



CERTIFICATION AND FINANCING PROPOSAL

PUBLIC TRANSPORTATION SYSTEM IMPROVEMENTS FOR THE AGUA CALIENTE CORRIDOR IN TIJUANA, BAJA CALIFORNIA

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EXECUTIVE SUMMARY

PUBLIC TRANSPORTATION SYSTEM IMPROVEMENTS FOR THE AGUA CALIENTE CORRIDOR IN TIJUANA, BAJA CALIFORNIA

Project Summary:

Project Name:	Public Transportation System Improvements for the Agua Caliente Corridor (the “Project”).
Project Type (Sector):	Mobility (Air quality).
Objective:	The purpose of the Project is to improve and modernize the public transportation system by facilitating the financing of buses that use cleaner technologies when compared with the existing fleet, including the acquisition of Euro-VI diesel and electric buses and associated recharge infrastructure. The Project will also help improve and promote the use of public transportation by providing a more accessible and reliable service in Tijuana.
Expected Outcomes:	By implementing the use of 39 diesel buses that comply with Euro-VI emission standards and three fully electric buses financed by NADBank, the Sponsor expects to achieve the following environmental outcomes: ¹ <ul style="list-style-type: none">▪ a reduction of approximately 2,120 metric tons/year of carbon dioxide (CO₂).▪ a reduction of approximately 10.8 metric tons/year of nitrogen oxides (NO_x).▪ a reduction of approximately 88 kilograms/year of particle matter (PM).▪ an increase in system reliability, increase in capacity for ridership (passengers per vehicle) and reduction in travel time.

¹ The anticipated results were calculated based on the expected number of round trips per diesel and electric bus in the Agua Caliente corridor. For NO_x and PM emissions, the target, relevant only to the diesel buses, is calculated based on the test results documented by PROFEPA in the compliance certificate for the Euro-VI model in comparison to the estimated emissions from the existing public transportation fleet. The estimated CO₂ emissions target considers the manufacturer's specifications for the Euro-VI diesel model in comparison with the estimated emissions from the existing fleet plus the estimated emission of CO₂ for the energy generation required to operate the electric buses based on the kWh/mile factor as defined in a U.S. Federal Transit Administration report and the national CO₂ emission factor in comparison with the emission specification of Euro VI diesel bus.

<https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/115086/zero-emission-bus-evaluation-results-king-county-metro-battery-electric-buses-fta-report-no-0118.pdf>

	<ul style="list-style-type: none">▪ the availability and use of the Violet Transport service dedicated to gender- and age-specific passengers.
Population to Benefit:	37,700 passengers per day. ²
Sponsor:	Grupo Bajabus.
Borrower:	Líneas de Transporte Urbano y Sub-Urbano de Baja California S.A. (Verde y Crema).
NADBank Loan Amount:	Up to MX\$177.9 million pesos (US\$10.2 million). ³

² The expected population served by the Project is a proportional figure based on the 72,856 total users established by the Sponsor's market study and its financial model. The total users of the corridor considered 81 buses, of which NADBank will only finance 39 Euro VI diesel and three electric buses.

³ Unless otherwise noted, all U.S. dollar figures are quoted at an exchange rate of \$17.4610 pesos per dollar, as of December 15, 2023.

CERTIFICATION AND FINANCING PROPOSAL

PUBLIC TRANSPORTATION SYSTEM IMPROVEMENTS FOR THE AGUA CALIENTE CORRIDOR IN TIJUANA, BAJA CALIFORNIA

1. PROJECT OVERVIEW AND EXPECTED OUTCOMES

The proposed project consists of financing the acquisition of 39 diesel 2024 Euro-VI model buses and three electric buses to be used for public transportation services within the Agua Caliente Corridor, an arterial road, in the city of Tijuana, Baja California (the “Project”). An additional 39 Euro-VI model buses will be financed by the Project sponsor through the Value Arrendadora program (Value), a line of credit previously certified by NADBank to promote the purchase of public transportation vehicles in the border region. Together, a total of 78 Euro-VI model buses and three electric buses are expected to meet the public transportation demands in the Agua Caliente Corridor and will replace the 509 vehicles currently operating in this route, which are composed mostly of older, lower-capacity, more polluting vehicles.

The Project will promote an increased use of public transportation by providing a more accessible and reliable service supported by formal bus stops and schedules, enhanced security for passengers, and a more user-friendly and transparent payment processing system. Furthermore, some of the new buses will be assigned as part of a subsidized transportation program (“*Transporte Violeta*”)⁴ to provide a more secure service at no cost to women and children. The Project will also include the necessary infrastructure to recharge the electric vehicles.

The use of Euro-VI diesel buses and the incorporation of electric buses are requirements established by NADBank as a condition for its financing. The required technology will be significantly cleaner than the current emissions norm (equivalent to Euro-V) and the buses typically available in the Mexican market.⁵

Compared to the existing vehicle fleet operating in the Agua Caliente corridor proportional to the buses to be financed directly by NADBank, the Project is expected to displace the emission

⁴ The Project sponsor obtained a contract with the Sustainable Mobility Institute of Baja California to provide the buses, operation, and service to “*Transporte Violeta*” program. The state government subsidizes the program and provides free transportation services to women and children under twelve years old along the Agua Caliente corridor. The program will facilitate gender- and age-specific transportation capacity for up to 54,000 users monthly to schools, daycare, workplaces, and health clinics in Tijuana.

