

Using information technologies for bridge management in Mexico's Royal Roads built between XVI and XVIII century

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ABSTRACT

Before the arrival of the Spanish conquerors in the territory now known as Mexico, Mesoamerican cultures had achieved a well-defined commercial/military routes between the most important cities in its region. The interest in the Vice Regal era (XVI-XIX centuries) for other goods, substantially modified the network of exchanges and forced the conquerors to open other paths toward regions often difficult to access. Efforts to discover and exploit natural resources gave rise to new communication avenues. Thanks to the interest of the Spanish settlers to extract precious metals (mainly gold and silver), they colonized new regions and configured a road network in order to benefit and export the product of the mines. As part of this process came other activities (agriculture, livestock, some manufacturing necessary for daily life, the trade), which were essential to supply the mining operations.

Since the XVI century, different regions were founded: the Nueva España, Nueva Galicia, Nueva Vizcaya, Nuevo Santander, and Nuevo Leon. Communications during the Colony were built based on two mutually perpendicular axes. The first route, East to West, between Veracruz-Mexico-Acapulco was a colossal bridge between the Atlantic Ocean and the Pacific Ocean, known then as the Seno Mexicano and Mar del Sur, respectively. The other axis, North to South, linked the northern region of the Viceroyalty with Mexico City, and at that time with Oaxaca, and Guatemala.

As part of the road infrastructure needed to get a continuous flux of goods, bridges were very important for crossing rivers, cliffs, and mountains. The fabrication of these structural elements were mainly made using the roman old school. The geometry, length, and materials used were varied, depending on the technical improvements of the time, and local labour expertise. The vice royal bridge vestiges are now scattered in the 2 million square km of the Mexican territory. Most of them are still in use, but others *were* forgotten in the old Royal Roads which went out of use. The National Institute of Anthropology and History (INAH, Spanish acronym) had an inventory of most of the archaeological (pre-Hispanic) and architectural vestiges, including a list of almost 800 bridges built between the XVI and the XVIII centuries.

This investigation deals with the methodology used (based on information technologies) to create a web-based management system for Vice Royal bridges, that is now available to be used in Mexico by the three government levels (Municipality, State, and Federal). It also includes the methodology used to georeference a part of the Camino Real de Tierra Adentro (Inland Royal Road), in the Queretaro State, and the way this information is now helping people to redirect efforts for conservation of the Royal Road heritage in Mexico.

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