

Hazards



SECTION 13 – HAZARDS

Introduction

The purpose of this section is to identify the main hazards that the City of Navasota is most likely to face. Due to its geographic location, Navasota does not encounter the broad range of possible natural and technological hazards that other communities must deal with. The two main threats to the City are hazardous cargo spills from both rail or truck transportation, and flooding as shown on the Federal Emergency Management Agency's flood plain designations. These two threats are discussed in detail in this section. Although other natural hazards such as tornados and severe weather exist, deficiencies in their planning will be addressed in the Future Hazards section (Section 23) included in the second part of this document.

Hazardous Material Release

Railroads

The most significant threat for a hazardous materials release in the City of Navasota comes from the presence of the railroad lines that run through the City.



Navasota Railroad

Because of Navasota's

prominence of the train route between Houston and Dallas, it is likely that various hazardous materials travel through the City on a regular basis. Information on what and how much hazardous material travels through the City is not available at this time due to information restrictions enforced by the Department of Homeland Security.

In the worst-case scenario, a large chlorine gas spill has the potential to affect all residents within a half-mile radius from the spill site (Map 13.1). In order to demonstrate the potential impact of such an event, a GIS analysis was conducted. This analysis used 17 randomly selected "spill sites" to determine an average number of citizens who may require evacuation or medical treatment. According to the analysis, an average of 643 people could be affected by such a spill. Map 13.1 shows the random spill sites, population density, and public facilities which might impact the number of people affected. It also contains a table showing the impact from each spill scenario. Weather conditions may also significantly increase or decrease the number of people exposed in any given situation. Most of Downtown Navasota and two Navasota Independent School District facilities are located within a half-mile of the railroad lines. The high density of students at these two locations during school hours makes them a high priority for emergency evacuation planning.