⁵ Mexican Official Standard NOM-044-SEMARNAT-2017 establishes the maximum permissible limits of emissions of carbon monoxide, nitrogen oxides, non-methane hydrocarbons, non-methane hydrocarbons plus nitrogen oxides, particulates and ammonium, originating from the exhaust of new diesel motors used for the propulsion of automotive vehicles, with a gross vehicular weight greater than 3,857 kilograms. The standard was adopted in 2006 and allows compliance with either U.S. 2004 or Euro-IV equivalent standards. (<http://transportpolicy.net/index.php?title=EU: Heavy-duty: Emissions>).

of an estimated 2,120 metric tons/year of carbon dioxide (CO₂), 10.8 metric tons/year of nitrogen oxides (NO_x) and 88 kilograms/year of particle matter (PM).

In addition to the acquisition of newer, cleaner vehicles, the project aims to modernize the operation and governance structure of the route by substituting 433 permit owners into a single formal enterprise with greater capacity for the programming of trips, maintenance of the equipment, centralized fare collection system, and enhanced security features. These changes will create the basis for further improvements to the overall system, including the introduction of additional electric buses.

2. ELIGIBILITY

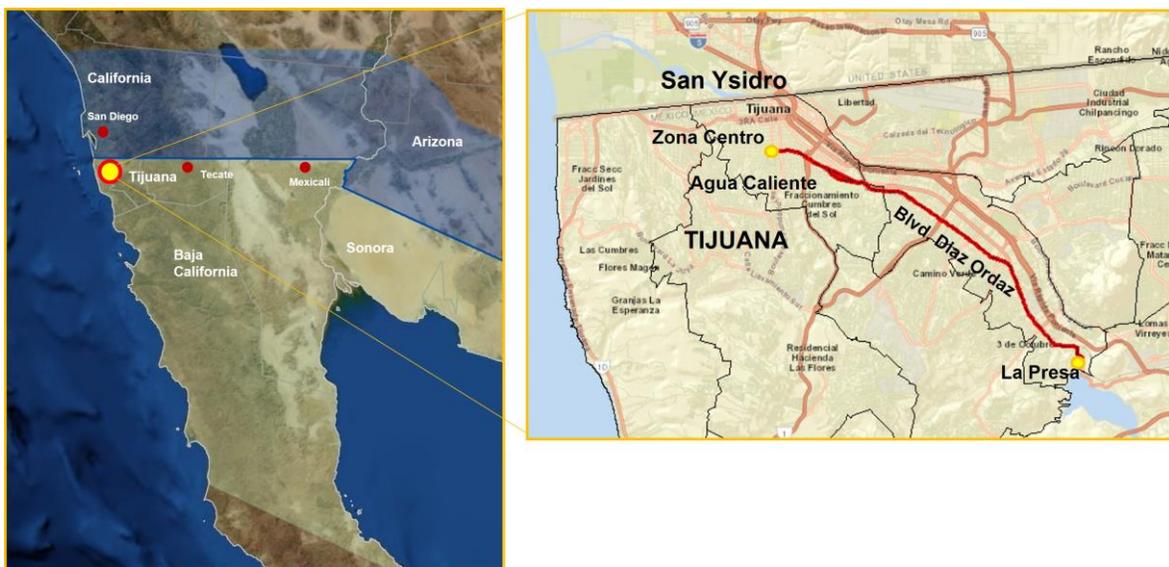
2.1. Project Type

The Project falls within the eligible category of mobility under the sector for air quality.

2.2. Project Location

The city of Tijuana is located in the northwest region of the state of Baja California, adjacent to the U.S.-Mexico border and approximately 16 miles south of the city of San Diego, California. The Agua Caliente Corridor runs parallel to the Tijuana River for about 10.5 miles, from downtown Tijuana near the U.S.-Mexico border to the “La Presa” Abelardo L. Rodríguez reservoir, southeast of the city and is roughly centered at the following coordinates: Latitude 32°30'4.50"N and longitude 116° 58'13.96"W. Figure 1 shows the location of the Project.

Figure 1
PROJECT LOCATION MAP



2.3. Project Sponsor and Legal Authority

The private-sector project sponsor is Grupo Bajabus, which has the legal authority to obtain financing and acquire buses to implement the Project. In 2016, the Sponsor received the concession to operate public transportation services in the Agua Caliente corridor for a term of 30 years through *Líneas de Transporte Urbano y Sub-Urbano de Baja California S.A. (Verde y Crema)*.

In September of 2023, the concession to operate the Agua Caliente corridor was amended by the Government of Baja California, through the Ministry of Environment and Sustainable Development (SMADS) and the Sustainable Mobility Institute (IMOS), to *Líneas de Transportes Urbanos y Suburbanos S.A.*). The concessionaire plans to incorporate other public transportation providers as shareholders. These shareholders will receive a monthly payment in exchange for their equity participation and the relocation of their fleets from the corridor. To secure an efficient, reliable, and accessible public transportation service for the users, the state government also elaborated a set of requirements and technical specifications applicable to the new concession.

3. CERTIFICATION CRITERIA

3.1. Technical Criteria

3.1.1. General Community Profile

According to the Mexican National Institute of Statistics, INEGI, the population of Tijuana was 1,922,523 in 2020, which represented approximately 51% of the state population. Based on the census data, the population of Tijuana increased by 280,953 residents between 2015 and 2020, and the economically active population was estimated to be 840,664 residents. In parallel, the city has experienced an increase in the use of personal vehicles, growing from 450,000 to 900,000 vehicles during the period of 2010 to 2020.⁶

The Project will be located within the urban area, where residents most likely rely on their personal vehicles to commute to work, school, residential and commercial areas. On the other hand, because of congested roadways and parking areas, those residents may also be more likely to consider using public transportation.

