# A Comprehensive Study of Historical Adobe Urban Dwellings: Case Study Guadalajara, Mexico

Jacquelin Flores
University of Oregon
Terminal Project
Winter 2014

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Terminal Project Approval Page

Student: Jacquelin Flores

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## I. INTRODUCTION

In the last decade, the city of Guadalajara, Mexico, has witnessed the inevitable loss of patrimonial buildings in the downtown area. The absence of enforced protective legislation, public education initiatives, public interest, public and private funding and urban sprawl in Mexican cities are all major contributors to the disappearance and loss of this invaluable cultural resource.

A great number of Guadalajara's urban patrimony, especially dwellings, are constructed of adobe. To this day, downtown Guadalajara harbors exceptional examples of adobe homes with an array of architectural trends including Colonial, Neo-classical, Eclectic, Neo-gothic and Neo-indigenous which are all unique to Latin America. It is in these homes that the *mestizaje*[1] of two cultures is reflected in their construction methods and architectural design. Architects, engineers and historians have reflected upon the ongoing loss of these exemplifying architectural treasures.

> *The built patrimony facing the biggest threat of extinction in Mexico is earthen architecture. This threat is due to the vulnerability of the material and to the lack of interest that people nowadays have in it. Even though this cultural heritage is an architectural typology that has been highly disseminated in this country throughout the centuries, we have witnessed the irreparable loss of hundreds of urban and rural adobe complexes that have been abandoned or intentionally demolished with the excuse that the*

[1] Mestizaje comes from the word mestizo, which is used as reference to any person of mixed blood. Specifically: a person of mixed European and American Indian ancestry. In Spanish America, the term denotes a person of combined Indian and European extraction.

*materials of which they are built are unstable, unsafe and unhealthy.*[2]

*Ph.D. Luis Fernando Guerrero Baca*

A brief overview of Mexican history is necessary to understand the uniqueness of Mexico's built environment and culture. The Spanish conquest created a new identity of peoples where two cultures collided and created what today epitomizes Mexican culture. This identity is tangible in our buildings, streets and way of life. This is why it is of pivotal importance these homes are maintained and conserved for future generations. A short overview of identifying characteristics is made to reinforce the variety of architectural styles and how they are all congruent to a visual historical landscape and of essential relevance to our cultural history.

The paradox concerning the dangerous nature of adobe structures and their lack of stability is addressed. If these homes are, in fact, unsound, how have they endured for so many years? Some adobe structures found near Guadalajara's city core date back to the sixteenth century. A brief review of restoration procedures and prevailing obstacles and common problems found in adobe buildings will be referenced.

An initial thought guided this research. It was the belief that the core problems concerning the preservation of historic adobe structure lied with the holes and deficiencies of Mexican preservation legislation. After viewing the legislation it became apparent that it was not as deficient as initially thought so the research had to expand in addressing many other social issues pertaining to the conservation of these adobe structures. Still, to truly understand the reason behind the dismay concerning

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[2] Luis Fernando Guerrero Baca, *Mexico: La Perdida de la Arquitectura de Adobe en Mexico.* (Heritage at Risk 2006/2007),112-114.

historic adobe buildings, an analytical view of active legislation and codes applicable to historic areas and buildings was required and necessary to discus. As in many cases, legislation is the most effective measure in the preservation of historic patrimony. A complete legislative package concerning Mexico's historic heritage exists but it is not meeting its core objectives. Why is legislation not enough to protect the historic adobe buildings in Guadalajara?

Historic adobe structures' vulnerability and unforeseen future is not a unique problem to Mexico. Many other countries have adobe structures valued for their cultural and historic qualities. In that case, how have other nations addressed the problem? A solution might be in government programs, non-profit efforts and community outreach, which will be addressed in this paper. Hopefully some of these international efforts can be transferred to aid in the conservancy endeavors of Guadalajara's historic adobe structures.

The historic buildings remaining in Guadalajara's downtown core embody Mexico's cultural history and therefore justify the attention of its community, lawmakers and the general public.

## II. BRIEF HISTORICAL BACKGROUND: GUADALAJARA, MEXICO

Guadalajara is the capital of the Mexican state of Jalisco. The city is located in the central region of Jalisco in the western-pacific region of Mexico. It is the third largest city in Mexico. Guadalajara's population as of 2010 is 4.4 million in the metropolitan area.[3]

Fig 1:
Map of Mexico, in yellow is the state of Jalisco; red dot represents the city of Guadalajara

The territory that later became known as Mexico was conquered by Hernan Cortes in 1519 representing the Spanish empire. On arrival, the Europeans found a land composed of many tribes with different cultures, language and ideologies. After the conquest, Mexico was a Spanish colony for 300 years, time in which it became a highly homogenized society. Mexico acquired its independence from the Spanish Empire in the early nineteenth century.[4]

Before the Spanish conquest, the native tribes of the Cocas and Tecuexes, that were relatively small in size and number, inhabited the valley where the city of Guadalajara was first founded. These tribes were subdued without much resistance by Nuño Beltrán de Guzmán in 1530. Some time later, the city of Guadalajara was

[3] "Guadlajara" Geo-Mexico. accessed November 11, 2012, http://geo-mexico.com/?p=3395.

[4] Mariana Yampolsky, and Chloë Sayer. *The Traditional Architecture of Mexico*. (New York: Thames and Hudson, 1993).

moved to Tlacotan where it remained until 1541. It was moved once again due to the war known as the rebellion of Mixton. After a brutal battle, the city finally found peace but with it also came a shortage of Native laborers. It was then forced to relocate for the third and last time.

The current location of Guadalajara was settled in the valley of Atemajac on February 14, 1542. The city developed rapidly and was soon the center of religious and governmental powers of the region. In 1560, King Felipe II decided to give the city of Guadalajara the royal license to move the Cathedral, the Royal Court and all tax officials from the city of Compostela, thus becoming the capital of the vast territory then referred to as el *Reinado de Nueva Galicia*.

This brought on massive urban development. The urban structure was conceived in accordance with the rest of the colonial cities. An urban trace, in the form of a grid, was given to most colonial cities. In Guadalajara, the *Plazuela* of *San Fernando* was set at the center. Later, friar Antonio de Segovia established the neighborhoods of *Mexicaltzingo, Mezquitán and Analco*. It was during this time, especially in the eighteenth century, that Guadalajara witnessed overall prosperity that also bestowed a historical legacy of architecture, culture and art.[5]

[5] "Historia de la Ciudad de Guadalajara: parte 2." Mexico Desconocido 2012, accessed November, 2012, http://www.mexicodesconocido.com.mx/historia-de-la-ciudad-de-guadalajara-parte-2.html.


Fig 2: Historical image of Guadalajara, San Juan de Dios neighborhood

On the 16th of September of 1810, Mexico declared Independence from the Spanish crown. The battle lasted 11 years and on September 27,1821, Spain signed the Treaty of Cordoba and Mexico was a sovereign entity. With this new independence came a period of adjustment and many other battles. Many of Mexico's citizens did not want to conform to the new government in place and were struggling for a liberal reform. The Mexican reform limited the Catholic involvement in land holdings, revenues, education and other governmental entities, creating a separation between state and church in the Constitution of 1857.

From 1876 to 1910, Mexico found itself in a land of order and progress but also with a dictatorship. *Porfirio Diaz* established many economical and technological advances but with his rule came enormous social disparities. This brought on the Mexican Revolution that lasted from 1910 to 1929. The Mexican Revolution was created by popular participation. It was a time of turmoil and violence. The conflict lasted around 20 years. During the Porfiraito (name given to the time under the dictatorship of Porfirio Diaz), economic stability brought with it an abundance of European influences, which are seen today in our railroads, streets, architecture and art. With the Revolution came the pride towards the indigenous roots, which are tangible in the Neo-colonial, *Neo-indigenismo*[6] and Regionalism styles of architecture.

[6] Neo-indigenismo: architectural style, which incorporated indigenous patterns and colors on facades of buildings.

## III. BRIEF HISTORICAL BACKGROUND: ARCHITECTURE

### History and Development of the Urban Trace:

As with most cities conquered by the Spanish crown in America, the *plaza* (an open urban public space, such as a city square) was the center of all social and economical ordinances. A social distinction was created with the urban placement of homes in accordance to their closeness to the same *plaza*. The urban territory was segregated socially, racially and economically. The influential and powerful were placed at the perimeters of the plaza while laborers and Indians were accommodated in the empty margins of the urban trace. Later with the homogenization of race in Mexico, race no longer played the pivotal role in urban placement. It was ultimately eclipsed by economic and social status. [7]

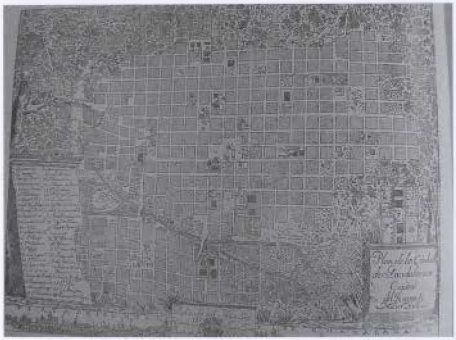

Fig 3: Urban trace of the Reinado de Nueva Galicia

In the 1670s, Spain had become the founding power of cities in Latin America. With the Spanish came knowledge of Renaissance urban theories and Christian ideals, which where so successful that they were made the model to

[7] "Casa, Habitacion Y Espacio Urbano en Mexico. De la Colonia al Liberalismo Decimonico." Scripta Nova 2003, accessed January 2013, http://www.ub.edu/geocrit/sn/sn-146(015).htm#_edn6).
Esteban Sanchez de Tagle, *Los dueños de la calle. Una historia de la vía pública en la época colonial.* (México: Departamento del Distrito Federal/Instituto Nacional de Antropología e Historia, 1997),

follow by law since 1573. These models are today the historical *casco*[8] and the starting point of many Mexican and Latin American cities.[9]

The central *plaza*, or also referred to as the square, was used and developed to effectively generate, control and coordinate the entire urban system. The *plaza* concentrated all buildings relevant to the function of the administrating government and power. The main church, in some cases a Cathedral, and the royal house were also located on the *plaza* facing each other. These buildings were normally very imposing in size and style convincing most if not all that this was the new governing power, the Spanish Crown.[10] The *plaza* was also to be used as the core of social and civic gatherings. It was specifically stated and understood that the most prominent business and merchants were to be placed here as well. The *plaza* was to be the center of civil and religious power, the image of an urban landmark, and the implemented meeting point of a new city.[11]

Fig 4: Arial of the downtown city plaza Guadalajara Jalisco (COPLAUR)

[8] Casco: the Spanish name given to the historical area of a city.

[9] Scripta Nova, "Casa, Habitacion Y Espacio Urbano en Mexico."

[10] Javier Aguilera Rojas. *Teoría urbanística en la colonización española de América. Las Ordenanzas de Nueva Población. Ciudad y Territorio.* 1977, (Mexico: n°1, enero-marzo) p.9-24.

[11] Scripta Nova, "Casa, Habitacion Y Espacio Urbano en Mexico."

**High Architecture:**

With the Spanish conquest, new architectural theories were introduced from the classic ordinance with an added Arabic flair. Unique models of designs were created with the construction of churches and convents. These structures formed the base for the evangelization of the indigenous peoples where their native ideology was still portrayed and was then denominated as the architectural style of *tequitqui*.[12] " *Tequitqui* art combines the European artistic tradition with the Indian aesthetics." Afterwards, the Baroque style was imposed in large cathedrals and government buildings. In rural areas, haciendas and large estates were built with a mozarabe style of architecture.[13]

Fig 5: Teatro Degollado. C.1960, (COPLAUR)

[12] "Historia de la Ciudad de Guadalajara: parte 1." Mexico Desconocido, 2012, accessed November 2012http://www.mexicodesconocido.com.mx/historia-de-la-ciudad-de-guadalajara-parte-1.html. Tequitqui is the combination of European artistic traditions with the indiguionus asthetics

[13] Mexico Desconocido, "Historia de la Ciudad de Guadalajara: parte 2."

