"LOESS HILLS MORNING"
PHOTOGRAPHER MICHAEL LELAND, 2015
VIA FLICKR.COM (CROPPED)

IOWA ECONOMIC
DEVELOPMENT AUTHORITY

COMPREHENSIVE REGIONAL LAND-USE PLAN

FOR MILLS AND FREMONT COUNTIES
IN RESPONSE TO
2019 MISSOURI RIVER FLOODING

31 JANUARY 2022

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Acknowledgments

This report was assembled for the Iowa Economic Development Authority (IEDA) in response to a U.S. Economic Development Authority (EDA) economic recovery strategic planning grant received for the creation of long-term regional redevelopment strategies in the areas of Mills and Fremont Counties flooded by the Missouri River in 2019. In addition to those listed below, the planning team is appreciative for all the input received from residents and other individuals from the region.

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Foreword

INTRODUCTION

In 2020, the Iowa Economic Development Authority (IEDA) received a U.S. Economic Development Authority (EDA) economic recovery strategic planning grant to create long-term regional redevelopment strategies that will leverage state, local, and private resources to foster economic growth and resilience of Mills and Fremont Counties.

The area, inundated by 2019 flooding along the Missouri River in Iowa, has suffered from multiple instances of flooding over the decades, however the 2019 floods saw devastating inundation in areas that had never flooded before, with over 2,600 individuals and over 460 business impacted.

Figure 0-1. Pacific Junction Mayor Andy Young during 2019 floods. Source: Des Moines Register.

As a result of deferred maintenance on flood protection structures, increased river flows, and the complicated process of updating FEMA's Regulatory Flood Risk Maps, the region struggles to prevent damaging impact. In anticipation of federal resources for flood response and recovery, both Iowa Homeland Security and Emergency Management (IHSEMD) and Iowa Economic Development Authority (IEDA) met regularly to assess needs. IEDA conducted a survey of affected residents, and IHSMED managed the execution of FEMA's individual and public assistance programs. Through these efforts,it became very clear that no one single State agency could assist the region in long-term future resiliency planning and that a partner approach to such a planning effort was necessary. As such, the IEDA secured funds through the strategic planning grant to coordinate such a comprehensive assessment and plan for this impacted region with focus on these strategic areas:

Western Mills County: Focus on Pacific Junction and the I-29 & Hwy 34 Interchange
This assessment and plan provides a compressive analysis of economic development needs along I-29 in Mills County focusing primarily on the intersection of I-29 and Highway 34, where current business and development exists. This section of the plan includes a comprehensive assessment of the town of Pacific Junction, a creative place-making analysis providing an analysis of future land use, land management, infrastructure, and flood control alternatives.

Northwest Fremont County: Focus on Hamburg and the I-29 & Hwy 2 Interchange
This plan provides a comprehensive assessment of economic development needs along I-29 in Fremont County focusing primarily on the intersection of I-29 and State Highway 2. This section of the plan includes a comprehensive assessment of the region providing an analysis of future land use, land management, infrastructure, and flood control alternatives.

The plan provides a comprehensive assessment of economic development needs for the City of Hamburg in Fremont County. This section of the plan includes a creative place-making analysis of Hamburg to provide comprehensive visioning for Hamburg's future, detailed municipal needs and improvements, an analysis of future land use, land management, infrastructure, and flood control alternatives.

DELIVERABLES

Additional Tools

In addition to this plan document, the following deliverables were generated throughout the planning effort and used to inform the plan.

Iowa Flood Center

The Iowa Flood Center provided flood modeling of the Missouri River to dynamically simulate propagation of flood waters across the river valley and to capture levee failure impacts. Model results will be published in the Iowa Flood Information System (IFIS), an on-line publicly accessible website. The system will serve as an information system for residents and land-owners to understand the potential impact on their homes and businesses during potential flooding events.

Safeguard Iowa Partnership

Up to six Business Continuity workshops for businesses impacted by flooding or at risk of flooding to reinforce how to protect valuable assets, resume work, and retain jobs during and after a disaster event.

RESULTS

The plan provides insight for future land use, identifies areas for future development, looks at infrastructure needs, and addresses possibilities for future commercial development areas. After identifying recovery projects through the strategic planning process, the state and local entities will again apply to EDA for funding to implement the identified projects, such as the building of business parks to encourage job creation, the hardening of infrastructure to protect and maintain existing businesses, and other creative projects to spur regional economic development.

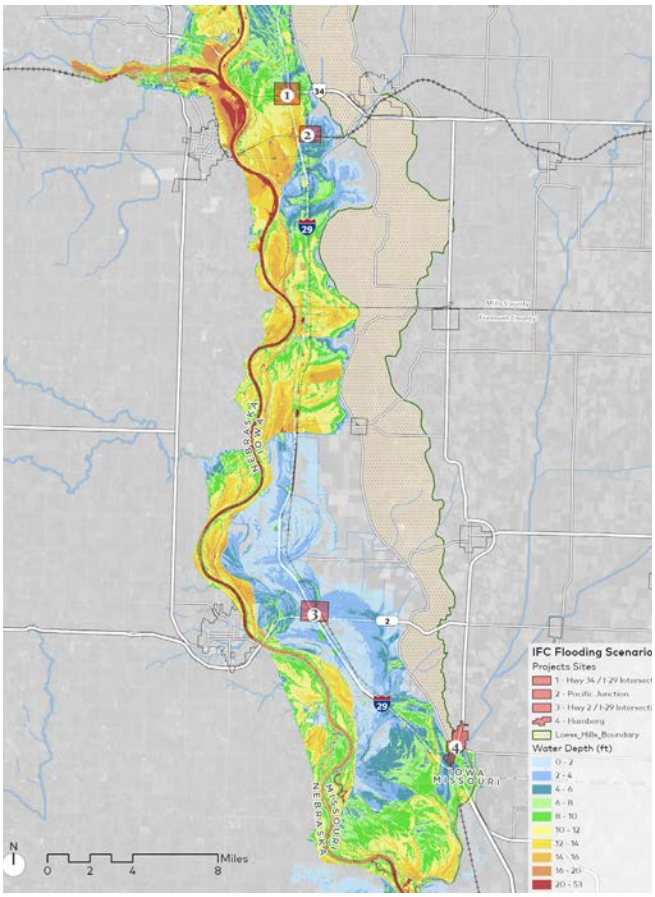

Figure 0-2. Flooding inundation modeling, 2019 Flood (Iowa Flood Center).

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1 EXECUTIVE SUMMARY

Executive Summary

BACKGROUND

In response to the historic Spring 2019 Missouri River flooding, the State of Iowa / Iowa Economic Development Authority (IEDA) identified a need to address future land use/public investment in Mills and Fremont counties in a holistic and comprehensive approach. In the months following the devastating flood, while local municipalities were working hard to recover their communities and directly assist impacted citizens, the State sought and secured funding from the United States Department of Commerce's Economic Development Administration (EDA) to support a multi-faceted, comprehensive planning effort. The intent was to coordinate the efforts of various State Agencies, State and Local partners, municipalities, and regional planning groups to generate a cohesive, forward-looking vision, one that is based upon the unique history, natural and cultural assets, and most importantly the people of the region, combined with the dynamic, emerging resources to rebuild a more resilient region.

This study was commissioned by IEDA utilizing funding from a EDA economic recovery strategic planning grant. Termed a "Vision of Hope for Mills/Fremont Counties" by the communities involved, the study follows the substantial community and landowner losses in the spring 2019 flood event, and so has a strong disaster recovery focus. It is more comprehensive in nature, however, and also addresses issues of sustainability and resiliency relevant to most rural areas throughout Iowa. The study includes planning recommendations that are intended to inform the near-term restoration of the affected communities in a way that integrates best practices in land use, infrastructure, and building, all with the restoration of longer-term sustainable ecological and economic land use concepts in mind.

Figure 1.0-1. Flooded Hamburg on April 2, 2019

(Source: Fremont County Emergency Management via https://www.kmaland.com/news/fate-of-fremont-county-flood-damaged-homes-still-unknown/article_3bd3123e-c04f-11e9-b9f6-7f62f322d9dd.html)

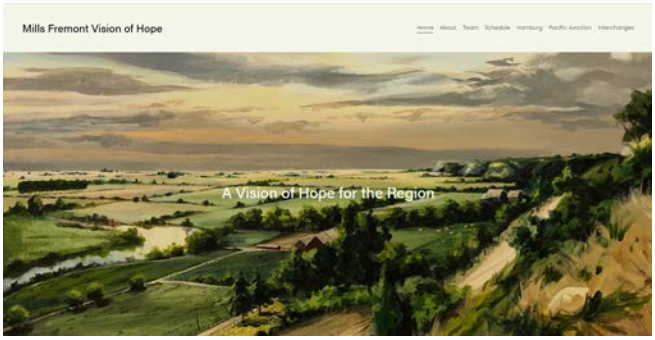

Figure 1.0-2. A Vision of Hope for the Region. Project website homepage: millsfremontvisionplan.org.

IEDA's goal was to create long-term regional redevelopment strategies that will leverage state, local, and private resources to foster economic growth and resilience of Mills and Fremont Counties. The intended outcomes of the study included:

- Levee assessment and impacts of flooding
- Land-use analysis and consideration of the communities of Hamburg and Pacific Junction, and I-29 interchanges at Highways 2 and 34
- Creative place-making workshops and generation of redevelopment ideas for Pacific Junction and Hamburg
- Descriptions of potential projects and initiatives that can be used to seek funding
- Final recommendations to the State and the Legislature.

PLANNING PROCESS AND RECOVERY

The role of the planning team was to engage partners and local community stakeholders, analyze data, and develop a final planning document to be used by the State and local municipalities guided by the goals listed above.

The multi-disciplinary planning team (led by BNIM) worked with an integrated methodology in collaboration with the local communities and other state agencies and regional partners. The process began in September 2020, approximately seventeen months after the floods, with early collaborative meetings with the project stakeholders. Given the COVID pandemic, engagement in community workshops was limited to initial public presentations in late October 2020 and final presentations in May 2021 and November 2021. Public meetings were limited in size and followed prescribed CDC recommendations. All other meetings were held virtually.

It became clear early in the planning process that even though nearly a year and a half had passed since the flood disaster, the local leaders (primarily the city clerks and mayors) were still "living with the flood". They were overwhelmed trying to manage their regular duties with flood buy-out coordination with home-owners and FEMA, organizing demolitions, and worrying about the future of their communities physically and financially given potential future modifications to FEMA flood maps.

IEDA, MAPA, SWIPCO and local representatives have been assisting the communities with the buy-out and recovery efforts. Even with this support, there is still a need for full-time staffing focused on strategy, tasks, funding, milestones, and implementation to manage the recovery efforts for the communities and to move the planning vision forward.

Figure 1.0-3. "We Are Hamburg" sign at City Hall signifying community resolve.

Figure 1.0-4. "Pacific Junction Rise Above" sign signifying community commitment.

LEVEES AND FLOOD MODELING

Pacific Junction and Hamburg and surrounding areas are protected from flooding by an extensive levee system along the Missouri River as well as its tributaries.

The levee system is conceptually simple but administratively complex. The levees were at least partially constructed by the Corps of Engineers) but are managed and maintained by local agencies and levee districts. Further, the Federal Emergency Management Agency that is responsible for floodplain mapping based on the levees has no role in constructing or maintaining the levees but requires they be certified as meeting certain standards, including three feet of freeboard between the top of levee and the 100-year flood profile. Once certified, FEMA will accredit the levees to avoid mapping the levee-protected areas as being in the floodplain.

Certification of the levee systems was outside the scope of this planning effort. However, the Iowa Flood Center (IFC) conducted modeling to determine the amount of freeboard present along the Missouri River tributary levees. They found that virtually no levee reaches protecting Pacific Junction and Hamburg have the required three feet of freeboard and there are a few areas where the levee would be over topped by the IFC-estimated 100-year flood profile. If certain standards are met but the levee is freeboard deficient, FEMA may map the area as being protected but receive different designation indicating that a reduced level of protection exists. The IFC modeling helps to show areas that could potentially receive this designation.

In addition to the freeboard analysis, IFC is developing the Missouri River Flood Information System to provide agencies and communities information to make informed decisions as flood threats are developing. The systems can also assist with floodplain management decision making.

Figure 1.0-5. Freeboard/levee analysis at Pacific Junction. Levees.

ECOLOGY AND AGRICULTURE

Consumers have been demanding more transparency in our food production. Who is producing our food and Where our food comes from have become increasingly important considerations in the marketplace. The latest focus of the buying public is - How our food is produced. Local, regional and export markets exist that pay a value-added premium for this level of transparency.

Farmers have numerous profitable opportunities to increase soil health and organic matter. Practices that are being promoted and practiced to achieve emerging carbon credit incentives and income all increase soil organic matter. Improvements to soil health will increase water holding capacity of the soil and reduce surface and tile water runoff. Flood reduction from healthier soil has been well documented by the Iowa Flood Center.

Information sharing and linking local/regional food production with the market is a role currently not being served by buyers or sellers. This is partly because the food system is considered private business and because linking farmers to buyers is not part of anyone's job description or institution's responsibility. This need for both agricultural/ food systems data and coordination is a growing necessity and opportunity that can best be served by a regionally based entity that is not battling in the competitive market space.

The current supply chain chaos has highlighted the need for close-coupled supply chains of essential materials. Food is a perishable product and to ensure food sovereignty and security, regional food systems must expand, providing farmers additional value in the market. The economic benefit of a more robust local/regional food system is exponential and ensures availability of healthy food in uncertain times.

Waste streams from multiple industries, including collections by municipalities, can be converted to enriched soil amendments that can provide nutrients ,soil organic matter and increase soil water holding capacity. Current agriculture fertilizer costs provide an economic advantage to process, combine and formulate these waste streams into known precision products that improve soil health while providing essential nutrients.

ECONOMIC CONTEXT

As a rural part of Iowa, the regional economy and employment opportunities are tied to agriculture (farming, equipment, crop processing and distribution), regional transportation, and services (including tourism). From a demographic perspective, the region was no longer at peak population even before the flood destroyed a number of homes and businesses. The flood exacerbated the already challenging issues associated with conversion to larger-scale farm and transportation operations requiring fewer locally-based workers and an aging population.

However, emerging resources available to address climate-related impacts such as regional flooding/ habitat loss, need for renewably-sourced energy, rural affordable housing, growing interest in healthy local food, and other issues provide a significant opportunity to renew the region for long-term economic stability.

PLANNING RECOMMENDATIONS

The following is a list of all of the planning recommendations concluded in this study, they are described and conceptually illustrated in the full report:

Regional Considerations

- Create Recovery Coordinator Position with Long-Term Funding
- Create Farmer Advisory Committee
- Create Levee District Coordination Entity
- Coordinate with BNSF on Regional Development Strategies
- Coordinate around Regional Agricultural Business - Local Food, Events and Festivals, Agri-Tourism
- Secure on-going Dedicated Funding for IFC - Flood Information System after IEDA funding expires.

Pacific Junction and I-29/Hwy 34 Interchange

- Fund Accreditation Study for Pony Creek and Keg Creek Levees
- Evaluate scope and funding to improve Pony Creek / Keg Creek Levees to Certification Standards
- Organize Community Stormwater/Ecology Projects
- Coordinate Railroad Junction Enhancement with BNSF
- Evaluate Wastewater System Resource Management
- Develop Food Production on Flood-impacted Properties
- Expand Regional Trail/Greenway
- Build a Brand around Agriculture and Community Identity Features
- Improve Broadband Access
- Develop Model High-Performance Housing Developments

I-29/Hwy 2 Interchange

- Commission L-575 Missouri River Levee Accreditation Study - In coordination with Hamburg Levees noted below; immediate need
- Perform detailed analysis on utility systems and current / future demands
  - Water Service
  - Sanitary Sewer
  - Broadband Access
  - Electric capacity
  - Stormwater - green infrastructure planning
- Complete IDOT Ring Levee
- Create a Fremont County Economic Development entity that is engaged with County Supervisors and contracted economic development staff to identify resources for planning and, if necessary, site preparation.
- Determine ultimate point-of-contact for Interchange development and ongoing activities and whether there is capacity to do the work
- Identify key properties, property owners and availability of those parcels to develop site plan for Interchange.
- Consider partnership with Nebraska City to conduct retail/dining analysis and identify market capacities and opportunities for expansion along Hwy 2 corridor on both sides of the river
- Conduct a study to determine the best way(s) to integrate public access to the river for recreational uses (boating, kayaking, fishing, etc.) in the area; link to potential expanded uses at Hwy 2 interchange

Hamburg

- Fund Accreditation Study for the Levee System Protecting Hamburg
- Evaluate Scope and Funding to Improve / Construct Levees to Certification Standards
- Organize Community Stormwater/Ecology Projects
- Develop Food Production and Long-term recreation plans for Flood Impacted Properties
- Create Nature Park / Bird Sanctuary inside Ditch 6 Levee
- Reinforce Community Identity Features
- Improve Broadband Access
- Develop Model High-Performance Housing Developments

PLAN INTEGRATION

There are existing studies either completed or being conducted in Mills and Fremont Counties. This plan implementation needs to coordinate with those efforts including:

- Lower Missouri River Planning Assistance to the States (PAS)
- ISU Extension Housing Readiness Study - Pacific Junction
- IDOT Ring Levee Project - Hwy 2 / I-29 Interchange
- L611 - L614 Levee Accreditation Study impacting Pacific Junction / Hwy 34 Interchange Development
- 2022 Homeland Security and Emergency Management Levee Study

POTENTIAL FUNDING SOURCES

Leaders in Southwest Iowa have already proven quite capable of securing support for their post-flood recovery. Their determination has already had an impact. But moving forward, when response and recovery funds are no longer applicable or available, Fremont and Mills counties will have to target traditional, existing programs at both the state and federal level. Those options include:

- USDA Rural Development
  - Community Facilities Loans and Grants
  - Broadband
  - Housing
  - Water/Sewer
  - Electric
  - Special Placemaking Grant

- EDA
  - Travel, Tourism and Outdoor Recreation
  - Good Jobs Challenge
- HUD
  - Multi-Family Project Development Loan Guarantees
  - Rural Housing Stability
  - CDBG
- EPA
- U.S. Army Corps of Engineers
- Federal Infrastructure Legislation
- State of Iowa IEDA/Empower Rural Iowa
- State of Iowa OCIO Broadband
- State of Iowa DOT
- State of Iowa IFA Housing Tax Credits
- State of Iowa IFA State Revolving Fund

CONCLUSION

This planning study is meant to serve as a tool to assist the communities in the Mills Fremont river corridor to plan and implement flood recovery and future development efforts in a way that is aligned with State of Iowa policies, programs, and priorities, and recognized best practices to evolve the greatest possibly resiliency and quality of life for all residents and property owners.

It is also intended to provide State elected officials and others with recommendations for policies, programs, and investments to best support these efforts to rebuild in a more sustainable way, and to demonstrate the potential that similar communities have throughout the state to achieve the same qualities and objectives.

The key takeaways from the study and process include:

- Despite the daunting challenge of rebuilding and improving the communities and their supporting services following the 2019 flood, and in light of ever-increasing unpredictability in extreme weather events, the assets and attributes of the region leveraged with emerging programs, resources, and anticipated regional infrastructure expansion/upgrades (transportation network, levee system, and others) can lead to a new era of improved quality of life and economic opportunity for current and future residents
- There are a number of challenges to rebuilding and improving community assets and regional infrastructure, but through the comprehensive, holistic approach suggested in this study, the future offers enormous potential to achieve the stated community goals and objectives
- Addressing and incorporating emerging trends and technologies in water/soil resource management, climate change mitigation, renewable energy, food systems/agricultural markets, eco-tourism, renewed interest in connection to nature, and others, the region has the potential to be a model for other rural regions and communities state-wide.

"... through the comprehensive, holistic approach suggested in this study, the future offers enormous potential to achieve the stated community goals and objectives."

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2

BACKGROUND

2.1 Regional / Community Descriptions

INTRODUCTION

The focus of this planning study is the western river plain portions of Mills and Fremont Counties (Iowa), the zone between the Loess Hills and the Missouri River. In particular, the focus of the study centers on three areas: the communities of Pacific Junction and Hamburg, Iowa, and the I-29 interchanges at Hwy. 34 and Hwy. 2.

This study was commissioned following a devastating flood disaster in spring of 2019 and so has a strong disaster recovery focus. It is comprehensive by nature, and also addresses issues of sustainability and resiliency relevant to most rural areas throughout Iowa. The study includes planning recommendations that are intended to help inform the near-term restoration of the affected communities in a way that integrates best practices in land use, infrastructure, and building with the restoration of longer-term sustainable ecological and economic land use concepts in mind.

"The study includes planning recommendations that are intended to help inform the near-term restoration of the affected communities in a way that integrates best practices in land use, infrastructure, and building with the restoration of longer-term sustainable ecological and economic land use concepts in mind."

CHARACTER OF THE REGION

History

From around 10,000 BC until the time of Western settlement in the mid-19th century, the broad river plain was an ecologically diverse prairie landscape interspersed with small, stable, base-flow streams and springs. The region was populated by several Native American tribes, including the Dakota Sioux, the Ioway, the Illini, the Otoe, and the Missouria. Each tribe had distinct cultures and ways of life and interacted with the landscape in a synergistic relationship to obtain all their daily needs, including food, clothing, building materials, medicines, and ceremonial plants.

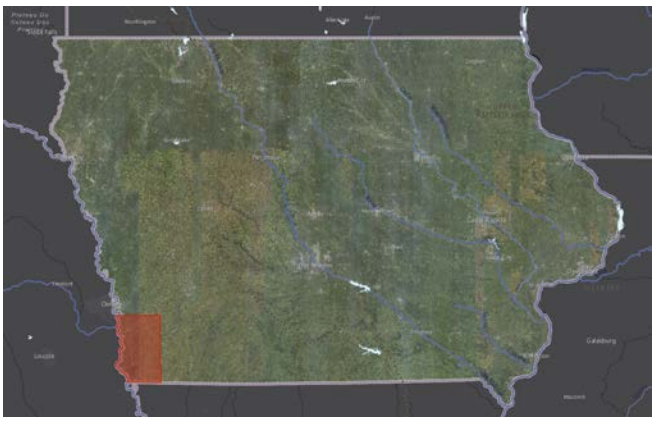


Figure 2.1-1. Planning Study Area.

In the mid-1800s, early settlers moving west from Illinois and other locations east introduced European agricultural practices, crops, and livestock, which adapted well to the rich, productive river plain soil and climate. The wind-blown soils of the Loess Hills largely prevented the portion of the study area in bluffs from being used for either agriculture or settlements. Since that time, the region has been primarily in agricultural land use. Much of the land is in seasonal row-crop agricultural production of corn and soybean rotations. Businesses that support the agricultural industry include grain processing and distribution.

The broad, open visual character of the region is heavily influenced by the dramatic topography of the Missouri River Valley, with the wooded slopes of the Nebraska side to the west and the Loess Hills rising to the east offering sublime beauty. Hunting, fishing, hiking, cycling, and other activities offer outdoor experiences for residents and visitors from

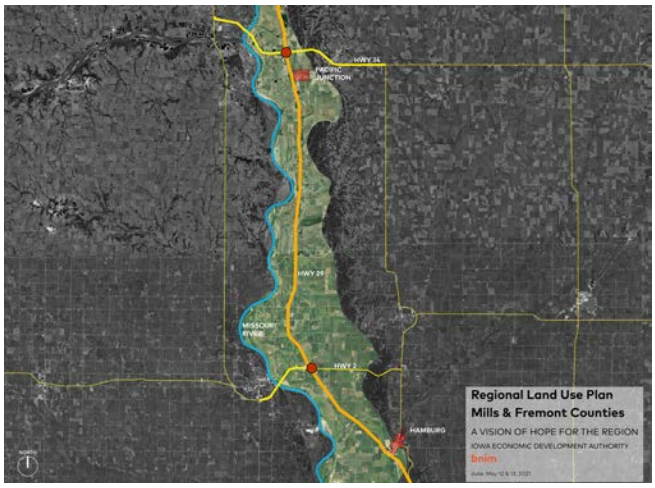


Figure 2.1-2. Regional map.

outside the region. The Loess Hills National Scenic Byway and the Lewis and Clark National Historic Trail attract weekend / seasonal travelers from Omaha, Kansas City, and beyond.

Flood of 2019

In the spring of 2019, following the wettest January-to-May season in U.S. history, the region experienced a catastrophic flooding event. Termed "The Great Flood of 2019" by the *New York Times*, the flood affected nearly 14 million people in multiple states, including at least three deaths in Iowa and Nebraska. The entire study area was severely impacted: the floodwaters dropped many feet of sand and silt onto large portions of the agricultural lands; roadways closed; the highway interchange areas were flooded; and emergency services were interrupted for days.

"...the broad river plain was an ecologically diverse prairie landscape interspersed with small, stable, base-flow streams and springs."

Figure 2.1-3. I-29 & Hwy 34 Interchange during 2019 flood event. Source: Des Moines Register.

Figure 2.1-4. South Hamburg during 2019 flood event. Source: Fremont County Emergency Management.

All of Pacific Junction and the southern portion of Hamburg were under several feet of water, and significant damage was sustained to homes and businesses. Some of the properties were subsequently bought out with FEMA funds, resulting in an altered planning framework as the basis for this study.

Pacific Junction

Pacific Junction (Mills County) was established in 1871 by the railroad industry to serve as a major rail interchange, with the eastern terminus of the Nebraska Burlington & Missouri River Railroad,

the western terminus of the Burlington & Missouri River Railroad, and providing a station on the Kansas City, Council Bluffs, & Saint Joseph Railroad. All three railroads were consolidated as part of the Chicago, Burlington and Quincy Railroad, which is now the Burlington Northern Santa Fe Railway (BNSF).

As it grew, Pacific Junction (PJ) was incorporated as a city in 1882. With jobs and businesses largely associated with serving the railroad industry, PJ's population peaked during the early 20th century at about 700 people and declined to under 500 as the railroad became more automated and required fewer and fewer workers.

As the railroad jobs diminished, Pacific Junction became largely residential with homes, a restaurant, museum, bank, church, and city services occupying most of the incorporated area. The town is a compact traditional town layout with mature canopy trees and a range of housing types/styles. Some historic homes and structures remain, the most significant of which is the 1914 Pacific Junction Public School, which graduated its last high school class in 1961 and closed permanently in 1986. Mills County seat, Glenwood, is approximately five miles to the northeast, and Pacific Junction is part of the Glenwood school and municipal utility (water, sewer, fire protection) districts. Railroad use, with trains passing through town, remains quite high with freight traffic at approximately forty trains per day.

Figure 2.1-5. Pacific Junction during 2019 flood event. Source: Wowt.com.

Figure 2.1-6. Buyout property in Pacific Junction (May 2021).

Pacific Junction was completely inundated with over eight feet of floodwaters in the 2019 flood event and had to be completely evacuated. Many of the homes and buildings suffered significant or total damage. Some residents have returned and rebuilt their homes, many have not; the 2020 census indicated a population of under 100. A number of the homes are still in the process of being bought-out by FEMA. Once these buy-outs are completed, they will be owned by the City of Pacific Junction and will be deed-restricted. These buy-out lots are dispersed across the town, and the community is concerned about the long-term use

Figure 2.1-7. Buyout map for Pacific Junction.

and maintenance of these properties. These buyout lots are shown in red in the image. The city also owns a buyout area (outlined in yellow on the map) that was purchased with funds outside of the FEMA process, are not deed-restricted, and can be used for future residential development.

I-29 / Hwy 34 Interchange

The interchange at 1-29 and Hwy 34 in Mills County is at the southern edge of the Omaha / Council Bluffs area and provides convenient access to several commercial businesses, the Midlands Raceway Park, a regional attraction, and Pacific Junction. The interchange area includes a recently improved service station/convenience store, which was impacted by the 2019 flood. Mills County has planned for a large area of land immediately southwest of the interchange to be developed with commercial-distribution-warehousing uses, which could be served by both highway and rail access.

Figure 2.1-8. Aerial map of Hwy 34 interchange.

Hamburg

Hamburg (Fremont County) is situated on the edge of the Loess Hills less than a quarter mile north of the Iowa-Missouri state line. Named after the German city, Hamburg was established following the Platte Purchase of former Native American territory, which opened the door to an influx of settlers of European descent. Available land adjacent to the Missouri River attracted people to the area once it became available.

The city was laid out and platted in 1857 with a traditional grid oriented diagonally towards the Missouri River. The south end of town was originally within about two miles of the river before the main channel bypassed the nearby bend. The town stretches from the river plain up into the base of the Loess Hills bluff, creating a picturesque setting.

Within about twenty years of platting, Hamburg was connected to two railroad lines. The town has had several major industries over the decades, including a mail-order flower and seed company (Inter-state Nurseries), fruit orchards, and a popcorn producer (Vogel Popcorn, purchased and now owned and operated by ConAgra Foods) headquartered in the city. Its popcorn is used in national brands Act II and Orville Redenbacher's.

Figure 2.1-9. Hamburg Main Street during 2019 flood event. Source: Iowa Public Television.

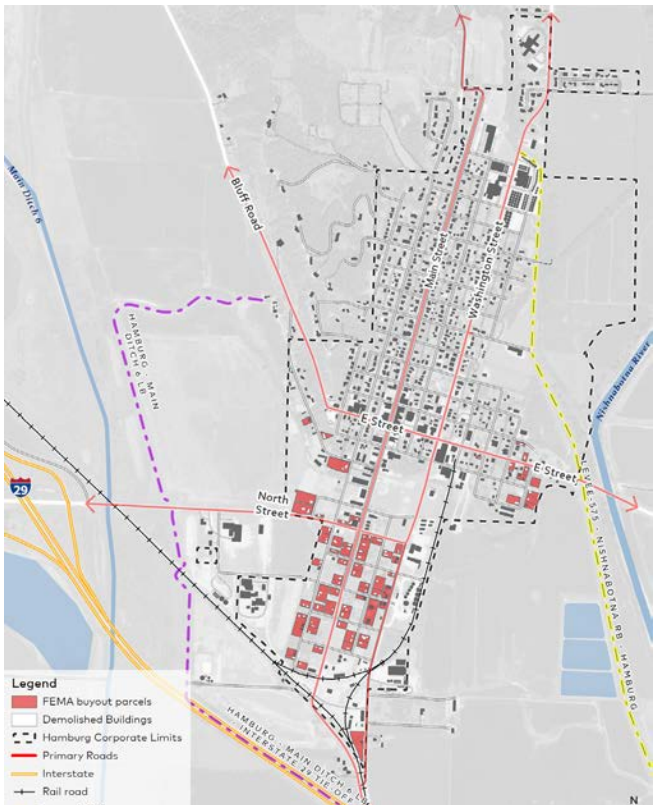


Figure 2.1-10. Buyout property map, Hamburg, Iowa; buy-out properties shown in red.

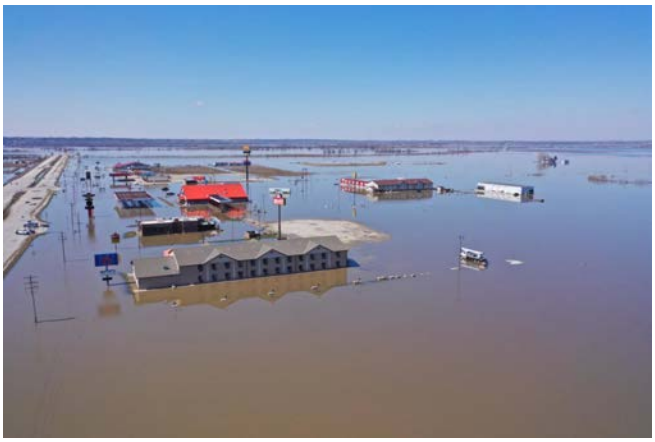


Figure 2.1-11. I29 & Hwy 2 Interchange during 2019 flood event. Source: Fremont County Emergency Management.

Hamburg's population grew to a peak of over 2,000 in the 1940s, and then slowly declined as some jobs were centralized or outsourced to around 1,200 (prior to the 2019 flood). In addition to ConAgra popcorn, major industries include Manildra and Bartlett Seed (agricultural processing/distribution) and AgriVision, a regional John Deere agricultural equipment dealer.

Hamburg's Main Street has several blocks of shops and businesses, many in older historic buildings, including a meat processing facility that handles much of the game from regional hunting, antique stores, a coffee shop, a popular restaurant (the Blue Moon Saloon), and the famous Stoner Drug. Hamburg has a local K-8 school at the north end of town. The former historic movie theater is owned by the City and used for public meetings, gatherings/events, and performances.

Hamburg's residents range from singles and young families to retired and elderly citizens with varying levels of mobility. Residences include an associated range of homes, from modest single- and multi-family residences to larger homes on Main Street and on the bluff overlooking the river valley. The local high school closed in 2011, which was recently purchased and occupied by St. Cornelius Orthodox Christian Retreat Center, and is being renovated to include meeting/performance space, a gym/workout space, and other amenities available to the community.

Hamburg has also been severely impacted by flooding throughout its history, including the 2019 event, which flooded about half of the city forcing residents to evacuate. The City is somewhat protected by a levee system (although it is not sufficient in larger flood events), which the City is now working to reconstruct/improve. The homes and businesses damaged in the flood were located towards the southern end of town (lower elevation); some properties in the area had been bought out in

Figure 2.1-12. Aerial map of Hwy 2 interchange.

Figure 2.1-13. Fremont County Project Site - Hamburg & Hwy 2 Interchange.

previous flood events and are owned by the City. Additional properties were bought out by FEMA and are now deed-restricted. Most of the residents and businesses have returned and repaired/rebuilt; the 2020 census indicates a population of under 900.

I-29 / Hwy 2 Interchange

The interchange at 1-29 and Hwy 2 in Fremont County is also a key gateway to access Hamburg to the east, and Nebraska City, Nebraska to the west. The interchange is currently developed with several highway-oriented uses, including service stations, a convenience store, and other retail/business uses. This interchange area was impacted by the 2019 flood and has not been fully renovated to pre-flood uses. Hwy 2 west of the interchange has been reconstructed and elevated to be more resilient to future flooding.

2.2 Integrated Planning Process

INTRODUCTION

The creation of a Comprehensive Land Use Plan for a region that covers two counties requires extensive and integrative engagement with a broad spectrum of representatives across the area. This includes civic and business leaders, various organizations that represent critical interest groups, and residents. The approach that the planning team used relied on regularly scheduled meetings that correlated with the type of engagement and input that was needed along the way. While the planning team met weekly to share new information and integrate strategies, the engagement with partners occurred more or less monthly to ensure that progress was being made, that all were informed of the planning team's direction (and to provide feedback on the work), and to ensure the significant breadth of information and parallel initiatives were absorbed and correlated. The following narrative describes the different tiers of stakeholders and the integrative planning process.

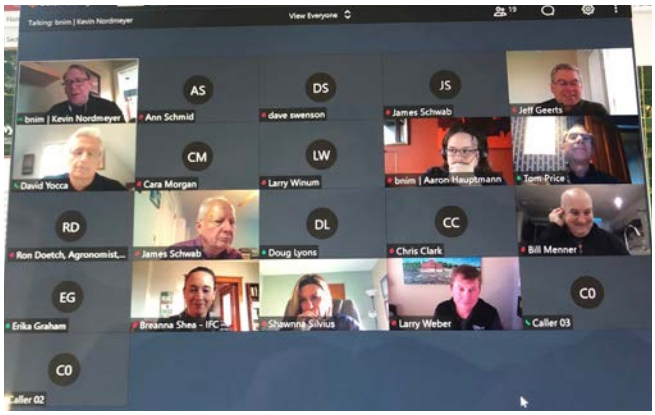


Figure 2.2-1. Community meetings were held in-person using pandemic protocols and online (as shown here) when COVID cases were rising.

STAKEHOLDERS

Project Partners

Planning partners for the duration of this effort include representatives from:

- The Iowa Flood Center (IFC)
- Iowa Department of Agriculture and Land Stewardship (IDALS)
- Iowa Department of Natural Resources (IDNR)
- Iowa Department of Transportation
- Safeguard Iowa Partnership (SIP)
- Metropolitan Area Planning Agency (MAPA)
- Mills County Economic Development (MCED)
- Southwest Iowa Planning Council (SWIPCO)

These are agencies IEDA identified in the original grant to the U.S. Department of Commerce. Beginning January 6, 2021, the planning team hosted online conversations with this group.

Stakeholder Steering Committee

In addition to the partners above, the planning team regularly engaged these key stakeholders, all of whom were invaluable resources for the effort:

- City of Hamburg
- City of Pacific Junction
- City of Glenwood
- Fremont County Board of Supervisors
- Mills County Board of Supervisors
- Golden Hills RC&D
- Mills County Economic Development Foundation
- Glenwood State Bank
- Shenandoah Chamber & Industry Assoc.

Other Project Contributors
Other interested parties were added to the effort as new information was revealed and strategies developed, including but not limited to these groups who participated in topical meetings during the project and/or contributed information:

- Iowa Department of Natural Resources (IDNR)
- US Army Corps of Engineers (USACE)
- Mills County Emergency Management
- Fremont County Emergency Management
- Iowa Homeland Security and Emergency Management (IHSEM)
- Burlington Northern Santa Fe Railroad (BNSF)
- Sustainable Iowa Land Trust (SILT)
- Nishnabotna Watershed Project Board

ENGAGEMENT

Planning Kickoff Meeting
The design team first visited the Mills and Fremont Counties region on October 1, 2020, for a kickoff meeting with both Partners and Steering Committee members identified above. This day long event included an initial convening at Hamburg City Hall and tour of the area. There was a relatively brief visit to the I-29/Hwy 2 interchange before continuing to Pacific Junction for a tour of the town and a drive by the I-29/Hwy 34 interchange.

The day was rounded out by a working session at Pony Creek Conservation Park where all participants discussed guiding principles, community concerns, opportunities, and responses to the following questions posed by the planning team:

- What are the things that you love the most about your community (i.e. Hamburg, Pacific Junction, Glenwood, region)?
- What things would make living in your community better (in addition to some degree of flooding risk reduction)?
- What do you envision your community to be like in 50 years?
- What challenges or barriers (in addition to issues associated with flooding) do you see in achieving that vision?

Fig. 2.2-2. In-person Planning Kickoff Meeting held at Pony Creek Conservation Park.

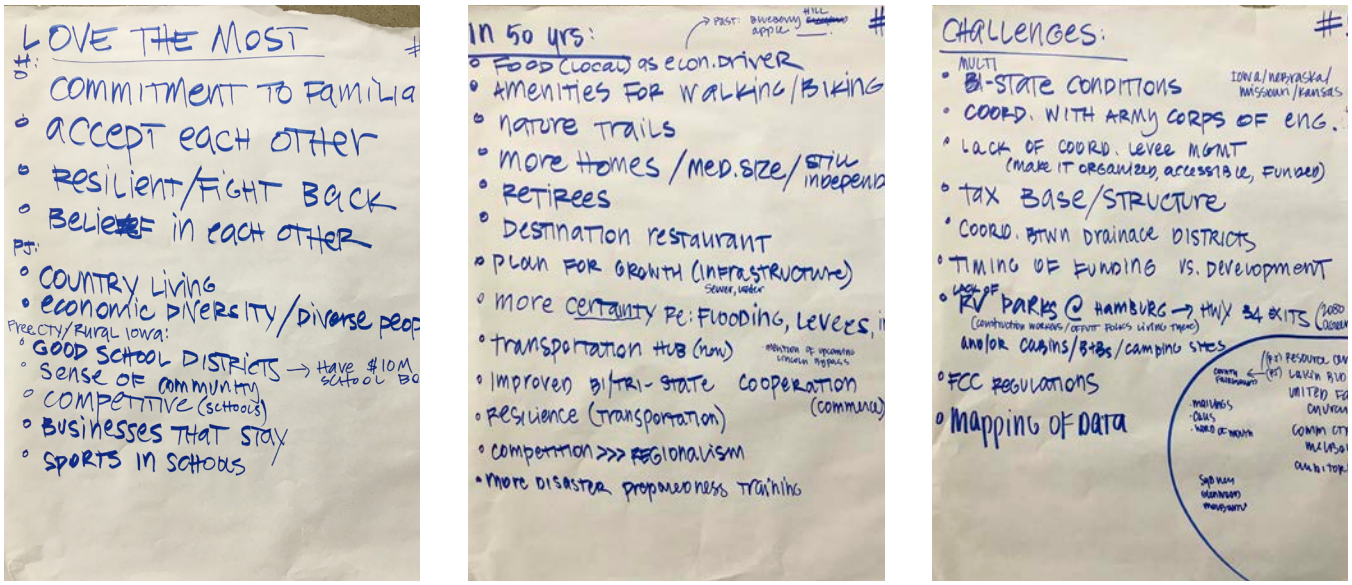


Fig. 2.2-3. Sample of input gathered during Planning Kickoff Meeting.

A full listing of feedback received during this session can be found in the Appendix.

Public Meetings / Community Workshops

General

The design team facilitated public meetings at three points during the planning process.

- October 28-29, 2020: In-person meetings in Pacific Junction and in Hamburg
- December 2-3, 2020: on Pacific Junction, Hamburg, Hwy 2 Interchange, and Hwy 34 Interchange
- May 12-13, 2021: In-person meetings in Pacific Junction and in Hamburg

Fall 2020

In-person Pacific Junction meetings were held at the PJ Emergency Center / Fire Station; Hamburg meetings were held at the Colonial Theater. Due to the pandemic, in-person meetings were modified to allow participation by employing standard protective measures including mask-wearing and social distancing. Numbers of attendees were also limited to avoid crowding.

The first public meetings in October (in-person) and December (online) 2020 had similar agendas:

- Presentation on the background of the land use planning project, including intentions, goals, and scope of work
- Presentation of other disaster recovery efforts and initial ideas for goals and strategies for each community
- Feedback received from attendees identifying key places in the community that are meaningful and aspects of the community that make their town a desirable place to live
- Final review of guiding principles and time for questions and answers

A full listing of feedback from these meetings can be found in the Appendix.

Fig. 2.2-4. In-person community meeting in Pacific Junction at the Emergency Center / Fire Station.

Fig. 2.2-5. In-person community meeting in Hamburg at the Colonial Theater.

Spring 2021

On-Going Community Conversations

The in-person public meetings in May 2021 continued the conversation with the communities, looking for feedback on specific ideas that the planning team has been investigating. The meetings included this format:

- Abbreviated review of project scope, schedule, and goals for the day
- Statement of the regional vision
- Overview of previously stated goals of:
  - Community/Uniqueness
  - Health / Connectedness
  - Stability / Predictability
  - Opportunity / Prosperity
  - Education / Demonstration
- Presentation by the Iowa Flood Center including overview of work-in-progress, levee status, and next steps
- Review of Draft Land Use Strategies that support the goals, including:
  - Gateways / connections / greenways
  - Green infrastructure
  - Replacement housing
  - Adaptive re-use of buyout land
  - Local food / food-based economy
  - Economic development / future growth
  - Public input on strategies (by voice and by written feedback via printed handout) and closing announcements

Feedback from Pacific Junction Meeting

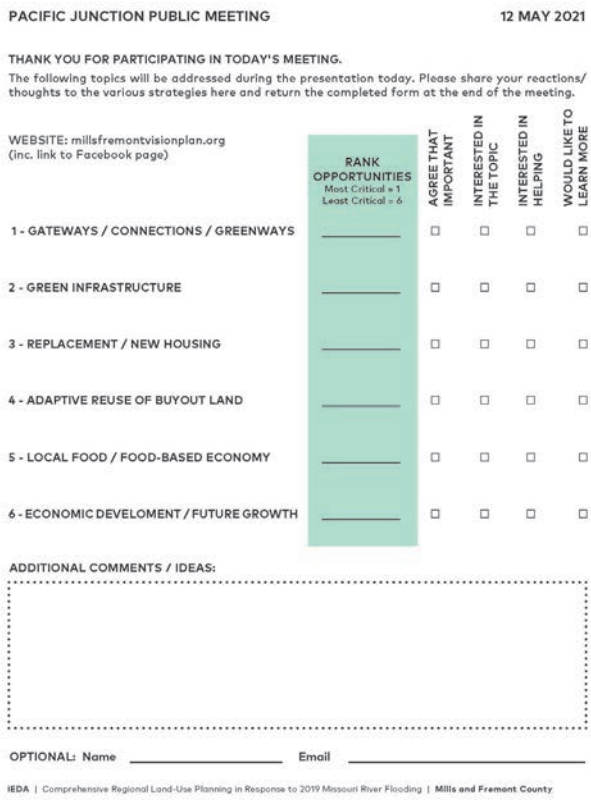
An abbreviated list of ideas shared from the Pacific Junction community follows:

- CDBG funding for original school building; possible addition of residential units and community uses
- Opportunities for use of now vacant lots
- Street and streetscape improvements
- Investment in levee improvements (connected to comfort of future investments)
- Opportunities connected to bike trails and local businesses

Fig. 2.2-6. Pacific Junction meeting handout.

Fig. 2.2-7. Hamburg meeting handout.

Fig. 2-2.8. Follow-up community meeting in Pacific Junction.



PACIFIC JUNCTION PUBLIC MEETING 12 MAY 2021

THANK YOU FOR PARTICIPATING IN TODAY'S MEETING.

The following topics will be addressed during the presentation today. Please share your reactions/ thoughts to the various strategies here and return the completed form at the end of the meeting.

WEBSITE: millsfremontvisionplan.org
(inc. link to Facebook page)

	RANK OPPORTUNITIES Most Critical = 1 Least Critical = 6	AGREE THAT IMPORTANT	INTERESTED IN THE TOPIC	INTERESTED IN HELPING	WOULD LIKE TO LEARN MORE
1 - GATEWAYS / CONNECTIONS / GREENWAYS		☐	☐	☐	☐
2 - GREEN INFRASTRUCTURE		☐	☐	☐	☐
3 - REPLACEMENT / NEW HOUSING		☐	☐	☐	☐
4 - ADAPTIVE REUSE OF BUYOUT LAND		☐	☐	☐	☐
5 - LOCAL FOOD / FOOD-BASED ECONOMY		☐	☐	☐	☐
6 - ECONOMIC DEVELOMENT / FUTURE GROWTH		☐	☐	☐	☐

ADDITIONAL COMMENTS / IDEAS:

OPTIONAL: Name _____ Email _____

IEDA | Comprehensive Regional Land-Use Planning in Response to 2019 Missouri River Flooding | Mills and Fremont County

Fig. 2.2-9. Meeting handout soliciting input on guiding principles and prioritization of planning strategies.

- Use of levee for hiking and connection to the river
- Consideration of residences for both young families and seniors

There were also on-going questions about the status of buy-out lots and possible uses for those allowed by FEMA and other regulatory agencies.

Possible conversion of the city park land to buildable lots was mentioned as well as potential synergy between railway land and city benefits.

Feedback from Hamburg Meeting

An abbreviated list of ideas shared from the Hamburg community follows:

- Opportunities from riders/visitors using the bike and hiking trails, as well as the scenic byways
- Upgrades to city sewers
- Need for high-speed internet service
- Opportunities and need for senior housing and other affordable and accessible options
- Potential for more residents due to pandemic trends of working-from-home
- Support for green infrastructure at main streets
- Improvements at community pool
- Viable opportunities for lots south of town including RV park, gardens, improved image for visitors arriving from I-29

As in Pacific Junction, there were on-going questions about status of buyout lots and potential uses of this land, status of infrastructure in the south part of town (lower elevations), as well as levee improvement opportunities and benefits.

In these meetings, a handout was provided to each attendee for reference during the meeting and to provide written feedback as well based on the presentation. Attendees were asked to rank the Draft Land Use Strategies noted above and to provide additional thoughts/comments based on the presentation.

While the planning team was in southwest Iowa, planned and impromptu smaller meetings with various stakeholders were also held within the community.

Student Input

One community meeting of note was a visit to the Hamburg Community Schools where a few members from the planning team met with a half dozen middle-schoolers. The side callout here identifies a sample of community amenities desired by this age group.

Other Meetings

The design team also met with a number of other community members in smaller scale meetings, including private citizens, business owner/ representatives, and other organizations to share background on the planning effort and solicit input on ideas and strategies that could be incorporated into the Comprehensive Land Use Plan. Examples of participants in these more focused conversations include:

- BNSF Railway
- Nishnabotna River Watershed Coalition
- U.S. Army Corps of Engineers
- City leadership from Hamburg and Pacific Junction
- Multiple other local and regional business, government, and civic leaders

IDEAS FROM HAMBURG COMMUNITY SCHOOLS' STUDENTS

- More amenities at the park, including a splash pad; something to do while hanging out with friends
- Roller skating venue, like in Shenandoah
- Bowling lanes, like in Nebraska City
- Tennis courts
- High School; deep desire to have a high school back in Hamburg, which was closed in 2011.
- Bike and cross-country trails; this was expressed as a real need. For cross-country, 1.6-mile trails for the middle school and 3.1-mile trails for the high school.
- Arcade
- Golf driving range, like in Shenandoah
- Mini-golf
- Soccer field
- Restaurants like DQ, Sonic, and Genji, plus a taco place and an ice cream shop
- Designated truck parking area
- Great interest in the pond where levee fill is being excavated: swimming, kayaking, fish habitat, camping, trails around, rental cabins.

3 ISSUES / ASSETS / OPPORTUNITIES

3.1 Regional River Hydrology

Southwest Iowa communities are subjected to floods originating in large regional watersheds like the Missouri and Platte River Watersheds, and smaller contributing drainage areas like the Nishnabotna River Watershed. The scale of these watersheds can be seen in Figure 3-1.1. Any combination of hydrologic conditions and precipitation events resulting in sufficient runoff can potentially lead to flooding. Historically, antecedent conditions and precipitation events have run the whole spectrum – from single moderate precipitation events landing on frozen, snow-covered ground, to snow melt occurring in the Rocky Mountains followed by several spring rainfall events.

Figure 3.1-1. Watershed map for southwest Iowa.

Much of the upstream Missouri River drainage area is regulated for flood control by a series of reservoir projects constructed by the U.S. Army Corps of Engineers. However, the reservoir system can be overwhelmed, most recently occurring during the 2011 Flood. Flood flows originating from the Missouri River have historically been long duration events, sustained for weeks or months. The Platte River, a tributary to the Missouri River, is largely not regulated for flood control, and together with its large drainage area can produce high, long duration flood flows, at times larger than flows on the Missouri River, as occurred during the March 2019 Flood.

While regional hydrologic events can lead to relatively large, long duration flooding on the Missouri River, localized storm events occurring within tributary watersheds like Keg, Pony, or the Nishnabotna watersheds can quickly generate intense, short-duration flooding events for Southwest Iowa. Similarly, these localized floods on smaller tributary streams can devastate communities, requiring many years to recover. The relatively small area of these tributary watersheds allows hydrologic conditions to change more quickly, and flooding can occur from much smaller, intense storm events. Heavy localized precipitation from convective storms often occurs within this region, and even with relatively dry antecedent conditions, soils can quickly become saturated, leading to significant runoff, as it did during the June 1998 Nishnabotna River Flood. Even moderate precipitation falling on wet or frozen ground can generate significant runoff, as it did in March 2019.

"While regional hydrologic events can lead to relatively large, long duration flooding on the Missouri River, localized storm events occurring within tributary watersheds like Keg, Pony, or the Nishnabotna watersheds can quickly generate intense, short-duration flooding events for Southwest Iowa.

3.2 Levee System and Floodplain Mapping

3.2.1 LEVEE SYSTEM

Introduction

Levee systems line the Missouri River and tributaries beginning at Omaha and continuing downstream past Hamburg, Iowa and into the state of Missouri. The levees have protected the Missouri River valley from numerous high flow events, encouraging continued farming and development in the Missouri River floodplain. However, when the levee system is overwhelmed, as it was in 2011 and 2019, flooding is devastating, wide-spread, and long lasting.

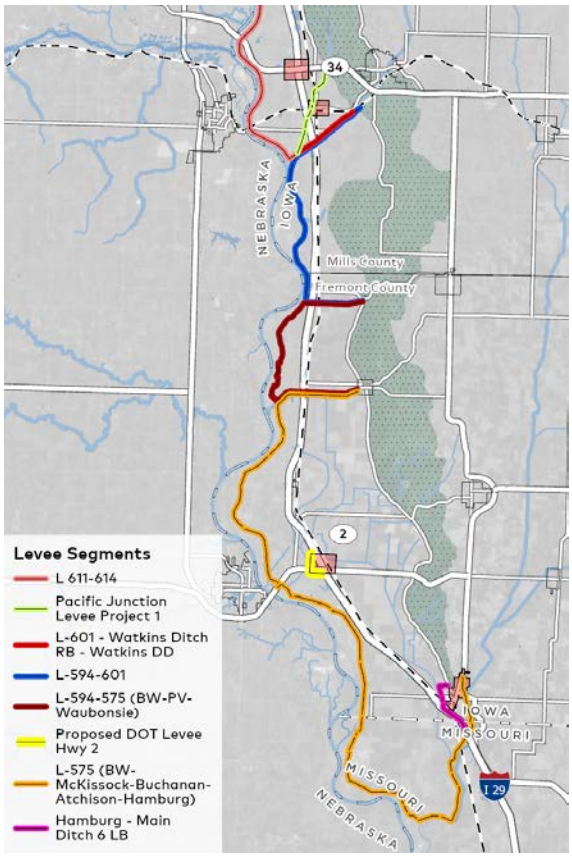


Figure 3.2-1. Levee configuration for study area.

> *"...when the levee system is overwhelmed, as it was in 2011 and 2019, flooding is devastating, wide-spread, and long lasting."*

Levee Information collected from the National Levee Database (NLD), the Corps Levee Sponsorship spreadsheet, and team communications during this planning project are summarized in the spreadsheet in the Appendix. The spreadsheet lists all the levee Systems in Mills and Fremont Counties along with a listing of the Segments within each of the Systems. The System references include links to the NLD. For each levee System and Segment, information is provided as described below. (Note that references to "right bank" and "left bank" are based on looking downstream.)

- Levee sponsor: This is the organization responsible for levee maintenance. Undefined indicates that no organization has been designated.
- Federal Levee/Non-Project: These two columns indicate whether the Segment was designed/ built by the Corps or by a local entity. Typically, levees built by a local entity are non-project levees. Typically, non-project segments damaged during a flood will not be repaired by the Corps.
- USACE rehabilitation Status: Levee Systems active in the Corp rehabilitation program (PL84-99) and damaged during a flood will be repaired by the Corps. Levees must be maintained and documented by the local sponsor to remain active in the program.
- Overtopping Annual Exceedance Probability (AEP)/Risk level: This refers to the probability of segment overtopping. A probability of 0.01 (or 1%) is equivalent to a 100-year event (1/0.01=100). These values may not be accurate for current watershed conditions and precipitation frequencies.
- Accreditation status: For FEMA floodplain mapping purposes, an accredited levee has been documented to meet all the requirements of 44 CFR 65.10 and therefore locations within the levee protected area would be mapped as Zone X (outside the 100-year floodplain). See

also Section 3.3.2 regarding mapping where levees that are not fully accredited due to inadequate levee height or otherwise do not meet the freeboard requirements of 44 CFR 65.10. Levee Systems must be re-accredited each time FEMA updates the floodplain mapping for an area.
- FEMA Region: All of Mills and Fremont Counties are located within Region 7 of FEMA's administrative districts.
- Levee District Contact / Company / phone / email: When available, contact information for each levee district is provided.

Pacific Junction Levees

The L-611-614 levee system (often referred to as the M&P levee) protects the Route 34 study area but does not protect Pacific Junction proper. This levee system is currently under accreditation study which is anticipated to be completed by late 2022. Most of this levee system is in the Corps Rehabilitation program (PL84-99 program) with the exception of the Lower Pony Creek right bank segment.

The L-601-Watkins Ditch levee system is the levee that protects Pacific Junction proper. The Creek to the southeast of PJ is often referred to as Keg Creek. However, the name of the system in the NLD is Watkins Creek. This levee system is inactive relative to the Corps rehab program. (The reason for being inactive is not given but may be due to lack of maintenance or maintenance records.) The level of flood protection of the levee Segments is reported to be 500-year (AEP=0.002) in the NLD but this is likely outdated. The Watkins Creek Segment was Federally constructed and the levee sponsor responsible for maintenance is the Watkins Drainage District. The Pony Creek segment was locally constructed and the levee sponsor responsible for maintenance is unknown. Neither segment is active in the Corps rehabilitation program, which typically means the Corps will not repair the levee segments if they are damaged during a flood. This levee system is indicated in the NLD as being accredited. However, FEMA is in the process of remapping this area and, to date, the levee has not been certified as meeting the 44 CFR 65.10 standards and therefore cannot be accredited. If an accreditation study is completed and it shows the system meets standards prior to the remapping study, the area would continue to be mapped outside the 100-year floodplain. However, as discussed in the Freeboard Analysis section (3.3.3), modeling by the Iowa Flood Center (IFC) indicates that most reaches have inadequate freeboard and some reaches are below 100-year flood stage.

