt pavement, thus increasing street paving coverage from 77% to 87%. The project is defined as an air quality improvement effort. The project is located within the 100 km border area.

2. Human Health and Environment

2.a Compliance with Applicable Environmental and Cultural Resource Laws and Regulations

Environmental and Public Health needs addressed by the proposed project:

The effects on human health directly related to prolonged exposure to particulate matter (particles with a diameter of 10µm or less) are eyes and nose irritation, an increase in respiratory illnesses, aggravation of asthma, a decrease in lung performance, and an increase of symptoms related to respiratory problems. The effects on human health are determined by the size of the particles, according to their degree of penetration and their permanence in the respiratory system. Most of the particles with a diameter larger than 5 µm are deposited in the upper airways (nose), windpipe and bronchial tubes. Particles with a smaller diameter have a higher probability of being deposited in the bronchi and pulmonary alveoli; therefore, smaller particles are more harmful to human health.

Beneficial environmental impacts that will result from the project's implementation include a reduction in the concentration of PM_{10} particles in the Hermosillo. Failure to implement the project will continue aggravating the problem of PM_{10} particles being dispersed into the atmosphere.

The project meets the following applicable environmental laws and regulations:

Official Mexican Norm NOM-025-SSA1-1993 establishes the maximum limits of PM_{10} concentration in the environment, necessary to protect public health. These limits are 50 $\mu g/m^3$ as the annual average for chronic exposure, and 120 $\mu g/m^3$ over 24 hours once a year, in case of acute exposure. The proposed project supports the ability to meet this air quality requirement.

Since these projects will be carried out within existing urban areas and roadways, a consultation with the National Anthropology and History Institute (INAH, in Spanish) is not required. Disturbances of any 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.

2.b Human Health and Environmental Impacts

Human Health Impacts

Direct and indirect benefits to human health:

- The project will reduce air pollution.
- The project will help reduce respiratory illnesses.

In 1996, the US Environmental Protection Agency (EPA) published a document titled "*Air Quality Criteria for Particulate Matter*" (AQC PM) that discusses, among other aspects related to

air pollution caused by suspended particles, various studies regarding the effects of said pollutants on human health. This document concludes that the vast majority of available epidemiological evidence suggests an increment in human mortality caused by short and long term exposure to particulate matter (PM) in the environment.

The document published by the EPA recognizes that the complexity of synergetic effects (association with other pollutants, particle size, source of the particulate matter, age and susceptibility of the exposed population, etc.) results in significant variations between the different studies on human exposure to atmospheric pollutants, including particulate matter. However, it concludes that said studies provide enough reasons to worry about the detectable effects on human health caused by the exposure to PM_{10} in the environment, even at levels below those established by the official norms.

Health statistics:

Although human health statistics for Sonora are limited, pursuant to information provided by Health Jurisdiction No. 26 of the State of Sonora through the Epidemiological Services Coordinating Office, the agency is aware of a high incidence of diseases caused by acute respiratory infections.

Health Jurisdiction No. 26 of Sonora has reported the most frequent diseases identified in the state of Sonora. Yearly incidence rates for respiratory diseases and intestinal infections have been prepared, based on a total of 785,082 residents in Hermosillo (CONAPO 2006 estimate) and information generated by the epidemiological surveillance system during a three-year period (see table below). Said disorders are among the 10 main causes of disease in the municipality.

Rate	2007	2008	2009
Incidence rate for respiratory diseases	292 x 1,000 residents	207 x 1,000 residents	333 x 1,000 residents
Incidence rate for intestinal diseases	51 x 1,000 residents	50 x 1,000 residents	48 x 1,000 residents

Source: Health Jurisdiction No. 26 of the State of Sonora, Secretariat of Health

Mexican Standard NOM-020-SSA1-1993 establishes that health risks associated to air pollutants are correlated to the time elapsed between the exposure and the onset of adverse effects in exposed individuals, and cause changes in pulmonary function that render affected individuals more susceptible to respiratory diseases and infections.

Environmental Impacts

Direct and Indirect Benefits:

Environmental Impacts:

The proposed tasks will immediately reduce the amount of suspended particles released by vehicular traffic on unpaved surfaces and disturbed by the gusty winds that frequently batter the city. These improvements will help reduce respiratory system illnesses and allergies, which are rather common in the region.

The project will also have a secondary effect by reducing the time required for travel by the average vehicle in the urban area, which will reduce the emission of combustion particles.