Most buildings with high architecture featured a Baroque style that was original to Latin America. This originality came from the different array of stone, brick and plaster found in the area. It differentiated from Spanish Baroque in its need to make architectural adjustments based upon the availability of materials. In Spanish architecture structural elements were given a Baroque decor but in New Spain Baroque elements were largely used for decorative purposes only. Many of the Baroque elements were found on the *retablo*. These facades are interesting on their own as they are made to mimic the interior architecture of the building. This is seen in cathedrals and temples as the main façade would be very similar to the wall behind the altar.

Fig 6: Governors palace in Guadalajara 1952 (COPLAUR)

High architecture in most Latin American cities is still an important element in cultural identity. Today, the emblem used to characterize the city of Guadalajara is the two prominent yellow towers of the Cathedral. This implies the social connection the citizens of Guadalajara have with the religious building and how as a culture Mexicans adapted to Spanish architecture and identified to it as part of their own

tradition and art. Good examples of high architecture are also seen in the Neo-Classical, Neo-Gothic and Eclectic styles. Most are built with masonry techniques and a wide array of *cantera*.[14]

Fig 7: Hospicio Cabanas, (COPLAUR)

[14] Cantera: quarried stone common in the region

**Urban Dwelling Architecture:**

In 1725, the city of Guadalajara witnessed the end of its first development stage. The society and city trace had to adapt to its new title as capital of Nueva Galicia. Guadalajara saw this transition from rural area, to city, to regional capital, to *virreinal* (viceregal) capital, and as a result the population tripled in the eighteenth century.[15] From 1720 to 1800, the urban trace expands from 100 to 200 hectares and its population doubled from 12,000 to 25,000 people. Housing also grew in this time period from 143 to 334 blocks. In the second half of the eighteenth century, Guadalajara's housing construction grew from 1,541 homes in 1738 to 4,487 homes in 1791, anticipating population growth.[16]

*Tequitqui* architecture was the name given to the high architectural style, which boasted a mix of Spanish and Indigenous traditions, art and constructive methods. It could also be perceived in the architecture used for Colonial style urban dwellings. A *Mestizaje*[17] occurs when the mix of two different cultures originate a new original culture and can be preserved in the urban dwelling of the time. Although not all historic dwellings found in Guadalajara are constructed in adobe, the principal focus of this paper will be on adobe dwelling found in the A and B perimeters of the historic protected area. The architectural styles will include Colonial, Neo-classical, Neo-gothic, Eclectic and Neo-colonial. These are terms used in

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[15] Rosalva Loreto Lopez. Casas, Viviendas y Hogares en la Historia de Mexico.

[16] M de la Mora Padilla, *Historia del reino de Nueva Galicia en la America Septentrional*, Guadalajara 1973, p. 504; Castaneda, *Vivir Guadalajara la ciudad y sus funciones*, Guadalajara, 1922, pp. 48-49.

[17] Mestizo: the word given to categorize race in New Spain, a mestizo was the son of a Spaniard and an indigenous native.

classifying architectural patrimony in Guadalajara Jalisco.[18]

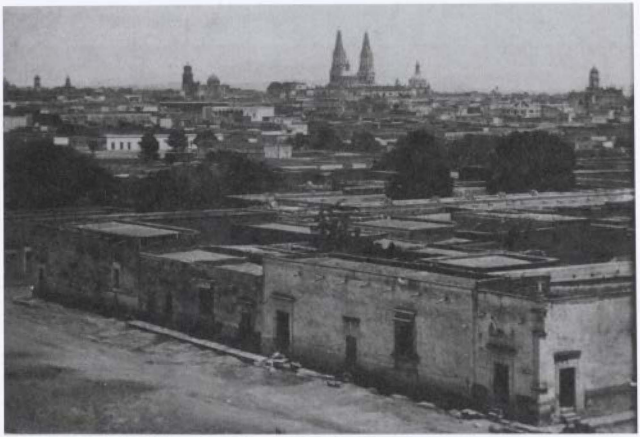


Fig. 8: Panoramic of Guadalajara from Analco neighborhood (COPLAUR)

Colonial dwellings present important architectural elements such as the *patio central*. Homes with a *patio central* are common in that most are accessed through the front *zaguan,* which is a passageway that connects to the iconic inner courtyard referred to as the *patio central*. The use of a *zaguan* in an urban home represented social and economic status. In the construction of homes held during the colonial period, 57% of them contained a *zaguan*. It was a symbol of constructive quality and was used to privatize the lives of the families inside.[19] In some cases the passageway

[18] Ignacio Gomez Arriola. *Criterios para la identificacion e inventario del patrimonio edificado de estado de Jalisco.*
[19] Rosalva Loreto Lopez. *Casas, Viviendas y Hogares en la Historia de Mexico.*

would wrap around the entire patio. This patio was used to distribute the architectural spaces and all the rooms would be accessed through it

Fig. 9: Interior of a private home. c. 1900 (COPLAUR)

The *patio central* created an architectural typology where the layout for these adobe Colonial structures depicted a C, U or square. The common areas were conveniently placed at the front of the house, while the bedrooms were distributed to the sides; kitchen and servant quarters were located at the rear of the structure.[20] The *patio central* was seen in 79% of homes built during colonial period in Guadalajara. This architectural element increased the price of construction but was justified as it

[20] Emilia Diaz Arreola, Liliana Fuentes Valles and Sofia Perez Martinez. *Manual de Conservacion de Monumentos Historicos y Arquitectura de Tierra.* (Chihuahua: INAH CONACULTA)

gave value to the way of life by guaranteeing a useful architectural floor plan and a pleasing separation from common and private family areas.[21]

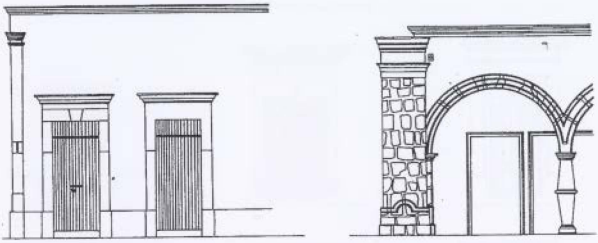


Fig 10: Examples of colonial dwelling facades (Gomez)

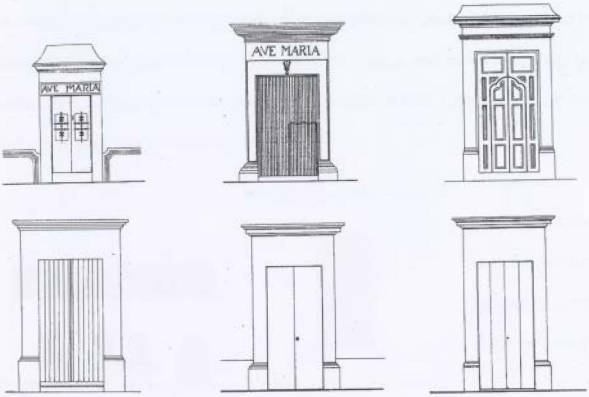
Guadalajara has always been identified as a tertiary economy. Since colonial times, many homes were adapted to include a *tienda* (store) in place of its living room at the front of the house. Having your own business or *tienda* was seen as an element of virtue and dignity to the family. In some cases, the stores were small and had a side entrance; in others, the store was the main objective of the construction and was placed at the front.

The construction typology in colonial urban dwellings is fairly similar in the sixteenth, seventeenth and eighteenth century. For three centuries, few variations were made in the manner materials were utilized, and the materials themselves remained the same. The most common construction materials used were adobe for walls, stone

[21] Rosalva Loreto Lopez. *Casas, Viviendas y Hogares en la Historia de Mexico.*

for foundations and in some cases walls, cantera for columns and detailing, lime for mortars and plasters, and wood for roofs, doors, window frames and other weight bearing elements.[22]

Fig 11: Examples of colonial dwelling doors and windows (Gomez)



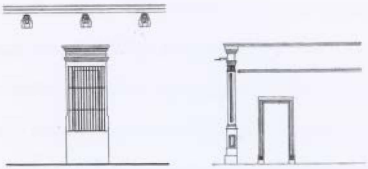



Fig 12: Colonial dwelling facade with Baroque detail (Gomez)

Dwellings incorporated religious Baroque elements by simplifying and readapting them. Urban colonial adobe dwelling facades

[22] Ruben Chiappero Osvaldo and Maria Clara Supisiche. *Arquitectura en Tierra Cruda: Breves concideraciones sobre la conservación y la restauración*.(Buenos Aires: Nobuko, 2003).

characteristically display spaces with a height of five meters per level. In the case of two story structures, a balcony supported by thick cornice of carved *cantera* was common. A simple cornice made out of *cantera* or brick usually crowned the walls. Ornamented columns or corner pilasters were common and were usually constructed of *cantera*. Finished walls were constructed with adobe or brick and stone masonry. Foundations were usually visible, constructed of *cantera*, and were close to eighty centimeters in height. Window openings varied from 0.90 to 1.20 meters wide and had an approximate vertical proportion of 1:2.

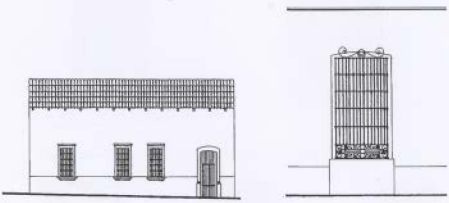


Fig 13: Vernacular or popular dwelling façade (Gomez)

Vernacular or popular architecture is an architectural typology present since the arrival of the Spanish to mid twentieth century. This architectural style was mostly seen in rural areas of the state (many were engulfed by the growth of the city). Communities adapted to the availability of materials and were not as concerned with keeping up trends. In general terms, vernacular and popular architecture show characteristics such as a thick heading over windows, single story, walls crowned with a simple cornice usually

made out of *teja*[23] *(clay tile used in a upside down "u" shape to cover roofs)* or brick.

Walls are made of adobe and in many cases, are left without any plaster covering.

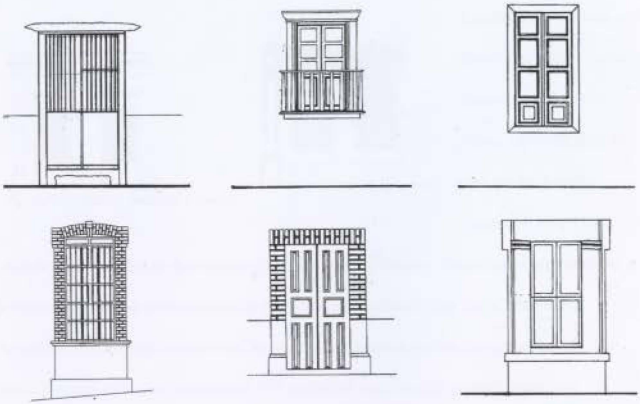


Fig 14: Vernacular or popular dwellings windows and doors (Gomez)

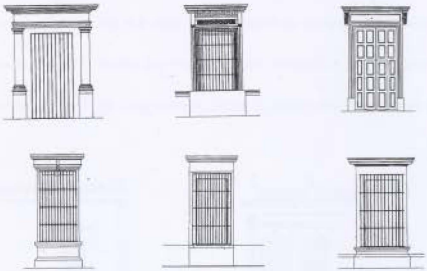


Fig 15: Neo-Classical window and doors

Window openings are an approximate width of 0.70 to 1.20 meters. Wooden *vigas*[24]

[23] *Teja: clay tile used in a upside down "u" shape to cover roofs*

[24] Vigas: rafters, beams

generally support an earthen horizontal roof. In some cases, an incline in the roof is formed by a wooden superstructure and covered with *teja*.

