

Community-Based Risk Assessments

In order to fully understand the impacts of hazardous events on a community level, individual communities underwent a broad risk assessment. Each community within Lac qui Parle County received a survey and two inventories to gather information to complete the project with the Emergency Management Director. The risk assessment survey requested included identification of likely hazards that may affect the community, as well as current land use development trends and the potential of future development. The risk assessment inventories were geared toward identifying vulnerable structures that may be affected by different hazard area boundaries and an inventory of community assets. Sample surveys and inventories are found in Appendix 9. Each community-based risk assessment is divided into four sections: existing development trends, potential of future growth and development, vulnerability assessment of structures by hazard, and an inventory of community assets.

In the original Lac qui Parle County All-Hazard Mitigation Plan, the Local Task Force and public prioritized hazards by risk. Of all hazards identified, two natural hazards were selected to likely occur on a city-wide rather than county-wide basis. These hazards include 1% Chance Floods and tornados. Each hazardous event was assigned a hazard boundary. The hazard boundary for floods was the 1% Chance Floodplain. It is important to note that the risk assessments for floods were performed using 2006 digital FIRM maps. The boundary for an F4-F5 Tornado is a half mile radius around a major thoroughfare(s) that crosses into a city. Communities were asked to perform risk assessments for each hazard type if it applied, which resulted in some communities completing risk assessments for a variety of number of hazards. Further, the option existed for communities to select a hazard that was not included within the top two natural hazards to occur in the city. A map has been provided for each hazard specific to the city, following the risk assessment that estimates the potential loss due to a hazardous event.

General city information for the risk assessments was gathered from the Lac qui Parle County Assessor, who provided broad land use parcel data from 2009. This data contained the total number of parcels within each land use category and a 2009 market rate value for the parcel for all non-exempt entities. All exempt parcels including hospitals, churches, government-owned facilities, and schools, have market values from 2010 as those properties. It is important to note that Lac qui Parle County's parcel data does not identify the number of structures per parcel and that utilizing parcel data may over or underestimate the actual number of structures within each community. Further, the market value utilized for the community-based risk assessment is for both the structure and the land, which causes an over-estimation of structure value.

In order to ensure the most consistent relevant information was used for each community, the vulnerability assessment inventory based on hazards was done at the parcel level, unless only a few particular structures were identified by city staff and the market value for those structures were used to provide the most accurate information as possible. In the event that multiple or a majority of parcels within a land use category that did not allow for intensive identification of structures, the total market value for a land use category was divided by the total number of parcels within that category and multiplied by the number of parcels in the land use category that reside within the hazard area in question. As data issues have been noted above, in the next All-

Hazard Mitigation Plan more updated information will be utilized to provide more accurate loss amounts for hazardous events.

The second portion of the risk assessment includes an inventory of community assets for each city in Lac qui Parle County. Cities were asked to provide a list of major employers, vulnerable populations in multi-family housing complexes, historical structures, institutional facilities, Hospitals/Police/Evacuation Center, and schools. The inventory includes the 2009 market value of all non-exempt assets, and estimated replacement/content/and function values. For all exempt properties, the market value was taken from 2004. Each of these asset's locations were identified and placed on all hazard maps. This is to show the connection between hazard boundaries and the location of assets. As mentioned previously, assets tended to vary from community to community; so all assets were categorized into one of seven categories:

- Major Employers (as defined by community)
- Emergency Services (Police, Fire, or Hospital-related structure)
- Historical Structure (as defined by community and State Historic Preservation Office)
- Institutional Building (government-owned structure, not related to Emergency Services)
- Multi-Family Housing
- Schools (Educational-related structure).

For the next update of the All-Hazard Mitigation Plan, the market value for exempt properties will be updated with 2010 values and hopefully have updated square footage amounts. An approximate replacement cost, content value, and function value was generated through the use of FEMA's Understanding Your Risk's Guide, which provided general percentage and rate information to determine the value of community assets in numerous methods. It is important to note that these costs and values are estimates based upon the square footage of the building. The square footage value does not necessarily provide the most accurate view of property. For example a building may be very large, but does not have a great amount of equipment or may be aged. Further a small building may hold a very profitable business/entity that could be newer and updated. Replacement cost is used to determine how much a current building or structure would cost to entirely rebuild the structure. Content value is a function of a percentage of damage applied to the replacement cost and is variable upon land use type. The function value represents the value of a building's use or function that would be lost if the building were damaged or closed.

City of Bellingham, Minnesota

Existing Development Trends.

Bellingham is the county's fourth largest city with 170 residents and 83 households (Minnesota State Demographic Center and Metropolitan Center 2007). Bellingham's population has been slowly decreasing since 1960, losing an average of 15 residents per decade over the past 40 years. The city's population projections estimate that Bellingham will continue to decrease at a modest rate over the next 20 years. While Bellingham has not completed any redevelopment projects, annexations, or land use changes in the past ten years; the City has completed two projects in the past three years. In 2007-2008, a new All-Tel cell phone tower was erected to improve connectivity and a new park shelter was purchased in 2009. The City of Bellingham's general land use category breakdown exists as the following show in Table 53 below.

Table 53. City of Bellingham – Land Use Category Allotments

Land Use Type	Parcel Count	Percent of Area
Residential	107	67.3%
Commercial	30	18.9%
Industrial	8	5.0%
Government	3	1.9%
Religious-Non-Profit	11	6.9%
Total	159	100.00%

Source: Lac qui Parle County Assessor 2009

Potential for Future Growth and Development.

Bellingham's future growth area for development is within current city limits. The focus of Bellingham is to maintain its current housing stock by sustaining residents and keeping homes updated. Future development could occur on or near the recently closed elementary school property located south of 1st street, for residential and commercial infill development. This area is not directly located in a hazardous area, but could be impacted by a tornado event.

Vulnerability Assessment of Structures by Hazard.

Of the two natural hazards selected as most likely to affect a city, one hazard does not apply to the City of Bellingham (100-year floodplain). Bellingham opted to perform a risk analysis on four potential hazardous events including an F4-F5 Tornado event, Straight-Line Wind event, Train Derailment, and a fire at a Grain Elevator. Each hazard was assigned a boundary and all structures within that boundary were identified and assessed by Lac qui Parle County Assessor 2009 market values. Tables 54, 55, 56, and 57 display the potential total number of structures that may be affected by the mentioned hazards within the defined hazard areas, in addition to a predicted devastation amount provided by 2009 assessed market values.

Bellingham Hazard 1. F4 – F5 Tornado

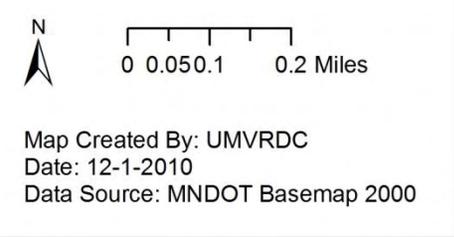
According to the National Weather Service, an acceptable method to estimate damage from a F4 or F5 tornado in a small community would be to model the situation after the event that occurred in Greensburg, Kansas with a population of approximately 1,500 people. The devastation was vast, totaling around \$250 million dollars – approximately 95% of the city was ruined. To model an F4 or F5 tornado, the National Weather Service suggested approximating that 90% of each land use category be considered demolished and totaling those losses for a final prediction of devastation, produced by 2009 market values. As shown in Table 55 (Figure 8 following page), the estimated devastation value of an F4 or F5 tornado is \$5,258,250 dollars affecting 143 structures.

Table 54. Bellingham Hazard 1: F4-F5 Tornado

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	107	96	\$3,544,200	\$3,189,780
Commercial	30	27	\$258,400	\$232,560
Industrial	8	7	\$1,210,700	\$1,089,630
Religious/ Non-profit	3	3	\$247,900	\$223,110
Government	11	10	\$581,300	\$523,170
Total	159	143	\$5,842,500	\$5,258,250

Figure 8: Bellingham Hazard 1: F4-F5 Tornado

Lac qui Parle County
All-Hazard Mitigation Plan



Bellingham Hazard 2. Straight-Line Winds

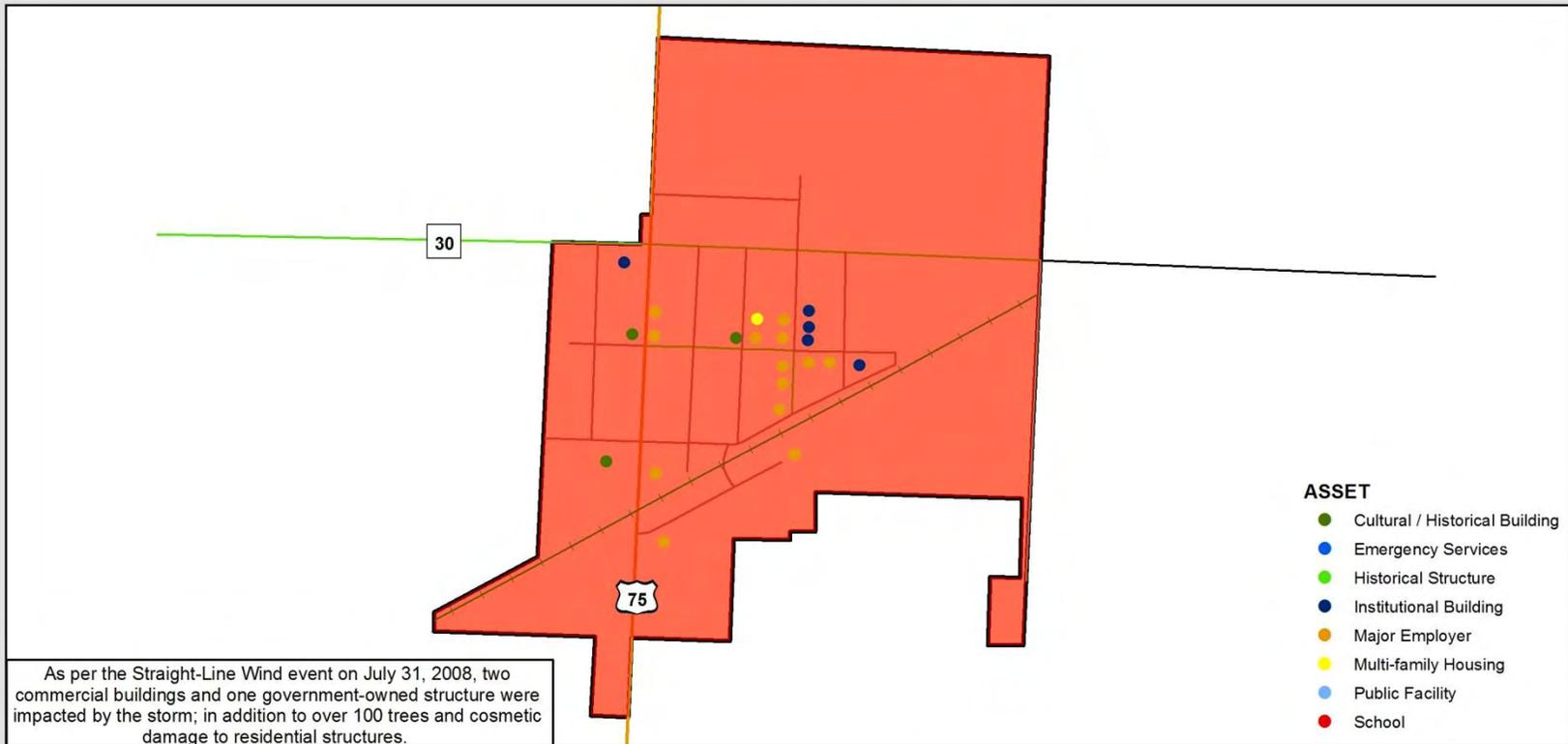
The second hazard area analyzed for Bellingham is straight-line winds. On July 31, 2008, Bellingham was impacted by straight-line winds causing damage to three separate structures (two commercial businesses and a government-owned structure). It is estimated that approximately \$17,000 went to replant trees as over one hundred were lost due to the winds. As shown in Table 55 (Figure 9 following page), the estimated devastation value of another straight-line wind event is \$85,000 dollars affecting 3 structures.

Table 55. Bellingham Hazard 2: Straight-Line Winds

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	107	0	\$3,544,200	\$0
Commercial	30	2	\$258,400	\$80,000
Industrial	8	0	\$1,210,700	\$0
Religious/ Non-profit	3	0	\$247,900	\$0
Government	11	1	\$581,300	\$5,000
Total	159	3	\$5,842,500	\$85,000

Figure 9: Bellingham Hazard 2: Straight-Line Winds

Lac qui Parle County
All-Hazard Mitigation Plan



Lac qui Parle County

Bellingham

- Bellingham
- Wind Impact Area

ROADS

- Township Roads
- County Road
- County State Aid Highway
- MN Trunk Highway
- U.S. Highway
- Railroad



0 0.050.1 0.2 Miles

Map Created By: UMRVDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Bellingham Hazard 3. Train Derailment

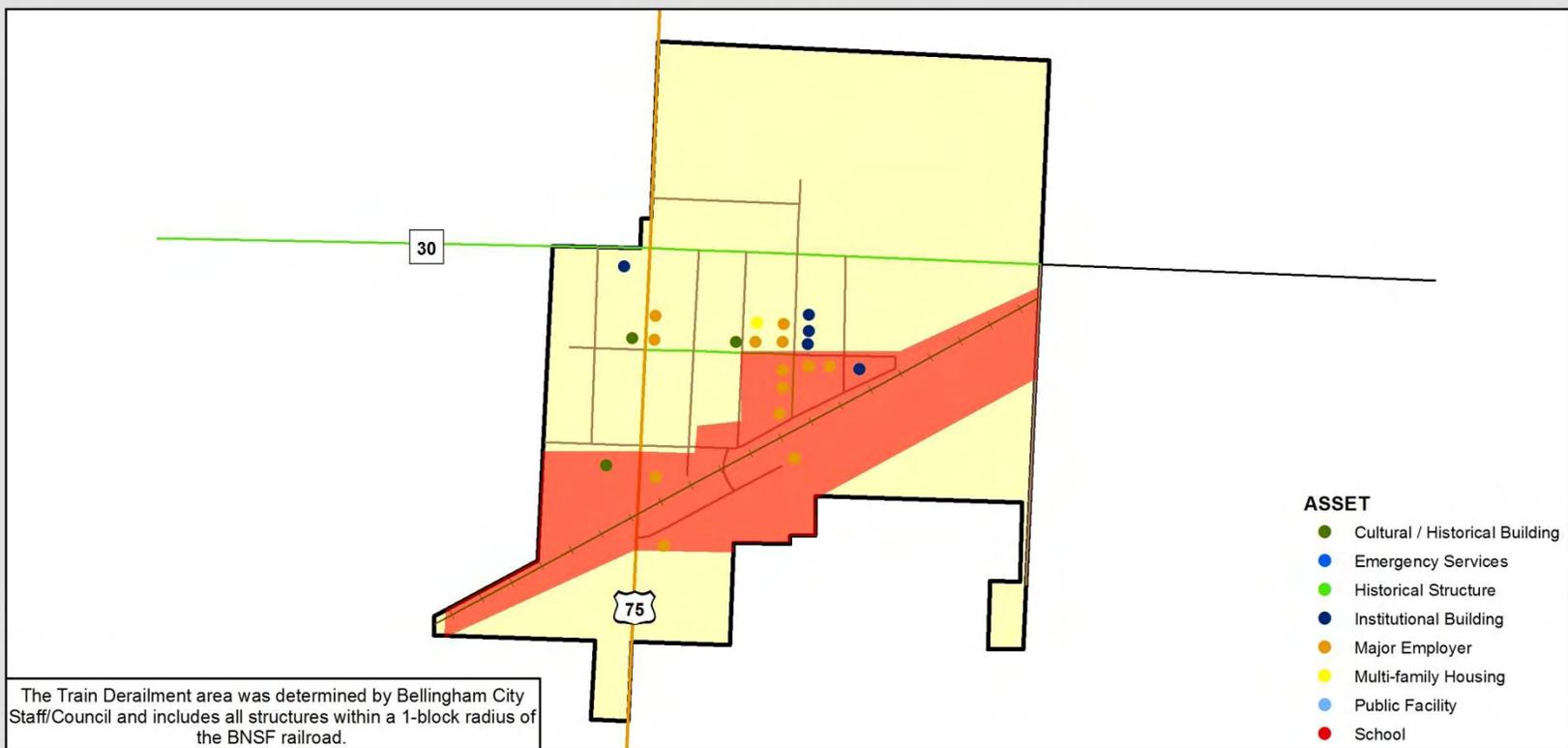
The third hazard area is the estimated impact of a train derailment in Bellingham. The Train Derailment area was determined by Bellingham City Staff/Council and includes all structures within a 1-block radius of the BNSF railroad. Within this hazard area are 12 commercial businesses and 24 residential dwellings. As shown in Table 56 (Figure 10 following page), the estimated devastation value of train derailment is \$899,921 dollars affecting 37 structures.

Table 56. Bellingham Hazard 3: Train Derailment

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	107	24	\$3,544,200	\$794,961
Commercial	30	12	\$258,400	\$103,360
Industrial	8	0	\$1,210,700	\$0
Religious/ Non-profit	3	0	\$247,900	\$0
Government	11	1	\$581,300	\$1,600
Total	159	37	\$5,842,500	\$899,921

Figure 10: Bellingham Hazard 3: Train Derailment

Lac qui Parle County
All-Hazard Mitigation Plan



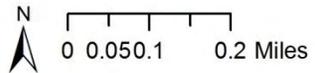
The Train Derailment area was determined by Bellingham City Staff/Council and includes all structures within a 1-block radius of the BNSF railroad.

- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School



- Bellingham
- Derailment Impact Area

- ROADS**
- Township Roads
 - County Road
 - County State Aid Highway
 - MN Trunk Highway
 - U.S. Highway
 - Railroad



Map Created By: UMRVDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Bellingham Hazard 4. Grain Elevator Fire

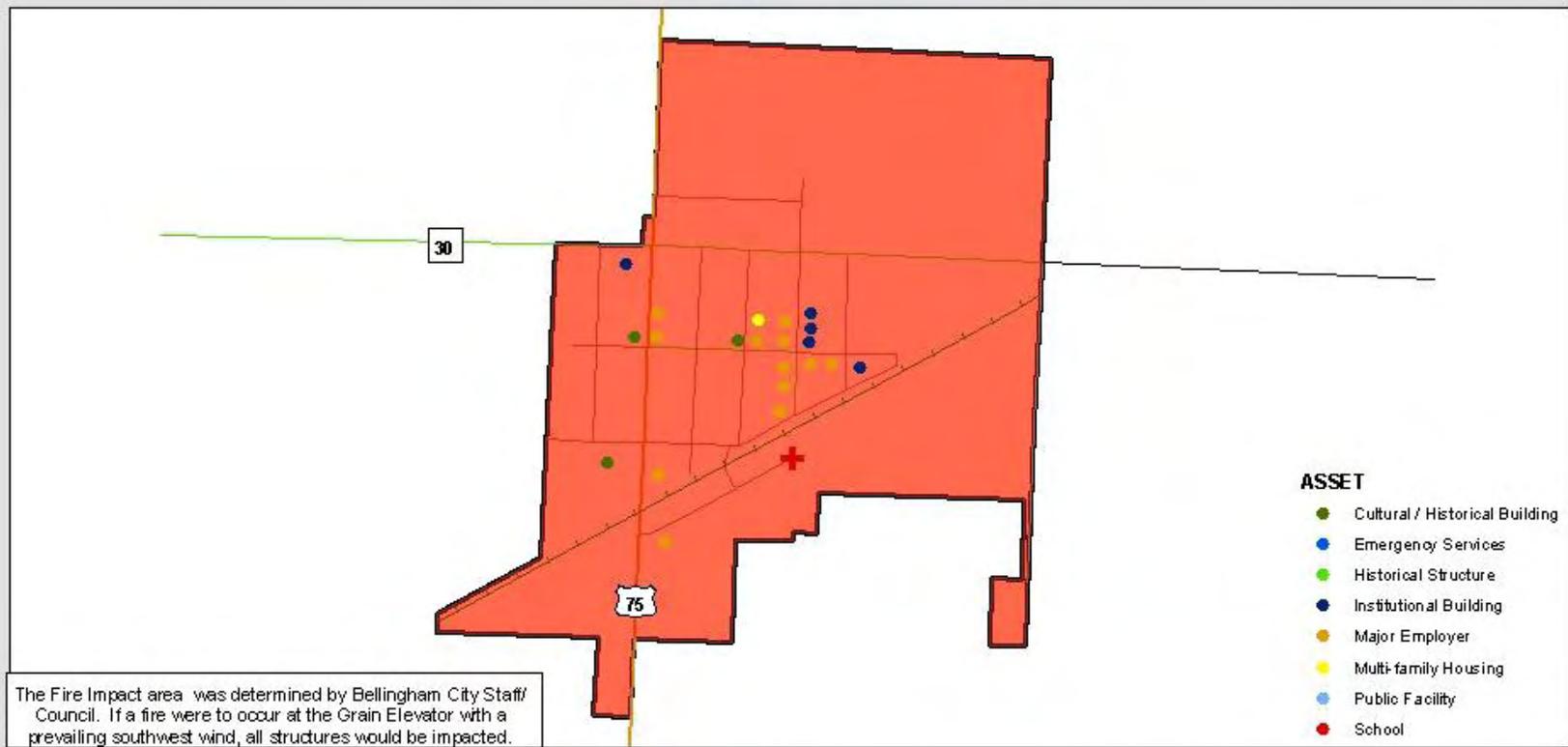
The fourth hazard area (Grain Elevator Fire) was determined by Bellingham city staff. If a fire were to occur at the Grain Elevator with a prevailing southwest wind, the entire community would be impacted. As shown in Table 57 (Figure 11 following page), the estimated devastation value of a grain elevator fire is \$5,842,500 dollars affecting all 159 structures.

Table 57. Bellingham Hazard 4: Grain Elevator Fire

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	107	107	\$3,544,200	\$3,544,200
Commercial	30	30	\$258,400	\$258,400
Industrial	8	8	\$1,210,700	\$1,210,700
Religious/ Non-profit	3	3	\$247,900	\$247,900
Government	11	11	\$581,300	\$581,300
Total	159	159	\$5,842,500	\$5,842,500

Figure 11: Bellingham Hazard 4: Bellingham Farmers Grain Elevator Fire

Lac qui Parle County
All-Hazard Mitigation Plan



<ul style="list-style-type: none"> Bellingham Fire Impact Area Grain Elevator 	<p>ROADS</p> <ul style="list-style-type: none"> Township Roads County Road County State Aid Highway MN Trunk Highway U.S. Highway + Railroad
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N

0 0.05 0.1 0.2 Miles

Map Created By: UMRVDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Inventory of Community Assets.

The City of Bellingham compiled a list of community assets shown in Table 58, including major employers in the business district, cultural/historical structures, vulnerable populations in multi-family housing complexes, and institutional facilities. The inventory includes the 2009 market value of all assets, and estimated replacement values, content values, and function values.

Table 58. City of Bellingham – Inventory of Community Assets

Name of Asset	Building Size (Sq.Ft)	Market Value (\$)	Replacement Value (\$)	Content Value (\$)	Function Value (\$)
Major Businesses					
Industry 1*	30,945	\$1,702,667	\$2,135,205	\$3,202,808	\$3,930,015
Professional Service 1	2,697	\$12,000	\$234,639	\$234,639	n/a
Professional Service 2	1,560	\$7,900	\$135,720	\$135,720	n/a
Personal Service 1	600	\$2,200	\$55,200	\$55,200	n/a
Personal Service 2	1,408	\$2,500	\$129,536	\$129,536	n/a
Bank	2,400	\$60,700	\$362,400	\$362,400	n/a
Commercial 1	6,594	\$46,000	\$441,798	\$441,798	\$197,820
Commercial 2	4,330	\$20,800	\$290,110	\$290,110	\$129,900
Commercial 3	1,408	\$4,200	\$94,336	\$94,336	\$42,240
Commercial 4	3,032	\$7,700	\$203,144	\$203,144	\$90,960
Commercial 5	1,122	\$7,600	\$75,174	\$75,174	\$33,660
Commercial 6	2,250	\$16,500	\$150,750	\$150,750	\$67,500
Wholesale	3,120	\$27,700	\$165,360	\$165,360	\$134,160
Cultural / Historical Structures					
Church 1	2,700	\$89,000	\$305,100	\$305,100	n/a
Church 2	2,240	\$76,600	\$253,120	\$253,120	n/a
Church 3	2,484	\$83,800	\$280,692	\$280,692	n/a
Multi-Family Housing					
Apartment	3,168	\$36,900	\$310,464	\$155,232	n/a
Institutional Buildings					
City Hall	4,560	\$46,500	\$401,280	\$401,280	n/a
Depot	1,152	\$12,400	\$101,376	\$101,376	n/a
County Shop	7,952	\$242,800	\$699,776	\$699,776	n/a
Water Treatment Plant	192	\$1,600	\$16,896	\$16,896	n/a
City Shop	3,600	\$48,000	\$316,800	\$316,800	n/a

*The market value includes 15 structures (warehouses/office space/storage), 30 structures that store in bushels, and 20 tanks. See Appendix 7 for more detailed information.

City of Boyd, Minnesota

Existing Development Trends.

Boyd's 176 people and 90 households make it the county's third largest city (Minnesota State Demographic Center and Metropolitan Center 2007). The city's population has decreased since 1960, losing 244 residents and 38 households. Due to its unstable population level for the last 40 years, the population projections do not anticipate much change over the next 20 years. While Boyd has not completed any annexations in the past ten years; the City redeveloped City Hall in 2002 into the Boyd Health Clinic and the United Prairie Bank was rehabilitated to accommodate City Offices. In 2005, the City Offices again were redeveloped into the Dawson Credit Union and City Offices moved into a vacant building space connected to the Boyd Health Clinic. Table 59 identifies Boyd's breakdown of land uses.

Table 59. City of Boyd – Land Use Category Allotments

Land Use Type	Parcel Count	Percent of Area
Residential	125	70.6%
Commercial	19	10.7%
Industrial	8	4.5%
Government	23	13.0%
Religious-Non-Profit	2	1.1%
Total	177	100.0%

Source: Lac qui Parle County Assessor 2009

Potential for Future Growth and Development.

Boyd is working as a community to keep residences in livable conditions and focusing on infill development and rehabilitation. The City has land available for development to occur should interest arise, including both commercial and residential development. Neither of the infill locations are located in hazard areas, outside of the potential of an F4-F5 Tornado event.

Vulnerability Assessment of Structures by Hazard.

The City of Boyd participates in numerous programs tailored to vulnerable low-income and senior residents. In 2006, Boyd participated in DEED's Small Cities Development Program to rehabilitate seven low-income residential homes and an additional five residences in 2010. Other programs include Meals on Wheels and the newly established Lac qui Parle Computer Commuter, a bus with computers and internet capabilities that travels to Lac qui Parle cities to teach skills and improve broadband service on a countywide scale. Finally, the City Office bathroom was rehabilitated to become handicap accessible for all city residents.

Of the two natural hazards selected as most likely to affect a city, both apply to the City of Boyd (F4-F5 Tornado and 100-year floodplain). Boyd opted to perform an additional risk analysis on the potential of a LP tank explosion in municipal limits. Each hazard was assigned a boundary and all structures within that boundary were identified and assessed by Lac qui Parle County Assessor 2009 market values. Tables 60, 61, and 62 display the potential total number of structures that may be affected by the mentioned hazards within the defined hazard areas, in addition to a predicted devastation amount provided by 2009 assessed market values.

Boyd Hazard 1. F4 – F5 Tornado

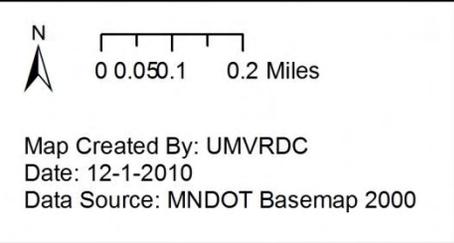
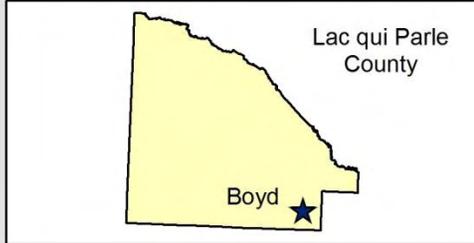
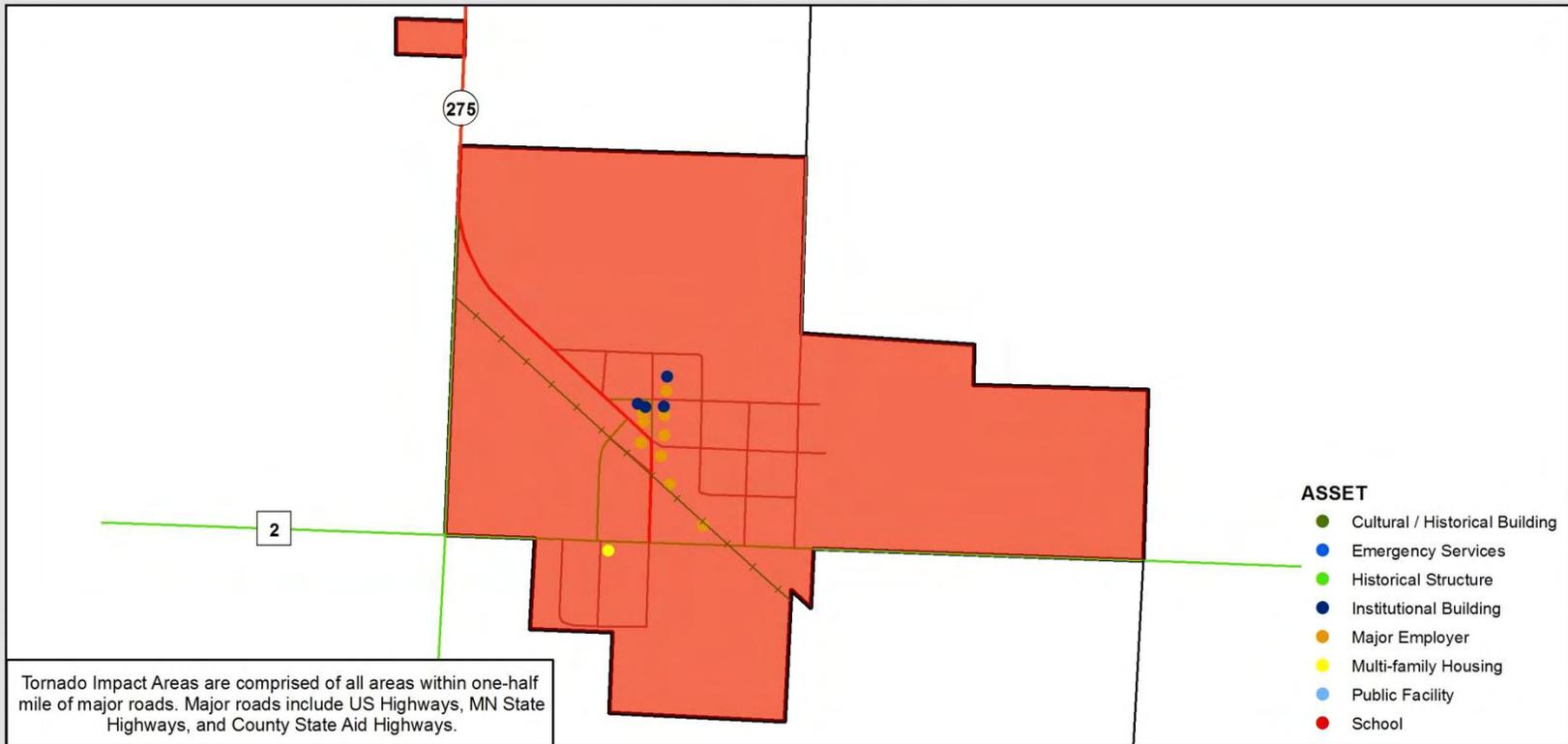
According to the National Weather Service, an acceptable method to estimate damage from a F4 or F5 tornado in a small community would be to model the situation after the event that occurred in Greensburg, Kansas with a population of approximately 1,500 people. The devastation was vast, totaling around \$250 million dollars – approximately 95% of the city was ruined. To model an F4 or F5 tornado, the National Weather Service suggested approximating that 90% of each land use category be considered demolished and totaling those losses for a final prediction of devastation, produced by 2009 market values. The critical facility in Table 60 is the Boyd Health Clinic constructed in 2002. As shown in Table 60 (Figure 12 following page), the estimated devastation value of an F4 or F5 tornado is \$3,292,110 dollars affecting 159 structures.