The project's anticipated negative impacts are temporary and will occur during the development of paving tasks, due to the use of heavy machinery, which may cause considerable dispersion of PM_{10} particles in the atmosphere. This impact will be temporary. Once the streets are paved a reduction of airborne PM_{10} particles will be achieved.

It is important to mention that the area affected by the project is located within the urban zone and therefore, no significant biotic impacts are anticipated, as there are no sensible habitats or ecosystems within the project area.

Mitigation Measures:

During the implementation of the project, measures will be taken to mitigate these temporary effects by introducing the preventive actions described in the table below:

1.- AIR AND NOISE

Site Preparation of the Areas to be Paved.		Mitigation Measures
Emission of dust and gases caused by excavation and cleaning, terrain preparation, excavation and formation of sub-grade, earthworks, hauling of excavation material and hydraulic base, formation of hydraulic base, and hydraulic asphalt/concrete layer.	**1.1**	Minimize the emission of dust generated by vehicular traffic by irrigating the area where work will be performed.
	1.2	To comply with regulations regarding atmospheric emissions caused by motor vehicles, all vehicles used in the project will adhere to a scheduled maintenance program. Vehicles transporting scrap materials produced during the construction should be covered by a canvas in order to avoid dispersing particles during the trajectory. Norm **NOM-041-ECOL-1993** establishes the maximum level of exhaust emissions allowed for vehicles using gasoline. Norm **NOM-042-ECOL-1993** establishes the maximum permissible level of unused hydrocarbons, carbon monoxide and nitrogen oxide in new motor vehicles, as well as evaporated hydrocarbons.

		Norm **NOM-044-ECOL-1993** establishes the maximum permissible levels of hydrocarbons, carbon monoxide, and nitrogen oxide, suspended particles, and smoke opacity from diesel engines.
		Norm **NOM-045-ECOL-1993** establishes the maximum permissible levels of smoke opacity from the exhausts of motor vehicles using diesel as fuel.
Noise emission caused by the circulation of motor vehicles and the use of heavy machinery during excavation and cleaning, terrain preparation, excavation and formation of subgrade, earthworks, hauling of excavation materials and hydraulic base, formation of hydraulic base, and hydraulic asphalt/concrete layer.	**1.3**	All vehicles operating must close their exhausts and operate at a low speed around the work area.
		Norm **NOM-080-ECOL-1994** establishes the maximum permissible limits for noise emission caused by motor vehicles, motorcycles and motor tricycles in circulation and their method of measurement.
	1.4	All machinery and equipment must comply with the following norm:
		NOM-080-STPS-1993, which establishes the maximum levels of noise exposure for project workers.
	1.5	Avoid having more than two teams working simultaneously, which could generate noise levels higher than the above mentioned norm.
	1.6	Work during the day to avoid causing noise while neighbors are at rest.
	1.7	Provide audio protection and persuade personnel exposed to noise to use protective equipment.

2.- WATER

Site Preparation and Construction

For excavation cleaning and wastewater. During construction, water will be necessary for dust control irrigation, preparation of concrete, compacting beddings, as well as potable water for human consumption and water for lavatories.	**2.1**	Wastewater collected in portable containers will be disposed of by an authorized company. These waters will be disposed of in approved areas and under the conditions established by the authorities in compliance with environmental laws in effect.
	2.2	The use of water should be optimized during the duration of the project.
	2.3	Potable water will be obtained in containers from local suppliers.
	2.4	Only raw water will be used for the different activities related to the project.
	2.5	The water required during the construction stage should be obtained from a water tap provided by the Water and Wastewater Utility (Agua de Hermosillo, in Spanish) or from any other source authorized by the National Water Commission (CONAGUA,in Spanish).

3.- SOILS

Construction stage.

During excavations.

3.1 Stone materials required for construction should be obtained, preferably, from authorized source providers. If the above is not possible, all necessary mitigation measures must be considered in order to minimize impacts in the area.

3.2 Excavations will only be performed in areas previously defined by the project.

3.3 In-fill activities will be performed, preferably, with the material from the excavations whenever appropriate. The excess material should be sent to a location authorized by the Municipality.

3.4 If it is necessary to extract any material for filling or any other activity from an area outside of the project, this location will be restored when the project is concluded to avoid erosion and changes to drainage patterns, as well as to restore the cover of native plant species.

3.5 All non-recyclable solid wastes must be disposed of according to applicable procedures and in facilities designated by the authorities for this purpose.

Handling of wastes generated during construction could affect the ground soil.

3.6 The work area will be cleaned periodically to avoid pollution and to control the dispersion of waste around the area.