Hamburg Levees

The L-575 Levee protects Hamburg from Missouri River and Nishnabotna River flooding. It also protects the Highway 2 area from flooding. The flood protection level of the various segments is quite variable, ranging from "not reported" to 500-year (AEP = 0.002). The protection level for the system, overall, is only reported to be 20-year (AEP = 0.05) in the NLD and therefore could not be certified or accredited as-is. This levee system is active in the Corps Rehab program. This levee is reported in the NLD as being an accredited levee system. However, FEMA is in the process of remapping this area and, to date, the levee has not been certified as meeting the 44 CFR 65.10 standards and therefore cannot be accredited. If an accreditation study is completed and it shows the system meets standards prior to the remapping study, the area could be mapped outside the 100-year floodplain. However, as discussed in the Freeboard Analysis section (3.3.3), modeling by the Iowa Flood Center (IFC) indicates that most reaches have inadequate freeboard and some reaches are below 100-year flood stage.

The Ditch 6 levee System also protects Hamburg. The Ditch 6 segment is a Federal levee but the Interstate 29 segment is a local levee connecting the Ditch 6 levee to the Nishnabotna levee along Interstate 29. This System is currently non-accredited in the NLD. An AEP is not provided in

the NLD but it is known that the existing profile is too low to provide 100-year protection. To reduce flood risk in Hamburg, the Corps and the City of Hamburg are reconstructing the Ditch 6 Segment. Hamburg officials are coordinating construction of the Ditch 6 levee with the IDOT elevating Highway 333 and BNSF Railway for closure structures where Ditch 6 cross these transportation routes.

3.2.2 FEMA FLOODPLAIN MAPPING

Introduction
The Federal Emergency Management Agency (FEMA) administers the National Flood Insurance Program (NFIP). As part of this program, Flood Insurance Rate Maps (FIRMs) are developed for communities to determine areas most at risk of flooding and sets insurance rates accordingly. The FIRM are often referred to as floodplain maps. A link is provided for the FIRM panels for Pacific Junction and Hamburg and vicinities from the FEMA Flood Mapping Service Center. For Pacific Junction, the maps are the current effective maps. For Hamburg, the maps are the best available information, which are the Preliminary Maps.

The FEMA maps are used for two primary purposes – insurance and regulation. When a property is located in Zone A or the Special Flood Hazard Area (typically the 100-year floodplain), Flood insurance is required to obtain a federally backed loan and most banks require it even when the loan isn't federally backed. The cost of insurance has historically been subsidized under the NFIP but FEMA is gradually reducing the subsidy and the insurance premiums will transition to actuarially-based rates. In many cases, the increase will be substantial.

FEMA maps are also used for regulation. New structures and substantially improved structures in the 100-year floodplain are required to elevate or otherwise floodproof. Residential structures are typically required to elevate above the base flood

"The FEMA maps are used for two primary purposes – insurance and regulation."

elevation (100-year) with a foot of freeboard but commercial structures are allowed to dry floodproof to prevent entry of water into the building.

The next two sections describe the mapping procedures for accredited and non-accredited levees.

Non-Accredited Levee Mapping Procedures
When levee systems are non-accredited, there are defined procedures for how to map the floodplain, taking into account the non-accredited levees that are present. This is in contrast to procedures used prior to July 2013 FEMA guidance that directed use of the "without levee" approach. This earlier approach simply assumed the levees were not present. More technologically advanced data collection and modeling methods allow for the post-2013, more refined, procedures.

There are five basic procedures to floodplain mapping under the 2013 guidance. The conditions under which those procedures are used are listed below and described in greater detail further below. The conditions listed below are in order of most protective to least protective against flooding.

1. Sound
2. Sound but Freeboard deficient
3. Overtopping
4. Structural based overtopping
5. Natural Valley

Typically different conditions will exist for different reaches of a levee system and the mapping procedure used for the system will often be a hybrid of those referenced. Figure 3.2-2 below indicates the conditions under which the various mapping procedures may be used.

Areas between the natural valley flood zone and the reduced flood zone resulting from the other procedures are designated as Zone D. (If the levee system is accredited, the area will all be Zone X) Zone D areas are still at risk but less than Zone A areas. Zone D is generally used when the levee is high enough to reduce the area of flooding but is not accredited due to insufficient freeboard. Zone D areas are not required to purchase flood insurance and have no FEMA-specified building elevation or other requirements. Zone D is at greater risk and less preferable than Zone X but better than Zone A in terms of land use and building restrictions.

Table 4: Summary of Stakeholder Data Requirements for Reach Analysis Procedures

Data Element	Applicable Portion of CFR	Reach Analysis Procedures				
		Sound	Freeboard Deficient	Overtopping Approach	Structural Based Inundation	Natural Valley
Elevation Information for Levee Crest and Toe	N/A	Required	Required	Required	Required	N/A
BFE + Freeboard Less than Levee Crest	44 CFR 65.10(b)(1)	Required	N/A	N/A	N/A	N/A
BFE Less than Levee Crest	N/A	Required	Required	N/A	N/A	N/A
O&M Plan	44 CFR 65.10(c)	Required	Required	Required	Recommended	N/A
Structural Design Requirements	44 CFR 65.10(b)(2) – 44 CFR 65.10(b)(7)	Required	Required	Required	N/A	N/A
Inspection Reports	44 CFR 65.10(c)(2)(iv)	Required	Required	Required	Recommended	N/A
Evaluation of Overtopping Erosion Potential	N/A	N/A	N/A	Required	N/A	N/A

Figure 3.2-2. Reach analysis procedures.

The procedures used to determine the flood zone are described below in reverse order from the previous list. They are discussed in order of least protective to most protective because Natural Valley is the base condition, essentially assuming no levees.

Natural Valley Analysis Procedure

This procedure includes the cross-section of the levee in the model such that it is not available for conveyance but otherwise ignores the levee and assumes the flood elevation is the same on the riverside and landside of the levee. This method is typically used when the base flood elevation is much higher than the levee crest such that the levees are hydraulically insignificant. Areas below the natural valley flood stage are designated Zone AE. This procedure also determines the outer edge of Zone D for the subsequent procedures. This would not be the preferred or appropriate approach for any of this plan's study area.

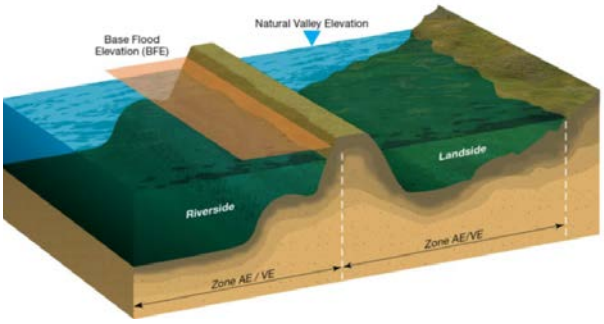


Figure 3.2-3. Cross section of a reach modeled using Natural Valley Procedure.

Structural Based Inundation Procedure

This approach models assumed levee breaches and there are procedures outlined in terms of the size, shape, and location of the breach. This approach is typically used when the levee crest is lower than the BFE and when there is insufficient data to verify structural integrity of the levee or there are known defects that would result in a breach if the levee overtopped. This approach will typically result in the landside flood stage being lower than the riverside. This approach can sometimes produce landside flood elevations that are higher than the Natural Valley (because the riverside flood stage will be much higher than the natural valley) but typically the landside stage will be lower because relatively small amounts of water pass through the breach and flow down the landside of the levee. Areas below the modeled flood elevation would be designated Zone AE and areas between this elevation and the natural valley elevation would be designated Zone D.

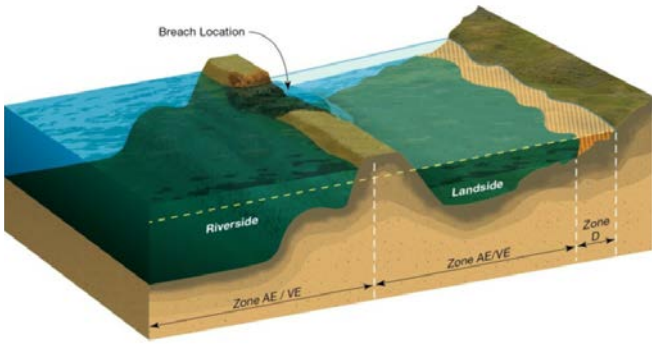


Figure 3.2-4. Cross section of a reach modeled using Structural Based Inundation Procedure.

Overtopping Procedure

This procedure models overtopping without breaching and is used when there are areas specifically armored against overtopping or the overtopping is sufficiently small or brief that structural failure would not be expected to occur. This can be used when the levee meets all the requirements of 44 CFR 65.10 except (b)(1) (i.e, meets structural requirements). Typically this would result in lower landside flood stages than the Natural Valley or the structural-based. Areas below the modeled flood elevation would be designated Zone AE and areas between this elevation and the natural valley elevation would be designated Zone D. This could potentially be used for the Nishnabotna levee, with a designated overflow location on the side opposite Hamburg.

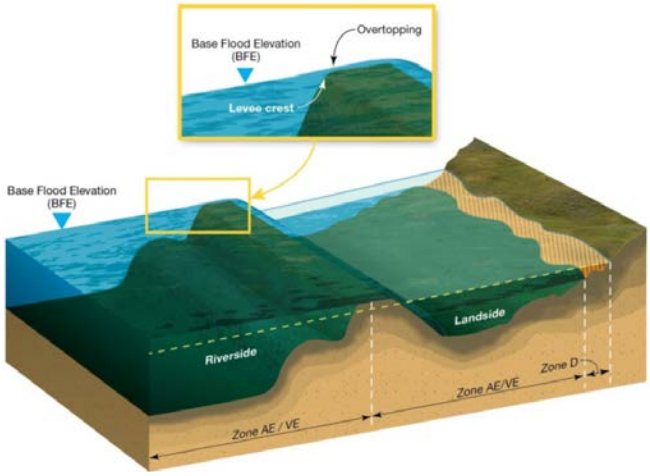


Figure 3.2-5. Cross section of a reach modeled using Overtopping Procedure.

Freeboard Deficient Procedure

This procedure is used when the levee has inadequate freeboard but otherwise meets the requirements of 44 CFR 65.10 and has an approved O&M Plan. Areas below the natural valley elevation would all be designated Zone D except areas flooded due to interior drainage.

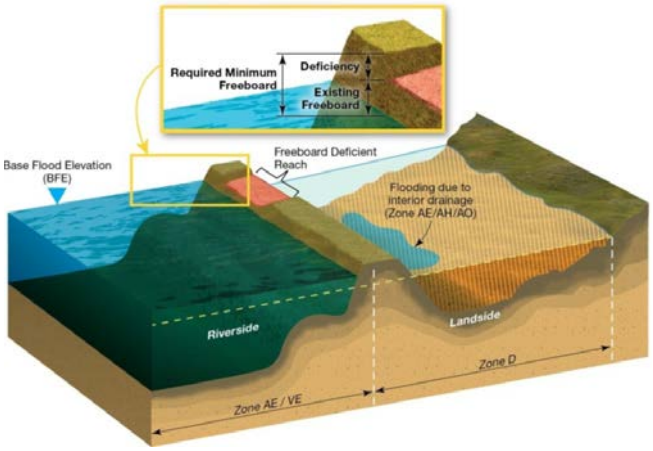


Figure 3.2-6. Cross section of a reach modeled using Freeboard Deficient Procedure.

Sound Levee Procedure

This would produce the same Zone D and Zone AE as the Freeboard deficient procedure. The modeling procedure is the same as would be used for an accredited levee and the only mapping difference between this and accredited levee is that the area below the natural valley flood height would be designated as Zone D rather than Zone X.

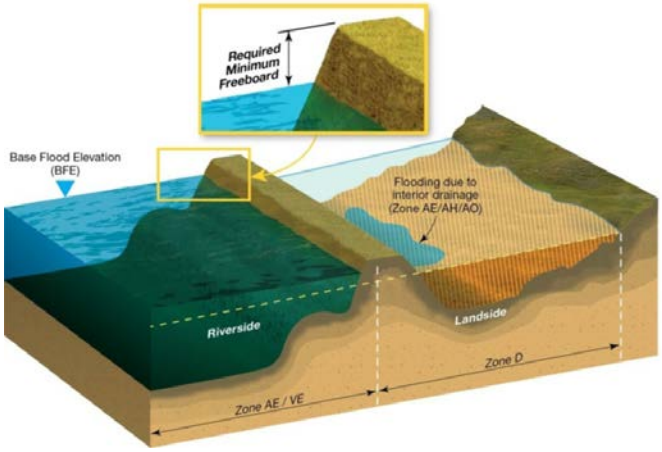


Figure 3.2-7. Cross section of a reach modeled using Sound Levee Procedure.

Levee Alternatives

Pacific Junction

Depending on the outcome of the current Missouri River L611-614 levee study and the availability of funding to make necessary improvements, it should be feasible to keep the Route 34 interchange and vicinity out of the floodplain. However, an alternative to the levee improvements would be to raise the entire area above the base flood elevation plus freeboard. This would require approximately 10M cubic yards of material to raise the roughly 1 square mile potential development area south of the interchange an average of ten feet. At $10/CY for fill material and grading, the cost would be approximately $160,000/acre or $100M to raise the entire square mile area. Given the value of land in the area and local resources, this would likely be infeasible without significant State or Federal financial assistance. Depending on the findings of the levee study, addressing the deficiencies identified by the study will likely be more cost effective than raising the elevation of this area.

It is recommended that a levee study be conducted for the Watkins Creek system to determine the necessary improvements to provide a minimum Zone D flood designation. An alternative to making levee improvements that the study would likely indicate, would be flood protection measures within the community. Because Pacific Junction proper is a developed area, raising grades would be infeasible. However, individual buildings could be raised. Based on the flood depths of six to ten feet, most of the homes would need to be raised a full story or more. Although individual homes would be protected, there would be no emergency access during periods of flood, likely requiring evacuation prior to the flood for at least the most vulnerable segment of the population. Improvements to existing water and sewer utilities would be required for the systems to continue to function during flood conditions. Significant repair of streets and other infrastructure would likely be required post-flood.

A ring levee may also be feasible for protecting segments of Pacific Junction proper. However, the railroad lines and streets into the community would be penetrations that would require gates, Hesco baskets, or similar temporary closures. These would likely require human intervention during floods, which could affect accreditation of the levees. Alternatively, multiple ring levees on either side of the railroad could be constructed and roads entering the community could potentially be ramped over the levee to avoid penetrations. Emergency access to the community from outside the levee would not be available during floods.

Given the likely cost and inconvenience associated with raising the individual structures and/or constructing ring levees as well as the duration of flooding, making the necessary improvements to the existing Watkins Creek levee System is likely to be the more attractive alternative.

Hamburg

It is recommended that accreditation studies be conducted for the Missouri River L595-601 (that includes the Nishnabotna River levee) and Hamburg Main Ditch 6 levee systems to determine the necessary improvements to provide a minimum Zone D flood designation. As with Pacific Junction, an alternative to making the necessary levee improvements would be a combination of raising individual buildings and ring levee(s). However, it is likely that the obstacles to these alternatives would be even greater in Hamburg than in Pacific junction and therefore making the necessary improvements to the levee systems is likely to be the more feasible alternative.

Another alternative for Hamburg may be to focus levee improvements and accreditation on the reaches of the Nishnabotna levee Segment and the Ditch 6 System required to protect Hamburg rather than on the entire L595-601 system. Since the Ditch 6 System is between Hamburg and the Missouri River, the Ditch 6 System could potentially provide necessary flood protection without the need for improvements to the Missouri River Segments.

3.3 Flood Modeling Scenarios

3.3.1 MISSOURI RIVER FLOOD INFORMATION SYSTEM

The devastating 2019 and 2011 Missouri River floods have had severe and lasting impacts on western Iowa communities. The increasing frequency of major Missouri River floods and their associated damages highlight a need for a Missouri River flood modeling system capable of estimating flood extent based upon historical, forecasted, and hypothetical flow scenarios. Having such a system will allow agencies, communities, and individuals to make informed decisions during the evolution of future flood threats and about management of the Missouri River floodplain.

With funding from the U.S. Department of Commerce Economic Development Administration, the Iowa Flood Center participated in the Comprehensive Assessment and Resiliency Plan for Mills and Fremont Counties to create the Missouri River Flood Information System (MRFIS). The system builds upon the award-winning Iowa Flood Information System (IFIS) that provides real-time flood alerts and forecasts, river levels, weather conditions, and more for the entire state of Iowa.

The Missouri River Flood Information System is a comprehensive one-stop web platform that provides real-time information on rainfall, floods, streamflow and inundation scenarios, and levee systems that can be easily modified to represent potential breaches. The spatial domain boundaries are the Gavin's Point dam and the James River on the north, the Platte River near Ashland on the

"The increasing frequency of major Missouri River floods and their associated damages highlight a need for a Missouri River flood modeling system capable of estimating flood extent based upon historical, forecasted, and hypothetical flow scenarios."

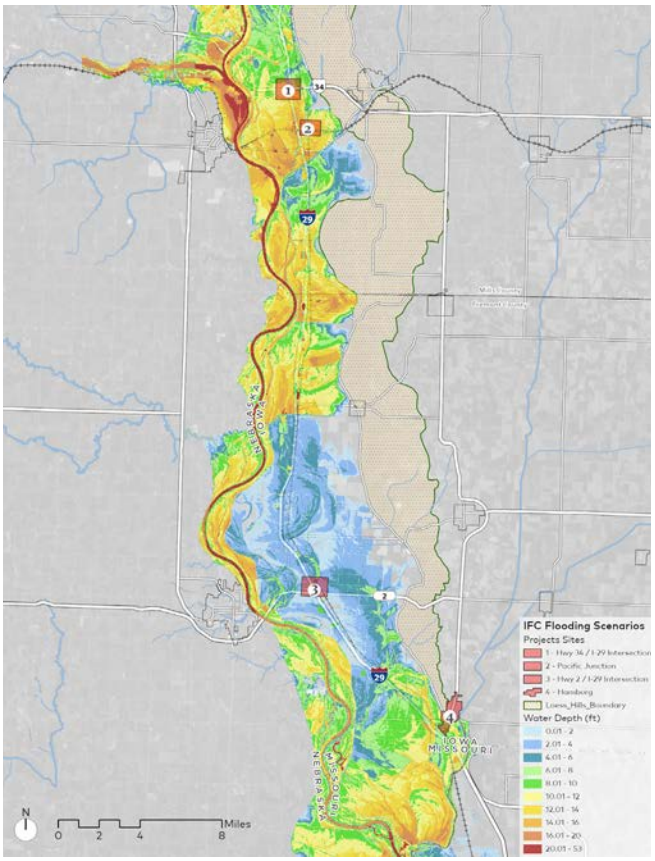


Figure 3.3-1. 2019 Flood Model map.

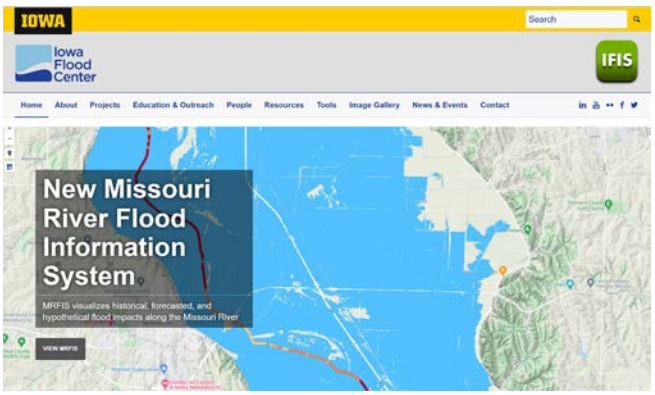


Figure 3.3-2. Iowa Flood Center website. (iowafloodcenter.org)

west, and the Missouri River at St Joseph in the south. The system displays weather and streamflow information through a user-friendly interface with advanced search capabilities. Rainfall information includes the most recent observations from weather radars, the precipitation forecasts for the next three days, and the past two weeks of rainfall events. The system integrates streamflow measurements from USGS, USACE and NWS sources for about 80 locations, including the Missouri river and tributaries. The Iowa Flood Center hydrologic model is used to estimate discharge forecasts for all the rivers of the domain in a fully automated way. The forecasts are available every six hours, have hourly temporal resolution and anticipate the conditions for the next nine days. A well-calibrated hydraulic model converts the discharge forecasts into river surface elevation, allowing to foresee maps of the inundation extent for riverine communities, in case a severe event occurs. In addition to providing information about real-time streamflow conditions of the basin, the system also includes a library of past flood event scenarios that severely affected the communities, e.g. the floods of 2011, 2016 and 2019. Also, there are included scenarios based on changes in agricultural practices and climate.

3.3.2 MODELING SCENARIOS

Background

IFC leveraged the U.S. Army Corps of Engineers' (USACE) 2015 Missouri River hydraulic model used in the Missouri River Recovery Program (US Army Corps of Engineers, 2018). The model simulates the Missouri River from Gavin's Point to St. Joseph, MO, and was developed using HEC-RAS 5.0.4 and one-dimensional (1D) geometry elements (cross-sections, storage areas, etc). Several tributaries were also modeled with varying degrees of detail and vintage.

IFC improved the USACE model by utilizing the most recent HEC-RAS 2D flow capabilities (v6.0.0 beta 2) for floodplain areas along much of the Iowa reach. The model was validated using observations from the historic 2011 and 2019 floods. Additionally, IFC incorporated levee alignment changes and other significant geometric changes that have occurred in the field since the original model was created.

Model Geometries

Model geometries were developed for the 2011 and 2019 historic flood simulations, current conditions, and base future levee configurations. The spatial differences in levee alignments for each of these configurations is shown in Figure 3.3-3.

2011 Levee Alignment

The 2011 Levee Alignment geometry utilizes the levee configuration during the 2011 Flood. Levee breach locations, timing, and dimensions were incorporated in the observed 2011 Flood simulation (Scenario A), but not for the 2011 Flood without breaches (Scenario C). This 2011 alignment is shown in Figure 3.3-3, as Pre-2011 (base alignment).

2019 Levee Alignment

The 2019 Levee Alignment geometry utilizes the levee configuration during the 2019 Flood. Levee breach locations, timing, and dimensions were incorporated in the observed 2019 Flood simulation (Scenario B), but not for the 2019 Flood without breaches (Scenario D). This 2019 alignment is shown in Figure 3.3-3, as Pre-2019. The most notable changes from the 2011 Levee Alignment are several levee setbacks along L-575 and L-594. The L-575 setbacks just upstream of the IA-2 crossing are setback nearly ½ mile, while those downstream of IA-2 are setback approximately 1 mile.

Current Levee Conditions

The current levee alignment geometry was developed using data provided by USACE Omaha District. These included several breach setbacks and planned setbacks throughout this reach, also shown in Figure 3.3-3. Additional changes were incorporated at the Iowa Highway 2 (IA-2) bridge crossing over the Missouri River using plans provided by the Iowa DOT and HDR Inc. A large

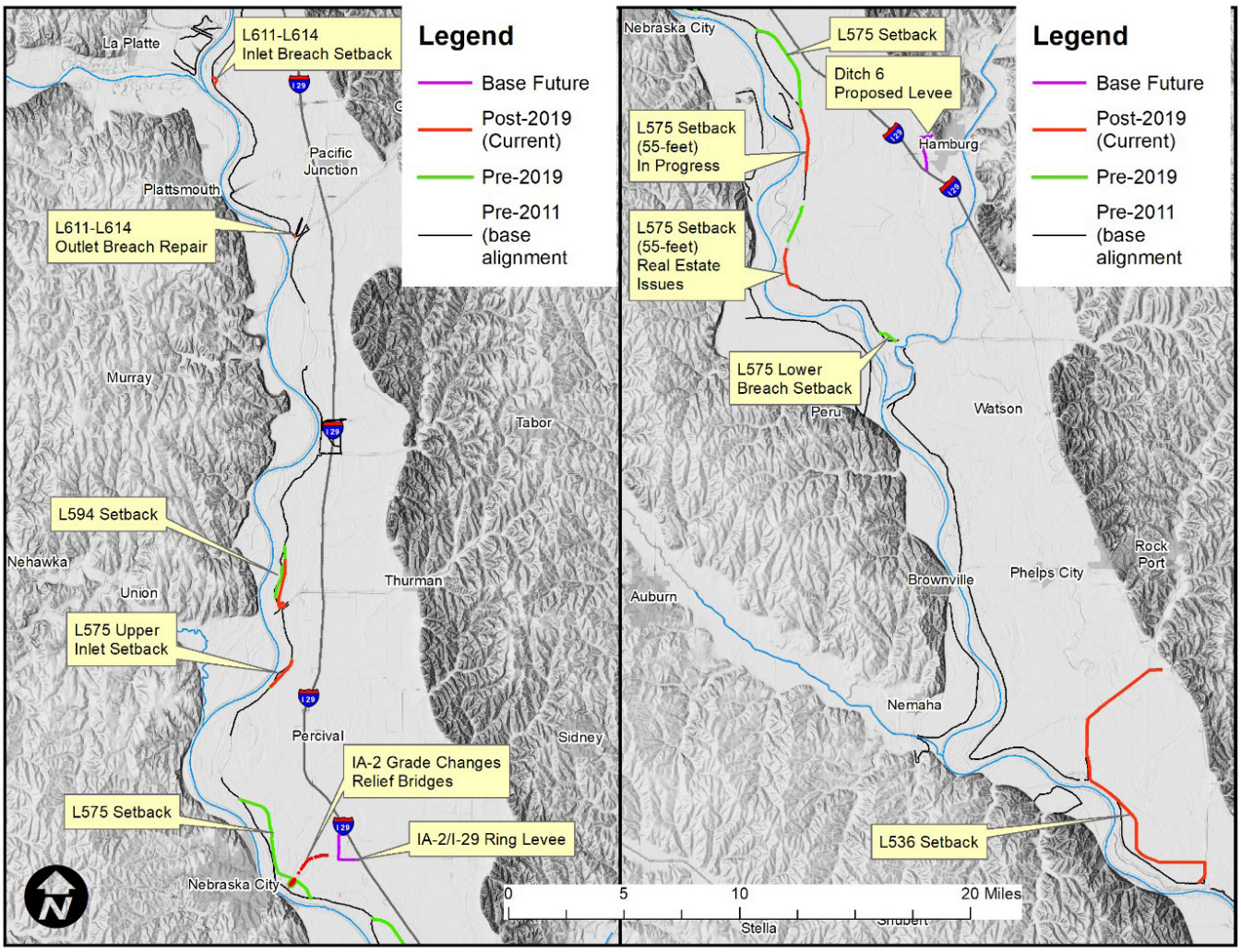


Figure 3.3-3. Levee alignment configurations used in developing model geometries. These include alignments in place during the 2011 and 2019 flood events, levee improvements following the 2019 flood (current conditions), and near future levee changes (base future conditions).

relief bridge was constructed on the riverward side of the levee, along with grade changes and other smaller relief bridges along the landward side of the levee along IA-2. This model geometry was utilized for developing the Base Future Conditions geometry and IFC's near real-time hydraulic model.

Base Future Conditions

The base future conditions geometry, alignments shown in Figure 3.3-3, was developed by incorporating proposed improvements likely to be constructed soon into the current levee conditions geometry. These improvements included the proposed Ditch 6 Levee near Hamburg and a ring levee near the IA-2 and Interstate 29 interchange. Several closure structures were also assumed for these structures, with elevations the same as nearby proposed levee embankments. This geometry was used for hypothetical Scenarios E, F, G, I, L, and M.

Artificially High Levees

This geometry was developed specifically for the levee freeboard analysis on Pony and Keg creeks near Pacific Junction, and Nishnabotna River near Hamburg. Levees along each of these streams were raised to artificially high levels to prevent any overtopping and provide a conservative estimate of required levee freeboard. This geometry and the levee freeboard analysis are discussed in more detail in the freeboard analysis narrative.

Model Scenarios

Several what-if scenarios were developed to better understand flood hazards in the study area using different levee geometries, breach scenarios, and hydrology. These configurations are summarized in Table 3.3-4.

Simulations of historical flooding events like those that occurred in 2011 and 2019 with different levee scenarios provide insight into the effect of levee breaches or levee improvements on flooding extent. Simulations of transposed historical precipitation events over different parts of the watershed provided insight into the influence of different, but equally likely, precipitation patterns on flooding.

Simulations of different watershed condition scenarios, provided insight into how changes in land use, land cover, and land management has affected flood flows and how watershed-scale improvements in soil health could reduce flooding.

Simulation of future precipitation based on varying climate projections provided insights into potential increases in flood risk for the Nishnabotna River at Hamburg.

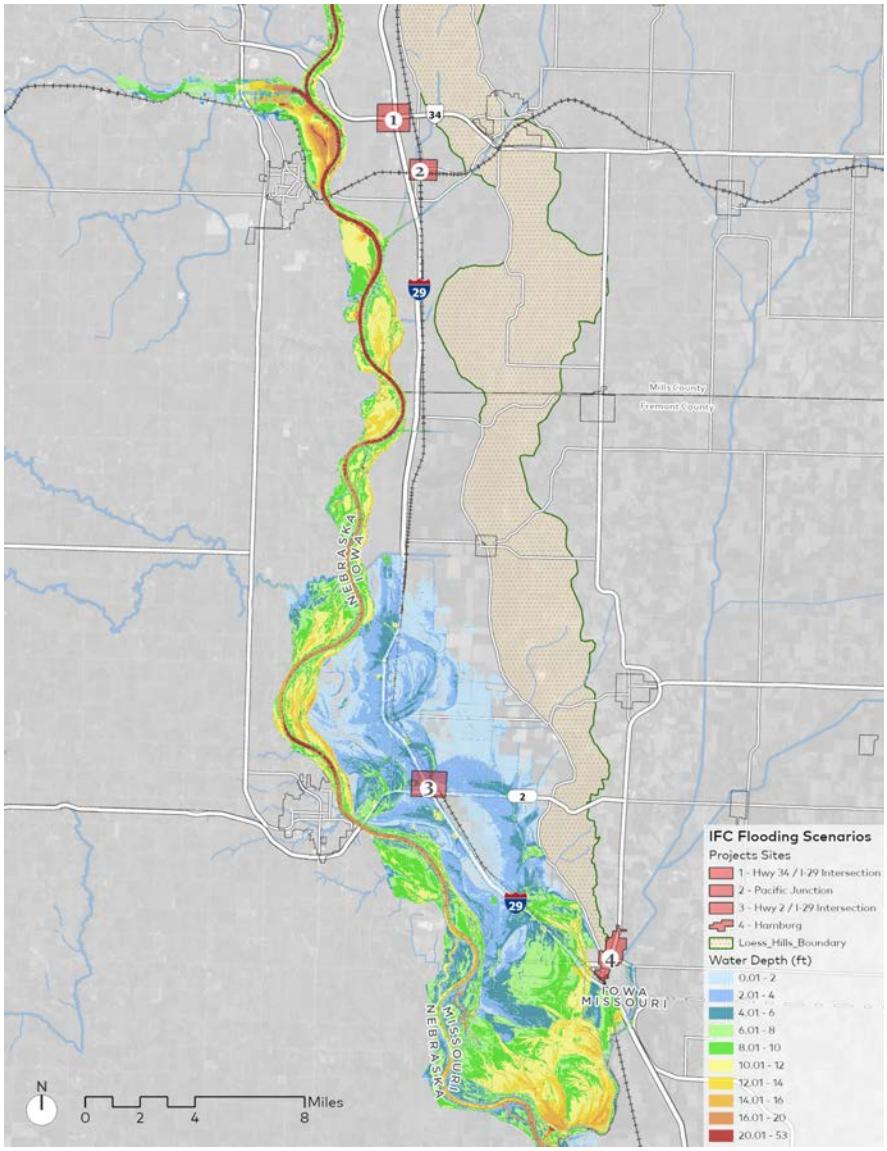
Historical Event Scenarios

	scenario	levee model geometry	hydrology	watershed conditions
Historical Event Scenarios				
A	2011 flood event	2011 levee alignment with observed breaches	2011 hydrology	current land use
B	2019 flood event	2019 levee alignment with observed breaches	2019 hydrology	current land use
C	2011 event without levee breaches	2011 levee alignment, without breaches	2011 hydrology	current land use
D	2019 event without levee breaches	2019 levee alignment, without breaches	2019 hydrology	current land use
E	2011 event with new levee alignment	Base future conditions [1]	2011 hydrology	current land use
F	2019 event with new levee alignment	Base future conditions [1]	2019 hydrology	current land use
G	transposition of April 2016 storm event to SW Iowa	Base future conditions [1]	same as April 2016 event	current land use
I	transposition of March 2019 precipitation to SW Iowa	Base future conditions [1]	2019 hydrology, 2020 flow on Missouri River, Platte River	current land use
Watershed Condition Scenarios				
L	pre-European settlement scenario, using April 2016 storm transposition	Base future conditions [1]	Pre-European soil characteristics (southwest Iowa)	pre-European settlement land use
M	improved soil health scenario, using April 2016 storm transposition	Base future conditions 1	Improved soil management and soil health	Current land use
Future Precipitation Scenarios				
N	Present Climate scenario	not applicable	Current climate	Current land use
O	Projected 2060 future climate scenarios[2]	not applicable	Future climate (southwest Iowa)	Current land use
P	Projected 2100 future climate scenarios[2]	not applicable	Future climate (southwest Iowa)	Current land use

[1] Base future conditions model includes - current Missouri River levee alignments and elevations, and likely improvements - Ditch 6 levee to be constructed in 2021, planned levee at I-29/IA-2 interchange, levee and roadway modifications at Hwy 2

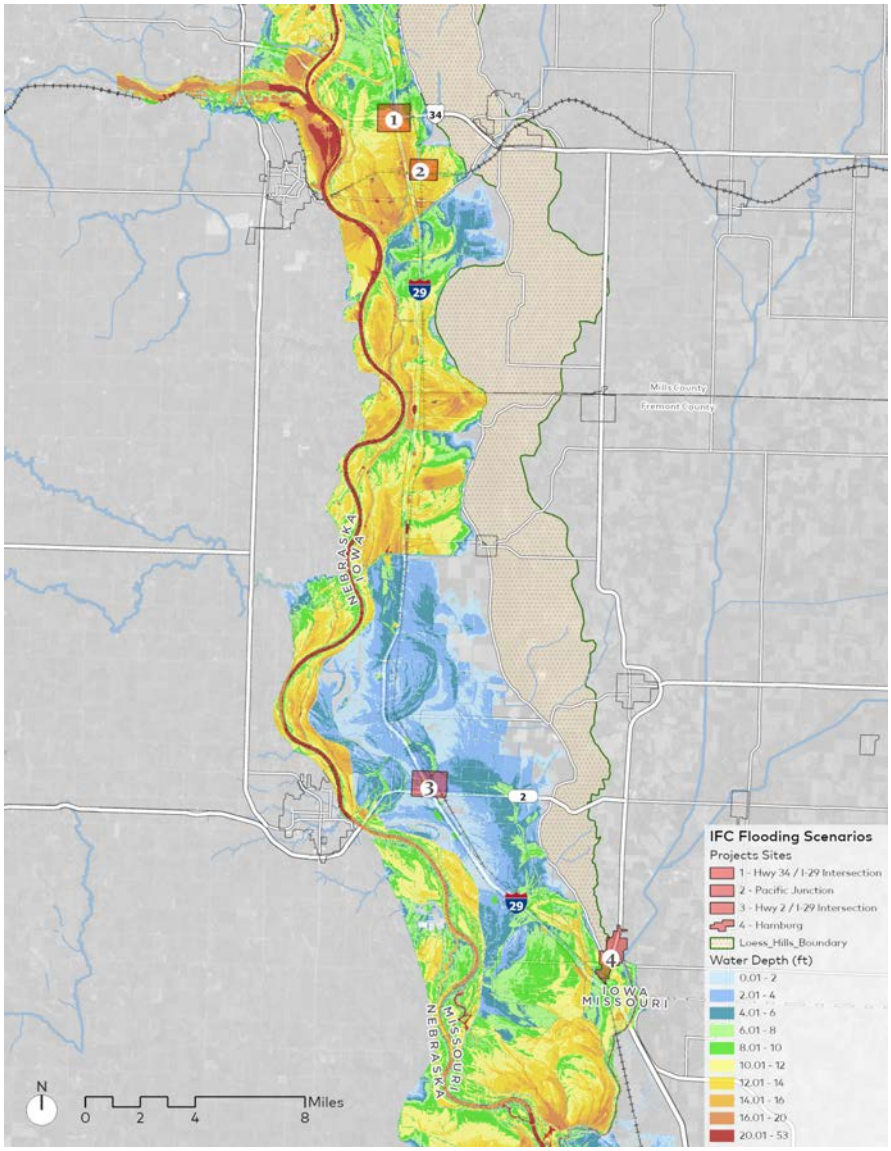
[2] Analysis completed with hydrologic model utilizing downscaled future climate and hydrology projections developed by a consortium of US research Institutes and federal agencies (https://gdo-dcp.ucllnl.org/)

Figure 3.3-4. Model scenario simulations to explore different geometries, breach scenarios, and hydrology.



Scenario A - 2011 Flood Event

This simulation utilizes flow observations at stream gaging stations during the 2011 Flood. Inflows from ungauged drainage areas along the Missouri River corridor were developed using IFC's Hillslope Link Model (HLM). Observed levee breach locations, timings, and geometries were incorporated into this simulation using data provided by USACE Omaha District, aerial imagery, and media reports. The model geometry utilizes the levee alignment during the 2011 Flood.

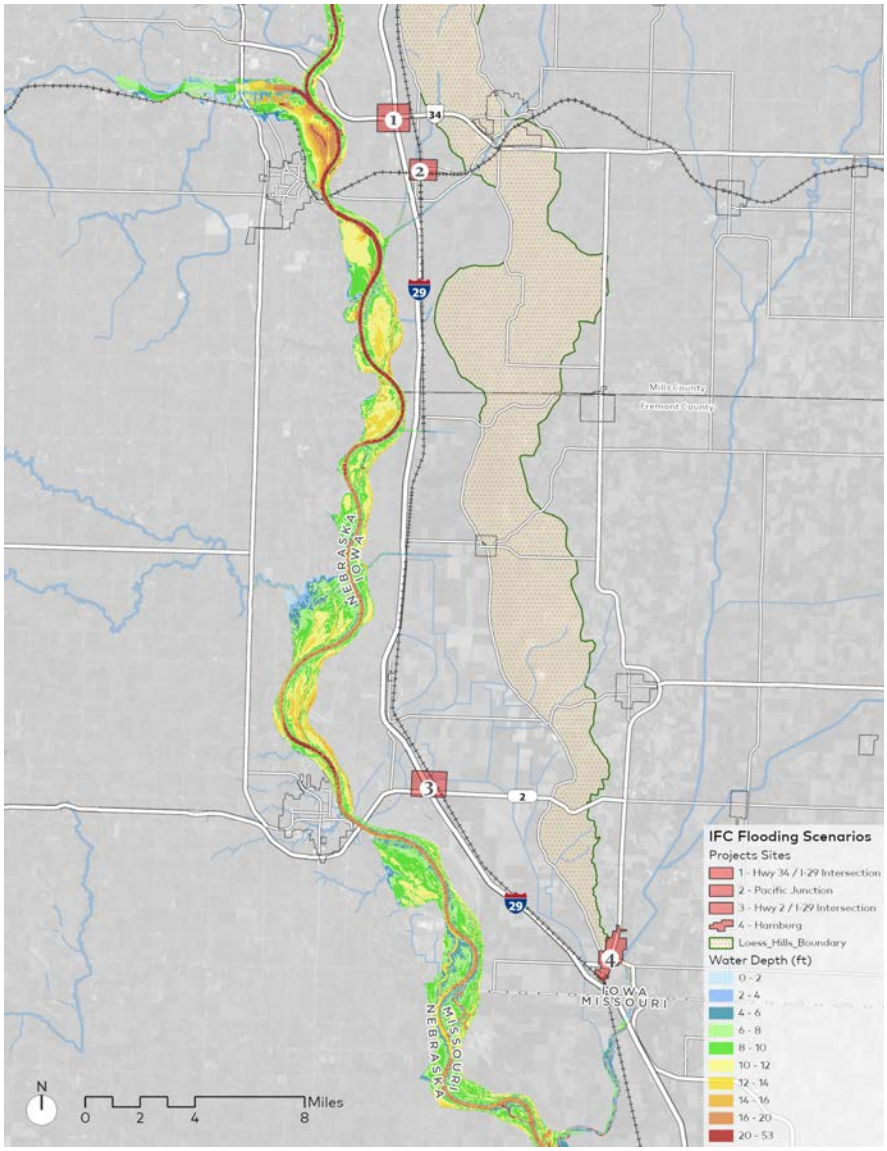


Scenario B - 2019 Flood Event

This simulation utilizes flow observations at stream gaging stations during the 2019 Flood. Inflows from ungauged drainage areas along the Missouri River corridor were developed using IFC's Hillslope Link Model (HLM). Observed levee breach locations, timings, and geometries were incorporated into this simulation using data provided by USACE Omaha District, aerial imagery, and media reports. The model geometry utilizes the levee alignment during the 2019 Flood.

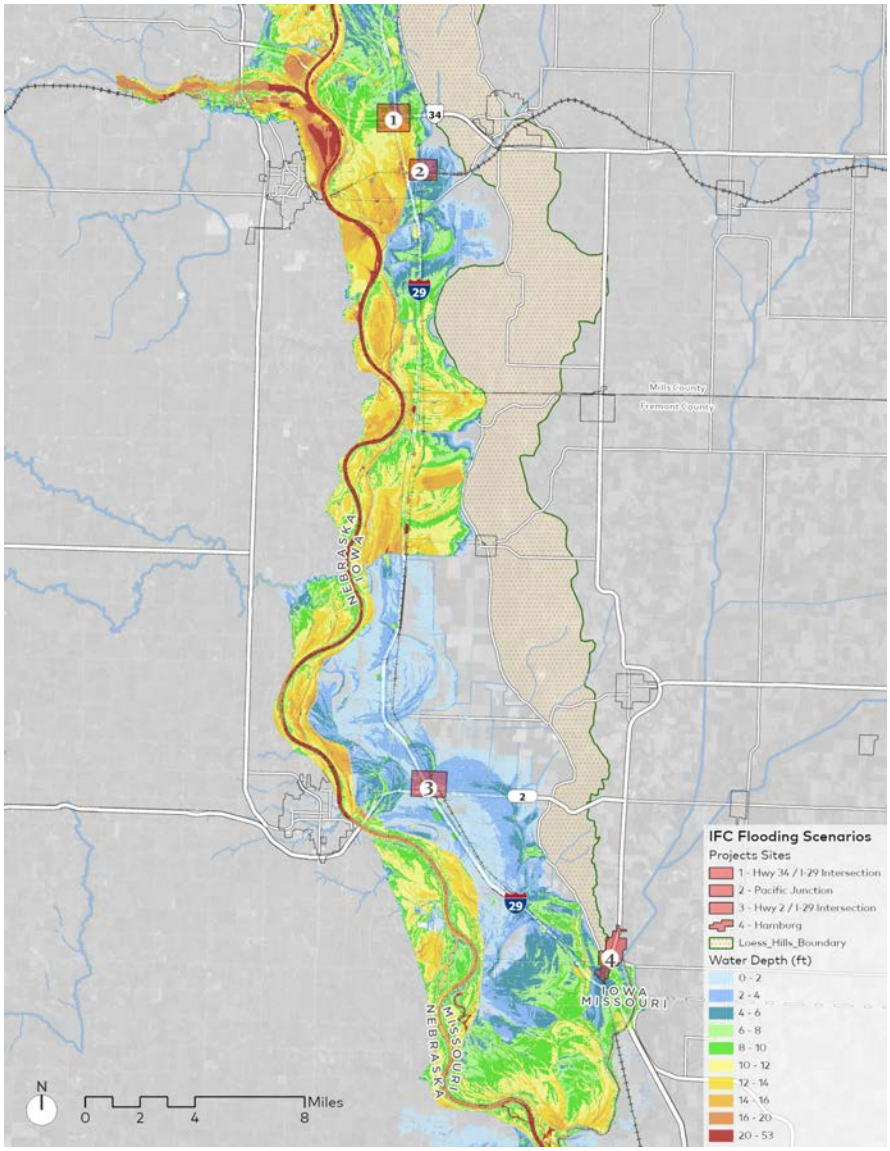
Comparison of the Scenario A and C figures that depict the 2011 flood with and without the breaches shows that Pacific Junction and the surrounding area were not impacted by the 2011 flood even with the breaches that occurred.

Similarly, Hamburg was not affected by the 2011 flood. However, in the Fremont County area outside of the Hamburg, including the Route 2 interchange, that was flooded in 2011 would have been spared had the breaches not occurred.



Scenario C - 2011 Flood Event Without Levee Breaches

This simulation is the same as Scenario A (2011 Flood), but without observed levee breaches. Levees were allowed to overtop during the simulation but it was assumed that the levees remained intact.

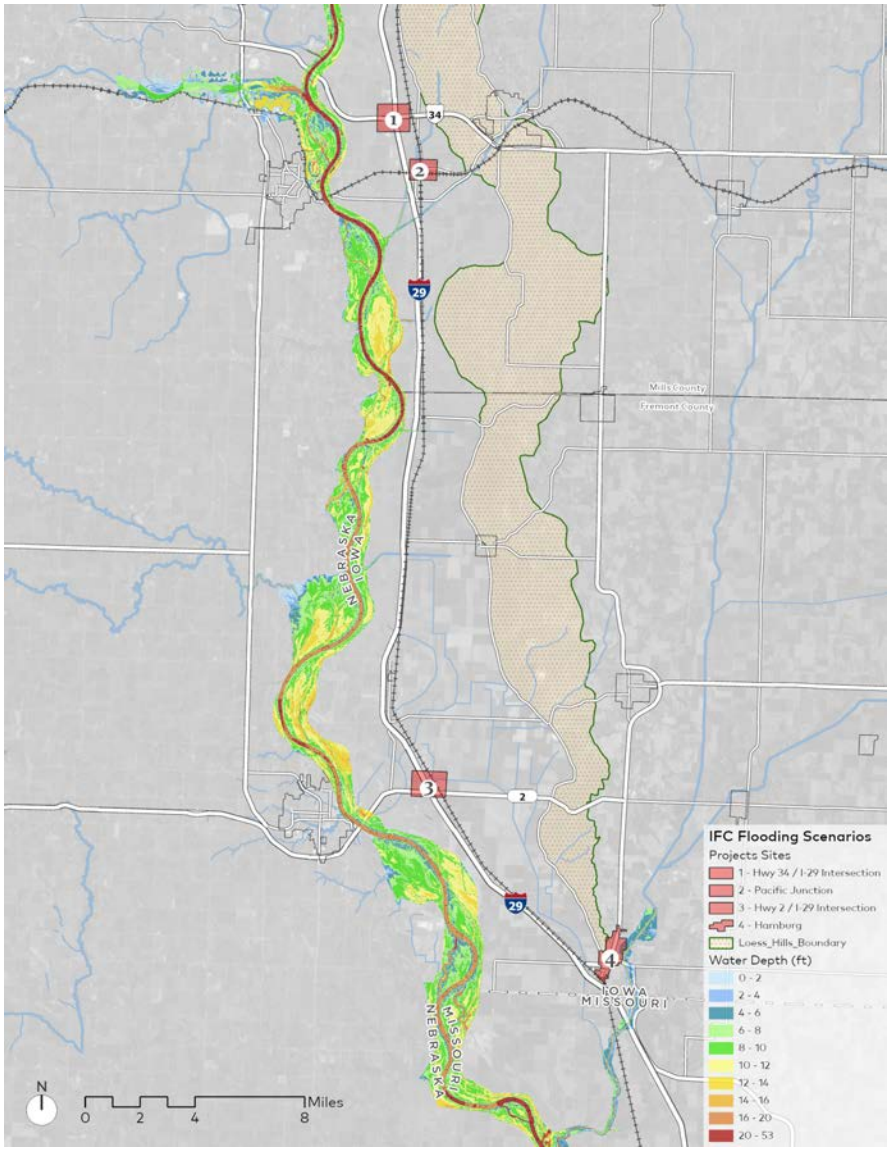


Scenario D - 2019 Flood Event Without Levee Breaches

This simulation is the same as Scenario B (2019 Flood), but without observed levee breaches. Levees were allowed to overtop during the simulation but it was assumed that the levees remained intact.

Comparison of the Scenario B and D figures that depict the 2019 flood with and without the breaches shows that Pacific Junction would still have been flooded had the breaches not occurred. However, the flood depth would have been reduced from approximately ten feet to approximately five feet. As illustrated by the difference in flood depth on either side of the Pony Creek levee, that levee would have been the reason for the lower flood depth in Pacific Junction. Further, with a taller Pony Creek levee, the 2019 event would have been completely excluded from Pacific Junction without the 2019 breaches and potentially even with the breaches.

In Fremont County, the breaches had little impact on flood depth outside Hamburg. Within Hamburg, the area south of E Street would have experienced lower flood heights and the area north of E Street would largely have been spared flooding had the breaches not occurred. As with the Pony Creek Levee, the difference in flood depth on either side of the Ditch 6 levee system shows that the levee provided some flood protection north of I-29. Had the levee system (including the I-29 reach) been taller, it potentially could have spared more of the town, at least under the no-breach scenario.

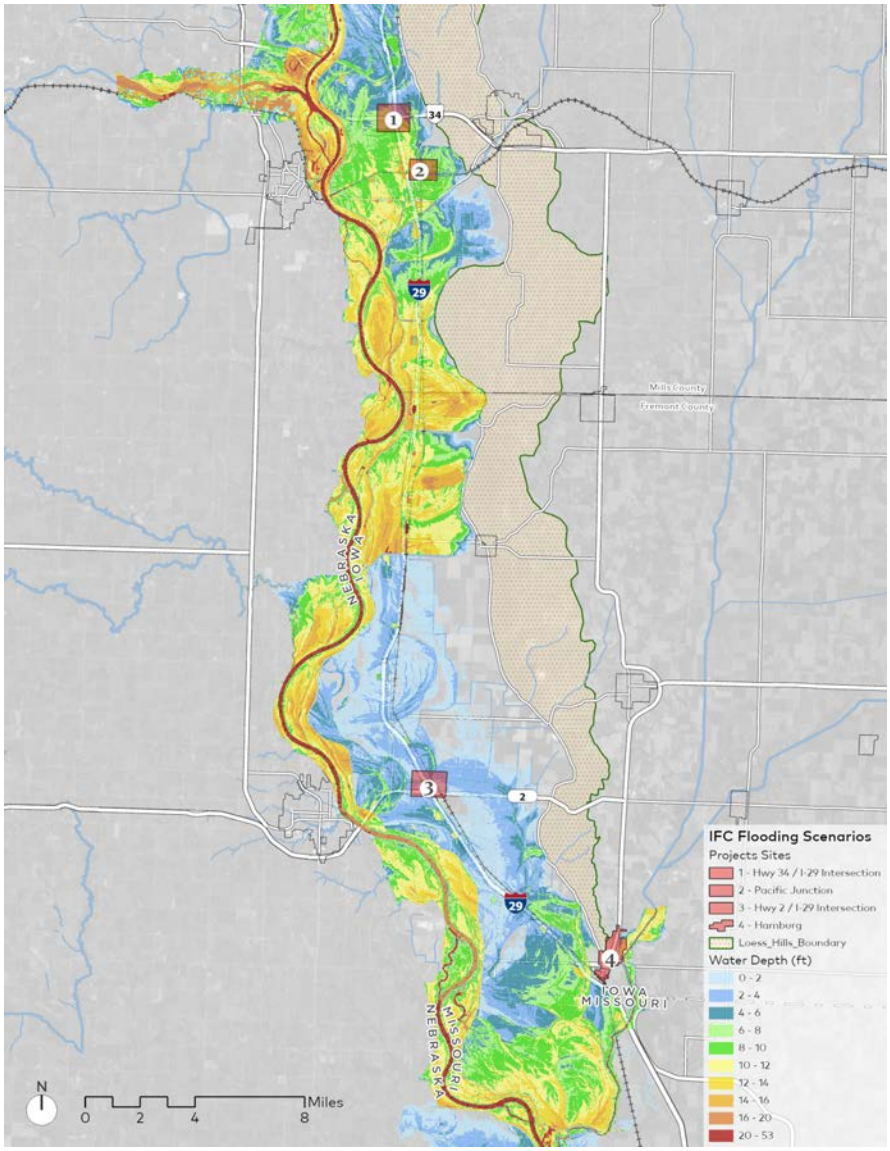


Scenario E - 2011 Event With New Levee Alignment

This simulation utilized the same inflows as Scenario A (2011 Flood), but utilized the base future conditions levee geometry, discussed in the previous section. Levees were not allowed to breach but could overtop during the simulation.

Comparison of the Scenario A and E figures that depict the 2011 flood with current and proposed levee configurations shows no benefit to Pacific Junction since Pacific Junction was not flooded by this event.

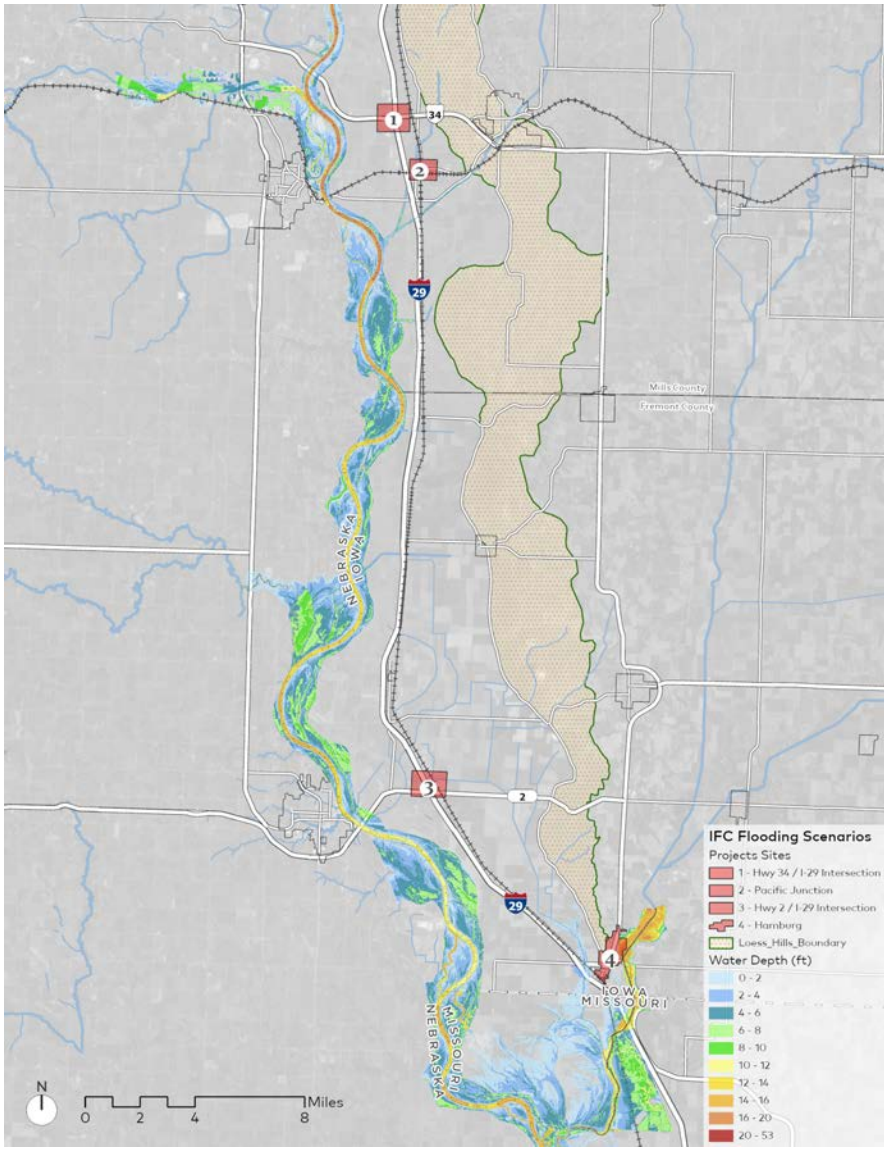
Within Fremont County, Hamburg was un-impacted by the 2011 flood. However, the area outside Hamburg, including the Route 2 interchange that was flooded, would have been protected by the proposed levee improvements. It should be noted that the improvements to the Missouri River levee would have been adequate to protect the Route 2 interchange without the proposed Route 2 ring levee.