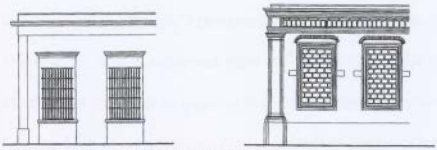


Fig 16: Neo Classical Dwellings (Gomez)

Guadalajara's urban dwellings with a Neo-classic style were in many cases erected in an adobe form of construction. This style is witnessed in the first years of the nineteenth century. Neo-classic architecture is a result of educated professionals in the construction field. The San Carlos Royal Academy of Fine Arts in Mexico City educates architects in the European trends. The Neo-classical style was introduced in a period of economical growth, therefore numerous buildings were erected boasting this new trend. Many older colonial homes were updated with the new style. Adobe or *cantera* walls are characteristic of the Neo-classical trend. Walls are made to look smooth with a plaster covering. The use of an architrave with its component cornice, frieze and architrave helped to give the building a sense of proportion within an urban domestic setting. Usually placed at the ends of the façade,

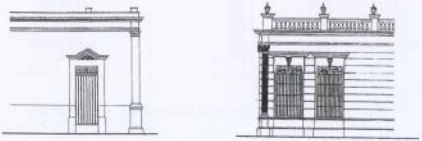


Fig 17: Eclectic Façade (Gomez)

classical pilasters support the architrave with a capital. Window openings reach an approximate width of 1.20 to 2.50 meters and a vertical proportion of 1:2.

By the mid nineteenth century, the formal Neo-classical style of architecture lost favor among the city's designers who increasingly gravitated to the Eclectic style. The Eclectic style is witnessed from the second half of the nineteenth century to the 1930s. This style was so popular that many older homes were adapted to display an Eclectic form of architecture. Walls are built of adobe or *ladrillo adobon*[25], and some representations boast a thick covering of plaster that is then crossed with horizontal lines. Window openings reach an approximate width of 1.20 to 2.50 meters and a vertical proportion of 1:2. The ends of facades are ornamented with pilasters.

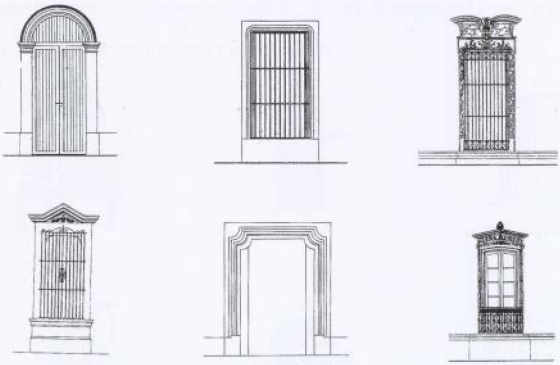


Fig 18: Eclectic windows and doors (Gomez)

[25] ladrillo adobon: brick

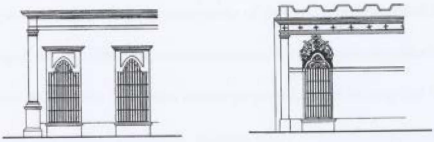


Fig 19: Neo-Gothic Façade (Gomez)

Historical adobe dwellings in Guadalajara also present a Neo-Gothic style of architecture. Neo-gothic architecture was witnessed in the second half of the nineteen and beginning of the twentieth century. Common characteristics of this architectural trend in urban dwellings are walls made of adobe, *ladrillo adobon* or *cantera*. Interior spaces reach heights of five meters per level. Balconies are ornamented with cornices. Window openings reach an approximate width of 1.20 to 2.50 meters and a vertical proportion of 1:2. Windows may portray a lanceted arch.

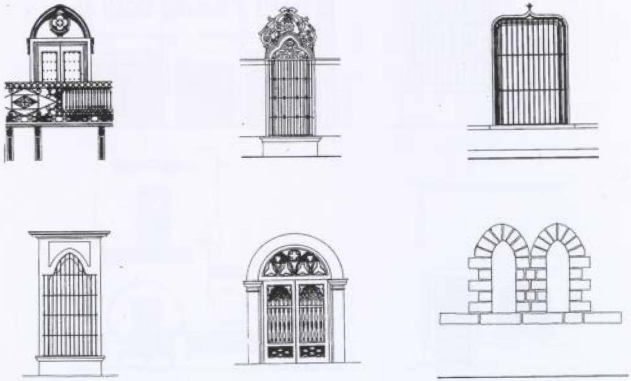
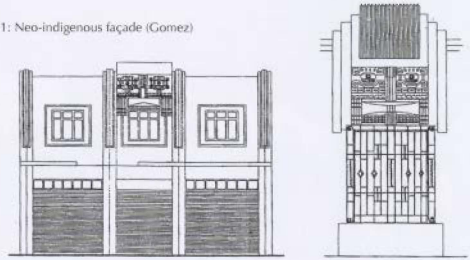


Fig 20: Neo-Gothic windows (Gomez)

Neo-colonial, *Neo-indigenismo* and Regionalism are all architectural styles that hope to bring back a Mexican style of design. After the Mexican Revolution, citizens longed for architectural representations with influences associated with Mexico and leave behind the European trends so popularized during the *Porfiriato*. Dwellings during this period are highly influenced by colonial trends, indigenous borders, fringes of pre-Hispanic origin and the use of characteristic colors, materials and finishes original to the region. Adobe and fired brick are the construction methods used to display these architectural trends.

Fig 21: Neo-indigenous façade (Gomez)



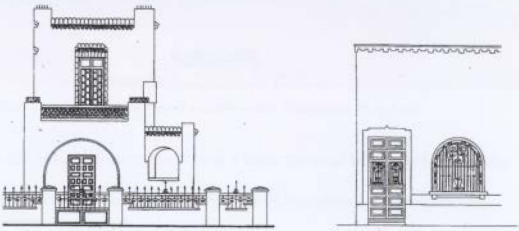


Fig 22: Regionalism façade (Gomez)

## IV. BRIEF HISTORICAL BACKGROUND: ADOBE

Historic adobe buildings are represented in many countries throughout the world, from Kyrgyzstan to New Mexico, U.S.A., illustrating the predominance of the construction method from culture to culture and generation to generation. In the world, some of the oldest indigenous and European structures were erected in an adobe form of construction. "As a consequence of their age, design and functions, surviving adobe buildings are among the most historically and culturally significant structures in their communities."[26]


Fig. 23: Picture of a whole family in front of an adobe home, Guadalajara (COPLAUR)

The use of earthen construction as a basic material has been common for most of Mexico's architectural history. Spaniards introduced the construction

[26] E. Leroy Tolles, et al., *Seismic Stabilization of Historic Adobe Structures: Final Report of the Getty Seismic Adobe Project.* (Los Angeles, CA: The Getty Conservation Institute, 2000.), XI.

technique in the XVI century in Latin America. Adobe construction flourished with the new Spanish and Arab influenced traditions. Europe had defined and perfected their earthen buildings. In Spain, many of these structures were developed with building traditions brought by the Moors. In colonial America, European earthen building traditions were translated and adapted into a rich element of colonial architecture.[27] This range of knowledge has permitted the development of adobe and solutions to many of the architectural problems found in this region, such as how to best use our natural resources and the adaptability to the wide range of climatic conditions found throughout the country.[28]

Adobe has many favorable characteristics for construction in arid regions: it provides effective thermal insulation, the skills and experience needed to build an adobe structure are minimal and it does not require the use of scarce or costly materials, nor the use of additional energy. Skilled technicians such as engineers and architects are generally not involved in this type of construction, hence the name *non-engineered* construction.[29] Adobe is an ancient and universal form of construction but also faces many cultural, economic, and social challenges.[30]

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[27] "Guia Practica para talleres de capacitacion de restauracion en adobe" Fundacion Antiplano, Chile 2010-2012, accessed November 2013
http://issuu.com/aricanativa/docs/guia_pr_ctica_capacitaci_n_en_restauraci_n_en_adob

[28] Baca, *Mexico: La Perdida de la Arquitectura de Adobe en Mexico.* 112-114.

[29] Marcial Blondet, et al., *Earthquake-Resistant Construction of Adobe Buildings: A Tutorial.* (EERI/IAEE World Housing Encyclopedia, Okland, California, 2003.)

[30] Tolles et al., *Seismic Stabilization of Historic Adobe Structures: Final Report of the Getty Seismic Adobe Project.* X

## V. PROBLEMS, MAINTENANCE AND RESTORATION OF ADOBE STRUCTURES

To begin the process of restoration, maintenance or just conservation, it is of pivotal importance to identify and determine the causes of deterioration. With most adobe restoration, it is essential to intervene with the same materials and of equal quality to that of the original to achieve continuity between old and new. Today the main causes for adobe deterioration are structural damage, water related problems, wind erosion, vegetation, insects and the use of incompatible materials. Many of the structural damages seen in adobe construction originate from an improper design, insufficient foundations, and inadequate or weak materials. Other contributing factors are those associated with the building's inadequate construction such as earthquakes, wind, water and in some cases, even snow.

Guadalajara witnesses thunder storms of great magnitude with an abundance of water in a short period of time. These rains can be detrimental to the structural soundness of an adobe structure.

Moisture is one of the largest causes for adobe deterioration. Moisture, particularly rainwater, traveling by capillary movement is the major cause for deterioration in adobe construction. Rainwater can cause many problems. One, known as "coving", is where the wall just above grade level is hollowed out because water accumulates at the foundation or splashes on to the wall. Water found underneath ground level, such as springs, high water tables or improper drainage, could travel through capillary action into the wall and cause the adobe to bulge, erode or cove. When water seeps into the wall from the ground up, the

bond between the clay particles in the adobe breaks down. When ground water travels up the adobe wall, it carries salts and minerals that are then deposited on the surface, which could also cause erosion.

Interventions for water damage can occur with proper planning and maintenance. The use of watertight roofs and adequate drainage is the best protection against leakage and most water damage. During the nineteen-century, many builders chose to cap parapet walls with fired bricks, because of its harder nature and suitability to the erosive actions of rainwater. However, if the structure originally did not contain firebrick the introduction of the new material will drastically change the structure's appearance and historical fabric.

The accumulation of rainwater near the adobe foundation should always be diverted away from the building. Regrading can divert water, as well as building gravel filled trenches or brick, tile and stone drip gutters. Regrading is the most effective intervention since gutters and trenches can potentially hold water near the structure's foundation.[31]

Fig 24: Salts deposited by rising groundwater and/or rainwater splash may have caused coving at the base of adobe wall (NPS)

One method of stabilizing adobe bricks is soil cement which is a mix of

[31] Nick Gromicko and Rob London. "*La Inspección de Adobe.*" Inspecting The World, accessed February 27 2012, **http://www.nachi.org/adobe-inspection-spanish.htm**

pulverized natural soil with a small amount of Portland cement and water. Due to the lower amount of cement, there are voids left which let the material crack and can repair the damage caused by coving. It is important to note that the use of concrete patches, cement stucco, and curb-like buttresses against the coving usually have negative effects because of the moisture that can be attracted and trapped behind the concrete. "Cement stucco and cement patches . . . *have* a thermal expansion coefficient of 3 to 10 times greater than that of adobe resulting in cracking of the stucco."[32] Cracks potentially will allow both liquid water and vapor to penetrate the adobe beneath and the stucco will also prevent the adobe wall from drying out. If the moisture becomes overwhelming the adobe will reach a consistency of soft putty.[33]

Other interventions for conserving adobe include the removal of neighboring shrubs, trees and foundation plantings; roots may be growing into the adobe and trapping excessive moisture, conducting it into the walls. Regrading should be considered if the level ground immediately adjacent to the wall is causing drainage problems. Footing drains can also be used around the building at the base of the walls or at the foundation to prevent the collective water from saturating the surrounding soil and adobe walls. The walls at the bottom of the trench should be lined with a polyethylene vapor barrier. Clay tile or plastic pipe

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[32] US Department of the Interior. Preservation of Historic Adobe Buildings, *Preservation Briefs*. (Technical Preservation Services: Technical Preservation Services: Office of Archeology and Historic Preservation/Heritage Conservation and Recreation Service. 1978).

[33] Ruben Osvaldo et al., Arquitectura en tierra cruda : breves concideraciones sobre la conservación y la restauració. (Buenos Aires: Nobuko, 2003.).

are then laid at the bottom of the trench, which will drain to an open gutter. The trench is then filled with gravel and porous soil.[34] These drains are also commonly referred to as French Drains[35]. Water damage must be addressed when considering the restoration of the adobe urban dwelling in Guadalajara. Wind can also cause structural damage to adobe constructions; particles such as rocks and debris thrown against the walls in high wind zones can cause horizontal cracks and the disintegration of the primary material. This damage is generally found on the upper half of the wall and corners.[36] Seeds are also some of the elements deposited by wind.