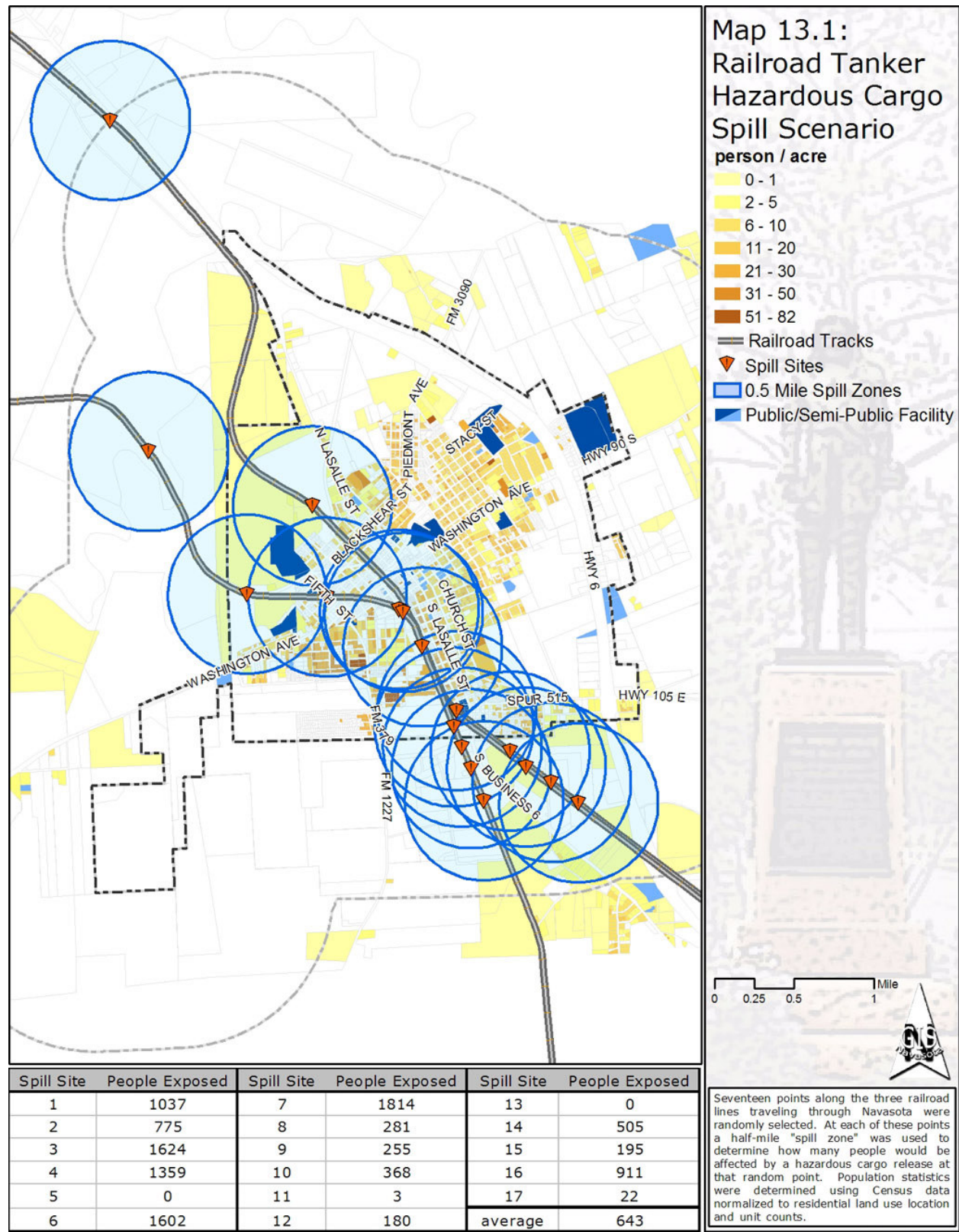
Highway Corridors

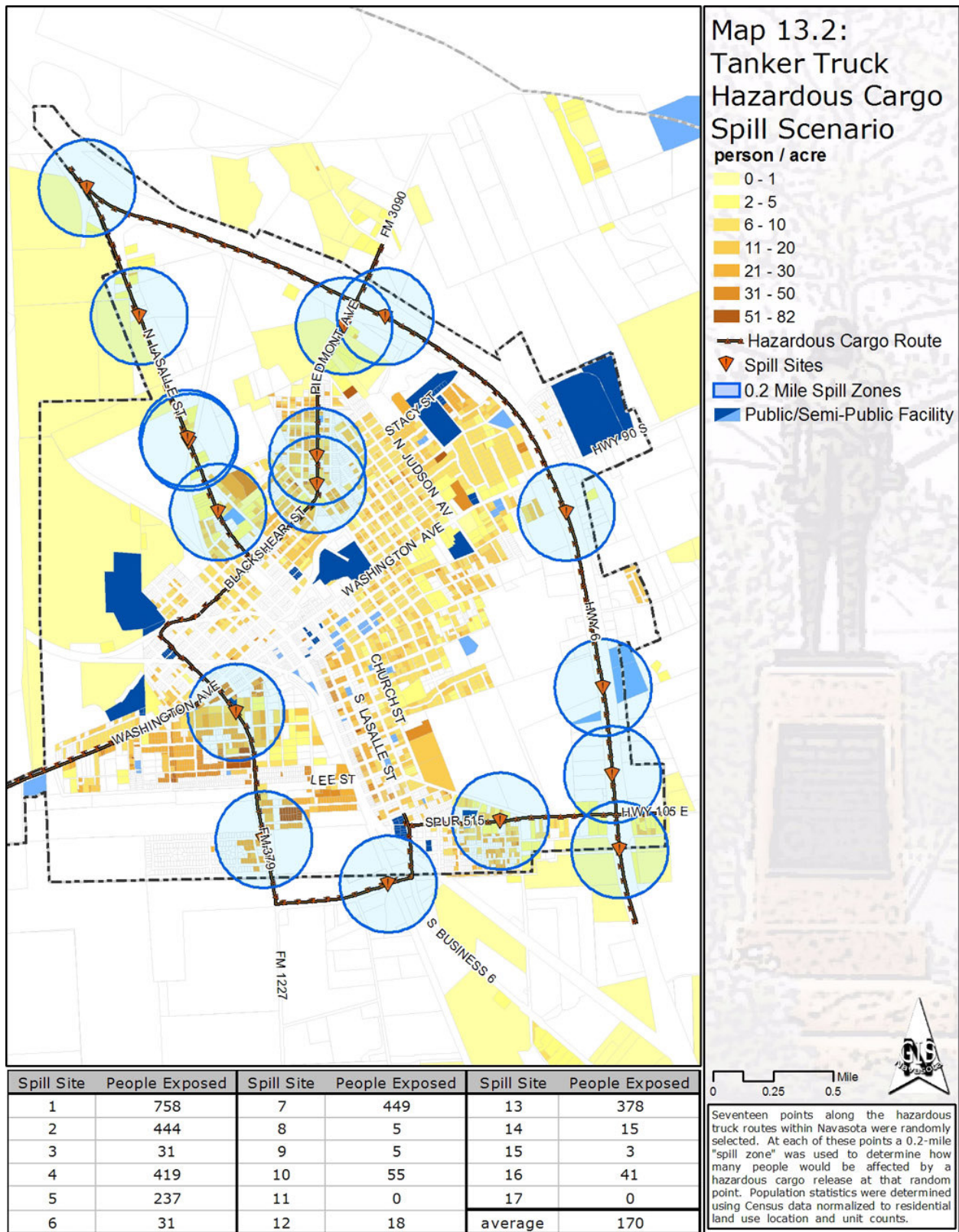
The City of Navasota also contains hazardous material corridors on its thoroughfare system. A serious hazardous materials release on the City's highways is less likely than on the railroad. Specific materials and the quantity carried through the City could not be obtained, also due to Homeland Security measures.