3.7 Bedding and compacting materials should be free of hazardous and non-hazardous wastes.

3.8 In order to avoid ground contamination generated by vehicles, machinery and equipment maintenance and oil change, these activities will be carried out in maintenance shops or in authorized facilities.

Impacts: The environmental impact resulting from the project will be positive overall, inasmuch as:
Street paving coverage will be increased, reducing thus environmental contamination and improving the quality of life of local residents by reducing the emission of airborne PM_{10} particles.

Transboundary Impacts: Negative transboundary impacts are not anticipated by the implementation this project.

Formal Environmental Authorization

Environmental Authorization:

- Pursuant to the provisions of the General Law on Ecological Equilibrium and Environmental Protection regarding Environmental Impact Assessments, which is generally observed throughout the national territory and is regulated by

the Executive Power through the Secretariat of the Environment and Natural Resources (SEMARNAT), the proposed project is not required to obtain previous authorization from SEMARNAT with regard to its environmental impact, according to the provisions of Chapter II, Article 5, Sections A through V.

- The Sustainable Development Code for the State of Sonora Article 28, law 171, does not establish as an assumption that roadway paving projects are required to obtain environmental impact clearance.

Assessment of Project Benefits: Project Results Matrix. Factor 3

Measurement of Project Results:	
1. Reduced harmful emissions	**Objectives and Indicators** Reduction of PM_{10} particles (Objective ≥ 22,120 Ton/yr) **Current Conditions** Emission of PM_{10} particles = 23,853 Ton/yr (AP-42 Calculation)
2. Reduced respiratory disease incidence rates	**Objectives and Indicators** Reduction in incidence of acute respiratory diseases (Objective ≤ 2009 baseline) **Current Conditions** Acute respiratory infections=11,539 cases per year
3. Increased number of residents with direct access to paved roads:	**Objectives and Indicators** Increased number of residents with direct access to paved roads (Objective= 154,400 residents) **Current Conditions** Residents with direct access to paved roads =0
Results: Goods and services produced by the project:	Construction of 21,083,140 ft^2 (1,558,668 m^2) of paved roads.

Pending Issues:

None.

Criterion Summary:

The project addresses a major human health and environmental issue by reducing the amount of suspended particles released by vehicular traffic traveling on unpaved surfaces, a condition that has an impact on the increased rate of respiratory illnesses among the population.

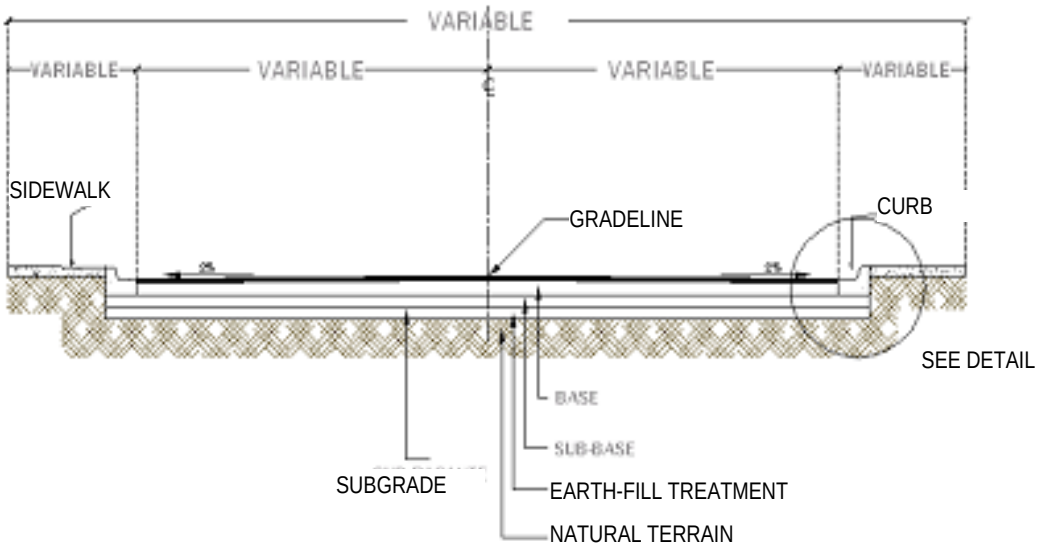
3. Technical Feasibility

3.a Technical Aspects

Project Development Criteria

Design Criteria: The project was designed following standard engineering practices and complies with the applicable Municipal Code. There are standard street paving designs available that will be used as the basis for developing the final designs for selected streets. Both asphalt and hydraulic concrete will be used for the project.

