CASE STUDY

Product solution for: City of La Paz, Bolivia

DigitalGlobe imagery helps La Paz plan for future growth

Built deep into a canyon and spreading upward into the surrounding Andes Mountains, La Paz is a growing city with a metropolitan area exceeding 2.3 million people that doesn’t have much room to expand. To help urban planning efforts, the city employed DigitalGlobe’s high-resolution satellite imagery for an extensive study to map roads, vegetation, buildings, and topographical conditions with an eye toward future growth.

A tight fit requires accuracy

La Paz, elevation 11,975 feet, is the world’s highest de facto capital city. Although not Bolivia’s official capital city, La Paz has the country’s largest concentration of government agencies and courts. It is also a major center of manufacturing and agriculture, and its environs contain some of the world’s largest deposits of tin. Development pressures are tremendous, yet the city faces many challenges because the towering Andes Mountains that surround it are the only avenue for growth.

To better understand its growth options and potential environmental impact, the city contracted with DigitalGlobe partner Aitec Engineering to conduct a detailed survey to produce a digital terrain model and a 3D rendering of the city’s roads, vegetation and buildings.

Accuracy was the prime consideration for the project. The goal was to produce a survey with level curves equidistant at one meter and render elements of the surrounding landscape in 3D, including agricultural areas, buildings, hydrology, forest and roadways. The study also specified the creation of a digital terrain model, topographic maps on a one square meter resolution. Aitec quickly determined that DigitalGlobe’s WorldView-2 satellite was the ideal solution for the project.

DigitalGlobe’s WorldView-2 satellite provides the only high-resolution 8-band multispectral commercial imagery available today. It is the ideal tool for remote sensing, providing complete coverage of the visual spectrum. WorldView-2 improves segmentation and classification of land and aquatic features beyond any other space-based remote sensing platform, critical to capturing the detailed imagery of La Paz and its surrounding environs.

Company information

DigitalGlobe partner Aitec is a leading engineering firm specializing in satellite photogrammetry, remote sensing, geographic information systems, geodesy, and geology for oil and gas, land management and environmental projects across Latin America and Africa.

www.aitec-geo.com
Imagery captured in record time

The main objective of this work was the production of the topography maps for the planning and design of three systems urban ropeways. The first stage of the project, based on stereoscopic pairs captured by the WorldView-2 satellite, consisted of performing aero triangulation supported by ground geodesic control points measured in the study area, with L1/L2 frequency GPS equipment to guarantee accuracy. Five main geodesic vertices were used as well as 50 control points and 35 checkpoints. Triangulation and adjustment were performed on the photogrammetric block, homologous points were calculated between images to produce epipolar imagery, and topographic data was extracted using algorithms developed for the project. Additionally, digital surface models were obtained, as well as digital terrain models.

The imagery was successfully captured within one week and with precision similar to that obtained through conventional topographic processes, which typically are expensive and can take weeks and months to complete.

A model for urban planning

Conducted with precise accuracy in record time, this cost-effective study provided the city of La Paz with a state-of-the-art, high-resolution snapshot of its entire infrastructure: roads, vegetation, buildings and surrounding environment. It will serve as the foundation for decision-making for systems urban cableways and highway planning to management of agricultural production, feasibility studies for new power plants, environmental analyses and land registries, among others.

“A study this thorough and complex, given the resources at hand, would not have been possible without the availability of technology like WorldView-2,” says Mr. Mattie. “The city now has a powerful decision-making tool moving forward.”

NELSON MATTIE, AITEC CEO

| Challenge | Create a digital terrain model and 3D rendering of the city’s infrastructure including roads, vegetation, hydrology, and buildings to use as a decision-making tool with which to plan future growth. |
| Solution  | Using DigitalGlobe WorldView-2 satellite imagery in an advanced digital photogrammetry environment, DigitalGlobe partner Aitec Engineering, produced the survey in record time and on budget. |
| Results   | Imagery was successfully captured within one week after WorldView-2 was deployed, enabling the delivery of a precise and accurate survey in record time and in an extremely cost-effective manner. |