Table 60. Boyd Hazard 1: F4-F5 Tornado

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	125	113	\$2,508,200	\$2,257,380
Commercial	19	17	\$121,600	\$109,440
Industrial	8	7	\$162,700	\$146,430
Religious/ Non-profit	2	2	\$196,600	\$176,940
Government	22	20	\$598,700	\$538,830
Critical Facility	1	1	\$70,100	\$63,090
Total	177	159	\$3,657,900	\$3,292,110

Figure 12: Boyd Hazard 1: F4-F5 Tornado

Lac Qui Parle County
All-Hazard Mitigation Plan



Boyd Hazard 2. 100-Year Flood Event

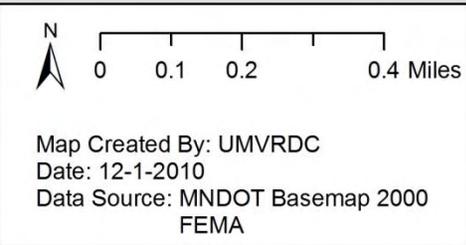
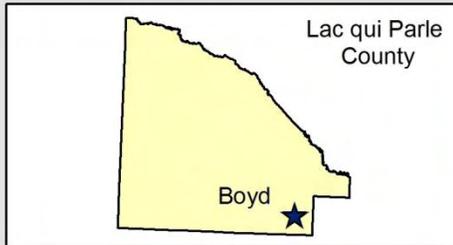
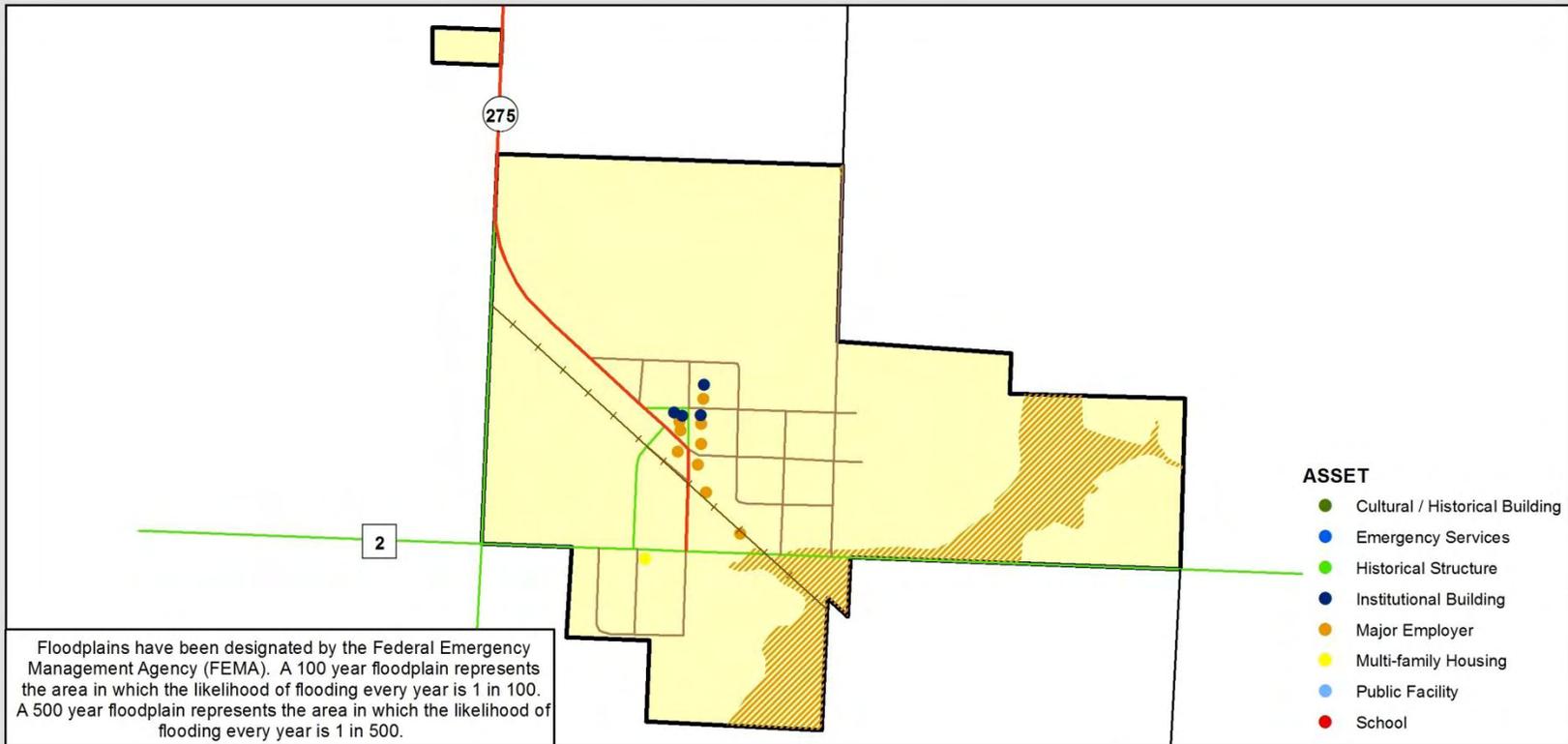
The second hazardous event that could impact the City of Boyd is a 100-year flood event. Currently the only developments located in the 100-year floodplain are four residential structures. Boyd does not have a Floodplain Ordinance to prevent future development in the 100-year floodplain, however; the City anticipates adopting such an ordinance in the next year. The land uses within the 100-year floodplain are the residential property and agricultural land, while the unique natural features are forested lands. As shown in Table 61 (Figure 13 following page), the estimated devastation value of a 100-year flood event is \$80,262 dollars.

Table 61. Boyd Hazard 2: 100-Year Flood Event

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	125	4	\$2,508,200	\$80,262
Commercial	19	0	\$121,600	\$0
Industrial	8	0	\$162,700	\$0
Religious/ Non-profit	2	0	\$196,600	\$0
Government	22	0	\$598,700	\$0
Critical Facility	1	0	\$70,100	\$0
Total	177	4	\$3,657,900	\$80,262

Figure 13: Boyd Hazard 2: 100-Year Flood Event

Lac qui Parle County
All-Hazard Mitigation Plan



Boyd Hazard 3. LP Storage Tank Explosion

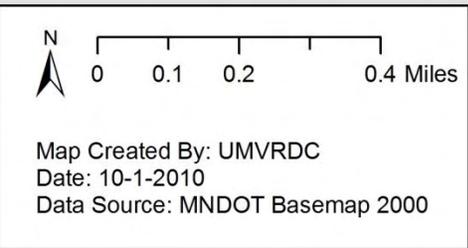
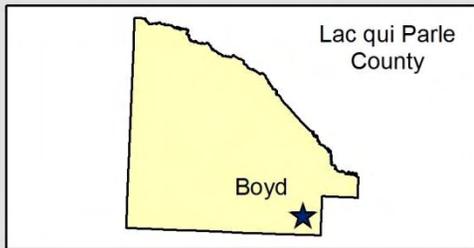
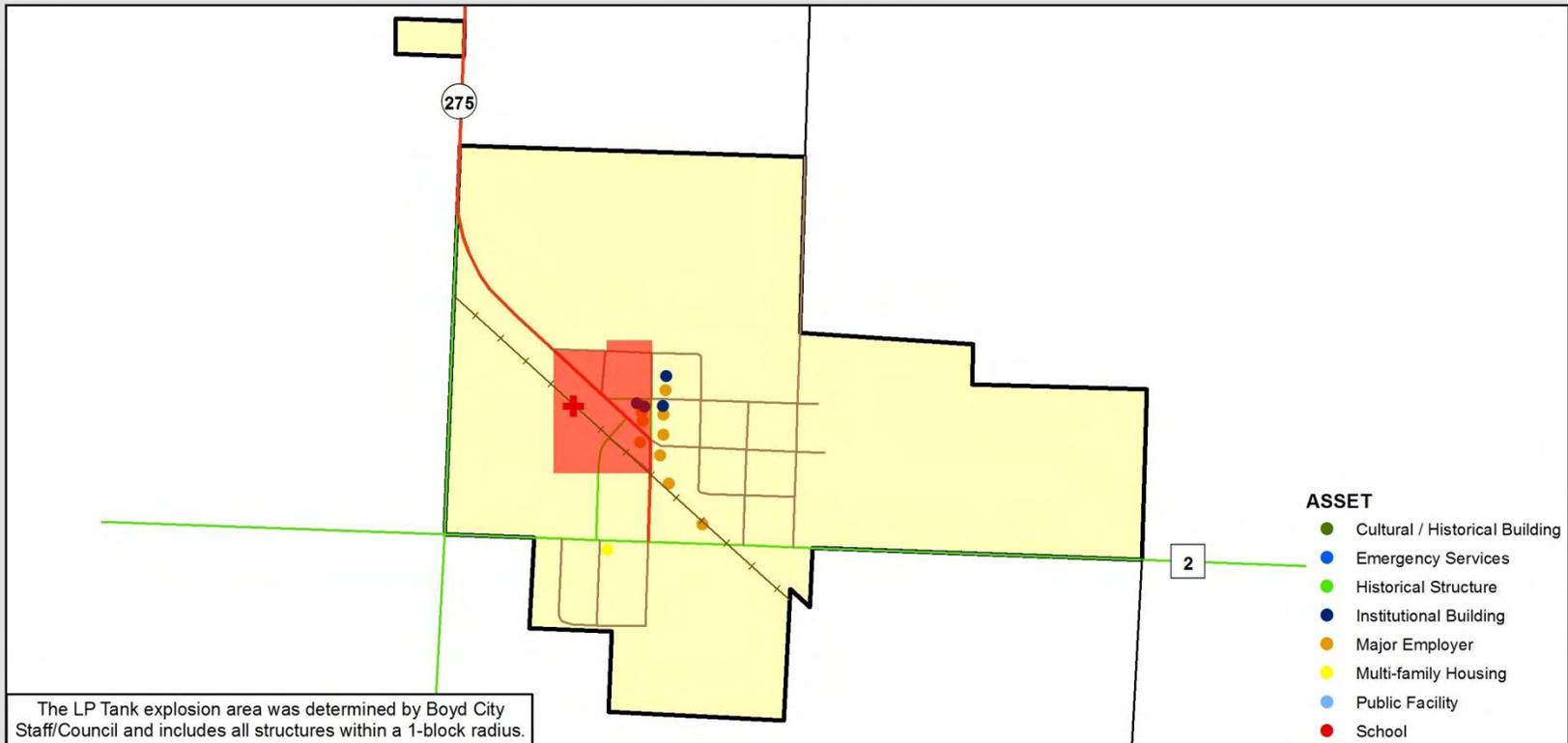
The third hazardous event that could impact the City of Boyd is an LP Storage Tank explosion. The LP Tank explosion area was determined by Boyd City Staff/Council and includes all structures within a 1-block radius. Within this area are twelve residences, three commercial businesses, two government-owned structures and the Boyd Health Clinic. As shown in Table 62 (Figure 14 following page), the estimated devastation value of an LP Storage Tank explosion \$431,587 dollars.

Table 62. Boyd Hazard 3: LP Storage Tank Explosion

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	125	12	\$2,508,200	\$240,787
Commercial	19	3	\$121,600	\$92,600
Industrial	8	0	\$162,700	\$0
Religious/ Non-profit	2	0	\$196,600	\$0
Government	22	2	\$598,700	\$28,100
Critical Facility	1	1	\$70,100	\$70,100
Total	177	18	\$3,657,900	\$431,587

Figure 14: Boyd Hazard 3: LP Storage Tank Explosion

Lac qui Parle County
All-Hazard Mitigation Plan



Inventory of Community Assets.

The City of Boyd compiled a list of community assets shown in Table 63, including major employers in the business district, cultural/historical structures, vulnerable populations in multi-family housing complexes, and institutional facilities. The inventory includes the 2009 market value of all assets, and estimated replacement values, content values, and function values.

Table 63. City of Boyd – Inventory of Community Assets

Name of Asset	Building Size (Sq. Ft)	Market Value (\$)	Replacement Value (\$)	Content Value (\$)	Function Value (\$)
Major Businesses					
Industry 1*	6,984	\$150,623	\$717,876	\$1,076,814	\$1,321,308
Professional Service	1,196	\$9,200	\$104,052	\$104,052	n/a
Bank	748	\$4,600	\$112,948	\$112,948	n/a
Commercial 1	4,403	\$26,800	\$295,001	\$295,001	\$132,090
Commercial 2	4,467	\$60,400	\$299,289	\$299,289	\$134,010
Commercial 3	6,728	\$13,700	\$450,776	\$450,776	\$201,690
Commercial 4	1,872	\$6,000	\$125,424	\$125,424	\$56,160
Commercial 5	1,488	\$5,400	\$99,696	\$99,696	\$44,640
Multi-Family Housing					
Apartment	1,884	\$17,200	\$184,632	\$92,316	n/a
Institutional Buildings					
City Offices	1,100	\$28,100	\$96,800	\$96,800	n/a
Boyd Post Office	1,500	\$5,000	\$132,000	\$132,000	n/a
Boyd Area Senior Citizens Center	996	\$3,480	\$87,648	\$87,648	n/a
Boyd Health Clinic	1,056	\$70,100	\$118,272	\$177,408	n/a

*The market value includes 5 buildings (warehouses/office space/storage) and 6 structures that store in bushels. See Appendix 7 for more detailed information.

City of Dawson, Minnesota

Existing Development Trends.

As of 2007, Dawson has a population of 1,419 people and 780 households, making it Lac qui Parle County's second largest city (Minnesota State Demographic Center and Metropolitan Center 2007). Dawson has decreased in population over the last 40 years, going from 1,766 people in 1960 to 1,419 people in 2007. Dawson's population and households have potential to grow in the future, with a major manufacturing sector and populous school district. Dawson has completed numerous projects including expanding the City Wastewater Treatment Plan in 2005, constructing a new Water Treatment Plant in 2004-2005 and a new cell phone tower in 2004-2005 to improve cell phone reception. In addition to the aforementioned projects, Dawson has had many redevelopment projects completed throughout the City. Pleasantview Apartments, a 16-unit facility, which serves low-moderate income families, was completely rehabilitated in 2009-2010 and the hospital underwent rehabilitation from 2008 and 2010. The Dawson Industrial Park has completed two projects including building demolition and construction in 2008 and the continued development of industrial company land. Table 64 identifies Dawson's breakdown of land uses.

Table 64. City of Dawson – Land Use Category Allotments

Land Use Type	Parcel Count	Percent of Area
Residential	644	80.4%
Commercial	91	11.4%
Industrial	32	3.9%
Agricultural	1	0.1%
Government	23	2.9%
Education	3	0.4%
Religious-Non-Profit	7	0.9%
Total	801	100.0%

Source: Lac qui Parle County Assessor 2009

Potential for Future Growth and Development.

Dawson has approximately 20 acres in the southeast section of City currently zoned residential and throughout the past 10 years there have been 6 new homes and 4 new duplexes constructed. Lastly, in anticipation of future development, Dawson annexed seven acres of agricultural land in 2002 for future commercial development opportunities. Neither of the locations are located in hazard areas, outside of the potential of an F4-F5 Tornado event.

Vulnerability Assessment of Structures by Hazard.

The City of Dawson participates in numerous programs tailored to vulnerable low-income and senior residents. In 2009-2010, Dawson participated in DEED's Small Cities Development Program to rehabilitate twelve low-income residential properties and assist commercial businesses. Other programs include Meals on Wheels, Senior Dining Center, and the newly established Lac qui Parle Computer Commuter, a bus with computers and internet capabilities that travels to Lac qui Parle cities to teach skills and improve broadband service on a countywide scale. Finally, the City Hall purchased electronic doors to improve accessibility for all Dawson residents.

Of the two natural hazards selected as most likely to affect a city, both apply to the City of Dawson (F4-F5 Tornado and 100-year floodplain). Dawson opted to perform an additional risk analysis on potential 100-year floodplains as determined by the City and the potential of commercial oil tanks explosion in municipal limits. Each hazard was assigned a boundary and all structures within that boundary were identified and assessed by Lac qui Parle County Assessor 2009 market values. Tables 65, 66, 67, and 68 display the potential total number of structures that may be affected by the mentioned hazards within the defined hazard areas, in addition to a predicted devastation amount provided by 2009 assessed market values.

Dawson Hazard 1. F4 – F5 Tornado

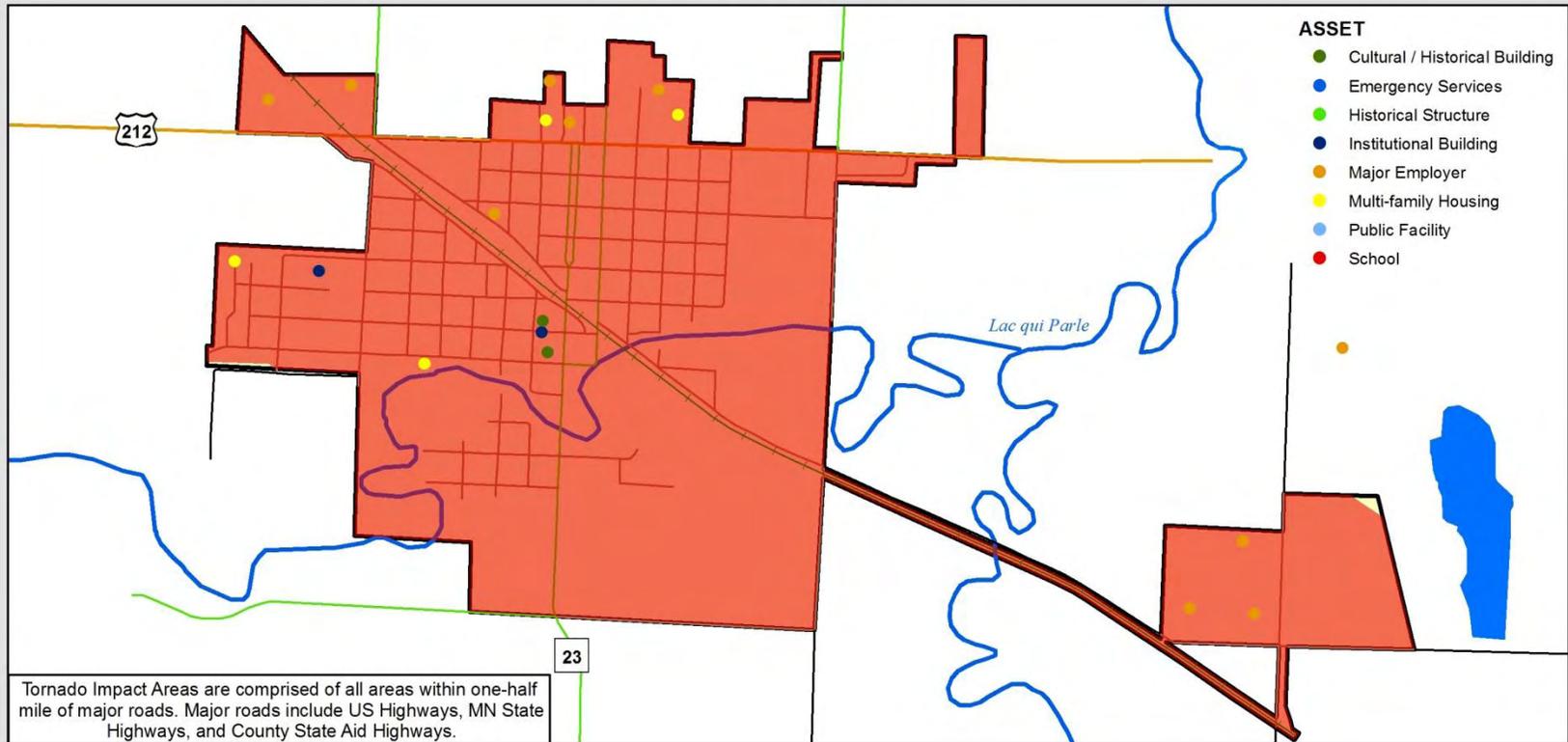
According to the National Weather Service, an acceptable method to estimate damage from a F4 or F5 tornado in a small community would be to model the situation after the event that occurred in Greensburg, Kansas with a population of approximately 1,500 people. The devastation was vast, totaling around \$250 million dollars – approximately 95% of the city was ruined. To model an F4 or F5 tornado, the National Weather Service suggested approximating that 90% of each land use category be considered demolished and totaling those losses for a final prediction of devastation, produced by 2009 market values. The critical facilities in Table 65 are the Johnson Memorial Hospital and Fire Hall. As shown in Table 65 (Figure 15 following page), the estimated devastation value of an F4 or F5 tornado is \$68,265,180 dollars affecting 721 structures.

