APSA

Gestión de Infraestructura

Chile · Colombia · Peru

1996

APSA was born in Chile, a leading roadway infrastructure country in Latin America

2012

We opened an APSA branch in Peru, where we have participated in infrastructure projects for the country's development

2015

APSA expands and opens a branch in Colombia, strategically located to be able to service markets in Central and North America.

More than 20 years evaluating countries' roadways and assessing public agencies to improve investment and maintenance decisions.

Our strategic allies are

- Governments
- Private sector licensees
- Infrastructure agencies
- Banks
- Investment groups

Our Market

At APSA, we are experts in one of the most innovative disciplines in civil engineering, Infrastructure Management. Our purpose is to deliver management services focused on the reality of the transportation infrastructure through consultations, studies, design, projects, evaluations and professional training.

Our branches have the capacity to explore the structural and functional condition of pavements quickly and with great precision thanks to the modern equipment, new technologies, specialized software and an expert team of civil engineers and technical support we utilize. We have more than 20 years of experience developing applied services in the area of roadway infrastructure with the public and private sector in South America, Central America and Oceania.

- We have worked with all of the concessions of roadways in Chile.
- We have led the evaluations of the National Pavement Network of the Ministry of Public Works of Chile.
- Yearly we evaluate and manage more than 10,000 kilometers of concession highways and more than 12,000 kilometers of public roadways.
- We are strategic partners for the auditing roadway and infrastructure purchases or sales.
- In Chile, Peru, Colombia, Mexico and Central America we participate in infrastructure valuation processes for engineering projects on roads that require preservation action to be able to comply with the operational thresholds.
- We have conducted service level evaluations for supervisory organizations.

Annual Evaluations

10.000 kms
Of highway concessions

12.000 kms
Of public roadways

ISO 9001
BUREAU VERITAS
Certification

Our Services

The management of infrastructure is applicable to a great variety of activities on different types of roadway, airport, ports and waterways, urban streets, and industrial pavement infrastructure applications.

Pavement management with maintenance and investment plans

- New projects
- Studies for competitive bids
- Exploration projects
- Construction projects
- Implementation of roadway infrastructure management systems
- Technical Due Diligence

Pavement Design

- Pavement rehabilitation
- New pavement design
- Special pavement design (airports, ports and industrial pavements)

Development of roadway inventory and evaluation of service level compliance

- Data collection with high-yield equipment

Structural evaluation of pavements

- Falling Weight Deflectometer
- Non-destructive evaluation using Ground Penetrating Radar (GPR)

Structural evaluation of pavements

- Evaluation of IRI, rutting, texture, cracking, friction.
- Evaluation of pavement marking and traffic signs.

Functional evaluation of pavements

- Chile
- Colombia
- Peru

Pavement Management with Maintenance and Investment Plans

We utilize the ideal technical equipment that allows us to assess and support our clients in the analysis of different projects through the bidding processes in construction or exploration. We create pavement structural designs and with the use of software such as HDM-4 modeling we create a lifecycle and investment optimization. Additionally, we perform audits for the sale or purchase of roadways and infrastructure.

•**Processes in construction.** We accompany our clients in the evaluation of compliance of design parameters and in case of finding situations not expected, we adjust the technical specifications of the initial structural design

• **Exploration projects.** We evaluate the progression of different functional and structural indicators, adjusting the performance of each against the demands of load and environmental conditions. In this way, we can indicate the opportune moment to conduct pavement interventions. We generate annual programs and monthly preservation plans during the exploration period of a roadway project.

•**Implementation of roadway infrastructure management systems.**
We assess the different project stages from system implementation to the development of information collection and processing procedures.

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Pavement Design

• **We realize the structural design** of flexible and/or rigid pavements for highways, airports, ports and waterways and industrial pavements through the use of expert technical equipment, with empirical methodologies and/or mechanics.

• **We conduct traffic forecast studies** which can include diverse aspects like flow analysis, capacity and vehicular fleet characterization through weight and configurations.

• **We realize the design** of structural solutions for the preservation and rehabilitation of pavements over the mid- and long-term, vis-à-vis the basis of technical and economic considerations, be they the latest social and/or private designation.