The Project is expected to create employment opportunities in the community. The sponsor expects that new jobs will be necessary to prepare the Project buses for the proposed public transportation service. Drivers will be employed to operate the new public transportation system vehicles, some of which will be current drivers trained to drive the new buses. Some of the current drivers will be relocated to alternative routes that feed the main corridor,

⁶ Source: Mobility Department of Tijuana (Secretaria de Movilidad de Tijuana), (<https://semov.tijuana.gob.mx/noticiaDependencia.aspx?idComunicado=29531>)

maintaining most of the existing jobs. Approximately 15 new on-site jobs to operate controls, monitoring and supervision of the system will also be needed.

Public Transportation Service

In Mexico, many public transportation options in border communities are inefficient, uncomfortable and unsafe. There are recurring complaints from system users, including poorly located and maintained bus stops, inconsistent routes and transit times to guarantee on time arrivals, as well as limited comfort characteristics, lack of vehicles equipped for passengers with disabilities, inconsistent pricing, unsafe transfer conditions, and poor quality of service provided by drivers with unsafe driving habits, representing a further risk to riders. The safety risks are exacerbated by deteriorated road conditions and old vehicles that experience frequent maintenance issues and generate higher polluting emissions.

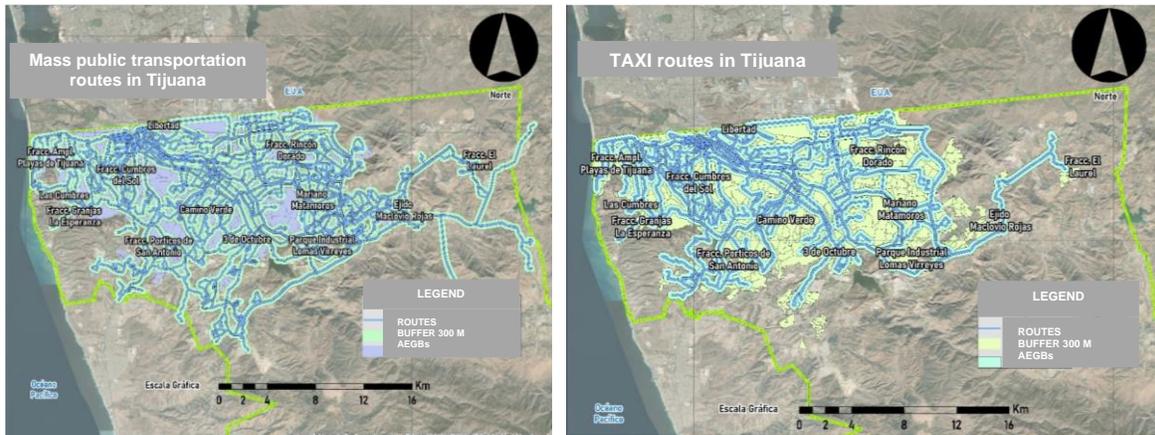
Additionally, there is a lack of adequate planning for urban mobility. Bus routes and transfer options do not reflect an adequate analysis, resulting in unbalanced service with some areas served by a large number of operators while other routes, mostly in low-income areas, have little to no service, leaving the residents with limited options for mobility. These conditions generate a cycle of increased usage of personal vehicles and less demand for public transportation. Dependence on personal vehicles and the low penetration of efficient public transportation systems lead to air pollution, noise, traffic congestion and loss of productivity, thus reducing the overall quality of life of residents.

Currently, the mass public transportation system in Tijuana is provided by buses and minibuses. The service in the municipality has 109 routes, covering approximately 2,970 miles and representing 58% of the urban area. The modality of “taxis” is also part of the public transportation service and is provided by vans, compact and mid-size vehicles, distributed in 127 routes, covering approximately 2,175 miles throughout the municipality. In 2018, the city of Tijuana reported approximately 16,700 public transportation permits, of which only 13,300 vehicles were in operation, 7,900 taxis and 3,700 public transportation buses and 1,700 private buses.⁷ Additionally, several companies have contracted private transportation services to guarantee a safe commute of their employees. Buses are routed to pick up employees near their homes and can only be used by company personnel.

The following figures show the coverage of public transportation options, including taxi service, in Tijuana.

⁷ Source: Public transportation Department of Tijuana press conference, (<http://www.pasajero7.com/transportistas-tijuana-tendran-renovar-sus-unidades/>).

Figure 2
TRANSPORTATION IN TIJUANA



Source: Sustainable Mobility Institute of Baja California

Corridor Agua Caliente

The Agua Caliente corridor consists of approximately 10.5 miles and is defined as the northwest-southeast transportation route serving a large part of Tijuana’s population. The Agua Caliente corridor is a critical arterial route providing transportation to commercial areas, workplaces, residential areas, schools, and recreational areas and giving access to other secondary routes. The zone of influence of the corridor, according to INEGI statistics, is estimated to include 165 neighborhoods, with an expected 138,486 potential users of the service, which represents a high vehicular flow in the region.

The Agua Caliente route is operated by two main providers, *Verde y Crema* and *Rojo y Negro*, and, even so, includes more than 430 permit owners and 509 vehicles to meet public transit needs. The public transportation service is provided mainly by buses, vans, compact and mid-size cars, available from 5:00 AM to 10:00 PM. In addition, the route presents a coexistence of providers that has generated inconsistencies in the schedules, a saturation of inefficient vehicles, a disregard to traffic rules, and an increasing risk of road accidents, among other problems. Users have expressed significant dissatisfaction with the quality of the public transportation service in the Agua Caliente corridor, highlighting that the service is unreliable and unsafe.

The implementation of the Project will help to address those concerns by incorporating high-capacity buses equipped with modernized facilities and payment methods. The Sponsor will establish an operation scheme in coordination with the transport authorities aimed at maintaining a high quality and efficient service as well as compliance with the concession terms.