Highway Corridor

A hazardous cargo spill analysis was conducted for these truck routes. This analysis was similar to the one described previously for a railroad tanker accident. Due to smaller storage capacities on trucks, the spill release range was reduced to two tenths of a mile. Map 13.2 shows the results of this analysis, and that an average of 170 residents could be affected in such a scenario. It is also important to note the potential impact of a spill occurring on Highway 6 close to Navasota High School. Under certain weather conditions the high school as well as the middle school may require evacuation.





Natural Hazards

Flooding

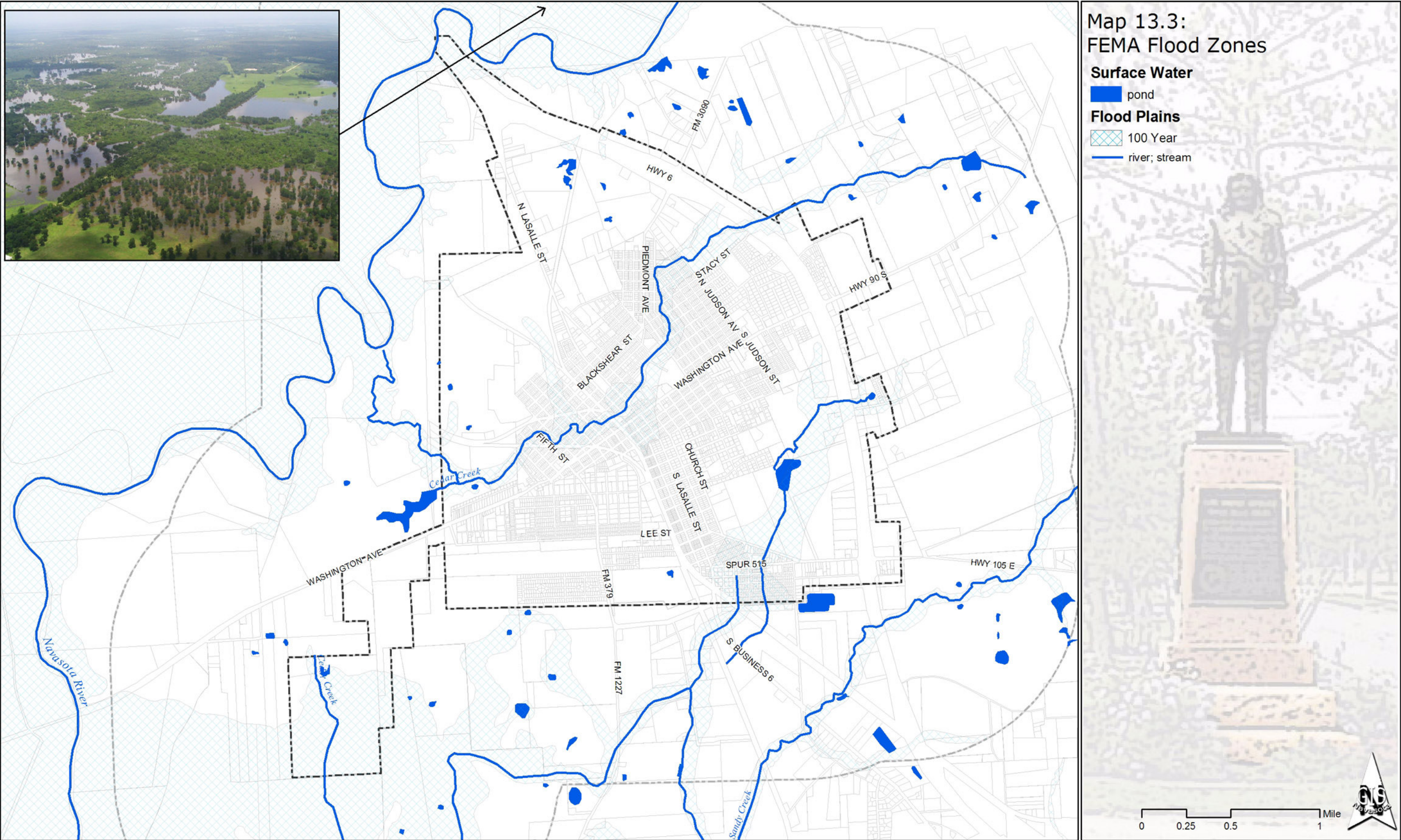
Portions of the City of Navasota have been built within both of the Federal Emergency Management Administration (FEMA) 100-year and 500-year designated flood plains. By definition, areas within a 100-year or 500-year flood plain respectively have a 1% or 0.2% chance in any one-year of being inundated. The FEMA flood plain maps were created in 1988, making them somewhat dated. Although the date of these maps is a concern, the rate of growth in terms of land use conversion from open and agriculture to urban uses has not been rapid during this time period. With this in mind, the accuracy of the FEMA maps should not be a topic of great concern.



