

# Beyond Mapping: Geographic Information Systems for Lead Hazard-Safe Houses in Houston

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## Abstract

The Bureau of Community and Children's Environmental Health in the City of Houston manages a Lead Hazard Control Program. The program requires case approvals through the Texas Historical Commission which is mandated to preserve the original character of the buildings in the Historic Districts. These approvals are based on the locations of the cases with respect to the Historic Districts boundaries. Communicating accurate location using conventional methods was very cumbersome and caused delays. Providing accurate spatial information is critical for informed-decision making by the Commission.

A project was undertaken to streamline this process using a free Geographic Information Systems (GIS) program. The project included development of a published map document (.pmf); a standardized map containing the Historic Districts, a grid and other layers. The program administrators, who received training to use ArcReader™, are able to locate addresses, print the relevant grid and send the cases for approval. The Historical Commission makes decisions using the same standardized map. The project has resulted in considerable cost and time savings.

## Introduction

A Geographic Information Systems (GIS) is helpful to locate features on the surface of the Earth. A GIS is comprised of computer software and hardware for capturing, analyzing and visualizing geographic data. Organizations are increasingly using GIS for their day-to-day decision making processes. This is especially true for local organizations dealing with address level data.

The Bureau of Community and Children's Environmental Health in the City of Houston manages a grant for lead hazard remediation as many of Houston's older residential dwellings have paints that contain hazardous amounts of lead. Lead is a poisonous heavy metal that hampers the development of the nervous system in growing children.

The department undertakes lead hazard remediation projects funded by the US Department of Housing and Urban Development (HUD) at houses that have tested positive for lead. The process involves alteration or replacement of windows/doors and wet scraping and repainting. As a result, the character of the building might change altogether. If the building is located within or close to the designated historic districts, the remediation process might affect the character of the district.

To prevent this, the grant requires the Bureau to get concurrence from the Texas Historical Commission be-

fore undertaking a remediation project. This is in accordance with Section 106 of the Historic Preservation Act which requires the Federal agencies to take into account of the effects of their undertakings on historic properties. Once a case is identified for remediation, a file containing a picture of the house along with other relevant information, including the location has to be send to the Texas Historical Commission, which is located at Austin. The Commission then determines the eligibility to undergo the remediation.

The crux of the issue is to convey the spatial information accurately to the Commission. The ideal way is to attach a map with each case file which shows the address of the house, the historic districts and monuments and other relevant features. The Bureau did not have the resources to do that. So, some crude methods had been adopted to show the location, which caused delays in getting the approval from the commission.

In order to solve this issue, a map document with the required layers was created using the GIS resources available within another program of the Health and Human Services. Copies of this map document, which was in a published format, were distributed to the Lead Program administrators in the Bureau. The next step was to install a free GIS software called ArcReader. Once the staff were trained to use it, they were able to make custom maps to show the location of the address and its spatial relations to the historic districts.

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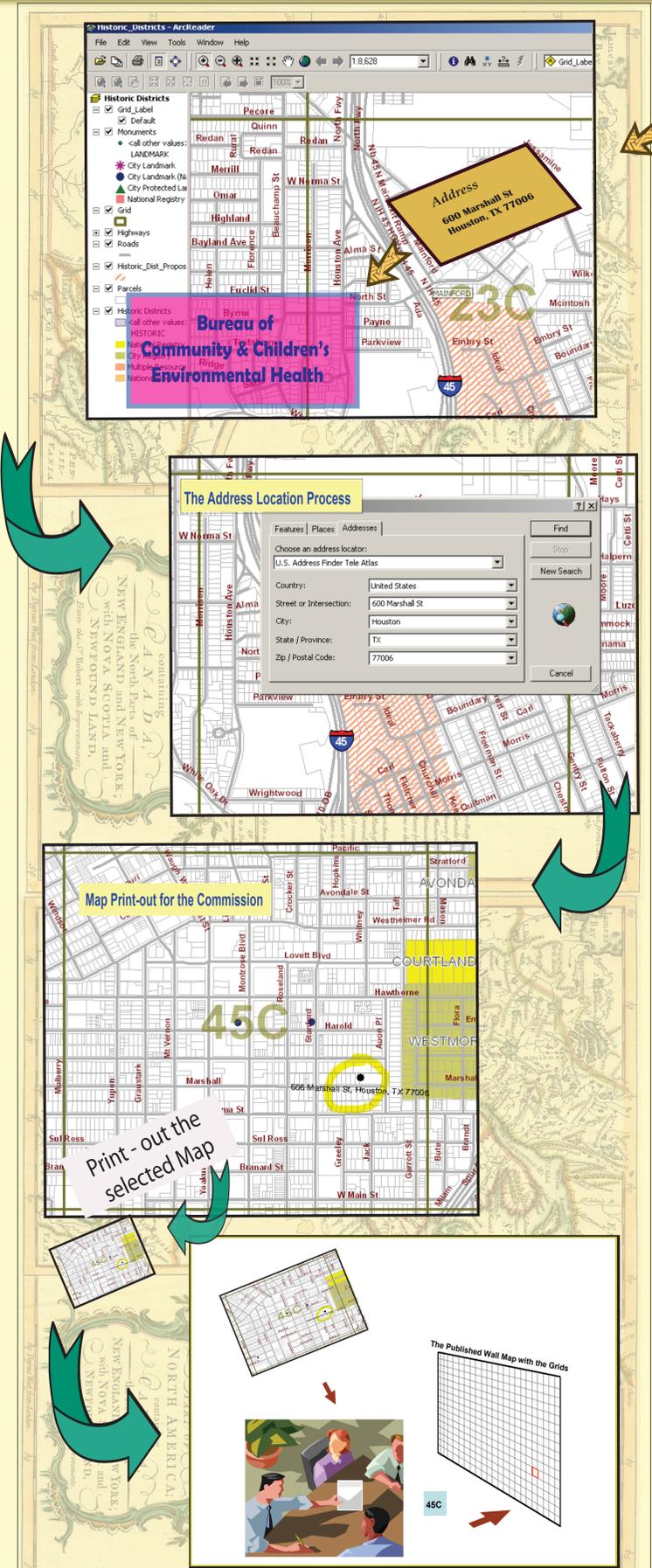


Fig 1: A House selected for the Lead Hazard Remediation Project

## Methodology

Several rounds of discussions had been held with the members of the Texas Historical Commission and the program administrators of the Bureau of Community and Children's Environmental Health to ascertain the work flow and data requirements for the GIS project. Once the requirements had been assessed, an ArcMap document (.mxd) comprised of the historic districts, monuments, roads, major highways, parcels and a custom grid was prepared at the GIS facility of the Community Health Statistics (CHS) under the Office of Surveillance and Public Health Preparedness (OSPHP).

The map document was then distributed among the program administrators as a published map document (.pmf) using ArcGIS Publisher extension of ArcGIS 9.2. The published map can be read by a free GIS Desktop product called ArcReader. The program administrators were trained in basic GIS analysis, address location, and making custom maps that can be send to the Commission along with the case files for approval.

## Conclusions

The GIS project has made the approval process much easier and faster. As the City is in its way to acquire an enterprise GIS system, ArcReader program can be integrated with Enterprise Map Printing (EMP) applications that allows to print standardized maps across all the City of Houston departments. A client/server or web browser based UI can be used to allow users to search the database for published layouts.