Urban Mobility Improvements

A comprehensive solution for urban mobility is needed to change these conditions. Public transportation services require changes in their design and implementation that include new models of operation and administration that guarantee quality service, the replacement of existing units with more efficient and safer vehicles, and new fee schemes designed to encourage ridership and benefit the low-income populations with access to education, job opportunities, and essential needs such as medical services and shopping. These changes will help reduce the inequality gaps in access to public transport services.⁸

In September 2023, to improve public transportation services in the Agua Caliente corridor, the state government amended the concession for public transportation service along the corridor. The concession terms specify that current service providers will be relocated from service within the corridor to secondary routes, connecting the outer neighborhoods of Tijuana with the Agua Caliente corridor, providing a more orderly and accessible service. The new provider also plans to employ a new fleet of vehicles that offers a higher-capacity, safe, and efficient passenger transportation option, increasing service confidence and improving the rider's experience.

Finally, while the federal law sets a maximum useful life of 15 years from the bus's date of manufacture, the state government has only established that public transportation vehicles must operate in optimal conditions without defining the number of years allowed to operate the passenger buses. However, NADBank's attention to this essential step for vehicles financed for public transportation has influenced the sponsor to develop its own scrapping program intended to remove older and less efficient vehicles from the road, including units operating across Grupo Bajabus service areas. As of now, the Sponsor has scrapped 32 units, and there are more in the scrapping pipeline.

3.1.2. Project Scope

While a total of 81 new public transportation vehicles will be acquired by the sponsor to provide service within the corridor, this Project consists of financing the acquisition of 39 diesel 2024 Euro-VI model buses and three electric buses. The buses purchased through the Project are expected to provide nearly seven round-trip routes each day within the corridor to serve approximately 37,700 passengers per day.⁹ Some of the new buses will be assigned for use as part of a subsidized transportation program ("*Transporte Violeta*")¹⁰ to provide a more secure

⁸ Source: 2023-2042, National Strategy for Mobility and Road Safety [Estrategia Nacional de Movilidad y Seguridad Vial 2023 - 2042], published by Federal Government (<https://www.gob.mx/sedatu/documentos/estrategia-nacional-de-movilidad-y-seguridad-vial?state=published>).

⁹ The expected population served by the Project is a proportional figure based on the 72,256 total users established by the Sponsor's market study and its financial model. The total users of the corridor considered 81 buses, of which NADBank will only finance 39 Euro-VI diesel and three electric buses.

¹⁰ The Project sponsor obtained a contract with the Sustainable Mobility Institute of Baja California to provide the buses, operation, and service to "*Transporte Violeta*" program. The state government subsidizes the program and provides free transportation services to women and children under twelve years old along the Agua Caliente corridor. The program will facilitate gender- and age-specific transportation capacity for up to 54,000 users monthly to schools, daycare, workplaces, and health clinics in Tijuana.

service at no cost to women and children. The Project will also include the necessary infrastructure to operate and power the electric vehicles.

The Project includes the acquisition of modernized payment technologies to establish a centralized payment processing system that improves control and reduces losses and allows for future integration with other branches of the system. New surveillance equipment will improve security for passengers with the incorporation of video cameras, and monitoring of the buses via satellite in a centralized system.

The Sponsor is currently evaluating electric bus models, potential suppliers, schedule of delivery and charging station technologies and will provide complete technical information as soon as it becomes available. While the Euro VI model buses will be acquired upon approval of financing, according to the Sponsor, they have received just one manufacturer presentation to be evaluated (Volvo) for the electric buses. Considering this option, the expected time to manufacture the buses is approximately 12 months and the estimated operation date for the three electric units is January 2025. Pricing and terms for acquiring the buses are still pending.

3.1.3. Technical Feasibility

The Sponsor hired a specialized firm to conduct a transportation study along the Agua Caliente corridor. The study describes the current conditions of public transportation, information of influence area, characteristics of users and concluded providing a set of alternatives for improvements. One of the alternatives to improve the service along the corridor is to replace the existing fleet with higher capacity buses.

To select the appropriate bus technology, the Sponsor evaluated buses from different top-tier suppliers in order to decide on the transportation vehicles best suited to the characteristics of the Project. Buses acquired for the Project must comply with Mexican emission standards, as well as NADBank requirements, and be supplied by a reliable bus manufacturer. The technology evaluation process also included an analysis of the characteristics, reliability, specifications, and performance of the buses, as well as a review of the supplier warranties, among other.

Based on the evaluation of several options, the sponsor determined that the new diesel buses will be manufactured and supplied by a Volvo Group Mexico that operates a factory in Tultitlan in the state of Mexico. The company has been established for 24 years and has proven to be a specialist manufacturer of public transport vehicles with proven designs and engineering. The innovative Euro-VI engine technology available from this group has been recognized for reducing harmful emissions and generating fuel savings when compared to other engines available on the market.¹¹ The Euro-VI engines is highly efficient in fuel combustion and increased power torque.

¹¹ Source: International Council on Clean Transportation, (<https://theicct.org/bien-preparados-aunque-poco-dispuestos-los-fabricantes-de-autobuses-y-camiones-piden-postergar-la-adopcion-de-la-norma-euro-vi-en-america-latina/#:~:text=Los%20fabricantes%20reconocen%20que%20los,pero%20no%20en%20Am%C3%A9rica%20Latina>).