Scenario F - 2019 Event With New Levee Alignment
This simulation utilized the same inflows as Scenario B (2019 Flood), but utilized the base future conditions levee geometry, discussed in the previous section. Levees were not allowed to breach but could overtop during the simulation.

Comparison of the Scenario B and F figures that depict the 2019 flood with current and proposed levee configurations shows that flood heights would be reduced with the proposed improvements but not eliminated for Pacific Junction. As indicated under the discussion of Scenario D with no breaches, a taller Pony Creek levee would potentially further reduce or eliminate flooding of Pacific Junction for this scenario.

In Fremont County, the proposed Route 2 ring levee would have been insufficient to prevent flooding of the interchange since I-29 was overtopped. However, Hamburg would have been spared flooding by this event with the proposed levee improvements represented in this scenario.

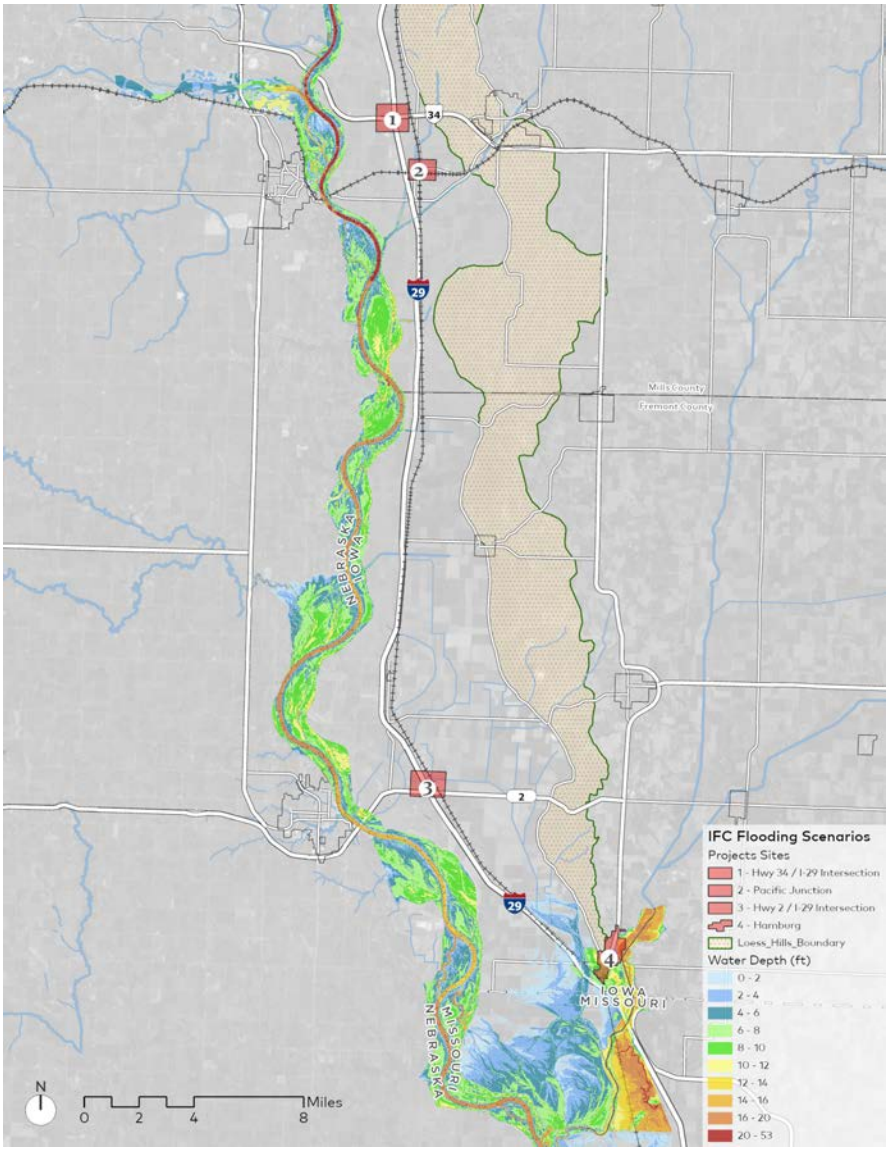


Scenario G - Transposition of April 2016 Storm Event to Southwest Iowa

This simulation utilized a storm transposed from northwest to southwest Iowa that occurred during late April 2016. IFC's HLM was used to develop inflow hydrographs for Pony and Keg creeks, and the Nishnabotna River using this transposed storm. All other inflows, including those on the Missouri and Platte Rivers, were gathered from observed stream flows during late April 2016. The watershed areas modeled using HLM for storm transposition scenarios are shown in Figure 3.3-5. The base future conditions levee geometry was utilized.

Review of the figures depicting Scenario G shows that Pacific Junction would not have been affected had the 2016 event occurred over the Pony and Keg Creek watersheds and the proposed levee improvements were implemented.

Similarly, Hamburg and the surrounding area would not have been affected had the 2016 flood occurred over the Nishnabotna watershed and the proposed levee improvements were implemented.



Scenario I - Transposition of March 2019 Precipitation to Southwest Iowa

This simulation utilized the heaviest swaths of the March 2019 precipitation transposed from central Nebraska to southwest Iowa. IFC's HLM was used to develop inflow hydrographs for Pony and Keg creeks, and the Nishnabotna River using this transposed storm. Like Scenario G, watershed areas modeled using HLM for this storm transposition are shown in Figure 3.3-5. All other inflows, including those on the Missouri and Platte Rivers, were gathered from flow observations during a sustained bank full flow period during spring 2020. The base future conditions levee geometry was utilized.

Review of the figures depicting Scenario I shows that Pacific Junction would not have been affected had the 2019 event occurred over the Pony and Keg Creek watersheds and the proposed levee improvements were implemented.

Conversely, had the 2019 event occurred over the Nishnabotna watershed, Hamburg would have been flooded even with the proposed levee improvements. The level of flooding within Hamburg would have been similar to what occurred during the 2019 flood as it actually occurred.

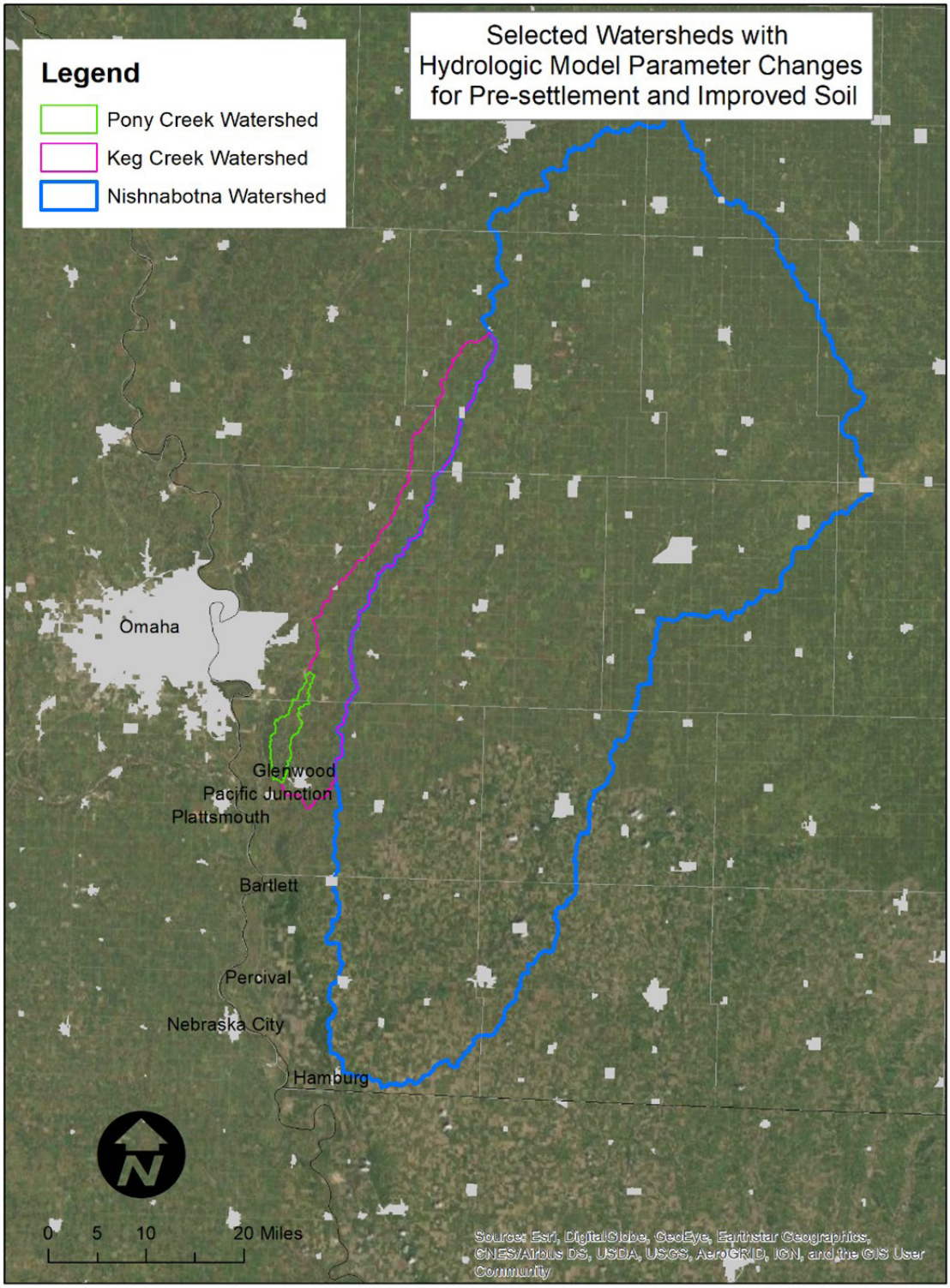


Figure 3.3-5. Pony Creek, Keg Creek, and Nishnabotna River watersheds used in storm transposition hydrology.

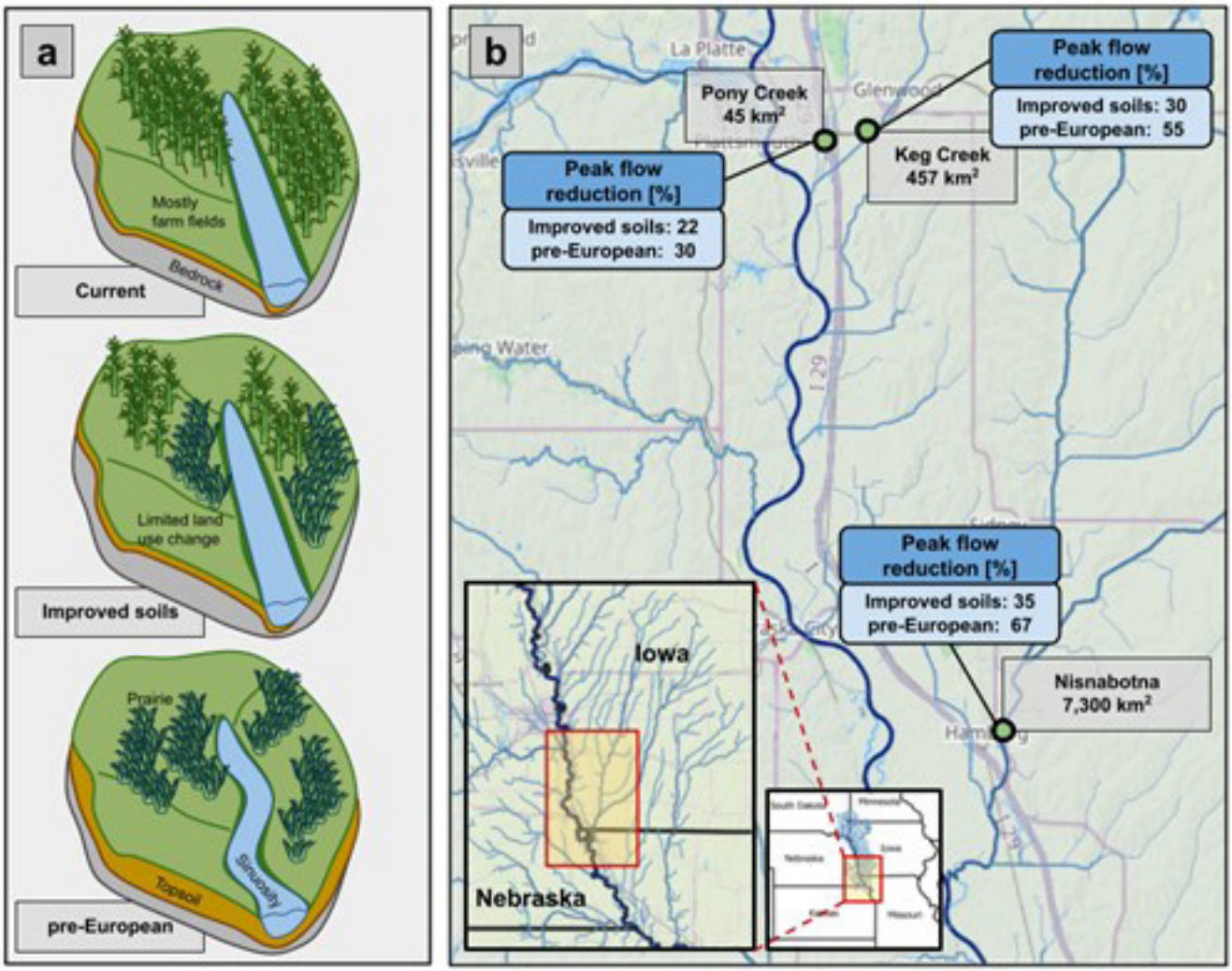


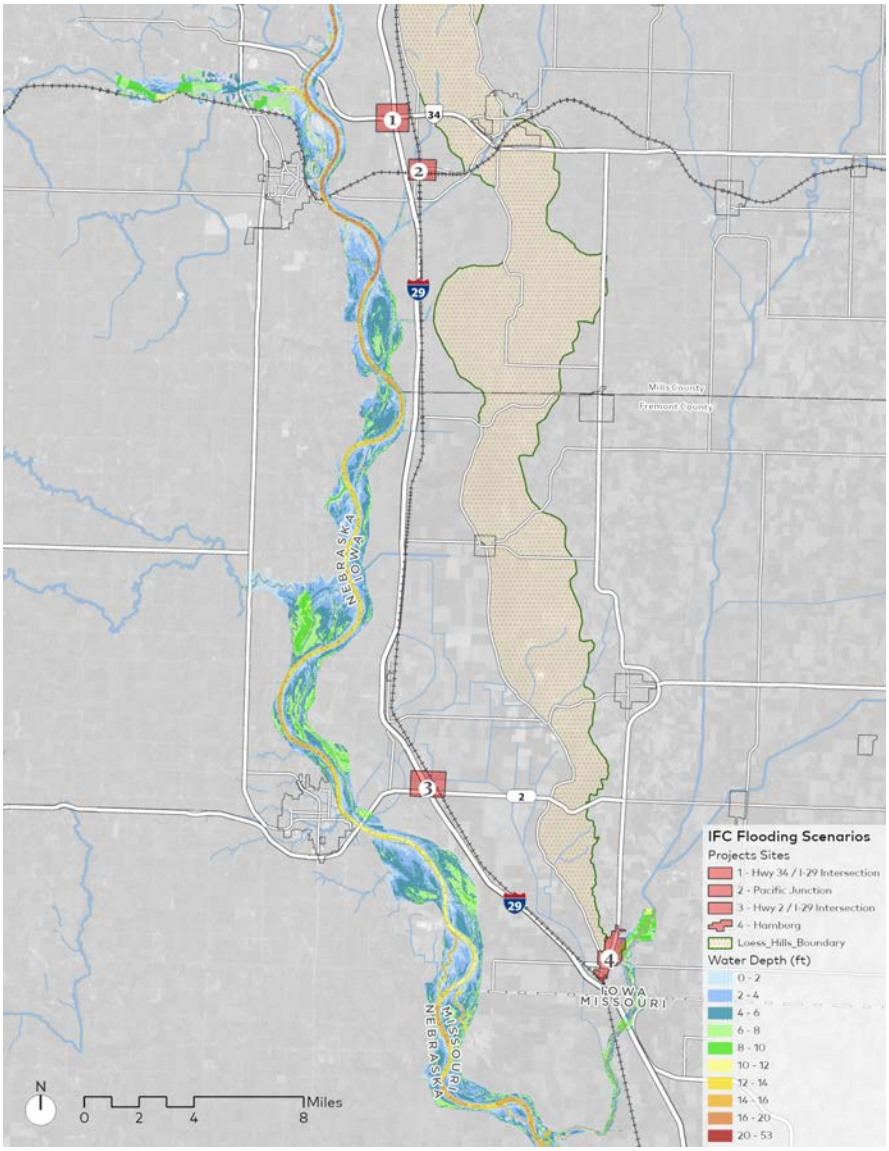
Figure 3.3-6. (a) Model setups - Current (Scenario G), Improved soils, and Pre-European. (b) Gauging sites and percentage peak flow reductions relative to the Current conditions scenario.

Watershed Condition Scenarios

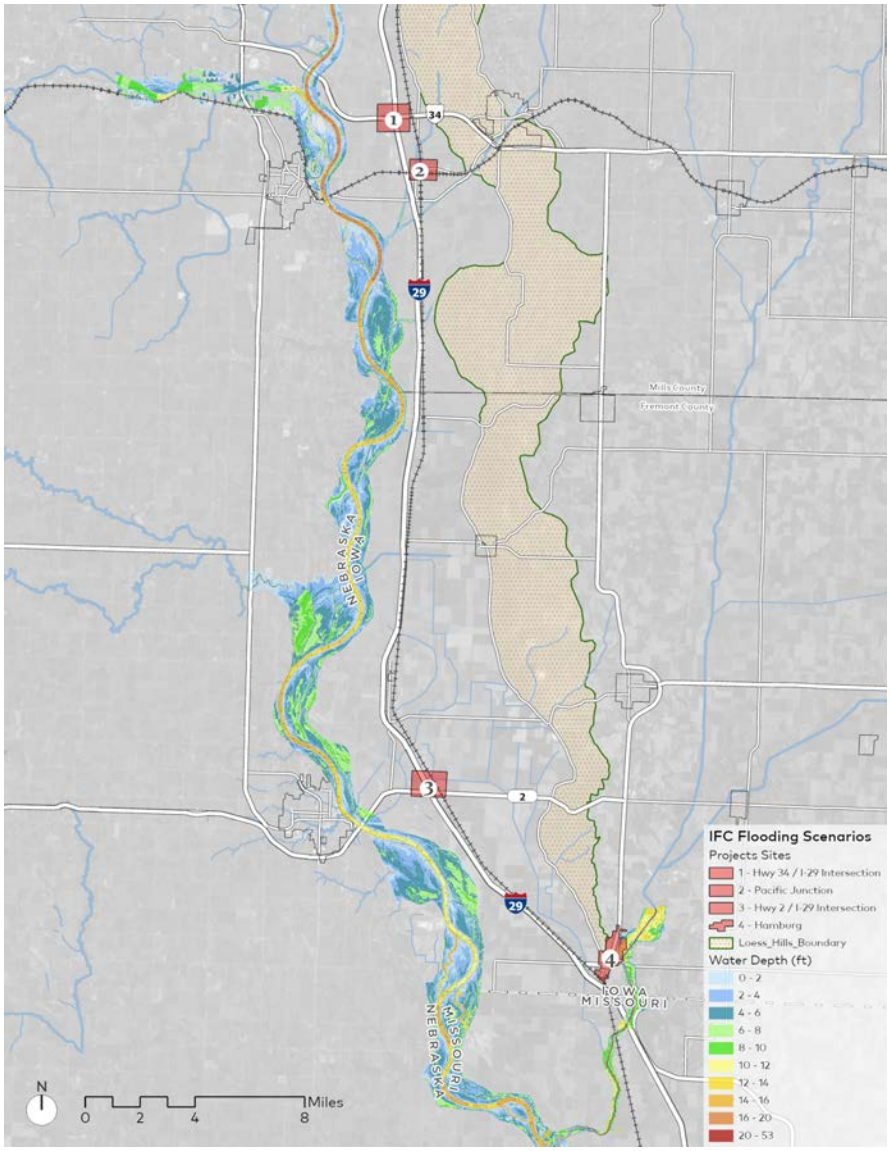
The Iowa Flood Center has developed three watershed condition flood scenarios for the Keg Creek, Pony Creek, and Nishnabotna River using the HLM model and the previously discussed transposed 2016 event. The three scenarios correspond to different watershed hydrologic conditions: current; pre-European settlement; and improved soils (see Figure 3.3-6). The purpose of these scenarios was to evaluate the influence of watershed hydrologic conditions on flood flows and flood heights.

Current Watershed Scenario (same as Scenario G)

The current condition scenario is the same as the previously described Scenarios G.



Scenario L - Pre-European Settlement Watershed
This simulation modified the HLM model parameters to represent pre-European settlement conditions. These modifications included parameters that describe land use, infiltration, evapotranspiration, and water velocity in the streams and rivers. The modifications implied slower water flows over the hillslopes and in the channels, higher infiltration rates, and a re-distribution of the evapotranspiration across the season. These changes were meant to represent the predominant presence of prairies, a thicker topsoil layer, and the original geometry of the channels. All other inflows, including those on the Missouri and Platte Rivers, were gathered from observed stream flows during late April 2016. The base future conditions levee geometry was utilized.



Scenario M – Improved Soil Watershed

This simulation modified the HLM model parameters to represent improved soils from present conditions. Higher infiltration rates at the hillslopes were utilized to represent many years of soil improvement practices. All other inflows, including those on the Missouri and Platte Rivers, were gathered from observed stream flows during late April 2016. The base future conditions levee geometry was utilized.

Watershed Condition Scenarios Results
The Current condition scenario had the highest peak flows followed by improved soil and then pre-European conditions. For the current conditions, the peak flows were 1,689, 115, and 13 cubic meters per second for the Nishnabotna River, Keg Creek, and Pony Creek, respectively. The most significant reductions occurred for the Nishnabotna River, with 35% and 67% peak flow reductions for the improved soils and pre-European, respectively. For Keg Creek, the peak flow reductions were 30% and 55% for the improved soils and pre-European. For Pony Creek, peak flow reductions were 22% and 30%, respectively. The results are summarized in the figure below.

Future Precipitation Scenarios
Throughout the region, State, and nation, more frequent and severe precipitation events are occurring with the 2019 event being one of the most severe to date in the Mills/Fremont County region. To understand the potential impact of increasingly severe precipitation events, a case study was conducted for the Nishnabotna River at Hamburg.

To conduct the study, daily precipitation and temperature data from existing climate projections datasets (http://gdodcp.ucllnl.org/downscaled_cmip_projections) were used. These projections were developed by climate researchers from around the world. The climate projections are available for the historical period 1950 – 2005, and the projected period 2005 – 2099. The horizontal resolution of data is 12 km by 12 km. The dataset coverage encompasses the continental United States but were clipped to the domain that contains the watershed of the Nishnabotna River. The climate projections consider two greenhouse gases emission scenarios: 1) a business-as-usual scenario where the emissions continue at the same rate as at present time, and 2) a greenhouse gases reduction scenario. To account for the water that would be removed from the watershed, modeled evapotranspiration (i.e. evaporation and plant transpiration) was also revised based on projected changes in air temperature available in the climate projections.

Hydrologic Model: To simulate streamflow and potential flooding, the previously discussed HLM hydrologic model was used. The same watershed conditions were used as for previous scenarios A through I. The model was then run continuously between 1950 and 2100 to produce hourly discharge simulations at the outlet of the Nishnabotna River basin at Hamburg. The historical record of precipitation and evapotranspiration was used for the 1950 through 2005 period. Precipitation and evapotranspiration from the two climate projections was used for the 2006 through 2100 period. From these simulations, the annual maximum peak flows were extracted for each of the two greenhouse gas emission scenarios.

Scenario N - Present Precipitation
For this scenario, the 1950 through 2005 model results were analyzed.

Scenario O - 2060 Precipitation
For this scenario, the 2006 through 2060 model results were analyzed for the two greenhouse gas emission scenarios.

Scenario P - 2100 Precipitation
For this scenario, the 2006 through 2100 model results were analyzed for the two greenhouse gas emission scenarios.

Future Precipitation Scenarios Results
The distribution of annual maximum flows and stages were taken from the hydrologic model simulations, splitting the analysis into the three time periods described above and for each of the two emission scenarios. The distribution of annual peaks was then analyzed as shown in the figures below.

Using climate projections for hydrologic modeling allows simulation of the impact of changes in the main climate drivers of flooding. Although climate

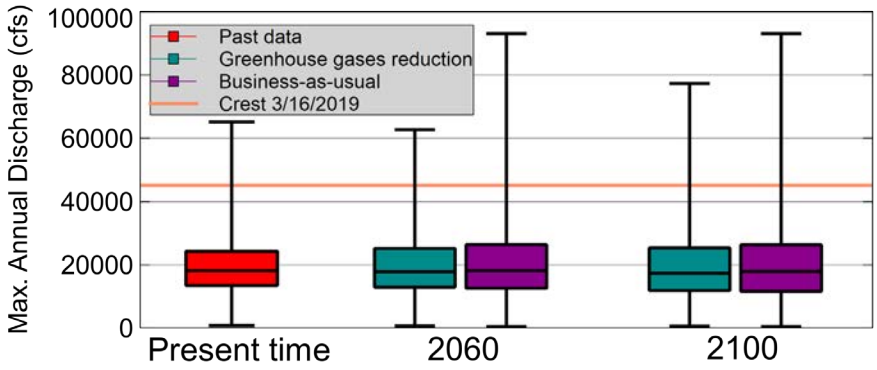


Figure 3.3-7. Annual Maximum Discharge.

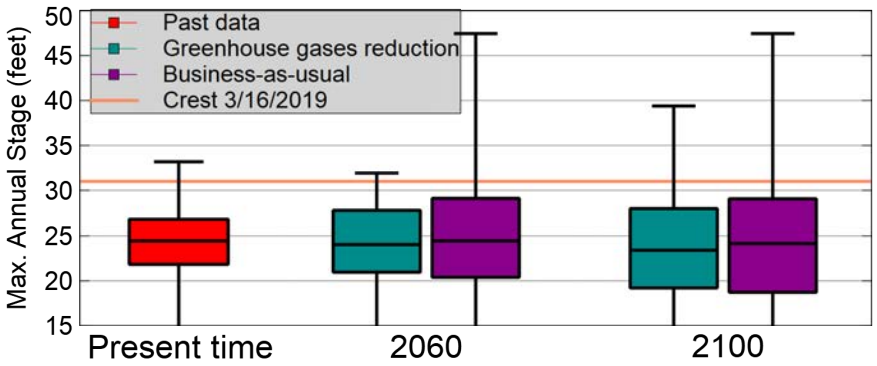


Figure 3.3-8. Annual Maximum Stage.

models have limitations on perfectly reproducing the observed climate, they provide a good estimation of the changes in the distribution of climatic variables and resulting hydrologic impacts. In the figures above, the statistical distribution of annual maximum flows (Figure 3.3-7) and stages (Figure 3.3-8) from the historical record is shown in red; in green, the projected maximums under a scenario of greenhouse gas reduction, and in purple, the projected maximums under a scenario where emissions continue as usual. The observed peaks during the March 2019 event at Hamburg are also shown. The analysis shows that the probability of occurrence for an event like March 2019 will be higher in the future.

In Figures 3.3-7 and 3.3-8, Nishnabotna Peak Flow and stage distributions at Hamburg. The boxplots show the distribution of the annual maximum flows and stages observed at the present time, the expected for 2060, and the expected at the end of the 21st century. The solid colored boxes contain 50% of the simulated annual maxima with the horizontal line representing the median value. The vertical black lines represent the range of the 25% highest flows and stages. The projections for 2060 and 2100 are based on two scenarios: a reduction in the greenhouse gas emissions (in green), and the case where greenhouse gas emissions continue as they are in present (in purple). The peaks observed during the March 2019 event are included for reference. The results show that the probability of occurrence for an event like March 2019 will be higher in the future.

3.3.3 FREEBOARD ANALYSIS

Background

As previously described, FEMA administers the flood mapping program and the areas mapped as floodplain depend on the presence of levees as well as certification and accreditation of the levees. Areas protected by levees that are fully accredited per the requirements of 44 CFR 65.10, including the minimum 3 feet of freeboard are mapped by FEMA as Zone X where no flood insurance is required no flood protection is required for new structures. Areas protected by levees that do not meet the three feet of freeboard requirement or where the levee profile

is lower than the 100-year flood profile may still be mapped as Zone D, provided the levee meets the other requirements in 44 CFR 65.10, using the previously described procedures. While Zone D areas do not enjoy the same level of protection as Zone X, Zone D areas also require no flood insurance and no flood protection for new structures.

This section describes a freeboard analysis that was conducted for Pony Creek, Keg (Watkins) Creek, and the Nishnabotna River. This section shows levee reaches that have sufficient freeboard, are freeboard deficient, and would be overtopped. Using these results, it can be determined which modeling procedures (See Section 3.3) would likely be used by FEMA during their remapping of these areas and therefore the potential flood zone designation if no levee modifications are made to increase levee heights.

Data and Methods

To understand potential deficiencies in levee heights near Hamburg and Pacific Junction, composite 100-year flood water surface elevations (WSEs) were developed from various sources described in Figure 3.3.-9. Missouri River 100-year WSE profiles were taken from a 2019 FEMA study that modeled Natural Valley conditions. These Natural Valley profiles were incorporated into the freeboard analysis where WSE elevations were higher than IFC modeled flood sources. Incorporating Missouri River Natural Valley water surface elevations conservatively assumes the levees along the Missouri River become de-accredited in the future, and communities may have to improve levees nearby, like those along smaller flooding sources like Keg and Pony Creeks, Ditch 6, and Nishnabotna River.

The currently effective FEMA 100-year discharges for Pony Creek, Keg Creek, Nishnabotna River, and Ditch 6 were simulated using hydraulic models noted in Table 3.3-10. The downstream stage boundary condition for each of these streams was

Flooding Source	Data Source	Affected Community
Missouri River	FEMA Study on Natural Valley Flood Profiles	Pacific Junction, Hamburg
Pony Creek	1D Model by IFC	Pacific Junction
Keg Creek	1D Model by IFC	Pacific Junction
Nishnabotna River	2D Model by IFC	Hamburg
Ditch 6	2D Model by IFC	Hamburg

Figure 3.3-9. Sources of flood profiles used in freeboard analysis.

the Missouri River at its effective 100-year discharge. The top of levee elevations within the models were configured to be artificially high, preventing any overtopping, providing a conservative estimate of potential 100-year water surface elevations. These water surface profiles were then compared to the top of levee elevations documented in the National Levee Database (NLD), or designed levee profiles in the case of Ditch 6 Levee.

Results

A map of estimated freeboard along the Nishnabotna River near Hamburg, Iowa, is shown in Figure 3.3-10. The majority of the left and right levees along the Nishnabotna River are overtopped or have inadequate freeboard for this event. The Nishnabotna River right levee upstream of I-29 would have to be raised at least four feet to meet freeboard requirements. Downstream of I-29, most of the right levee system would have to be raised five to six feet to meet freeboard requirements. Profiles of the simulated water surface and left and right top of levee elevations are shown in Figure 3.3-11. Estimated freeboard along the left and right

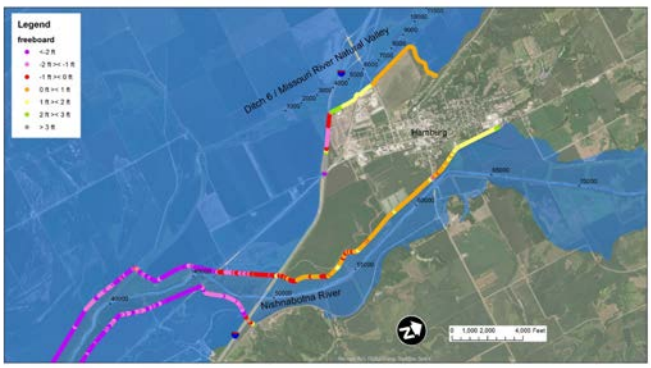


Figure 3.3-10. Estimated freeboard along Nishnabotna River near Hamburg, Iowa. No overtopping allowed.

levees is shown in Figure 3.3-12.

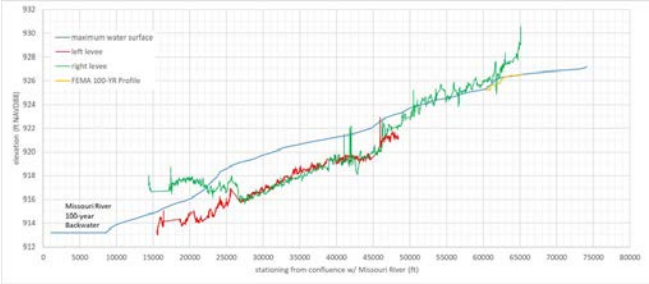


Figure 3.3-11. Water surface elevation profile of the Nishnabotna River shown with left and right top of levee elevations.

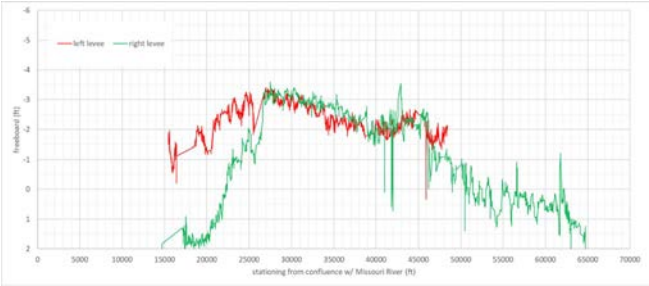


Figure 3.3-12. Estimated freeboard along the Nishnabotna River for the left and right levees.

Figure 3.3-13. Estimated freeboard along Ditch 6 near Hamburg, Iowa. No overtopping allowed.

Figure 3.3-14. Depiction of inundation behind the levee if the I-29 closure structure is not in place.

A map of estimated freeboard along the planned Ditch 6 levee near Hamburg, Iowa, is shown in Figure 3.3-13. Much of the north end of the planned Ditch 6 levee has inadequate freeboard when compared to Missouri River natural valley elevations. Achieving adequate freeboard would require raising much of the planned Ditch 6 levee by at least 2 to 3 feet. A substantial closure structure is required along I-29, which is noted in Figure 4, along with other closures at roadways and railway crossings. A depiction of the resulting inundation if the I-29 closure structure is not in place is shown in Figure 3.3-14. Profiles of the simulated water surface, and left and right top of levee elevations are shown in Figure 3.3-15. Estimated freeboard along the left and right levees is shown in Figure 3.3-16.

A map of estimated freeboard along Pony and Keg creeks near Hamburg, Iowa, is shown in Figure 3.3-17. Significant portions of levees along each creek have inadequate freeboard. Pony Creek's right levee includes Missouri River water surface elevations under natural valley conditions when higher than the 100-year Pony Creek profile. There are overtopping (negative freeboard) locations along Pony and Keg creeks, shown in red in Figure 3.3-17. Inundation resulting from the overtopping of Pony and Keg creeks at the lowest freeboard location are shown in Figure 3.3-18 and 3.3-19, respectively. Achieving adequate freeboard would require raising most of the levees by 2-4 feet. Profiles of the Keg Creek simulated water surface, and left and right top of levee elevations are shown in Figure 3.3-20. Estimated freeboard along Keg Creek left and right levees is shown in Figure 3.3-21.

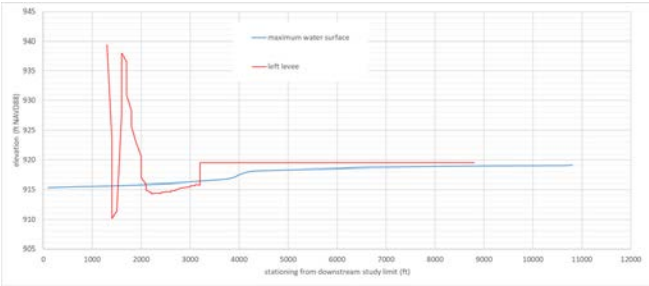


Figure 3.3-15. Water surface elevation profile along Ditch 6, also including Missouri River water surface elevations under natural valley conditions, shown with left top of levee elevations.

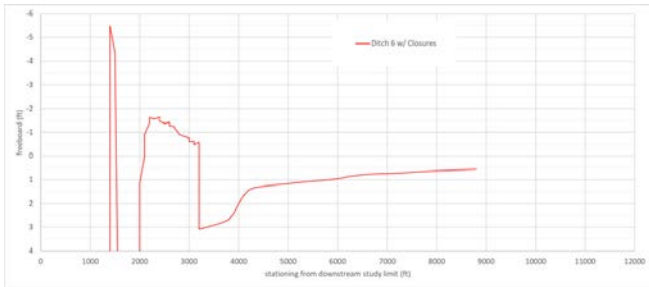


Figure 3.3-16. Estimated freeboard along Ditch 6 for the planned left levee.

Profiles of the Pony Creek simulated water surface, Missouri River water surface elevations under natural valley conditions, and left and right top of levee elevations are shown in Figure 3.3-22. Estimated freeboard along Pony Creek left and right levees is shown in Figure 3.3-23.

Figure 3.3-17. Estimated freeboard along Pony and Keg creeks near Pacific Junction, Iowa. No overtopping allowed.

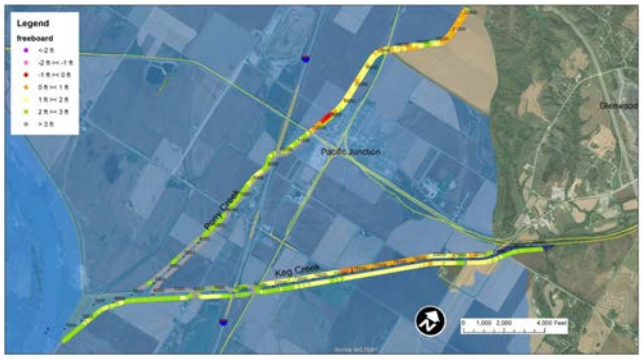


Figure 3.3-18. Depiction of inundation behind the levees if Keg Creek is overtopped at lowest freeboard location.

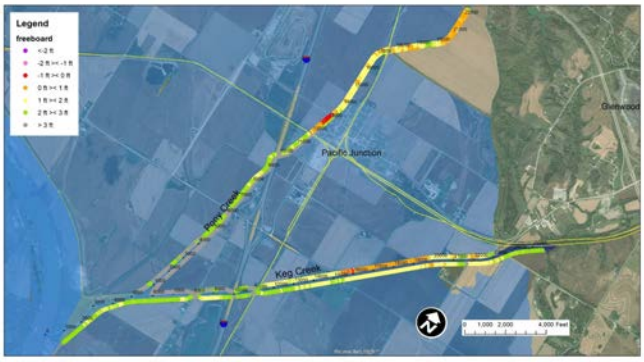


Figure 3.3.3-19. Depiction of inundation behind the levees if Pony Creek is overtopped at lowest freeboard location.

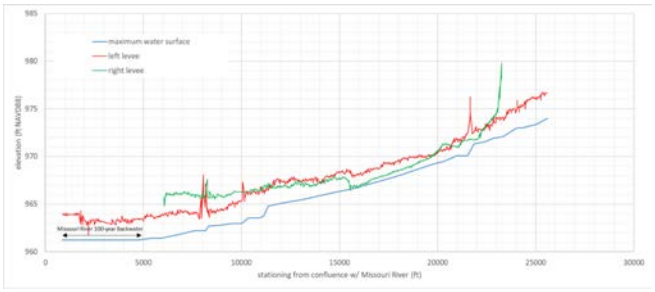


Figure 3.3-20. Water surface elevation profile of the Keg Creek shown with left and right top of levee elevations.

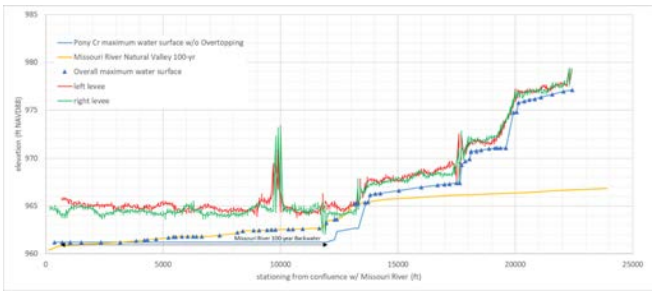


Figure 3.3-22. Water surface elevation profile of Pony Creek and Missouri River water surface elevations under natural valley conditions shown with left and right top of levee elevations.

Figure 3.3-21. Estimated freeboard along Keg Creek for the left and right levees.

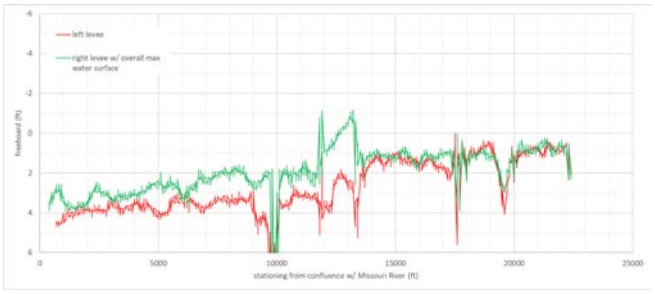


Figure 3.3-23. Estimated freeboard along Pony Creek for the left and right levees.

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FEMA. (2021, 12 07). Natural Valley Procedures. Retrieved from FEMA Information Sheet: https://www.fema.gov/sites/default/files/documents/fema_natural-valley.pdf

3.4 Land Use Analysis

3.4.1 REGIONAL LAND USE

Disasters always leave their mark on a community or region. In a minor disaster, the impacts may be small or temporary, but in a serious or major disaster, many changes in the local or regional landscape will be long-lasting or even permanent. Businesses close. Whole neighborhoods are obliterated. Understanding what those changes are and why they occurred is critical in any plan for recovery. Some changes in land use may have obvious negative repercussions for the community's future, but others may present new opportunities that, if seized, can bolster the community's future resilience. These often require bold vision to implement, but, If ignored, they can also result in lost opportunities that future leaders and generations may ultimately regret.

The imperative is to examine both the land use that pre-existed the disaster and the changes that resulted from the damage it wrought. The disaster in this case was a flood, but many of the same questions would pertain in a windstorm, a wildfire, an earthquake, or any other scenario. Disasters reveal weaknesses, but they also reveal opportunities through better planning to address those vulnerabilities. This section seeks to address land use in Mills and Fremont Counties, and specifically in Pacific Junction and Hamburg, within that framework to maximize the focus on creating a more viable, sustainable, and resilient future.

Figure 3.4-1. Scenic byway along the Loess Hills.

Pre-existing comprehensive plans for both Mills and Fremont Counties make clear the power of geography in influencing land use, and the two counties' hazard mitigation plans[1] make clear the proximity to natural hazards. Both are predominantly rural counties, but Mills County is somewhat less so because of its greater proximity to the Omaha-Council Bluffs metropolitan area. Together, they comprise the extreme southwestern corner of Iowa, bounded to the west by the Missouri River and in Fremont by the Missouri border. Mills County had approximately 15,000 people in the 2010 census versus half that total in Fremont. Development trends flowing out of the Omaha area favor growth in Mills County because of proximity, but both counties have struggled to retain their populations.

However, both gain some development prospects through their access to I-29, which runs south to Missouri through both counties roughly parallel to the Missouri River. That has opened some opportunities for development near the interchanges with state highways, most notably U.S. Route 34 about two miles north of Pacific Junction and Iowa Highway 2 several miles north of Hamburg. I-29 is the major pathway from either county to Council Bluffs with easy access to interstate bridges across the Missouri River to Omaha.

The much greater proximity of Mills County to the Omaha metropolitan area undoubtedly accounts for much of the growth of Glenwood, the largest municipality in Mills County, and in the county overall. The 2017 Mills County comprehensive plan notes 14% population growth from 1990 to 2010, followed by a slight decline of 2.1% from 2010 to 2015. Initial estimates show the population basically stagnated between then and the 2020 census,

1 Local hazard mitigation plans, produced at the county level in Iowa on a multi-jurisdictional basis, serve both to document existing hazards and to qualify the participating jurisdictions under the Disaster Mitigation Act of 2000 for federal hazard mitigation grant programs, providing the plan is approved by FEMA as complying with federal requirements and adopted by the relevant governmental units.

which came, however, the year after the 2019 floods and may well reflect some resulting outmigration, largely from flooded communities like Pacific Junction. Even small numbers of departures in that context are noticeable in a smaller county like Mills. Glenwood, with a 2020 population of 5,500, is showing halting but steady growth with just over one-third of the county's total population.

Statistics from the Mills County Multi-Jurisdictional Pre-Disaster Mitigation Plan (2019) show three periods in which double-digit percentages of the current housing stock were built, with much smaller portions developed between them. American Community Survey data in the plan from 2016 show about 28% of the housing (1,739 units) built prior to 1940, followed by a boom of 1,044 units in the 1970s, with a smaller boom during the 1990s (867) and 2000s (846). All other decades were in the lower three digits. Similar data included in the Fremont County hazard mitigation plan show 35.9% of housing units built before 1940, with a much flatter percentage spread across the decades since then, reflecting slow but continuing population decline and thus little market for new or replacement housing, but also an aging housing supply. However, it is likely that much of the housing stock destroyed or bought out because of recent flooding is older, making the remainder look a bit newer in future inventories. Replacement housing built since the flood would further reduce the average age of housing in either county. Those prospects are discussed in more detail elsewhere in this report.

In rural counties, however, residential housing constitutes a minute portion of overall land use, and that is the case in Mills and Fremont. Agriculture is the predominant land use in almost all Iowa counties, but especially here.

The current Mills County comprehensive plan, adopted in 2017, states that Agriculture/Undeveloped accounts for 95.5% of the county's unincorporated land, which constitutes all but 6.14 out of 441 square miles, or 98.6%. That total includes the Loess Hills open space in the western part of the county, which, because of steep slopes and their potential for erosion, is mostly best left undeveloped. Residential housing ranks second of six categories at 3.8%. Commercial and industrial parcels make up less than 1%. Although employment is not indicative of the land use because density of employment per acre varies wildly among uses, the three largest employers in Mills are health care and social assistance (17.9%), retail (12.2%), and manufacturing (8.43%).[2] Transportation and warehousing, which can be highly land-consumptive, employ 6.13%, ranking fifth.

While not reflective of actual land use, the Mills County zoning map does show a significant amount of land zoned industrial in the far northwestern part of the county, an area larger than all other industrial areas combined; the second largest, though much smaller, area is directly south of Pacific Junction. Two other industrially zoned areas in the middle and eastern parts of the county are far smaller by comparison. Reflecting aspirations to take advantage of the I-29 corridor, a large area to the west and northwest of Pacific Junction surrounding the interstate highway is zoned for highway commercial, though most of that land appears to remain in agricultural use or open space.

Commercial and industrial uses are more typically found inside incorporated municipalities, and the largest urban center in Mills County is Glenwood. The biggest exception would be development at the I-29/Highway 34 interchange, as is also the case in Fremont County with the I-29/Highway 2 interchange. Both involve a mix of retail and hospitality uses with some warehousing and other transportation- dependent enterprises. Both counties are looking to those interchanges to enhance economic development opportunities using roughly one square mile each, but much

2 See Data USA at https://datausa.io/profile/geo/mills-county-ia.

depends on how those opportunities materialize. Both interchanges are also dependent for their economic resilience on hazard mitigation efforts such as ring levees to protect businesses from flooding. The section on Planning Recommendations below contains further discussion of these strategies.

Fremont County is considerably more rural with only half the population and no municipality close to Glenwood in size. About 85% of the land is in agricultural use, mostly corn and soybean production with about 14% in pasture and grasslands, plus 6.2% in forest, much of that in the Loess Hills. Incorporated municipalities make up about 7%.[3] Much of the urban industry is related in some way to food and agriculture, underscoring the dominance of that sector in the local economy.

The county benefits less, economically, in terms of access and proximity to the Omaha-Council Bluffs metro area because it is further removed. The county seat, Sidney, had 1,138 people in the 2010 Census, which shrank by almost 100, or about 8-9%, a decade later. Hamburg, tucked into the far southwest corner of the state and county, is slightly smaller, with 890 in 2020, according to the U.S. Census. Only Tabor comes close to 1,000 among the handful of other communities in Fremont County. The county's most recent comprehensive plan, from 2006, notes that agriculture is the dominant land use county-wide, with about 80% of that land devoted to crops. The second largest land use in Fremont County is devoted to conservation because of the Loess Hills, which occupy a long slice of land parallel to the Missouri River on the western side of the county. As in Mills County, these lands provide some opportunity for developing recreational uses and should probably remain largely undeveloped as a valuable natural resource.

"As in Mills County, these lands provide some opportunity for developing recreational uses and should probably remain largely undeveloped as a valuable natural resource."

3.4.2 REGIONAL TRANSPORTATION

Transportation in both counties is primarily influenced by the presence of three factors:

- Interstate 29
- BNSF Railroad
- Missouri River

Highways

Highways powerfully influence economic development, and major industrial and commercial land uses, by virtue of providing the pathways for moving products or attracting customers. Since its inception, the U.S. interstate highway system has sat atop the hierarchy of automotive transportation corridors, in part because it provides connectivity to an entire nationwide system of multi-lane highways. I-29 serves that function regionally by providing a direct connection between the Omaha-Council Bluffs metro area and Kansas City, but on a larger scale by extending all the way north to the Canadian border leading toward Winnipeg, Manitoba, intersecting along the way with four other major interstates, most notably I-80 through Omaha. Its impact on Mills and Fremont Counties is illustrated through Iowa Department of Transportation (IDOT) flow maps, which show a 2016 annual average daily traffic count of nearly 20,000 vehicles at the northern end of Mills County, down to just below 14,000 at the southern end, entering Fremont.[4] That flow remains largely consistent to the Missouri line, where it decreases

3 Fremont County Multi-Jurisdictional Hazard Mitigation Plan, approved by FEMA April 26, 2017, prepared by Southwest Iowa Planning Council.

4 See https://iowadot.gov/maps/msp/traffic/2016/counties/MILLS.pdf.

only to 13,300.[5] The surveys are conducted every four years, so new data should be available soon, probably showing some increase. But the result is that the traffic counts exceed the population in both counties. Capturing that traffic is the goal of economic development centered around the highway interchanges where state or U.S. highways intersect with I-29. In contrast, almost all other corridors carry only a fraction of such traffic, with the exception of Highway 34, with about half of the I-29 count, and the small segment of Highway 2 leading west into Nebraska (about 8,000 per day). Highway 2 has gained importance because it provides an efficient link between Fremont County and Lincoln, Nebraska, where it links to I-80.

Together, I-29 and its primary highway connections within Fremont and Mills Counties gives them an effective means of moving farm crops, manufactured goods, and processed foods to larger regional and national markets. Also important for economic development, however, is the opportunity to use the interchanges along I-29 to capture some of that traffic for restaurants, fuel sales, hotel stays, and similar retail transactions as well as warehouse storage and similar larger uses that benefit significantly from such locations.

The primary challenge, however, in light of the 2019 flooding, but also earlier episodes, is to effectively protect such areas from flood hazards. When I-29 or the crossroads are underwater, massive detours become necessary, as was the case in 2019. For instance, in March 2019, IDOT reported 17 closures, and one affecting a long stretch of I-29 redirected traffic along I-35, adding 100 miles to a trip between Sioux City and Kansas City.[6] Numerous local detours produced significant inconvenience for area residents, particularly including any needing to commute into the Omaha area. Such improvements have been the focus of planning and investments by IDOT in the past two years.

Levees also play a role in such protection, as does raising roadbeds above base flood elevations, not only as determined currently but ideally for those projected for coming decades as a result of increases in high-precipitation rainstorms, as discussed in the river hydrology and flooding section above. In Fremont County, the L-575 levee provides the primary protection nearest the Missouri River, protecting both the BNSF Railroad and I-29, Highway 2, and the combination of businesses at the I-29/Highway 2 interchange, whose most noticeable operation is the Sapp Brothers truck stop. According to the Fremont County hazard mitigation plan approved in 2017, L-575 protects 70,000 acres of land and about 900 buildings.[7]

Railroads

The railroad lines through both counties are owned by the Burlington Northern Santa Fe Railway (BNSF). In Mills County, one line runs north and south in a rough parallel to I-29, while an east-west line largely parallels Highway 34. Amtrak operates one east-west corridor (California Zephyr) along the BNSF line between Chicago and San Francisco, but with stops outside the county in Creston and Omaha. The intersection between the routes occurs in Pacific Junction, just west of the downtown. In some locations, the raised bed of the railroad can effectively provide a flood barrier, affecting potential land use and development in and around Pacific Junction.

In Fremont County, the BNSF continues the north-south route down to Hamburg and into Missouri, again parallel to I-29. However, another route extends southwest into Fremont from Montgomery County, ending at Farragut, with the largest stop at Shenandoah. The two lines do not connect. These freight lines provide service largely to agricultural operations and food manufacturers.

5 See https://iowadot.gov/maps/msp/traffic/2016/counties/FREMONT.pdf.

6 https://www.desmoinesregister.com/story/news/2019/03/21/iowa-flooding-dot-travel-flooded-roads-rail-interstate-closed-department-of-transportation-trucking/3232505002/.

7 Fremont County Multi-Jurisdictional Hazard Mitigation Plan.

Missouri River

As a factor in regional transportation, the Missouri River is perhaps less important as a carrier of barge traffic than as a physical barrier and boundary between Iowa and Nebraska, crossed by a series of highway bridges, most importantly on Highway 34 in Mills County and Highway 2 in Fremont. Those are also the two non-interstate highways closest to Pacific Junction and Hamburg, respectively. These bridges are the two major direct corridors between Nebraska and the two Iowa counties, making their continued safe operation in the face of future disasters a huge regional concern. Significant improvements have been underway along Hwy 2. No barge facilities currently exist in either county, but producers have access to such facilities across the river in Nebraska City and upstream on the Iowa side in Council Bluffs.[8]

Trails

While the three factors discussed above constitute the core of regional transportation, non-motorized transportation provides an increasing opportunity for economic and recreational activity that enhances the attraction and quality of life of the region. These create reasons for some people to wish to live in the area, including those who may commute to employment in the metropolitan area, and for tourists to visit. The Loess Hills have long provided natural beauty that attracts visitors throughout their length from Sioux City to Hamburg, but pedestrian and bicycle trails through the region augment accessibility through active transportation that may attract hunters, bird watchers, bicyclists, and others who love outdoor activities.[9] Concern for the preservation of the scenic and environmental value of the area has motivated ongoing regional planning efforts,[10] including some specific to the Loess Hills, and are the focus of efforts by Golden Hills Resource Conservation & Development (Golden Hills RC&D). Because of these factors, planners and public officials should not ignore the existing trails and the potential for connecting small towns like Hamburg and Pacific Junction, with their small businesses, to them through extensions and new trails. Similar trails have demonstrated considerable popularity in other regions with less scenic potential than the Loess Hills and these two counties possess. Discussion of how these trails and scenic areas may be used appears in the sections below on Community Objectives and Vision, and Planning Recommendations.

3.4.3 PACIFIC JUNCTION

Figure 3.4-2. Pacific Junction, Iowa.

The floods of 2019 unfortunately affected the entire low-lying, almost flat landscape of the town of Pacific Junction. The proximate cause was a major breach in the L611-614 levee at the confluence of the Missouri River with the Platte River, producing

8 A Comprehensive Plan for Fremont County, Iowa, 2006, p. 42; and River Barge Terminal Directory, Iowa Department of Transportation, Revised April 2011.

9 For example, see Loess Hills: Shaped by Nature, available at: https://www.visitloesshills.org/uploads/4/5/6/3/45639541/loess_hills_guidebook_final_.pdf.

10 For example, see The Loess Hills Alliance, The Loess Hills of Western Iowa: Common Vision and Comprehensive Plan 2011, available at http://www.loesshillsalliance.com/uploads/4/5/6/3/45639541/loesshillsalliance-comprehensiveplan-hq.pdf.

inundation up to 18 feet within the leveed area.[11] Within Pacific Junction itself, in an August 2021 podcast with Iowa Public Radio, both Mayor Andy Young and City Clerk Korrena Neppl recalled boating through flood waters 8 to 10 feet deep in town in the days immediately following the flood.[12] The outcome was that almost nothing was untouched by the flood waters, including the entire downtown and all city buildings.