Project Components: Asphalt Pavement

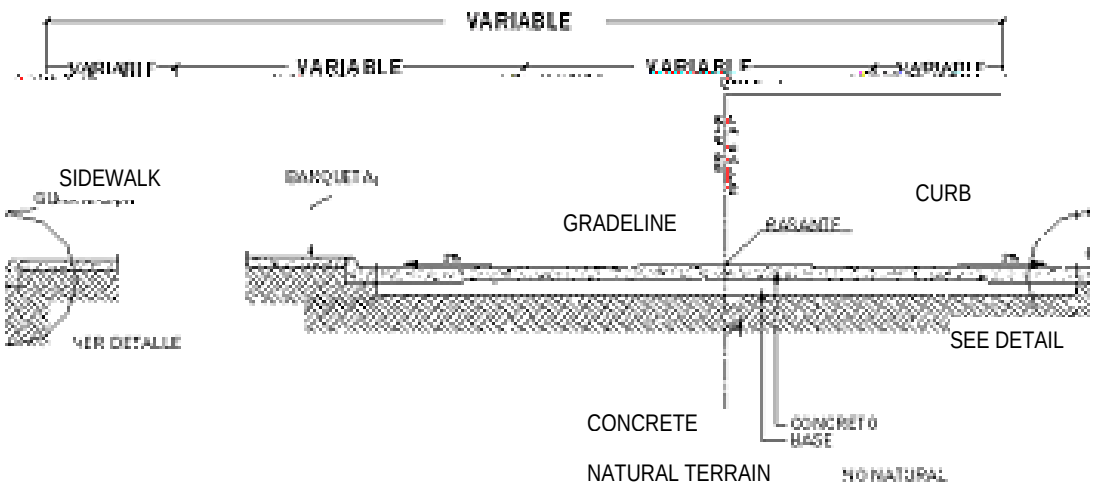


Hydraulic Pavement

The cutting or opening will be done with a motor grader depending on the stage of construction. A width of 80 cm. will be considered in intersections for access. The excess of unusable material produced by the cut will be removed from the work area and hauled to a waste site designated by Public Works department and outside of the work area.

The base will be constructed with selected bank material typically used for lining, as established by Public Works Department regulations. 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 100 MDD consolidation.

The supply and placement of black polyethylene rubber on the previously swept hydraulic pavement includes overlaps, folds, cuts, tools and labor. Pre-mixed concrete will have a normal resistance of MR=36 kg/cm^2, F'c = 300 Kg/cm^2, 19mm maximum aggregate size (MAS) and 15cm R.N. The concrete will be poured in transverse slabs with a surface no larger than 22 m² in order to avoid fractures caused by temperature; caulking will be applied to the joints, including vibrating and curing with a material designed for this purpose. The project includes the construction of curbs similar to those described above, as shown in the following figure:



Other Design Criteria:

For pavement, irrigation saturation of the hydraulic base will be performed, as well as the tack coating for the asphalt layer, followed by the installation of the hydraulic concrete. The project also includes trace and leveling of curbs and the manufacturing of hydraulic concrete curbs.

The project will include terrain plotting and leveling, excavation or cutting, hauling of material, formation and compaction of earth-fills, treatment of the subgrade layer, and development of the hydraulic base layer. As for the pavement, the project includes the hydraulic base prime coating, and the tack coating for the asphalt layer, followed by the installation of the asphalt concrete layer. The project also includes curb plotting and leveling, and the construction of hydraulic concrete curbs.

The geometric design of roadways will incorporate the installation of a minimum 2% transverse slope (crown) towards the center of the street that will convey runoffs to the shoulders, Manholes will be built above the runoff level to prevent water from infiltrating the sewage system. Manholes that are not located at the pavement crown will need to be elevated at the runoff level and sealed to prevent infiltration of rainwater. The design will incorporate slope and surface runoff control measures.

Appropriate Technology

Assessment of Alternatives:

Roadways to be paved were selected according to the following criteria:

- Roadways with heavy traffic
- Roadways that provide access to school areas
- Roadways that provide access to low income subdivisions (*colonias*)

Asphalt or hydraulic concrete were considered as options for roadway paving. Hydraulic concrete was considered for main intersections with heavy traffic in order to reduce maintenance and extend the surface life cycle, while asphalt pavement was considered for secondary streets with less traffic. Additionally, flexible pavement (asphalt) or rigid pavement (hydraulic concrete) was selected on the basis of the city's geotechnical zoning established in the roadway study developed by the City.