Fencing or trees can be used as a wind barrier or breaker if there is presence of high winds. Trees must be placed far away from the structure so the roots will not bring negative effects to the "earth-fast" building.[37] Wind tunnels can be created in the streets of the colonial city but speed power and consistency are not as prevalent in the downtown area of Guadalajara. Also because of the proximity of other homes, street and cars, many of the solutions such as harboring trees are not convenient or advised.

Adobe construction by nature is attractive to the germination of intrusive vegetation, making it one of the causes for deterioration. Roots and the retention of moisture by vegetation may cause the break down of adobe brick and therefore

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[34] Gromicko, Nick, Rob London La Inspección de Adobe.

[35] "*French Drains,*" Wikipedia The Free Encyclopedia, accessed July 2013. http://en.wikipedia.org/wiki/French_drains

[36] Osvaldoet al., *Arquitectura en tierra cruda : breves concideraciones sobre la conservación y la restauració.*

[37] US Department of the Interior, *Preservation Briefs. Preservation of Historic Adobe Buildings.*

cause structural damage. The burrowing and nesting of animals, birds and insects in walls and foundations will destroy the structural soundness of adobe buildings. It is important to take into consideration the presence of termites. Even Though there might not be much wood in the walls, termites can travel through the clay contributing to the lack of structural soundness.[38]

Fig 25: Water damage and growing vegetation on an adobe building

Termite wood infested *vigas, savinos, lintels,* wall braces and flooring should always be replaced with wood. From a preservation point of view, when replacing windows, doors and interior floors, it is advised when feasible to replace with the same form, material, and style of each.[39]

The use of incompatible materials in adobe buildings is another common factor in the deterioration process. Historic adobe buildings have been periodically restored utilizing concrete or steel. This can cause the adjoining adobe to collapse. The reason for this is simple: the newer materials, which will expand at different

[38] Osvaldo, *Arquitectura en tierra cruda : breves concideraciones sobre la conservación y la restauració.*
[39] Ibid

rates due to temperature changes, tear down the relatively weaker adobe material. The application of materials such as plastic and latex on the outside portion of the walls also will not expand at the same rate as the rest of the structure and will eventually cause portions of the wall to break off.[40]

When replacing, patching or repairing an adobe brick, effort should be made to find clay with similar texture and color to that of the original fabric. If the adobe brick is only partially disintegrated a patch could be put in place. This is done by scrapping off the deteriorated area and replacing with appropriate adobe mud. Although some builders reuse the fragments scraped of by grounding them and mixing with water, it is now advised by professionals to restrain from doing this since the reused material could contain high concentrations of salts and minerals. If a substantial amount of the adobe brick has deteriorated, it can be replaced with one made on site or a commercially made brick composed of un-stabilized (has no chemical additives) adobe. It is important to mention that cinder blocks and concrete blocks should not be used as replacements since they are not compatible with older adobe bricks.[41]

As with adobe bricks, when replacing mortar it should match the original fabric as closely as possible. Adobe mud mortar should never be replaced with lime mortar or Portland cement mortar. Mortars of lime or cement do not have the same thermal expansion rate as that of the adobe brick. In some historic adobe

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[40] Osvaldo, *Arquitectura en tierra cruda : breves concideraciones sobre la conservación y la restauració*
[41] US Department of the Interior, *Preservation Briefs. Preservation of Historic Adobe Buildings.*

buildings, the presence of cement as an original material of construction has been found. If this is the case, the cement must not be removed or replaced with mud mortar because this will result in the destruction of the adobe brick. If repairing cracks in the mortar, it will be necessary to rake out the cracks to depth of two or three inches of the mortar joint's width to create a good *key* (mechanical bond). Bricks should be lightly sprayed with water to increase a cohesive bond and then grouted with new mud mortar.[42]

Historically adobe brick structures would have an exterior surface coating. Adobe surface coatings were generally made out of mud plaster and in some cases, lime plaster and Portland cement were used, which make the recoating process much harder. When deteriorated, surface coatings on adobe buildings should be treated like other adobe repairs: with materials of the same quality and ones originally found on the building. It is important to scrape off entirely the deteriorated surface coating, being careful not to damage the adobe brick, before repairing begins

Earthquakes have destroyed or highly damaged many of the culturally representative structures made with adobe. Adobe structures are highly vulnerable to seismic activity. Architects and builders have categorized adobe buildings as un-reinforced masonry. Typical modes of failure during earthquakes include severe cracking and disintegration of walls, separation of walls at the corners, and

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[42] Osvaldo, *Arquitectura en tierra cruda : breves concideraciones sobre la conservación y la restauració*

separation of roofs from the walls, which, in most cases, leads to collapse.[43]

Traditional adobe construction responds very poorly to earthquake ground shaking, suffering serious structural damage or collapse, and causing a significant loss of life and property. Seismic deficiencies of adobe construction are caused by the heavy weight of the structures, their low strength, and brittle behavior. During strong earthquakes, due to their heavy weight, these structures develop high levels of seismic forces they are unable to resist, and therefore fail abruptly.[44] Around 30% of the world's population lives in earth-made construction. Approximately 50% of the population in developing countries, including the majority of the rural population and at least 20% of the urban and suburban population, live in earthen dwellings.[45] The Getty Conservation Institute has addressed the threats of seismic destruction of cultural properties around the world, from Los Angeles, California to South America, areas of the Mediterranean

Fig. 26: Building in Chile destroyed after seismic activity (Directorio construccion)

[43] Blondet, Marcial, et al., *Earthquake-Resistant Construction of Adobe Buildings: A Tutorial.* 7
[44] ibid 6
[45] ibid 7

and China, which contain enormous concentrations of cultural patrimony. The most recent study is *The Getty Seismic Adobe Project* (GSAP) that was initiated in 1990 after the 1989 Loma Prieta earthquake in California.


Fig 27: World distribution of Earth Architecture (Sensi, 2003)

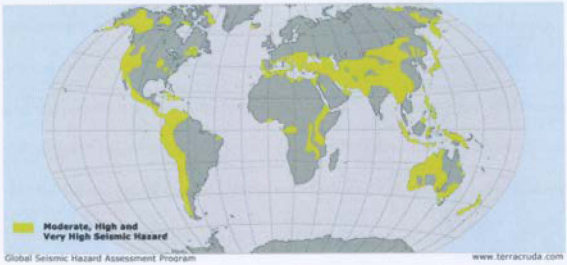


Fig 28: World distribution of moderate and his seismic risk (Sensi 2003)

The GSAP tested retrofitting on adobe buildings involving horizontal and vertical straps, ties, vertical center-core rods, and improvement on the anchoring of the roof to the walls. As part of this project, nine small-scale (1:5) model buildings were

tested on the shaking table at the John A. Blume Earthquake Center at Stanford University in Palo Alto, California, U.S.A. Two large scale (1:2) model buildings were tested during the final phase of the GSAP research program at the Institute of Earthquake Engineering and Engineering Seismology (IZIIS), in the University of "SS. Cyril and Methodius" in Skopje, in the former Yugoslav Republic of Macedonia.

All these methods proved to be successful in reducing the tendency of the building to collapse. In-plane damage was less using the vertical straps; these helped prevent large displacement of the walls but did not prevent small cracks from accruing. They are also useful in preventing piers from becoming unstable.[46]

Nylon straps made of 0.3 cm wide, flexible, woven nylon were placed horizontally or vertically, forming a loop either around the entire building or around an individual wall. The straps were passed through small holes in the wall and the two ends were knotted together. Vertical straps were most effective for reducing the risk of out-of-plane wall collapse.[47] This solution has had valuable seismic outcomes but can be unsightly and could be distracting to the historical character of historic buildings.

Vertical center-core rods installed in the adobe walls were effective in delaying and limiting the damage both in-plane and out-of-plane walls. Although in the GSAP test models, cracks did appear on the in-plane walls they never

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[46] Tolles et al., *Seismic Stabilization of Historic Adobe Structures: Final Report of the Getty Seismic Adobe Project.* 146
[47] ibid 97

became severe. In the out-of-plane walls, center core rods act as reinforcing elements. The steel rods were grouted with epoxy to create an effective shear transfer between adobe and steel, creating a positive attachment. Because of these center-core rods, the walls will act as structural reinforcing elements in the vertical direction. The center-core rods also act as dowel pins that minimize the relative motion of the adobe bricks. Center-core rods will not disturb or damage the wall's surface.[48]

Another technique tested by the GSAP was the strapping system. Strapping on the structure has minimal impact on the historic fabric of the wall and is also reversible. If the surface has murals of historic importance, the installation of strapping technique is not appropriate.[49] "For most historic buildings, however, surface renderings of walls are not particularly significant, especially in cases where there is deterioration of plaster / stucco or damage has accrued from an earthquake."[50] Unfortunately, many of the seismic retrofits suggested by the GSAP are extremely expensive and technically difficult, therefore not a viable solution for most of the vulnerable adobe architecture in risk. It is one of the most worrisome faults with adobe structures.

Today adobe constructions are still very common in developing countries and many efforts have been made to disseminate education and information on structurally sound adobe rural dwellings. Adobe construction is today used in rural

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[48] Tolles et al., *Seismic Stabilization of Historic Adobe Structures: Final Report of the Getty Seismic Adobe Project*. 146.
[49] ibid 146.
[50] ibid 147.

areas of marginal countries, where the vulnerability of life is tremendous. Many governments are issuing educational pamphlets where construction steps are illustrated and explained in lay terms. An example of this is the *A Practical Guide for Workshops in Adobe Restoration* (*Guia Practiaca para talleres de capacitacion de restauracion en adobe*). The Chilean government issued a pamphlet with the overall information on how to classify adobe structures and the problems associated with this type of earthen construction. In one of their sections there is a how to, step-by-step guide on applying *geomalla* (geomesh) on existing buildings as a stabilizing retrofit. Stanford University also used geomesh as a seismic retrofit on existing schools in villages located in the Andes. "As a result, the local schoolhouse is much safer, and the villagers know how to replicate the process in other vulnerable buildings."[51] This and other measures taken by local governments should result in more sound and stable future adobe structures.

The next images are from the *A Practical Guide for Workshops in Adobe Restoration* indicating step-by-step illustrations on the use of geomesh for seismic retrofitting:

[51] Loius Bergeron, *"Peruvian villagers shown how to protect adobe buildings from earthquake collapse."* Stanford Report (nov, 21, 2011) accessed November 2012, http://news.stanford.edu/news/2011/november/peru-seismic-retrofit-112111.html

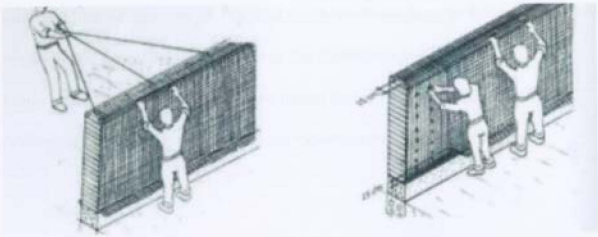


Fig. 29: Geomesh used to strengthen adobe walls (Chile Gov)

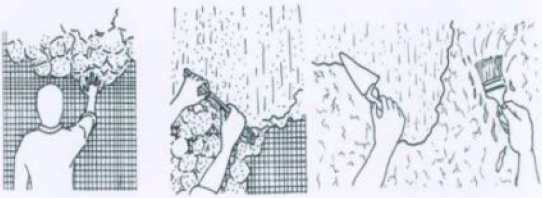


Fig. 30: Covering of geomesh reinforced adobe wall with outer plaster. (Chile Gove)

When it comes to the seismic retrofitting of historic adobe structures, technology and interventions still seem expensive or highly invasive to the historical integrity. Although further study in the seismic retrofitting field of historic structures continues, maintenance still plays a pivotal role in keeping an adobe dwelling structurally sound.

These are just a few examples of available interventions in the deterioration of adobe structures. As mentioned, many pamphlets and guides exist to aid in the restoration of adobe structures, detailing in depth the interventions available to

salvage a historic structure. *A Practical Guide for Workshops in Adobe Restoration* issued by the Chilean government and *The Conservation Manual for Historic Monuments and Earthen Architecture* issued by the National Institute of Archeology and History of the Mexican Government are good examples.