The public transportation service along the Agua Caliente corridor must comply with the state standard IMOS-NT-MR-01-2022, which establishes technical specifications, service operations requirements, and provider terms. The standard is applicable for the corridor and was published in June 2022 by the Institute of Sustainable Mobility of the State of Baja California to transition to a more orderly, accessible, and efficient public transportation service. Based on this standard, the state will only grant permits to individuals to provide transportation services under the principles of public safety, environmentally friendly technologies, and good management practices that promote and improve urban mobility. Table 1 summarizes the bus specifications.

Table 1
VEHICLE SPECIFICATIONS

Bus brand/model	Volvo B8R / D8RLE
	
Engine brand	Volvo D8K
Fuel	Diesel
Number of passengers	up to 100
Emission technology	Euro-VI
Total length	11,690 mm/11,707 mm
Total width	2,500 mm
Type of entry	Low-entry bus with step-free access for wheelchairs, walkers, strollers.
Other*	The Volvo B8Rs have the Euro-VI Volvo D8K diesel engine, six cylinders in line with a power of 320 hp and a torque of 1,200 Nm. from 1,050 to 1,600 rpm, complemented by a Voith D864.6 automatic transmission. The brakes are Volvo EBS5 electronically controlled disc brakes, ABS system, combined braking with retarder, hill start assist, brake assist, and hydraulic retarder integrated into the transmission.

The emissions specifications from the buses exceed Mexican regulations and have been able to obtain the certification required by the Federal Attorney for Environmental Protection (PROFEPA), which ensures compliance with Mexican Standard NOM-044-SEMARNAT-2017

and NOM-079-SEMARNAT-1994.¹² The certification No. PFPA-SII-DGATI-VN-0890/2019 confirms that the proposed technology meets the efficiency requirements in NO_x, PM and noise emissions.

It is important to note that other preferred cleaner alternatives, such as electric and compressed natural gas (CNG) buses, are not a feasible option to meet the needs of the Project because of the cost and lack of availability of both fuel and infrastructure. For example, an entire fleet of electric buses would not be affordable with the prevailing bus fares and absence of electric recharge infrastructure. Similarly natural gas infrastructure is also not widely available in Tijuana. NADBank identified only one CNG station in the city. Additionally, since compliance with the Euro-VI standards is not required until 2025, there is limited availability of Euro-VI CNG buses on the market. If NADBank was not involved in the financing, the Project would be implemented with Euro-V diesel buses in compliance with existing regulations, which would not accomplish the greater emission reduction expected from the proposed Euro-VI diesel model.

In parallel to operating the public transportation system with the diesel Euro-VI buses, the Sponsor will integrate three electric buses into the Agua Caliente corridor services as well as invest in the necessary charging station to accommodate the investment.

3.1.4. Land Acquisition and Right-of-Way Requirements

There are no land acquisition and right-of-way requirements for the proposed Project. In the terms of the concession, the local government is obligated to provide access to necessary public infrastructure along the corridor to support the successful operations of the new public transportation system.

3.1.5. Project Milestones

Milestones required to advance the Project included activities such as compliance with federal standards, determining the Project's technical feasibility, obtaining a concession to operate in the corridor, and meeting the technical specifications of public transport. The Sponsor is expected to fulfill the Project milestones to start operating in November 2023. Table 2 describes the status of those tasks.

¹² Mexican standard NOM-044-SEMARNAT-2017 establishes the maximum permissible limits of emissions of carbon monoxide, nitrogen oxides, non-methane hydrocarbons, non-methane hydrocarbons plus nitrogen oxides, particulates and ammonium, originating from the exhaust of new motors that use diesel as fuel and that will be utilized for the propulsion of automotive vehicles, with gross vehicular weight greater than 3,857 kilograms, while standard NOM-079-SEMARNAT-1994 establishes the maximum permissible noise emission limits and test method for factory-new motor vehicles.

Table 2
SUMMARY OF PROJECT MILESTONES

Key Milestones	Status
Emissions NOM certificate issued by PROFEPA	Completed (August 2019)
Technical study of operational feasibility (Part I and II)	Completed (June 2022)
Corridor Agua Caliente resolution by IMOS and SMADS	Completed (June 2022)
Corridor Agua Caliente concession title by State Government	Completed (June 2016)
Technical specifications for Agua Caliente route operation established by IMOS	Completed (June 2022)
Transfer of the Concession Amended	Completed (September 2023)
Commercial operation date (COD)	Expected November 2023

A total fleet of 81 vehicles will be used for public transportation services within the Agua Caliente Corridor. The first acquisitions of 39 diesel buses are expected in November through the Value line of credit. Subsequent purchases are expected to be purchased with proceeds from the direct NADBank loan. The Sponsor expects to submit the purchase order for electric buses in December 2023 and manufacturing of the electric buses will take up to 12 months from the date of the purchase order.

3.1.6. Management and Operation

Currently, the Borrower is part of a large transportation group with more than 1,400 units, generating 2,200 direct jobs and annually moving a total of 47 million users in Baja California. The Sponsor will implement the Project through Líneas de Transporte Urbano y Sub-Urbano de Baja California S.A., which will acquire the 78 diesel (through the two financing structures) and the three electric buses as part of the fleet to operate the 10.5 miles of Agua Caliente corridor.

Currently, the Sponsor's group is managing different lines of business, including inter-state transportation services in Coahuila, Sinaloa, Sonora, Baja California, and Baja California Sur; binational transportation services provided from Tijuana to southern communities in California; public passenger services provided between municipalities through urban and suburban vehicles, and package and delivery services.

Maintenance tasks will be performed directly by specialized personnel of the bus manufacturer based on an agreed miles-driven standard, including preventive and corrective maintenance tasks. The buses will have a two-year manufacturer warranty with an option to renew annually for up to 10 years. In addition, the Sponsor will ensure that drivers have appropriate training for the handling and operation of the new units. Furthermore, the Sponsor is responsible for keeping all of the systems related to payments, monitoring and surveillance working properly.