Table 65. Dawson Hazard 1: F4-F5 Tornado

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	644	580	\$37,688,900	\$33,920,010
Commercial	91	82	\$4,164,500	\$3,748,050
Industrial	32	29	\$5,167,800	\$4,651,020
Agricultural	1	1	\$28,800	\$25,920
Religious/ Non-profit	7	6	\$499,200	\$449,280
Government	18	16	\$4,056,600	\$3,650,940
Utilities	2	2	\$668,600	\$601,740
Education	3	3	\$18,717,600	\$16,845,840
Critical Facilities	3	3	\$4,858,200	\$4,372,380
Total	801	721	\$75,850,200	\$68,265,180

Figure 15: Dawson Hazard 1: F4-F5 Tornado

Lac qui Parle County
All-Hazard Mitigation Plan



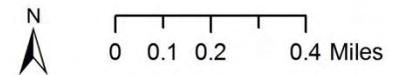
Tornado Impact Areas are comprised of all areas within one-half mile of major roads. Major roads include US Highways, MN State Highways, and County State Aid Highways.

- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School



- Lac qui Parle County**
- Dawson
 - Tornado Impact Area
 - Water Bodies

- ROADS**
- Township Roads
 - County Road
 - County State Aid Highway
 - MN Trunk Highway
 - U.S. Highway
 - Railroad



Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Dawson Hazard 2. 100-Year Flood Event

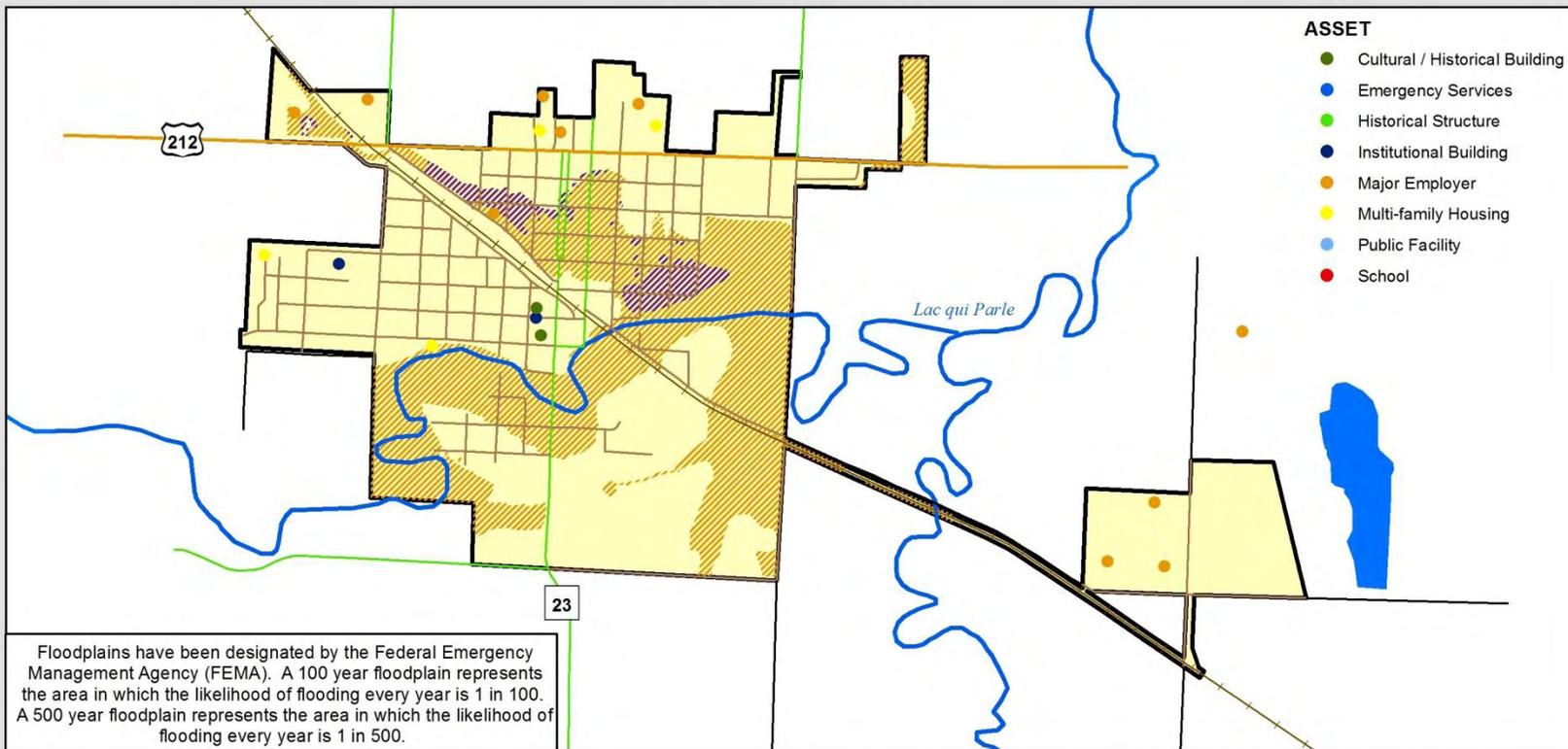
The second hazard area for risk analysis is a 100-year flood event as determined by digital Flood Insurance Rate Maps dated March 2006. The general land uses located in the 100-year floodplain include residential, commercial, government and an industrial property. There are no future development opportunities within the 100-year floodplain as Dawson passed a stringent Floodplain Management Ordinance in 1978 and last updated the ordinances in February 2006. Dawson has completed a great amount of converting land within the designated floodplains into city parks and trails. Of the 644 residential properties, 12 are located in 100-year floodplain, in addition to 3 commercial businesses, two government structures (Ambulance Garage and Wastewater Treatment Plant) and an industrial business. As shown in Table 66 (Figure 16 following page), the estimated devastation value of a 100-year flood event is \$1,857,169 dollars affecting 18 structures.

Table 66. Dawson Hazard 2: 100-Year Flood Event

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	644	12	\$37,688,900	\$702,278
Commercial	91	3	\$4,164,500	\$137,291
Industrial	32	1	\$5,167,800	\$246,400
Agricultural	1	0	\$28,800	\$0
Religious/ Non-profit	7	0	\$499,200	\$0
Government	18	2	\$4,056,600	\$771,200
Utilities	2	0	\$668,600	\$0
Education	3	0	\$18,717,600	\$0
Critical Facilities	3	0	\$4,858,200	\$0
Total	801	18	\$75,850,200	\$1,857,169

Figure 16: Dawson Hazard 2: 100-Year Flood Event (Current FEMA Floodplains)

Lac qui Parle County
All-Hazard Mitigation Plan



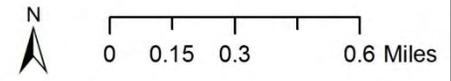
- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School

Floodplains have been designated by the Federal Emergency Management Agency (FEMA). A 100 year floodplain represents the area in which the likelihood of flooding every year is 1 in 100. A 500 year floodplain represents the area in which the likelihood of flooding every year is 1 in 500.



- FEMA DESIGNATED FLOODPLAIN**
- Dawson
 - Water Bodies
 - 100 Year Boundary
 - 500 Year Boundary

- ROADS**
- Township Roads
 - County Road
 - County State Aid Highway
 - MN Trunk Highway
 - U.S. Highway
 - Railroad



Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000
FEMA

Dawson Hazard 3. 100-Year Flood Event (Proposed Floodplains)

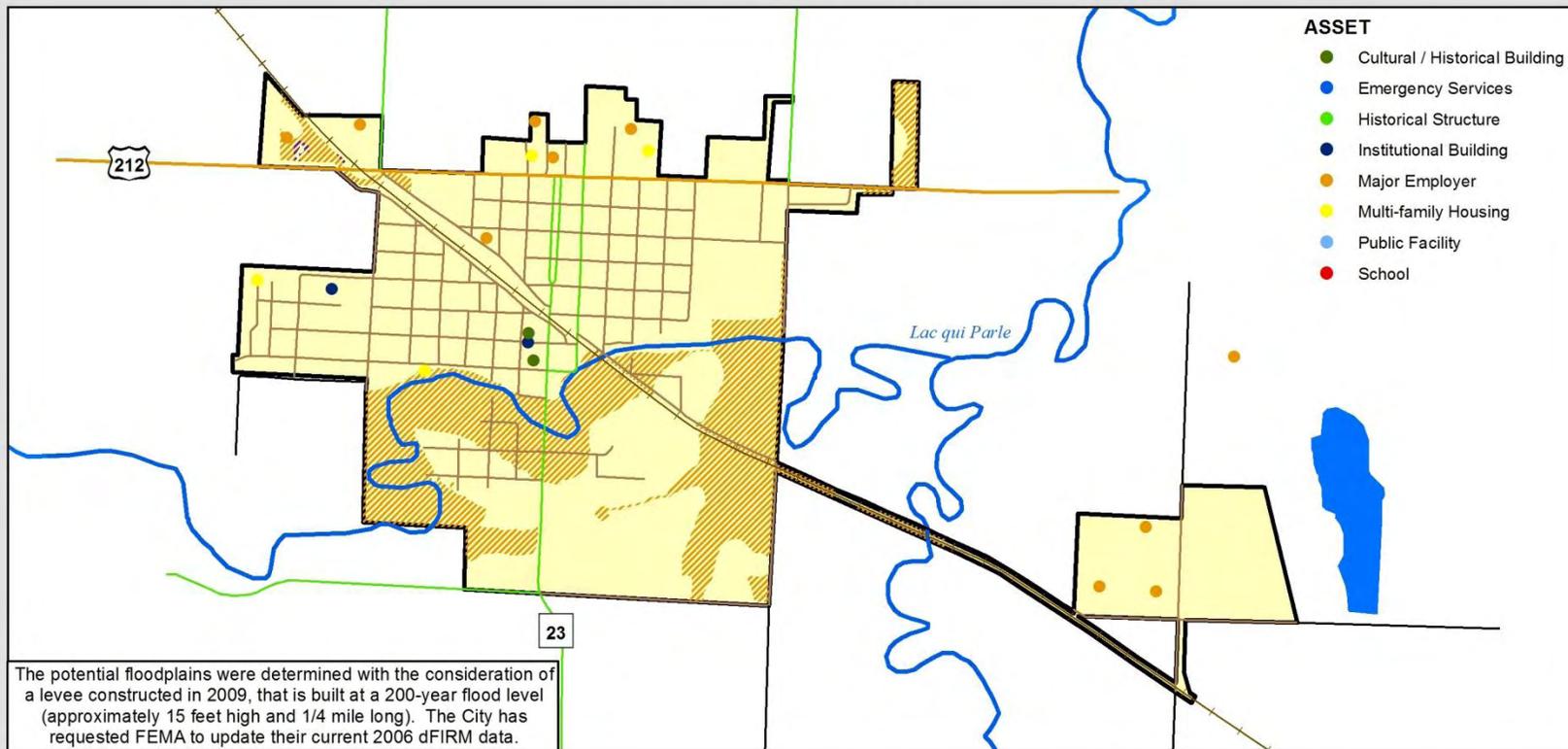
The third hazard area for risk analysis is a 100-year flood event as determined by the City of Dawson. The potential floodplains were determined with the consideration of a levee constructed in 2009 built at a 200-year flood level (approximately 15 feet high and 1/4 mile long). The City has requested FEMA to update their current 2006 digital Flood Insurance Rate Map data. The general land uses located in the 100-year floodplain include residential, commercial, and industrial properties. It is important that more properties would be located in these proposed floodplains, 18 compared to 20; however two major government structures would be excluded and the overall cost would decrease by approximately \$500,000 dollars. Of the 644 residential properties, 16 are located in 100-year floodplain, in addition to 3 commercial businesses and an industrial business. As shown in Table 67 (Figure 17 following page), the estimated devastation value of the proposed 100-year floodplains is \$1,320,061 dollars affecting 20 structures.

Table 67. Dawson Hazard 3: 100-Year Flood Event (Proposed Floodplains)

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	644	16	\$37,688,900	\$936,370
Commercial	91	3	\$4,164,500	\$137,291
Industrial	32	1	\$5,167,800	\$246,400
Agricultural	1	0	\$28,800	\$0
Religious/ Non-profit	7	0	\$499,200	\$0
Government	18	0	\$4,056,600	\$0
Utilities	2	0	\$668,600	\$0
Education	3	0	\$18,717,600	\$0
Critical Facilities	3	0	\$4,858,200	\$0
Total	801	20	\$75,850,200	\$1,320,061

Figure 17: Dawson Hazard 3: 100-Year Flood Event (Proposed New Floodplains)

Lac qui Parle County
All-Hazard Mitigation Plan



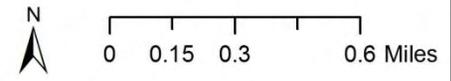
- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School

The potential floodplains were determined with the consideration of a levee constructed in 2009, that is built at a 200-year flood level (approximately 15 feet high and 1/4 mile long). The City has requested FEMA to update their current 2006 dFIRM data.



- FEMA DESIGNATED FLOODPLAIN**
- Dawson
 - Water Bodies
 - ▨ 100 Year Boundary
 - ▨ 500 Year Boundary

- ROADS**
- Township Roads
 - County Road
 - County State Aid Highway
 - MN Trunk Highway
 - U.S. Highway
 - Railroad



Map Created By: UMRDRC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000
FEMA

Dawson Hazard 4. Fire/Explosion of Commercial Oil Tanks

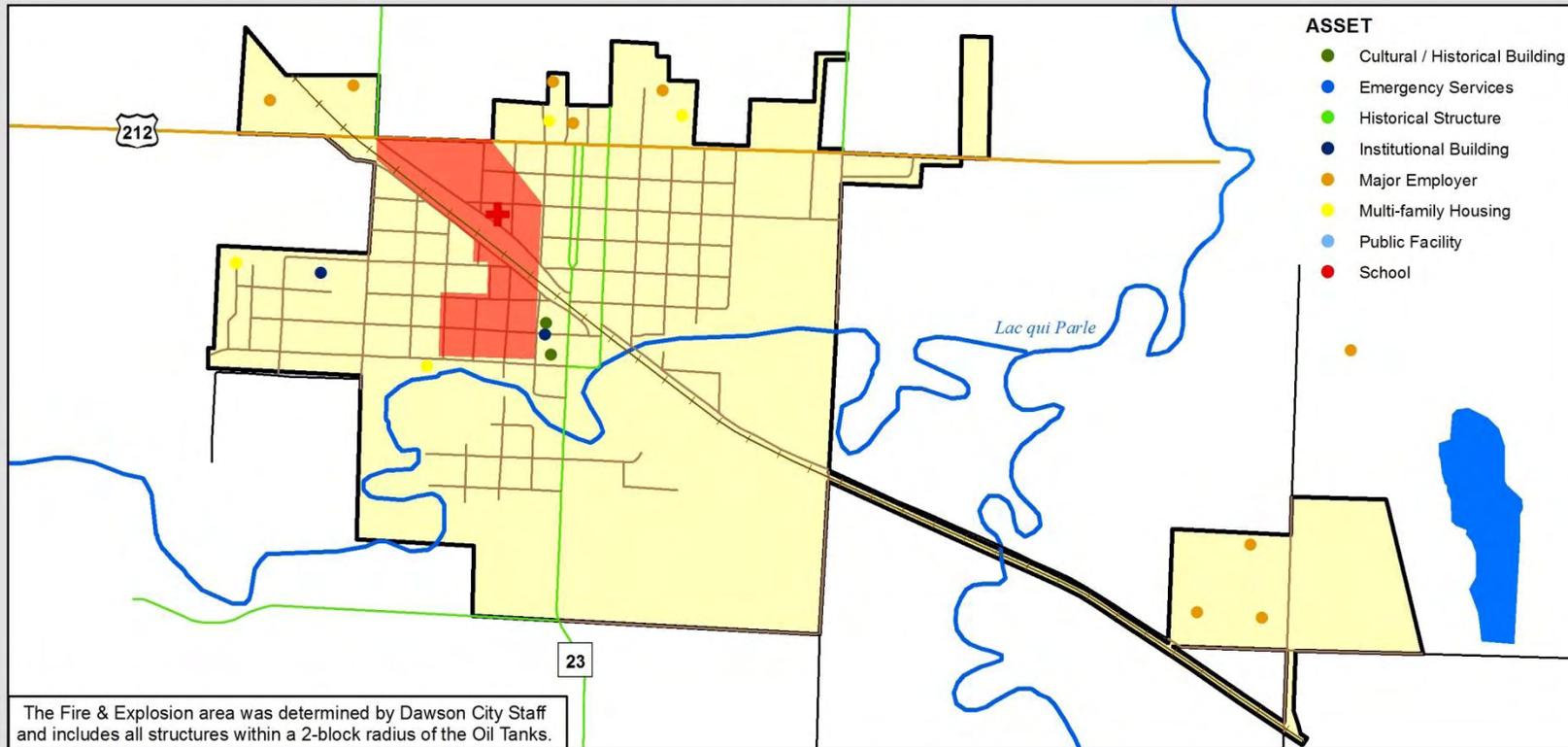
The fourth hazard area for risk analysis is a fire/explosion area as determined by Dawson City Staff and includes all structures within a two-block radius of four commercial soybean oil tanks. A total of 17 structures are within the defined area including fourteen residences, one industrial business, and one church. As shown in Table 68 (Figure 18 following page), the estimated devastation value of a fire/explosion of commercial oil tanks is \$21,925,568 dollars affecting 17 structures.

