City of Martindale, Texas

Asset Inventory and GIS Database Development

Introduction

Purpose

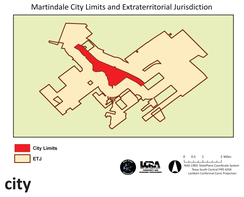
Provide a Geographic Information System (GIS) database containing vital geographic information on land use, housing, thoroughfares and street networks, and storm water drainage to -

1. Aid the city in making informed decisions about these assets during the development of the City of Martindale's Comprehensive Plan
2. Provide city officials tools for visualizing these assets in the planning of expanded infra-structure to accomodate future growth within the community

Background

In late February 2010, GeoCats Solutions, in association with Kirk Scanlon of the Lower Colorado River Authority (LCRA), proposed the City of Martindale: Asset Inventory and GIS Database Development project to Jeff Caldwell, Martindale's City Administrator, as a solution to the current and anticipated challenges faced their city in their efforts do the develop a Comprehensive Master Plan

Martindale City Limits and Extraterritorial Jurisdiction



Scope

The geographic extent includes:

Martindale's city limits
Statutory ETJ: half-mile buffer around the city limits
Voluntary ETJ: additional twenty square miles around the city

Project Objectives

1. Provide asset inventory of land use, housing, thoroughfares and street networks, and storm water drainage encompassing the study area

2. Perform analysis of land use, which includes reviewing current land use and determining and mapping possible alternatives for future land use

3. Perform analysis of housing, which includes examining housing characteristics and determining and mapping areas most in need of housing improvements

4. Perform analysis of thoroughfares and street networks, which includes reviewing current conditions and mapping the hierarchy of current road systems

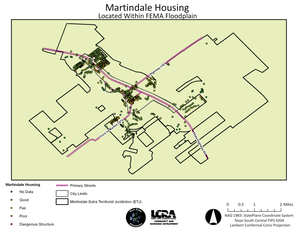
5. Perform analysis of storm water drainage, which includes reviewing current storm water infrastructure, mapping flood plains, contours, and identifying problem drainage areas

6. Develop a GIS database, or geodatabase, of all four assets inventoried

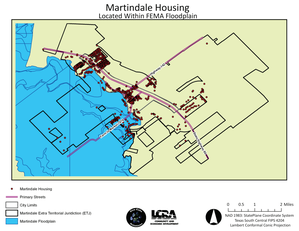
7. Convert GIS database to a format compatible with the Google Earth Application

Housing

Martindale Housing
Located Within FEMA Floodplain

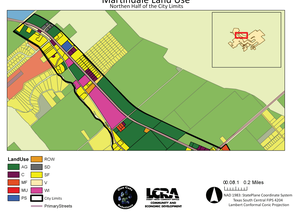


Martindale Housing
Located Within FEMA Floodplain

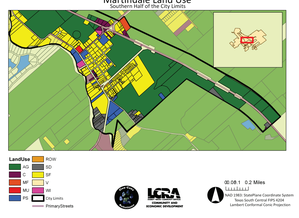


Land Use

Martindale Land Use
Northen Half of the City Limits



Martindale Land Use
Southern Half of the City Limits



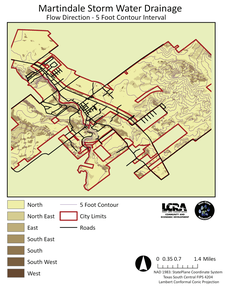
Thoroughfares and Streets

Martindale Roadways

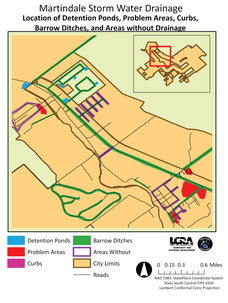
Martindale Roadway Materials

Storm Water Drainage

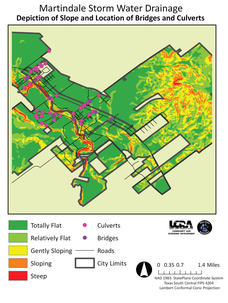
Martindale Storm Water Drainage
Flow Direction - 5 Foot Contour Interval