The maintenance of the infrastructure related to the route, the stations and the signing will be the responsibility of the Municipality of Tijuana, the IMOS, and the state government. The Sponsor is in the process of obtaining the approval from the Municipality to use existing

parking infrastructure, maintenance yards and administrative offices to operate the corridor service.

3.2. Environmental Criteria

3.2.1. Environmental and Health Effects/Impacts

A. Existing Conditions

Many public transportation options in border communities are inefficient, uncomfortable, and unsafe, and they do not provide a comprehensive solution for urban mobility, generating a vicious cycle of increased usage of personal vehicles and less demand for public transportation. Dependence on personal vehicles and the low penetration of efficient public transportation systems lead to air pollution, noise, traffic congestion and loss of productivity, thus reducing the overall quality of life of residents.

In 2021, Mexico emitted a total of 456 million metric tons of carbon dioxide, and transportation accounted for approximately 32% of the emissions (146.2 million metric tons).¹³ In addition, the Baja California government implemented an air quality monitoring system with a total of eleven stations distributed in the municipalities, four stations are in Tijuana. The last report published in 2020 reported a total of 109 days with high levels of air pollutants mainly particulate matter (PM₁₀).¹⁴

According to the 2018 -2027 Management Program to Improve Air Quality for Baja California, poor air quality in the state is attributed to the use of private vehicles, which are often imported used cars, with deficient mechanical condition and with an absence of the emission control systems (catalytic converter), causing significant amounts of pollutants emissions. Additionally, air quality is impacted by the cross-border activity at the six border ports or checkpoints located in the state, where approximately 80 million passengers and 30 million commercial vehicles cross annually.¹⁵ According to Tijuana's Environmental Protection department, poor air quality along the border increases cases of asthma and cardio-pulmonary disease — both of which can result in death.¹⁶

The Tijuana's atmospheric basin includes the communities of San Ysidro and Otay, which have records of high concentrations of particulate matter related to the use of motor vehicles and

¹³ Source: INECC, Inventario Nacional de Emisiones de Gases y Compuestos de Efecto Invernadero [National Inventory of Greenhouse Gas and Compound Emissions], (<https://datos.gob.mx/busca/dataset/inventario-nacional-de-emisiones-de-gases-y-compuestos-de-efecto-invernadero-inegycei/resource/d202a24f-cc1f-46d2-80e8-5d3389e92378>).

¹⁴ Source: Mexican national ecology and climate change institute, Instituto Nacional de Ecología y Cambio Climático (INECC) of the Mexican Ministry of Environment and Natural Resources (SEMARNAT), 2020 National Air Quality Report, Mexico, (<https://sinaica.inecc.gob.mx/archivo/informes/Informe2020.pdf>).

¹⁵ Source: 2018 -2027 Management Program to Improve Air Quality for Baja California, (https://www.gob.mx/cms/uploads/attachment/file/310361/24_ProAire_Baja_California.pdf).

¹⁶ Source: California Air Resources Board, ([California, City of Tijuana collaborate in battle to improve border air quality | California Air Resources Board](#)).

border crossing activity.¹⁷ In April 2022, the California Air Resources Board announced the delivery of low-cost sensors to the City of Tijuana to provide air monitoring of particulate matter along the border. The sensors will facilitate the exchange of information on air quality in both regions and will improve the ability to enforce regulations to prevent negative impacts on border residents due to pollution.¹⁸

B. Project Impacts

The Project is expected to improve and modernize the public transportation systems by the acquisition of buses with cleaner technologies that offer a higher-capacity passenger, safe, fast, and accessible transportation option for the existing demand in the corridor of Agua Caliente in the urban area of Tijuana. At the same time, the new public transportation system is expected to reduce emissions related to vehicle operation and urban congestion, which serves a broader environmental and human health benefit.

Currently, the public transportation service in the Agua Caliente corridor includes approximately 509 light-duty gasoline and diesel vehicles with low passenger capacity (109 buses, 364 minivans and 36 compact and mid-size vehicles). These vehicles are mainly owner-operated and create adverse traffic conditions and increased emissions.

The overall improvement of the public transportation service along the corridor will include the operation of 81 new high-capacity buses to replace the existing inefficient 509 vehicles. The overall CO₂ emissions of the public transportation service along this corridor will decrease approximately 50% with the new buses and around 90% for other harmful emissions. The overall impact is described below:

¹⁷ Source: Department of Environmental and Occupational Health Sciences, University of Washington, (<https://deohs.washington.edu/san-ysidro-air-quality-and-border-traffic-study>).

¹⁸ Source: California Air Resource Board (<https://ww2.arb.ca.gov/news/california-city-tijuana-collaborate-battle-improve-border-air-quality>).

Table 3
PUBLIC TRANSPORTATION IN AGUA CALIENTE CORRIDOR
OVERAL EMISSIONS

Vehicle Type	Number of Vehicles	Hours of Operation /day	Length of trip (minutes)	Emissions		
				NOx (ton/year)	PM (kg/year)	CO2 (ton/year)
Baseline						
Current public transportation vehicles (Diesel and gasoline-fueled vehicles)	509	15:00	215	22.3	344	8,700
Proposed overall improvements						
a. Financed by NADBank: Euro-VI Diesel-fueled (39) & Electric buses (3)	42	15:00	112	0.6	20	2,300
b. Financed through Value: Euro-VI Diesel-fueled buses (39)	39	15:00	112	0.6	20	2,200
Overall improvements	81	15:00	112	1.2	40	4,500
Emissions avoided with the implementation of the entire redesign of the public transportation system along the Agua Caliente corridor:				21.1	304	4,200

* The estimated CO₂ emissions target considers the manufacturer's specifications for the 78 Euro-VI diesel model plus the estimated emission of CO₂ for the energy generation required to operate the three electric buses based on 2.36 kWh/mile factor and 0.423 tons of CO₂ per Mega-watt hour published by SENER. The emissions factors for electric buses for NOx and PM calculations are not officially published.