Discussions of hydrology, flooding scenarios, and levee rebuilding and certification appear in preceding sections of this chapter; the discussion here will focus on the land-use implications and impacts of the event, which, according to Pacific Junction officials, had never happened previously in the town's history. However, both levee breaches and overtopping are always potential hazards when a large enough storm occurs. In 2019, that perfect storm occurred.

The dominant issue affecting the future of Pacific Junction is its pervasive flatness at one of the lower elevations of Mills County, which ranges overall from about 1,350 feet above sea level northwest of Glenwood to 950 feet in some areas adjacent to the Missouri River. This relatively dramatic differential, uncommon in Iowa, is in part attributable to the Loess Hills, which themselves can rise 200 feet above surrounding farm country. Pacific Junction lies in a low area southwest of Glenwood, which is almost entirely in the hills straddling Keg Creek. Pacific Junction is generally around 955 feet above sea level with only small variations, while U.S. Geological Survey contour maps show areas to the east in Glenwood basically rising from 1,000 to more than 1,250 feet. Even without levee failures to the west, the result is a challenge in drainage and stormwater management that affects water utilities and wastewater management. By summer 2021, FEMA had indicated a willingness to fund improvements such as pumping stations and replacement facilities for the city hall, ambulance building, and community center. However, for a small town already devastated by the loss of homes in recent flood-related buyouts and left with minimal commercial activity, the financial burden of infrastructure improvements is daunting.

Development and Land Use

Zoning poses a challenge for moving forward, mostly because the zoning ordinance needs to be both updated and reconstituted. The documentation that existed prior to 2019 was destroyed in the flood, including the zoning map, and a written or electronic version apparently does not exist; one document provided by the Southwest Iowa Planning Commission (SWIPCO) contains some of the zoning language as well as zoning and land-use maps, but they date to an urban renewal plan in 2004.[13] City Clerk Neppl is skeptical that they reflect current zoning. However, overburdened local officials have had neither the time nor the resources to redraft or reconstitute the zoning code. They almost certainly could benefit from outside technical assistance in doing this, which would help the city move forward with considering and approving any new development plans. One major and possibly crucial option, discussed in the section on recommendations, is to fund the hiring of a Recovery Coordinator through the regional Council of Governments (COG), perhaps in conjunction with providing similar services for Hamburg. The funds would almost surely have to come from state or federal grant sources.

The zoning map in the document prepared by SWIPCO at that time shows three zoning districts, with the areas adjacent to and south of the BNSF tracks designated for industrial use, a narrow sliver

11 Missouri River Left Bank Levee Resilience Mapping: Missouri River Levees, Iowa Silver Jackets Interagency Project, February 2020.

12 See Talk of Iowa | Listen to Podcasts On Demand Free | TuneIn; "For One Small Town, The Recovery from the 2019 Flood Hasn't Stopped," 8/27/21.

13 Southwest Iowa Planning Council, Urban Renewal Plan: Pacific Junction Urban Renewal District, Pacific Junction, Iowa. 2004.

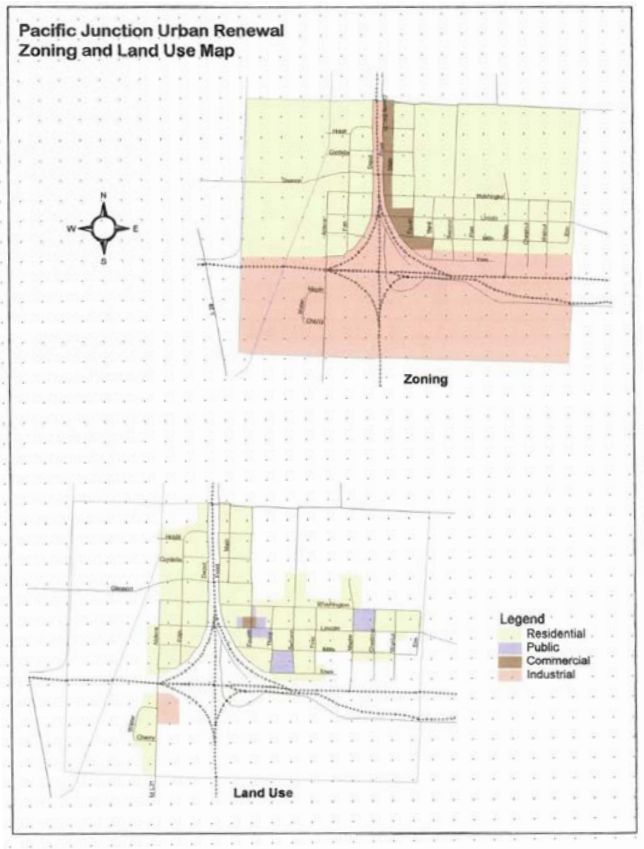

Figure 3.4-3. Zoning map for Pacific Junction..

of land just east of the north-south tracks and to the north of the east-west tracks for commercial uses, and the rest, in the northeast and northwest quadrants, zoned for residential uses. There are small public parks largely in the residential area to the east, but most of the industrial designation in that 2004 map is so far unrealized, remaining in open space or agricultural use.

The predicament Pacific Junction faces is clear in a Rural Housing Readiness Action Plan released by Iowa State University Extension and Outreach.[14] The plan notes that the city acted to purchase 36 lots from residents to preserve them from FEMA deed restrictions by not using hazard mitigation grant funds. However, because only 40 of 200 lots remain on the tax rolls, the city has neither the financial nor the administrative wherewithal to undertake new development and, without loans or grants from outside sources, it may not be able to survive financially until new homes can be added to the tax rolls. Consequently, the ISU plan outlines what it considers three "stark" choices for Pacific Junction as a municipality:

- Build homes on the lots
- Allow and negotiate annexation by neighboring Glenwood
- Discontinue Pacific Junction as an incorporated city

Relieving those concerns for at least the near future, however, the city received news in September that it was granted $576,000 in Flood Recovery funds from the Iowa Flood Mitigation Board to cover matching fund requirements for FEMA grants it had received. (FEMA covered 75%, and the State of Iowa had already matched 10%; this was to handle the remainder.)[15]

Buyouts

As of late August 2021, although 132 buyouts of flooded properties were in progress, not quite half of those buyouts had been completed. Buyouts have occupied what is surely an unsustainable amount of the city clerk's time. Because most of the buyout properties from the 2019 flood are to the west and near the railroad tracks, there is a current need to rezone much of that land out of residential use and into something more accurately reflecting its current potential. Generally, the recommended zoning in areas with high percentages of deed-restricted properties is open space, if for no other reason than to make visible into the future the fact that parcels acquired with FEMA hazard mitigation grants may no longer be considered for development. Allowed uses under the FEMA deed restrictions for buyouts exclude any permanent structures except for open pavilions and public

14 Iowa State University Extension and Outreach. 2021. Rural Housing Readiness Action Plan: Pacific Junction.

15 E-mail from Larry Winum, Glenwood State Bank, September 28, 2021, to various recipients following a string of e-mails from others announcing and explaining the decision.

restrooms that may accompany park space. As a result, the city is following the common practice of gradually removing much of the infrastructure that served this area.

There are two key considerations in planning a new future for land use in Pacific Junction. One regards the potential, albeit deed-restricted, uses of the parcels acquired in the buyout area. Another is where Pacific Junction could grow or expand in the future if it can attract people to rebuild its population, which fell from 471 in the 2010 census to 96 in the 2020 census, presumably due in large part to the 2019 flooding. Like many small towns across the nation, Pacific Junction had been slowly shrinking for the past century, peaking at 744 in 1890 and remaining below 600 since the 1930s.[16] Its population seems to have remained in steady decline even in the years immediately preceding the 2019 flood.

The latter question rests heavily on the status of the rebuilt levees protecting the area, most notably the Missouri River levee that failed. Two steps are crucial. First, the levee must be certified by a registered professional engineer; then it must be accredited by FEMA, which allows it to be labeled Zone X on a flood insurance rate map (FIRM) instead of a Special Flood Hazard Area (SFHA).[17] This critical determination by FEMA, at this time, holds the key to whether flood insurance is affordable and investors or developers see an economically viable path for creating new housing or commercial uses. With accreditation, it may become possible to develop housing on current farmland to the north of the city and expand in that direction, attracting new or previous residents. But clearing the FEMA accreditation

"There are two key considerations in planning a new future for land use in Pacific Junction. One regards the potential, albeit deed-restricted, uses of the parcels acquired in the buyout area. Another is where Pacific Junction could grow or expand in the future if it can attract people to rebuild its population …"

hurdle is central to all such aspirations. In short, Pacific Junction is not in control of its own fate, at least for the foreseeable future.

The other question concerns the future of the buyout properties as well as how their future uses affect the future of those properties nearby that remain in private hands. Because buyouts with federal mitigation grants require the presence of a structure that is being removed, empty lots are not eligible, but the buyouts are also voluntary under federal law. The possible resulting mixture of deed-restricted and privately held parcels produces what is commonly referred to as a checkerboard pattern. This can mean that the city must maintain some infrastructure to service rebuilt or surviving structures that are more widely separated than before the disaster. Without good planning, what can materialize is a disparate collection of open space that may impose maintenance burdens, such as mowing, on a community with a shrunken tax base. Even with some planning for alternative uses, it can be difficult to establish adequate contiguity among the parcels assembled. Owners of undeveloped lots may develop unrealistic expectations concerning a purchase price if the community uses other approaches to acquire such lands, such as eminent domain or the use of other grants that do not involve the use restrictions of FEMA mitigation assistance or HUD's CDBG program.

16 See Iowa Data Center at https://www.iowadatacenter.org/datatables/PlacesAll/plpopulation18502000.pdf

17 Levee Certification vs. Accreditation. Federal Emergency Management Agency. October 2012. Available at https://www.mvk.usace.army.mil/Portals/58/docs/LSAC/LeveeCertification.pdf.

Nonetheless, open space uses do not rule out options such as small-scale or urban agriculture. Subsequent sections of this report explore those options, but they are well within an emerging set of practices for post-disaster buyout lands in communities across the U.S.

Transportation

Pacific Junction acquired its name from its status as a crossroads for what became the BNSF Railway. This junction between east-west and north-south routes sits just southwest of the center of town, and the land surrounding that switchyard frames the structure of the entire town. BNSF notes approximately forty trains travel through Pacific Junction daily. Thus, work with BNSF to agree on potential uses for the land surrounding the junction is essential in determining how it may influence surrounding uses. Currently, most of that land consists of grassy open space with one shed that is being removed. Because other potential uses are prospective and require collaboration and support from BNSF, they are discussed in the later section on recommendations.

Pacific Junction also sits in the shadow of the Loess Hills and near a great deal of public open space that can facilitate trails for hikers, bicyclists, and other outdoor enthusiasts. The Pony Creek Nature Center is an excellent example of these assets and Golden Hills RC&D offers excellent capabilities for facilitating both open space preservation and outdoor recreation and tourism. Trails from nearby recreational paths represent an opportunity to attract users to small stores, coffee shops, and casual entertainment, if done well.

Figure 3.4-4. Railway wye at Pacific Junction.

Figure 3.4-5. View of Loess Hills from Pacific Junction.

Figure 3.4-6. Inside the Pony Creek Nature Center.

Those possibilities are also explored in subsequent sections of the report but may play a role in reviving a modest commercial sector that was devastated by the flood.

Finally, Pacific Junction lies near but does not contain an interchange area between I-29 and Highway 34, which presently includes a BP gas station and convenience store plus a closed motel and Loves outlet (recently reopened). This interchange is a little less than four miles northwest of the city and lies outside the control of Pacific Junction; it is thus an economic development responsibility of Mills County. It has been the subject of past planning efforts including one plan prepared in 2011 by JEO Consulting Group.

3.4.4 HAMBURG

Hamburg, a small city in the far southwest corner of Fremont County, faces different circumstances, and a consequently different future, from Pacific Junction. While the southernmost part of the city was flooded in 2019, the city lies nestled against and even into the hills to the north and west, which give it significant land above and outside the floodplain in which to expand and develop. The flooding that occurred, which produced significant losses, was the result of levee overtopping but not levee failures. Unlike Pacific Junction's proximity to Glenwood, Hamburg has no larger neighbors nearby. The one major similarity, however, is that the city lies near I-29, and there is also a highway interchange at Highway 2 and I-29, also outside the city limits and several miles away, and therefore, a focus of development for the county but not for Hamburg itself.

Hamburg is also larger. The 2010 census showed Hamburg with 1,185 people, but that fell to 996 in 2020, a significant but not drastic decline, much of it triggered by the losses suffered in the floods of 2019, which have resulted in buyouts of most of the land south of North Street (see map), accompanied by the departure or relocation of many of the property owners.

Transportation

As is the case with Pacific Junction, major transportation routes help define the access and opportunities Hamburg enjoys. To the west, I-29 brings significant traffic past the city, even though Hamburg lies several miles south of Highway 2, which produces a busy interchange to the northwest. Fremont County is seeking ways of addressing some congestion issues in the area around the interchange. However, that combination provides a relatively short route to Nebraska City, just over the bridge across the Missouri River, and from there to Lincoln, connecting to I-80.

Hamburg also benefits from rail connections: BNSF runs south from Mills County along the perimeter of Hamburg and facilitates rail transportation for agricultural industrial facilities Bartlett, Manildra, and ConAgra. These have long helped Hamburg maintain a healthy industrial employment base.

Secondary highway routes connect Hamburg to the major corridors outside its boundaries. North Street (333) connects to and crosses I-29 west of town, but turns north from its eastern terminus at Washington Street, until it becomes U.S. 275 north of E Street. Extending south from Mills County, and Sidney within Fremont County, U.S. 275 forms an L on the eastern side of Hamburg, running east out of town as E Street and north as Washington Street.

Several local or county roads create connections to the nearby Loess Hills to the northwest of Hamburg, most notably Bluff Road (L44), affording views and home sites that support scenic and recreational opportunities in the area. The Loess Hills Scenic Byway offers strategic opportunities to benefit from scenic tourism including non-motorized excursions by regional outdoors enthusiasts.

Figure 3.4-7 Flood wall in Hamburg.

Figure 3.4-8. Flood cleanup of HUD rental housing.

Flood Damage and Consequences

Hamburg has one decided advantage in fashioning a new future from its recovery: differences in elevation within the city that put significant areas outside the floodplain. Nonetheless, Hamburg has faced its own major challenges in flood recovery because the 2019 inundation placed most locations south of C Street underwater because of flooding from the Missouri River. This included the popular Main Street restaurant, Blue Moon Bar & Grill, almost all of the area just west of the city, and a mix of areas, depending on elevation, to the east of Washington Street as far north as M Street. However, the flood spared City Hall and some vital businesses that were slightly north and farther uphill along Main Street. Still, the damage and disruption to Hamburg were massive, and the city continues to be challenged with its recovery plans.

The biggest immediate problem involves the Ditch 6 levee, which sits just west of the city. Local officials had it built higher quickly in the 2011 flood to protect the community from the overflowing Missouri River, but because the temporary additions that raised the levee were not built to federal standards, it had to be torn down. Plans were underway to rebuild the levee when the 2019 flood struck, overtopping the shorter height that remained and inundating most of the city. Ditch 6 is not the primary levee along the Missouri River itself, but a smaller protective levee along the western perimeter intended to provide direct protection. Another levee exists on the eastern side of Hamburg to protect it from flooding along the Nishnabotna River. These are discussed in the section of the report on levees. The primary point is that work with the U.S. Army Corps of Engineers to rebuild the Ditch 6 levee, enabled by new legislation co-sponsored by U.S. Rep. Cindy Axne, got underway in May 2021. FEMA accreditation of that levee, if it happens, will unquestionably influence the viability and direction of at least some of Hamburg's future development.

The borrow pit from which the earth will come to raise the Ditch 6 levee by an additional eight feet will lie between the western end of the town's development and the levee itself. The city has reported to the project team that the U.S. Army Corps of Engineers made clear that the 115 acres behind the levee may not be used for commercial development. Construction is not permitted because it would interfere with levee hydraulics. The result is that the area will largely be confined to open space and wetlands and will constitute a type of buffer zone between the levee and developed

areas of the city.[18]

The primary thrust of new development in Hamburg is largely uphill, where the city has annexed additional land for the purpose. Much of this land, on the northern end of Main Street north of the Marnie Sims Elementary School (also known as Hamburg Community Schools) and near Grape Community Hospital on Washington Street, will be used for new housing, discussed below under Housing. It offers Hamburg the opportunity to relocate its center of gravity to higher ground and regain some of its lost population through new housing options.

Buyouts and Alternative Land Uses

Figure 3.4-9. Buyout area south of North Street in Hamburg (May 2021).

As noted, most buyouts have occurred (or will) south of North Street, with a few on the eastern end of Hamburg, east of Adams Street in a small pocket on either side of E Street (Highway 275). Combined with existing city- or county-owned properties, these vacated lots in some contiguous formation offer opportunities for urban agricultural activities appropriate for deed-restricted lands that are nonetheless more creative uses than vacant lots producing no property tax revenues. The map showing the buyout status of those areas makes clear where such parcels are congregated within the existing city limits.

As of September 2020, the city had 73 properties in either active or alternative status for acquisition and demolition, of which 63 were active. It should be noted that FEMA rules allow use of such funds (mostly Hazard Mitigation Grant Program, a post-disaster grant program) only for parcels with structures. Communities wishing to acquire undeveloped parcels to create contiguous open space must use other funds. In any case, acquisitions with FEMA funds must be voluntary.

It is again important to stress that FEMA rules for acquisitions of flood-damaged properties by the city impose deed restrictions that prohibit any permanent structures other than open pavilions and public restrooms. Aside from the fact that these deed restrictions are entered into the public records of ownership of the parcels acquired, it is wise to rezone the area to public open space to make clear to future local officials and potential developers that development is not permissible. However, small crop production such as orchards or community gardens would be permissible uses. That opens up a different set of opportunities not only for the use of the land but the appearance of the city itself and its entryway along North Street. In short, creative use of the land can assist in future image making for the city of Hamburg. This can include functions like seasonal farmers' markets, ecological and agricultural education for students and adults, and passive recreation. These options are discussed later in other sections of the report.

Zoning and Land-use Controls

The city has a zoning ordinance that appears to date to the 1990s and thus is due for an update, especially considering that changing circumstances include recent annexations. Alexsis Fleener at SWIPCO has indicated that she is helping prepare such an update for the city, and adoption of the update would appear

18 Comments by Alan Dovel, Hamburg Public Works Director, to a partners meeting for this project, 10/20/2021.

to be a timely opportunity to digitize the new code and arrange for remote storage and public website access to avoid any potential data loss. As the city annexes land and expands to include development sites on higher ground, the need to make zoning for these new areas transparent and accessible will underscore the desirability of digital code and map storage. Underscoring this point was the felicitous discovery in October 2021 of two previously missing copies of the city's zoning map, which had been lost in the rush to move such materials out of City Hall during the flood.[19]

As is common in smaller communities, the organizational structure of the zoning ordinance is relatively simple and straightforward, providing for a Planning & Zoning Commission and a zoning administrator for enforcement. The code describes four districts— agricultural, residential, commercial, and industrial. The original zoning map referenced dates to 1970, with four amendments through 1995. The residential district prescribes minimum lot areas of 9,240 square feet for one-family housing and minimum lot width of 66 feet, along with some other prescriptions that may need to be revisited to create the flexibility that may be needed for new developments encompassing smaller, affordable units for low- and middle-income homeowners.[20]

The existing code includes a subdivision ordinance that is probably also worth revisiting as part of the assistance from SWIPCO to update land-use codes. Those updates are in process but obviously will take some time to complete and for the city to adopt, which means there is adequate time for discussion of the full scope of the updates that SWIPCO may need to undertake.

Hamburg is listed by FEMA as a member of the National Flood Insurance Program, but the extent of its 100-year floodplain for regulatory purposes is likely to depend on the ultimate status and accreditation of levees along the Nishnabotna and Missouri Rivers and, importantly, the Ditch 6 levee currently being reconstructed to the west of town, as discussed in the previous section of this report. Adequate height for these levees remains a question mark, as do openings at the railroad and Highway 333; the answers will determine to a considerable extent which locations in Hamburg remain viable for business and residential

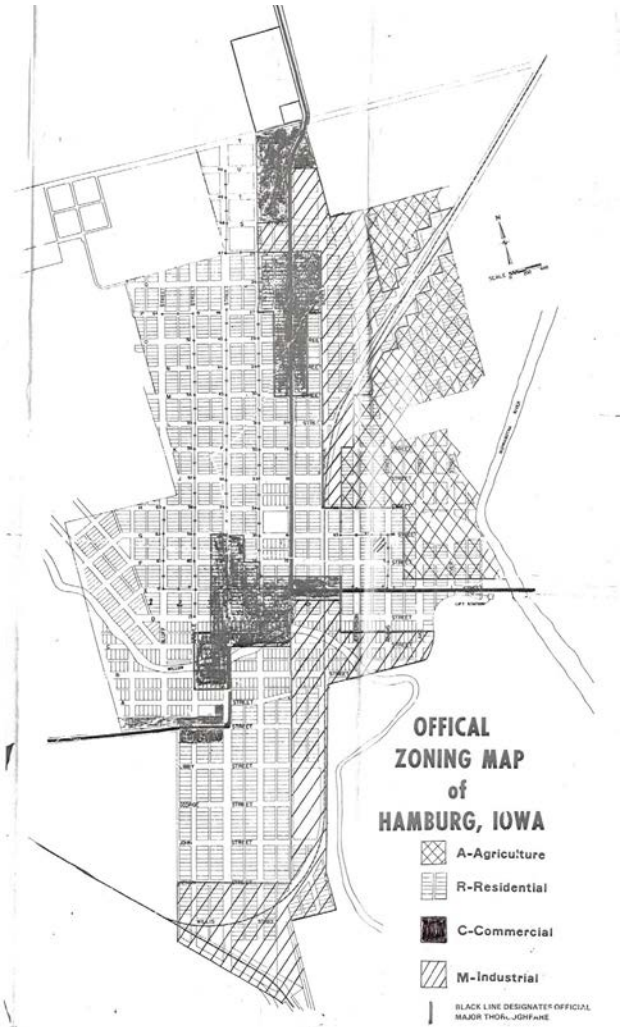

Figure 3.4-10. Hamburg zoning map.

19 Report by Sheryl Owen, city clerk of City of Hamburg, in IEDA project partners meeting, 10/20/2021.

20 City of Hamburg, Chapter 165, Zoning Regulations—General Provisions, and Chapter 166, Zoning Regulations—District Regulations.

investment, given the impacts of rising flood insurance rates. This is no longer much of an issue in the buyout areas in southern Hamburg, but could significantly influence land-use decision making in some parts of the downtown commercial district.

Rebuilding Commercial and Industrial Sectors

In 2019, floods invaded the commercial and industrial sectors well into the lower sections of Main Street that were most vulnerable, including the Blue Moon Bar & Grill at the corner of Main and C Street, which was under 5 feet of water. The flooded area to the south largely consisted of residential housing in what is now the bulk of the buyout area, but also the Clayton Sports Complex, which is largely open fields used for baseball and other sports. However, the NAPA Auto Parts and Dollar General stores lie to the south and west of the park and within the flooded area, as do the Manildra Milling[21] and Bartlett Grain facilities. The former and now closed Hamburg Inn, a small motel subsequently listed for sale, was also within the area of inundation. All of these were affected at the time. The agricultural manufacturers used their own 538 employees for flood cleanup and restoration.[22] Given the BNSF route at the perimeter of Hamburg, railroad operations were also clearly hampered at the time, as were some surrounding truck routes.

Considering the damage wrought on the Hamburg business community by the 2019 events, it is worth noting that the city has managed thus far to encourage and recruit new businesses in locating in the city, especially in blocks along Main Street that still require better flood protection, although new businesses can and should design new buildings with flood mitigation in mind. The NAPA store moved twice in one year but has decided to

"Considering the damage wrought on the Hamburg business community by the 2019 events, it is worth noting that the city has managed thus far to encourage and recruit new businesses in locating in the city, especially in blocks along Main Street that still require better flood protection …"

Figure 3.4-11. Dovel's Locker.

Figure 3.4-12. Preparing to open Relax & Unwind coffee shop (October 2020).

21 See Gelski, Jeff, "U.S. Midwest flooding bogs down mills, railroad operations," WorldGrain.com, 3/20/2019, at https://www.world-grain.com/articles/11810-us-midwest-flooding-bogs-down-mills-railroad-operations.

22 Comments from Mayor Cathy Crain, initial meeting at City Hall with project team, 10/1/2020.

remain.[23] Dollar General is a newer arrival since the flood, locating on Rte. J64 (310th Street, which becomes North Street past Argyle, to the east). Recruitment of new business in Hamburg, like all small towns, occurs almost entirely on the retail level, one new store at a time. With persistent effort, progress has occurred.

Among those elements of progress have been the following:

- A new 2-story, 28-room hotel on Main Street immediately to the north of City Hall.[24]
- Investment in a new grocery store on Main Street, whose plans are still pending.
- Reinvestment by the owner of the 6,200-square-foot Old Harvest restaurant to convert the building into an events center.[25]
- Construction underway for the Dovel Locker, a small meat-processing plant handling beef, pork, and deer, in part servicing the needs of area hunters, at the northwest corner of E & Main Street.
- Completion of the new, 9,000-square-foot Dollar General store in February 2021.
- Opening of the new tea/coffee shop, Relax & Unwind, across Main Street from Dovel Locker.
- Purchase by a new investor of the former Hamburg Inn, converting it to a combination of new uses including on-site laundry for a trailer park.[26]

While each of these new businesses is its own small victory, cumulatively they are laying the groundwork for the possibility of a more vital Main Street commercial business district that can make Hamburg a community that will attract new residents and retain existing families, while also

"The primary issue concerning housing in Hamburg is that of replacing affordable and senior housing ..."

providing a modest number of jobs to supplement the public and institutional sector (schools, hospitals, etc.) and the more large-scale employment at the reopened manufacturing facilities.

The redevelopment of business districts in small towns and cities can sometimes seem a matter of connecting dots among various unused parcels of land, especially in a situation where businesses have failed to reopen after extensive losses or destruction from a natural disaster. That certainly seems to describe much of the slow, deliberate, and painstaking process occurring in Hamburg. It is also a process of recreating a sense of place with the types of establishments that mean the most to residents. In that sense, the restoration and continued presence of certain types of businesses, such as the Blue Moon (restaurant/bar), Stoner Drug (pharmacy), and other attractions like a bakery, ice cream shop, or professional services can fill in the emotional and economic blanks in addition to the physical spaces. Both are crucial to successful disaster recovery.

Housing

The primary issue concerning housing in Hamburg is that of replacing affordable and senior housing because the Low Rent Housing Agency of Hamburg lost much of Park Washington Plaza in the flood of 2019. When the floods struck in March 2019, residents of the complex were roused from sleep to evacuate the area at 4 a.m., and many lost numerous personal and important belongings.[27] Most of the residents were single and elderly.

23 Comments from Mayor Crain, cited in footnote 22.

24 See WOWT, "The Future of Main Street in Hamburg, Iowa, at https://www.wowt.com/2020/10/17/the-future-of-main-street-in-hamburg-iowa/

25 Cathy Crain, meeting with IEDA partners, 10/20/2021.

26 Ibid.

27 For some personal accounts of the flood's impacts, see "Hamburg Flood: Residents find strength through church, community," Iowa Conference United Methodist Church, April 12, 2019, at https://www.iaumc.org/newsdetail/hamburg-flood-residents-find-strength-through-church-community-12793395.

The homes were near Washington and E Street, at the northern edge of the flooded parts of downtown Hamburg. The site had decided locational advantages for residents because of its proximity to existing services like a convenience store and medical clinic, but its flood-prone location created problems that ultimately outweighed those advantages, including issues of financing rebuilding in a floodplain. Almost a year later, the city found itself about $500,000 short of the needed money to restore senior housing. Including the senior housing, the city lost 47 units of rental housing in the flood.[28] Additional considerations naturally included higher costs of flood insurance in the old location and the availability of FEMA money for rebuilding on a less flood-prone location on higher ground.

The focus shifted to building new replacement housing at higher locations further up Main Street and Washington St. These new projects, while promising much better flood resilience, also meant that displaced residents, many living in temporary housing arrangements outside Hamburg, would have to wait for the city to secure new property for development, consider proposals for developing the new sites, and then oversee the actual implementation of those plans, which are still under consideration at this time. The city has acquired land north of Marnie Sims Elementary School and across Washington Street from George C. Grape Community Hospital, both at least a dozen blocks north and northeast of the former locations near City Hall and the business district. Meanwhile, the city had to seek buyers for the existing rental property.

The plan is to build 40 units of housing in the new North Ridge Hills subdivision north of the elementary school in an area between Main Street and Washington Street (U.S. Route 275), west of both the hospital and Fox Circle, a small L-shaped extension of 290th Street west of Washington with a handful of homes. The exact alignment and design of the subdivision was under discussion in the fall of 2021, with some ideas offered by the BNIM project team that focuses on walkability (sidewalks and trails) and a mixture of home sizes.

The housing agency will be developing 16 units of replacement rental housing funded by the U.S. Department of Housing and Urban Development (HUD) on the western side of the 10-acre site on what is currently undeveloped farmland just to the east of U.S. 275, with the remainder of the site available for other new housing. The HUD-supported housing is the intended replacement for the Park Washington Plaza that was flooded in 2019. HUD will also pay for streets in the new rental housing area. Across the street, the George C. Grape Community Hospital would no longer be quite so isolated from the community, as it has been. In combination with existing and potential trails and access to open space on the northern fringe of Hamburg, this presents a unique opportunity for community building. Meanwhile, new ownership is expected for the old downtown site for redevelopment into likely new market-rate rental housing after the flooded housing is torn down.

28 See Manion, Kurt, "Park Washington Plaza residents won't be returning soon due to funding gap," Nebraska City News-Press, January 15, 2020, at https://www.ncnewspress.com/story/news/2020/01/15/park-washington-plaza-residents-wont-be-returning-soon-due-to-funding-gap/112009490/.

Summary

Hamburg has seen its share of struggles resulting from the Missouri River floods of 2019. The buyouts in the southern end of Hamburg will forever change the center of gravity of the community by eliminating most lots in that area from further development as a result of deed restrictions required by the FEMA hazard mitigation grants. However, that part of the city has long been vulnerable to flooding as a result of its location in the Special Flood Hazard Area, or 100-year floodplain, and even with rebuilt levees, climate change is likely to increase the long-term vulnerability of the area and the propensity in the region for more intense flood events.

Thus, the city's emotional and logistical center of gravity is moving uphill, as it probably should for reasons of securing the city's long-term resilience against future flooding. It may also serve to tie the city more closely to the Loess Hills and its surrounding natural heritage, which may eventually serve other positive purposes in reshaping the city's image. At the same time, the city can use the acquired lowlands to create a new entryway from the south with a combination of natural beauty and urban agriculture that are discussed later in this report. The availability of uplands for new development gives the city a resilient advantage as well as an opportunity for a more creative brand of disaster recovery.

3.5 Natural Resources

3.5.1 REGIONAL ECOLOGY

The ecology of Mills and Fremont Counties is heavily influenced by the hydrology of the Missouri River, and associated soil conditions that are the result of both deposition of nutrient-rich soil in the alluvial river plain and wind-blown Loess Hills soils in the adjacent bluffs. The landscapes that evolved in these conditions over the past 18,000 years (as throughout the Midwest) are primarily deep-rooted perennial grasslands (prairies) that sustained massive populations of grazing animals, primarily bison and elk, thus bountiful hunting that supported Native American tribes. The people co-evolved with this prairie landscape by managing the land with annual fire and other practices that helped evolve an extremely diverse ecology that provided habitat for an amazing array of birds, insects, and other fauna.

Immediately following Western settlement of the region in the early to mid-nineteenth century, the floodplain prairies were converted to grain agriculture and pasture.

The Loess Hills bluffs contained some timber, which was harvested, but were not practical to farm, and therefore kept largely intact. A series of levees were constructed along the river and the

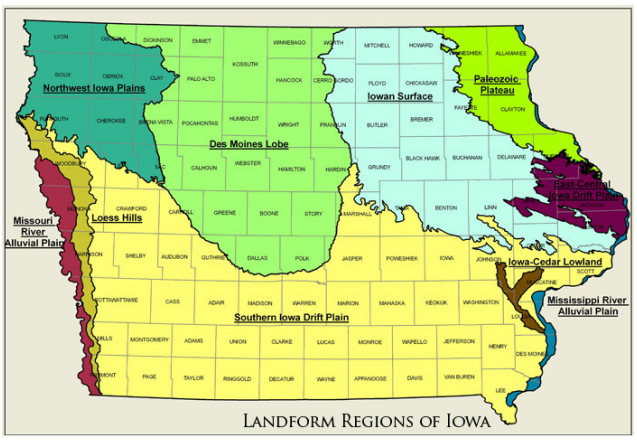

Figure 3.5-1. Buyout area south of North Street in Hamburg (May 2021).

Figure 3.5-2. Loess Hills and alluvial river plain.

Figure 3.5-3. Loess Hills National Scenic Byway Spine and Excursion Loops.

"The Loess Hills Scenic Byway provides access to the spectacular views and natural areas that stretch north and south through the region. Hunting and fishing are extremely popular in the area, as is bird-watching and hiking."

main tributary streams to minimize impacts from flooding on agricultural operations, transportation routes, and the small towns that grew to provide shops, services, schools, and churches to the primarily farming populations.

Mills and Fremont Counties retain an array of critical native Iowa landscapes, some along the Missouri River, and much in the Loess Hills. The Loess Hills Scenic Byway provides access to the spectacular views and natural areas that stretch north and south through the region. Hunting and fishing are extremely popular in the area, as is bird-watching and hiking.

3.5.2 AGRICULTURE AND FOOD SYSTEMS

Introduction

The agriculture of Mills and Fremont counties straddles two distinctly different landforms-the flat, fertile floodplain adjacent to the untamed Missouri River and the fragile Loess Hill soil, requiring expert stewardship at all times. At the turn of the twentieth century, small-scale livestock and diversified crop production dominated the region. After WWII, with advances in technology and chemistry, the rural flight began as farms scaled up to the opportunity of intense production of commodities with low labor requirements.

Lacking the ability to float barges of grain and fertilizer on the Missouri River, the rail and interstate highway system has developed to provide a transportation network to make the region's

Figure 3.5-6. View across the river plain.

commodity grain very fluid, reaching domestic livestock feeding operations, ethanol production facilities and export markets. "We are creating new wealth" said a long-time farmer of the rich soil of the Missouri river floodplain. Indeed, sunlight converted to energy through the amazing corn plant and the abundant proteins of the leguminous crop of soybeans has created tremendous value for the region.

According to the USDA, NASS Census of Agriculture, in 2017 crop production had a combined value of over $227 million in the two-county region while livestock represented $22 million. Slightly over 90% of the farmland is in intense commodity crop production. Because of the environmental sensitivity of the region's farmland, almost 50% of the land is planted using no till techniques and another 20% is farmed using reduced till. A conservation practice that is increasing rapidly is the planting of a cover crop following soybeans or corn, now up to 8%. Agriculture infrastructure and industry has consolidated in the region to service the sheer volume of corn and soybean production, including importing the crop production inputs to support production of over 400,000 acres of corn and soybeans. The livestock type is mainly cattle and calves, with hog numbers low for typical counties in Iowa.

Cattle have a long history in the region and it is common for regional agricultural trends to continue because the geographic elements that spawn the activity most likely still exist. What appears

uncommon is the disappearance of local food production. At the turn of the 20th Century, 30 fruit orchards dotted the landscape and the vegetables, melons and potatoes were rowed and bedded on the outwash plains. The soil, rainfall and temperatures favor production of these crops, yet these and other produce crops are largely absent from the region.

This report looks at three general areas of agriculture in the region:

- Large-scale, industrial, commodity agriculture
- Small-scale / local food agriculture
- Regional agriculture infrastructure

After characterization, several recommendations are outlined and considered for barriers and impact, which are also incorporated into the report's aggregated recommendations in the Executive Summary.

Large-scale, Industrial Commodity Agriculture

Large-scale agriculture is a primary land use in Mills and Fremont Counties and has a significant role in protecting or degrading resources. Residents and businesses of the region, as well as other Iowa communities connected by the landscape, are impacted by the stewardship of these resources. The benefits of protecting the region are many. Technology has treated this sector well. Machinery, electronics and chemicals allow for capacity and efficiency not rivaled by any other sector. With the current labor shortages and future expected scarcity of workers, the man hour capacity of food and feed production has expanded exponentially. In one hour, one worker can harvest more corn than an entire crew in 1950 could accomplish in a day.

"At the turn of the 20th Century, 30 fruit orchards dotted the landscape and the vegetables, melons and potatoes were rowed and bedded on the outwash plains. The soil, rainfall and temperatures favor production of these crops, yet these and other produce crops are largely absent from the region."

Over 90% of operations are family farms despite the migration of the sons and daughters to urban areas for higher paying jobs and the rural flight makes it difficult to find competent workers willing to work for low wages. Despite the labor crunch, all the land gets farmed at record-yielding capacity. Technology has replaced the need for labor but has created the need for wide-spread broadband internet capabilities. This infrastructure need is massive and will require federal action to adequately serve the farm equipment operating today. Each farm power unit needs both GPS and an internet connection

Figure 3.5-7. Aerial photo of farmland.

to function properly. There are other benefits and disadvantages of this farming system. One key benefit is labor reduction. In 1850, it required 48 minutes of labor to produce one bushel of corn. By 1930, that was reduced to 12 minutes of labor per bushel. Today, the labor required to produce one bushel of corn is around 1 second.

Compromises to the environment have been the major concern of large-scale agriculture, which has been the focus of many books, documentaries, and environmental conferences. The major environmental concerns are wind and water erosion of the soil, reduction of organic matter, nutrient run-off (which impairs the water quality and ecology of wetlands, streams, and rivers) and flooding caused by increasingly less-absorptive soil and lack of vegetation during portions of the year. In recent years farmers have adapted to more no-till seed bed preparation, strip-till, and cover cropping to try to mitigate these impacts. The Iowa Department of Agriculture and Land Stewardship has been instrumental in the promotion of these conservation techniques with cost-share and leadership. With larger farm assemblages, farmers today may farm in several different counties. It is reported that many farmers have made their residence in urban areas, away from the land they are stewarding. Some farmers now farm both in the high terrace cropland as well as in the river bottom. Remote sensing technology allows farmers to monitor conditions from a remote location.

Farmers are poised to benefit from emerging policy and incentives relative to climate change. Numerous companies are now promoting carbon credits that promise payment back to the farm gate. Carbon credits encourage restorative farming practices and are a new monetary stream that will likely supplement the commodity grains.

Recommendation: Promote Regenerative Agricultural Practices in the Region

Increased surface water runoff from row crop industrial-scale farming is definitely a significant source of both flooding and nutrient pollution in rivers, streams, and wetlands. While some degree of flooding in the Missouri River floodplain is a natural condition, it is heavily influenced by land cover, and will increase with more intense, localized rain events and other hydrological instabilities resulting from climate change-related impacts.

Regenerative Agriculture is a system of farming principles and practices designed to increase soil health and fertility, which results in cascading benefits including increased yields, greater biodiversity, and enhanced ecosystem services. Overall watershed improvement will result from enhanced on-site infiltration, reduced surface water runoff and associated soil erosion, and decreased downstream flooding.

Regenerative Agriculture relies on various methods (cover crops, perennial crops and pastures, prairie strips/buffers, soil amendments, etc.) to capture carbon in soil and in the aboveground biomass, reversing the decades-long trend toward increased atmospheric carbon. Market-based Regenerative Agriculture practices can improve the viability and profitability of annual crops (corn/soybean) and provide revenue streams from other crops and products, such as cellulosic biofuels.

With existing municipalities and multiple processors in the region, compost can quickly provide benefits for Regenerative Agriculture. Compost is a proven, valuable soil amendment and the potential need is significant, far exceeding the potential supply. The development of the compost market is a challenge for all concerned with this reuse of valuable resources. There is good scientific support for use of compost in modern agriculture,

but there is little that is typically used in practice. Barriers to supplying the agriculture market demands include:

1. The costs of transportation and the need for improvements in economic and scalable application methods.
2. Consistent, reliable composition of the product allowing for precision application for the specific rate required by the needs of the soil and crop produced.
3. Increased management requirements of using compost versus highly concentrated chemical products.

Agriculture of Mills and Fremont County is influenced by regional, national, and global forces. These include commodity markets, economic pressures, shifting consumer tastes, regional environmental concerns, climate disruption, and state and national agricultural policy. While these forces are complex, vulnerability to these forces can be summarized as a lack of resilience in the food and farming systems present in the county. Shifting national and international market trends, tightening commodities markets, and increasing cost of inputs pose challenges to the modern farmer. These factors boil down to a nearly universal challenge: profitability.

Two common methods for bringing more dollars back to the farm are scaling-up or broadening scope. Scaling-up can increase profitability via an economy of scale; however, scaling-up is limited by availability of land and credit, and does not always reduce risk. Broadening scope can include diversification, adding value to products, organic production, and participation in conservation programs. These techniques could incur additional costs and require education and support to begin operations; however, they may provide resiliency against economic and environmental challenges.

The Iowa Department of Natural Resources (Iowa DNR) has identified the following impacts of climate change in Iowa:

- Increased precipitation
- Increased frequency of precipitation extremes that lead to flooding
- Increase of 8 percent more precipitation from 1873 to 2008.
- A larger increase in precipitation in eastern Iowa than in western Iowa
- Higher temperatures
- Long-term winter temperatures have increased six times more than summer temperatures
- Nighttime temperatures have increased more than daytime temperatures since 1970

The drought of 2012 was telling of the impact of climate change, and the Western Iowa Floods of 2019 had national impacts on corn yield. Iowa's humidity has risen substantially, especially in summer, which now has 13 percent more atmospheric moisture than 35 years ago as indicated by a 3-5 degree F, rise in dew-point temperature. This fuels convective thunderstorms that provide more summer precipitation. Risks to agriculture from climate change could include market disruption, changing insurance rates, unpredictable weather patterns, increased

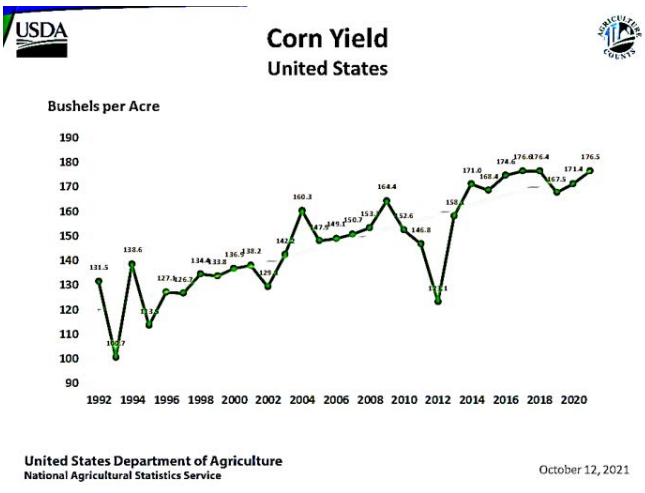

Figure 3.5-8. Corn yield (USDA).

magnitude and frequency of extreme weather events, greater amounts of precipitation and humidity, and increased or changing pest and disease pressure. Some of these risks lead into other issues; increased or intense precipitation may lead to more flooding and increased soil erosion.

Per the 2014 National Climate Assessment,[1] prepared by a team of more than 300 experts guided by a 60-member Federal Advisory Committee, which was extensively reviewed by federal agencies and a panel of the National Academy of Sciences, a key issue for the future of agriculture is as follows:

> "In the next few decades, longer growing seasons and rising carbon dioxide levels will increase yields of some crops, though those benefits will be progressively offset by extreme weather events. Though adaptation options can reduce some of the detrimental effects, in the long term, the combined stresses associated with climate change are expected to decrease agricultural productivity. This region's agriculture should position itself to be resilient and adaptable as climate and economic forces change"

Recommendation: Form a Farmer Advisory Committee (FAC)

Though there are many agriculture- and conservation-oriented groups active in the region, agriculture currently does not have formal representation within the county government or a regional, locally organized group for collaboration. A Farming Advisory Committee could be used to represent the farming community and advise the county and state government on the interests of the agricultural community. This committee may also include promoting agricultural business development, connecting county residents to appropriate agricultural resources, and facilitation of communication between different groups within the farming community. These meetings would be a space for farmers to discuss their ideas or concerns, share resources, and develop locally driven solutions to some of the challenges described in this chapter. The agricultural forum participants should reconvene to discuss the opportunities and structure of an FAC. To help combat that threat and preserve agricultural land, the FAC could enlist support for innovative agricultural-based business and agricultural diversity including the support of beginning farmers and smaller farms of 10 to 40 acres, particularly those that are oriented to the local foods industries.

Additionally, coordination with county planning, zoning, soil and water conservation districts (SWCDs), extension councils, and tourism to support business niches that are appropriate for rural areas, e.g., farm stands, orchards, wineries, and breweries. Large-scale agriculture provides a major portion of the rural landscape of the region. Agricultural landscapes and local food production contribute additional values in other areas such as tourism, business investment, land values, and international recognition of place.

The major barrier to this recommendation is pulling cross-sector interest into the same room. The corn-grower association provides vital functions but tends to stratify groups rather than diversify. This initiative requires participants to put bias and differences aside for productive group discussion and leveraging resources. The impact of this pooling of resources could attract more businesses to the region, increase tourism dollars, and provide a place of origin for large-scale agriculture to attract national and international buyers of commodities. Increased densification of agricultural businesses could provide a better support structure of farm operators while contributing to the regional economy. Local business leaders have indicated their willingness to participate in such an initiative and both farmers and farm groups have indicated

1 Alejandro Plastina, extension economist, Iowa State University, Estimated Costs of Crop Production in Iowa – 2021

the same. The successful outcome would benefit all sectors of the region and positive environmental impacts will take center stage. This position could be a part of a regional comprehensive plan and be tasked with other responsibilities.

Recommendation: Support Small-Scale Local Foods Agriculture in the Region

The Census of Agriculture of 2017 reports eight direct-to-consumer marketers in the two-county region. Fremont and Mills Counties report around $300,000 of annual specialty crop sales. By contrast, Washtenaw County, Michigan, reports over $15 million in annual specialty crop sales. The largest urban area within this Michigan County is Ann Arbor, population 367,000. The combined population of Mills and Fremont Counties is 29,540.

While these locations are quite different in many ways, there are some similarities- both have large urban populations not in the county jurisdiction, but are accessible markets, and have farms largely if not exclusively dedicated to industrial-scale corn and soybean crops that result in nutrient run off impacting local streams and contributing to localized flooding. In the Washtenaw County example, farmers have begun to seize the opportunity to add to revenue streams and capitalize on the regional market demands. This could be a significant opportunity for Mills and Fremont Counties.

Small-scale and regional agriculture will need to market in the larger population base of Omaha and Council Bluffs with a combined population of 538,000 to achieve significant scale and scope.

Sparsely established around a large region of Omaha/Council Bluffs, stretching nearly 100 miles, are small-scale farms producing human consumable food from garden vegetables to processed meat, milk and cheese. Many of these farmers focus on selling their products in the urban region of Omaha/Council Bluffs. Some drive up to two hours to get to the abundant farmers markets,

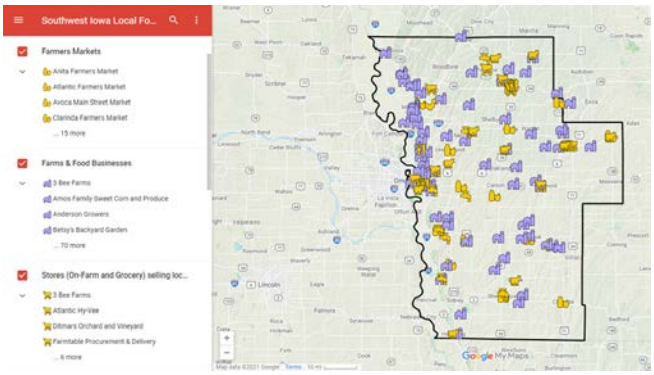

Figure 3.5-9. Local food map.

restaurants, and consumers of the region. Most local food businesses surveyed are maintaining profitability and are well-established. The Golden Hills Resource Conservation and Development (RC&D) serve the eight counties of Western Iowa. Today, the Golden Hills RC&D broadly promotes local food from local farms and agri-tours. This effort promotes both tourism to the region and highlights the opportunity for local food production and consumption.

Throughout the 1980's, the Golden Hills projects focused largely on crop diversification in the region, but by 1990 they broadened their goals to these four areas:

- Developing businesses based on the area's natural, cultural and other resources;
- Working with local governments on projects to benefit the environment;
- Filling gaps in services to people at risk;
- Improving water quantity and quality.

Generally, farmers innovate in response to opportunity. For the past 40 years, the Golden Hills RC&D has been highlighting opportunities for local foods, small-scale agriculture, preservation of the unique Loess Hills, and identifying the region as ecologically rich, unique and diverse.

The current website hosted by Local Harvest.org features six active Iowa farmers and six farmers

markets when searching the Omaha/Council Bluffs region.

All indications are that these markets are underserved despite the tremendous effort by many individuals and organizational capacity. Surveying small-scale area farmers on barriers to expansion highlights lack of access to land, labor, and support infrastructure. Recently, the USDA has broadened insurance coverage that allows participation by small-scale agriculture, thus removing some of the risk.

Golden Hills RC&D has become a strong voice in the region that includes small-scale agriculture and local food systems. Part of the barrier to unify these efforts is the lack of broad awareness that local food and local farmers are important on many levels. Lack of experience, training, and financing can be overcome, and the markets already exist. Other efforts to address the access to needed resources, be it land or loans for small-scale agriculture, need to join in that chorus to make resources more readily available. This will have impacts on tourism and economic development as regional identity is better developed.

Pulling together opportunities and resources could be an activity for the Farm Advisory Committee, noted earlier. Hamburg and Pacific junction will both have vacant lots that can be used for local, small-scale agriculture. If these lots can be used for small-scale agriculture, it will reduce maintenance cost for the municipality and provide economic benefit as well as add character to the region.

Figure 3.5-10. WanderLoess map and directory.

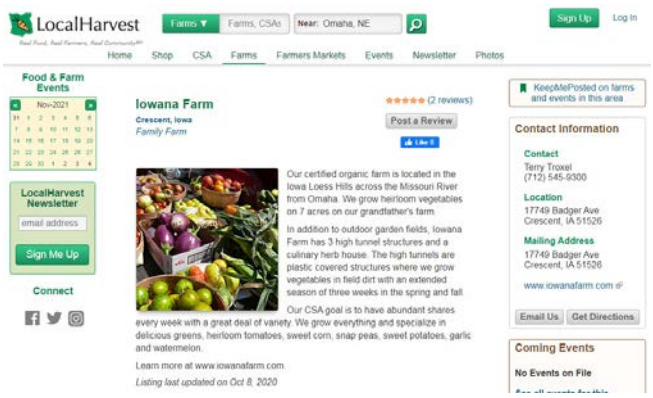

Figure 3.5-11. Local Harvest website.

3.6 Economic Context

INTRODUCTION

As part of this study, an economic analysis of the study area was performed (by planning team member Dave Swenson, Economist) as a way to characterize and align economic development initiatives with the disaster recovery and resiliency recommendations of the study. The full report (attached in the Appendix) includes a baseline evaluation of the Fremont County and the Mills County socio-economic foundations, and high-level projections of several potential economic development scenarios,

The baseline evaluations are intended to provide a set of indicators that help planners and local decision makers understand key characteristics of the residents and the economy that they maintain. All data come from standard government sources – the Census Bureau, the Bureau of Economic Analysis, the USDA, the Bureau of Labor Statistics, the Iowa Department of Revenue and Finance, and Iowa State University research, as examples.

Most of the analysis is at the county level, although pertinent census and taxable trade data for Hamburg and Pacific Junction are provided. Where useful, the performances of the two study counties are contrasted with the state of Iowa to provide perspective.

There are dozens of social, economic, environmental, and fiscal indicators that could be added to this analysis, but the purpose here is to provide a foundation for decision making, not a comprehensive summary of regional strengths and weaknesses. That kind of compilation should be part of a region-wide planning effort and involve more stakeholders and more analysis. The main point of the analysis undertaken is to investigate dimensions of the two regions that help to understand their respective capacities for resilience. The format of this analysis looks at selected area characteristics that are both standard and that previous research has determined is indicative of community change, standing, or capacity. For each, a short discussion of what it indicates and, separately, what the indicator implies is provided. Demographic dynamics are presented first followed by the economic analysis.

3.6.1 PRE-FLOOD DEMOGRAPHICS

The population of Mills County is stable owing primarily to its proximity to the greater Omaha-Council Bluffs metropolitan area. The population of Pacific Junction had demonstrated some stability over the decade, but was ultimately reduced sharply because of widespread destruction of homes.

Fremont County and Hamburg are both declining, which is the dominant pattern for purely rural counties. Purely rural counties are those that do not have a community of 2,500 or more.

Both Fremont County and Mills County have much higher fractions of their populations in the 45 to 64 age group than the state average, and Fremont County has a higher percentage of persons 65 and over than either Mills County or the state of Iowa. A comparative deficit of young adults ages 25 to 44 is more pronounced in Fremont County.

Both counties have substantially fewer minorities than is the state's average experience. Further, both counties' poverty rates are lower than the state rate.

In explaining their population changes over time, Fremont County suffers from natural decline in that deaths exceed births. Both counties have substantial domestic outmigration. This factor alone explains 84 percent of the population loss endured by Fremont County this decade.

Fremont County has a much higher fraction of its housing stock constructed prior to 1970 and a significantly higher housing vacancy rate than Mills County or the state of Iowa. Accordingly, the median housing value in Fremont County is 61

percent lower than in Mills County and 39 percent lower than the state average. Median household incomes in Fremont County are 27 percent less than in Mills County and 8 percent less than the state.

Workforce participation rates for both men and women were lower than in Mills County or the state in Fremont County owing to its older population base. Both counties had notably lower percentages of their adults 25 and over who had completed a bachelor's degree or higher.

Three approaches to estimating future county level populations were employed. Two were done by this analyst, and one other was from a private sector vendor. All three anticipated continued declines in the Fremont County population through 2030. The ISU analysis anticipated no growth for Mills County, but the private sector estimate anticipated moderate growth between 2020 and 2030. In all instances, this researcher's estimates were more pessimistic than the private sector.

3.6.2 PRE-FLOOD ECONOMY

Both counties have suffered declines in area employment this decade, with the sharpest declines occurring in Fremont County.

Mills County has realized substantial growth in the number of business establishments with employees. In recent years, Fremont County business establishments have been stable despite declining overall employment county-wide.

Inflation adjusted wage growth per job was relatively strong in Mills County early this decade before leveling off. Since around 2010, however, average real wages have declined markedly in Fremont County.

Fremont County's labor supply has declined sharply since mid-decade. Estimates of the Mills County labor supply demonstrated substantial growth in the last few years before the pandemic.

Both counties were substantially dependent on out-of-county employment sources for their labor incomes, though that dependence as a fraction of total personal income has decreased some in Mills County compared to the last decade. Fremont County dependence on external employment had grown substantially since mid-decade. For Fremont County, more than 70 percent of its residents with payroll jobs worked outside of the county. In Mills County, that fraction was 73 percent.

In terms of job growth and industrial composition, Fremont County had 7.6 percent fewer jobs in 2018 than it had in 2010. The manufacturing sector led that decline with a 41 percent reduction in jobs. Mills county employment declined 4.6 percent. It enjoyed strong gains in manufacturing and in wholesale sector jobs, but it had substantial declines in federal and state government jobs.

Real (inflation adjusted) taxable retail and service sales Fremont County peaked in 2016 and have since tailed off. City of Hamburg sales declined markedly for much of the last decade, but have been essentially flat since. Both county and city data report noticeable declines in 2019, the flood year.

Mills County real taxable sales grew sharply from 2010 through its peak in 2016 before leveling off. A substantial fraction of that growth was attributable to very strong gains in Pacific Junction where real taxable sales peaked at just under $10 million in 2018.

Both counties had declines in farm proprietorships between 2001 and 2006, but the number of farmers has since leveled off.