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Development of roadway inventories and level of service compliance evaluations

We utilize high-technological equipment for the development of roadway inventories that employ collected technical information, systematized with data obtained from measurements taken in the field. The inventories are marked as planning and management tools at a network level. There are two levels of inventories:

- **Basic Roadway Inventory:** Availing ourselves the ultimate technological equipment for the identification and registration of geo-referenced data of principal trajectory points of highways, longitudes, basic characteristics, axis geometry, type of tread surface and state of transit.

- **Qualified Roadway Inventory:** We identify and register the data associated with the geometric axis outline, pavement structural characteristics of the highways, complementary constructions, roadway safety and traffic.

Evaluation of compliance with service levels. Conducted in accordance with that indicated in the bidding bases, through the execution of measurements of all the condition indicators with high-yield equipment, additionally compliance with state of drainage, vertical signals and pavement marking, among others, is evaluated.

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Structural evaluation of pavements

We rely on FWD and HWD Impact Deflectometers, equipment with the capacity to perform the structural evaluation on highways, ports, airports and for industrial pavements. The equipment performs the load application and through geo-phones registers the produced deformation.

Results:

- The identification of uniform sections in structural capacity.
- Characterization of pavement structure layers.
- Evaluation of pavement structural capacity.
- Structural follow-up during the exploration phase.
- Compliance with the design demands in the construction phase.
- Remaining life studies.

Evaluation of thicknesses using Ground-penetrating radar (GPR).

The GPR allows us to ascertain the characteristics of the distinct layers that compose the pavement structure. Determining the thickness, the existence of cavities, discontinuities, among other factors, in a continuous and non-destructive fashion.

Equipment for collecting roadway inventories and conducting roadway safety audits.

Equipment for collecting roadway inventory and assessing roadway security. A vehicle with four high-resolution cameras that permit capturing the totality of the roadway elements. A high-precision GPS antenna that allows capturing spatial and geographical location. The device registers and combines the inertial data it receives via gyroscopes, accelerometers and GPS, determining the geometry of the roadway (Geometry of the roadway, longitudinal profile and transversal profiles).

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Functional evaluation of pavements

We utilize Laser Profilometer (Class 1 according to ASTM), that allow for the evaluation of pavement roughness and texture with great precision and high yield.

Results:

- Evaluation of roughness (IRI).
- Evaluation of pavement texture.

Equipment for the evaluation of rutting

We utilize equipment comprised of a GPS receptor, a precision odometer and two laser camera that record the profile in two dimensions, allowing for the determination of any deformity in the profile with great precision.

Results:

- Determination of rutting within millimeters in each track of the vehicle's wheel circulation.

Skid Resistance testing (Griptester)

We utilize equipment comprised of a GPS receptor, a precision odometer and two laser camera that record the profile in two dimensions, allowing for the determination of any deformity in the profile with great precision.

Results:

- A skid resistance coefficient measured over the circulation line of the measuring wheel.

Signaling Evaluation

We have portable equipment that allows us to determine the retro-reflection luminance of pavement marking. The equipment presents a simple calibration and incorporates microprocessors that guarantee efficient management. We also utilize equipment to determine the specific reflective value of retro-reflective material for night visibility.

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APSA is the first company in Latin America to adapt an automated inspection and processing system for surface deterioration with Laser Crack Measurement System (LCMS), achieving adaptation of the system according to visual inspection methodologies of each country.

LCMS Equipment

We utilize LCMS equipment that has high velocity cameras and optics that allow us to acquire profiles in three dimensions with high resolution The LCMS has as high-rendition and great repetition of data, eliminating subjectivity of data collection done manually.

Data collection information is done with a width of four meters and up to a speed of 100 km/hr, day or night.

Results:

- Automatic detection of cracks and classification according to their severity.
- Detection of potholes, ravelling, sealed cracks and joinings in concrete pavements
- Evaluation of Rutting.
- Evaluation of roughness
- Evaluation of macro-texture on all widths of lanes.
- Measurements of transversal and longitudinal gradings

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Relevant projects in different markets

Projects managed from Chile

Project: iRAP evaluation for road safety of the roadway network of three regions in Chile, 2,600 km long.
Year:2017.
Description: Collected the characteristics of the routes by means of iRAP certified equipment.