Navasota 1912 Flood

The City of Navasota is a participating community in the National Flood Insurance Program. Essentially, this allows the community's residents to purchase flood insurance. A secondary benefit of this program is reduced insurance costs through the "Community Rating System" program and other mitigation related activities that are open to the City. At present, Navasota does not participate in any additional FEMA programs.

An analysis was conducted with a Geographical Information System (GIS) (Map 13.3 and Table 13.1). The flood data used for this analysis is known as the FEMA Q3 data, a digital reproduction of the original Flood Insurance Rate Map (FIRM). The results of this analysis are fairly encouraging: 65% percent of the parcels within the 100-year flood plain are undeveloped, either in Open Space or Vacant land use classifications. Another 11% of the flood plain is an Agricultural use. Only 150 acres, roughly 24% of lands within the flood plain, are urban uses. Although this percentage of urban uses within the flood plain appears to be high, considering that roughly 18.5% of the city's area is within the flood plain puts this figure in a different perspective.



The properties within the 500-year flood plain should not be of great alarm considering their relatively low numbers and small flood probabilities, but are still worth mentioning. A small portion of the City of Navasota is categorized as 500-year flood plain. These areas lie primarily along the thin borders of the 100-year designation (Figure 13.2). The 500-year flood plain area encompasses a mere 21 acres, approximately 39% of which is in residential uses. About 37% of the 500-year flood plain is not in urban uses, and it is made up primarily of vacant or undeveloped land.

Table 13.1: Description of Land Parcels Within the 100-year Flood Plain

Land Use Classification	Number of Land Parcels	Area (Acres)	Percent of Area by Land Use
Residential	263	49.4	7.8%
Commercial	65	62.0	9.8%
Industrial	24	18.5	2.9%
Public/Institutional	34	8.2	1.3%
Transportation	17	1.7	0.3%
Downtown	102	10.8	1.7%
Open Space	54	214.1	34.0%
Agriculture	9	68.4	10.9%
Vacant	351	196.1	31.2%
Total:	919	629.3	100.0%

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On the whole, the City of Navasota is subject to risks to life and property from flood events. The risk is, however, small in comparison to other communities that are located in areas of chronic flooding. While certain areas may encounter frequent drainage or puddling problems, there is no recent record of wide-scale flooding within the City. There are some residential and commercial areas, including portions of the Downtown, which are at risk to flooding in terms of the 100-year flood plain. Fortunately, the bulk of the at-risk areas are undeveloped or in agricultural uses, drastically reducing property loss threats from floods.

Table 13.2: Description of Land Parcels Within the 500-year Flood plain

Land Use Classification	Number of Land Parcels	Area (Acres)	Percent of Area by Land Use
Residential	49	8.3	39.4%
Commercial	11	2.9	13.8%
Industrial	0	0.0	0.0%
Public/Institutional	10	1.4	6.8%
Transportation	1	0.1	0.3%
Downtown	5	0.7	3.1%
Open Space	9	1.5	7.0%
Agriculture	1	1.5	7.3%
Vacant	16	4.7	22.2%
Total:	102.0	21.0	100.0%

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Conclusion

Hazardous cargo spills associated with the railroad, and flooding are the two most pressing hazard issues to be faced today in Navasota. Solutions on how to confront these hazards is discussed in the Hazard Mitigation Plan covered in the Future Hazards section (Section 23), including planning activities, mitigation strategies, and possible funding sources.