## VI. URBAN ADOBE DWELLINGS TODAY

Fig 31: Guadalajara Jal. (COPLAUR)

It was common practice for traditional Mexican communities to live in adobe structures, which were inherited from their ancestors. Families would periodically manage preventive maintenance that preserved these structures in stable conditions. Although the educated community is aware of all the inherited advantages of these adobe structures, the houses are still on the brink of extinction. Because of the readiness and accessibility of industrialized materials, adobe construction has diminished dramatically in the urban setting. The majority of the Mexican society believes that adobe structures as indicative of poor dignity, unhealthy living conditions, and even a dangerous mode for habitation. Adobe homes are considered a symbol of poverty and are hindered by the advance of technology, to the extent that all financial institutions and urban developers refuse to offer lines of credit for the maintenance or restoration of these structures. Most of these structures are considered worthless and a price is solely given to the plot of land in which they stand.[52]

[52] Baca, "Mexico: La Perdida de la Arquitectura de Adobe en Mexico." 112-114.

The preliminary results of Mexico's 2010 population census revealed that the population residing in the Guadalajara Metropolitan Area increased from 3.7 million in 2000 to 4.4 million in 2010. However, the municipality of Guadalajara demonstrated a significant decline in population since 2000, from 1,647,720 to 1,494,134. These census results illustrate how the Guadalajara Metropolitan Area is continuing to

Fig 32: Existing Adobe structure in Guadalajara Jal. (Flores)

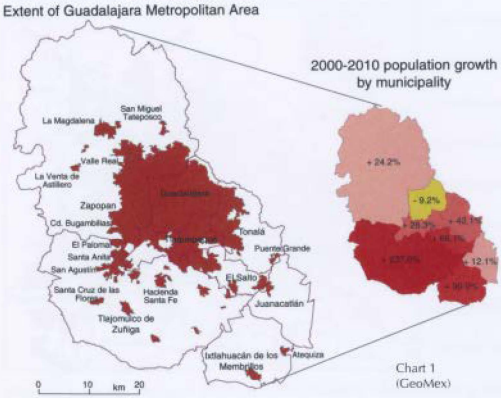
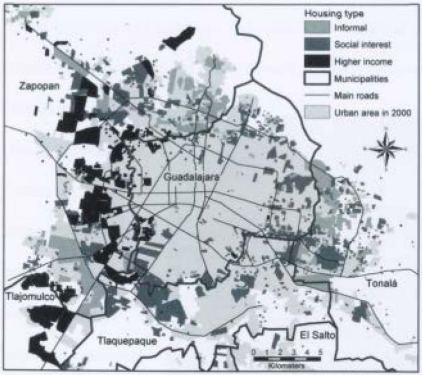



Chart 1
(GeoMex)

experience the effects of suburbanization and counter urbanization.[53] Guadalajara currently has a shortage of accessible housing, yet many of the homes found in prime locations such as that of the downtown core are abandoned or vacant. Guadalajara's housing market has seen a significant shift in investment, land use and economical and political ideology in the last decades. "Reforms that reflect a neoliberal ideology have affected the production of space in urban Mexico by liberalizing access to credit for housing and promoting private land development. Yet the emphasis on housing as a private investment rather than as a more general social goal excludes most workers outside of the formal economy who have no access to these benefits, a huge number of Mexicans."[54] In *Buying Development: Housing and Urban Growth in Guadalajara, Mexico,* Guadalajara's housing development is classified in three groups: formal (generally social-interest or government funded), higher income and informal housing. As seen in chart 2, the majority of the housing development from

Chart 2: new housing developments, 1970-2000 (Hamer et al.)




[53] "Population Change in the Guadalajara Metropolitan Area." Geo Mexico, accessed November 2012, http://geo-mexico.com/?p=3395.

[54] Hamer et al. Buying Development: Housing and Urban Growth in Guadalajara, Mexico, (Urban Geography, 30:05, 2009) 471

1970 to 2000 took place in the outskirts of the city's perimeter. When developing this area's utility infrastructure, its planned transportation networks, basic services and provisions are over looked. "As a result, the housing boom creates a fragmented city with little concern for the integrated whole."[55]

The trend of diminishing populations in the downtown core has become an alarming trend for the urban planning division of Guadalajara and today *COPLAUR* (Urban Planning Commission for the municipality of Guadalajara) is proposing to reduce the area of designated historical significance protected by current regulations. This will not only aid in the destruction of many historic adobe urban dwellings but will also introduce new architecture, which like in past history, will only clash with the remaining historical buildings and reduce the historical context of the city. A prevalent source assisting in the loss of the historical adobe urban dwelling is abandonment. The President of the Historic Downtown Patronage, Enrique Ramos Flores, has proposed the reduction of the historical perimeter. He, like others in

Fig 33: Adobe Building Guadalajara Jal. (Flores)

[55] Hamer et al., Buying Development: Housing and Urban Growth in Guadalajara, Mexico, 485

positions of government power, believes that the area delineated as historic is too big. This is believed to correlate with the lack of intervention by government agencies. Other hindering factors are the lack of information, communication, investment and expropriation power.[56]

According to municipal authorities, Guadalajara contains 24,418 structures of patrimony value. In the last 10 years, it is said that Guadalajara has lost close to 2,200 historic homes. In 2000 and 2004, the Committee for the Historic Downtown, Neighborhoods and Traditional area of the Municipality of Guadalajara conducted a study of historic dwelling inventory. This study classified 14,000 original dwellings from the sixteenth to the nineteenth centuries located in perimeter A and B of designated historic area (see figure on pg. 48) and estimated that approximately 7,000 have lost their historic value because of obvious visible deterioration. It is stated that only 5,746 of the 14,000 in the downtown area of Guadalajara are receiving continuous maintenance.[57] It is believed that more than 9,800 of these historic structures are leased to renters, which

Fig. 34: Adobe home with supports, Gdl (Informador)

[56] *"Pretenden reducir el Centro Histórico."* El Informador, January 2013, accesed November 2012, http://www.informador.com.mx/jalisco/2013/432108/6/pretenden-reducir-el-centro-historico.htm

[57] El Informador, *"Pretenden reducir el Centro Histórico."*

have no interest in the restoration efforts of the structure and are hesitant to let government officials in the homes to assess the state of the building. Ignacio Gomez Arreola, architect for the INAH (National Institute for Anthropology and History), confirms that every rain season (May to August) two or three historic homes fall as a result of abandonment.[58] Arreola says that owners let homes fall little by little and show no interest in restoring or maintaining them. Of homes "about to collapse we would be talking of about 30".[59]

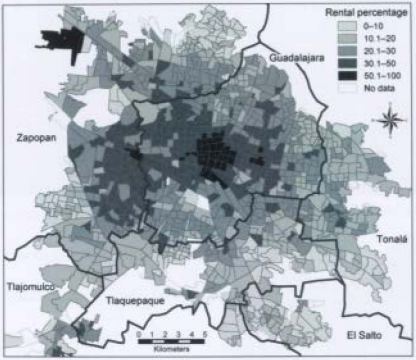



Chart 3: Rental percentage in the metropolitan area of Guadalajara (Harner et al.)

Mexico has done admirable work in the conservation and restoration of monumental historical patrimony. The beauty of Mexico's historical heritage is well represented by the vast number of Baroque religious properties, by the governmental buildings and public plazas and gardens. Still, there is a disconnect from a true historical representation of our patrimony if the urban dwelling is not preserved. It is the urban

[58] El Informador, *"Pretenden reducir el Centro Histórico."*
[59] ibid

dwelling structure, which aids and gives us a context to the use and meaning of those monumental structures. Without the monumental structures being accessible to society, a fundamental question arises. Who used and built these common areas?

Fig 35: Adobe structure Guadalajara Jal. (Flores)

Through these urban dwellings, one can perceive the actual historic landscape of a colonial city. The story told by a built environment is only fully comprehended if all aspects of the historical context are included. The city of Guadalajara did not flourish solely because a majestic cathedral and government buildings were built in the area, but also because of the growing community where families settled and generation after generation of people decided to reside and make a livelihood.

Fig 36: Adobe structure Guadalajara Jal. (Flores)

## VII. MEXICAN LEGISLATION

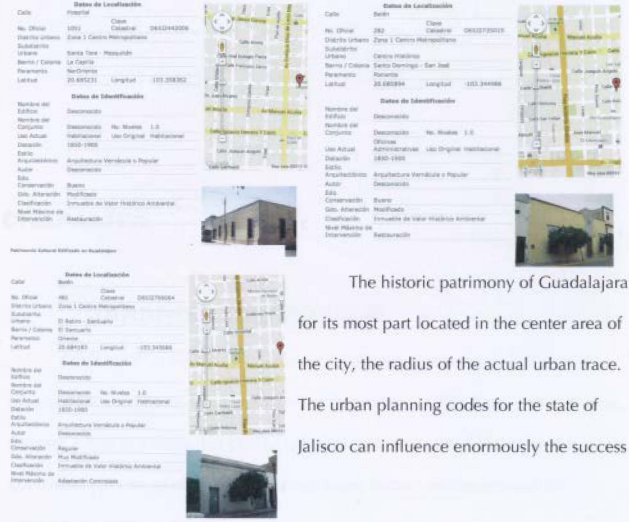
When dealing with the preservation of historic patrimony legislation, codes and regulations have an important role. Mexican regulation concerning historic structures is sound and detailed. Various regulations from different entities and institutes compose Mexican conservation legislature. It starts at the federal level and steps down to state and then the municipal level. Articles in city codes and federal regulations prove the thought and awareness the government has toward conserving Mexico's built heritage. Still, today many historic buildings, in particular the most vulnerable adobe historic buildings, are being demolished, abandoned or simply falling apart.

To fully understand problems concerning historic adobe buildings, every angle must be examined including legislation at different levels. In the Civil Code for the State of Jalisco under the title number five for property, Chapter one is dedicated to the law for culture and natural patrimony for the state of Jalisco. Article three of this civil code states that the executive power of the state of Jalisco and municipal governments must protect the cultural patrimony of the state and the nation and will do this by: identifying, classifying, cataloging, restoring, conserving and diffusing the values of the state's cultural patrimony and it will regulate use and interventions made to each structure.

The civil code pertains to the state entity, in this case Jalisco, but leaves cataloging to each municipal government. The municipal government of Guadalajara complies with an interactive catalog system online. The inventory includes location data such as street name, official urban number, district, sub-district, neighborhood,

latitude and longitude. Identifying characteristics are also included such as name of structure, number of stories, actual use, original use, date, architectural style, author (architect), and state of conservation, alterations, classifications and interventions. There is no mention of constructive methods, and there is no current system that groups the listing by style, date or any other character but street name and perimeter. It is important to mention that this inventory is rarely updated and architects and historians in the field believe it should include the current state of architectural interiors as well.[60]

Fig. 37: examples of inventory database

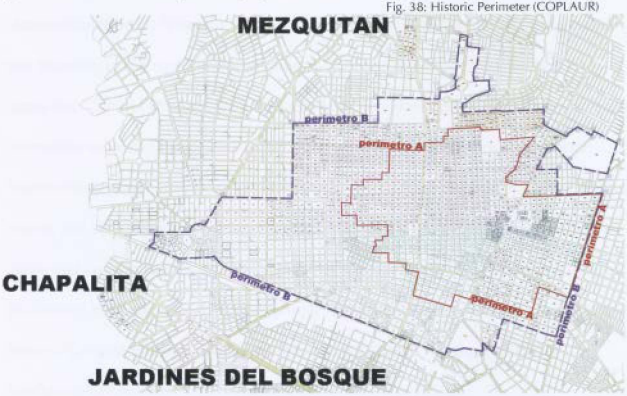


The historic patrimony of Guadalajara is for its most part located in the center area of the city, the radius of the actual urban trace. The urban planning codes for the state of Jalisco can influence enormously the success

[60] El Informaor, *"Pretenden reducir el Centro Histórico"*.

and conservation process of existing historic structures. The Urban Planning code for the State of Jalisco in Title Ten, the Urban and Architectural Cultural Patrimony, states through Article 336 that the municipality is to use all laws made to protect and conserve structural patrimony. Partial urban planning plans must identify all structures with cultural value that must be protected. Municipalities must take into consideration the protection of the historic structures when authorizing licenses and permits for public investments and private projects.