Farming accounts for nearly 13 percent of all jobs in Fremont County, and 8.2 percent in Mills. Farmers are nearly 30 percent of all Fremont County business proprietors compared to 19.4 percent in Mills County.

Flood related statistics indicate that crop insurance payments in Fremont County in 2019 were $12.7

million higher than was the average of the previous three years. That value in Mills County was $3.94 million higher. USDA payments to Fremont County farmers were $15.45 million more in 2019 than the average of the three years previous. The Mills County value was $11.53 million more.

3.6.3 POST-RECOVERY SCENARIOS

This study considered potential positive economic outcomes that might accrue to both Fremont and Mill County in light of post-flood reconstruction as well as expected infrastructure improvements in both counties. Normal economic restoration is not the focus here – basic recovery, restoration, and rehabilitation, as examples – instead, the analysis looked at the worth of potential growth opportunities that are deemed reasonable given both counties' economies and recent circumstances. The categories chosen were gleaned from conversations with residents and leaders in the affected communities as well as with other project consultants.

The growth categories analyzed are basic. In Fremont County, expanded manufacturing, the addition of travel-related businesses, and general warehousing opportunities were chosen. Mills County, too, is a candidate for additional travel-related businesses, but it envisions more specific opportunities in the warehousing category. Due to its proximity to major highways and to the Omaha – Council Bluffs metropolitan region, it considers itself a candidate for larger warehousing and distribution facilities. In addition, owing to the planned addition of meat processing in the county, a cold-storage facility was added to the list of likely growth industries.

"Normal economic restoration is not the focus here – basic recovery, restoration, and rehabilitation, as examples – instead, the analysis looked at the worth of potential growth opportunities that are deemed reasonable given both counties' economies and recent circumstances."

There is new housing construction occurring in Fremont County and Mills County. The short-run construction economy effects of those additions are also summarized.

Finally, there were discussions in both counties involving the conversion of now undevelopable land into local food production. The appended report measured the regional economic gains that would accrue for each 50 acres of local production of fruits and vegetables cultivated in the area economies.

All of the following scenarios are expressed as annualized values.

Fremont County Scenarios
The first two scenarios involve travel-related development opportunities. Anticipated highway improvements and flood prevention projects suggest that there are good prospects for a new truck stop / travel center and for a new hotel.

New truck stop / travel center
The truck stop / travel center would support a total of $4.75 million in total output and $2.4 million in value added, of which $1.48 million would be labor income paid to a total of 44 jobholders.

New hotel or motel
Using statewide averages, a new hotel would add $2.04 million in output to the regional economy and $1.11 million in value added, of which $595,329 would be labor income to 21.2 jobholders.

General warehousing operation
After all multiplied through effects were accounted, a new warehouse would have $3.9 million in total output and generate $2.14 million in value added, of which $1.74 million would be labor income to 46.5 jobholders.

Manufacturing expansion in the county
Here, the top three food-related manufacturers in the county – wet corn milling, animal slaughter, and spices and extracts – were allowed to each increase employment by 25 percent. Growth in these three food processing industries would yield $53.2 million in output and $10.96 million in total value added generated, of which $6.3 million would be labor income to nearly 109 jobholders.

Mills County Scenarios
Economic opportunities in Mills County are both similar and distinct from Fremont County. It too is a potential site for travel related businesses, but it also believes that its proximity to the greater metropolitan region means they have an enhanced potential for larger warehouses or distribution businesses.

New or expanded truck stop / travel center
Investments in an improved travel center in Mills County would yield $4.9 million in total county output and $2.49 million in value added, of which $1.53 million would be labor income to 43 jobholders.

New hotel or motel
New lodging facilities in Mills County would produce $2.17 million in output and $1.21 million in value added, of which $648,510 would be labor income to 21.2 workers.

Expanded warehousing facilities
Mills County officials believe they could host larger warehouse operations than is the state norm. This analysis used the Henry County, Iowa, economy, home to two large warehouse and distribution centers, to provide employment, labor income, and output factors from which to adjust the Mills County model. Such a facility, were it to locate in Mills County, would boost county output by $32.49 million and value added boosted by $13.22 million, of which $9.96 million would be labor income to 284 workers.

Cold storage facility
Mills County also considers itself a candidate for a cold storage facility. Using state averages, if that kind of facility located in the county, it would account for $9.82 million in annual output and $3.99 million in additional value added, of which $3.01 million would be labor income payments to 86 workers.

Short Term Effects: Recovery-Related Housing Construction
Both Fremont County and Mills County have post-flood related housing construction either ongoing or planned. This analysis looks at the short-term local economic consequences of that construction. These economic outcomes are short-term because they only last during the construction period, they do not represent permanent additions to these counties' economies.

Fremont County Construction Projects
A total of $13.85 million in spending for new housing and for related infrastructure is planned for Fremont County. After all supply and household spending relationships are considered, new construction in Fremont County would, during the construction period, boost output by $19.11 million and value added by $13.02 million, of which $11.25 million would be labor income payments to 198 total workers.

Mills County Construction Projects
Recovery related housing and infrastructure construction activity in Mills County is anticipated to costs $33.67 million. After all supply and consumption relationships are tallied, the construction would stimulate $43.54 million in total local output and $25.81 million in value added, of which $21.61 million would be total labor income to 511 jobholders.

A Local Foods Scenario
Some of the flooded land in both Fremont County and Mills County cannot be used for residential or non-agricultural commercial purposes in the future

(FEMA buy-out properties). A portion of that land, however, might be suitable for horticultural crop development or the annual production of fruits and vegetables. Existing research by this author on local foods potential in Iowa is used to estimate the job and income producing potential of this option were it to eventuate.

This analysis is for both Fremont and Mills County. On this topic, there are negligible production costs differences between the two counties. Efficiently growing 50 acres of some mix of regionally-desired fruits and vegetables in either county would generate $432,302 in wholesale sales at the farm gate, the growing of which would require 1.1 jobholders making $66,933 in labor income. Considering all regionally-supplied inputs and all other consumption from labor, this scenario would generate $567,447 in total output in the counties per 50 acres cultivated and $409,804 in value added, of which $109,642 would be labor income to two jobholders.

4 Community Vision and Opportunities

4.1 Guiding Principles and Vision for the Region

INTRODUCTION

The western portions of Mills and Fremont Counties have been impacted by challenges associated with rapidly changing natural and cultural/economic forces. This plan addresses the land use and long-term resiliency of this region to protect the viability and sustainability of these places and their way of life that are essential to the people of the region and the State of Iowa. This requires that the issues and interests of two small cities, two highway interchanges, and the surrounding region be aligned under a common vision.

The planning process engaged each community and many other stakeholders in the region to discover and articulate a comprehensive list of challenges faced in the region. The Project Team then co-evolved a set of Guiding Principles to provide a framework to contextualize and prioritize a set of recommendations to best inform the phased redevelopment / improvement / restoration of land uses, infrastructure, and other community assets. The overarching goal is a cohesive, integrated set of planning recommendations that will facilitate community aspirations through alignment with State of Iowa initiatives and resources, emerging markets, and best ecological and high-performance planning and building practices.

The following Guiding Principles emerged through our planning process with the Project Team, the steering committee comprised of representatives from Hamburg, Pacific Junction, Mills and Fremont Counties, partner organizations to IEDA, and public participants:

"This plan addresses the land use and long-term resiliency of this region to protect the viability and sustainability of these places and their way of life that are essential to the people of the region and the State of Iowa.

Figure 4.1-1. Public Meeting in Pacific Junction.

GUIDING PRINCIPLES

1. **Community / Uniqueness**
   This acknowledges aspects of community identity that residents do not believe they would find anywhere else, at least not in the same context, and which make living there special.

2. **Health / Connectedness**
   A community is more than its buildings; it is its people, their wellness, and their connection to the land and environment around them, and how health and the land reinforce each other.

3. **Stability / Predictability**
   There are enduring aspects of life in a community that give people confidence about putting down roots and believing in the community's durability and resilience, but it is important to identify them.

4. **Opportunity / Prosperity**
   People need to feel their community and its surroundings offer opportunities to prosper, to grow, and to live productively, generating resources that will secure a bright future.

5. **Education / Demonstration**
   If the community is to embrace and celebrate a plan for recovery, it must find creative ways to share that information, illustrate key points, engage in creative outreach, and educate people on the strategies needed and how success will be measured.

GUIDING PRINCIPLE 1

Community / Uniqueness
This acknowledges aspects of community identity that residents do not believe they would find anywhere else, at least not in the same context, and which make living there special.

Vision: Continue to provide and expand unique qualities and amenities combined with a strong sense of community values and neighborliness.

- Protect and foster multi-generational neighbor interaction / community lifestyle
- Identify, maintain, and build upon what is unique and special about Hamburg and Pacific Junction
- Integrate related uses in each town / interchange: transportation-oriented retail / services / lodging
- Build and renovate structures within the community to elevate and support existing systems and businesses – that reinforce community
- Balance local enterprises that offer unique qualities and experiences with national corporate chains/franchises (at interchanges)
- Support local destination restaurants, camping, lodging
- Provide lifestyle not offered in regional urban areas: friendly small-town setting, on the grid, and connected to natural beauty of the valley/ Loess Hills
- Ensure all new land uses / developments are compatible for context: some uses better-suited for in-town, some better-suited for highway/ railway corridors and interchanges

Figure 4.1-2. Old school building, Pacific Junction.

Figure 4.1-3. Store on Main Street, Hamburg.

Figure 4.1-4. Mural, Hamburg.

Figure 4.1-5. Mural and memorial, Pacific Junction.

GUIDING PRINCIPLE 2

Health / Connectedness

A community is more than its buildings; it is its people, their wellness, and their connection to the land and environment around them, and how health and the land reinforce each other.

Vision: Offers a healthy lifestyle that connects people with each other and their place.

- Create or enhance opportunities to connect to the land/outdoors
- Create or enhance opportunities to connect with each other
- Create or enhance recreational opportunities: hunting, fishing, hiking, cycling, walking
- Restore / re-create local farms/food gardens adjacent to towns (convert buy-out properties to "eco-food parks" that generate revenue, restore ecology, and provide recreation) to support a healthy local food culture
- Rebuild main streets to be more walkable / bikeable
- Build and renovate structures that support improved health and wellness
- Develop and support activities /events to draw people from the region
- Provide access to a local food culture by "urban" communities within and visitors to the region

Figure 4.1-6. Paved cycling trails.

Figure 4.1-7. Community gardening.

Figure 4.1-8. Streetscapes..

Figure 4.1-9. Camping.

GUIDING PRINCIPLE 3

Stability/Predictability
There are enduring aspects of life in a community that give people confidence about putting down roots and believing in the community's durability and resilience, but it is important to identify them.

Vision: Rebuild with best available technological and environmental practices for long-term resiliency.

- Support the restoration and stewardship of the local ecology and natural processes to be more in harmony with nature including restoring lost trees and natural landscapes (i.e., green stormwater infrastructure, naturalized drainageways, reinstatement of controlled burning in Loess Hills slopes, etc.)
- Determine/establish base flood elevations and build in level of safety to accommodate future events
- Develop resilient infrastructure that is adapted to change and can accommodate more unpredictable weather patterns, storm events, etc.
- Focus on and invest in long-term solutions and strategies (i.e., avoid spending resources on short-term or temporary measures; instill a sense of permanence and reliability)
- Provide for all generations: Seniors AND Youth (engage both in the process to rebuild/renovate)
- Develop infrastructure that is district-scale, green, and resilient (water, energy, communication, high-speed internet, micro-grids)
- Build in stability through high-performance strategies such as energy-efficiency and renewable energy, water conservation, green infrastructure systems, etc.
- Strengthen relationships with all employers in town and in the region
- Improve communications through proactive, regular informational sessions with the Corps of Engineers, Iowa Flood Center, IEDA, and others who share latest real-time information on status of flood plains, funding, etc.


Figure 4.1-10. Green roofs.


Figure 4.1-11. Photovoltaic panels on roof.

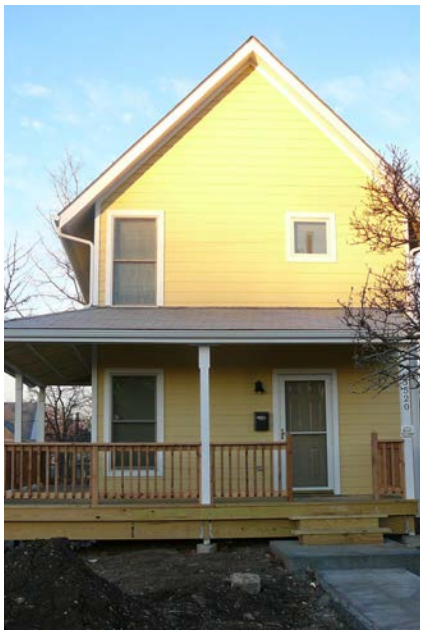
Figure 4.1-12. High-performance affordable housing.

GUIDING PRINCIPLE 4

Opportunity/Prosperity
People need to feel their community and its surroundings offer opportunities to prosper, to grow, and to live productively, generating resources that will secure a bright future.

Vision: Grow and support a strong local economy through diverse opportunities for all citizens.

- Develop a comprehensive approach that ensures a diversity of opportunities and prosperity for all
- Embrace the Missouri River through a combination of flood-proof and flood-tolerant infrastructure, greenway connections, etc.
- Optimize available funding and support through rebuilding toward long-term solutions
- Promote a thoughtful mix of home values for families and growth: build/rebuild affordable homes for fixed-income, seniors, young families, as well as plan for mid-level and executive homes
- Foster local business enterprise by creating connections to larger markets (for locally crafted goods via internet and transportation hub/network)
- Promote and support best farming practices to build soil health and ability to hold water (and support Iowa Nutrient Reduction priorities)
- Establish clear edge/boundaries for redeveloped towns, allowing some flexibility for limited/contained growth/expansion with awareness of flood risks related to those boundaries
- Appeal to diverse range of funding sources through comprehensive approach
- Deepen connection with Offutt Air Force Base

Figure 4.1-15. Relax and Unwind.


Figure 4.1-14. Love's #650.


Figure 4.1-15. Housing mix.


Figure 4.1-16. Best practices in the land.

GUIDING PRINCIPLE 5

Education/Demonstration
If the community is to embrace and celebrate a plan for recovery, it must find creative ways to share that information, illustrate key points, engage in creative outreach, and educate people on the strategies needed and how success will be measured.

Vision: Empower citizens through educational opportunities and provide an inspirational demonstration of sustainable living for the state/region.

- Utilize the completed community redevelopment plan for the region as a living document that guides and informs land use/development decisions and fosters community dialogue.
- Host regular events that are both social and informational (regarding planning and rebuilding efforts)
- Identify pilot/catalyst projects that demonstrate best practices
- Equip elected officials, teachers, and community leaders with knowledge and access to resources to help implement vision over time (capacity building)
- Support local trade schools and high school programs – engage students in the future planning of their community
- Monitor and report progress based upon shared objectives, values, and metrics – develop on-going communication strategies


Figure 4.1-17. Environmental education.


Figure 4.1-18. Agricultural education.


Figure 4.1-19. Classroom education.


Figure 4.1-20. Public presentations.

4.2 Objectives

4.2.1 REGIONAL OBJECTIVES

Land use and development objectives emerged through the planning process; some are specific to each of the two communities (Pacific Junction and Hamburg), some more regional in nature, all of them interrelated in some ways. A set of specific planning recommendations has been developed for each community and the highway corridor / interchanges that are intended to provide a way to meet these objectives over time.

- Regional Transportation Network
- Capitalize upon Growing Markets
- Support / Facilitate Eco-Tourism
- Protect / Restore Regional Ecology
- Coordinate Efforts Regionally
  - Projects
  - Levee Districts
  - Agriculture
  - Messaging / Marketing

4.2.2 PACIFIC JUNCTION

Several important near-term objectives need to be met as critical next steps towards rebuilding a more resilient and sustainable Pacific Junction, including:

Levees
Determine the requirements and timing for accreditation of the Pony Creek and Keg Creek levees protecting the community and development area south of Pacific Junction

Buyout Properties
Re-purpose the deed-restricted FEMA buyout properties to reduce maintenance costs/liabilities to the City, provide viable land uses that benefit the community, and potentially generate revenue to support long-term maintenance and operations.

Replacement Housing
Provide affordable, high-quality replacement housing for the citizens of Pacific Junction who lost their homes in the 2019 flood event. Plan and re-purpose lots acquired by the City that are not deed-restricted and improve with sustainable green infrastructure, walkable planning concepts, and other best practices supported by State of Iowa policies and programs.

Community Center
Create a new multiple-purpose community center as a community amenity.

Improve Storm Drainage
Address the drainage problems in the community that result in sewer back-ups, basement flooding, and incurred expenses for the City. Utilize green infrastructure and other best practices supported by State of Iowa policies and programs.

4.2.3 I-29 / HWY 34 INTERCHANGE

Several important near-term objectives need to be met as critical next steps towards rebuilding a more resilient and sustainable interchange development area, including:

Leverage Prior Development Plans
Build upon prior development master plans for the area including goals and marketing developed prior to 2019 for the Eagle Crossing Business Park.

Levees
Confirm the schedule and findings of the L 611 - 614 levee accreditation study to be completed in 2022.

Infrastructure Coordination and IEDA Certified Sites
Continue to coordinate with BNSF and IDOT regarding transportation connectivity goals, requirements, timing and budgets for the commercial and light industrial land-use zones of the interchange development area.

After the accreditation studies are complete, consider steps required to achieve IEDA Certified Sites Status. This process would yield a roadmap for development.

4.2.4 I-29 / HWY 2 INTERCHANGE

Several important near-term objectives need to be met as critical next steps towards rebuilding a more resilient and sustainable Hamburg, including:

Levees
Determine the requirements and timing for accreditation of the L-575 Levee and continue to coordinate with the IDOT regarding the completion of the interchange ring levee and new levee district.

Infrastructure Coordination and IEDA Certified Sites
Concurrent with developing an economic development plan for the interchange, conduct a detailed study of the infrastructure requirements to support short-term and long-term development.

Continue to coordinate with IDOT regarding transportation connectivity goals, requirements, timing and budgets for the commercial and light industrial land-use zones of the interchange development area. Coordinate with BNSF regarding opportunities for rail connectivity for the light industrial area northeast of the interchange.

Consider steps required to achieve IEDA Certified Sites Status particularly for the area northeast of the interchange. This process would yield a roadmap for light industrial development.

Economic Development Plan
Concurrent with the development of a detailed plan for infrastructure improvements for the entire interchange area, organize a focused development team and point-person to create a development vision for the interchange.

4.2.5 HAMBURG

Several important near-term objectives need to be met as critical next steps towards rebuilding a more resilient and sustainable Hamburg, including:

Levees
Determine the requirements for accreditation of the levee systems protecting the community including evaluation of how I-29 functions as a levee currently which will either require improvements in coordination with the IDOT or construction of a new levee to replace the function of I-29 as a levee. In addition, this holistic levee evaluation will require coordination with USACE and IDNR in their continued PAS study with Missouri, Nebraska, and Kansas.

Buyout Properties
Re-purpose the deed-restricted FEMA buyout properties to reduce maintenance costs/liabilities to the City, provide viable land uses that benefit the community, and potentially generate revenue to support long-term maintenance and operations.

Replacement Housing
Provide affordable, high-quality replacement housing for the citizens of Hamburg who lost their homes in the 2019 flood event. Prioritize sites already owned by the City and improve with sustainable green infrastructure, walkable planning concepts, and other best practices supported by State of Iowa policies and programs.

Improve Storm Drainage
Address the drainage problems in the community. Utilize green infrastructure and other best practices supported by State of Iowa policies and programs. Create a green stormwater infrastructure demonstration project at the school to provide a living laboratory for students.

Levee Borrow Area
Plan beneficial use for the site purchased by the City to provide borrow material to rebuild the flood protection levee. Consider how this area can become a positive and beautiful front door to the community. Utilize ecologically restorative approach and other best practices supported by State of Iowa policies and programs to create a prairie / wetland / wildlife habitat and trail / recreation area .

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5 PLANNING RECOMMENDATIONS

5.1 Development Guidelines

Figure 5.1-1. Green Streets Criteria.

5.1.1 THE IOWA GREEN STREETS CRITERIA

The following planning and design standards can and should be applied to all future development for the communities of Pacific Junction and Hamburg. The Iowa Green Streets Criteria (IGSC) developed by IEDA promotes public health, energy efficiency, water conservation, smart locations, operational savings, and sustainable building practices. The strategies in the criteria enhance affordable housing, community facilities, town centers and whole communities. The full Green Streets Criteria document can be found on the IEDA website: https://www.iowaeda.com/green-streets/

An abbreviated checklist is provided in the Appendix of this report for reference.

The IGSC includes guidelines for utilizing an integrated design process to:

- Select appropriate sites for development that support community connectivity, walkability, connections to nature and utilize existing infrastructure
- Create site plans and landscapes that utilize native plants and are designed for effective stormwater management through green infrastructure strategies
- Design and build structures that conserve water, energy, and material resources as well as integrated renewable energy technologies
- Provide for healthy interior environments through appropriate material selection, ventilation design, and implementation
- Provide for long-term performance through the development of owner's maintenance and operation manuals

All of the planning recommendations for Hamburg and Pacific Junction that follow incorporate design strategies consistent with the IGSC. In addition, the following ecological urban design standards are overarching standards that link the guiding principles and vision developed by the communities with the location, context, and site design strategies of the IGSC.

5.1.2 ECOLOGICAL URBAN DESIGN STANDARDS FOR PACIFIC JUNCTION AND HAMBURG

1. **Views/Orientation**
   - Optimize views to Loess Hills and other existing (or created) natural features
   - Orient buildings and sites to optimize solar exposure and natural daylight
   - Provide community wayfinding signage including clearly identified gateways to encourage visitation from regional transportation and scenic road networks (cars, motorcycles, bicycles, pedestrians)

2. **Mix of uses**
   - Avoid concentration of single uses within a larger area: mix housing types/levels of affordability; integrate services (non-retail businesses, gardens, etc.)
   - Optimize proximity of retail shops/services within compact, walkable Main Street setting with larger anchors at either end
   - Provide uses that are functional for both residents and visitors
   - Encourage indoor/outdoor uses such as café space, display spaces, etc.
   - Strategically locate public/institutional uses
   - Minimize off-street parking to minimize paved surfaces for cars

3. **Finely grained pedestrian / bike network**
   - 200'-400' pedestrian grid, avoid dead-end streets and long blocks
   - Plan for accessibility for all abilities
   - Prioritize non-motorized safety and convenience without compromising auto/truck access

4. **Streets as vital public space**
   - Provide public uses and/or building facades that offer street wall and sense of human-scale
   - Delineate spaces for cars/trucks
   - Integrate trees and other vegetation for multiple benefits
   - Plan for multi-functional, multi-purpose public infrastructure

5. **Connection to Nature**
   - Integrate landscape surfaces for multiple functions- water, beauty
   - Provide public park space close to every home
   - Maximize street trees and diverse native tree canopy
   - Plan for low-input landscapes with authentic, native/adapted plantings
   - Create habitat for pollinators, birds, and other native species

6. **Signature feature or element**
   - Create adaptation of existing elements
   - Ensure visibility from primary access points
   - Accommodate seasonal use, attract visitors, benefit residents

7. **Building / Site Design guidelines**
   - Incorporate authentically local design strategies
   - Plan for adaptive re-use
   - Maximize reclaimed/recycled content
   - Minimize embodied carbon footprint through careful use and reuse of materials,
   - Optimize building performance (water, energy, human health and well-being)
   - Design with long-term maintenance and durability in mind

Figure 5.1-2. IEDA Certified Sites.

5.1.3 IOWA ECONOMIC DEVELOPMENT AUTHORITY CERTIFIED SITE PROGRAM

For the light industrial development land uses around the I-29 / Hwy 34 interchange, the southeast portion of the city of Pacific Junction south of the BNSF Railway, and the I-29 / Hwy 2 Interchange, detailed review of the IEDA Certified Site Program requirements as applied to these areas could provide a specific development roadmap for certification as project-ready development sites. The minimum criteria for the program include:

- Property availability
  - Property developability
  - Overall site size and developable acreage
  - Located outside the 100-year flood plain
  - Soil, environmental, archaeological, habitat, wetlands criteria
- Zoning
- Transportation
  - Served by roads meeting IDOT standards
  - Access to rail
- Utilities
  - Power, gas, water, wastewater

If the site(s) cannot meet all the criteria for certification, the criteria can still be used to determine the key items, tasks, and timetables needed for key budgets and decision-making milestones.

As noted above and in the recommendations that follow, the first key item for all areas within this planning document is to receive accreditation of levees protecting these development areas to keep them outside the 100-year flood plain, or where applicable, elevating the lots above the 100-year flood plain. The study is ongoing currently for the L611 - 614 levees protecting the Highway 34 interchange development area. This report recommends accreditation studies for the levees protecting Pacific Junction and Hamburg as well, which, if successful in accreditation, can protect those communities and allow for continued development. The Hwy 2 / I-29 interchange and development area is protected by the L-575 levee along the Missouri River. Recommendations include an accreditation study on this levee as well. In addition, the IDOT is in Phase Three of improvements for Hwy 2 which include creating a ring levee to protect some development area west of the interchange and the interchange structure itself.

IEDA Certified Site Program Guidebook is included in the Appendix. Additional information about the Certified Site Program can be found here: https://www.iowaeda.com/locations/

5.2 Regional I-29 Corridor

Figure 5.2-1. Drone image of region north of Hamburg.

Regional Planning Recommendations

Create Recovery Coordinator Position with Long-Term Funding

One of the most pervasive problems in small town America following disasters is the lack of staff capacity to handle the multitude of demands on their time. They must immediately navigate the various regulatory agencies and funding mechanisms, then meet numerous deadlines in completing grant applications for federal and state assistance to meet recovery needs while contending with multiple stresses on existing systems as a result of disaster damage and losses of life and property, including losses to their own families. The result is often burnout and the loss of critical opportunities to build better, stronger communities.

These stresses have been readily apparent in the communities affected by the 2019 flooding. Both Pacific Junction and Hamburg have suffered significant population loss, loss of tax base, and time demands in completing buyouts of flood-damaged properties.

State or federal support in funding a position for a local or regional recovery coordinator for such communities has become a common means of alleviating such stresses and helping communities to seize the moment in creating new resilience to help shield them against future disasters. Such a position can be filled for a limited period of years by someone trained in public administration and recovery planning, so that the community becomes ready to move forward on its own.

The situation for these two communities is such that sharing a single recovery coordinator on a regional basis, presumably through a regional planning entity, makes the most sense. IEDA and state partners can certainly help determine the most logical and beneficial approach to making this happen.

Create Farmer Advisory Committee
Although there are many agriculture- and conservation-oriented groups active in the region, agriculture currently does not have formal representation within the county government or a regional, locally organized group for collaboration. A Farming Advisory Committee could be used to represent the farming community and advise the county and state government on the interests of the agricultural community. This committee may also include promoting agricultural business and economic development, connecting county residents to appropriate agricultural resources, and facilitation of communication between different groups within the farming community.

Create Levee District Coordination Entity
During the planning process and engagement with the Nishnabotna Watershed Coalition, it has become evident that a similar concept and structure could be utilized to benefit the Levee Districts in the Mills and Fremont county study area. The concept of the watershed management approach creates a program through which Iowans in the watershed are working together to address factors that contribute to floods. This approach is consistent with other statewide programs in Iowa to reduce flooding and improve water quality, such as the Iowa Flood Mitigation Program and the Iowa Nutrient Reduction Strategy.

A similarly organized "Levee District Management Approach" entity could have levee district, county leadership and engineering staff, IDNR, IDOT, and USACE representatives among other regional stakeholders to meet regularly and proactively management all levees in the region to maintain them to an accredited status. An organized coalition could proactively:

- Discuss best management practices
- Determine accreditation status for levees and schedule for re-certification
- Coordinate maintenance schedules
- Identify projects and funding needs
- Communicate with county and state government to inform of issues, concerns, and needs
- Communicate issues and funding needs to the Iowa Flood Mitigation Board

As of the writing of this report, Iowa Homeland Security and Emergency Management (HSEMD) is leading a levee study with other state agencies and the Iowa Flood Center through funds appropriated from the General Fund of the HSEMD to be completed by January 1, 2023. This study will provide needed next steps to nurture this concept of organized levee management in the region.

Coordinate with BNSF on Regional Development Strategies
Regular communication beyond other planning recommendations outlined in this report should be maintained between regional representatives and the transportation industry including BNSF Railway and the IDOT to coordinate their short and long-term transportation plans for the region with regional development initiatives and levee improvements.

Coordinate around Regional Agricultural Business - Local Food, Events and Festivals, Agri-Tourism
The Southwest Iowa Local Food Guide is already in place; it is broadly available and updated annually by the Golden Hills RC&D. This broad umbrella for the illumination of local food production, processing, wholesale and resale including celebration events provides a megaphone echoing throughout the region, including hiking and biking trails, agritourism, and ecological attraction of the Loess Hills. From local municipalities to schools and private businesses, notice can be widely broadcast to diverse interests of the region of local food activities - new and old. More activities can accelerate quickly with this already established communication. The bottlenecks are regulations that hamper local food systems, financing for small-scale enterprises that cannot meet the lending ratios of larger farms, and access to land.

Secure on-going Dedicated Funding for IFC - Flood Information System after IEDA funding expires

With funding from the U.S. of Commerce Economic Development Administration, the Iowa Flood Center participated in the Comprehensive Assessment and Resiliency Plan for Mills and Fremont Counties to create the Missouri River Flood Information System (MRFIS). The system builds upon the award-winning Iowa Flood Information System (IFIS) that provides real-time flood alerts and forecasts, river levels, weather conditions, and more for the entire state of Iowa. MRFIS provides comprehensive information on floods, streamflow and mitigation scenarios, and levee systems that can be easily modified to represent breaches.

The comprehensive information system provides Iowans with enhanced, reliable, and timely information about potential flood impacts. The system is particularly useful during flood events for community emergency responders and local authorities responsible for public safety, resiliency planning, and economic development. Additionally, the system can be leveraged to help communities receive a reduction in flood insurance premiums through the National Flood Insurance Program. The agencies that will benefit most from the system include Iowa Homeland Security and Emergency Management, Iowa Department of Natural Resources, Iowa Department of Transportation, and federal agency partners responsible for flood forecasting and preparedness in Iowa.

To operate and maintain MRFIS, additional funding support is needed. Although the system is fully automated and runs continuously, i.e. 24/7, staff engineers are needed to monitor the forecast system performance, compare forecasts to field observations and to ingest information from the field with respect to potential, or actual levee breaches. Also, continued effort is required to incorporate technological advancements and updates of software and computer operating systems and to integrate MRFIS into the publicly accessible Iowa Flood Information System (IFIS), a one-stop-shop for all of Iowa's flood-relevant data resources. MRFIS will continue to serve as a long-term repository of historical flood information, as well as, a resource for evaluating how future management changes on the Missouri River and its tributaries affect Iowa's flood risks. Lastly, IFC's outreach and communications specialists will actively engage Iowa communities along the Missouri River to educate them on flood risk, the use of MRFIS, and provide continued support towards their flood resiliency needs.

Operation and Maintenance Budget Proposal: $125,000 annually (estimated - subject to change)

5.3 Pacific Junction and I-29 / Hwy 34 Interchange

Figure 5.3-1. Drone image of Pacific Junction.

As noted earlier in this report, the community of Pacific Junction and businesses at the Highway 34 interchange incurred significant damage to the structures in their community and to their community spirit. As noted in the ISU Rural Housing Readiness Study, the community leaders have been consumed since the flood coordinating with FEMA and completing the buyout process for nearly 160 properties. This has put a strain on city leaders emotionally and financially.

In the first meeting with the community stakeholders when asked what their dreams and needs were for re-planning their community, the response given was "We need someone to paint a picture of what hope looks like". Over the last year, several steering committee meetings and public meetings were held to gather the issues and ideas needed to make a series of recommendations for how to reduce the uncertainty for people and businesses to desire to move back to the community and begin to illustrate what a viable and sustainable future (hope) could look like for Pacific Junction.

To reduce uncertainty, it is essential that accreditation studies are completed and plans put in place to certify the levees protecting the community so FEMA will recognize these improvements when re-mapping the floodplain..

As a result of the buyouts, a significant portion of the land area of Pacific Junction will be deed-restricted. There is great opportunity to see these parcels as productive land for growing food, managing stormwater sustainably, and other valuable ecosystem services through a holistic sustainable site approach. This is suggested as an alternative to using the land simply as open space and creating a long-term maintenance liability associated with conventional park development practices, especially for a city with limited resources. The city can rent the land to local farmers to grow food and begin to revive a spirit of place that celebrates the small-town values and railway heritage along with the growth, processing, distribution, consumption and seasonal celebration of healthy, locally grown seed and food.

The compact size and original town grid layout provide the foundation for a pleasant, walkable village with a focus on local food and nature- the things many of the residents expressed were most cherished to them about their town. In fact, new developments that integrate new homes with regenerative farms/gardens as the open/amenity space with other community features is an idea that is gaining traction nationally- the term "agri-hood" is used to describe developments with these features. Pacific Junction could offer the same qualities in an authentic setting with a long history.

The housing that can be built on the land purchased by the city is shown to be planned with a greater density of lots to maximize the utilization of the land and access is provided from alleys and garages to the rear. Alleys can be constructed with porous paving to allow the alley to manage stormwater and reduce flooding. Several communities in Iowa have implemented this technology. By utilizing alleys, it allows the homes to present themselves to Lincoln Ave - the main thoroughfare through town - with front yards, porches, sidewalks, and landscaping to create a pedestrian, walkable community. As in the recommendations for Hamburg, the home designs should provide an affordable mix of types and sizes, should be designed to IEDA's Green Streets Criteria and to the greatest extent possible incorporate renewable energy technologies to generate as much energy as they consume to reduce long term energy costs and carbon contributions.

The stormwater concept for the community is shown to utilize green infrastructure strategies to slow, cool, clean and infiltrate stormwater and reduce internal flooding within the community. The diagram included illustrates the drainage paths in the community that are currently ditches and culverts to pumping stations. These areas should be reconstructed as landscaped bioswales to manage stormwater sustainability. Also as in Hamburg, Lincoln Ave in the business district can be improved to manage stormwater at the main intersection and provide for an improved streetscape with trees and native landscaping. This design also shortens the street crossing to make a safer intersection for pedestrians and provides traffic calming (reduced speeds) in the area with the most pedestrian traffic. The landscaped bioswales that would be constructed along each side of Lincoln Ave as it extends east and west of the business district provides for a tree-lined beautiful experience for residents and visitors.

Other construction projects include FEMA- funded city hall, ambulance building and community center. It is not known at the time of this report when these will be constructed, but they must be constructed in the locations where they currently exist according to FEMA.

There is interest by the owner of the existing bar and grille on Lincoln Avenue to renovate the structure, and community members recently held a brain-storming session with Golden Hills RC&D about projects that could be started. One idea presented was to utilize a rail car or shipping container as a seasonal / pop-up retail or restaurant linked to bicycle trail traffic or farmers markets / festivals in the "agri-hood" concept. The community noted an example of this idea is Stanley's Snack Shack in Crescent, Iowa near Council Bluffs. An illustration of this idea for Pacific Junction is presented in this report utilizing a rail car as part of the history of the community.

The open space in the railroad wye in the center of the community is currently rough brush and gravel and is owned by BNSF. Storage buildings have recently been removed and the area is quite large and barren. BNSF collaborated in discussions throughout the process regarding rail access for the Pacific Junction and Highway 34 Interchange development. In those discussions, the idea of beautifying the wye with locally authentic native

prairie plantings was proposed along with the idea to utilize the area for improved stormwater management and the implementation of small-scale wind turbines or photovoltaics. In addition, there is an opportunity for the installation of art in the prairie and link to the rich heritage of Pacific Junction and BNSF. BNSF indicated a willingness to allow for beautification of the wye and would require more discussions and formal agreements to maintain safety for the public.

The planning recommendations that follow begin to outline strategies that are born out of the guiding principles described earlier. These planning strategies when implemented together as a community that includes Pacific Junction and the development areas of the Highway 34 interchange can begin to build a vision of hope for Pacific Junction.

1. **Fund Accreditation Study Funding for Pony Creek and Keg Creek Levees**
   - Determine what is required to certify levees to avoid FEMA remapping the community within the 100 year floodplain
   - Based on comparison to the cost of the current M&P certification study, the estimated cost to conduct an accreditation study for the Watkins Creek system (that includes the Watkins Creek right bank and Pony Creek left bank protecting Pacific Junction) would be in the range of $500,000. This does not include the cost of levee modifications that may be necessary to raise the height of the levee and/or address structural deficiencies. The time required to complete the levee study may be up to a year, depending on the number of borings required to conduct the structural assessment, the condition of the levee, and the current status of O&M documentation and plans.
   - **Potential cost of accreditation study $500,000**

2. **Evaluate scope and funding to improve Pony Creek / Keg Creek Levee Improvements to Certification Standards**
   - Need for improvements to levees likely to achieve certification
   - Necessary to maintain 500-year flood plain designation and avoid additional restrictions on all properties not deed-restricted

3. **Organize Community Stormwater/Ecology Projects**
   - Integrated Street Reconstruction with stormwater projects (green infrastructure elements)
   - Two conditions- Lincoln Avenue (downtown) and other existing streets
   - Other integrated stormwater/ecology improvements
   - **Stormwater Bumpouts illustrated on following pages on Lincoln Ave. ($250,000 - $350,000) construction cost and design fees**

4. **Coordinate Railroad Junction Enhancement with BNSF**
   - Coordination with BSNF on water management / beautification of the railroad junction
   - Could include demonstration low-input prairie landscape, sculptural/community identity/public art elements

5. **Evaluate Wastewater System Resource Management**
   - Sanitary sewer study, explore localized living technologies for improved efficiencies
   - Funding for sewer / water improvements to facilitate affordable residential development

6. **Develop Food Production on Flood-impacted Properties**
    - Development of FEMA deed-restricted buyout lots for local food / seed production
    - Develop high-performance affordable housing on City-owned parcels not deed-restricted
    - Other community and/or commercial uses:
        - Pop-up retail / restaurants
        - Re-purposed rail car or container(s)

7. **Expand Regional Trail / Greenway**
    - Funding for planning, development, and long-term maintenance of recreation / bike trails to connect PJ to existing trails

8. **Build a Brand around Agriculture and Community Identity Features**
    - Gateway signage
    - Wayfinding
    - Interpretive (culture, natural history, etc.)

9. **Improve Broadband Access**
    - Ensure optimal broadband accessibility

10. **Develop Model High-Performance Housing Developments:**
    - City-Owned Properties
    - Adjacent previously platted parcels

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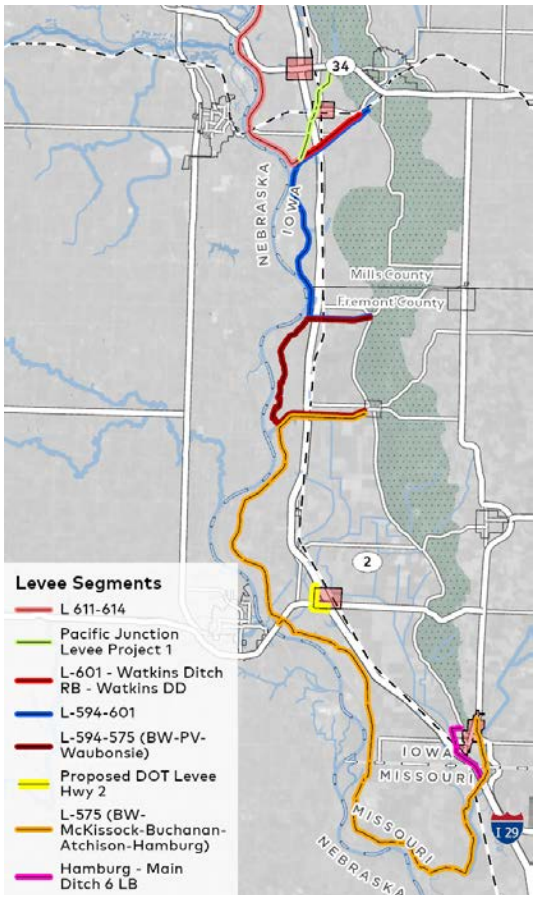
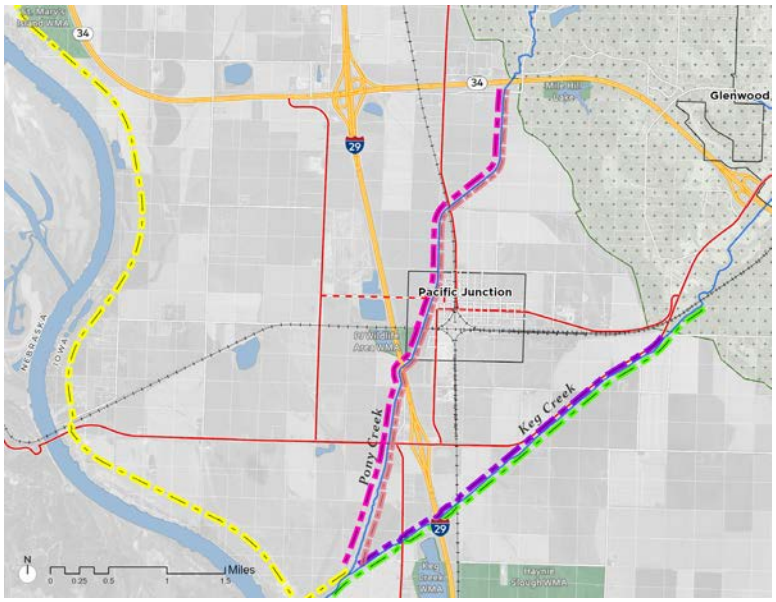


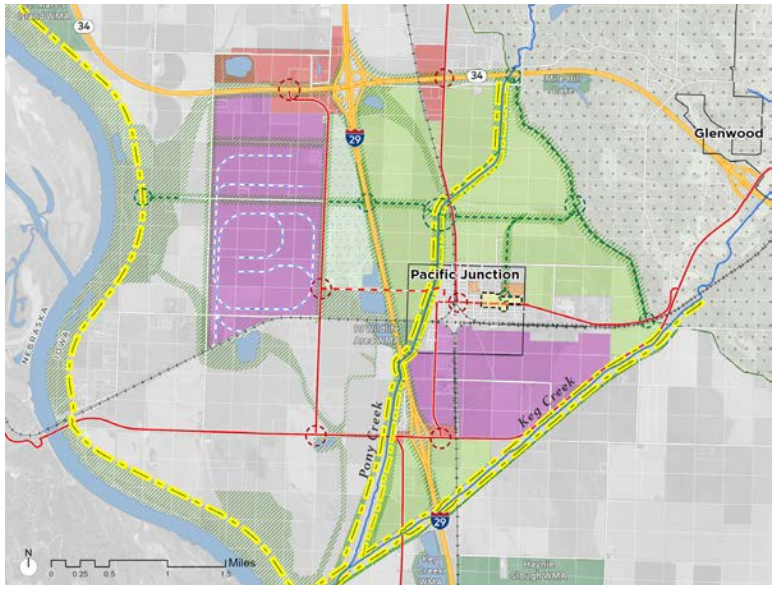
Levee configuration for study area

Bike trail plan



Levee - L611-614
Levee - Pony Creek Right Bank
Levee - Pony Creek Right Bank
Levee - 601 - Watkins Ditch
Levee - L-594-601

Levees Protecting Highway 34 Interchange and Pacific Junction



Primary roads
Proposed Road Upgrade
Railway
Proposed Railway Loop
Levees
Trails
Greenways
PJ Redevelopment Zone
Distribution/Light Industrial
Commercial / Mixed Use
Regenerative Agriculture
New Residential Areas

Land-use plan for Pacific Junction and Hwy 34 Interchange

FOOD AND SEED PRODUCTION ON BUYOUT PROPERTIES

View looking southeast of buyout property utilized for food production

Buyout properties

Pacific Junction buyout map

Festivals

Urban vineyard

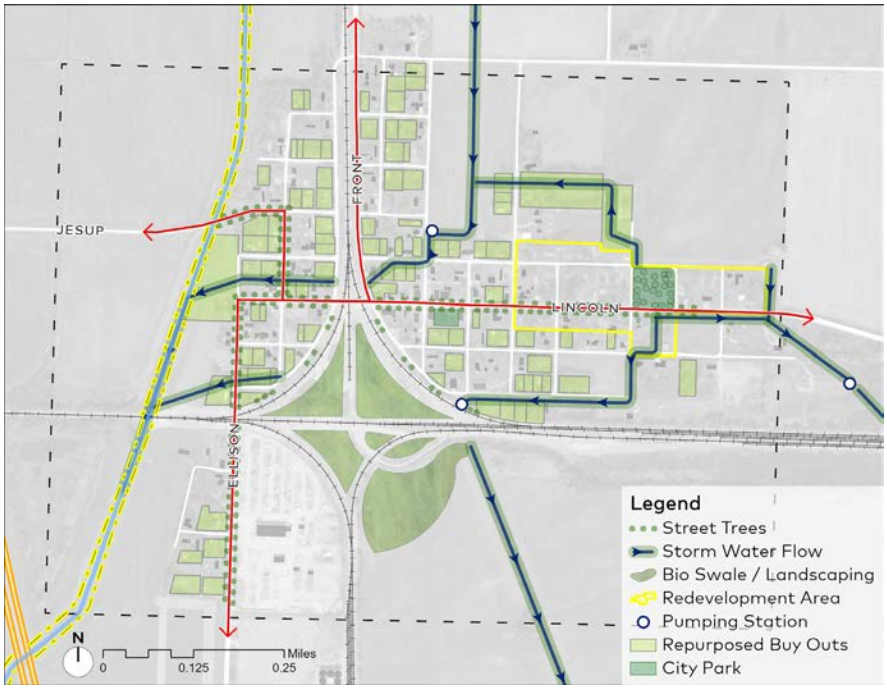
Food production

Farmer's market

Teaching health and nutrition

Bird's eye view of Pacific Junction

Native landscape buffer to manage storm water between agriculture and residential similar to prairie strip shown above

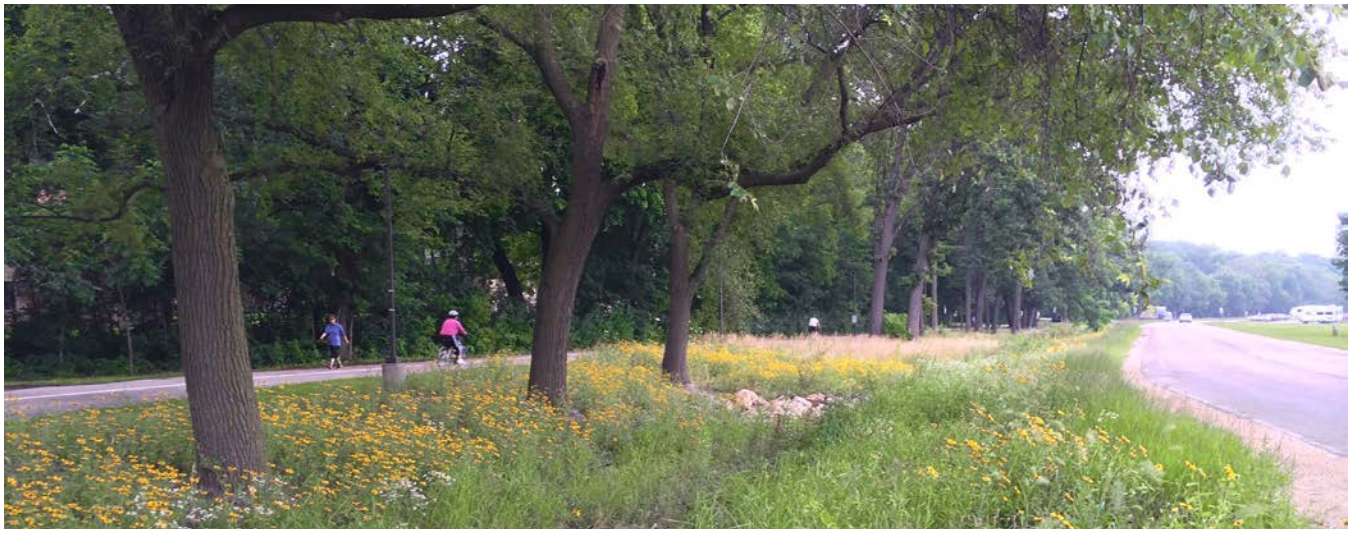


Green infrastructure concept for community

Pervious alley in new residential

Bioswale under construction

Bioswale

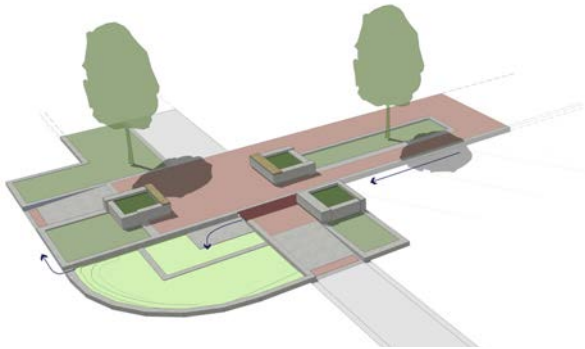


Examples of green infrastructure bioswales denoted by green lines on map above

DOWNTOWN BUSINESS / STREETSCAPE OPPORTUNITIES

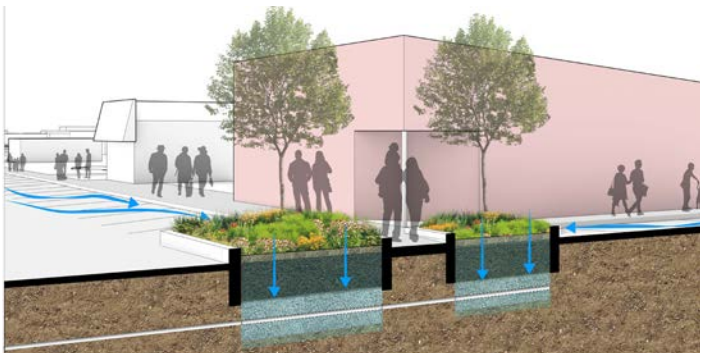
Pacific Junction Main Street Improvements

Bumpout design with bioswale



Typical bumpout design

Extension of streetscape west towards school



Bumpout stormwater management

Streetscape improvements and storm water management

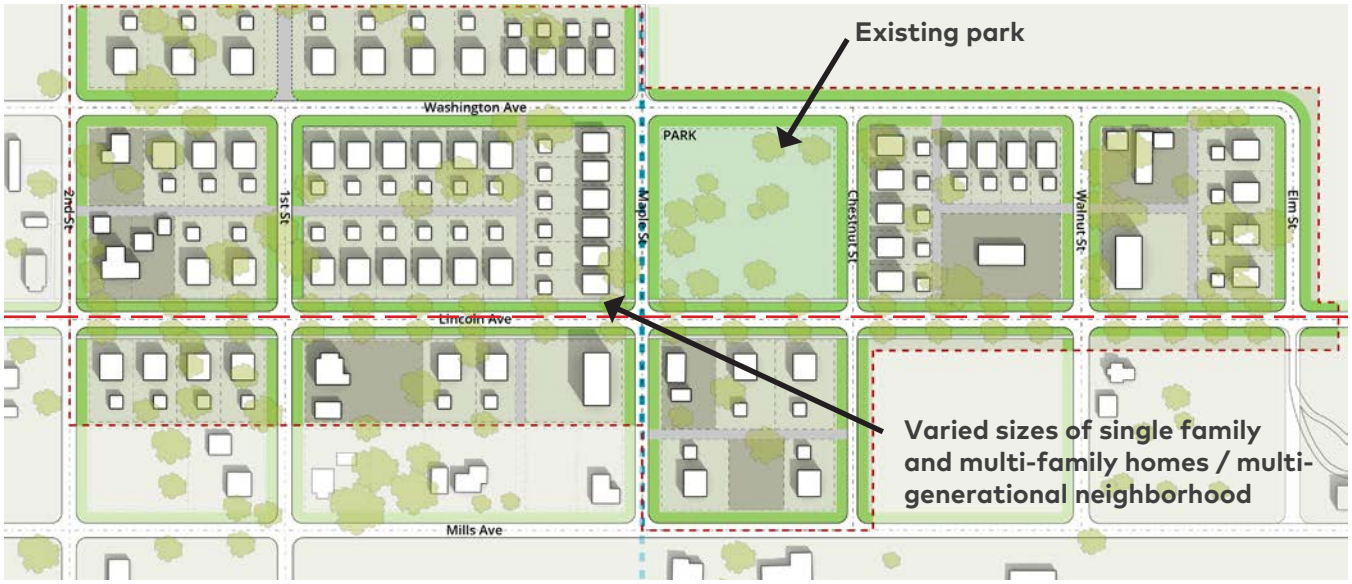
Concept of pop-up restaurant or retail in renovated railcar and renovated downtown buildings

Example of stormwater bumpout

Examples of local businesses for pop-up restaurants

CONSTRUCTION OF HIGH-PERFORMANCE HOMES

Pacific Junction - Bird's Eye View



Concept for residential layout on unrestricted properties owned by city; creation of a walkable neighborhood

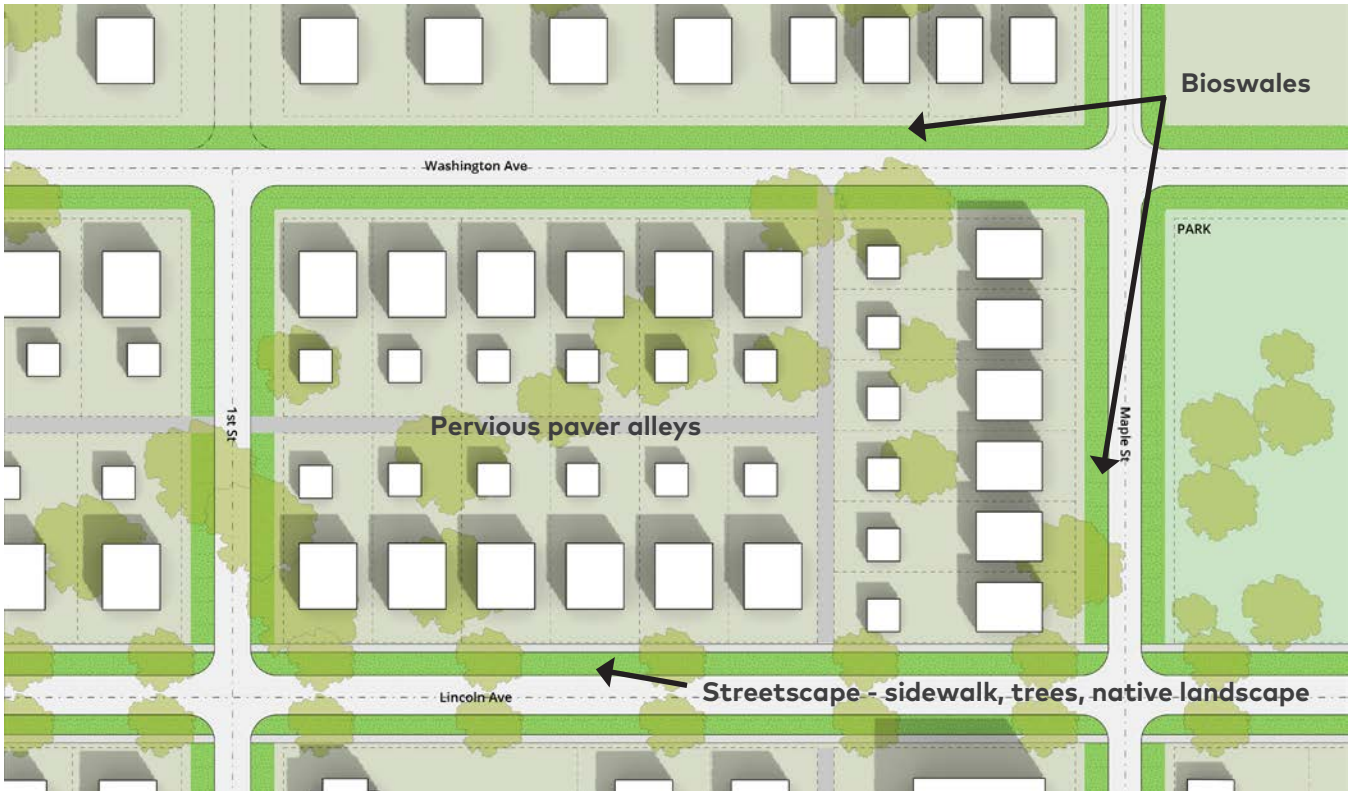
Existing Lincoln Avenue streetscape

Proposed streetscape / stormwater drainage

Unrestricted city-owned properties (yellow outline)

Native landscape and trail connections

Bioswale



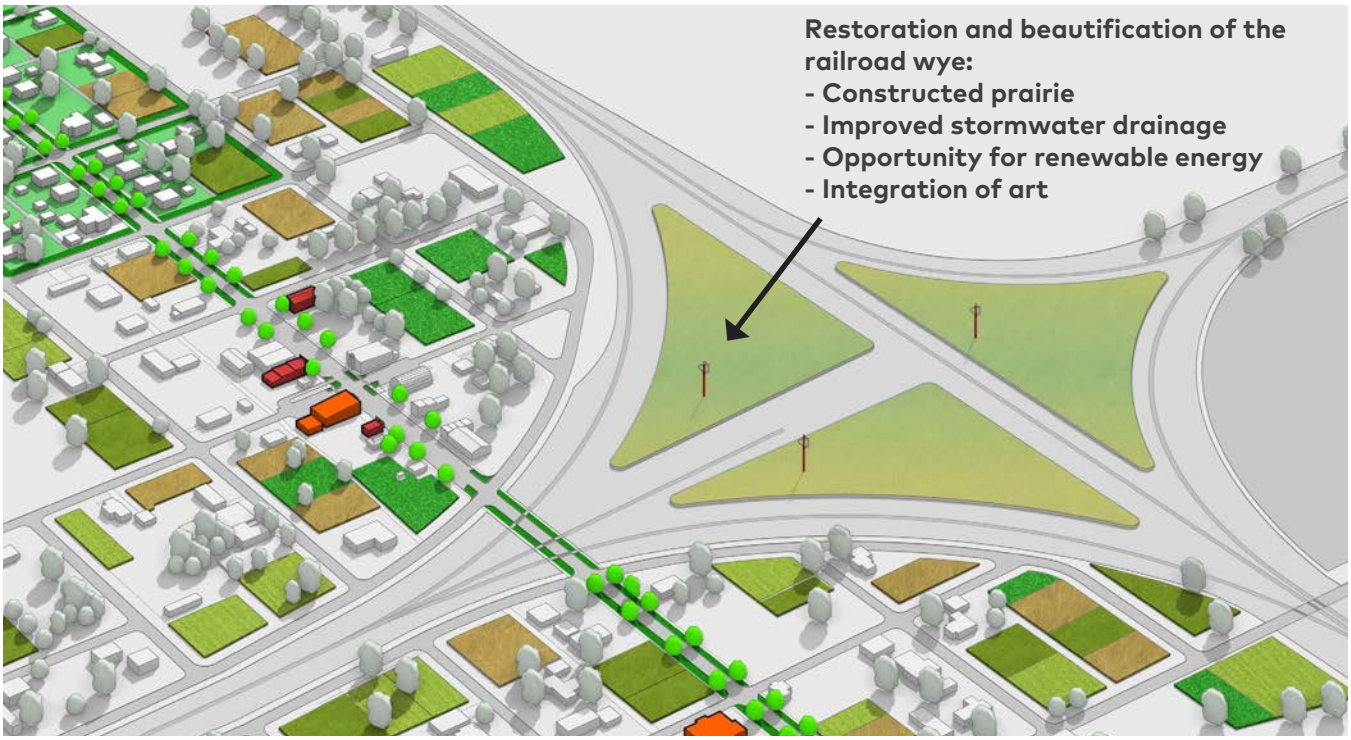
High-performance, walkable neighborhood with porches in front yard and garages in back.