Table 68. Dawson Hazard 4: Fire/Explosion of Commercial Oil Tanks

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	644	14	\$37,688,900	\$819,324
Commercial	91	0	\$4,164,500	\$0
Industrial	32	1	\$5,167,800	\$2,064,144
Agricultural	1	0	\$28,800	\$0
Religious/ Non-profit	7	1	\$499,200	\$324,500
Government	18	0	\$4,056,600	\$0
Utilities	2	0	\$668,600	\$0
Education	3	1	\$18,717,600	\$18,717,600
Critical Facilities	3	0	\$4,858,200	\$0
Total	801	17	\$75,850,200	\$21,925,568

Figure 18: Dawson Hazard 4: Fire & Explosion of Commercial Oil Tanks

Lac qui Parle County
All-Hazard Mitigation Plan



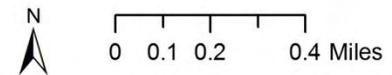
- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School

The Fire & Explosion area was determined by Dawson City Staff and includes all structures within a 2-block radius of the Oil Tanks.



- Dawson
- ⊕ Oil Tanks
- Explosion Impact Area
- Water Bodies

- ROADS**
- Township Roads
 - County Road
 - County State Aid Highway
 - MN Trunk Highway
 - U.S. Highway
 - Railroad



Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Inventory of Community Assets.

The City of Dawson compiled a list of community assets shown in Table 69, including major employers in the business district, cultural/historical structures, vulnerable populations in multi-family housing complexes, and institutional facilities. The inventory includes the 2009 market value of all assets, and estimated replacement values, content values, and function values.

Table 69. City of Dawson – Inventory of Community Assets

Name of Asset	Building Size (Sq. Ft)	Market Value (\$)	Replacement Value (\$)	Content Value (\$)	Function Value (\$)
Major Businesses					
Commercial	16,176	\$47,200	\$1,083,792	\$1,083,792	\$485,280
Industry 1	16,804	\$29,700	\$1,125,868	\$1,125,868	\$504,120
Industry 2	23,085	\$449,200	\$1,592,865	\$2,389,298	\$2,931,795
Industry 3	10,800	\$152,900	\$745,200	\$1,117,800	\$1,371,600
Industry 4	14,720	\$246,400	\$1,015,680	\$1,523,520	\$1,869,440
Industry 5*	37,528	\$727,129	\$2,589,432	\$3,884,148	\$4,766,056
Industry 6*	109,615	\$2,064,144	\$7,563,435	\$11,345,153	\$13,921,105
Industry 7*	72,645	\$3,082,411	\$5,012,505	\$7,518,758	\$9,225,915
Industry 8	24,530	\$33,700	\$1,692,570	\$2,538,855	\$3,115,310
Cultural/Historical Structures					
Historical Structure 1	5,440	\$442,200	\$614,720	\$614,720	n/a
Historical Structure 2	2,130	\$13,300	\$240,690	\$240,690	n/a
Education					
School	160,676	\$18,717,600	\$14,621,516	\$14,621,516	n/a
Multi-Family Housing					
Apartment 1	5,982	\$106,700	\$586,236	\$293,188	n/a
Apartment 2	24,840	\$233,800	\$2,434,320	\$1,217,160	n/a
Apartment 3	11,626	\$420,900	\$1,139,348	\$569,674	n/a
Apartment 4	6,336	\$4,300	\$620,928	\$310,464	n/a
Institutional Buildings					
Hospital	60,264	\$4,758,400	\$8,738,280	\$13,107,420	n/a
Wastewater Treatment Plant	25,562	\$686,300	\$2,249,456	\$2,249,456	n/a
Water Treatment Plant	2,900	\$1,011,300	\$255,200	\$255,200	n/a
Dawson City Hall	12,037	\$351,100	\$1,059,256	\$1,059,256	n/a
Dawson Fire Hall	7,200	\$258,600	\$936,000	\$1,404,000	n/a

*The market values include numerous buildings, tank, and structures that store in bushels. See Appendix 7 for more detailed information.

City of Louisburg, Minnesota

Existing Development Trends.

Louisburg is Lac qui Parle County's smallest city with approximately 42 people and 18 households (Minnesota State Demographic Center and Metropolitan Center 2007). Louisburg's population has declined since 1960. However, even though it has lost a significant number of people since 1960, Louisburg has managed to maintain a number of households over the same time period. This obviously reflects that fewer people on average live in each household as compared to 40 years ago – a common trend throughout rural Minnesota. Louisburg has not completed any redevelopment projects, annexations, or experienced land use changed in the past five years. Table 70 identifies Louisburg's breakdown of land uses.

Table 70. City of Louisburg – Land Use Category Allotments

Land Use Type	Parcel Count	Percent of Area
Residential	41	82.0%
Religious	1	2.0%
Government	2	4.0%
Private Storage	6	12.0%
Total	50	100.0%

Source: Lac qui Parle County Assessor 2009

Potential for Future Growth and Development.

Louisburg as a City is focusing on infill residential development for the future. There are numerous vacant commercial buildings scattered throughout the town that could be prime redevelopment sites. The locations are not located in hazard areas, outside of the potential of an F4-F5 Tornado event.

Vulnerability Assessment of Structures by Hazard.

The City of Louisburg has obtained a portable ramp that is available to ensure that the City Hall/Fire Hall is accessible to persons with disabilities. Of the two natural hazards selected as most likely to affect a city, one applies to the City of Louisburg, as no floodplains are located within municipal limits. Louisburg opted to perform an additional risk analysis on the potential of a train derailment event. Tables 71 and 72 display the potential total number of structures that may be affected by the mentioned hazards within the defined hazard areas, in addition to a predicted devastation amount provided by 2009 assessed market values.

Louisburg Hazard 1. F4 – F5 Tornado

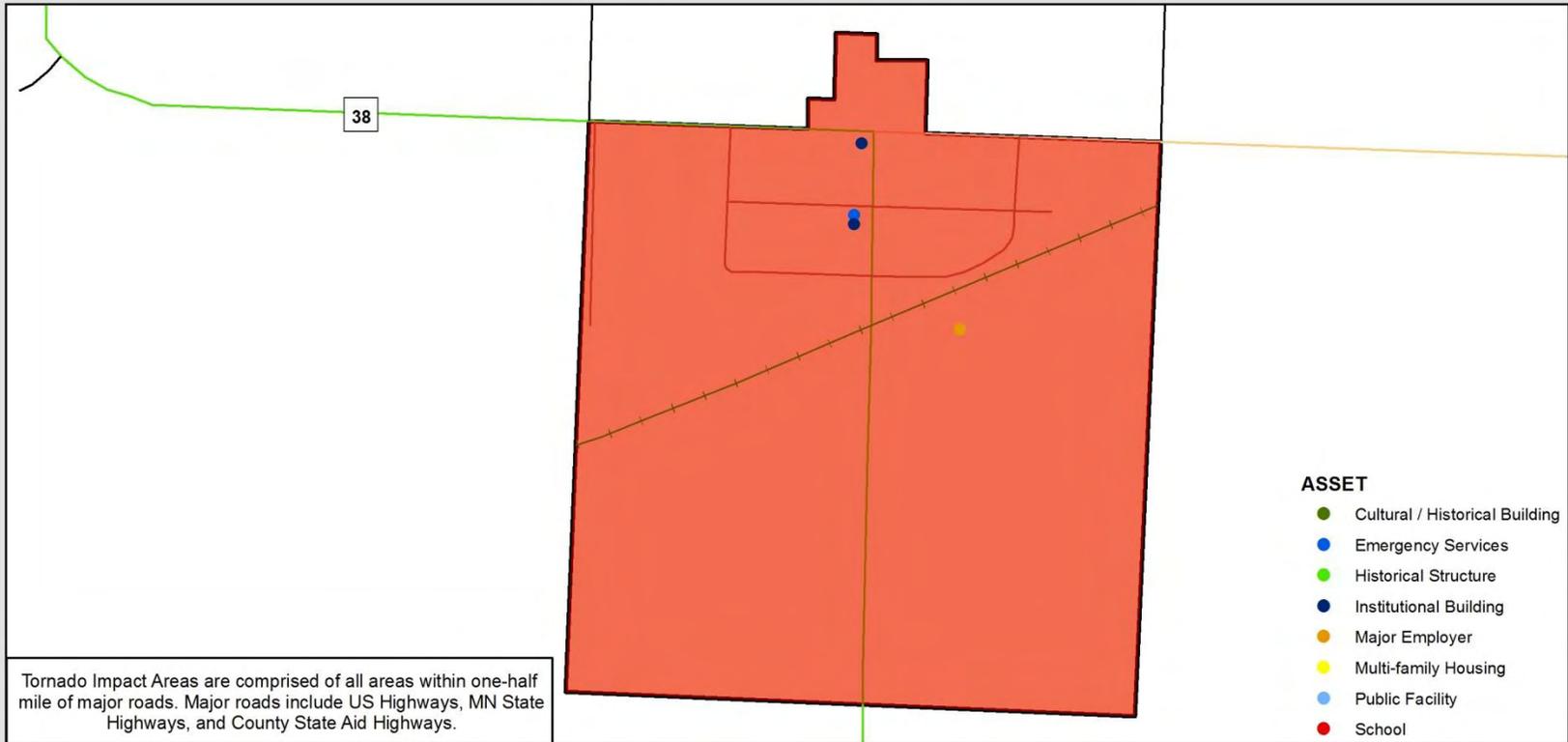
According to the National Weather Service, an acceptable method to estimate damage from a F4 or F5 tornado in a small community would be to model the situation after the event that occurred in Greensburg, Kansas with a population of approximately 1,500 people. The devastation was vast, totaling around \$250 million dollars – approximately 95% of the city was ruined. To model an F4 or F5 tornado, the National Weather Service suggested approximating that 90% of each land use category be considered demolished and totaling those losses for a final prediction of devastation, produced by 2009 market values. The government-owned structures include a grain elevator and a City Hall/Fire Hall. The Private Storage buildings were originally a Post Office/Grocery Store, Café, Bank, and also include basic storage for two businesses outside city limits and private citizens. All of these buildings are now used solely for storage and do not generate funds. As shown in Table 71 (Figure 19 following page), the estimated devastation value of an F4 or F5 tornado is \$948,150 dollars affecting 45 structures.

Table 71. Louisburg Hazard 1: F4-F5 Tornado

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	41	37	\$585,900	\$527,310
Government	2	1	\$195,300	\$175,770
Religious	1	2	\$256,500	\$230,850
Private Storage	6	5	\$15,800	\$14,220
Total	50	45	\$1,053,500	\$948,150

Figure 19: Louisburg Hazard 1: F4-F5 Tornado

Lac qui Parle County
All-Hazard Mitigation Plan



Tornado Impact Areas are comprised of all areas within one-half mile of major roads. Major roads include US Highways, MN State Highways, and County State Aid Highways.

ASSET

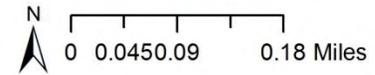
- Cultural / Historical Building
- Emergency Services
- Historical Structure
- Institutional Building
- Major Employer
- Multi-family Housing
- Public Facility
- School



- Louisburg
- Tornado Impact Area

ROADS

- Township Roads
- County Road
- County State Aid Highway
- MN Trunk Highway
- U.S. Highway
- Railroad



Map Created By: UMRVDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Louisburg Hazard 2. Train Derailment

The second hazard area is a one-block radius surrounding the railroad that bisects Louisburg, as determined by City Staff. Five residential properties, the city-owned Grain Elevator and 2 of the private storage buildings were located in this area. As shown in Table 72 (Figure 20 following page), the estimated devastation value of a train derailment is \$327,818 dollars affecting 7 structures.

Table 72. Louisburg Hazard 2: Train Derailment

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	41	5	\$585,900	\$71,451
Religious	1	0	\$195,300	\$0
Government	2	1	\$256,500	\$251,100
Private Storage	6	2	\$15,800	\$5,267
Total	50	7	\$1,053,500	\$327,818

Figure 20: Louisburg Hazard 2: Train Derailment

Lac qui Parle County
All-Hazard Mitigation Plan



The Train Derailment area was determined by Louisburg City Staff and includes all structures within a 1-block radius of the railroad.

- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School



- ROADS**
- Township Roads
 - County Road
 - County State Aid Highway
 - MN Trunk Highway
 - U.S. Highway
 - Railroad
- Louisburg
 Derailment Impact Area

Map Created By: UMRVDC
 Date: 12-1-2010
 Data Source: MNDOT Basemap 2000

Inventory of Community Assets.

The City of Louisburg compiled a list of community assets shown in Table 73, including the major business, a cultural/historical structure, and an institutional facility. The inventory includes the 2009 market value of all assets, and estimated replacement values, content values, and function values.

Table 73. City of Louisburg – Inventory of Community Assets

Name of Asset	Building Size (Sq. Ft)	Market Value (\$)	Replacement Value (\$)	Content Value (\$)	Function Value (\$)
Major Business					
Industry 1*	2,918	\$320,667	\$201,342	\$302,013	\$370,586
Cultural/Historical Structure					
Church	2,986	\$195,300	\$337,418	\$337,418	n/a
Institutional Buildings					
City Hall/Fire Hall	5,400	\$5,400	\$702,000	\$1,053,000	n/a

*The market value includes 3 structures (warehouses/office space/storage) and 26 structures that store in bushels. See Appendix 7 for more detailed information.

City of Madison, Minnesota

Existing Development Trends.

Madison is Lac qui Parle County's largest city with approximately 1,681 people and 780 households (Minnesota State Demographic Center and Metropolitan Center 2007). There has been a slow decrease in population of Madison since 1960 and the 2020 projected population of 1,468. Madison has completed major redevelopment projects including renovating City Hall, Library, and Elementary School. Also in 2005 an industrial businesses performed renovations. Infrastructure renewal has been a large project for Madison and the City will have completed 80% of water, sewer, and stormwater infrastructure from 2009-2011, with the project totaling \$17 million funded through USDA – Rural Development. Lastly, the hospital has been under recurring renovation and a portion of residential land has been redeveloped for hospital living assistance. Table 74 identifies Madison's breakdown of land uses.

Table 74. City of Madison – Land Use Category Allotments

Land Use Type	Parcel Count	Percent of Area
Residential	716	83.7%
Commercial	83	9.7%
Industrial	13	1.5%
Agricultural	1	0.1%
Religious/Non-Profit	12	1.4%
Government	28	3.3%
Educational	2	0.2%
Total	855	100.0%

Source: Lac qui Parle County Assessor 2009

Potential for Future Growth and Development.

Three annexations of agricultural land have occurred and each have been slated for certain development. Future development opportunities are located surrounding Madison proper within municipal limits. East and south of the City, land has been made available for industrial development; while in the west and southern portion of the city is slated for residential development. Lastly, commercial development has been proposed along Highway 40. These areas are not in hazard areas. The locations are not located in hazard areas, outside of the potential of an F4-F5 Tornado event.

Vulnerability Assessment of Structures by Hazard.

Numerous programs are available and offered to low income residents, seniors, and those with disabilities within the City of Madison. Prairie 5 Community Action Committee is strongly supported throughout the city and provides numerous meals to seniors thru Meals on Wheels and the Community Senior Center. The City also has participated in the Small Cities Development Program since 2008, which provides funding to low-income persons for housing rehabilitation. Other programs concerning transportation and medical assistance are offered through the County and through the Hospital.

Of the two natural hazards selected as most likely to affect a city, one applies to the City of Madison, as no floodplains are located within municipal limits. Madison opted to perform an additional risk analysis on the potential of a train derailment/explosion at an industrial business. Tables 75 and 76 display the potential total number of structures that may be affected by the mentioned hazards within the defined hazard areas, in addition to a predicted devastation amount provided by 2009 assessed market values.