Since the scope of the Project proposed for certification and financing includes only 39 new Euro-VI diesel buses and three electric buses, only a proportion of the avoided emissions is attributable directly to the buses to be financed by NADBank. This portion is equivalent to replacing 52% of the existing vehicles with the vehicles mentioned above.

Furthermore, a complete round-trip route within the corridor requires about 215 minutes on average. The technical study for the transportation system shows that with the improvement of service and the implementation of the Project, the route time is reduced to 112 minutes. In addition, the public transport units that currently operate in the corridor will be relocated on feeder routes to the Agua Caliente corridor, offering an alternative to reduce the use of personal vehicles from outside of the corridor. Consequently, the operation of the new buses will reduce direct emissions and indirect emissions by reducing congestion, accelerate traffic flow, and provide a better option to encourage residents to switch to public transportation. The Sponsor will report on the relocation of higher polluting vehicles from service in the corridor as the new buses enter service and demonstrate that the availability of bus services to customers has not been reduced.

The implementation of the Project will reduce emissions in the Agua Caliente corridor due to the replacement of the existing fleet with more efficient technology and greater passenger capacity. A summary of the expected outcomes specific to the proposed Project is presented below.

Table 4
PROJECT BENEFITS

Benefit	Impact
Reduction in round trip time	103 minutes
Reduction in NOx emissions	10.8 tons/year
Reduction in PM emissions	88 kg/year
Reduction in CO ₂ emissions	2,200 tons/year*

*CO₂ emissions were calculated based on the specification of the bus manufacturer and model (Euro-VI) and the estimated emission of CO₂ for the energy generation required to operate the three electric buses.

In addition to providing a cleaner and more effective vehicle for public transportation, the Project aims to modernize the overall operation of the Agua Caliente corridor by:

- Reducing vehicular congestion based on increased passenger capacity per vehicle trip and fewer, more efficient public transit vehicles in operation;
- Providing for a more streamlined operation under a single concession with an experienced company, offering benefits related to operation and maintenance, training, and accountability;
- Establishing formal bus stops and schedules to increase access and reliability for potential riders;
- Managing a centralized payment processing system that improves control, reduces losses, and allows for future integration with other branches of the system; and
- Improving security for passengers with the incorporation of a centralized system with video cameras and the capability to monitor buses via satellite.
- Improving the availability and use of safe and affordable transportation through the Violet transport program dedicated to gender- and age-specific passengers.

Besides providing significant environmental benefits, while improving mobility and quality of life for residents in Tijuana, the Project's investment in electric vehicles will help accelerate the transition of public transport to cleaner and more efficient technologies in metropolitan areas with a high demand for mobility and the need for a better-quality service for their ridership.

C. Transboundary Impacts

The proposed Project is expected to positively impact the transboundary air basin of Tijuana, Baja California, and San Ysidro, California. No negative transboundary impacts are expected as a result of Project implementation.

3.2.2. Compliance with Applicable Environmental Laws and Regulations

A. Environmental Clearance

The Mexican federal government enacted NOM-044-SEMARNAT-2017, which establishes the maximum permissible limits of emissions of carbon monoxide and other pollutants from the exhaust of new motors that use diesel as fuel with vehicular weight greater than 3,857 kilograms. The maximum limits were initially set as equivalent to Euro-IV for heavy vehicles with diesel engines; however, a 2019 update promotes the use of Euro-V technology, but the standard is not yet enforceable.¹⁹

According to the provisions of Mexican norms and regulations, an emissions certificate issued by PROFEPA is required to ensure compliance with the applicable emissions limits. The proposed Project will use diesel fuel vehicles that are better than the emission levels established in this standard. While not required by law in Mexico until 2025, the diesel buses proposed in the Project are Euro-VI models, which are an efficient technology compared with the previous generation of diesel engines. As previously mentioned, Certificate No. PFPA-SII-DGATI-VN-0890/2019 was issued by PROFEPA for the proposed bus specifications. NADBank will verify that the diesel buses acquired correspond to those described in the certificate.

In addition, electric mobility is included in Mexico's Mobility and Road Safety Law recognizing and allowing the use of electric vehicles for public transportation. The regulations for fully electric passenger buses are currently under development in Mexico, as well as the infrastructure for electric charging.

B. Mitigation Measures

Due to the nature of the Project, no mitigation measures are identified.

C. Pending Environmental Tasks and Authorizations

No environmental authorizations are pending for Project implementation.

3.3. Financial Criteria

The NADBank's portion of the Project's plan consists of providing financing to Líneas de Transporte Urbano y Sub-Urbano de Baja California S.A. in the form of a loan for up to MXN\$177.9 million from NADBank (the "Loan"). The required Project financing is estimated at

¹⁹ Euro-V emission standards were adopted by the Europe Union Parliament in 2009 with the maximum limits equivalent to 0.4 g/kilowatt-hour (KWh) for Carbon monoxide (CO), 2 mg/KWh for NOx and 30 for PM.

MXN\$204.1 million for the acquisition of 39 low-emission Euro-VI diesel buses and 3 electric buses (including payment collection and surveillance equipment) that will replace existing vehicles in the Corredor Agua Caliente located in Tijuana, Baja California.