High-performance home

Pervious paver alley

Residential rain garden

BEAUTIFICATION OF RAILROAD WYE



Pacific Junction concept view of the wye

Drone image of railway wye

Native prairie

Opportunity for prairie volunteers and education

Small scale wind turbine

Integration of art

Opportunity for inventive wind turbines as art

5.4 Hamburg

Figure 5.4-1. Drone image of Pacific Junction.

As a larger community than Pacific Junction with terrain that varies from the Loess Hills at the northwest to the lower floodplain land at the southeast, Hamburg did not have the same extent of flooding across the entire community in the most recent 2019 floods. However, they still endured considerable flooding within the 100 year floodplain that impacted the western businesses, southern residential lots, and a considerable portion of the mixed uses around the main street business district.

Even though the community stakeholders and leaders noted in many meetings that they still feel like they are "in the flood", they have been able to organize for re-building quicker since they have more of their community outside the current floodplain with the FEMA buyout area defined as a portion of the community in lieu of being spread across the entire town areas in Pacific Junction. Much of this recent development and renovation work has been in the Main Street "downtown" area.

As of the writing of this report, the community has developed:

- Ditch 6 Levee project
- Dollar General Store
- Dovel's Locker
- Relax and Unwind Coffee Shop
- New grocery store - in process
- New hotel - in process
- Colonial Theater Improvements
- Former motel renovated into mixed -use
- Two infill housing projects on Main Street
- Indoor golf facility renovation - in process

With development progress in Hamburg over the last 3 years, the community is more committed to continue to restore the community after the flood by nurturing additional development utilizing the guiding principles developed as part of the planning recommendations included in this report. However, as in Pacific Junction, to reduce uncertainty for any further development, it is

essential that accreditation studies are completed and plans put in place to certify the levees protecting the community so FEMA will recognize these improvements when re-mapping the floodplain. Increasing the extent of the 100 year floodplain would have a significant impact limiting further development along Main Street in the downtown business area and significant business and residential areas to the southwest.

In Hamburg, the city grid was established along Main Street extending from the northeast to the southwest. The current school and new 40 unit, proposed CDBG-funded North Ridge Hills housing development (currently in design) will provide a northern anchor (of resilient new development) to Main Street at the base of the Loess Hills. The southern anchor will be the approximate 100 acre FEMA buyout property. The downtown business district sits roughly halfway between these two community anchors.

In the near term, the patchwork buyout properties, as in Pacific Junction, can become productive land for producing local food. The long-term plan envisions acquiring the lots in between the individual buyout parcels to create a larger contiguous land area for food production, a pond and other community scale stormwater management features, and recreational RV park.

The northern anchor to Main Street will be a newly constructed 40 unit residential neighborhood funded with recently awarded CDBG HUD disaster recovery funds. This neighborhood will follow the Iowa Green Streets Criteria creating a multi-generational neighborhood and connected to the existing neighborhood fabric of Hamburg. As noted earlier, these criteria require the sustainable management of stormwater; the utilization of native landscapes and ecological restorative design strategies; and the efficient use of resources for building construction materials, water, and energy. In addition, the homes are being designed to follow the US Department of Energy's Zero Energy Ready Home Program and are planned to incorporate renewable energy systems to create at least as much energy as they consume. Construction is anticipated to begin in 2022.

The current surface drainage in Hamburg and the existing Main Street storm water system can be improved through the incorporation of infiltration-based green infrastructure design strategies. The illustrations include a community diagram indicating the transformation of current surface drainage, ditch, and culvert systems to constructed bioswales that will slow, clean, cool, and infiltrate stormwater, lessening the impact on urban flooding. Within the downtown business district, the concept proposes to improve the streetscape by adding constructed bioswales, landscaping, and street trees to manage stormwater sustainably while calming traffic and providing other benefits.

As part of the "front door" experience for travelers and residents, the community desires to create "gateways", including a new sign on each side of the interstate exit identifying the community of Hamburg. The quality of this signage could begin to establish the spirit and commitment the residents have for their community.

In addition, the approach into town can be improved to transform the existing drainage ditches on each side of Highway 333 to native landscaped bioswales as the road extends into the intersection of Main Street. There is also a great opportunity to restore the approximate 130 acre land inside the newly built Ditch 6 Levee to create a new nature park, including native prairie, wetlands and wildlife habitat with view areas and trail system. This wildlife restoration area can be a visual front door to the community and part of a connected community plan including the buyout agricultural plots, main street stormwater improvements, and high performance neighborhoods.

Through all of these planning recommendations a goal is to elevate connections to food production, processing, and agriculture while reinforcing connections to the region's rich natural amenities. These are essential components of this Vision of Hope for Hamburg and the Mills/Fremont County Region.

1. **Fund Accreditation Study for the Levee System Protecting Hamburg**
   - Determine what is required to certify levees to avoid FEMA remapping community with greater 100 year flood impact area
   - Based on comparison to the cost of the current M&P certification study, the estimated cost to certify the Nishnabotna and Ditch 6 levees would be in the range of $400,000. This does not include the cost of levee modifications that may be necessary to raise the height of the levee and/or address structural deficiencies. The time required to complete the levee study may be up to a year, depending on the number of borings required to conduct the structural assessment, the condition of the levee, and the current status of O&M documentation and plans.
   - **Potential cost of accreditation study $400,000 - would not include the entire L - 575 Levee**

2. **Evaluate Scope and Funding to Improve / Construct Levees to Certification Standards**
   - Modifications for Nishnabotna and Ditch 6 levees
   - Creation / construction of new "connector" levee between Ditch 6 and Nishnabotna

3. **Organize Community Stormwater/Ecology Projects**
   - Initiate a series of restorative greening retrofits in the public realm to improve water quality and reduce nuisance flooding, funding for design, construction, and long-term maintenance/stewardship:
   - Main Street green infrastructure stormwater / streetscape improvements
     - **Stormwater Bumpouts estimated $500,000 to $600,000**
   - Stormwater drainage/water quality/ecology improvements
   - Construction of multiple-benefit green infrastructure / bioswales in current drainage areas / ditches
   - School stormwater project – in coordination with school children
     - **School stormwater project ($300,000 to $350,000) potential construction costs including design fees**

4. **Develop Food Production and Long-term recreation plans for Flood Impacted Properties**
   - Buyout lots converted to local food production / stormwater management / habitat
   - Long term vision of increased acreage for local food production / multi-benefit water management/fishing pond / RV camping

5. **Create Nature Park / Bird Sanctuary inside Ditch 6 Levee**
   - Utilize Ditch 6 levee borrow area owned by the City (area immediately inside levee)
   - Restore land with natural landscapes- Prairie, wetlands;
   - Utilize for passive recreation- wildlife viewing; trails

6. **Reinforce Community Identity Features**
   - Gateway signage
   - Wayfinding
   - Interpretive (culture, natural history, etc.)

7. **Improve Broadband Access**
   - Ensure optimal broadband accessibility

8. **Develop Model High-Performance Housing Developments**
   - North Ridge Hills Development projects
   - Affordable Housing

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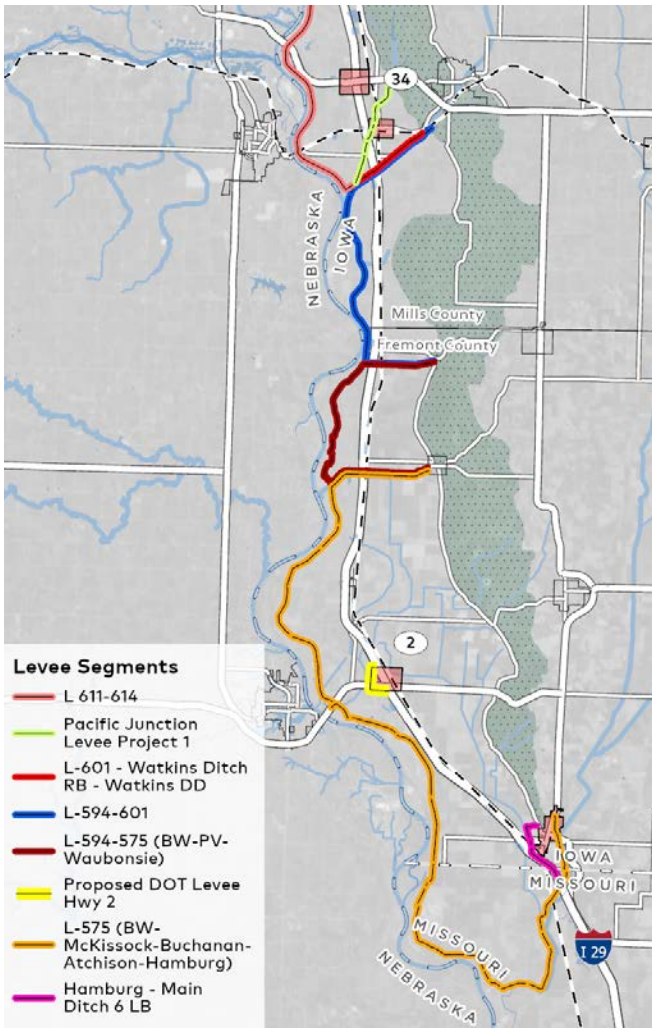
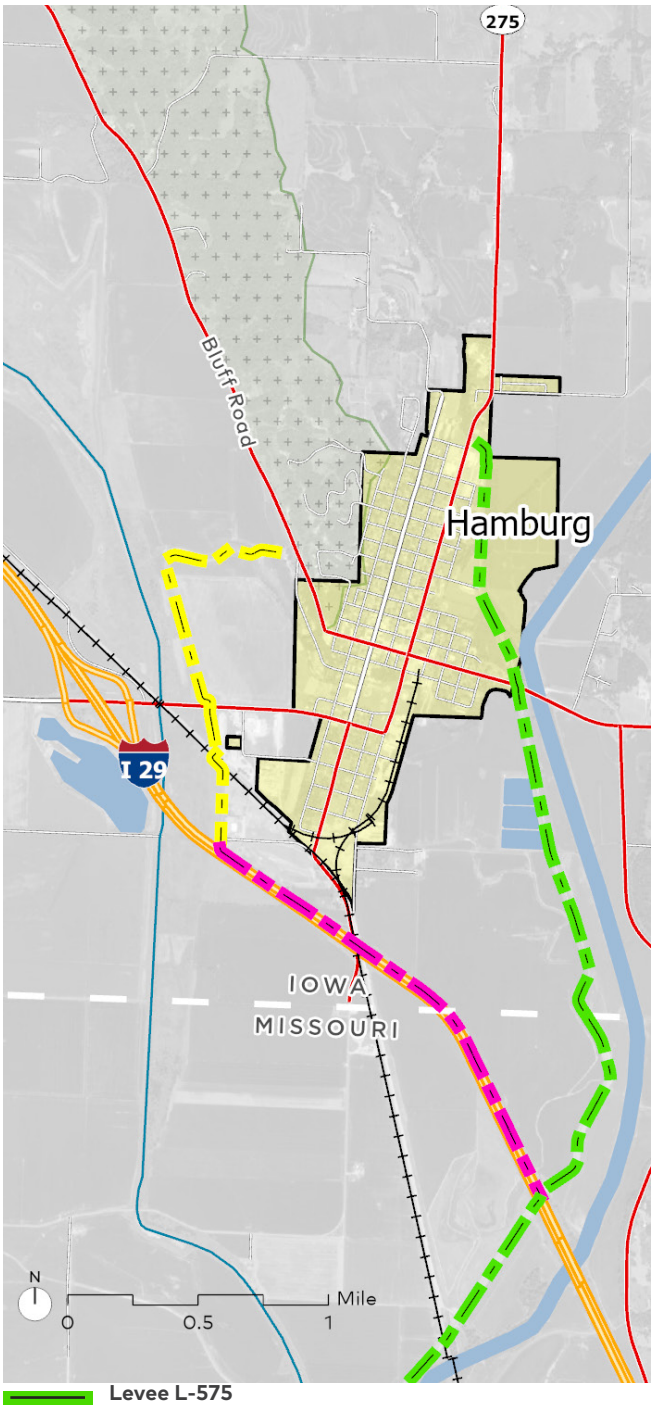
FLOOD PROTECTION / LAND USE/ CONNECTION TO REGIONAL TRAILS AND GREENWAYS



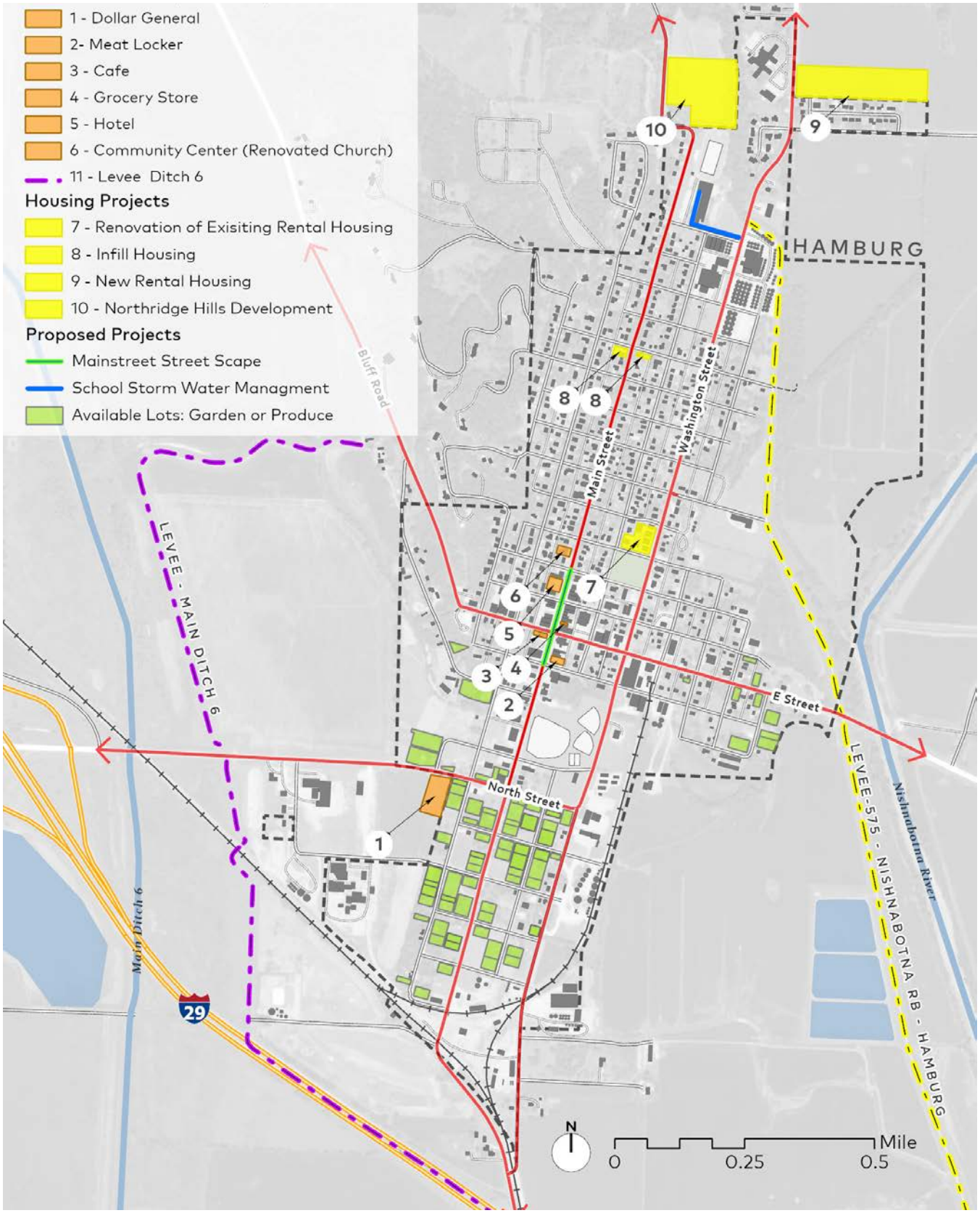
Levee system for study area

Bike trail and greenway access



Levees protecting Hamburg

RECENT PROJECTS



Hamburg map showing recent and potential projects.

Drone image of community

Proposed Hamburg Grocery

Ditch 6 levee construction nearing completion (December 2021)

Dovel's Locker

Existing rental housing, potential private renovation

Recently constructed infill house

Downtown Hamburg

Recent renovation of Relax & Unwind cafe

FOOD AND SEED PRODUCTION / RECREATION ON BUYOUT PROPERTIES

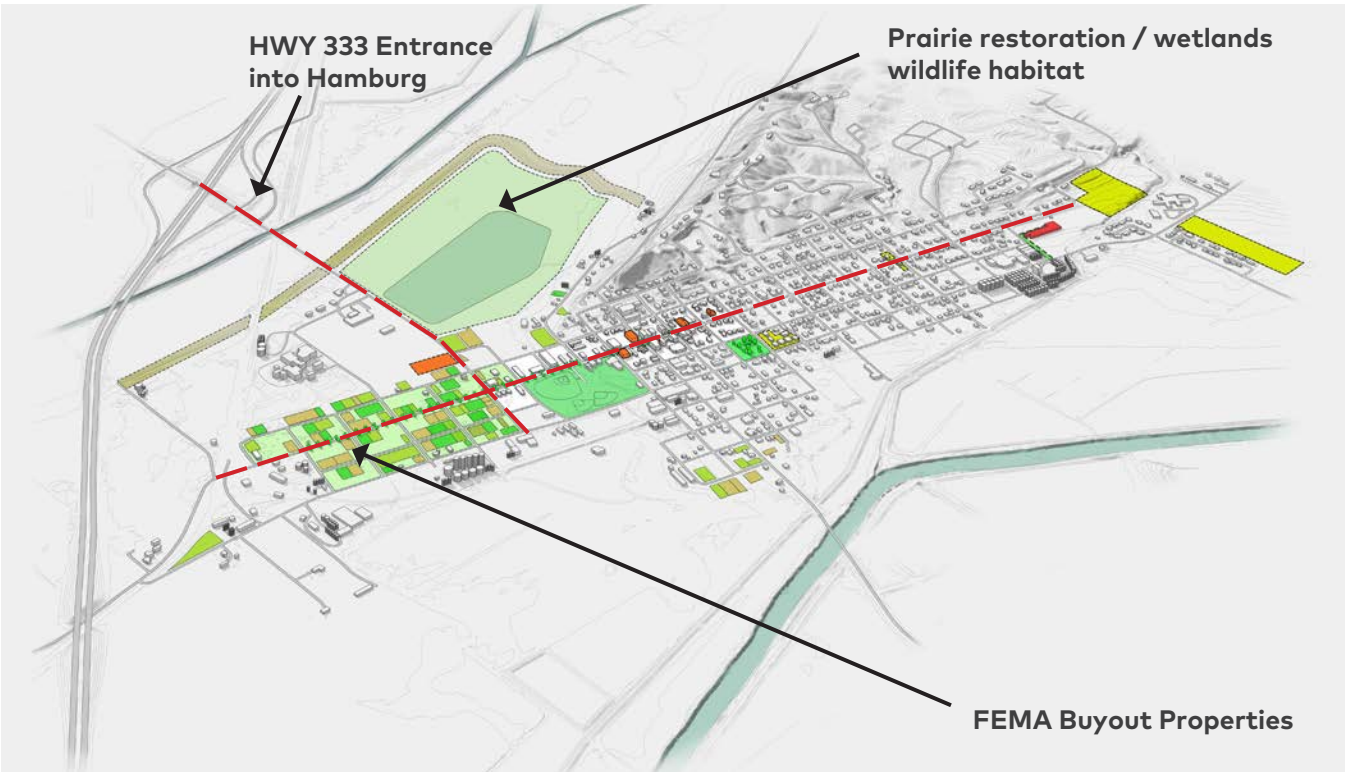
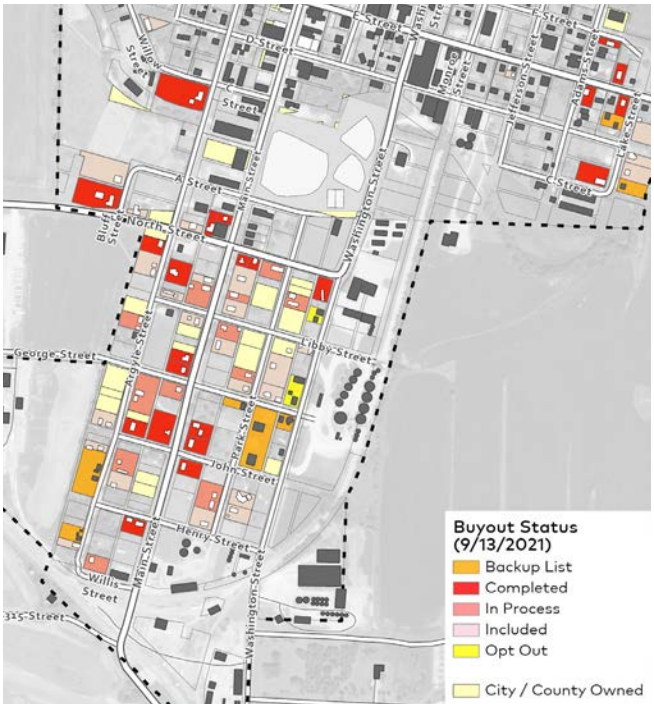


Diagram of community focus area

Existing buyout properties



Buyout map

Farm festivals

Food production

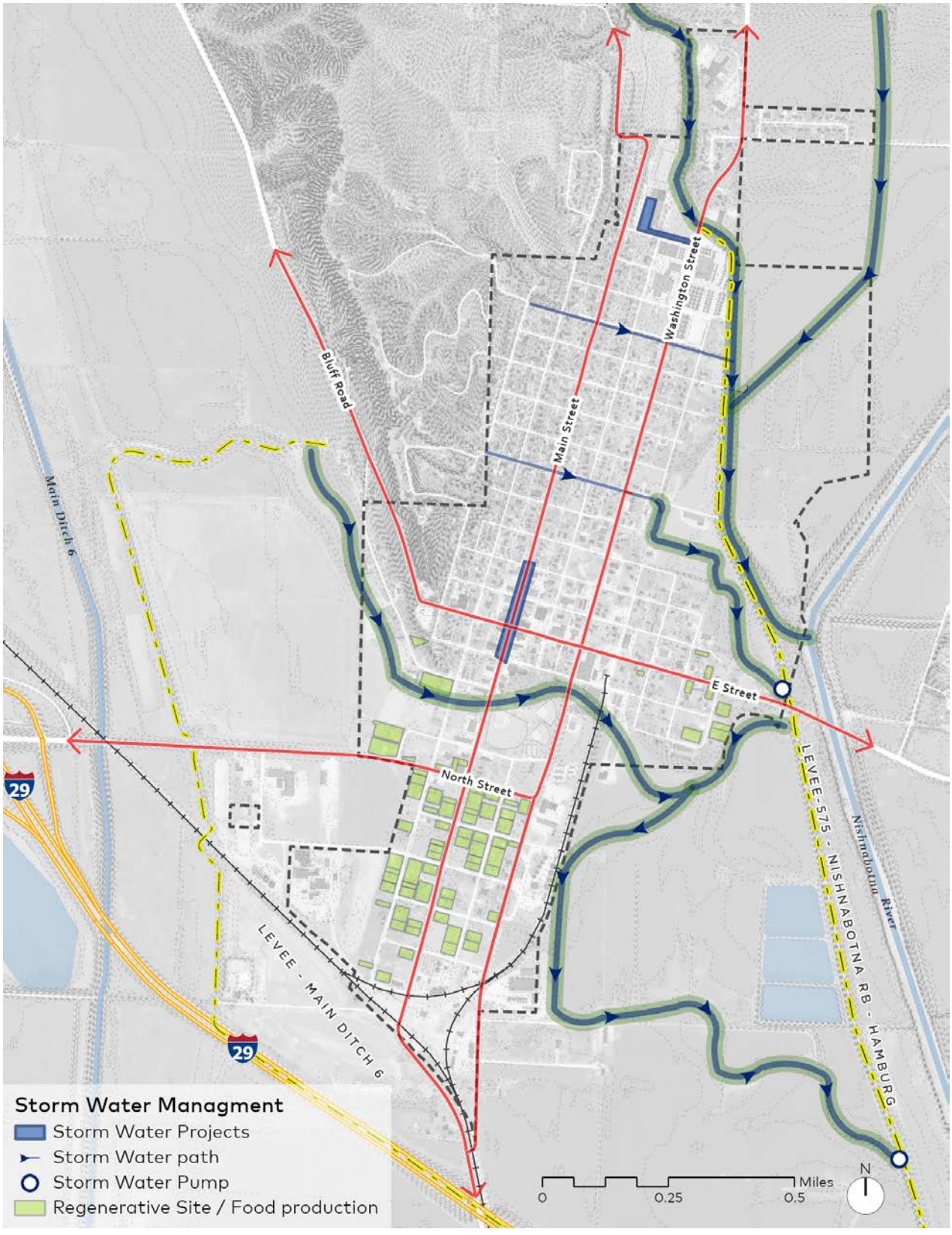
Potential future pond in buyout area

Celebrations

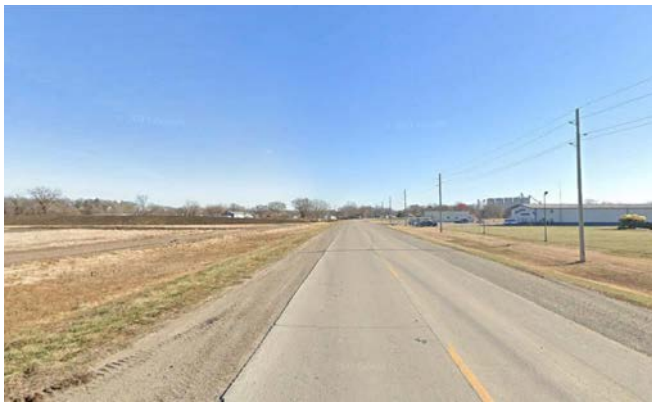
Potential RV camping in buyout configuration

Future RV camping and pond in buyout area

Farmer's markets



Green infrastructure / stormwater plan for community

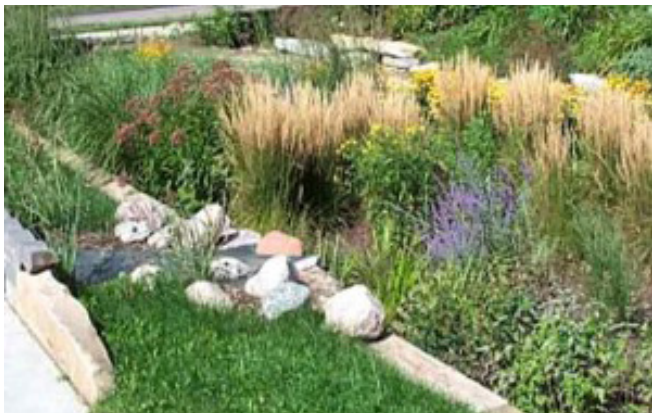


Current green infrastructure

Potential future green insfrastructure

Bioswale under construction

Bioswale



Bioswale opportunity

Bioswale in community

Existing drainage issues northeast of baseball field

Opportunity for improved drainage

Hamburg downtown stormwater and streetscape enhancements, looking south

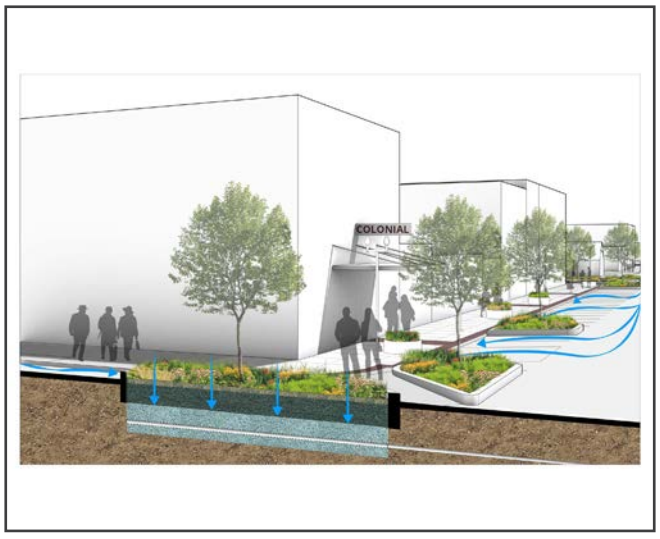


Diagram of stormwater bumpout by the Colonial Theater

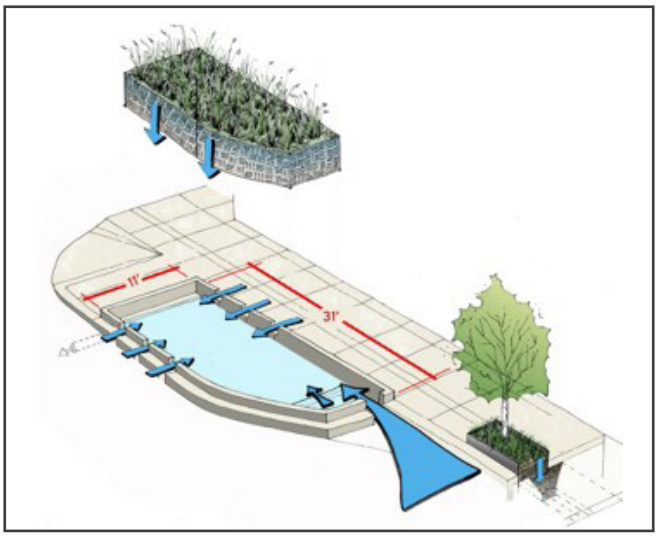


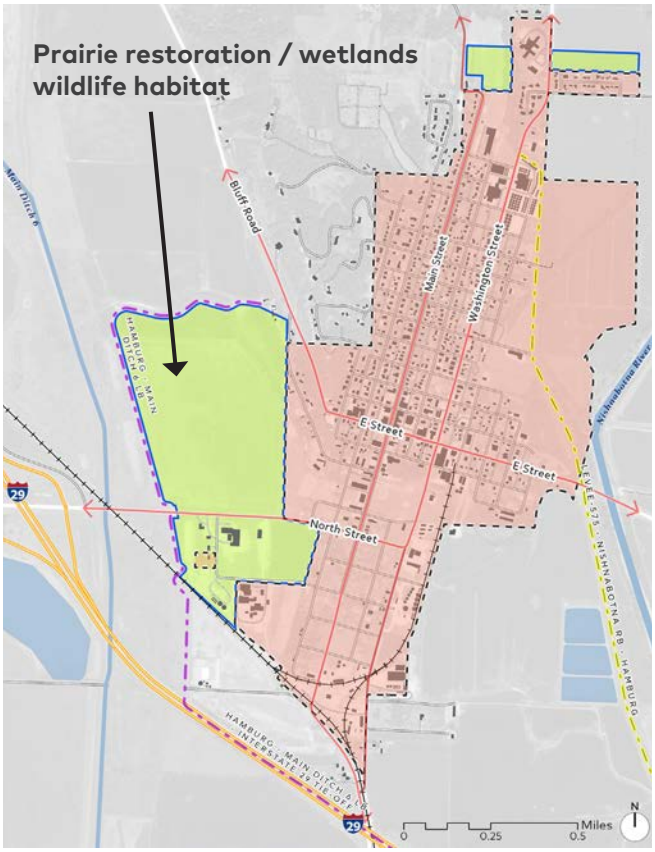
Diagram of how a stormwater bumpout works

Site plan for Main Street stormwater bumpouts

Example of stormwater bumpout

Example of stormwater bumpout intersection

CREATION OF NATURE PRESERVE AND WILDLIFE HABITAT



Annexation plan of Hamburg

Accessible trail through habitat

Environmental education

Opportunity for wetlands and wildlife habitat

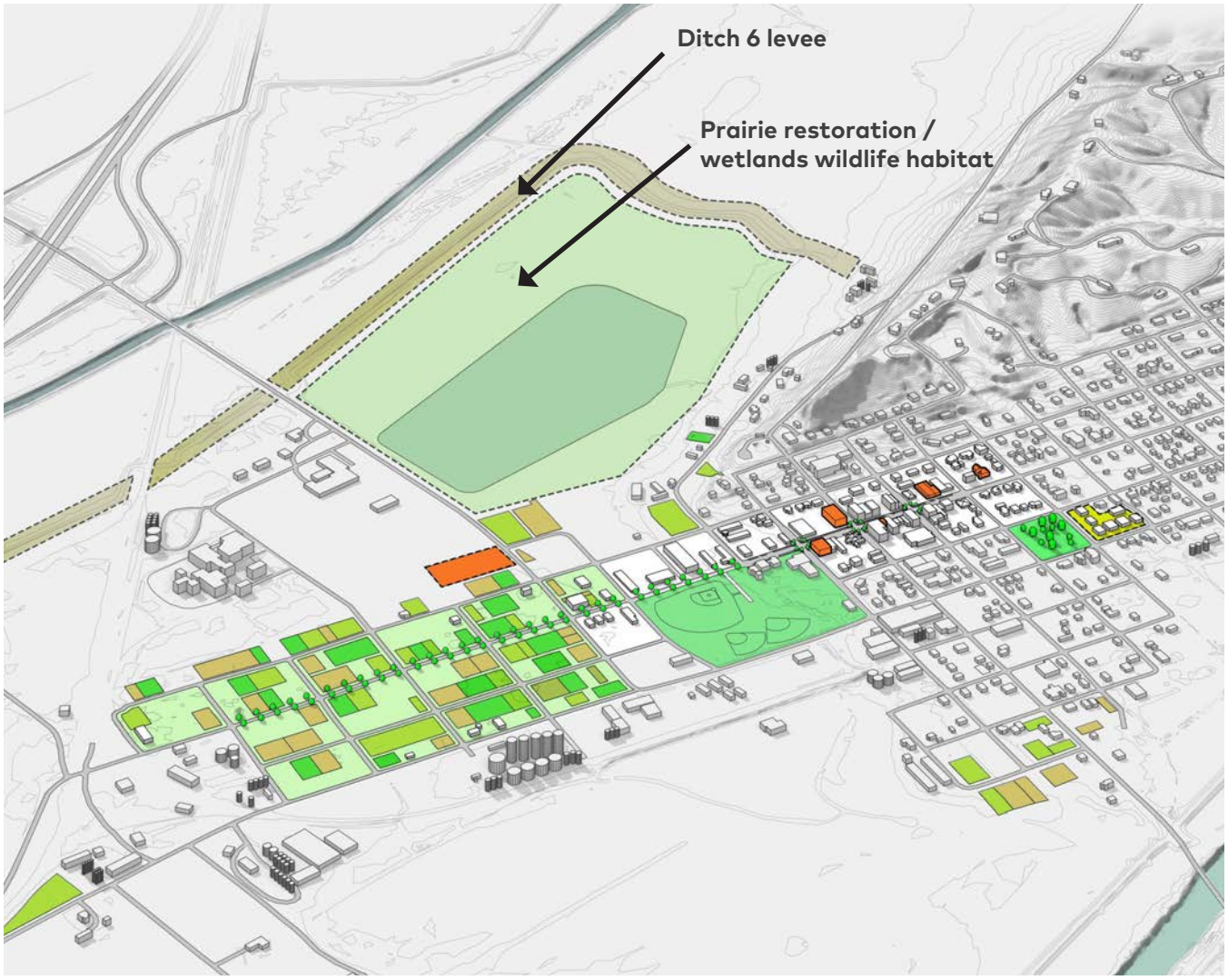
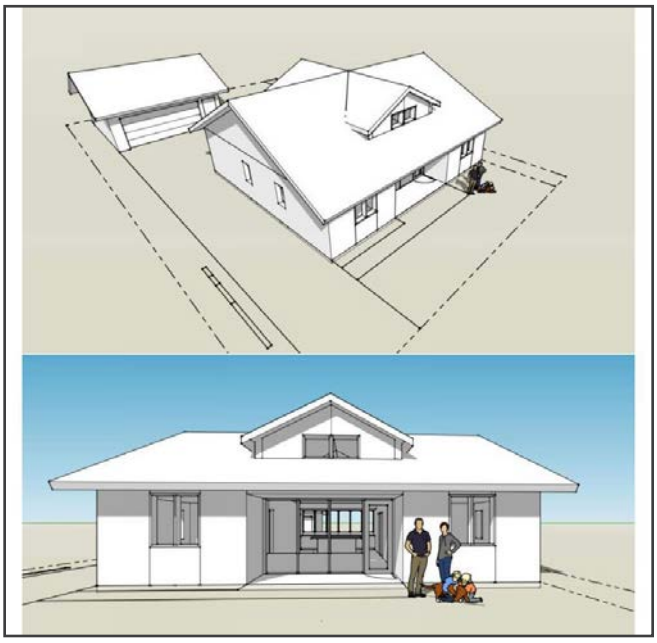


Diagram illustrating opportunity for prairie and wildlife habitat

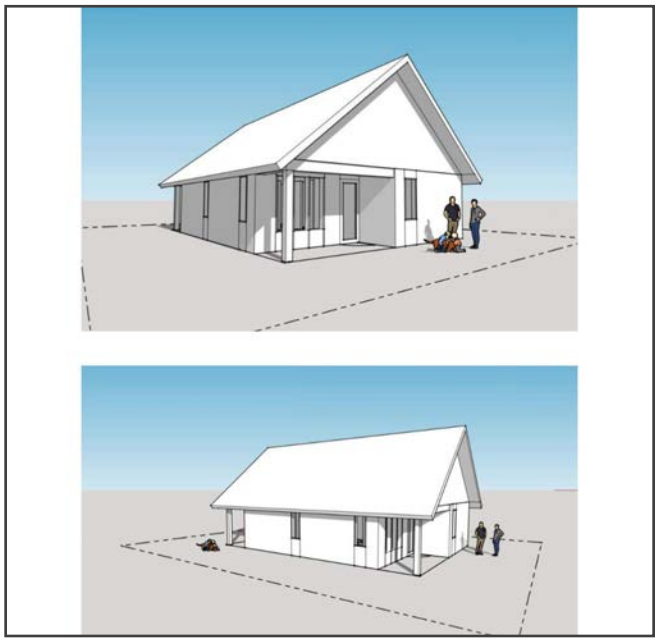
Prairie restoration with trails

CONSTRUCTION OF HIGH-PERFORMANCE NEIGHBORHOOD - NORTH RIDGE HILLS

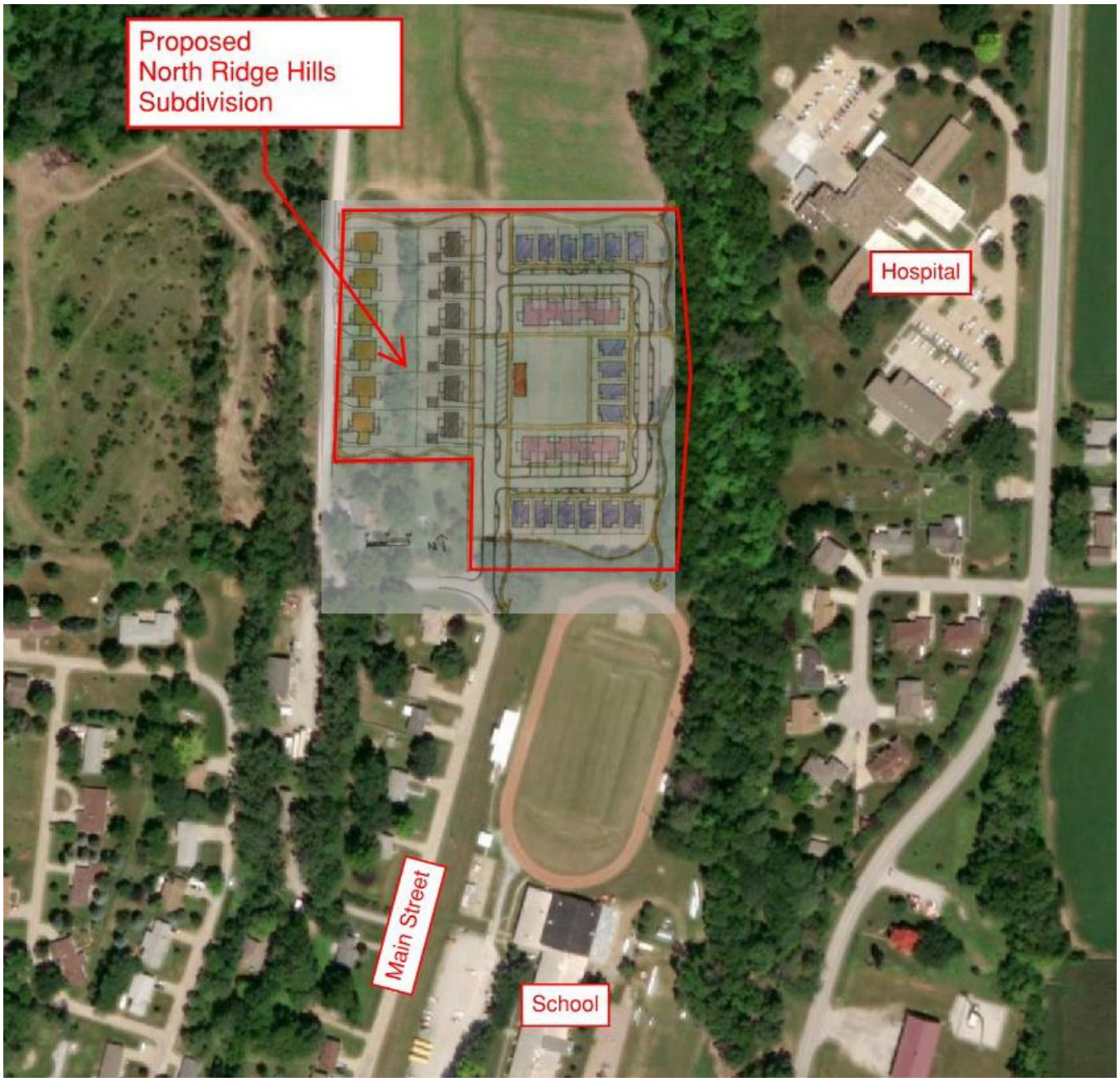
North Ridge Hills development proposal; CDBG HUD awarded project



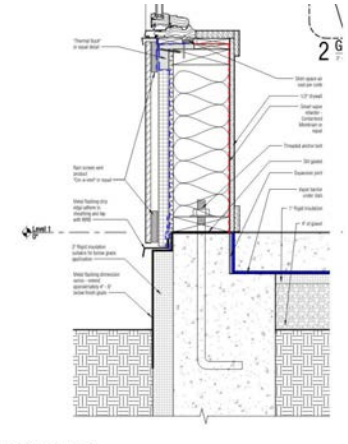
High-performance home design; DOE Zero Energy Ready



High-performance home design; DOE Zero Energy Ready



Main Street extension into North Ridge Hills development



High-performances wall section

Native landscape concept and stormwater management

5.5 I-29 / Hwy 2 Interchange

Figure 5.5-1. View of retail at I-29 / Hwy 2 interchange.

Iowa Hwy 2 is a vital connection for the region because of its crossing of the Missouri River. Many people commute to work or access important services by using this connection. In addition, this is an important freight corridor connecting I-29 in Iowa to I-80 in Nebraska. Iowa 2 currently carries about 8,200 vehicles per day with about 1,700 of those vehicles being trucks. Because of this connection the US Department of Defense has identified this as a Strategic Highway Network Connector. Therefore, in the event of flooding, it is important to keep this crossing above flood waters as much as possible.

The Iowa Transportation Commission (Commission) has programmed three phases of Iowa 2 resiliency work between the Missouri River and I-29. The first two phases have been completed with the third phase scheduled to begin this year.

- Phase 1: Construction of Missouri River overflow bridges and realigned levee to reduce a 'pinch point' in the river.
  - Complete
  - Cost: $34 million
- Phase 2: Raised the grade of Iowa 2 from new overflow bridges to Horse Creek bridges
  - Complete
  - Cost: $17 million
- Phase 3: Between Horse Creek bridges and I-29: Additional drainage structure and protective dike construction
  - To be let in FY 2022
  - Cost: $3.5 million

In addition, Phase 3 will provide some protection to existing and future businesses near the Iowa 2 and I-29 interchange. As demand for development increases over time, the levee could be reconfigured to encompass and protect more developable land south of Iowa 2 and west of I-29.

The Interstate 29-Highway 2 interchange is one of marked opportunity and an abundance of challenges. Investments in the transportation infrastructure – both in Iowa and Nebraska – make it a key gateway. And expected increases in traffic counts creates a chance for Fremont County leaders to foster new business, generate new industry and capitalize on thousands of additional travelers passing through this exchange.

The development of the South Beltway Project near Lincoln, NE, which will give motorists connecting on I-80/I-29 a bypass around the capitol, will dramatically increase traffic counts on Highway 2 in both Nebraska and Iowa, especially as it connects to I-29 just northwest of Hamburg. Already, improvements to Highway 2 as noted above on both sides of the Missouri River have led to a dramatic increase in truck traffic, according to local leaders.

The I-29/Highway 2 interchange already has some development: a Sapp Brothers truck stop and hotel are located at the northwest segment. Residents in nearby Nebraska City, a community of 7,200, say they would welcome new dining options – citing a shortage in their city. And there is a belief that the Iowa interchange could successfully host a series of dining and entertainment options

But the 2019 floods dramatically impacted other lower-lying businesses and a state welcome center there has yet to re-open. Meetings with property owners and county economic development leadership indicates uncertainty regarding flood mitigation is precluding investment. But the threat of future floods is not the only barrier to development at the interchange.

Available land at the interchange is held by a few owners. Water comes via a well privately held by the owners of the truckstop, sewer is via individual septic systems and the capacity to serve additional users is currently limited. There have been conversations with USDA Rural Development, but its water/wastewater programs require a governmental entity or non-profit partner. Sapp Brothers would have to seek different funding. Meanwhile, broadband could be available, and a telecommunications cooperative in Rockport, Missouri, has indicated interest in providing service if incentives were available.

The eastern side of I-29 features a swath of developable land – bounded by the interstate on one side and the Loess Hills on the other. There have been reports of a possible 1,400 acre solar farm in this area, but as of this writing no final commitment has been made. There is also a local consensus that additional services for truckers, opportunities for warehousing driven by the increased truck traffic prompted by the Lincoln South Beltway Project, and an overall lack of dining and entertainment in the region has set a site ripe for growth.

But access to utilities and cooperative landowners, as well as local capacity in this unincorporated area, poses the greatest challenges to development. Fremont County currently contracts with the Shenandoah Chamber & Industry Association and is the primary point of contact for prospects and developers. And local leaders have speculated it's unlikely county government could make significant financial investments in infrastructure, site development or incentives. Its debt capacity is limited by other, recent projects.

Southwest Regional Water District has current plans to extend service to areas east of Hamburg. But it's plans do not currently include the I-29/ Hwy 2 interchange. There have been discussions between the District's leadership and USDA Rural Development regarding that site. But nothing has been said recently on the topic. There has also been speculation that the City of Sidney could be a provider, but the distance could make that unworkable.

Lastly, the interchange is located very close to the Missouri River in a stretch that is suitable for improved river access for recreational uses such as boating, kayaking, and fishing. There is demand to increased facilities to access the river, and sites exist within very close range of the interchange. This creates greater potential to synergize the expanded development at the interchange with

ecotourism and river-oriented recreation in additional to highway-oriented uses.

The following are specific planning recommendations for this interchange.