The project applicant has established coordination with the Municipal Water and Wastewater Commission (Agua de Hermosillo) to ensure that water and wastewater collection services have been introduced in streets selected for paving. A design plan that outlines the proposed construction schedule is available.

Property and Right-of-Way Requirements

Requirements: Inasmuch as the proposed street paving project will be developed within the urban area and existing rights-of-way, no additional land or rights-of-way need to be purchased by the City, which has municipal jurisdiction over the project. Additionally, no land use changes will be made in the areas required for the project.

During the project's implementation, the City of Hermosillo, through its Department of Public Works, will oversee the execution of the proposed construction tasks.

Project Tasks and Timelines

Project Timeline: The city anticipates completing the construction of the proposed project in thirty six months, with tasks initiated in 2009.

3.b Management and Operations

Project Management

Resources: According to the Internal Code of Municipal Public Administration and other applicable agreements and provisions, the City of Hermosillo is empowered to provide maintenance to existing roadways by patching up potholes and carrying out other engineering tasks as required for the proper operation of the traffic infrastructure. The City of Hermosillo will be the agency responsible for implementing preventive and corrective maintenance and absorbing operation and maintenance costs, which will be part of its operating budget.

Operation and Maintenance

Organization: The Hermosillo Department of Public Works has a Director, Assistant Director, Unit Managers and trained personnel to operate and maintain the system. Additionally, the city has

	available specialized personnel to provide technical support.
Operation Plan:	The Services and Public Works Law requires the Department of Public Works to have an Operations Manual to provide maintenance to existing and future paved streets. A specific Operation and Maintenance Plan will be developed prior to the completion of paving tasks. The existing manual is currently under review and any identified deficiencies will be included in the project for improvement and revision.
Permits, licenses, and other regulatory requirements:	The project was designed following standard engineering practices and complies with the applicable Municipal Code. There are standard street paving designs available that will be used as the basis for developing the final designs for selected streets. As previously mentioned, both asphalt and hydraulic concrete will be used for the project.
Reviewing Agencies:	- BECC - City of Hermosillo 2009-2012 - NADB

Pending Issues:

None.

Criterion Summary:

A review of alternatives was developed to determine which roadways would be paved. Hydraulic concrete was considered for main intersections with heavy traffic in order to reduce maintenance and extend the surface life cycle, while asphalt pavement was considered for secondary streets with less traffic.

The project was designed following standard engineering practices.
The project applicant has established coordination with the Municipal Water and Wastewater Commission (Agua de Hermosillo, in Spanish) to ensure that water and wastewater collection services have been introduced in streets selected for paving.

4. Financial feasibility

4.a Proof of Financial Feasibility

Financial Conditions

Information submitted: Hermosillo 2005-2010 financial statements.

Financial Analysis Results: Hermosillo Municipality shows a solid financial position and, based on NADB conservative assumptions should be able to generate the net operating cash sufficient to cover current debt, and the projected obligations under this proposed loan.

A detailed discussion of the financial feasibility of the project is presented in the NADB Loan Proposal document for this project.

Project Costs, Financial Structure and other plans for Capital Investments

Item: Pavement of 1,548,668 m^2 of dirt roads to improve air quality, increase coverage of pavement and reduce the generation of dust and airborne particles.

Final Cost: **MX $827.7 million**[1/]

Funding Scheme:

Source	Type	Amount	%
NADB	Loan	$230.0	28
Local Government	Grant / Budgetary Revenue	$597.9	72
	Total:	$827.9	100

1/ The Total Project Cost, defined in Hermosillo's paving project.

Primary Source of Revenue:

Source of Revenue: Future federal tax revenues ("Participaciones") into an irrevocable trust.

4.b Legal Considerations:

Project management: The project will be managed directly by Municipality of Hermosillo public works secretary, which has the legal and technical capacity to implement the Project.

Pending Issues:

None.

Criterion Summary:

The project meets all applicable financial feasibility criteria.

5. Public Participation

5.a Community Environmental Infrastructure Projects – Community-wide impact

Steering Committee

Date of establishment:

The project sponsor as an existing practice establishes a Steering Committee for each of the projects to be completed. To date, the Secretariat of Social Development has established 30 of such committees related to the investments proposed with this project, which have been formally installed. These committees have available their bylaws, records of attendance and administration of oath to committee members, agreements, and comments.