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Project: Pavement inspection study of the metropolitan Chile paved roadway network.
Year: 2016-2107.
Description: Evaluation of 1,200 kilometers of the paved national network of Chile, performing falling weight deflectometer, skid resistance, IRI, rutting, cracking and determination of parameters for HDM-4 modeling.

Project: Expert audit for highway management.
Year: 2016-2017.
Description: Evaluation of 800 kilometers of five highways that unite Santiago with the region of Valparaiso and Coquimbo, performing IRI, rutting, and pavement condition inspection, including cracking, falling weight deflectometer and HDM-4 modeling.

Project: Auscultation study of the paved roadway network of Chile's Antofagasta region.
Year: 2016.
Description: Evaluation of 1,100 kilometers of Chile's paved national network, performing falling weight deflectometer, IRI, rutting, cracking and determination of parameters for HDM-4 modeling.

Project: iRAP evaluation for roadway safety project of the Cobre roadway with a 140-kilometer lane extension.
Year: 2015.
Description: Collecting the characteristics of the routes by means of certified iRAP equipment.

Project: Auscultation study of the Chilean paved roadway network.

Year: 2015-2017.
Description: Evaluation of 12,100 kilometers of Chile's paved national network, performing falling weight deflectometer, skid resistance, IRI, rutting, cracking and determination of parameters for HDM-4 modeling.

Year: 2013-2015.
Description: Evaluation of 10,000 kilometers of Chile's paved national network, performing falling weight deflectometer, skid resistance, IRI, rutting, cracking and determination of parameters for HDM-4 modeling.

Year: 2011-2013
Description: Evaluation of 8,500 kilometers of Chile's paved national network, performing falling weight deflectometer, skid resistance, IRI, rutting, cracking and determination of parameters for HDM-4 modeling.

Year:2009-2011.
Description: Evaluation of 4,500 kilometers of Chile's paved national network, performing IRI, and rutting evaluations, survey cracks and parameter determination for HDM-4 modeling.

Project: iRAP evaluation for roadway safety project of Central Licensed Highway Concession, with 470 kilometers of lanes.
Year: 2015-2016.
Description: Collecting the characteristics of the routes by means of certified iRAP equipment.

Project: Basic methodological study for the management of road infrastructure assets.
Year: 2013.
Description: Methodological development for the management of road infrastructure assets of Chile, implementing calculation software and implementation of same.

Projects managed from Peru

Project: Measurement and evaluation of service levels, roughness, deflection levels and wait time for 15 licensed contracts in operation
Year: 2017, 2016, 2015, 2014, 2013
Description: Measurement and service level evaluation for roughness (IRI), deflection and wait time for concessions in operation.

Project: iRAP evaluation for roadway safety project for the Norvial Highway Concession, 100 kilometers of lane.
Year: 2016.
Description: Collecting the characteristics of the routes by means of certified iRAP equipment.

Project: iRAP evaluation for pilot roadway safety project of the Interoceanica IIRSA Norte Highway, with a 100 kilometer extension.
Year: 2013.
Description: Collecting the characteristics of the routes by means of certified iRAP equipment.

Project: iRAP evaluation pilot roadway safety project for the Interoceanica IIRSA Norte Highway, with a 1,000-kilometer extension.
Year: 2012.
Description: Collecting the characteristics of the routes by means of certified iRAP equipment.

Projects managed from Colombia

Project: Structural Design of Pavement and Maintenance Plan of 700 kilometers of roadway in Melbourne, Australia.
Year: 2017.
Description: Analysis of the available information of the 700 kilometer lane, design of new and rehabilitated pavement structure, modeling of a maintenance plan for a 30-year horizon.

Project: Modeling and prediction of a Pavement deterioration using HDM-4. Maintenance plan for Libramento Villahermsa, Mexico
Year: 2016.

Description: Analysis of the available information of 90.1 kilometers of lane and modeling and prediction of a Pavement deterioration using HDM-4. Maintenance plan for a 20-year horizon.

Project: iRAP roadway network evaluation of Colombian highways. Performed collecting 12,000 kilometers of paved network.
Year: 2012-2013.
Description: Collecting the characteristics of the routes by means of certified iRAP equipment.

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