1. **Commission L-575 Missouri River Levee Accreditation Study - In coordination with Hamburg Levees noted below - is an immediate need**
    - In coordination with Hamburg Nishnabotna Levee; this is an immediate need

2. **Detailed analysis on utility systems and current / future demands**
    - Water Service
    - Sanitary Sewer
    - Broadband Access
    - Electric capacity
    - Stormwater - green infrastructure planning

3. **Complete IDOT Ring Levee**

4. **Create a Fremont County Economic Development entity that is engaged with County Supervisors and contracted economic development staff to identify resources for planning and, if necessary, site preparation**

5. **Determine ultimate point-of-contact for Interchange development and ongoing activities and whether there is capacity to do that work**

6. **Identify key properties, property owners and availability of those parcels to develop site plan for Interchange**

7. **Consider partnership with Nebraska City to conduct retail/dining analysis and identify market capacities and opportunities for expansion along Highway 2 corridor on both sides of the river**

8. **Conduct a study to determine the best way(s) to integrate public access to the river for recreational uses (boating, kayaking, fishing, etc.) in the area, and link to potential expanded uses at Hwy 2 interchange**

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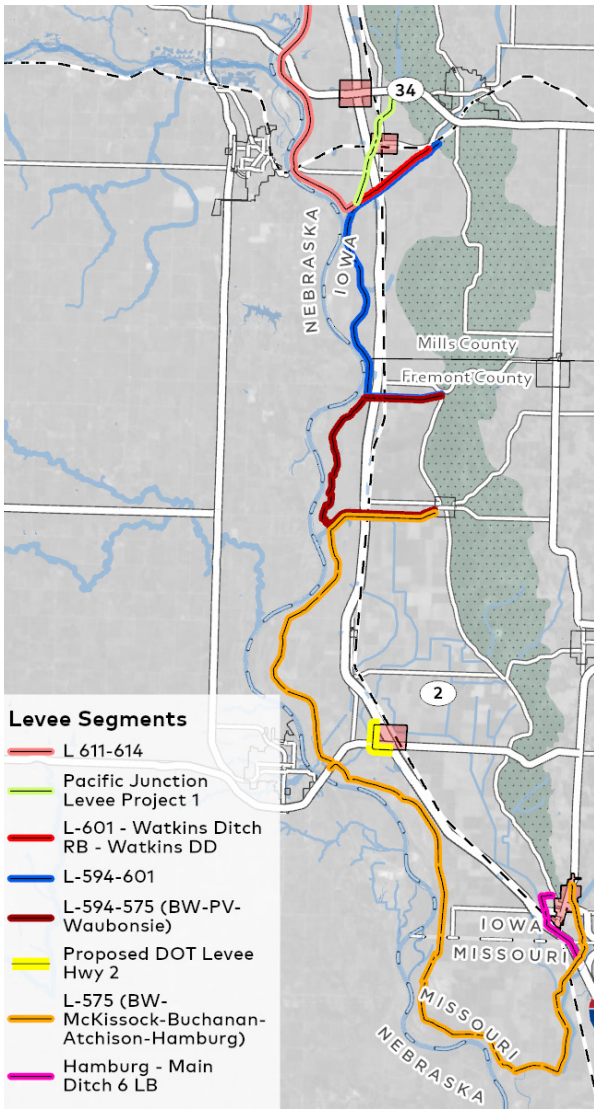


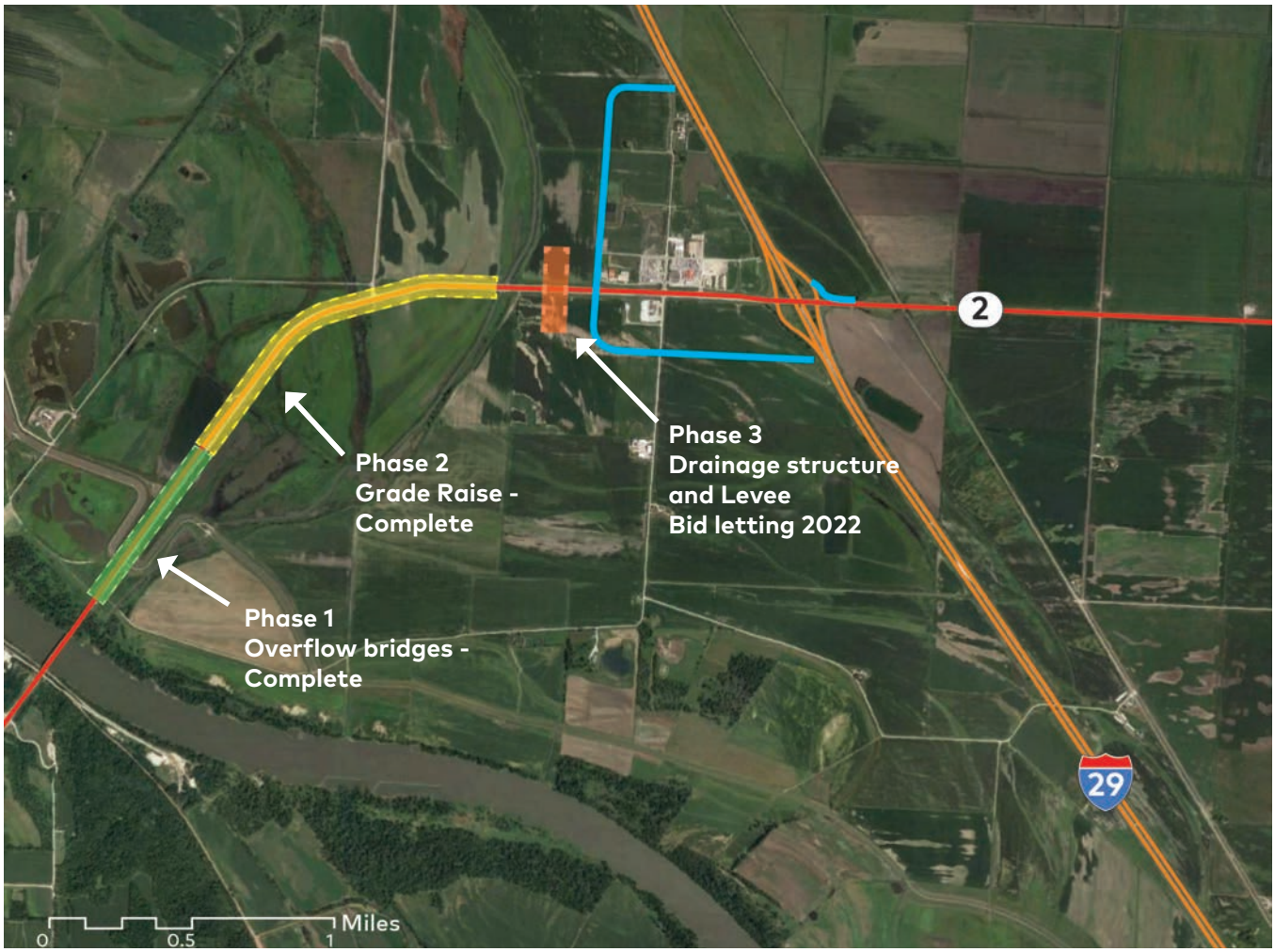
Regional levee map

2019 flooding

Aerial map of Hwy 2 interchange; existing condition

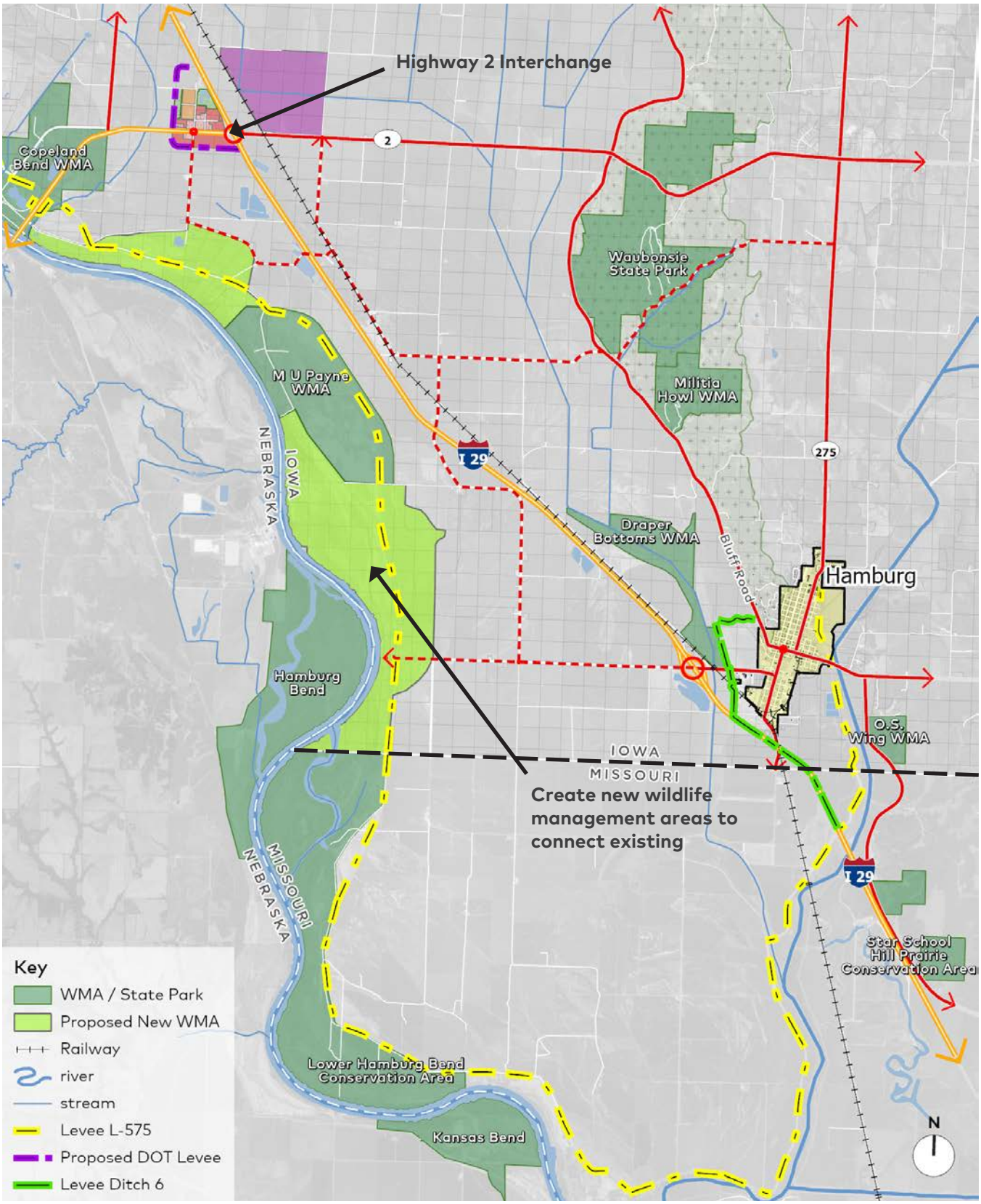
I-29 & Hwy 2 Interchange during 2019 flood event; Source: Fremont County Emergency Management

I29 & Hwy 2 Interchange during 2019 flood event; Source: Fremont County Emergency Management

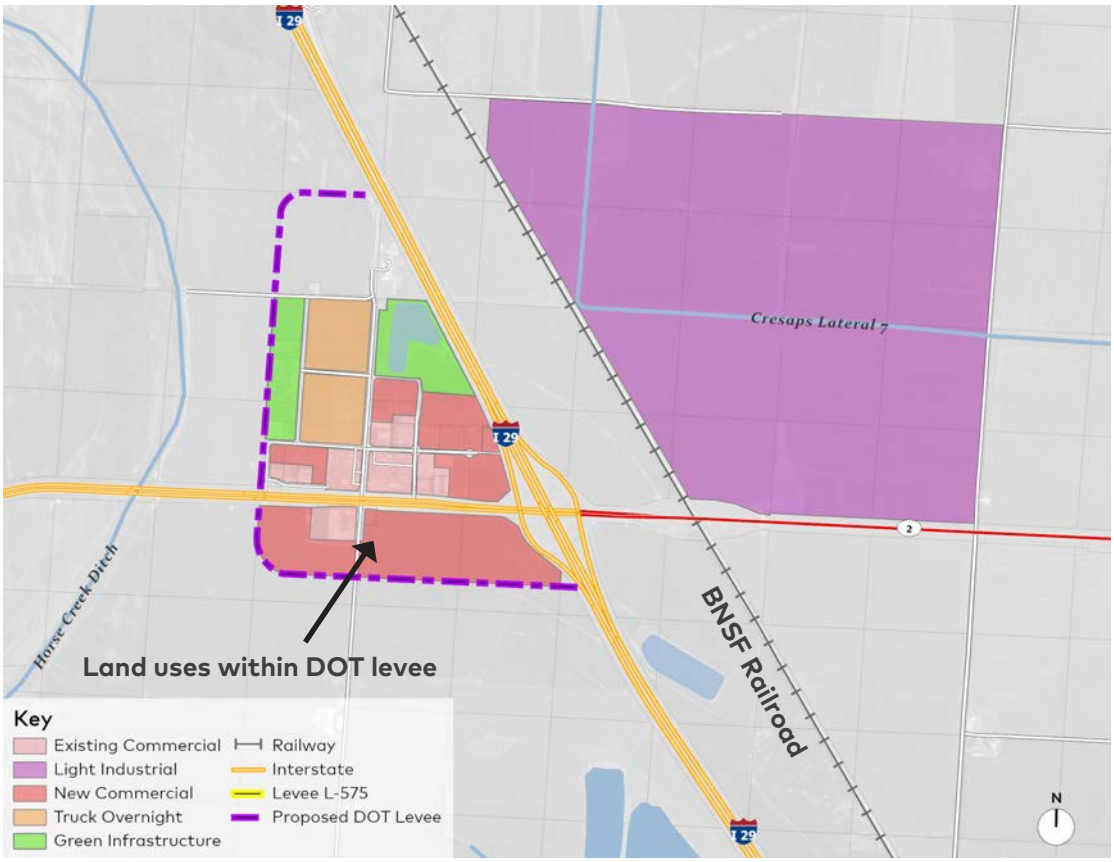


Iowa Transportation Commission; resiliency investment since 2019 floods: $54.5 million

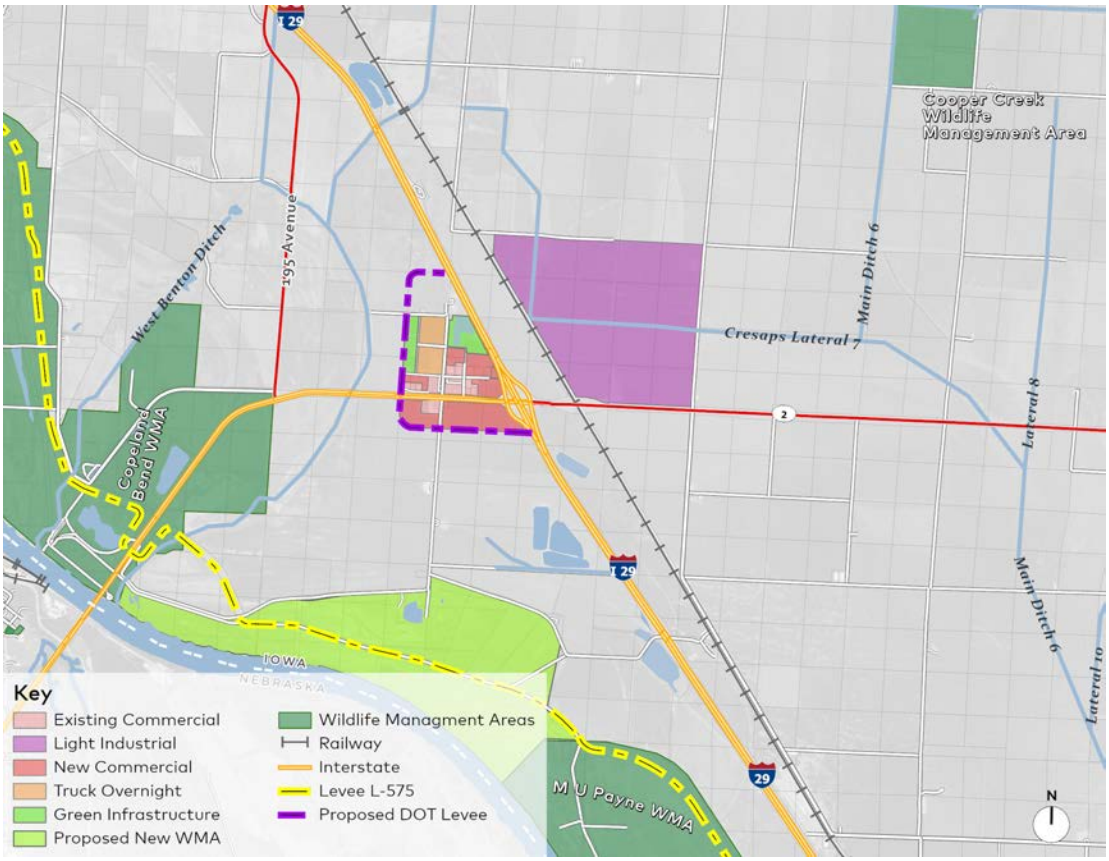
Overflow bridge



Regional diagram of Hamburg in relationship to Hwy 2 Interchange and Missouri River

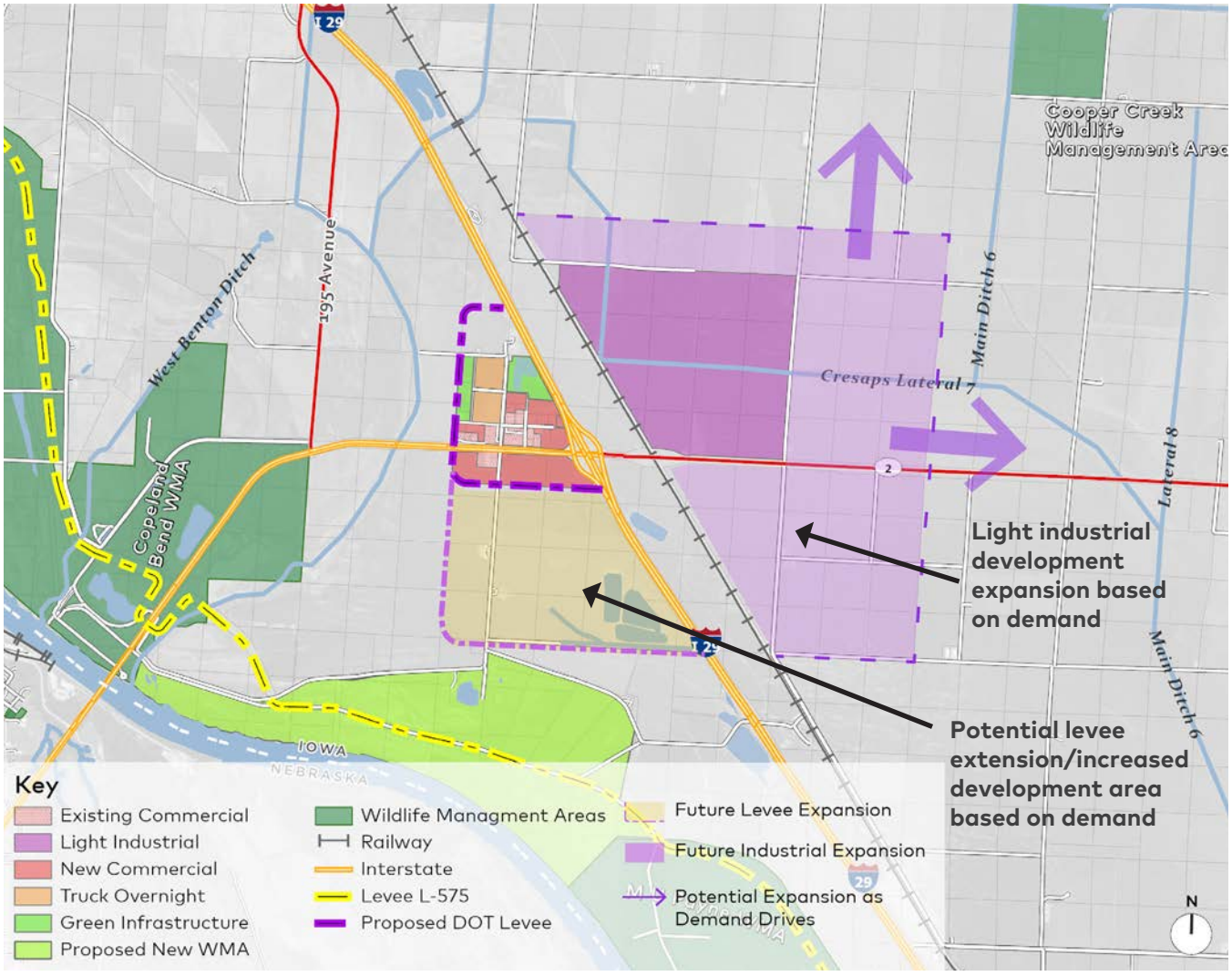


Hwy 2 Interchange Land Use Plan indicating DOT levee



Hwy 2 Interchange Land Use Plan in relationship with the river and wildlife management areas.

Example of solar energy field the size of what has been discussed in the area



Hwy 2 Interchange Land Use Plan in relationship with the river and wildlife management areas, indicating potential expansion of development based on demand

Existing Sapp Bros truck stop

Existing Motel 6

Opportunity for RV development

Opportunity to connect & increase wildlife management areas and to Missouri River

Opportunities for light industrial, warehousing, and distribution facilities

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6 PLAN INTEGRATION

6.1 Related Planning Initiatives

6.1.1 BUSINESS TRAINING (SAFEGUARD IOWA)

In support of the State's Comprehensive land use planning effort in Southwest Iowa, the Safeguard Iowa Partnership (SIP) (a private-public-partnership focused on providing disaster preparedness and resilience training and assistance to Iowa's communities and business), entered into an agreement with the Iowa Economic Development Authority (IEDA) to provide training seminars and workshops to businesses in the impacted area on business continuity and emergency planning development. These trainings focused on helping businesses with resiliency efforts in Mills and Fremont Counties. As with all activities involving face-to-face contact during the pandemic, the opportunity to deliver training was severely curtailed from the original pre-pandemic proposal. Initially, the 2020 Executive Director of SIP, August Geisinger, developed an online version of the Safeguard Iowa Business Continuity Seminar; however, no entities were interested in this training in an online version at the time.

As the pandemic abated in late spring and early summer of 2021, there was a renewed effort to generate interest from organizations in Mills and Fremont Counties for Business Continuity Training.

On May 11, 2021, BNIM and IEDA personnel, among others, participated in meetings on site in Fremont and Mills Counties. They also distributed a flyer, prepared by SIP, which described the Business Continuity Trainings in some depth.

After outreaches to, and assistance from, Cathy Crain, the Mayor of Hamburg (Fremont County), interested businesses were identified and trainings scheduled for September 2, 2021, and delivered on that date. Participants included personnel from the George C. Grape Community Hospital, Medical Clinic PC, a local vehicle towing and recovery service, and the City of Hamburg.

During the week of October 18, 2021, the current SIP Executive Director Jeff Ritzman made an outreach to Marco Floreani, Executive Director of the Mills County Economic Development Foundation, regarding outreach to Mills County businesses for Business Continuity Training. On November 9, 2021, SIP Executive Director Ritzman conducted Business Continuity Training in Glenwood for participants from five different organizations. Those organizations included Mills County Economic Development, Glenwood State Bank, the City of Pacific Junction, Jim Hughes Real Estate, and the Mills County Supervisors.

As of December, 2021, SIP has delivered trainings to nine unique organizations, exceeding the original goal of serving six impacted businesses. This effort was funded in coordination with the efforts of this plan, making business and communities more resilient as they recover from the 2019 Iowa Floods.

6.1.2 CONSIDERATIONS AND ANALYSIS FOR FLOOD RISK RESILIENCY FOR THE LOWER MISSOURI RIVER (USACE)

The Lower Missouri River Flood Risk Resiliency Planning Assistance to States (PAS) study is a collaborative effort between the US Army Corps of Engineers (USACE) and the states of Iowa, Missouri, Nebraska, and Kansas. The study area includes investigating flood risk along the Lower Missouri River from Sioux City, IA to St. Louis, MO. The goal of the study is to develop strategies to reduce the flood risk and recommend floodplain management opportunities for local, state, and Federal agencies. The goal is to improve future flood risk resiliency for communities along the Lower Missouri River.
The first phase of the study including the Mills and Fremont County portions of the Missouri River was initiated in fall of 2020 and the final report is still in development. The study involves local stakeholder engagement and identifying direct and

indirect impacts of flooding on communities. In addition, problematic "pinch points" were identified through stakeholder meetings that are areas of recurring flooding, severe flooding, or impacts on infrastructure, etc. The study will summarize the analysis and problem areas and will identify the next steps to recommend as part of a larger system plan for the study area. This planning effort provides the best opportunity to incorporate leading-edge ecological practices with flood risk management. The USACE Engineering With Nature (EWN) Initiative is an emerging program that could be applied. "EWN is the intentional alignment of natural and engineering processes to efficiently and sustainably deliver economic, environmental, and social benefits associated with infrastructure through collaboration." (Excerpted from the USACE EWN website.)

6.1.3 IOWA WATERSHED APPROACH / NISHNABOTNA WATERSHEDS

The Iowa Watershed Approach (IWA) represents a program through which Iowans are working together to address factors that contribute to floods. This approach is consistent with other statewide programs in Iowa to reduce flooding and improve water quality, such as the Iowa Flood Mitigation Program and the Iowa Nutrient Reduction Strategy.

The IWA accomplishes six specific goals in each watershed: 1) reduce flood risk; 2) improve water quality; 3) increase flood resilience; 4) engage stakeholders through collaboration and outreach/ education; 5) improve quality of life and health, especially for susceptible populations; and 6) develop a program that is scalable and replicable throughout the Midwest and the United States.

The East and West Nishnabotna Watershed coalitions, managed by Golden Hills RC&D, were engaged in this planning process through update presentations made by the planning team at the regular quarterly watershed meetings.. The East and West Nishnabotna watersheds are important contributors to potential flooding in Hamburg. IFC modeling completed as part of this report demonstrates the positive benefits of the East and West Nishnabotna watersheds' best management practices on future flooding in Hamburg. Continued engagement between the City of Hamburg and watershed partners is essential as future studies and initiatives develop.

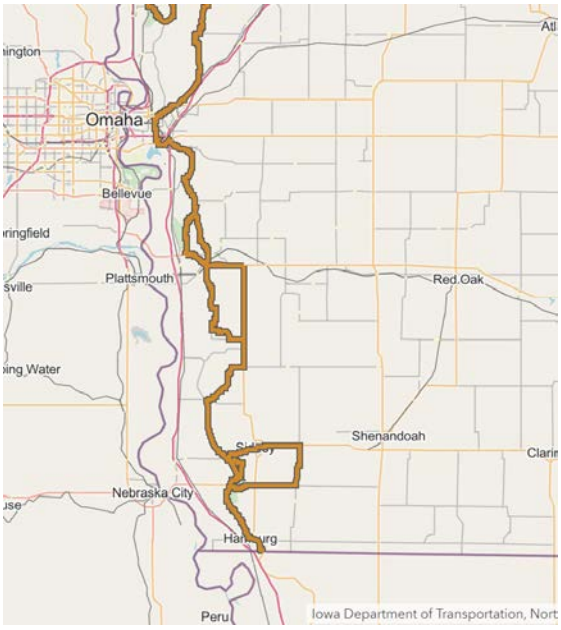

Fig 6.1-1. Iowa's Byways-Loess Hills.

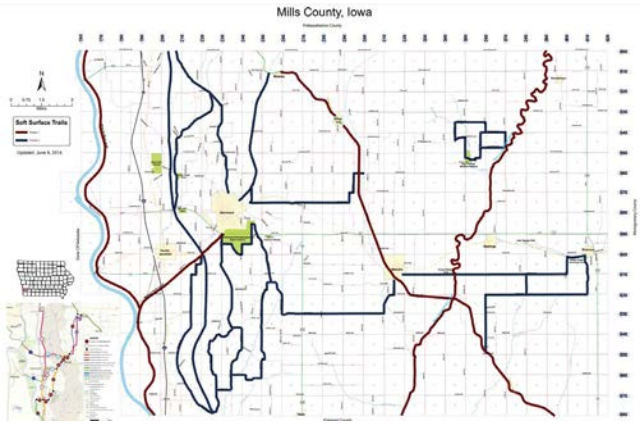

Figure 6.1-2. Surface Trail Plan.

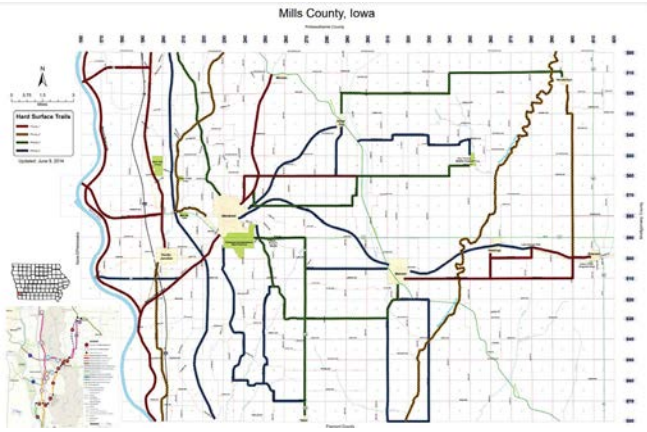

Figure 6.1-3 Surface Trail Plan.

6.1.4 TRAILS / GREENWAY PLANNING

A great opportunity for both communities, the two interchanges, and the two-county region in general is to coordinate future implementation of planning strategies with existing recreational trails and the existing scenic byways. Both communities felt incorporating regional recreational trails and greenways within their communities would offer opportunities for residents, businesses, and tourism. Both Mills and Fremont Counties have on-going regional trail expansion initiatives for hard-surface and soft-surface trails. This planning effort has incorporated those regional trails as part of recommended multiple-benefit greenway corridors that link the communities of Pacific Junction and Hamburg to ecological resources and recreational opportunities of this network. Each community should engage with Golden Hills RC&D to continue dialogue and initiatives that connect them to long term plans for the region regarding trails and events. The particular plans that should be considered are:

- Loess Hills National Scenic Byway
- Lewis & Clark National Historic Trail
- Mills County Trails Plan
- Fremont County Comprehensive Trails Plan

6.1.5 RURAL HOUSING READINESS ACTION PLAN - PACIFIC JUNCTION (ISU EXTENSION)

Iowa State University Extension & Outreach - Community and Economic Development in June 2021 partnered with IEDA and Mills County Economic Development Foundation to complete a rural housing readiness plan for Pacific Junction. The action plan provides observations and a realistic assessment of the challenges and opportunities for the community. One statement in the plan summarizes the situation.

"Indeed, the hope of Pacific Junction's continued existence as a municipality depends on new housing being built. It will require sustained partnerships and investment by county, state, and federal entities to make this happen as the city does not have the capacity to do so on its own."

The planning recommendations made earlier in this report do not provide solutions to the challenges outlined in the ISU
Extension report, but are intended to provide planning solutions and ideas assuming the community is able to rise above the challenges presented in the ISU report with additional help from county, state, and federal entities.

The full Housing Readiness Action Plan is included in the Appendix of this report.

6.1.6 IOWA 2 PHASING PLAN (IDOT)

The Iowa Transportation Commission has programmed three phases of Iowa 2 resiliency work between the Missouri River and I-29. The first two phases have been completed with the third phase scheduled to begin this year 2022.

Phase 1: Construction of Missouri River overflow bridges and realigned levee to reduce a 'pinch point' in the river - complete.

Phase 2: Raised the grade of Iowa 2 from new overflow bridges to Horse Creek bridges - complete.

Phase 3: Between Horse Creek bridges and I-29: Additional drainage structure and protective dike construction (ring levee) at truck stop area at interchange. Scheduled for FY 2022.

6.1.7 L611-614 ACCREDITATION STUDY

A levee study is currently underway. The study includes a structural evaluation of the levee to ensure it meets standards and is capable of withstanding flood forces, a freeboard assessments to determine necessary levee height relative to flood heights to meet FEMA's 3 foot standard, and development of Operation and Maintenance plans to ensure long term integrity of the levee system. The report will identify deficiencies, recommend improvements, and provide cost estimates for necessary improvements.

6.1.8 HAMBURG DITCH 6 LEVEE CONSTRUCTION

The city of Hamburg has been coordinating the design and construction of the reconstruction of the Ditch 6 Levee since 2020. USACE has been constructing the levee and was nearing completion in November 2021 with the basic construction of the levee utilizing the borrow area on the protected side of the levee. The City of Hamburg noted coordination continues with the BNSF Railway and the IDOT for closure structures at the railway and the reconstruction / elevation of Hwy 333 in order to accommodate the new geometry of the levee. IDOT is currently in design for the elevation of Hwy 333 and work should begin in 2022.

IFC modeling used in this planning effort acknowledges the new levee construction and alignment. In meetings held with USACE, community and other project partners, it was noted the Ditch 6 levee would not be certified as part of this construction effort and would need to be considered in context with the other levees protecting Hamburg - the Nishnabotna Levee which is part of the L-575 system and I-29 levee. The levee freeboard analysis in this report was a response to these discussions as a preliminary step and impetus for the recommendation to conduct an accreditation study of all levees protecting the community.

6.1.9 LEVEE STUDY - HSEMD 2022

As of the writing of this report, Iowa Homeland Security and Emergency Management (HSEMD) is

leading a levee study with other state agencies and the Iowa Flood Center through funds appropriated from the General Fund of the HSEMD to be completed by January 1, 2023.

The purpose of the up-coming study is to identify areas where the governance and funding of levee districts as specified in chapter 468 could be improved at the state and local level. The study shall also provide recommendations regarding the type and scope of necessary or desired improvements and the implementation of such improvements.

Participating/Advisory Agencies

- Homeland Security and Emergency Management(HSEMD) - Coordinating/Lead
- Department of Natural Resources (DNR)
- Department of Agriculture and Land Stewardship (IDALS)
- Department of Transportation (DOT)
- Iowa Economic Development Authority (IEDA)
- Iowa Flood Center (IFC)

The intent of the study is to build on existing information and studies to develop a more complete picture of levees and levee management in Iowa. HSEMD will work closely with DNR and IFC to utilize their expertise in flood control and water management to develop a more complete picture of the existing levees. HSEMD will communicate with Levee District leadership to identify their financial and operational challenges as well as get their inputs on how to best address these challenges. HSEMD will also communicate with other states to learn how they manage their levee systems.

The Department of Homeland Security and Emergency Management shall evaluate in detail all of the following:

- The status of present levee district operations, including the structural status of levees, the financial status of the levee districts, and any associated regulatory status.
- The future operational and funding challenges for levee district operations.
- Submit a report containing the results of the study and recommendations regarding the future governance and funding of the levee districts, including the implementation of improvements, to the General Assembly by January 1, 2023.

In addition to the report to the General Assembly, HSEMD will have developed an Iowa Levee Portfolio, GIS mapping of all levees, and enhanced interagency communication/coordination related to levee management.

6.2 Funding Opportunities

Southwest Iowa leaders have been successful to date in leveraging a wide variety of funding sources: federal, state, nonprofit and for-profit. But the work that is to come will require funding from programs and partners that are not specifically driven by disaster response and/or recovery.

To date, federal funds have been received from FEMA, EDA and HUD while the State of Iowa has made available a variety of programs ranging from Emergency Management to Economic Development. The City of Hamburg, for example, has attacked post-flood housing issues by maximizing both HUD and state housing funding sources. The City of Pacific Junction has leaned heavily on FEMA, to date. As it looks to the future, its plan will require much more.

Perhaps the funding source with the greatest breadth is USDA Rural Development (RD). Its 40+ programs can be used for housing, business, water/sewer, energy and community facilities. All of Fremont and Mills counties are 100% eligible for RD programs, and their median household incomes make Hamburg, Pacific Junction and the two interchanges potentially eligible for grant dollars, in addition to the loans and loan guarantees that are the foundation for RD. At the same time, there are special program - such as the rural placemaking grant - that could provide an opportunity to embed technical assistance providers/ partners. The capacity such a grant could help build would be significant.

Another immediate source of funding comes from the infrastructure legislation recently passed by Congress. It includes significant resources for roads, bridges, levees and other infrastructure needs facing both counties after the floods. Rep. Cindy Axne has met recently with mayors from the region to explain how the funds might be accessed. And Sen. Charles Grassley is encouraging the use of these funds for flood mitigation and prevention.

Meanwhile, the State of Iowa has been intentional about identifying both existing programs and carving out new opportunities - primarily through the Iowa Economic Development Authority - allowing the communities and counties to address immediate needs. For example, Pacific Junction took advantage of the Rural Housing Readiness Assessment program, which is housed within IEDA's Rural Revitalization Program. It brought in experts to analyze the city's post-flood housing needs and strategies to address them.

As noted above, leaders in Southwest Iowa have already proven quite capable of securing support for their post-flood recovery. Their determination has already had an impact. But moving forward, when response and recovery funds are no longer applicable or available, Fremont and Mills counties will have to target traditional, existing programs at both the state and federal level. Those options include:

- USDA Rural Development
  - Community Facilities Loans and Grants
  - Broadband
  - Housing
  - Water/Sewer
  - Electric
  - Special Placemaking Grant
- EDA
  - Travel, Tourism and Outdoor Recreation
  - Good Jobs Challenge
- HUD
  - Multi-Family Project Development Loan Guarantees
  - Rural Housing Stability
  - CDBG
- EPA
- U.S. Army Corps of Engineers
- Federal Infrastructure Legislation
- State of Iowa IEDA/Empower Rural Iowa
- State of Iowa OCIO Broadband
- State of Iowa DOT
- State of Iowa IFA Housing Tax Credits
- State of Iowa IFA State Revolving Fund

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APPENDIX

A.1 Planning Kickoff Meeting - Partner and Steering Committee Input

INTRODUCTION

As described in Chapter 2 of this report, the design team hosted a kickoff meeting with both Partners and Steering Committee members in October 2020. This day-long event included an initial convening at Hamburg City Hall and tour of the area. There was a relatively brief visit to the I-29/Hwy 2 interchange before continuing to Pacific Junction for a tour of the town and a drive by the I-29/Hwy 34 interchange.

The day was rounded out by a working session at Pony Creek Conservation Park where all participants discussed guiding principles, community concerns, opportunities, and responses to the questions posed by the planning team. This is the feedback received from that gathering.

WHAT ARE THE THINGS THAT YOU LOVE THE MOST ABOUT YOUR COMMUNITY (I.E. HAMBURG, PACIFIC JUNCTION, GLENWOOD, REGION)?

Hamburg

- Commitment to familiar
- Accept each other
- Resilient / fight back
- Belief in each other
- Have utilities/streets

Pacific Junction

- Country living
- Economic diversity / diverse people
- Good school districts; have $10M school bond
- Sense of community
- Competitive (schools)
- Businesses that stay
- Sports in schools
- 17,000 acres of public land
- Scenic byways / flyway
- Natural resources
- Views/ vista / trails
- Wedding venues
- Have utilities / streets

Glenwood

- Homecoming / reunions
- Attached to community (even if moved away)
- Air Force base adjacent (10 min away)
- New subdivisions coming (60-70 units)
- Nebraska Medical Center (25 min away)
- Omaha adjacent (25 min away)
- Highways 34 and 370
- Less traffic east / south of O
- Multi-generational opportunities
- New homes ($190,000-390,000)

WHAT THINGS WOULD MAKE LIVING IN YOUR COMMUNITY BETTER (IN ADDITION TO SOME DEGREE OF FLOODING RISK REDUCTION)?

- Reliable internet
- High-speed connectivity
- Bandwidth capacity (for upload and download)
- Remapping
- Define served vs. underserved
- Underground fiber
- Levee #2
- Restaurants
- Hotels
- Rental houses
- Small business (retail, coffee, etc.)
- Schools (maintain)
- Entertainment (events, recreation)
- New C-Block near Shenandoah (Veterans)
- Want to be near quiet, non-urban
- Stormwater / trails / retention/ recreation
- Detention < multiple goals
- Lewis + Clark trail (Sioux City to Hamburg)
- Four-county trail system (inc. Mills and Fremont)
- Levee trails
- Green infrastructure
- Facility for veterans

WHAT DO YOU ENVISION YOUR COMMUNITY TO BE LIKE IN 50 YEARS?

- Food (local) as economy driver
- Amenities for walking / biking
- Nature trails
- More homes / medium-size
- Still independent
- Retirees
- Destination restaurant
- Plan for growth (infrastructure) – sewer, water
- More certainty re: flooding, levees, insurance
- Transportation (mention of upcoming Lincoln bypass)
- Improved bi-state and tri-state cooperation
- Resilience (transportation)
- Competition >> regionalism
- More disaster preparedness training

WHAT CHALLENGES OR BARRIERS (IN ADDITION TO ISSUES ASSOCIATED WITH FLOODING) DO YOU SEE IN ACHIEVING THAT VISION?

- Multi-state conditions (IA/NE/MO/KS)
- Coordination with Army Corps of Engineering (levees, water, infrastructure)
- Lack of coordination in levee management
- Make it organized, accessible, funded
- Tax base / structure
- Coordination between drainage districts
- Timing of funding vs. development
- Lack of RV parks @ Hamburg > Hwy 64 exits
- Constructions folks living there
- Lack of cabins / camping sites
- FCC regulations
- Mapping of data
- Determination of flood plan
- Resources to keep up with levee/ flood protection assets
- Levee accreditation process
- Getting necessary documentation standardized and digitized for small communities
- Emergency response roads flooded
- People are more health conscious

SOCIAL AND ECONOMIC CHARACTERISTICS OF FREMONT AND MILLS COUNTY: A BASELINE FOR ANALYSIS, DISCUSSION, AND POLICY DEVELOPMENT

Supporting research for the:

Comprehensive Regional Land-Use Planning for Mills and Fremont Counties in Response to the 2019 Missouri River Flooding project

Dave Swenson[1]
October 2020

[1] Consulting contributor. Author is also a research scientist in the Department of Economics, Iowa State University

SOCIAL AND ECONOMIC CHARACTERISTICS OF FREMONT AND MILLS COUNTY: A BASELINE FOR ANALYSIS, DISCUSSION, AND POLICY DEVELOPMENT

Introduction and Overview

This report is a baseline evaluation of the Fremont County and the Mills County socio-economic foundations. Its purpose is to provide a set of indicators to help planners and local decision makers understand key characteristics of the residents and the economy that they maintain. All of the data in this report come from standard government sources – the Census Bureau, the Bureau of Economic Analysis, the USDA, the Bureau of Labor Statistics, the Iowa Department of Revenue and Finance, and Iowa State University research, as examples.

Most of the analysis is at the county level, although pertinent census and taxable trade data for Hamburg and Pacific Junction are provided. Where useful, the performance of the two study counties is contrasted with the state of Iowa to provide perspective.

There are dozens of social, economic, environmental, and fiscal indicators that could be added to this analysis, but the purpose here is to provide a foundation for decision making, not a comprehensive summary of regional strengths and weaknesses. That kind of compilation should be part of a region-wide planning effort and involve more stakeholders and more analysis. The main point of this is to investigate dimensions of the two regions that help to understand their respective capacities for resilience.

The format of this analysis looks at selected area characteristics that are both standard and that previous research has determined to be indicative of community change, standing, or capacity. For each, a short discussion of what it indicates and, separately, what the indicator implies is provided. Demographic dynamics are presented first followed by an economic analysis.

Key Findings: Demographic

The population of Mills County is stable owing primarily to its proximity to the greater Omaha-Council Bluffs metropolitan area. The population of Pacific Junction had demonstrated some stability over the decade, but was ultimately reduced sharply because of widespread destruction of households.

Fremont County and Hamburg are both declining, which is the dominant pattern for purely rural counties. Purely rural counties are those that do not have a community of 2,500 or more.

Both Fremont County and Mills County have much higher fractions of their populations in the 45 to 64 age group than the state average, and Fremont County has a higher percentage of persons 65 and over than either Mills County or the state of Iowa. A comparative deficit of young adults ages 25 to 44 is more pronounced in Fremont County.

Both counties have substantially fewer minorities than is the state's average experience. Further, both counties' poverty rates are lower than the state rate.

In explaining their population changes over time, Fremont County suffers from natural decline in that deaths exceed births. Both counties have substantial domestic outmigration. This factor alone explains 84 percent of the population loss endured by Fremont County this decade.

Fremont County has a much higher fraction of its housing stock constructed prior to 1970 and a significantly higher housing vacancy rate than Mills County or the state of Iowa. Accordingly, the median housing value in Fremont County is 61 percent lower than in Mills County and 39 percent lower than the state average. Median household incomes in Fremont County are 27 percent less than in Mills County and 8 percent less than the state.

Workforce participation rates for both men and women were lower than in Mills County and the state in Fremont County owing to their older population base. Both counties had lower percentages of their adults 25 and over who had completed a bachelor's degree or higher.

Three approaches to estimating future county level populations were employed. Two were done by this analyst, and one other was from a private sector vendor. All three anticipated continued declines in the Fremont County population through 2030. The ISU analysis anticipated no growth for Mills County, but the private sector estimate anticipated moderate growth between 2020 and 2030. In all instances, this researcher's estimates were more pessimistic than the private sector estimates.

Key Findings: The Economy

Both counties have suffered declines in area employment this decade, with the sharpest declines occurring in Fremont County.

Mills County has realized substantial growth in the number of business establishments with employees. In recent years, Fremont County business establishments have been stable despite declining overall employment countywide.

Inflation adjusted wage growth per job was relatively strong in Mills County early this decade before leveling off. Since around 2010, however, real wages have declined markedly in Fremont County.

Fremont County's labor supply has declined sharply since mid-decade. Estimates of the Mills County labor supply demonstrate substantial growth in the last few years before the pandemic.

Both counties are substantially dependent on out-of-county employment sources for their labor incomes, though that dependence as a fraction of total personal income has decreased some in Mills County compared to the last decade. Fremont County dependence on external employment has grown substantially since mid-decade. For Fremont County, more than 70 percent of its residents with payroll jobs work outside of the county. In Mills County, that fraction is 73 percent.

In terms of job growth and industrial composition, Fremont County had 7.6 percent fewer jobs in 2018 than it had in 2010. The manufacturing sector led that decline with a 41 percent reduction in jobs. Mills county employment declined 4.6 percent. It enjoyed strong gains in manufacturing and in wholesale sector jobs, but it had substantial declines in federal and state government jobs.

Real (inflation adjusted) taxable retail and service sales Fremont County peaked in 2016 and have since tailed off. City of Hamburg sales declined markedly for much of the last decade, but have been essentially flat since. Both county and city data report noticeable declines in 2019, the flood year.

Mills County real taxable sales grew sharply from 2010 through its peak in 2016 before leveling off. A substantial fraction of that growth is attributable to very strong gains in Pacific Junction where real taxable sales peaked at just under $10 million in 2018.

Both counties had declines in farm proprietorships between 2001 and 2006, but the number of farmers has since leveled off.

Farming accounts for nearly 13 percent of all jobs in Fremont County, and 8.2 percent in Mills. Farmers are nearly 30 percent of all Fremont County business proprietors compared to 19.4 percent in Mills County.

Flood related statistics indicate that crop insurance payments in Fremont County were $12.7 million higher than was the average of the previous three years. That value in Mills County was $3.94 million higher. USDA payments to Fremont County farmers were $15.45 million more in 2019 than the average of the three years previous. The Mills County value was $11.53 million more.

Study Area Demographics

Fremont County and Mills County have distinct demographic differences and some similarities. This section looks at key indicators to understand the dynamics of change in the counties and the critical components of their population bases. Initially, selected characteristics of Pacific Junction and Hamburg are included as well, but most comparisons will be done at the county level.

Population and Population Trends

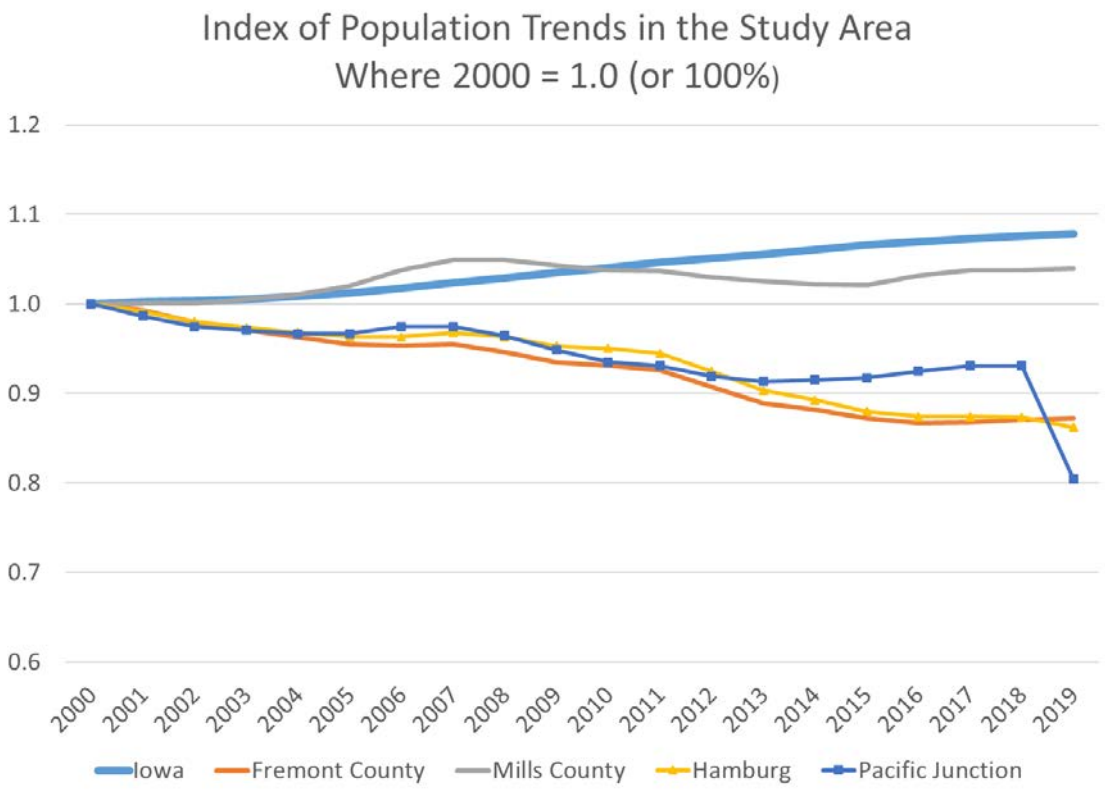
TABLE 1

Population Change, 2010 to 2019

	2010	2019	Percentage Change
Iowa	3,046,871	3,155,070	3.6%
Fremont County	7,438	6,960	-6.4%
Mills County	15,059	15,109	0.3%
Hamburg	1,187	1,060	-10.7%
Pacific Junction	471	342	-27.4%

Source: Annual County and Resident Population Estimates by Selected Age Groups and Sex: April 1, 2010 to July 1, 2019, U.S. Census

FIGURE 1



Indications

Since 2000, Mills County and Fremont County have been on divergent population change paths. Fremont County was 6.4 percent smaller in 2019 than in 2010, and Mills County was 0.3% larger (Table 1). Mills County is part of the greater Omaha-Council Bluffs metropolitan region, and enjoys stability because of its proximity to a core metropolis. Fremont County is beyond the primary beneficial spread of the Omaha-Council Bluffs metro and has continuously contracted the last two decades (Figure 1). In all, the city of Hamburg and Fremont County have more or less contracted in concert over time. Pacific Junction had demonstrated some population stability and minor growth from around 2013 through 2018 before its population falling off sharply in 2019.

Implications

As part of a metropolitan area, Mills County would expect to and does demonstrate population stability. Fremont County in contrast, is classified as a rural county in that it has no urbanized communities of 2,500 or more. As is the long term pattern in nearly all Iowa rural counties, Fremont County and the community of Hamburg would be expected to lose population over the course of the next decade, although both exhibited population stability over the second half of the current decade through 2018.

Given the number of homes destroyed in Pacific Junction, very few residents currently reside in the community. Final U.S. census values that will be released in the spring of 2021 will provide an accounting of the short term magnitude of flood-related population consequences.

County Population Composition: By Age

TABLE 2

2019 Populations by Age Group

	Fremont County	Percent of Total	Mills County	Percent of Total	State of Iowa	Percent of Total
Under 18	1,537	22.1%	3,496	23.1%	726,841	23.0%
18-24	465	6.7%	1,082	7.2%	313,705	9.9%
25-44	1,413	20.3%	3,351	22.2%	783,365	24.8%
45-64	1,916	27.5%	4,324	28.6%	778,205	24.7%
65 and more	1,629	23.4%	2,856	18.9%	552,954	17.5%
Total	6,960	100.0%	15,109	100.0%	3,155,070	100.0%

Source: Annual County and Resident Population Estimates by Selected Age Groups and Sex: April 1, 2010 to July 1, 2019, U.S. Census

Indications

County composition by age group tells us that Fremont County has proportionately fewer people under 18 and more over ages 65 or older than is the case in Mills County or the state. Mills County has a substantially higher fraction of its population in the ages 25 to 64 age group at 50.8 percent compared to 47.8 percent in Fremont County, and 49.5 percent for the state of Iowa. The Census Bureau does not provide age group estimates for communities during the intercensal years.

Implications

A county's composition is an indirect indicator of its capacity for growth. Mills County, for example, has proportionately more people ages 25 to 44, the ages where families have children, yielding in turn, proportionately more youth under 18. In contrast, Fremont has a substantially higher fraction of its population age 65 or more. In all, Mills County's population distribution mirrors the state average more closely than it does Fremont County. One would expect Mills County to have more policies and programs that addressed the needs of younger families with children, while Fremont County, considering all of its local governments, would likely emphasize the needs of the elderly somewhat more.

County Composition: Racial, Ethnic, and Other Characteristics

TABLE 3

Racial, Ethnic, and other Social Characteristics

	Fremont County	Mills County	Iowa
Racial or Ethnic Characteristics		*Percent*	
White	96.7	97.4	91.9
Other racial designations	3.3	2.6	8.1
Hispanic	2.6	3.0	6.3
Other Social Characteristics			
Percent adults over 24 with no high school diploma or its equivalency	7.5	6.6	8.0
Percent of households with single parents of children 18 and under	6.0	7.4	8.4
Percent of households with someone 65 or older	34.5	30.1	28.1
Percent ages 18 - 64 with disability (noninstitutionalized civilians)	11.7	14.8	9.3
Percent with public-provided health insurance (noninstitutionalized civilians)	43.2	34.9	33.9
Percent of individuals in poverty	9.5	8.6	10.7
Percent of households with children in poverty	10.5	8.9	12.3

Source: American Community Survey, 2018 Five-Year Estimates, U.S. Census

Indications

Table 3 contains a standard set of county level indicators that tell us about area racial or ethnic diversity followed by a set of characteristics used to measure potential social dependency. Both Fremont County and Mills County have much lower minority population averages than the state as measured by races that are classified as nonwhite and of Hispanic or Latino residents, which is an ethnic, not a racial designation. Stated simply, these two counties are substantially whiter than an already very white state of Iowa.

The other social characteristics listed help us to understand core social strengths and weaknesses. Both counties have lower percentages of their adults lacking a high school diploma than the state as a whole, and both have lower fractions of their households that are composed of single parents with minor children. Fremont county has a much higher proportion of its households containing a person 65 or over than both the state average and Mills County. Higher proportions of their noninstitutionalized civilian populations, ages 18 to 64, are disabled than is the case for the state, with Mills County's number

posting substantially higher.[2] Fremont County's much higher dependence on public provided health insurance is explained in part by its higher elderly population. Finally, poverty rates in both counties, both for individuals as well as for households with children, are lower than the state average. [3]

Implications

Thorough evaluations of community and county characteristics look for sets of community or county attributes that create the capacity for problem solving and resiliency. Areas need adequate stocks of community and economic capital to thrive. Poverty, single parenthood, lower average educational levels, and higher incidences of disabilities are often indirect indicators of community stress. Overall, neither county stands out negatively on these measures. Fremont County having a much higher percentage of households with an elderly resident is not surprising knowing its designation as a rural county.

The listing of the racial or ethnic composition of the population also indicates that both counties are similar to many of Iowa's more rural areas in that they lack diversity. Counties that are the exception across the state typically are those that have animal feeding or animal products manufacturing facilities. There are notable examples in Iowa demonstrating that nonmetropolitan counties with higher levels of population diversity often exhibit social and demographic resilience, while nearly all of Iowa's more rural counties with very low levels of diversity continue to endure depopulation.

Elements of County Population Change

TABLE 4

Composition of Population Change, 2010 - 2019

	Fremont	Mills	State of Iowa
Total Change	-478	50	108,199
Natural Change	-105	140	89,895
Births	721	1,380	358,277
Deaths	826	1,240	268,382
Net Migration	-379	-89	18,712
International	22	11	47,837
Domestic	-401	-100	-29,125
Residual	6	-1	-408

Source: Estimates of the Components of Resident Population Change for Counties: April 1, 2010 to July 1, 2019, U.S. Census.

[2] Residents of the state of Iowa's Glenwood Resource Center would be considered institutionalized and not part of this tally. The higher percentage posted for Mills County suggests, perhaps, group homes housing the resident disabled who are otherwise, however, not considered institutionalized.

[3] Note: the same American Community Survey data set contains many of these estimates for Pacific Junction and Hamburg. Owing to the comparatively small size of the communities, however, the statistical margins of error are relatively large making it difficult to make declarations about community characteristics with confidence. County level data, though subject to the same statistical confidence considerations, are more likely to be reflective of the characteristics of the counties.

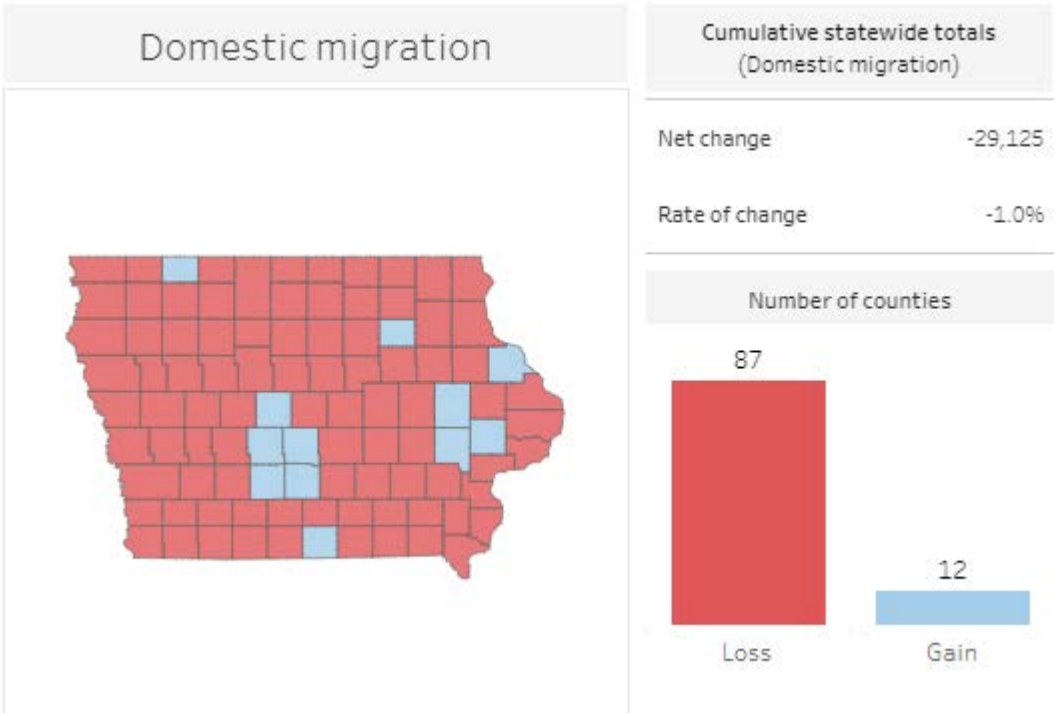
Indications

There are two components to population change in a county: natural change, as measured by births minus deaths, and net migration, either domestic or international in origin. The state of Iowa, over the past decade, found that natural change was nearly five-times greater than net positive migration in explaining its growth. Fremont County, found itself in natural decline, in that deaths exceeded resident births, and it also had strong domestic outmigration. Mills County had positive natural change, and much less net outmigration combining for positive population growth this decade.

Implications

Iowa's net migration statistics are explained solely by international migration. Domestic migration at the state level was negative. In fact, 87 of Iowa's 99 counties posted net domestic outmigration, as portrayed in Figure 2. The incidence of domestic outmigration is the key component of rural population decline over the decades. The strength of outmigration coupled with natural decline are the driving prerequisites of population loss primarily among the more rural counties, like Fremont. Fremont County is also one of 50 Iowa counties in natural decline. A larger elderly population and a comparatively smaller young adult population (ages 25 to 44) in the prime child bearing ages are the key factors.

FIGURE 2



Housing Indicators

TABLE 5

Pre-Disaster Housing Characteristics

	Fremont	Mills	State of Iowa
Total housing units	3,445	6,135	1,386,722
Percent owner occupied	64.4%	71.0%	64.5%
Percent mobile homes	5.3%	4.4%	3.7%
Percent vacant	13.2%	8.9%	9.4%
Percent built before 1970	62.4%	47.4%	51.5%
Median housing value	$ 102,700	$ 165,200	$ 142,300
Median rent	$ 636	$ 748	$ 766
Median household income	$ 54,281	$ 69,177	$ 58,570
Percent of homeowners whose selected costs exceed 35% of household income	13.0%	14.5%	14.1%
Percent of renters whose gross rents exceed 35% of household income	26.4%	37.3%	35.2%

Source: American Community Survey, 2018 Five-Year Estimates, U.S. Census.

Indications

Housing supply analyses take into consideration the number of total units, the number of those that are owner-occupied, those that are rentals, and those that are vacant. Mills County had a much higher rate of owner-occupied homes than Fremont County or the state, and Fremont County had a much higher vacancy rate than Mills County or Iowa. Fremont County's housing stock is significantly older in that 62.4 percent was built before 1970. Mills County's fraction of older homes was much smaller at 47.3 percent.