The Project will be financed with a loan from NADBank and equity from the Sponsor. The source of payment for the loan will be the revenue generated by the transportation services provided by the “Corredor Agua Caliente” concession that will be pledged to a loan administration and payment trust. In addition, The Project will generate revenue from the *Transporte Violeta Program*, a state government-subsidized service, that will also be pledged to a trust. The project’s revenue is estimated to be sufficient to i) pay the debt service of the loan; ii) fund the debt service reserve and other reserves; iii) comply with debt service coverage requirements; and iv) cover scheduled operation and maintenance (O&M) expenses.

Considering the Project’s characteristics and based on the financial and risk analyses performed, the proposed Project is financially feasible and presents an acceptable level of risk. Therefore, NADBank proposes to provide a market-rate loan for up to MXN\$177.9 million for the Project’s completion.

4. PUBLIC ACCESS TO INFORMATION

4.1. Public Consultation

On December 12, 2023, NADBank published the draft certification and financing proposal for a 30-day public comment period. The following Project documentation is available upon request:

- Baja California government concession resolution IMOS/ dated in September 2023.
- PROFEPA Certificate PFPA-SII-DGATI-VN-0890/2019.

4.2. Outreach Activities

The Sponsor has followed all public consultation requirements in order to comply with applicable permitting processes. The local government has continuously informed residents about the Project through press interviews and social media networks. In particular, the need to improve and organize the public transportation service in the Agua Caliente corridor was published in the government’s official gazette in February 2023. As a formal action in May 2023, to support public transportation investments, state legislators published an amendment to the sustainable mobility law to guarantee the right to a safe, continuous, efficient, sustainable, and environmentally friendly public transportation service.

NADBank conducted a media search to identify potential public opinion about the Project. References to the Project were found on the websites listed below:

- *El Imparcial* (October 12, 2023) – “En noviembre operará ruta Agua Caliente” [The Agua Caliente route will operate in November], <https://www.elimparcial.com/tijuana/tijuana/En-noviembre-iniciaran-operaciones-nuevos-camiones-en-Corredor-Agua-Caliente-20231011-0011.html>
- *Uniradio Informa* (May 20, 2023) – “Se mantiene política de mejorar movilidad y modernización en corredor Agua Caliente: Gobernadora” [Policy to improve mobility and modernization of Agua Caliente Corridor maintained: Governor], <https://www.uniradioinforma.com/gobierno/se-mantiene-politica-mejorar-movilidad-modernizacion-corredor-agua-caliente-gobernadora-n667174>
- *Zeta Tijuana* (May 16, 2023) – “Reordenamiento de bulevard Diaz Ordaz iniciará a finales de agosto de 2023: IMOS (Instituto de Movilidad Sustentable)” [Reordering of Diaz Ordaz Boulevard will begin at the end of August 2023: IMOS (Sustainable Mobility Institute)], <https://zetatijuana.com/2023/05/reordenamiento-de-bulevar-diaz-ordaz-iniciara-a-finales-de-agosto-de-2023-imos/>
- *Infotijuas* (April 26, 2023) – “Asegura IMOS que taxis rojos tienen garantizados sus derechos” [IMOS assures that red taxis have their rights guaranteed], <https://infotijuas.com/2023/04/26/asegura-imos-que-taxis-rojos-tienen-garantizados-sus-derechos/>
- *Baja News* (April 26, 2023) – “Taxis rojo con negro llevaron a cabo un bloqueo de la carretera Tijuana-Tecate” [Red and black taxis carried out a blockade on the Tijuana-Tecate highway], <https://bajanews.mx/noticias/10194/Video-Taxis-Rojo-con-negro-llevaron-a-cabo-un-bloqueo-de-la-carretera-Tijuana-Tecate>
- *La Jornada* (April 26, 2023) – “Taxis rojos bloquean carretera varias horas; no perderán derechos, reitera IMOS” [Red taxis blocked the highway for several hours; will not lose rights, reiterates IMOS]
- *Notizona* (March 9, 2023) – “Pseudolíderes buscan seguir explotando el transporte público del corredor Agua Caliente: IMOS [Pseudo-leaders seek to continue exploiting public transport of the Agua Caliente Corridor: IMOS], <https://notizona.mx/pseudolideres-buscan-seguir-explotando-el-transporte-publico-del-corredor-agua-caliente-imos/>
- *El Sol de Tijuana* (November 10, 2022) – “Reordenamiento en Blvd. Agua Caliente estará listo en marzo de 2023” [Reordering on Agua Caliente Boulevard will be ready in March 2023], <https://www.elsoldetijuana.com.mx/local/reordenamiento-en-blvd.-agua-caliente-estara-listo-en-marzo-de-2023-9171645.html>
- *Zeta Tijuana* (October 10, 2022) – “Persiste opacidad en Corredor Agua Caliente” [Opacity persists in Agua Caliente Corridor], <https://zetatijuana.com/2022/10/persiste-opacidad-en-corredor-agua-caliente/>

- Greentology (January 28, 2022) – “Ruta Violeta transporta y protege a las mujeres en Tijuana” [Violet route protects women in Tijuana], <https://greentology.life/2022/01/28/ruta-violeta-transporta-y-protege-a-las-mujeres-en-tijuana/>

In summary, the publications highlight many of the concerns based on current conditions of the public transportation system in Tijuana and the plan to develop the Project. Opposition to the Project has been publicly demonstrated, especially efforts organized by the existing public transit service providers operating in the Agua Caliente corridor. The state government and public transportation authorities along with the Project sponsor have been working with those service providers to negotiate an appropriate solution to allow them to operate in coordination with the new approach.