Steering Committee members:

Steering Committees have been established according to the following structure:

-Chairperson
-Secretary
-Treasurer
-Deputy Chairperson
-Deputy Secretary
-Deputy Treasurer

Date of approval of Public Participation Plan :

BECC closely reviewed and validated the existing public outreach practices and activities specific to the project with the Secretariat of Social Development and concluded that the efforts met the intent of a public participation plan.

Public access to project information:

Technical and financial information on each of the proposed projects is made available to the public for review thought the Community Committee, workshops, bus stops, community centers, etc. The Steering Committee, with assistance from the project sponsor prepared the following:

- Flyers
- Megaphone advertising

Project information is available at :

Site/Hours	Contact /Tel.	Address/Municipality
Office of the Secretariat of Social Development	(662) 289-3094	Dr. Aguilar entre Galeana y Comonfort No. 17 Hermosillo, Sonora

Additionally, the project's technical and financial information

	was made available on the Secretariat of Social Development's website: http://www.hermosillo.gob.mx/entidades/?id=13
Additional outreach activities:	The "Council in your Neighborhood, ayuntamiento en tu colonia, in Spanish" newsletter, a local media outlet, published a feature on paving service coverage. A project factsheet was developed and distributed. The project launching was published in major newspapers of statewide distribution.
First Public Meeting:	The launching of the "Transforming Hermosillo with you" program was published on February 14 in three major newspapers of regional distribution. To date, 16 public meetings have been held in the *colonias* served by the program. The launching ceremony was held in Calle Gaxiola colonia Arco Iris in the municipality of Hermosillo. The meeting was used to present the project's technical, financial, and environmental aspects. Approximately 120 residents of the project area and other communities attended the meeting, which was directed by the Mayor. Media features and the minutes of neighborhood meetings reflect that the community has shown support for the project.
Second Public Meeting:	N/A
Final Public Participation Report	
Final Report:	Documentation gathered during BECC's review of outreach efforts for the project has been archived in the project file and is considered appropriate to represent a Final Public Participation Report.
Post-Certification Public Participation Activities	
Post-Certification Activities:	The project applicant intends to continue outreach activities for this and other project investments in accordance with existing practices and procedures to support the project´s long-term feasibility.

Pending Issues:

None.

Criterion Summary:

The project meets the BECC's Public Participation criterion.

6. Sustainable Development

6.a Human and Institutional Capacity Building

Project Operation and Maintenance:

The project applicant will be the agency responsible for operating and maintaining the system through:

- The Directorate of Public Works.

The applicant has the basic institutional and human capacity to operate and maintain the project through the use of:

- Trained personnel
- Training program
- Operations Manual for roadway maintenance

Human and Institutional Capacity Building:

Actions considered by the project will strengthen the City of Hermosillo by increasing its capacity to provide street paving services and coverage. Additionally, the NADB loan will not have a negative impact on the city's financial situation; on the contrary, it has the potential of improving its debt capacity, a significant consideration that will help maintain the city's current credit rating to address future infrastructure needs in Hermosillo.

6.b Conformance to applicable Local, State, and Regional Regulations and Conservation and Development Plans

Local and Regional Plans addressed by the project:

The proposed project conforms to applicable plans and actions described in the following documents:

- 2009- 2015 State Development Plan
- 2009- 2012 Municipal Development Plan
- The project adheres to the U.S.-Mexico Border 2012 Environmental Program by meeting Goal 2 –Reduce air emissions as much as possible, towards the attainment of each country's national ambient air quality standards, and reduces exposure to contaminants in the border region.

Laws and Regulations addressed by the project:

The project meets applicable municipal regulations pursuant to roadway paving within the city.

6.c Natural Resource Conservation

- The final design includes the implementation of green building practices as part of the technical construction specifications.
- The purpose of the project is to improve the quality of air in Hermosillo, and benefit the health of residents of

the border region without deteriorating the environment. The project does not interfere in any way with the conservation of natural resources in the area, as it will be carried out in an urban area and over existing roadways, and will not require any changes regarding land use patterns.

- The project contributes to reduce environmental deterioration by expanding the existing roadway system from 77% to 87%.

6.d Community Development

The project will promote community development by reducing the incidence of respiratory illnesses in the region. Direct benefits to the community are foreseen, and include an improved quality of life of the population by reducing pollution levels; reducing travel times; promoting quick access to emergency, security and other public services; fostering economic development, and increasing the value of properties located adjacent to the project site.

Pending Issues:

None.

Criterion Summary:

The project complies with all sustainable development principles.