Fig. 38: Historic Perimeter (COPLAUR)




*COPLAUR*[61] is the Urban Planning Commission for the municipality of Guadalajara and has its own Urban Zoning Regulation. In Title One, Urban Zoning, Chapter 1 Article 3 states that *COPLAUR* is the technical unit of the municipal government in charge of planning and regulating human settlements and the

[61] *comision de planeacion urbana*

conservation, improvement, growth and determination, reservations, uses and destinations of areas and sites of the municipal centers, to organize, coordinate, implement, participate, promote, monitor, assess, advise, disseminate, update, inform and promote sustainable urban development of the municipal territory. Section CVI of the same article classifies Artistic Monuments as those established by Federal Law, which correspond to buildings that were constructed from 1901 to the present and that are of some relevant value. Section CVII describes Historical Monuments as those established by Federal Law, and correspond to buildings that were built within the sixteenth to the nineteenth centuries and contain relevant value. Section CXXII states that Cultural Heritage is all movable and immovable property with tangible and intangible values; cultural property of archaeological value, historical or artistic; traditional to visual image, and is protective of the cultural landscape, environmental space, and socio-economic character, which keeps the natural balance. As well as those that contain historic features which document identity, animation, customs, economic, scientific or technical accomplishments and are of relevance to the states history. Cultural heritage also is referred to as that which holds a spiritual or intellectual inheritance for Guadalajara and the state of Jalisco.

Section CXXIII defines who and what are the Trustees: Trustees of the Historical Center, neighborhoods and traditional areas of the Municipality of Guadalajara. Section CXXIV affirms the scope and section known as Perimeter "A" that is the area in which there is a major concentration of buildings considered Historical Monuments. Its definition corresponds to the growth of the city of Guadalajara until 1900. Section

CXXV illustrates Perimeter "B", the area that was delineated with the purpose of protecting architecture, which was used until the first half of the twentieth century.

In the same municipal code of urban planning, Title Two articulates on The Use of Plots and Land of Guadalajara and in its Classification of Zones.

Article 24 Section II states that Mexican urban development law classifies areas of historic and cultural value as a protected area. These areas are identified on urban development plans with a PP (*proteccion patrimonial*, protected patrimony) key. To be classified as Protected Patrimony, the structure must be declared as historically significant by the Committee for the Historic Downtown, Neighborhoods and Traditional area of the Municipality of Guadalajara. The Director General of Public Works, the Board of Trustees of the Historical Center, the Director of Artistic and Historical Patrimony of Culture of the Government of the State and the Committee on Urban Planning compose the Committee for the Historic Downtown.

Protected Patrimony (PP) is subdivided into:

a) Areas of historic patrimony protected by law are those which are archeological monuments or the assumption of existing archeological findings of value. Artistic monuments related to open spaces where topographic elements give esthetic value or are relevant to the cultural landscape of historic monuments. These monuments are those, which are related to an important date or event of national importance. These, in particular, are protected under the Federal Law of Historic Monuments and Archeological Areas. Artistic and Historic monuments are controlled by the National Institute of Anthropology and

History and are classified on Partial Urban Development Plans with an adjoining key of PH.

b) Areas of cultural protected patrimony are those not classified as protected areas of historic patrimony but are contained in the urban trace and can add historic, architectural and cultural value. It is stated that structures with high historic or artistic value are under the control of the State and Municipal Government and protected by State laws, plans and programs. These buildings are classified on Partial Urban Development Plans with an adjoining key of PC.

c) Areas protected for urban cultural landscape are all structures, which on their own are not classified as protected by law for their historical patrimony but contain architectural value which help form the cultural landscape. These structures are said to contain and promote character by their urban elements. For this reason, they are to be protected by the Urban Development Plan and identified with the adjoining key of PF.

Urban Development laws X and XI protect areas that are described as transferring, generating, receiving and developing human rights. These include protected historic patrimony (PP), protected natural areas, conserved natural areas, and aquifers, and have to contain the sub key of GTD (generating development) and RTD (receiving development).

The municipal government counts on specific regulations for the area known as Historic Center and traditional districts of the Municipality of Guadalajara. These groups of articles are specific in the conservation, protection and restoration of the

historic perimeter and cataloged patrimony. Article 4 states that public works is the entity responsible for coordinating all proceedings to expedite authorization and licensees viewed in the Law of Urban Development. Article 8 states that the Secretary of Culture is specialized in the matter of preservation and should be held responsible for the promotion, execution and actions needed to protect and increase the artistic, cultural and architectural value. Article 9 describes The Committee for the Historic Downtown, which is formed by an inter-institutional commission, as having the objective to speed up and unify procedures and determination for nomination (Reference Table 1).

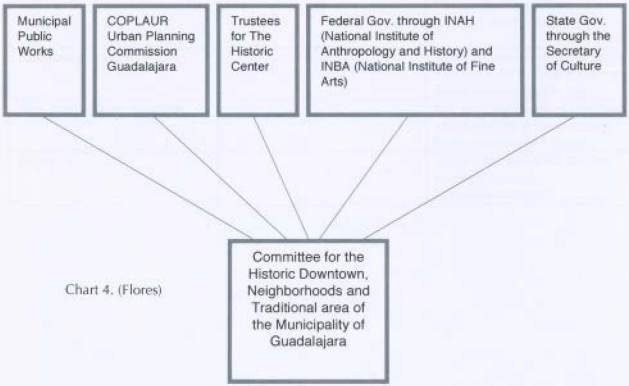



Chart 4. (Flores)

Article 43 states in accordance to its characteristics and architectural value patrimonial structures are classified in the following categories Reference Table 2

Chart 5. (Flores)

| Patrimonial Structures | Importance/Category | Observations |
|---|---|---|
| Historical Monument Determined by Law | Federal<br>Classified as category "A" | Structures built between XVI y XI, for public use |
| Historic Monuments of Civil Relevance | Federal level<br>Classified as category A and B | Esthetic value |
| Artistic Monument | | |
| Structure of relevant artistic value | State level<br>Classified as category A and B | Built after 1900, has architectural value as an individual or as part of an urban complex |
| Structure of relevant cultural landscape value | State level<br>Classified as category C | Property of cultural landscape value<br>C1: built before 1900<br>C2: built after 1900 |
| Harmonious structures | | Are not considered of heritage value but are not deteriorating factor to the urban image |
| Non Harmonious structures | | Are not considered of heritage value and are a deteriorating factor to the urban image |
| Empty lot | | No erected structure and are potential to new building/structure |

Article 48 states that The Committee of the Historic Downtown is the authority in issuing the opinion and guidelines of the scope and type of work that may be performed on each property, within the areas of protected patrimony.

Chart 6. (Flores)

| Patrimonial Structures | Intervention | Over seen by |
|---|---|---|
| Historical Monument Determined by Law | Only specialized restoration and conservation | INAH and Committee for the Historic Downtown |
| Historic Monuments of Civil Relevance | Specialized restoration and conservation may be authorized | INAH and Committee for the Historic Downtown |
| Artistic Monument | Restoration and conservation | INBA, Secretary of Culture and Committee for the Historic Downtown |
| Structure of relevant artistic value | Restoration, conservation and controlled rehabilitation | Secretary of Culture and Committee for the Historic Downtown |
| Structure of relevant cultural landscape value | May be authorized for conservation, restoration specialist, controlled adaptation and fitness to the urban image | Committee for the Historic Downtown |
| Harmonious structures | Controlled adaptation, adaptation to the urban image and controlled replacement | Committee for the Historic Downtown |
| Non Harmonious structures | Adaptation to the urban image and controlled replacement, according to the specific characteristics of each work and the needs of the user | Committee for the Historic Downtown |
| Empty lot | According to the needs of the interested and based on established uses and specific zoning, should meet the criteria for integration to the urban image that are marked by the Committee | Public Works and Committee for the Historic Downtown |

Article 52 states that all structures found in the patrimonial zone must maintain the architectural configuration of its interior and exterior parameters, including all

constructive elements such as height, walls, proportions, materials, textures and color. It is prohibited to subdivide the façade of a structure. It also states that, in exceptional cases, some modifications on the exterior walls are permitted to accommodate an opening to be used as a garage.

Article 53 describes structures, awnings, appliances, pipes, cables, and any other elements, systems, or parts of mechanical installations, such as electrical, storm, sanitary and other superimposed on the façade as prohibited on all patrimonial structures, with the exception of those produced at the time of the original construction.

Mexican Conservation legislation is difficult to understand because so many governmental secretaries share it. As seen before, some regulations are controlled by the federal government but are to be enforced by the municipal government. Institutes such as INAH have federal power in deciding and enforcing urban development regulations. Although these are to be enforced by *PRODEUR*[62], (*Procuraduria de Desarollo Urbano*) which is another independent commission that specializes only in enforcement of regulation, time and time again the authorities arrive too late to the site and irreversible damage has already occurred to patrimonial structures, especially the most vulnerable, adobe and mid-century architecture.

Professionals in the field of preservation accredit the size of the historic perimeter, the lack of communication between different government agencies and the public and the scarcity of funds as leading factors to the disinvestment and loss of the

[62] Attorney's Office of Urban Development

historical structures. Another issue mentioned by government officials is the absence of expropriation laws to aid government and preservationist in the conservation effort. It is a common thought that much of the problem lay in the hands of property owners, as there are many who see no value in the restoration efforts and others who simply do not have the economical resources.

## VIII. U.S. HISTORIC PRESERVATION PROGRAMS: SOME TRANSFERABLE IDEAS

Guadalajara's preservation efforts rely on the romanticized argument that historic buildings should be protected and restored because they represent a tangible symbol which illustrate who we are as a culture. The nostalgic arguments are important to the advancement of our culture and national identity but today conservation efforts demand concrete benefits to the conservation of these structures. The shortage and demand of low income housing in the metropolitan area of Guadalajara is an ongoing obstacle. The continuing urban sprawl and depletion of our natural resources is another factor hindering the urban landscape.

Today, U.S. legislators and urban planners are turning to historic preservation as a valuable mechanism in combating issues such as urban sprawl, affordable housing and deteriorated historic communities. In the 1960s and 70s, federal and state governments were concerned with the increasing need of affordable housing and deteriorated communities. In a direct action to this, entire communities were demolished and new unattractive low income housing construction was put in place. Some years later the failure of this approach to the problem was evident. In numerous cases, the results were suburban sprawl and weaker downtowns.[63] Now historic preservation is being used as a catalyst for economic development, community revitalization, and conservation of energy resources.

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[63] Urbana Renewal.

In the United States, historic preservation has been a significant partner in accommodating low-income housing. National figures in 2000 show that 31% of homeowners with an annual household income below $20,000 lived in older and historic homes as well as 34% of renters with the same household income. Population minorities are also included in these statistics as 31% of African Americans and 24% of Hispanics live in older and historic homes as well as 29% of the elderly community. In the year 2000, 11,000 historic districts existed in the U.S. and the majority is located in low to moderate-income neighborhoods.[64] "Older historic neighborhoods contribute far more than a sense of evolution and history. Older and historic neighborhoods provide homes for families of every economic level, but particularly for those in need of affordable housing."[65]

A sponsored study by the U.S. Department of Housing and Urban Development (HUD) estimated that the cost of repairing an old home with significant physical problems would be approximately $75,000. Repair costs to an older home with moderate physical problems would be $25,000.[66] Many of the older home inventory fall into the first category with significant physical problems but when considering location, built quality and design, rehabilitation is a possible option for many. "While it is sometimes possible to build something more cheaply than the rehabilitation of an

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[64] U.S. department of Housing and Urban Development. *"Historic Preservation in housing and community Development"*. (Office of Community Planning and Development, Office of Environment and Energy, 1991)
[65] Yeater, *"Historic preservation: It works for community revitalization! In Feldman"*, (R. M. & Wheaton, J. Eds. The Greystone in Historic North Lawndale, Chicago: UIC City Design Center, 2006,) 25-30.
[66] ibid

historic building, historic rehabilitation is always competitive when quality is part of the equation."[67]

HUD in collaboration with the Federal Office of Community Planning and Office of Environment and Energy encourage city officials to use the Community Development Block Grant Program (CDBG) in projects undertaking historic preservation.