Martindale Storm Water Drainage
Location of Detention Ponds, Problem Areas, Curbs, Barrow Ditches, and Areas without Drainage



Martindale Storm Water Drainage
Depiction of Slope and Location of Bridges and Culverts



Data

Secondary Data

Used primarily to create a base map on which all field surveys and asset data would be based.
Obtained from the following sources:

1. Capital Area Council of Governments (CAPCOG)
   - 2009 6 Inch Aerial Imagery
   - Parcel data for Caldwell County and Hays County
   - Federal Emergency Management Agency (FEMA) Flood Plain
2. Texas Department of Transportation (TxDOT)
   - Urban Areas
   - Station Counts
   - Roadways
   - 2009 Aerial Imagery
3. Lower Colorado River Authority (LCRA)
   - Guadalupe County Parcel data
   - City Limits
4. Texas Natural Resources Information (TNRIS)
   - Digital Elevation Model: Caldwell County
5. Caldwell, Hays, and Guadalupe County Governments
   - Appraisal District
6. Bobcat Planning - Spring 2008 Advanced GIS II Project Group
   - Extraterritorial Jurisdiction
   - Address Points

Primary Data

Obtained through a series of field surveys and ground observations.
Created by using ArcCatalog to establish point, line, and polygon shapefiles and personal geodatabases.
Features were defined in ArcMap using the Editor Toolbar sketch functions. Their attribute tables were expanded to include relevant information. ArcToolbox Analysis Tool was used to create a buffer around Martindale City Limtis.
Spatial Analyst was also used to derive contours, slope, and flow direction from the DEM.

1. Land Use (Polygons)
2. Housing (Points and Polygons)
   - Location
   - Condition:
     + Good + Fair + Deterioriated
   - Type:
     + Manufactured + Vacant + Dangerous Structure
   - Identification of houses located in FEMA Flood Plain
3. Thoroughfares and Streets (Lines)
   - Material
   - Condition
   - Hierarchy of Road Systems
4. Storm Water Drainage (Points and Polygons)
   - Contours and Slope
   - FEMA Flood Plain
   - Flow Direction
   - Location of:
     + Culverts + Areas without Drainage + Bridges
     + Problem Areas + Curbs + Barrow Ditches
   - Culverts:
     + Percentage Clogged
     + Corrugated Metal Piping Width
     + Number of Pipes
     + Type:
       - Reinforced Concrete Box Culvert WITH Corrugated Metal Piping
       - Reinforced Concrete Box Culvert WITHOUT Corrugated Metal Piping
       - Corrugated Metal Piping NOT Reinforced by Concrete

Conclusion

GeoCats Solutions has completed the development of a geodatabase consisting of datasets that depict the current land use, housing conditions, storm water drainage infrastructure, and thoroughfares and streets within the City of Martindale and the associated ETJs.

The completion of the asset datasets and the correlating GIS database will allow city officials to make informed de-cisions concerning future development and improvement, as well as enable residents to view current conditions and better understand the surroundings in which they live.

The data has been provided to city officials in a format compatible for use with the Google Earth application for the purpose of continued use by the city, independent of GIS software.

The GIS method was chosen over alternative formats such as Computer-Aided Design (CAD) because the data is spatially referenced, can easily be converted into formats independent of GIS, is user friendly, and allows for analy-sis. It is also becoming a national trend for local governments to possess a GIS for their town.

All Objectives Were Achieved.

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Project Members: Lauren Bain, Michelle Couden, HannaH Rogers
Advanced GIS II - Spring 2010
Professor: Yongmei Lu
Lab Instructor: Jay Parsons

Special Thanks to:
Kirk Scanlon, LCRA
Jeff Caldwell, City of Martindale
Chris Holtkamp, LCRA