Madison Hazard 1. F4 – F5 Tornado

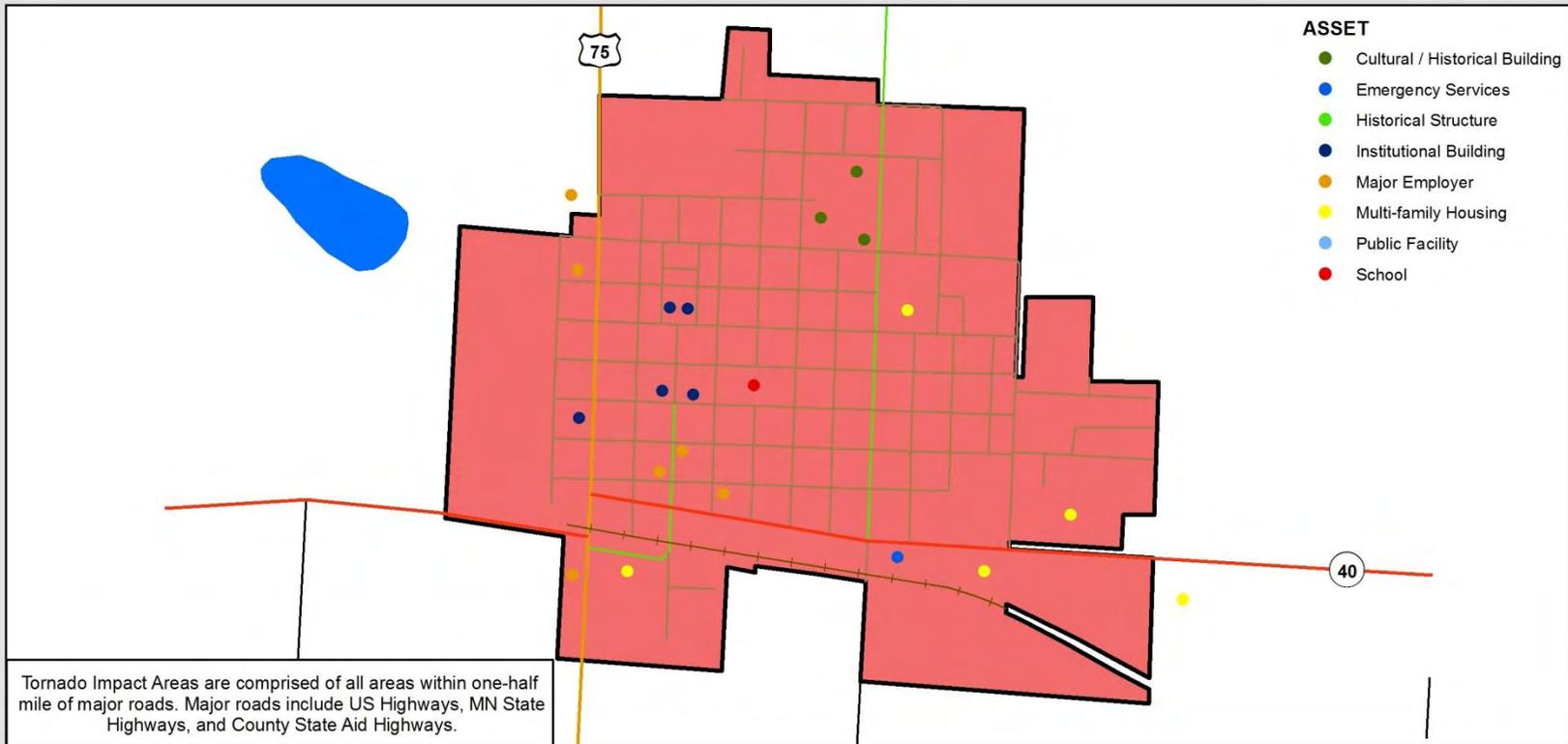
According to the National Weather Service, an acceptable method to estimate damage from a F4 or F5 tornado in a small community would be to model the situation after the event that occurred in Greensburg, Kansas with a population of approximately 1,500 people. The devastation was vast, totaling around \$250 million dollars – approximately 95% of the city was ruined. To model an F4 or F5 tornado, the National Weather Service suggested approximating that 90% of each land use category be considered demolished and totaling those losses for a final prediction of devastation, produced by 2009 market values. The hazardous facilities listed in Table 75 are three industrial businesses, while the critical facility is the hospital. As shown in Table 75 (Figure 21 following page), the estimated devastation value of an F4 or F5 tornado is \$60,458,760 dollars affecting 770 structures.

Table 75. Madison Hazard 1: F4-F5 Tornado

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	716	644	\$39,066,200	\$35,159,580
Commercial	83	75	\$2,321,716	\$2,089,544
Industrial	10	9	\$1,240,300	\$1,116,270
Agricultural	1	1	\$43,300	\$38,970
Religious/Non-Profit	12	11	\$8,889,600	\$8,000,640
Government	27	24	\$8,005,800	\$7,205,220
Education	2	2	\$3,831,800	\$3,448,620
Hazardous Facilities	3	3	\$1,220,384	\$1,098,346
Critical Facilities	1	1	\$2,557,300	\$2,301,570
Total	855	770	\$67,176,400	\$60,458,760

Figure 21: Madison Hazard 1: F4-F5 Tornado

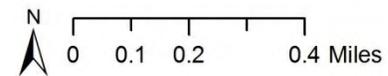
Lac qui Parle County
All-Hazard Mitigation Plan



Tornado Impact Areas are comprised of all areas within one-half mile of major roads. Major roads include US Highways, MN State Highways, and County State Aid Highways.



<p>Lac qui Parle County</p> <ul style="list-style-type: none"> Madison Tornado Impact Area Water Bodies 	<p>ROADS</p> <ul style="list-style-type: none"> Township Roads County Road County State Aid Highway MN Trunk Highway U.S. Highway Railroad
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Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Madison Hazard 2. Train Derailment/Explosion at Grain Elevator

The second hazard area is a Train Derailment/Explosion at a Grain Elevator as defined by Madison City Staff. The railroad ends at the Grain Elevator, which is also the location of a fertilizer plant and the main Natural Gas line that serves the City. This hazard area includes approximately 200 residential properties, 75 commercial businesses, 8 industrial properties, 1 church, 7 government structures and all the hazardous facilities. As shown in Table 76 (Figure 22 following page), the estimated devastation value of a Train Derailment/Explosion at the Grain Elevator is \$18,021,300 dollars affecting 293 structures.

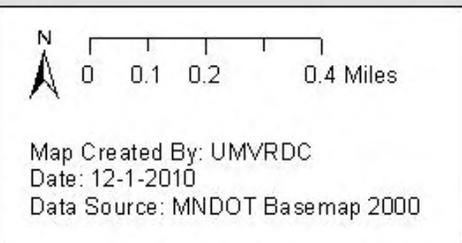
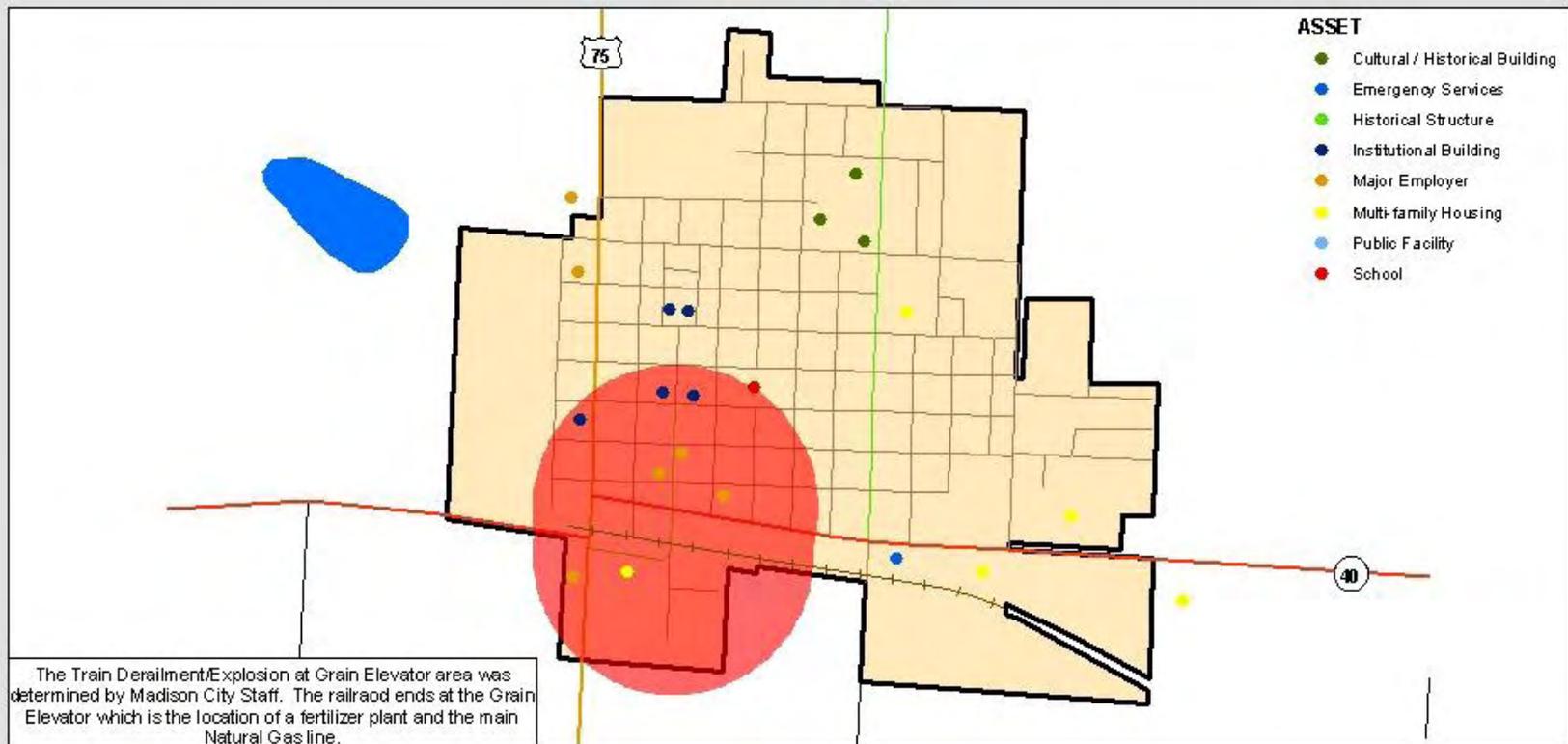
Table 76. Madison Hazard 2: Train Derailment/Explosion at Grain Elevator

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	716	200	\$39,066,200	\$10,912,346
Commercial	83	75	\$2,321,716	\$2,089,544
Industrial	10	8	\$1,240,300	\$930,225
Agricultural	1	0	\$43,300	\$0
Religious/Non-Profit	12	1	\$8,889,600	\$521,100
Government	27	7	\$8,005,800	\$2,347,700
Education	2	0	\$3,831,800	\$0
Hazardous Facilities	3	3	\$1,220,384	\$1,220,384
Critical Facilities	1	0	\$2,557,300	\$0
Total	855	293	\$67,176,400	\$18,021,300

Figure 22: Madison Hazard 2: Train Derailment/Explosion at Cargill Grain Elevator

Lac qui Parle County

All-Hazard Mitigation Plan



Inventory of Community Assets.

The City of Madison compiled a list of community assets shown in Table 77, including major employers in the business district, cultural/historical structures, education facilities, vulnerable populations in multi-family housing complexes, and institutional facilities. The inventory includes the 2009 market value of all assets, and estimated replacement values, content values, and function values.

Table 77. City of Madison – Inventory of Community Assets

Name of Asset	Building Size (Sq. Ft)	Market Value (\$)	Replacement Value (\$)	Content Value (\$)	Function Value (\$)
Major Businesses					
Industry 1*	5,520	\$995,831	\$380,880	\$571,320	\$701,040
Bank 1	7,206	\$177,400	\$1,088,106	\$1,088,106	n/a
Bank 2	4,988	\$157,400	\$753,188	\$753,188	n/a
Industry 2	31,744	\$229,500	\$2,190,336	\$3,285,504	\$4,031,488
Industry 3	34,024	\$151,300	\$2,347,656	\$3,521,484	\$4,321,048
Commercial 1	13,570	\$121,200	\$909,190	\$909,190	\$407,100
Commercial 2	4,305	\$57,000	\$288,435	\$288,435	\$129,150
Commercial 3	11,132	\$44,600	\$745,844	\$745,844	\$333,960
Commercial 4	11,736	\$44,500	\$786,312	\$786,312	\$352,080
Commercial 5	2,394	\$43,700	\$160,398	\$160,398	\$71,820
Commercial 6	31,656	\$185,300	\$2,120,952	\$2,120,952	\$949,680
Commercial 7	42,808	\$216,000	\$2,868,136	\$2,868,136	\$1,284,240
Cultural/Historical Structures					
Historical Structure	4,460	\$655,000	\$503,980	\$503,980	n/a
Church 1	24,200	\$1,363,800	\$2,734,600	\$2,734,600	n/a
Church 2	8,033	\$521,100	\$907,729	\$907,729	n/a
Church 3	10,969	\$568,100	\$1,239,497	\$1,239,497	n/a
Education					
School	97,393	\$3,831,800	\$8,862,763	\$8,862,763	n/a
Multi-Family Housing					
Apartment 1	3,440	\$1,684,000	\$337,120	\$168,560	n/a
Apartment 2	23,968	\$274,600	\$2,348,864	\$1,174,432	n/a
Apartment 3	32,378	\$824,300	\$3,173,044	\$1,586,522	n/a
Apartment 4	27,995	\$717,800	\$2,743,510	\$1,371,755	n/a
Apartment 5	11,525	\$568,800	\$1,129,450	\$564,725	n/a
Institutional Buildings					
LqP Courthouse/Jail/Public	22,804	\$1,741,900	\$2,006,752	\$2,006,752	n/a
City Hall	7,744	\$212,200	\$681,472	\$681,472	n/a
Hospital	20,750	\$2,557,300	\$3,008,750	\$4,513,125	n/a
Swimming Pool	13,510	\$183,100	\$1,188,880	\$1,188,880	n/a

*The market value includes 8 buildings (warehouses/office space/storage) and 6 structures that store in bushels. See Appendix 7 for more detailed information.

City of Marietta, Minnesota

Existing Development Trends.

Marietta is Lac qui Parle County's third smallest city with approximately 174 people and 82 households (Minnesota State Demographic Center and Metropolitan Center 2007). Marietta's population has been steadily decreasing since 1960. Similarly, the city's housing stock decreased during the same time-span, going from 120 dwellings in 1960 to 82 in the year 2007, therefore losing 33 percent of the households in only 47 years. One major redevelopment in Marietta was the conversion of a grocery store/restaurant to a medical clinic from 2004 – 2005. Other recently completed projects include a new City storage shed and an addition onto the Fire Hall. Aside from the aforementioned projects, no other development, land use changes, or annexations have occurred in the past ten years. Table 78 identifies Marietta's breakdown of land uses.

Table 78. City of Marietta – Land Use Category Allotments

Land Use Type	Parcel Count	Percent of Area
Residential	107	77.0%
Commercial	15	10.8%
Industrial	1	0.7%
Agricultural	1	0.7%
Religious/Non-Profit	3	2.2%
Government	12	8.6%
Total	139	100.0%

Source: Lac qui Parle County Assessor 2009

Potential for Future Growth and Development.

The potential for future development includes a annexation of five residential properties and one commercial business, containing approximately 10 acres of land along the eastern edge of Marietta. Future growth continues to depend on residential infill development particularly along the northeast section of the City along 4th Avenue and 5th Street in the vacant school lot block and along State Highway 40. The mentioned areas are not located in hazard areas, outside of the potential of a F4-F5 Tornado event.

Vulnerability Assessment of Structures by Hazard.

Numerous programs are available and offered to low income residents, seniors, and those with disabilities within the City of Marietta. Prairie 5 Community Action Committee is strongly supported throughout the city and provides seniors nutritional meals that are driven to homes (3-5 meals daily). In addition the program provides approximately 20 meals daily in the Senior Citizen Center. The City also has participated in the Small Cities Development Program since 2009, which provides funding to low-income persons to rehabilitate two owner-occupied residences. Satellite Health Clinic is open two mornings a week to serve residents and the Fire Hall is now handicap-accessible for voting.

Of the two natural hazards selected as most likely to affect a city, both apply to the City of Marietta (F4-F5 Tornado and 100-year Flood Event). Marietta opted to perform an additional risk analysis on the transportation of hazardous materials. Tables 79, 80 and 81 display the potential total number of structures that may be affected by the mentioned hazards within the defined hazard areas, in addition to a predicted devastation amount provided by 2009 assessed market values.