The CDBG's primary objectives are to provide decent housing, a sustainable living environment and economic opportunities to people of low and moderate income.[68] In the process, implementing a historic preservation program saves valuable energy resources. Historic preservation is also important in conserving the historic landscape and identity of each community, giving each a sense of place. The logic behind many community revitalization programs is that if one house is restored and given a higher economical and nostalgic value others will follow. "[An] individual invested in an older, often derelict, property, resulting in one renewed old building, others saw the example and did likewise, often down the street in a similarly under-loved property, and that made two. Soon it was happening in surrounding blocks, and the neighborhood was coming to life again. Community revitalization was the consequence – not the cause - of these isolated but numerous commitments of ordinary people."[69]

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[67] Yeater, *"Historic preservation: It works for community revitalization!"*
[68] Section 101
[69] Yeater, *"Historic preservation: It works for community revitalization!"* 25-30

CDBG programs support many activities, which may be linked to the conservation of historic properties. In the community planning process, opportunities to formulate community goals and objectives could include strategies for preservation. Community development, housing, land use, economic development and energy conservation can all be used to include historic elements. Data collection, studies, analysis and implementing measures are all activities eligible for CDBG grants, which can aid in the historic preservation objective. Another activity closely related to preservation is archeological surveys that include reconnaissance surveys of CDBG sites that contain valuable historic resources.

All CDBG projects are in compliance with Section 106 of the National Historic Preservation Act, which include historic preservation plans and the rehabilitation or restoration of historic properties. These are direct actions on behalf of the CDBG but many indirect actions still apply. Economic development can be directly linked to historic preservation and many advantages come from the rehabilitation of an older structure. Administrative costs can also be covered by CDBG funds and linked to preservation as in conducting surveys, market analysis, costs of site and utility plans, narrative descriptions of proposed development or rehabilitation, preliminary cost estimates, urban design documentation, and "sketch drawings", including preservation objectives and making proposals compatible with historic settings.[70] "HUD's mission and its funding capabilities make the agency an important force in many communities, thus making HUD uniquely positioned to promote the Preserve America program and

[70] Yeater, *"Historic preservation: It works for community revitalization!"*, 25-30.

historic preservation. Productive use of historic properties is an important tool for providing affordable housing and supporting economic development. HUD's active participation in Preserve America leverages the agency's ability to use preservation as a critical component in fulfilling its mission and in improving the quality of life for people throughout the country."[71]

HUD programs like the CDBG are solutions to the low income-housing problem in the U.S. using historic preservation. Historic preservation has also been connected to "saving tax money by reusing buildings and infrastructure, conserving resources, preventing urban sprawl, revitalizing community centers, and can impact and encourage private investment."[72]

Programs like these are valuable ideas that could be transferred and reinterpreted to solve some of the housing and historic preservation issues found today in Guadalajara, Mexico. Adobe structures have been given an unfavorable reputation for many years, but it is structures like these that comprehend much of our historic patrimony. Banks and other mortgage lending entities are discriminating towards buildings made out of adobe and refuse credit lines to owners of such structures.

Guadalajara today is faced with a declining population problem and a low-income housing shortage. In 1972, the Mexican Federal Institute for Workers Housing (INFONAVIT) was created. INFONAVIT is the largest mortgage lender in Latin America with more than 5 million mortgages. "From 1972 through 2000, INFONAVIT funded

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[71] HUD and Preserve America. *"HUD and Preserve America Working together to Build Sustainable Communities."* Accessed October 2013, http://www.achp.gov/docs/PAHUDFactSheet.pdf

[72] Bob Turner, "Historic preservation gentrification or economic development." Skidmore Collage 2002.

more than 2 million housing units, or 15.5% of all houses built during that time period. Since 2000, INFONAVIT has granted another 1.7 million credits for housing, providing housing for about 10% of all Mexican families."[73]

NFONAVIT has made homeownership a possibility to many Mexicans as before private bank mortgage credits were and are still beyond the means of many Mexican citizens. The creation of INFONAVIT also led to a massive production of homes by developers and home building firms. Although homeownership became a possibility for many through the years, the social dwelling built for INFONAVIT mortgages has become almost uninhabitable. As the president of the board of Architects in Mexico stated, many of these new homes are not meeting minimum space requirements and mortgages have become inaccessible. The social and interfamily problems created from *barrios* (neighborhoods) such as these are now costing state governments more in public security.[74] "The contemporary urban residential landscape is a reflection of a deregulated housing market that facilitates a boom in house construction but produces little incentive to integrate these new developments through cohesively planned transportation networks, utility infrastructure, and provision of basic services."[75]

Many of these *barrios* are also contributing to the urban sprawl problem many Mexican cities are now facing. Guadalajara's urban trace grows each day, engulfing and destroying valuable natural resources such as el Bosque de La Primavera (a

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[73] Harner et al., *"Buying Development: Housing and Urban Growth in Guadalajara."* p. 467

[74] Buscador de Arquitectura. *"Arquitectura: 2001 a 2010: 2007: Critican expertos casas de Infonavit"*. accessed July 2013, http://noticias.arq.com.mx/Detalles/9091.html#.Ue8gEmBJ_Nc

[75] Harner et al., *"Buying Development: Housing and Urban Growth in Guadalajara."* p. 485

protected forest on the outskirts of the urban trace). "Guadalajara now grows in a chaotic manner reminiscent of U.S.-style sprawl, replete with congested roads, segregated enclaves, concentrations of poverty, and construction in hazardous environments."[76]

Although HUD programs have had a bad reputation with preservationist groups, many of the core ideas could be used to protect and save residential homes in Guadalajara. Programs such as the CDBG can be helpful in addressing the depopulation problems in the historic downtown area of Guadalajara and the loss of valuable historic patrimony.

The Main Street program is another transferable idea. The Main Street program was created by the National Trust for Historic Preservation and primarily focuses on revitalizing districts by leveraging local assets such as enterprises and creating community pride. The program undertakes projects with The Main Street Four Point Approach. The fist step is to organize, establishing "consensus and cooperation by building partnerships among the various groups that have a stake in the commercial district."[77] A governing board of directors is put in place and a volunteer driven revitalization program is encouraged. The second point is promotion that has as a fundamental goal, to create a positive image and give the community, consumers and investors pride and confidence in their commercial district. As a third point, The Main Street Program focuses on the physical aspects of creating a safe, inviting environment

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[76] Hamer et al., *"Buying Development: Housing and Urban Growth in Guadalajara."* p. 485

[77] The Main Street Center. *"The Main Four Point Approach"*, accessed august 2012 http://www.preservationnation.org/main-street/about-main-street/the-approach/#.UiKW8GBJ_Nc

for shoppers, workers and visitors. Through design activities and installing good maintenance practices, communities create an appealing visual atmosphere. Enhancing the district's physical appearance includes the rehabilitation of historic buildings, encouraging appropriate new construction, developing sensitive design management systems and educating businesses and property owners about design quality and long term planning.[78] The last point is 'economic restructuring', where inciting competitiveness and merchandising skills to current and future business owners strengthens a balanced commercial mix.

In the past fifteen years, Guadalajara's area known as Chapultepec has undergone a physical and economical resurfacing. Many of the homes and business located in the perimeter are well maintained and socially valued. A vibrant international and local community lives and works in the district. Many high-end restaurants and shops invested in the buildings and affluent people followed, making it one of the most exciting and culturally diverse neighborhoods in Guadalajara. This is an example of business being the catalyst to economical and cultural development. Chapultepec's rekindling was more of an organic un-programmed growth but can still aid as a case study to the importance and power of commercial business development and how this can initiate a stable historic neighborhood. Today Chapultepec in many ways is vibrant place thanks to the many restaurants, cafes, book, and leisure stores. The city government did play a role in creating this creative place as it allowed the public arena to be used as a place of leisure and cultural endeavor with concerts, art

[78] The Main Street Center. *"The Main Four Point Approach"*

displays and well thought out landscaping. The area has seen an increase in economical value and has also lured highly educated and professionals to invest and live in the area.

It is important to mention that there has been a negative side to the introduction and accommodating to a new affluent population. There exists an ongoing issue with the introduction of new architecture, luxury housing buildings and gentrification.

Government entities, laws and regulations do not solely carry out historic preservation in the U.S.; for the most part, it is the dedication of an individual or group of individuals. Most historic preservation and community revitalization programs start with an individual fixing up or rehabilitating a forgotten building in a discarded neighborhood and a community embracing the inherited benefits of having a usable and restored historic structure.

Guadalajara and Mexico do not have a nonprofit and grassroots culture as the United States does. Most non-governmental agencies doing work in Guadalajara are international NGO's. As we have seen in cities throughout the United States the involvement of a community and a bottom up approach to the revitalization of a community or neighborhood is a determining factor in motivating sustainable growth. COPLAUR understands the importance of an involved community and has for the last decade hosted and funded a competition of projects addressing the restoration of residential patrimony. This is a good approach in getting professional, property owners and the public generally interested in the importance of preservation and restoration.

Yet the efforts of a competition do not suffice or address the urgency of the poor conditions in which much of our historical patrimony lies.

It is imperative in preservation effort to engage the community in the process of preservation. Efforts done by non-profit organizations such as *Cornerstones* are valuable ideas that could be transferred to the revitalization of Guadalajara's historic downtown. *Cornerstones* is a community partnership that has worked to preserve the architectural heritage and social traditions in more than 300 locations in the greater southwest region.[79] Their main focus is on the conservation of construction in adobe. "Since its inception in 1986, *Cornerstones* has participated in more than 50 such restoration projects which have not only served to preserve important historic buildings that are central to cultural heritage and community life, but have built and strengthened community in the process."[80]

"*Cornerstones* disseminates important technical information regarding the restoration and maintenance of historic buildings to a large number of people very efficiently through one and two-day community workshops on various topics of adobe preservation." *Cornerstones* has approached the problem by starting a model program for the preservation and maintenance of historic adobe structures, which involve the training of youth in traditional building skills.

Additionally, *Cornerstones* has revitalized communities and helped the affirmation of cultural values by getting people involved in the preservation efforts of

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[79] Cornerstones Community Partnerships, "*Preserving Architectural Heritage and Community Traditions in New Mexico and the Southwest*", accessed November 2012, http://cstones.org/Based_Preservation_Approach/index.html.
[80] ibid

their own heritage. Other services include technical assistance, loans, equipment and fundraising expertise.

*Cornerstones* has disseminated its mission by getting the community involved, with handbook publications, preservation workshops and training programs. "Our programs seek to strengthen communities by bringing young and older people together for a common cause – preservation of traditional culture."[81]

Involving community members and volunteers drives hands-on assistance. Experts in the field help by working with the community in training on how to lead restoration projects. *Cornerstones* also helps the community organize Saturday workshops where the youth is given marketable training, "[r]ecognizing the important role young people play in carrying on cultural traditions."

With help from partnering organizations such as the National Endowment for the Arts, *Cornerstones* has been able to reach out to students and provide paid internships. This is a fabulous way of getting the people involved and educating them at the same time. "Education is the key to success and sustainability of community-based preservation projects. Participants can take skills learned in the workshops and teach them to others in their communities."[82]

A hand-on experience in the most ancient form of construction can lead to great personal growth. These jobs have a social meaning that cannot be done by one single person. It takes a community to restore an adobe building. It is very laborious

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[81] Cornerstones Community "Partnerships *Preserving Architectural Heritage and Community Traditions in New Mexico and the Southwest*".
[82] Ibid

and short-cuts are rarely taken because machinery is not applied well to this traditional form of construction.

*Cornerstones* also gets new preservationists involved in the conservation efforts by partnering with universities in sponsoring field schools. New professionals are given the opportunity to learn about historic preservation policy, have hands on stabilization and co-work with experienced professional leaders.