Marietta Hazard 1. F4 – F5 Tornado

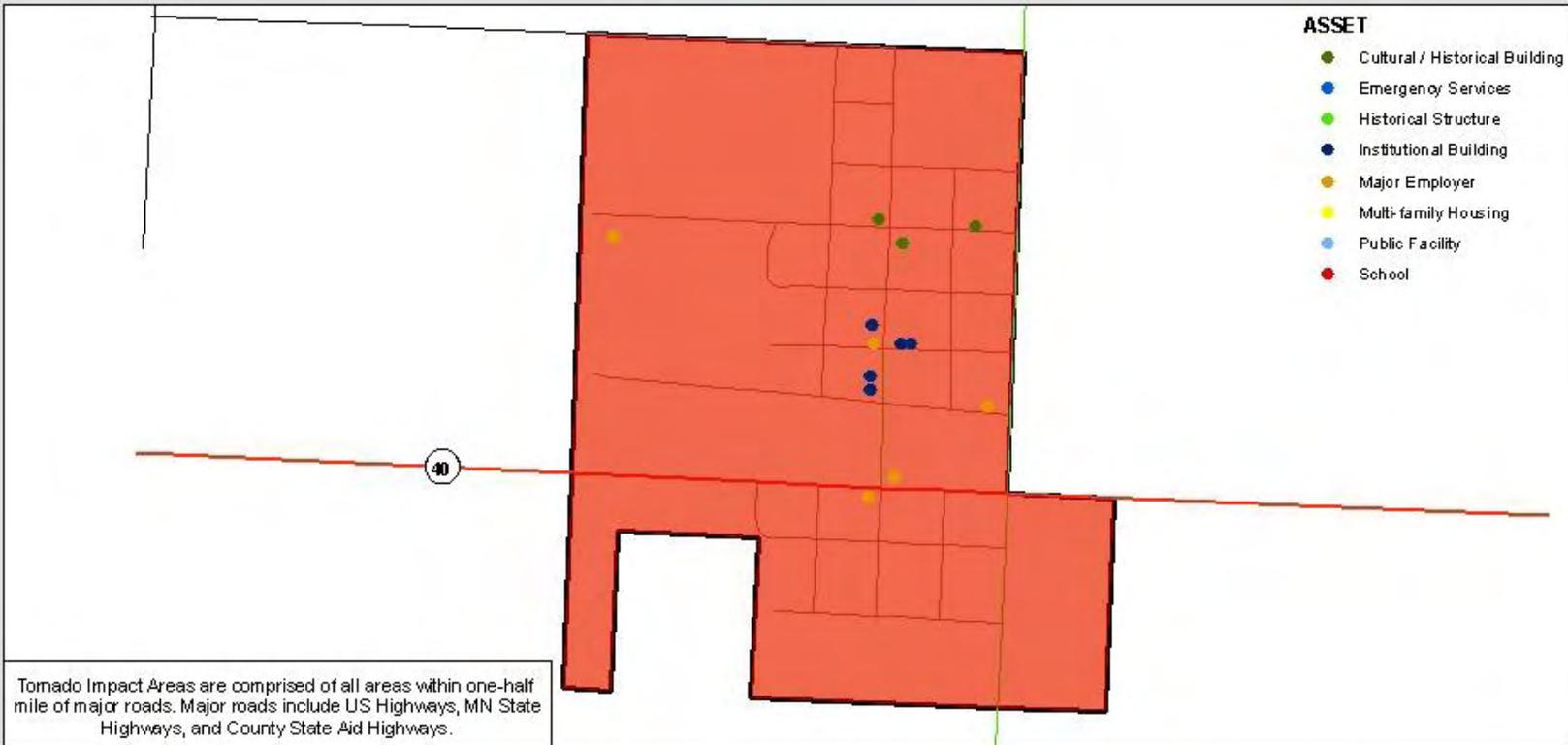
According to the National Weather Service, an acceptable method to estimate damage from a F4 or F5 tornado in a small community would be to model the situation after the event that occurred in Greensburg, Kansas with a population of approximately 1,500 people. The devastation was vast, totaling around \$250 million dollars – approximately 95% of the city was ruined. To model an F4 or F5 tornado, the National Weather Service suggested approximating that 90% of each land use category be considered demolished and totaling those losses for a final prediction of devastation, produced by 2009 market values. The critical facilities listed in Table 80 are the Satellite Health Clinic and Fire Hall. As shown in Table 79 (Figure 23 following page), the estimated devastation value of an F4 or F5 tornado is \$2,849,580 dollars affecting 125 structures.

Table 79. Marietta Hazard 1: F4-F5 Tornado

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	107	96	\$2,238,900	\$2,015,010
Commercial	15	14	\$183,600	\$165,240
Industrial	1	1	\$20,900	\$18,810
Agricultural	1	1	\$26,200	\$23,580
Religious/ Non-Profit	3	3	\$274,500	\$247,050
Government	9	8	\$233,300	\$209,970
Utilities	1	1	\$23,500	\$21,150
Critical Facilities	2	2	\$165,300	\$148,770
Total	139	125	\$3,166,200	\$2,849,580

Figure 23: Marietta Hazard 1: F4-F5 Tornado

Lac qui Parle County
All-Hazard Mitigation Plan



- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School

Tomado Impact Areas are comprised of all areas within one-half mile of major roads. Major roads include US Highways, MN State Highways, and County State Aid Highways.



- ROADS**
- Township Roads
 - County Road
 - County State Aid Highway
 - MN Trunk Highway
 - U.S. Highway

N

0 0.05 0.1 0.2 Miles

Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Marietta Hazard 2. 100-Year Flood Event

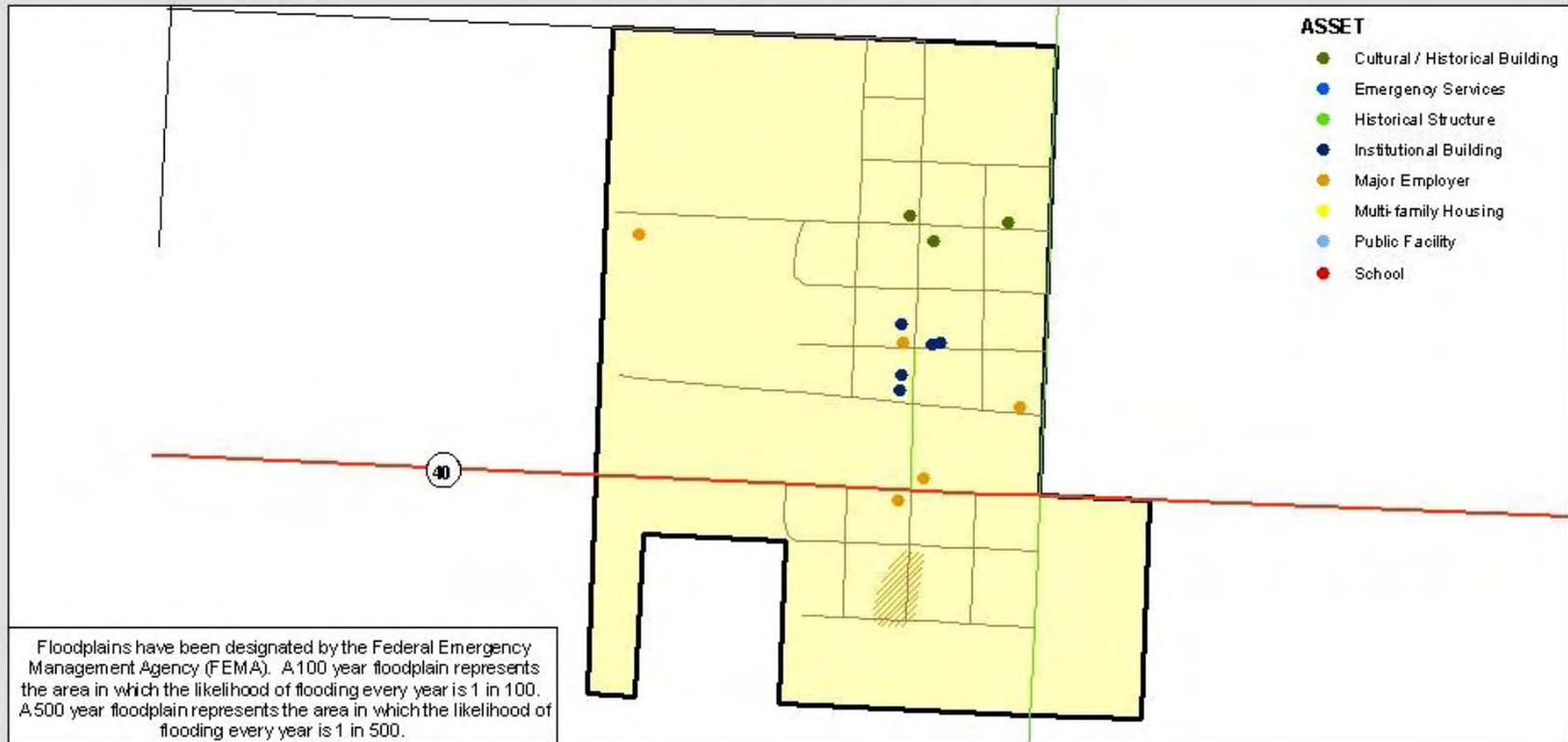
The second hazard area for risk analysis is a 100-year flood event as determined by digital Flood Insurance Rate Maps dated March 2006. The general land use located in the 100-year floodplain is residential and agricultural land. There are no immediate or future development plans for 100-year floodplain; however the City does not have a Floodplain Ordinance at this time. Nassau intends to adopt a Floodplain Management Ordinance in the next year. Currently, as shown in Table 80 below and Figure 24 (following page), there is a single residential dwelling in the 100-year floodplain, that could cost approximately \$20,924 dollars if it were inundated with flood waters.

Table 80. Marietta Hazard 2: 100-Year Flood Event

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	107	1	\$2,238,900	\$20,924
Commercial	15	0	\$183,600	\$0
Industrial	1	0	\$20,900	\$0
Agricultural	1	0	\$26,200	\$0
Religious/ Non-profit	3	0	\$274,500	\$0
Government	9	0	\$233,300	\$0
Utilities	1	0	\$23,500	\$0
Critical Facilities	2	0	\$165,300	\$0
Total	139	1	\$3,166,200	\$20,924

Figure 24: Marietta Hazard 2: 100-Year Flood Event

Lac qui Parle County
All-Hazard Mitigation Plan



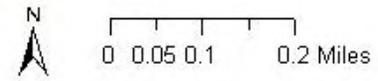
- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School

Floodplains have been designated by the Federal Emergency Management Agency (FEMA). A 100 year floodplain represents the area in which the likelihood of flooding every year is 1 in 100. A 500 year floodplain represents the area in which the likelihood of flooding every year is 1 in 500.



- FEMA DESIGNATED FLOODPLAIN**
- Marietta
 - ▨ 100 Year Boundary
 - ▨ 500 Year Boundary

- ROADS**
- Township Roads
 - County Road
 - County State Aid Highway
 - MN Trunk Highway
 - U.S. Highway



Map Created By: UMVRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000
FEMA

Marietta Hazard 3. Transportation of Hazardous Materials

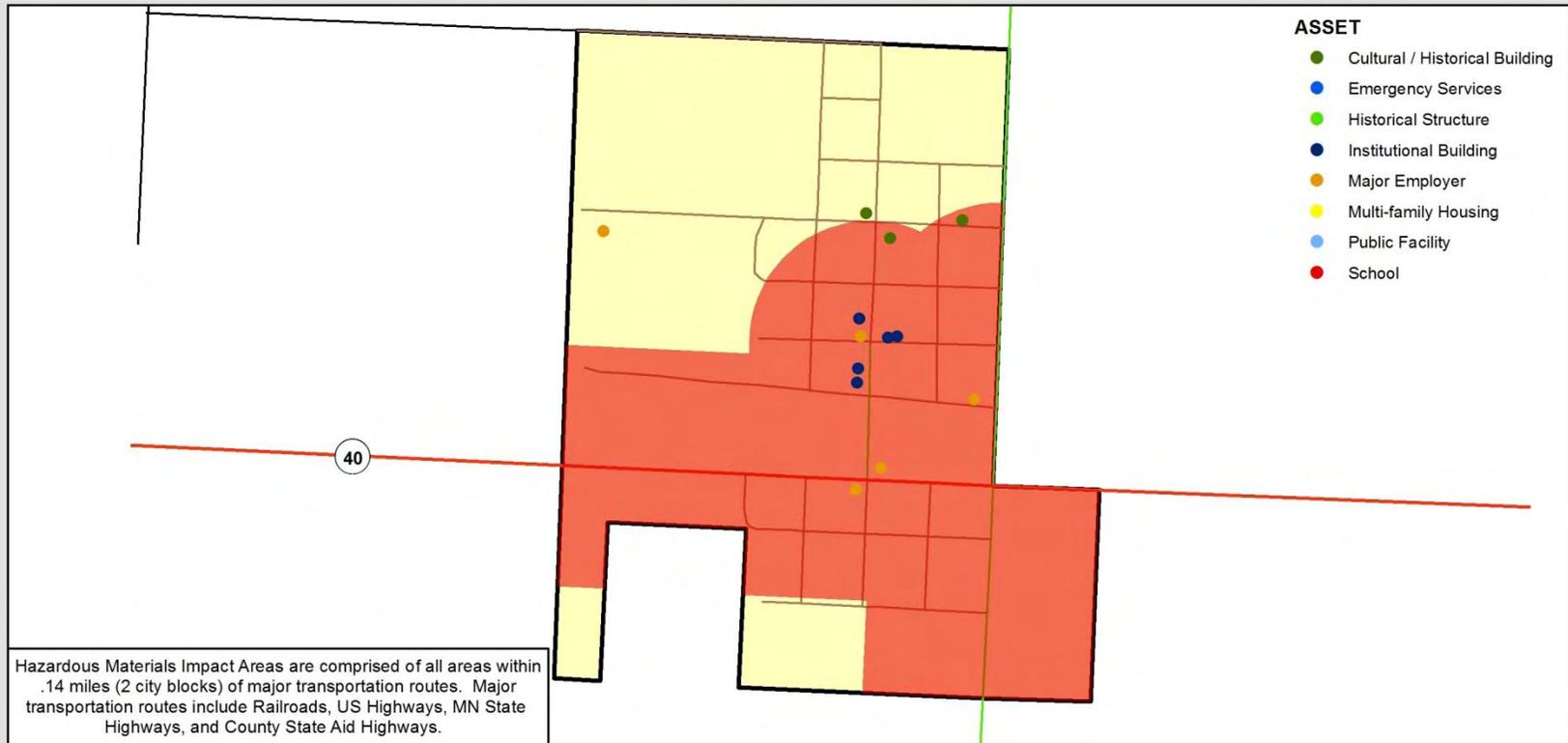
The third hazard boundary area was for the transportation of hazardous materials. The specific hazardous materials were not identified and could potentially take form as a solid, liquid, or gas and each have the ability to affect structure differently, thus any structure within a two-block area around any major transportation route including state/county highways and railroads was identified. Marietta has one major transportation route (State Highway 40) that intersects through the middle of the city. As shown in Table 81 and Figure 25 (following page), 33 of 139 parcels could be impacted; the majority of which 28 residences, 3 commercial businesses, and the Marietta Clinic and City Storage Facility, with a final predicted devastation value of \$666,780 dollars.

Table 81. Marietta Hazard 3: Transportation of Hazardous Materials

Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	107	28	\$2,238,900	\$585,880
Commercial	15	3	\$183,600	\$51,900
Industrial	1	0	\$20,900	\$0
Agricultural	1	0	\$26,200	\$0
Religious/ Non-profit	3	0	\$274,500	\$0
Government	9	1	\$233,300	\$20,900
Utilities	1	0	\$23,500	\$0
Critical Facilities	2	1	\$165,300	\$8,100
Total	139	33	\$3,166,200	\$666,780

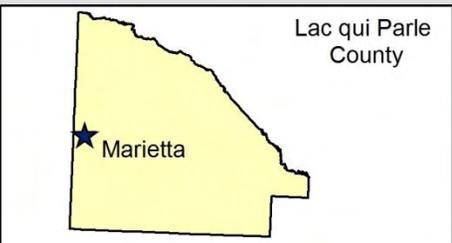
Figure 25: Marietta Hazard 3: Transportation of Hazardous Materials

Lac qui Parle
All-Hazard Mitigation Plan



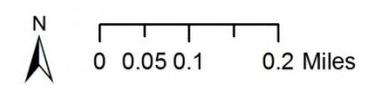
- ASSET**
- Cultural / Historical Building
 - Emergency Services
 - Historical Structure
 - Institutional Building
 - Major Employer
 - Multi-family Housing
 - Public Facility
 - School

Hazardous Materials Impact Areas are comprised of all areas within .14 miles (2 city blocks) of major transportation routes. Major transportation routes include Railroads, US Highways, MN State Highways, and County State Aid Highways.



- Marietta
- Hazard Materials Impact Area

- ROADS**
- Township
 - County Road
 - County State Aid Highway
 - State Highway
 - US Highway
 - Railroad



Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Inventory of Community Assets.

The City of Marietta compiled a list of community assets shown in Table 82, including major employers in the business district, cultural/historical structures, and institutional facilities. The inventory includes the 2009 market value of all assets, and estimated replacement values, content values, and function values.

Table 82. City of Marietta – Inventory of Community Assets

Name of Asset	Building Size (Sq. Ft)	Market Value (\$)	Replacement Value (\$)	Content Value (\$)	Function Value (\$)
Major Businesses					
Commercial 1	1,792	\$9,200	\$120,064	\$120,064	\$53,760
Commercial 2	3,222	\$23,400	\$215,874	\$215,874	\$96,660
Commercial 3	5,640	\$40,200	\$377,880	\$377,880	\$169,200
Commercial 4	4,992	\$19,300	\$334,464	\$334,464	\$149,760
Bank	3,000	\$74,500	\$201,000	\$201,000	\$90,000
Cultural/Historical Structures					
Church 1	1,950	\$90,000	\$220,350	\$220,350	n/a
Church 2	2,128	\$95,800	\$240,464	\$240,464	n/a
Church 3	1,984	\$88,700	\$224,192	\$224,192	n/a
Institutional Buildings					
Marietta Clinic	624	\$8,100	\$54,912	\$54,912	n/a
Marietta Post Office	644	\$21,600	\$56,672	\$56,672	n/a
Marietta Fire Hall	7,756	\$157,200	\$1,008,280	\$1,512,420	n/a
Marietta City Hall / Senior Center	2,064	\$96,900	\$181,632	\$181,632	n/a
City Storage Facility	2,280	\$20,900	\$200,640	\$200,640	n/a

City of Nassau, Minnesota

Existing Development Trends.

Nassau is Lac qui Parle County's second smallest city. Nassau's population reached a peak in 1960 with 182 residents but has leveled out in 1990 and 2000 to its current population of approximately 78 residents (Minnesota State Demographic Center and Metropolitan Center 2007). The city's housing stock had decreased through 1980 and leveled out in 1990 and 2000, ending at 39 households in 2007. Two development projects in Nassau occurred in 2009 and 2009-2010, where agricultural land was converted to commercial/residential property. A final project was the construction of a municipal sewer system in 2003. Aside from the aforementioned projects, no other development, land use changes, or annexations have occurred in the past ten years. Table 83 identifies Nassau's breakdown of land uses.

Table 83. City of Nassau – Land Use Category Allotments

Land Use Type	Parcel Count	Percent of Area
Residential	56	71.0%
Commercial	8	10.1%
Industrial	8	10.1%
Religious/Non-Profit	2	2.5%
Government	5	6.3%
Total	79	100.0%

Source: Lac qui Parle County Assessor 2009

Potential for Future Growth and Development.

The potential for future development lies in the southeast corner of municipal limits and residential and commercial infill. It is possible that more agricultural land could be converted into residential properties. The mentioned areas are not located in hazard areas, outside of the potential of a F4-F5 Tornado event.

Vulnerability Assessment of Structures by Hazard.

The City of Nassau does not offer programs for low income or senior residents; however City Hall was rehabilitated in 2008 with the addition of a handicap accessible ramp and railing for residents. Of the two natural hazards selected as most likely to affect a city, both apply to the City of Nassau (F4-F5 Tornado and 100-year Flood Event). Nassau opted to perform an additional risk analysis on a potential fire at the grain elevator. Tables 85, 86 and 87 display the potential total number of structures that may be affected by the mentioned hazards within the defined hazard areas, in addition to a predicted devastation amount provided by 2009 assessed market values.

Nassau Hazard 1. F4 – F5 Tornado

According to the National Weather Service, an acceptable method to estimate damage from a F4 or F5 tornado in a small community would be to model the situation after the event that occurred in Greensburg, Kansas with a population of approximately 1,500 people. The devastation was vast, totaling around \$250 million dollars – approximately 95% of the city was ruined. To model an F4 or F5 tornado, the National Weather Service suggested approximating that 90% of each land use category be considered demolished and totaling those losses for a final prediction of devastation, produced by 2009 market values. The critical facility in Table 84 is the Fire Hall and as shown in Table 85 (Figure 26 following page), the estimated devastation value of an F4 or F5 tornado is \$1,679,580 dollars affecting 71 structures.

Table 84. Nassau Hazard 1: F4-F5 Tornado

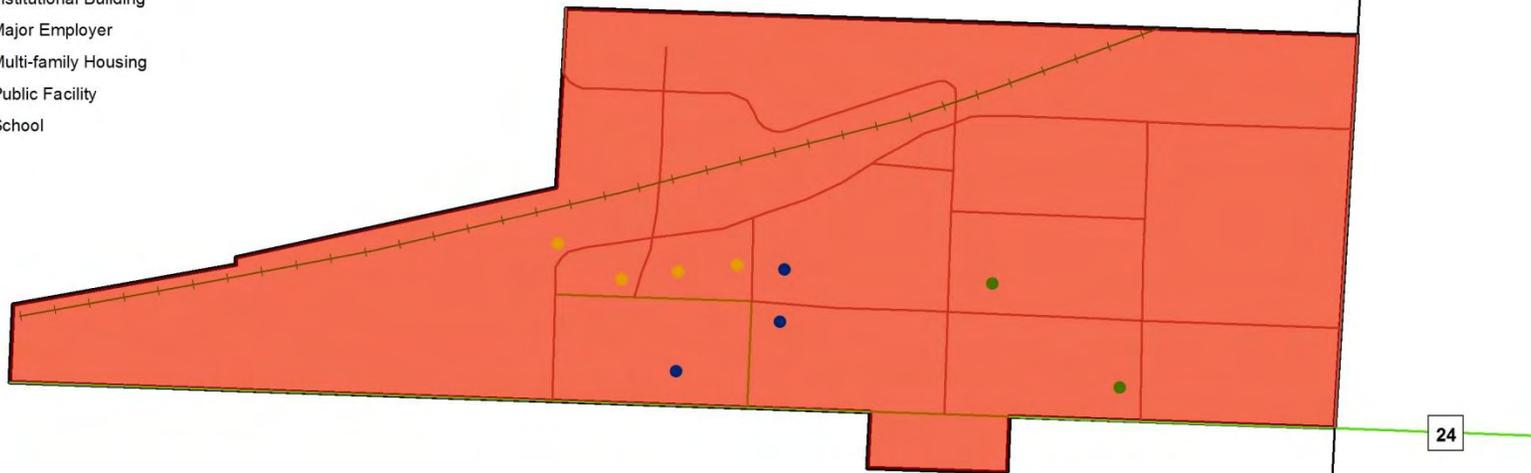
Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	56	50	\$1,221,700	\$1,099,530
Commercial	8	7	\$131,700	\$118,530
Industrial	8	7	\$154,700	\$139,230
Religious/ Non-Profit	2	2	\$270,500	\$243,450
Government	4	4	\$37,900	\$34,110
Critical Facility	1	1	\$49,700	\$44,730
Total	79	71	\$1,866,200	\$1,679,580

Figure 26: Nassau Hazard 1: F4-F5 Tornado

Lac qui Parle County
All-Hazard Mitigation Plan

ASSET

- Cultural / Historical Building
- Emergency Services
- Historical Structure
- Institutional Building
- Major Employer
- Multi-family Housing
- Public Facility
- School



Tornado Impact Areas are comprised of all areas within one-half mile of major roads. Major roads include US Highways, MN State Highways, and County State Aid Highways.

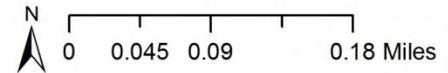


Lac qui Parle
County

- Nassau
- Tornado Impact Area

ROADS

- Township Roads
- County Road
- County State Aid Highway
- MN Trunk Highway
- U.S. Highway
- Railroad



Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Nassau Hazard 2. 100-Year Flood Event

The second hazard area for risk analysis is a 100-year flood event as determined by digital Flood Insurance Rate Maps dated March 2006. The general land use located in the 100-year floodplain is agricultural land that was part of a new tile and ditch program in 2006. No future development has been presented in the 100-year floodplain and the City intends to adopt a Floodplain Management Ordinance within a year. Currently, as shown in Table 85 below and Figure 27 (following page) there are no structures within the 100-year floodplain in the City of Nassau.

Table 85. Nassau Hazard 2: 100-Year Flood Event

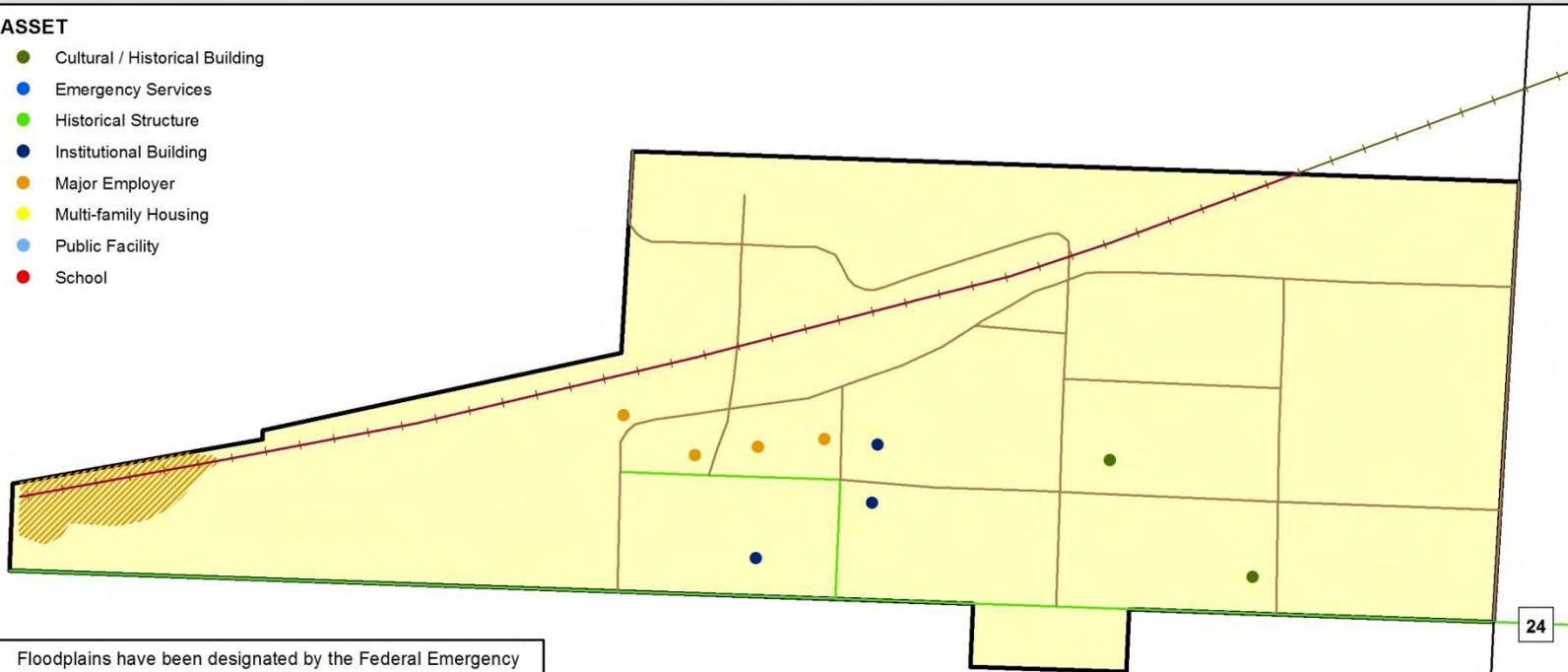
Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	56	0	\$1,221,700	\$0
Commercial	8	0	\$131,700	\$0
Industrial	8	0	\$154,700	\$0
Religious/ Non-profit	2	0	\$270,500	\$0
Government	4	0	\$37,900	\$0
Critical Facility	1	0	\$49,700	\$0
Total	79	0	\$1,866,200	\$0

Figure 27: Nassau Hazard 2: 100-Year Flood Event

Lac qui Parle County
All-Hazard Mitigation Plan

ASSET

- Cultural / Historical Building
- Emergency Services
- Historical Structure
- Institutional Building
- Major Employer
- Multi-family Housing
- Public Facility
- School



Floodplains have been designated by the Federal Emergency Management Agency (FEMA). A 100 year floodplain represents the area in which the likelihood of flooding every year is 1 in 100. A 500 year floodplain represents the area in which the likelihood of flooding every year is 1 in 500.

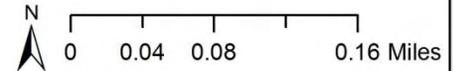


Lac qui Parle
County

- Nassau
- FEMA DESIGNATED FLOODPLAIN
- ▨ 100 Year Boundary
- ▨ 500 Year Boundary

ROADS

- Township Roads
- County Road
- County State Aid Highway
- MN Trunk Highway
- U.S. Highway
- Railroad



Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000
FEMA

Nassau Hazard 3. Fire at Grain Elevator

The third hazard for risk analysis is a fire at Nassau’s Farmers Grain Elevator. The hazard area was determined by Nassau City Staff and includes all structures within a 2-block area. Of the 79 parcels, only 13 structures fall within the area. As shown in Table 86 below and Figure 28 (following page), this includes 9 residences, 3 commercial buildings, and the Nassau Fire Hall, totaling \$365,345 dollars; approximately 20 percent of the total city value.

Table 86. Nassau Hazard 2: Fire at Grain Elevator

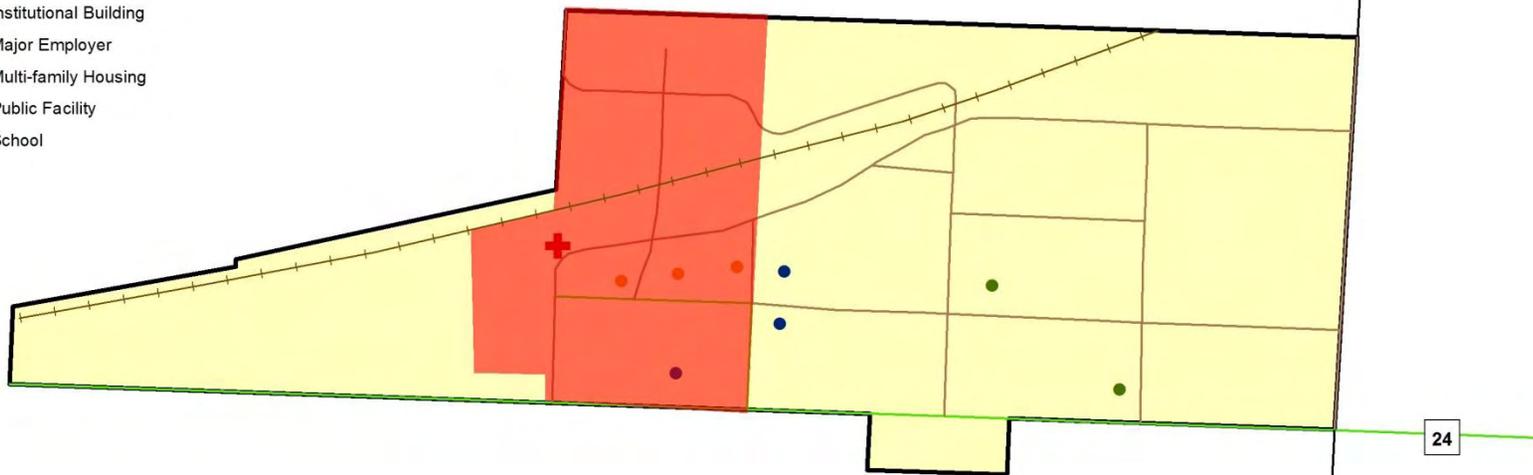
Type of Parcel	Number of Parcels		Value of Parcels	
	# in Community	# in Hazard Area	\$ in Community	\$ in Hazard Area
Residential	56	9	\$1,221,700	\$196,345
Commercial	8	3	\$131,700	\$119,300
Industrial	8	0	\$154,700	\$0
Religious/ Non-profit	2	0	\$270,500	\$0
Government	4	0	\$37,900	\$0
Critical Facility	1	1	\$49,700	\$49,700
Total	79	13	\$1,866,200	\$365,345

Figure 28: Nassau Hazard 3: Fire at Nassau Farmers Grain Elevator

Lac qui Parle County
All-Hazard Mitigation Plan

ASSET

- Cultural / Historical Building
- Emergency Services
- Historical Structure
- Institutional Building
- Major Employer
- Multi-family Housing
- Public Facility
- School



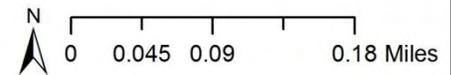
The Fire area was determined by Nassau City Staff and includes all structures within a 2-block radius of the Commercial property.



- Nassau
- Fire Impact Area
- ⊕ Grain Elevator

ROADS

- Township Roads
- County Road
- County State Aid Highway
- MN Trunk Highway
- U.S. Highway
- Railroad



Map Created By: UMRDC
Date: 12-1-2010
Data Source: MNDOT Basemap 2000

Inventory of Community Assets.

The City of Nassau compiled a list of community assets shown in Table 87, including major employers in the business district, cultural/historical structures, and institutional facilities. The inventory includes the 2009 market value of all assets, and estimated replacement values, content values, and function values.

Table 87. City of Nassau – Inventory of Community Assets

Name of Asset	Building Size (Sq. Ft)	Market Value (\$)	Replacement Value (\$)	Content Value (\$)	Function Value (\$)
Major Businesses					
Industry 1*	31,538	\$883,596	\$2,176,122	\$3,264,183	\$4,005,326
Commercial 1	16,000	\$111,700	\$1,072,000	\$1,072,000	\$480,000
Commercial 2	1,780	\$7,600	\$119,260	\$119,260	\$53,400
Cultural/Historical Structures					
Church 1	1,362	\$42,000	\$153,906	\$153,906	n/a
Church 2	4,480	\$228,500	\$506,240	\$506,240	n/a
Institutional Buildings					
City Hall/Senior Center	2,240	\$22,500	\$197,120	\$197,120	n/a
City Office	540	\$9,400	\$47,520	\$47,520	n/a
Fire Hall	2,880	\$49,700	\$374,400	\$561,600	n/a

*The market value includes 21 structures (warehouses/office space/storage), 12 tanks and 12 structures that store in bushels. See Appendix 7 for more detailed information.