Recent efforts have produced a manual for flood damaged adobe buildings, which was partially funded by the National Center for Preservation Technology and Training. To better publicize their mission and efforts, the manual was produced in both English and Spanish. It was distributed both physically and via Internet to communities across the boarder such as those in Chihuahua, Mexico.[83] *Cornerstones* has also published the "Adobe Architecture Conservation Handbook", which is a how-to manual on traditional adobe preservation techniques and is meticulously designed for non-professionals.[84]

Non-profits with missions such as *Cornerstones* could be of great aid to the preservation process in Guadalajara. Project models such as these could be of important value as there exists a disconnect between the society and these historic buildings. Hands on knowledge and work could help owners and preservation activists obtain a sense of productivity and resourcefulness toward the deterioration problems.

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[83] Cornerstones Community "Partnerships *Preserving Architectural Heritage and Community Traditions in New Mexico and the Southwest*".
[84] Ibid

The city and community could take the problem into their own hands and have knowledgeable solutions with the aid of workshops and professional assistance.

The city of Santa Fe, New Mexico has also done admirable work with adobe preservation. One of the most interesting topics, though, is their new embrace toward an old form of construction. The city of Santa Fe embraces and advocates for new adobe construction. Their adobe construction code familiarizes individuals with the effectiveness and advantages of adobe. This code makes adobe construction tangible, current and helps in maintaining a homogenized urban esthetic. While conserving valuable natural resources with the reduction in need of man made materials and the use of heaters and air conditioners in the extreme dessert climate. If Guadalajara were to promote new adobe construction, the ideology and taboos toward the ancient form of building would change.


Fig. 39: Downtown Guadalajara. C. 1900 (COPLAUR)

The history of Guadalajara is incomplete without the stories told by the historical adobe urban dwelling. It is with these structures that a link exists to our monumental patrimony. Cathedrals, plazas, public gardens and all government buildings were created to provide a sanctuary, a weekend outing, a social order and a

community gathering. To fully protect our heritage, conservation measures must extend to the protection of the common urban dwelling. This is approached by revitalizing a community's appreciation towards the historical structures, by implementing preservation legislation and even by expropriation of land on adobe homeowners. A comprehensive analysis of all the hindering factors concerning the adobe buildings helps focus efforts from the preservation community.

Fig. 40: Downtown Guadalajara c. 1900 (COPLAUR)

To begin to address the problem of deteriorating adobe urban dwelling in Guadalajara, one must see it from different angles. Thus, the solution must also be reached using a multifaceted approach. Taking ideas from previous cases of rescued adobe structures in other parts of the world, the focus becomes clear. The first focal area is based on policy adaptation, considering the existing local policy and legislative process. Together with government support, there needs to be an effort to educate the community about the value of historical structures that rescue our roots but also change the argument to include sustainable urban growth.

COPLAUR with its restoration project competitions and social media have helped get the community access to historic information. COPLAUR has initiated the conversation and sparked the interest of many through their Facebook page. The page has helped illustrate the region of Guadalajara with the use of remarkable historic photography and short informational stories. These resources aid in the effort of creating a grassroots movement fundamental in establishing a practice of continuous maintenance and conservation of the historic patrimony.

Community advocacy is a must in addressing preservation measures. This will aid in economical appreciation, which will also help in maintaining used and livable architecture in the historic downtown. As both community and government agencies come together, a link between them will be necessary. A community engagement group can help in the enlisting and education of volunteers and restoration processes. Non-profit and community organizations can serve as managerial support and legal aid along the difficult process of restoring and conserving historical structures.

Although very complex, partnerships like these between grassroots movements and government agencies should support the revitalization of the heart of what used to be a vibrant downtown Guadalajara.

This project addresses the historical, physical, legislative and cultural aspects hindering the preservation of adobe urban dwellings. Understanding the architecture and construction methods of adobe help in the restoration of earthen structures. Enough technology and evidence exist to dismiss the unfounded perception that adobe buildings are harmful or unsafe for human habitation.

The wide array of architectural styles contributes in telling the illustrated story of our architectural history. These buildings are a tangible element to the past and embody the cities' history.

Guadalajara today finds itself in a disordered and disjointed urban growth. The city's growth into the outer limits of the metropolitan perimeter and the new housing development ideology has broken the cohesiveness of the city. The importance of conserving our residential downtown not only salvages our cultural identity but also could aid in establishing a sustainable, integrated downtown historic district.

*"The history of a community contributes to its personality. Preserving the history of a place through its significant historic resources gives a community its unique character. Historic preservation provides a link to the roots of the community and its people. Overall, historic preservation adds to the quality of life making for a more livable community. Historic preservation involves much more*

*than simply saving and restoring old buildings and sites of historic importance; there are economic, cultural, environmental, and educational benefits of historic preservation, all of which are inextricably connected to one another and to the living memory of involved communities.*[85]

Fig. 41: San Juan de Dios, Guadalajara. C. 1900 (COPLAUR)

[85] Hawaii SHPO, "Why Preserve", accessed January 2013, http://www.historichawaii.org/WhyPreserve/WhyPreserve.html

## X. DEFENITIONS

Cantera:
Type of natural stone abundantly found in Jalisco. Very porous, abundantly used in masonry Mexican architecture for structure or ornamentation.

Casco Historico:
Historic area usually downtown.

COPLAUR:
Urban Planning Commission for the municipality of Guadalajara.

Ladrillo Adobon:
Brick made out of earthen materials.

Mestizo:
Used as reference to any person of mixed blood; specifically: a person of mixed European and American Indian ancestry. In Spanish America the term denotes a person of combined Indian and European extraction.

Mestizaje:
The mix of two races, which result in a group of individuals as well as their ideas and culture.

Mexicaltzingo, Mezquitán and Analco:
Names given to some of the first neighborhoods in Guadalajara.

Neoindigenismo: architectural style, which incorporated indigenous patterns and colors on facades of buildings.

Patio Central:
Inner courtyard *with* diverse uses depending on social class of the house, such as work area or garden. Usually surrounded by walls, galleries or halls. Used as a distributor of spaces within the structure.

Plaza:
usually found in the center of colonial cities. Big open areas where gatherings can be held

PRODEUR:
"Procuraduria de Desarollo Urbano" attorneys office for urban development, the government branch responsible in enforcing legislation and codes.

Reinado de Nueva Galicia:
Name given by the Spaniards to the region known today as Guadalajara o el Valle de Atemajac.

Retablo:
Collection of paintings, murals, or sculptures that represent a series of events or a story.

Teja:
Cooked clay in the shape of a canal or "u" used to cover roofs.

Tequitqui:
The mixture of Spanish art with indigenous influence.

Tienda:
Store establishment were articles are being sold to the public.

Vigas:
Structural element used to support the roof usually made out of wood.

Zaguan:
Covered area situated inside a house immediately after the front door or main entry to the structure. Usually used in colonial architecture.

## XI. BIBLIOGRAPHY


Aguilar-Moreno, Manuel. *Handbook to Life in the Aztec World*. New York: Facts on File, 2006.

Aguilera Rojas, Javier. *Teoría urbanística en la colonización española de América. Las Ordenanzas de Nueva Población. Ciudad y Territorio 1977*. Mexico: n°1, Enero-Marzo.

Bergeron ,Loius *"Peruvian villagers shown how to protect adobe buildings from earthquake collapse."* Stanford Report, Nov, 21, 201. http://news.stanford.edu/news/2011/november/peru-seismic-retrofit-112111.html (accessed November 2012).

Blondet, Marcial, Gladys Villa Garcia M., Svetlana Brzev, *Earthquake-Resistant Construction of Adobe Buildings: A Tutorial*. EERI/IAEE World Housing Encyclopedia, Okland, California, 2003.

Clifton, James R. *Preservation of Historic Adobe Structures: A Status Report*. Washington, D.C.: National Bureau of Standards Technical Note 934, US Government Printing Office, Stock No. 003-00301740-0, Feb. 1977.

Conference on the Conservation of Earthen Architecture. "International Conference on the Conservation of Earthen Architecture: adobe 90 preprints" Los Angeles. (1990).

Cornerstones Community Partnerships *"Preserving Architectural Heritage and Community Traditions in New Mexico and the Southwest"* http://cstones.org/ (accessed February 1st 2012).

Cullimore, Clarence C. *Santa Barbara Adobes*. (Santa Barbara, Calif.): Santa Barbara Book Pub. Co, 1948.

Diaz Arreola, Emilia, Liliana Fuentes Valles and Sofia Perez Martinez. Manual de Conservacion de Monumentos Historicos y Arquitectura de Tierra. Chihuahua: INAH CONACULTA.

Dethier, Jean. *Down to Earth: Mud Architecture, an Old Idea, a New Future : Based on an Exhibition at the Centre Georges Pompidou*. London: Thames and Hudson, 1982.

Ferrero, Alejandro. "Arquitectura con Tierra en Uruguay." *Horizontes* 1(2010): 39-42.

Harner, John., Edithe Jimnenez Huerta, and Heriberto Cruz Solis. "Buying Development: Housing and Urban Growth in Guadalajara, Mexico." *Urban Geography,* 30 no.5 (May 2013): 465-489.

Geo-Mexico: the geography and dynamics of modern Mexico "Population Change in the Guadlajara Metropolitan Area" http://geo-mexico.com/?p=3395 (accessed November 11, 2012)

Gromicko, Nick, Rob London "La Inspección de Adobe." Inspecting The World. http://www.nachi.org/adobe-inspection-spanish.htm (accessed February 27 2012).

Guerrero Baca, Luis Fernando. *Mexico: La Perdiad de la Arquitectura de Adobe en Mexico*. Mexico: Heritage at Risk, 2006/2007.

Haapala, K. V. "Stabilizing and Restoring Old Adobe Structures in California." *Newsletter of the National Association of Restoration Specialists*. Murphy, Calif., June 1972.

Iowa, Jerome. *Ageless Adobe: History and Preservation in Southwestern Architecture*. Santa Fe, N.M., USA: Sunstone Press, 1985.

Lumpkins, William T. Adobe, *Past and Present*. Sante Fe, N.M.: Museum of New Mexico, 1974.

Mexico Desconocido. "Historia de la Ciudad de Guadalajara: parte 1." Mexico Descoocido (2012). http://www.mexicodesconocido.com.mx/historia-de-la-ciudad-de-guadalajara-parte-1.html (accessed November 2012).

Mexico Desconocido. "Historia de la Ciudad de Guadalajara: parte 2." Mexico Descoocido (2012). http://www.mexicodesconocido.com.mx/historia-de-la-ciudad-de-guadalajara-parte-2.html (accessed November 2012).

New Mexico Historic Earthen Buildings Housing and Construction Codes, General 2009.

Osvaldo, Ruben Chiappero, Maria Clara Supisiche. *Arquitectura en tierra cruda: breves concideraciones sobre la conservación y la restauració.* Buenos Aires: Nobuko, 2003.

Scripta Nova, "Casa, Habitacion Y Espacio Urbano en Mexico. De la Colonia al Liberalismo Decimonico." Scripta Nova 2003, http://www.ub.edu/geocrit/sn/sn-146(015).htm#_edn6 (accessed January 2013)

Technical Preservation Services: Office of Archeology and Historic Preservation/Heritage Conservation and Recreation Service. "Preservation of Historic Adobe Buildings," *Preservation Briefs*. Technical Preservation Services: US Department of the Interior, 1978.

Tolles, E. Leroy, Edna E. Kimbro, Frederick A. Webster and William S. Ginell. *Seismic Stabilization of Historic Adobe Structures: Final Report of the Getty Seismic Adobe Project*. Los Angeles, CA: The Getty Conservation Institute, 2000.

Vargas Soto, Moises. "Urban Reconfiguration for the Consolidation of Patrimony." *Horizotes* 2(2012): 44-49.

Yampolsky, Mariana, and Chloë Sayer. *The Traditional Architecture of Mexico*. New York: Thames and Hudson, 1993.

Bergeron ,Loius *"Peruvian villagers shown how to protect adobe buildings from earthquake collapse."* Stanford Report (nov, 21, 2011) accessed November 2012, http://news.stanford.edu/news/2011/november/peru-seismic-retrofit-112111.html