The financial characteristics of housing, too, show Fremont County lagging its neighbor and the state of Iowa. Median household incomes in the county were $54,281, 21.5 percent less than in Mills County. Median housing values in Fremont County were 37.8 percent less than in Mills County, and 27.8 percent less than the state average. The Median rent in Fremont County was $636, substantially less than Mills County or the state.

Issues associated with area affordability often arise, especially in more urban areas where housing prices appreciate rapidly. For all three entities, the fractions of homeowners (of those for whom costs could be determined) whose mortgage and other selected costs exceeded 35 percent of their incomes were similar. Among renters (for whom costs could be determined), Fremont County realized a percentage of cost-burdened residents of 26.4 percent, which was substantially less than Mills County's or the state's average. That would have been expected looking at the ratio of median housing values to median household incomes – Fremont County's ratio is less than two, whereas Mills County's and the state's ratios are greater than two.

Implications

At the outset, it is important to note that a significant number of homes in both Fremont and Mills County were damaged or destroyed in the 2019 flood. How many of those homes are permanently uninhabitable is yet to be determined, but the number is substantial, and there are federal buy-out procedures underway that will ultimately reduce the number of housing units in both counties.

Even though there are vacant housing units in both counties, vacancy in and of itself does not insure habitability. Many vacant homes, especially in more rural portions of the state are dilapidated or unsafe owing to long term disinvestment.

A further implication is clearly evident in the summary statistics. Though not measured here, the number of building permits for housing in Fremont County is very low – the community, as is the case with most rural areas, has difficulty attracting new housing investment because of dwindling populations and lower residential incomes. Mills County as part of the Omaha-Council Bluffs metro has enjoyed minor population growth, yet has a more robust housing market as evidenced by median housing values. Housing stock recovery favors Mills County more so than it does Fremont County.

Human Capital

TABLE 6

Human Capital

	Fremont	Mills	State of Iowa
Male labor force	1,892	4,163	881,158
Male participation rate	67.9%	70.4%	71.5%
Male unemployment rate	3.2%	3.7%	3.7%
Female labor force	1,609	3,604	798,632
Female participation rate	56.8%	61.0%	63.0%
Female unemployment rate	3.6%	3.3%	3.1%
Of Adults 25 or Older, Highest Level Completed			
Percent high school graduate or equivalency	35.9%	34.6%	31.1%
Percent beyond high school but no bachelor's degree	37.4%	35.1%	32.7%
Percent with bachelor's degree or higher	19.3%	23.7%	28.2%

Source: American Community Survey, 2018 Five-Year Estimates, U.S. Census.

Indications

Key attributes of a region's population that explain their collective abilities and probabilities of participating in the economy are subsumed in the broad term human capital. In Table 6 we see that Fremont County residents are less likely to be labor force participants than is the Mills County or State of Iowa experience as measured by both the male and female participation rates. That is because Fremont County has proportionately more elderly residents in the denominator of that rate (all persons age 16 and over) than is the case among the comparisons who are by virtue of their ages more likely to be

retired. Nonetheless, unemployment rates prior to the flooding events were enviably low in both counties suggesting they were likely at full employment.

The education level of the current population, age 25 and older is the other key human capital component. Where participation rates are a measure of supply, educational attainment refers to worker abilities. Both Fremont County and Mills County have substantially higher numbers of residents with high school only diplomas than is the state average. Both, additionally, have much lower percentages with college bachelor's degrees or higher: Mills County's percentage is 4.6 percentage points lower than the state level, and Fremont County's value is nearly 9 percentage points lower.

Implications

These counties' participation rates and population education levels are functions of their existing economic structures and the longer term demographic trends that have affected their growth or decline. We can also add the fraction of their populations that are ages 25-44 (from Table 2) to this list as that population is composed significantly of the skill learning and skill applying segments of an area's working population that drive productivity and income growth. Both county values were lower than the state average, and Fremont County's was, again, much lower.

These factors are also a function of employment opportunities nearby. Mills County is a more urban county and it is adjacent to major metropolitan labor demand. Fremont County is rural, and external employment opportunities are limited to demand from comparatively much smaller nearby economies.

Population Projections

There is no government agency that provides population projections for Iowa counties. These types of estimates can be more reliably made a couple of years after decennial censuses after factoring in births, age-specific survival rates, and patterns of migration. However, we are in the period prior to a release of official census figures, and that method of analysis would rely on near decade-old migration data that would not apply to the current situation in both counties. Stale data do not yield confident projections.

An alternative measure used by this analyst is to calculate the long term trend of each county's share of the state population and then use those predicted values for the next decade. To do that, a projection for the state for 2030 needs to be made. The U.S. Census stopped providing state level projections. Two approaches were taken: predicted shares of state population for the counties through 2030 were applied against annual state population levels that assumed the state's rate of growth the next decade would be the same as last decade. A slightly higher projection of the Iowa 2030 population was also found at the Weldon Cooper Center for Public Policy at the University of Virginia, and that value was used to provide a second set of county projections to 2030.

Finally, a private firm, Woods and Poole, has provided projections of population and employment at the county level for many years. ISU Extension for Communities and Economic Development possesses their more recent county level estimates, and those values are also reported here.

Indications

The three projections show that the Woods and Poole estimates for 2020 are slightly lower for Fremont County and slightly higher for Mills County than the ISU based set of projections. By 2030, the ISU estimates have Fremont County continuing its population slide, declining by nearly 600 persons through

this next decade. Woods and Poole estimates are more optimistic and expect the county population to decline by 125 persons.

The ISU estimates have Mills County declining slightly through the decade, whereas Woods and Poole anticipate growth of 563 persons.

TABLE 7

Population Projections for Study Counties Through 2030

	2010 Census	2020 Estimated ISU*	2030 Projected ISU*
Fremont	7,438	6,915	6,320
Mills	15,059	15,104	15,020

	2010 Census	2020 Estimated ISU**	2030 Projected ISU**
Fremont	7,438	6,915	6,320
Mills	15,059	15,104	15,035

	2010 Census	2020 Woods and Poole	2030 Woods and Poole
Fremont	7,438	6,858	6,733
Mills	15,059	15,152	15,715

* Assumes the state of Iowa grows at the same compounded annual rate between 2019 and 2030 as it did between 2010 and 2019.

** Uses a projected state of Iowa population of 3,317,412 in 2030 to drive the county growth / decline estimates. This figure is based on estimates published by Weldon Cooper Center for Public Policy, University of Virginia, 2018. https://demographics.coopercenter.org/united-states-interactive-map

Implications

Population projections for Iowa's counties can be a fraught process. There is every reason to assume, for example, that Fremont County's population slide will continue, but the degree of that decline remains to be seen. Has, for example, the recent loss in employment in the county (see the next section) accelerated population decline, or did it result in a short term adjustment that now possibly over-states future population decline?

Mills County is very close to the booming metropolitan region to the west in the Omaha area and, to a lesser degree to the north in Council Bluffs area. Counties bordering core metropolitan areas are expected to grow, yet the Mills County population has been relatively flat over the past decade. The Woods and Poole data are more optimistic about growth. The equation in the ISU data assumes virtually no growth for the county. And again, only time will tell how reliable these projects are.

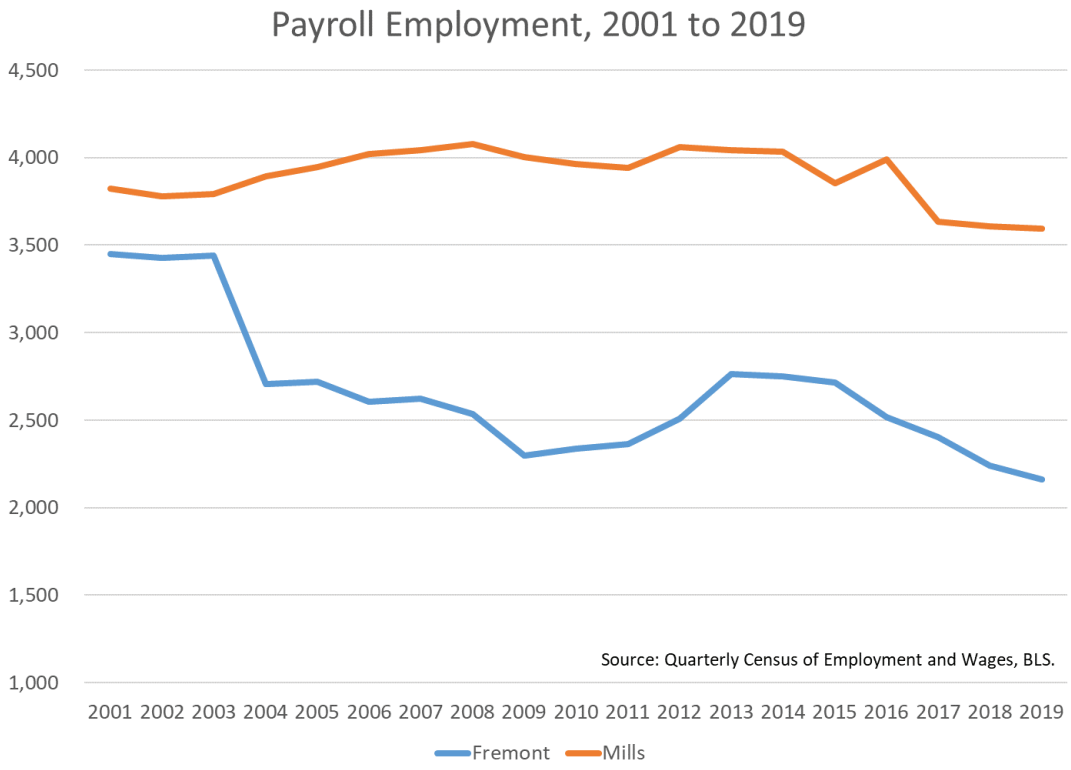
Regardless, all three estimates conclude that Fremont County is expected to decline and that Mills County is expected to hold its own over the next decade and may in fact realize minor growth.

The Study Area Economies

We measure regional economic performance in terms of labor supply, job growth, the composition of income, external employment opportunities, and local taxable retail trade. As has already been mentioned, Mills County and Fremont County fit into distinctly different classifications: Fremont County is a rural county, whereas Mills is, in fact, an urban county that is subsumed within a much larger metropolitan economy. This categorical difference will explain a substantial portion of the performance and economic composition differences that will be presented in this section.

Job Trends

FIGURE 3



Indications

Fremont County jobs have declined markedly this century. The county suffered a sharp loss in area payroll employment in 2004, continued declining into the Great Recession, slowly recovered some of its lost jobs until 2013, and then consistently shed jobs since. In 2019, payroll jobs were 37.4 percent less than they were in 2001. Mills County, in contrast, saw minor job growth and comparative consistency in payroll employment through 2016 before a sharp loss and continued erosion through 2019. Jobs in Mills County were 6.0 percent less in 2019 than those posted in 2001.

Implications

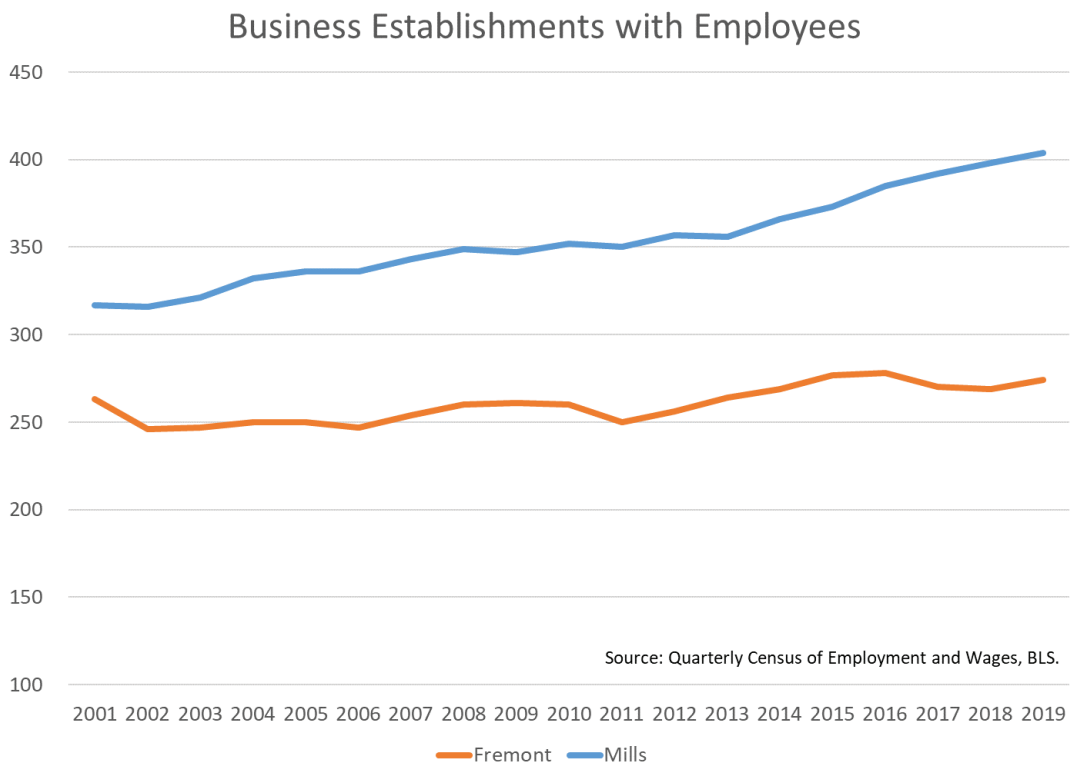
Mills County benefits from its metropolitan designation. The more densely populated counties in the Omaha and Council Bluffs metro region are posting strong economic and demographic growth; in contrast, Mills County is only able to achieve relative population and local employment stability from its

inclusion. The data do not indicate growth spillovers from core metropolitan activity nearby; instead they mostly indicate sufficient proximity to prevent decline.

Fremont County, on the other hand, does not have a nearby economic engine that is strong enough to support its workforce or to induce population growth. The vast majority of Iowa's counties that are not part of metropolitan regions have witnessed job losses over the past two decades. Fremont County is somewhat distinct in that its recovery from the Great Recession posted by 2013 more jobs than it had in 2004, but that growth dwindled thereafter turning into a net loss.

Establishment Trends

FIGURE 4



Indications

In sharp contrast with the previous figure, county business establishments, those with payroll employees, have remained stable or grew. Despite sharp job losses in Fremont County, the number of employers is in fact larger in 2019 than it was in 2001. Mills County has posted quite strong business establishment growth from 2001 to 2019 of 27.4 percent. That pace of growth in fact accelerated from 2013 on through 2019.

Implications

Increases in establishments in light of either relatively flat or declining employment means that the average business has fewer employees over time. There are many reasons for this, but one important factor is the incremental adoption of labor saving technologies. Another factor is that, most especially for Fremont County, rural areas tend to lose area hardware, groceries, lumber, and clothing retailers, many of which are replaced by, as examples, personal services businesses like salons, insurance

agencies, tattoo artists, and antique and consignment shops all of which usually have relatively few employees per operation.

Wage Trends

FIGURE 5

Indications

Real (inflation adjusted) wages in Mills County have grown consistently for nearly all of the past two decades. Jobholders in that county earned, in 2019 constant dollars, $44,390 in 2019 compared to $33,734 in 2001. Fremont County wages grew consistently last decade and were higher than Mills County compensation per job. Real salaries and wages peaked in 2011 at $43,025, but then declined sharply to just over $35,000 per job in 2017 before recovering to $38,887 in 2019.

Implications

The values in Figure 5 represent pay by place of work, i.e., either Mills County or Fremont County, not by place of residence. It tells us the prevailing average pay in the local economy. Commuters are able to find work in other counties, and residents of Mills County are able to more easily tap into core metropolitan economy labor demand that pays substantially more than rural labor demand. This helps explain why median household incomes in Mills County were 27.5 percent higher than in Fremont County (See Table 5).

The reversal of fortunes between the two counties is also stark. As late as 2012, Fremont County enjoyed average real pay per job higher than workers in Mills County. The loss of real earnings and employment thereafter (see Figure 3) indicates that those lost jobs were among the better paying in the county.

Labor Supply Trends

FIGURE 6

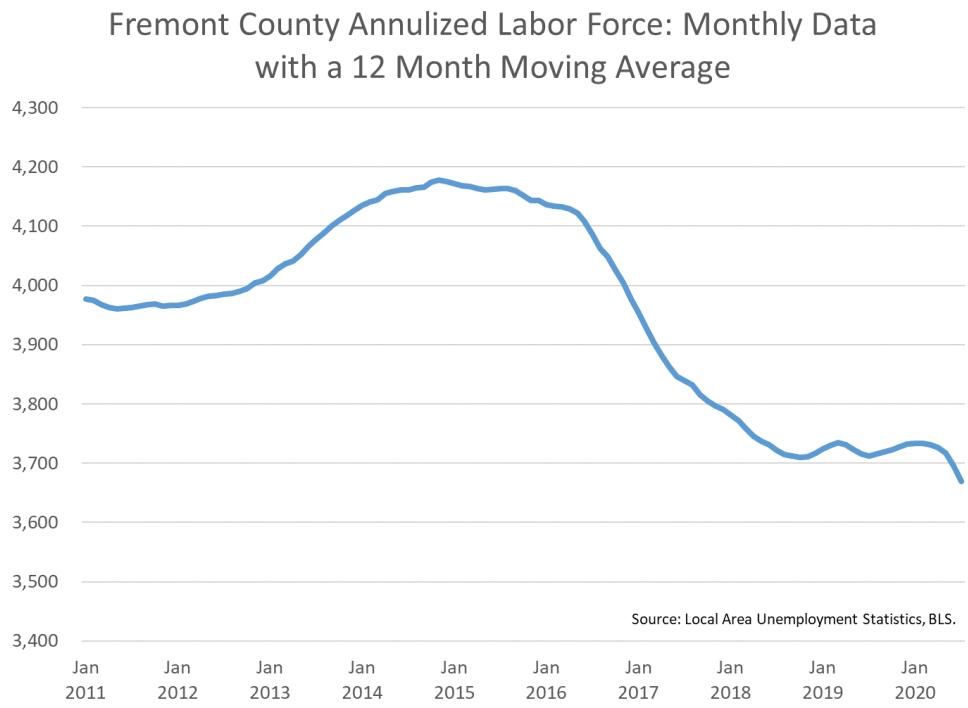
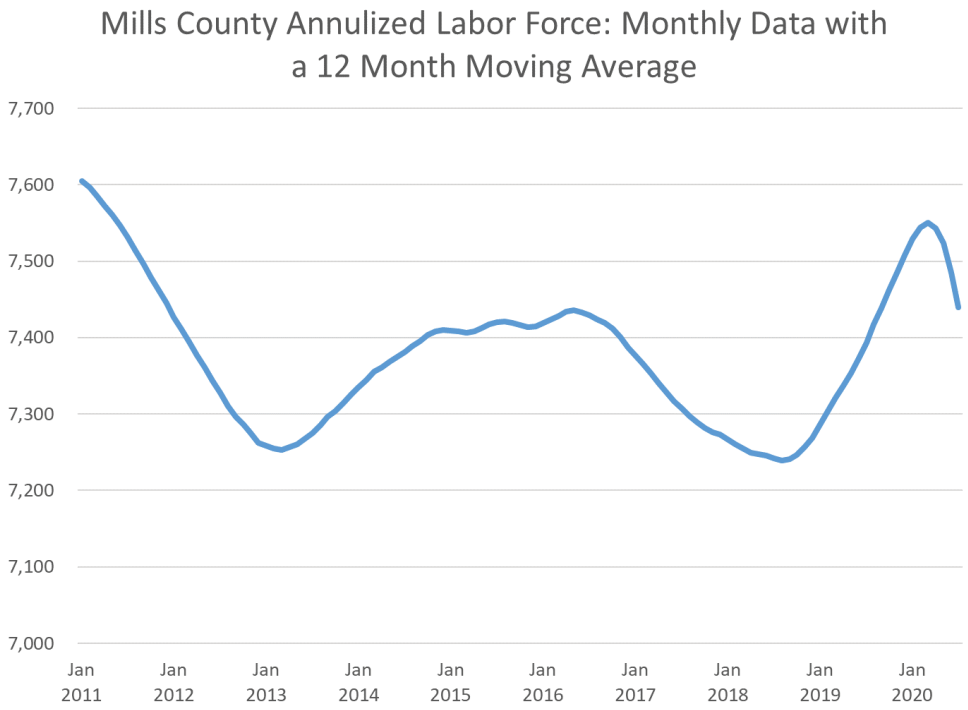


FIGURE 7



Indications

The two study counties have starkly different labor supply trends. The labor force is composed of persons who are employed plus persons who are unemployed but actively looking for a job.[4] Fremont County's labor supply, as measured on a continuous 12 month moving average, peaked in November of 2014 at 4,177. It has since contracted sharply to a pre-pandemic low of 3,734 in January of 2020. The sharp decline as a result of the pandemic yielded a July annualized value of 3,670.

Mills County's labor force declined sharply from January 2011 through January 2013, recovered partially through May of 2015 to 7,435, and then declined again before climbing to a January 2020 level of 7,529. Its July 2020 pandemic affected value was 7,439 on an annualized basis.

Implications

The state of Iowa realized a contraction in its labor force in the mid-2010s. This was due in large part to a growing number of the oldest Baby Boom generation exiting the workforce. But Iowa's labor force recovered a few years later, perhaps due to incrementally higher wages, and continued to grow up to the cusp of the pandemic recession. As is the case above, the state's labor force contracted sharply, and the state had, as of September 2020, recovered more than half of the jobs that it lost during the huge downturn that peaked in April of 2020. Even though jobs recovered, continued stagnation in labor force size remained. This suggests that previously employed persons had permanently left the labor force because of the pandemic, either because the kind of job they were doing no longer could be done safely or older workers found themselves uncomfortable working in light of increased morbidity or mortality risks. There was also substantial evidence that female workers, especially those with young children, left the labor force because of childcare difficulties.

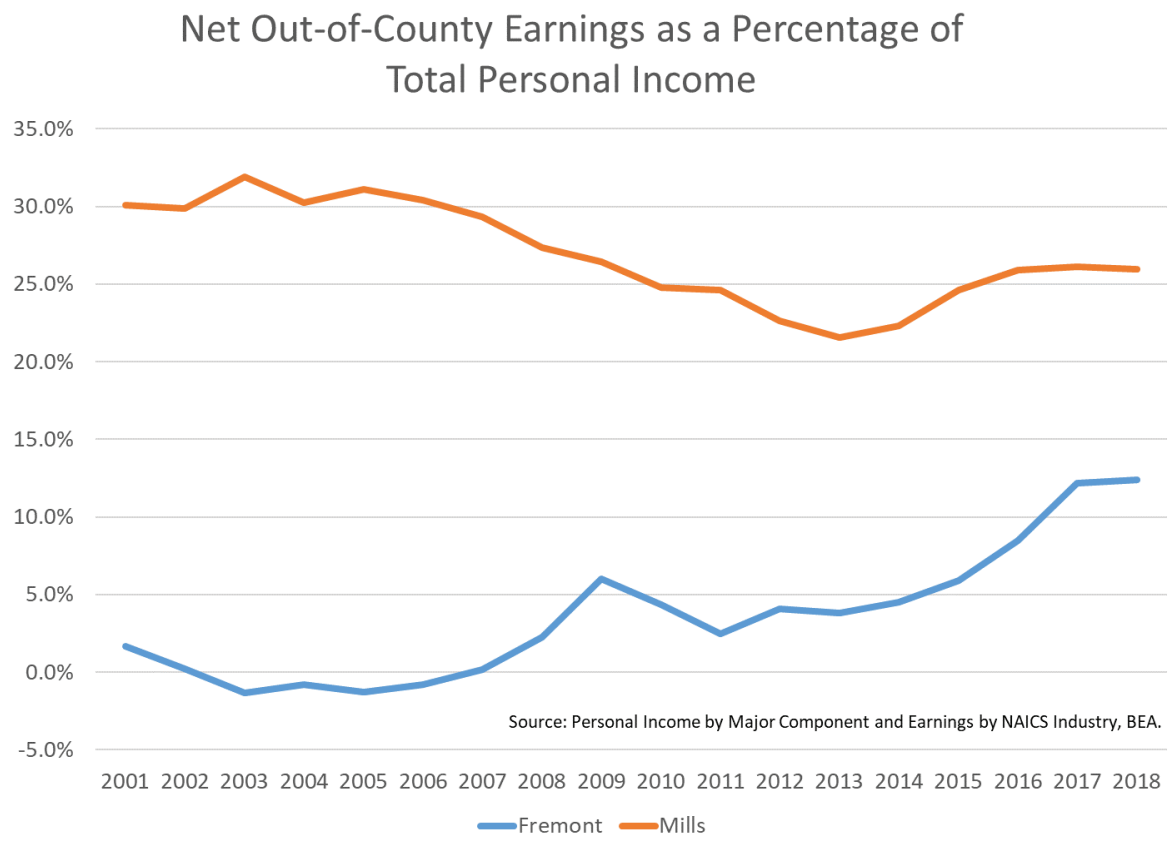
This pattern is in evidence across most of the state, and most especially in its rural counties. In the aggregate, their labor forces have contracted, as has been the case in Fremont and Mills County, and it is likely that an important component of that contraction contains previous workers who would still be in the labor force were it not for the pandemic.

All of this noted, the pronounced reduction in labor supply that occurred in Fremont County during the latter half of this decade is driven by two factors: first, it has a much older population and a much smaller young adult population than Mills County or the state average, and second, sharp loss in jobs in the county facilitated outmigration.

[4] During the current pandemic recession, there are people who are unemployed because they cannot work owing to the nature of the business within which they worked. Those among this group are not necessarily seeking employment, they are, instead, prevented from working. These count among the unemployed in determining the size of the labor force.

External Earnings Income Dependence

FIGURE 8



Indications

The Bureau of Economic Analysis (BEA) annually estimates the derivation of incomes in U.S. counties. In so doing, it takes into account earnings that are made by county residents from working outside of the county. It also discounts earnings generated in the county that go to non-county residents. Figure 8 shows the net earnings value for the study counties expressed as fractions of their respective total personal incomes.

Historically, the net exchange between external earnings for Fremont County residents compared to nonresidents working in the county mostly canceled each other out during the early portion of the previous decade. County dependence on external earnings then grew to around 5 percent of personal income or less into the mid 2010s. That fraction grew appreciably from 2015 where it was 5.9 percent to 12.4 percent by 2018.

Mills county net dependence on external earnings expressed as a proportion of county personal income was at or above 30 percent from 2001 through 2007. It declined to a low of 21.5 percent during the Great Recession, but recovered to 26.0 percent by 2018.

Implications

Figure 8 should be interpreted as a gauge of an area's dependence on external jobs or its dependence on an external labor force. A subsequent section isolates the components of personal income for the study counties.

Here, when the net earnings adjustment is positive, it means that more money is earned from external employment by local residents than is lost to external workers who work in the county. When it is negative, it means that more money is earned by external workers who are nonresidents than by resident workers who rely on external employment. A county like Polk, for example, would produce a strong negative value in its numerator because of the strong flow of labor in from surrounding counties – many more workers commute in than commute out for their jobs.

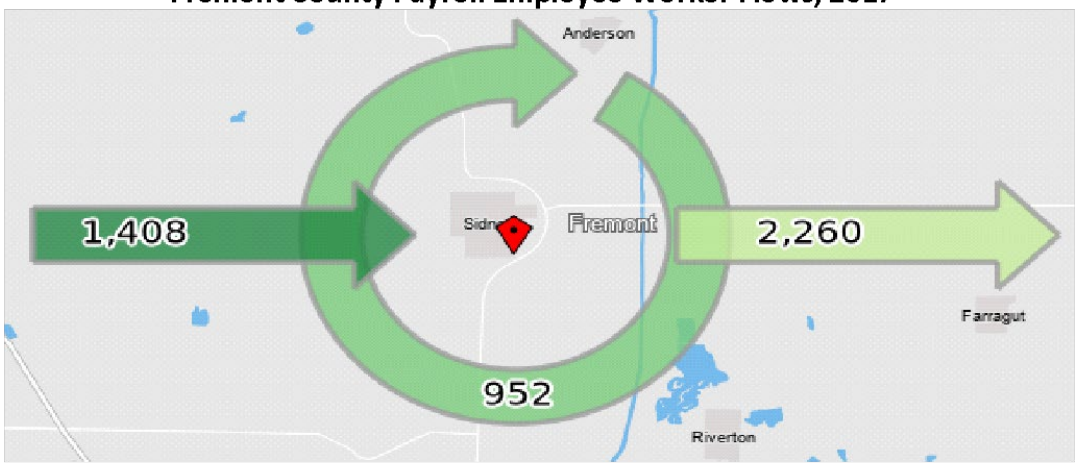
Figure 9 provides a three-indication summary of payroll employment dynamics in the study counties. The left arrow pointing towards the center represents the flow of nonresident workers into the county – workers whose county place of residence was different from their place of work. The circular center figure represents the workers who both live in that county *and* work in that county. The rightmost arrow indicates the number of county residents who work in some other county.

In Fremont County, 29.6 percent of the residents with payroll jobs both lived and worked in the county. Of the jobs that are located in the county, 40.3 percent are held by Fremont County residents. The ratio of outcommuters to incommuters is 1.6:1.

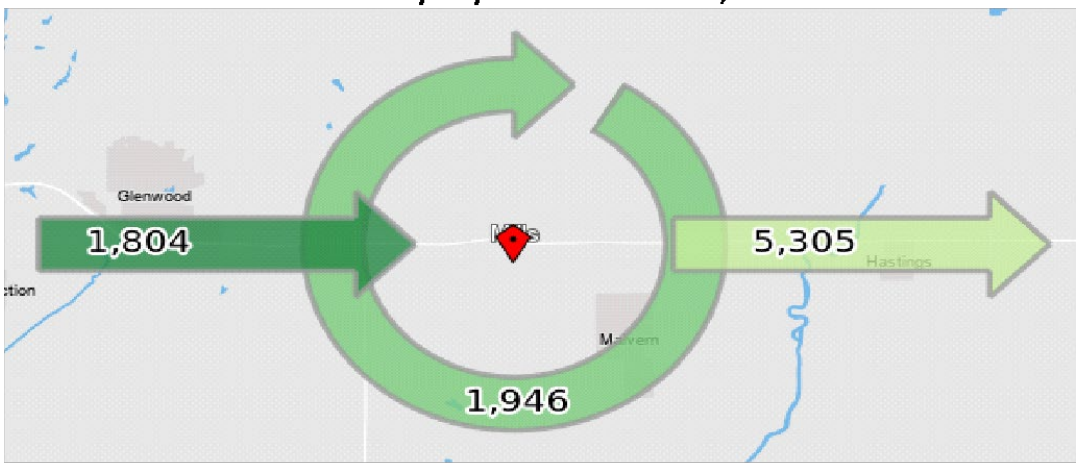
For Mills County, 26.8 percent of the residents with payroll jobs both lived and worked in the county. Of the jobs located in the county, 51.9 percent were held by Mills County residents. The Mills County ratio of outcommuters to incommuters is 2.9:1.

FIGURE 9

Fremont County Payroll Employee Worker Flows, 2017



Mills County Payroll Worker Flows, 2017



Both counties are very dependent on external employment opportunities to sustain their counties. Mills County can count on metropolitan area economic spillovers that benefit them. There is population growth on the Nebraska side of the counties that abut Fremont County, but that growth is nowhere as dense as that adjacent to Mills County.

Nearly 70 percent and 73 percent of resident nonfarm payroll workers in Fremont and Mills County, respectively, are estimated to depend on external employers. [5]

[5] These data come from the On the Map data tool at the U.S. Census. They do not include proprietors. Proprietors are highly likely to live in the same county as their businesses. When a different data source is used that considers all payroll workers and proprietors, 53 percent and 55 percent, respectively, for Fremont County and Mills County were estimated to work out of county. See Commuting Characteristics by Sex, ACS, 2018, U.S. Census.

Industrial Composition

TABLE 8

Total Full-time and Part-Time Employment, 2018

	Fremont County		Mills County	
	2018	Percentage Change, 2010 to 2018	2018	Percentage Change, 2010 to 2018
Total employment (number of jobs)	3,966	-7.6%	5,912	-4.6%
By type				
Wage and salary employment	2,725	-11.2%	3,924	-9.5%
Proprietors employment	1,241	1.6%	1,988	6.9%
Farm proprietors employment	371	-0.8%	386	-1.0%
Nonfarm proprietors employment	870	2.6%	1,602	9.1%
By industry				
Farm employment	504	0.6%	484	-5.5%
Nonfarm employment	3,462	-8.7%	5,428	-4.5%
Construction	132	10.0%	361	7.8%
Manufacturing	594	-41.3%	268	36.7%
Wholesale trade	147	14.0%	204	46.8%
Retail trade	499	-2.0%	517	0.0%
Finance and insurance	157	-3.1%	201	-5.2%
Real estate and rental and leasing	102	34.2%	313	33.8%
All other private industries	1,339	6.8%	1,968	-10.7%
Federal government	53	-46.2%	88	-45.5%
State and local government	439	-4.6%	1,508	-13.0%

Source: Total Full-Time and Part-Time Employment by NAICS Industry, BEA.

Indications

Data for 2018 are the latest available from the U.S. BEA. In Table 8, aggregated summaries of major industrial groups are presented. Because of data suppression, there is a comparatively large number of jobs in the "All other private industries."

Both counties realized minor declines in farm proprietorships and gains in nonfarm proprietorships over the decade. Although 2010 was close to the worst period of the Great Recession, both counties posted nonetheless fewer jobholders in 2018.

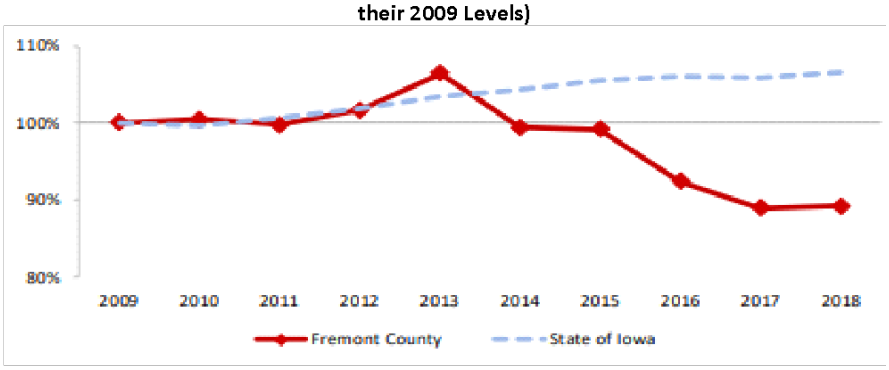
Sharp declines in manufacturing and in federal government employment are most evident in Fremont County. Mills County also had sharp percentage reductions in federal government employment as well as in state and local government. Both counties realized gains in real estate and rental and leasing, which also includes the leasing of agricultural land, and Mills County posted strong gains in both manufacturing and in wholesale trade jobs.

Implications

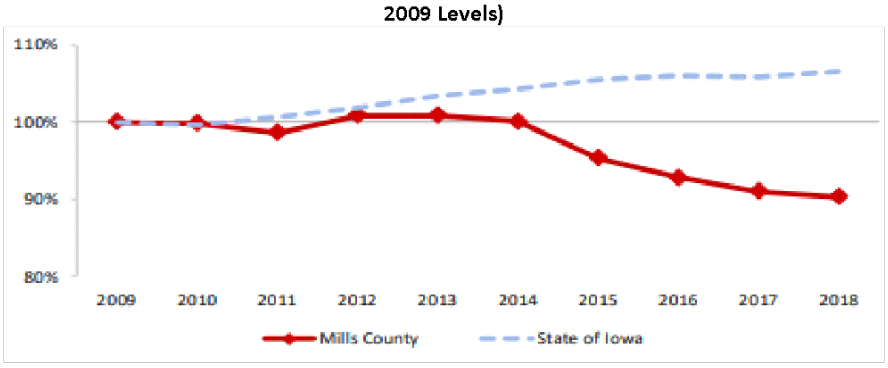
Continued erosion in Fremont County has already been documented above in Figure 3, but the stagnation evident in Mills County despite its proximity to the Omaha – Council Bluffs metro can also be characterized as a weakness. One would expect significant positive population and economic spillovers, yet they are clearly not in evidence.

FIGURE 10

Fremont County Employment Change Compared to the State (Indexed as Percentages of their 2009 Levels)



Mills County Employment Trend Compared to the State (Indexed as Percentages of their 2009 Levels)



Source: Retail Trade Analysis, Fiscal Year 2019, Iowa Community Indiators Project, Iowa State University

Fremont County is significantly dominated by goods producing employment (agriculture, construction, and manufacturing). In 2018, 31.0 percent of all jobs were classified as such. In Mills County, that figure was 18.1 percent. The significance of this dependence is important in terms of future growth. Agriculture and manufacturing, especially, are not job-adding industries. Over time, both are expected

to shed labor while maintaining or even increasing output. Counties with job mixes that are closer to the state average are more likely to realize growth rates similar to the state. Fremont County's mix is significantly more concentrated in goods production than the state average.

Income Composition

TABLE 9

Composition of Income in 2018

	Fremont	Mills
	In thousands	
Total personal income	$ 317,475	$ 853,269
Earnings	176,330	523,602
Dividends, interests, and rents	62,690	127,598
Transfer payments	78,455	202,069
	Percent of total	
Total personal income	100.0%	100.0%
Earnings	55.5%	61.4%
Dividends, interests, and rents	19.7%	15.0%
Transfer payments	24.7%	23.7%

Source: Bureau of Economic Analysis

Indications

Earnings are the wages and salaries plus the benefits that workers make from employment. Investment incomes are mostly in the forms of dividends, interests, and rents. Transfer payments come primarily from the federal government and to a lesser degree the state government. They include social security payments to the elderly, survivors, and the disabled; Medicare and Medicaid; unemployment insurance; the Supplemental Nutrition Assistance Program (SNAP); and Temporary Assistance to Needy Families (TANF). They also include student grants and other aids to education, veterans' benefits, and the Earned Income Tax Credit.

Table 9 contains a complete accounting of income from all sources for our counties. In 2018, the Mills County total personal income was $853.3 million, and Fremont's was $317.5 million. Earnings were a much smaller fraction of income in Fremont County than in Mills, but Fremont County had a much higher dependence on investment income (a substantial portion of which is likely agricultural land rents). Even though Fremont County has a much higher fraction of elderly residents than Mills, its dependence on transfer payments was only one percentage point higher.

Implications

Growing economies have higher reliance on earnings from work. The state average for 2018 was 62.6 percent, very close to the Mills County average. Counties that are more dependent on investments or transfers are usually retirement counties or very rural counties, like Fremont.

It's important to note that earnings are apportioned to the county of the employee, so persons who work outside of their county carry their earnings back to their county of residence. Even if a regional

economy is comparatively stagnant, access to external job opportunities can significantly bolster the earnings percentage of a county's economy.

Both counties, too, have much higher dependences on transfer payments. The state average is 17.4 percent. Acquiring nearly a quarter of the counties' incomes from transfers rather than from employment or investments is also usually an indicator of significantly constrained growth potential.

Taxable Trade and Service Sales

Unlike much of the economics data just presented, there is good information about taxable retail and service sales activity at both the county and the community levels in Iowa.[6] This section will look at the study counties by county and flood-affected major city.

Indications

Fremont County taxable retail and service sales are adjusted for inflation and expressed in constant 2019 dollars (Figure 11). County sales were $70.0 million in 2000, declined to $58.2 million towards the end of the
Great Recession, and then recovered smartly to $75.4 million in 2015. Thereafter, sales declined sharply to $44.5 million in fiscal year 2019.[7]

City of Hamburg real taxable sales peaked in 2001 at $15.6 million (in constant 2019 dollars). Though declining markedly and constantly to $7.9 million in 2009, the community enjoyed comparative stability for much of the current decade. By fiscal 2019, though, community sales had declined to $6.3 million. It is not unreasonable to assume that the downturn in fiscal 2019 for both the county and the community were significantly due to the flood.

There are other indicators of county and community trade strength, but a revealing measure is called Trade Area Capture (TAC). This measures the number of residents statistically served by area firms. When compared to a county or a city's current population, it allows for the calculation of a Pull Factor where a pull factor of 1.0 means that a county's or a community's TAC is equal to its population.[8] If the TAC is greater than the area population, then the Pull Factor is greater than 1.0 and suggests the county or the community is engaging in sales beyond its political boundaries. If the TAC is less than 1.0, then a region is not statistically serving its resident population and there are, therefore, sales leakages.

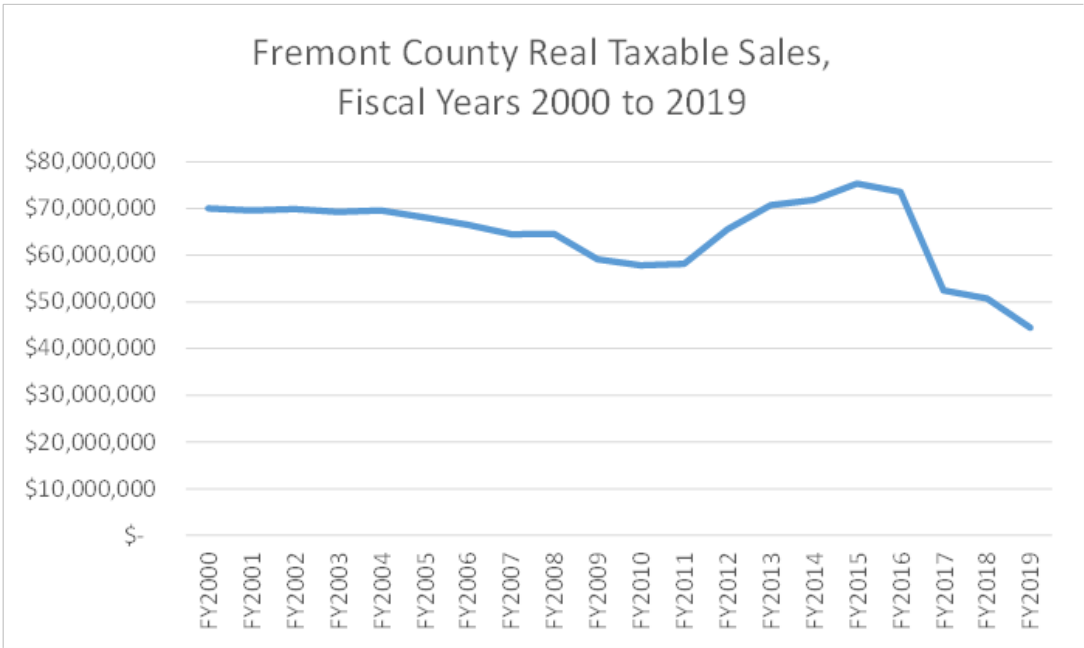
[6] Annual retail analysis reports are produced for all of Iowa's counties and most of its cities can be find at the Iowa State University, Department of Economics, Community Indicators Project website: https://www.icip.iastate.edu/retail

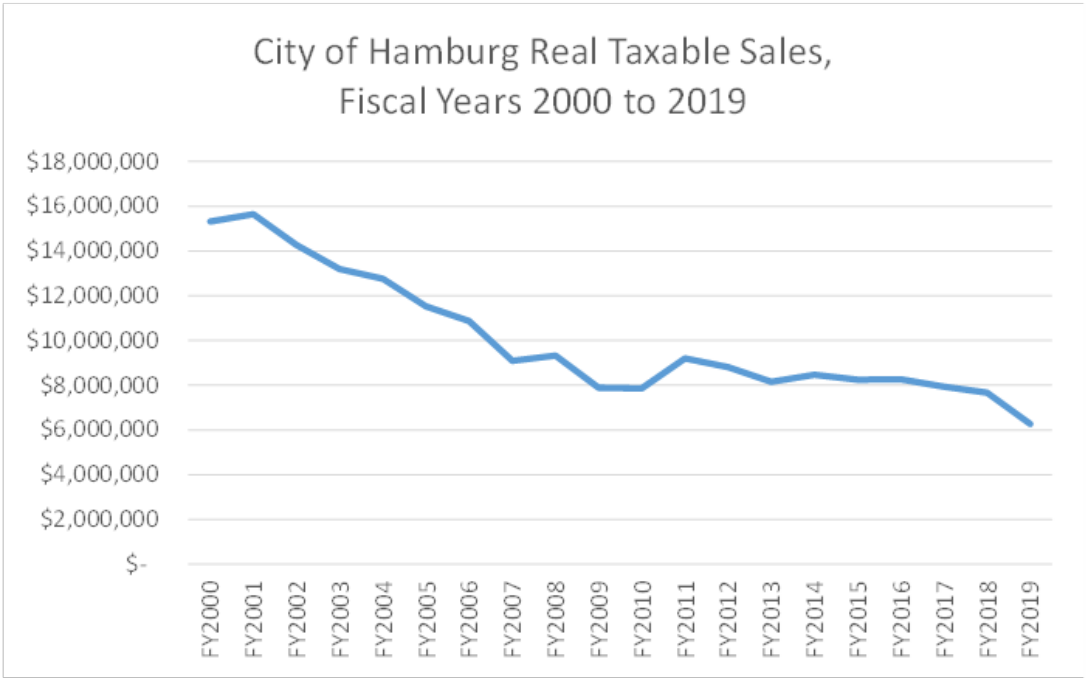
[7] Fiscal years are from July 1 through June 30 of the following year.

[8] The Trade Area Capture and the Pull Factor values are calculated for each county and city in Iowa based on their trade performance as compared to a much larger reference group, and takes into account an area's average income, which determines their ability to purchase goods and services. These values are updated annually.

Fremont County and Hamburg

FIGURE 11





Implications

As is clearly evident in Table 10, both Fremont County and the community of Hamburg suffer from significant sales leakages. Both entities' TAC values are half or less of their respective populations, as measured by their pull factor values (which is TAC divided by population). This means that the full range of goods and services required by county and Hamburg community residents is not available for sale in

sufficient quantities to meet local demands, and area shoppers must buy those items and services in other, nearby counties.[9]

TABLE 10

Standardized Indicators of Area Taxable Sales Performance in Fiscal 2019

	Trade Area Capture	Population	Pull Factor
Fremont County	3,501	6,971	0.50
Hamburg	518	1,076	0.48

Mills County and Pacific Junction

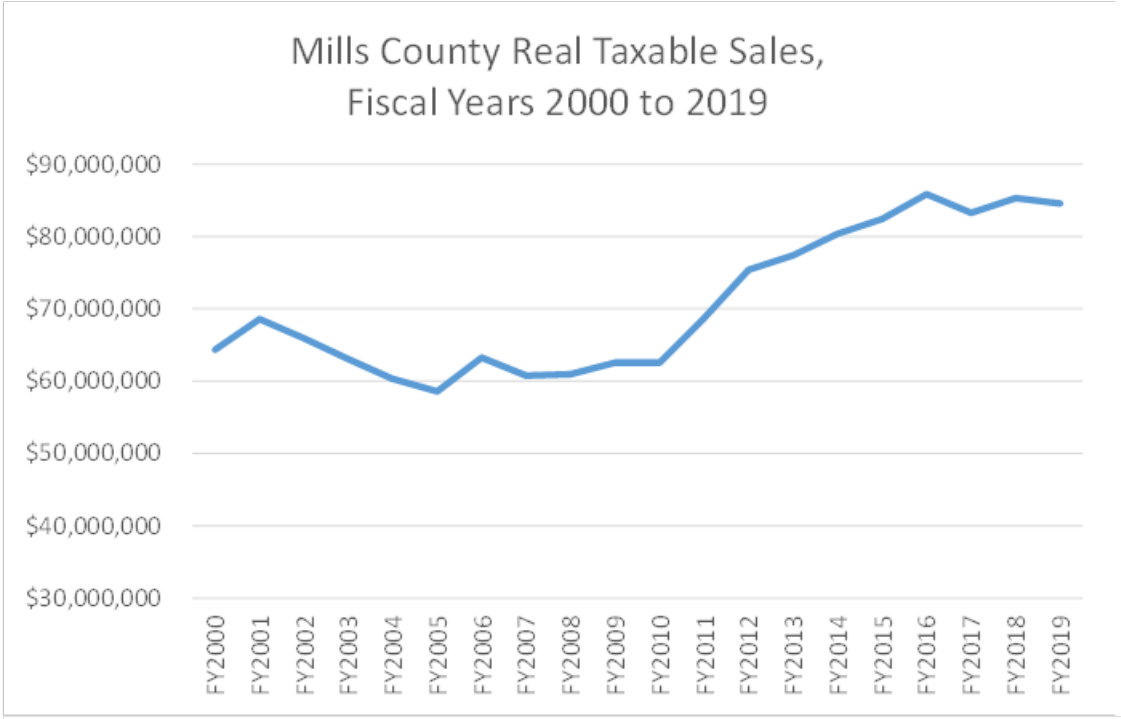
Mills County and Pacific Junction taxable sales performances are much more influenced by closer proximity to the Omaha-Council Bluffs metropolitan area as well as benefiting from substantial travel related spending.

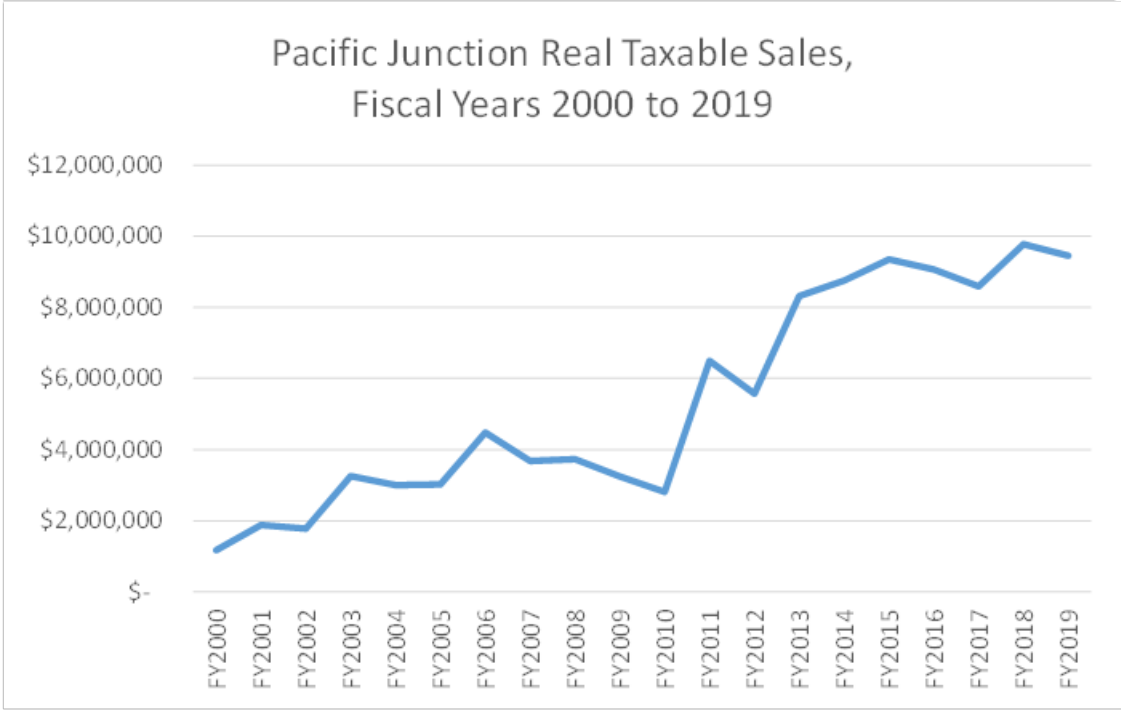
Indications

Mills County real taxable sales remained relatively flat both prior to and during the Great Recession at around $60 million per year. From 2011, though, they grew substantially to $84.6 million in fiscal 2019. Pacific Junction taxable sales showed remarkable growth. In fiscal 2001, they were $2.0 million, but by fiscal 2019 they were $9.5 million, the bulk of which occurred from 2011 on. A substantial portion of Mills County's growth is explained by the growth in Pacific Junction. And the growth in Pacific Junction was substantially due to travel related developments that added a truck dealership and travel center and dining facilities at a nearby major highway intersection. The community of Pacific Junction recorded just about $186,500 in real taxable sales per firm in 2007. By fiscal 2018, before the flood, that value had risen to $465,180. Nearly all of this growth was driven by very high volume sales by only a few very large firms.

[9] The Fremont County Retail Trade Analysis report for fiscal 2019 provides much more detail about area trade performance and is a useful reference document for understanding comparative performance over time. It can be found at https://www.icip.iastate.edu/sites/default/files/retail/retail_19071.pdf. The same document for the City of Hamburg is found at https://www.icip.iastate.edu/sites/default/files/retail/retail_1933780.pdf.

FIGURE 12





Implications

Mills County's proximity to the metro plus its population stability portend a probability of future population growth and trade growth. The gain in taxable sales realized this decade is substantially larger than the amounts that were attributable to the boom in sales in Pacific Junction. Nonetheless,

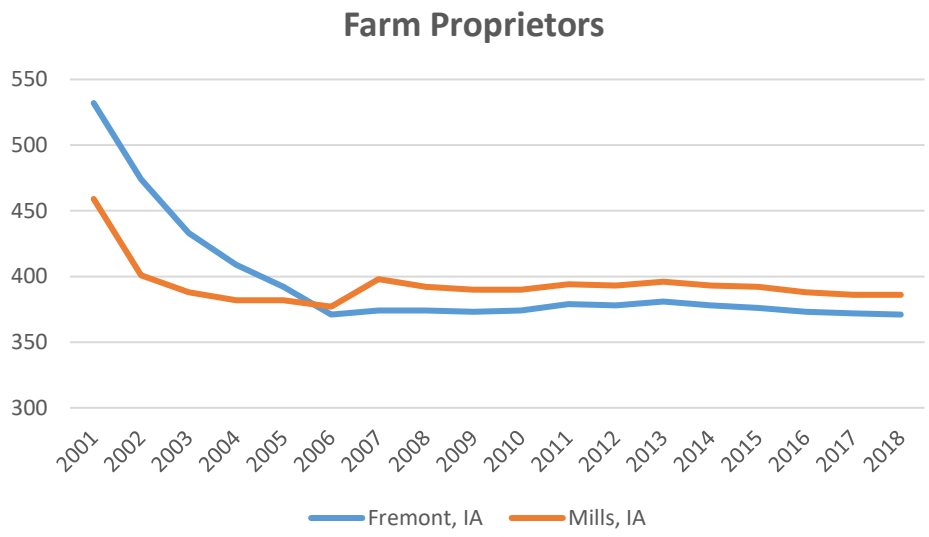
owing to high rates of outcommuting and the sheer draw of the metropolitan region, it is not likely that the county's standardized trade performance will improve substantially.

The situation in Pacific Junction is dire. Their windfall in sales was associated with travel retail and services investments and subsequent robust sales. The flood destroyed those investments and nearly all of the business operations in the community. While it is reasonable to presume that some, mostly service oriented operations might survive in the short run, without substantial residential recovery and engineering improvements, it is unlikely that there will be commercial investment in that community.[10]

Agriculture: General Indicators

Agriculture is an important sector for both counties. In this section, basic economic characteristics are introduced followed by flood disaster related findings.

FIGURE 13



[10] The Mills County Retail Trade Analysis report for fiscal 2019 provides much more detail about area trade performance and is a useful reference document for understanding comparative performance over time. It can be found at https://www.icip.iastate.edu/sites/default/files/retail/retail_19129.pdf. The same document for the City of Hamburg is found at https://www.icip.iastate.edu/sites/default/files/retail/retail_1960825.pdf.

TABLE 11

Ag-Related Economic Indicators

	Fremont	Mills
Farm employment as a percent of total county employment in 2018	12.7%	8.2%
Farm employment incomes, 2016-2018, as a percent of total county income	4.1%	0.4%
Farm proprietors as a percent of all proprietors in 2018	29.9%	19.4%

Indications

The number of farmers declined markedly in the early 2000s for both counties, but the number of farms have remained remarkably stable since about 2007. Interestingly, Mills had 16 percent more farms than Fremont County in 2001, but by 2018, it had about 4 percent fewer (Figure 13).

Table 11 informs us about the comparative importance of farming in the study counties across three indicators: as percentages of total employment, incomes, and entrepreneurship. Clearly, Fremont County is much more dependent on its farm sector than Mills County. Mills County, notably, averaged negative farm proprietor incomes in 2016 and 2018, so total farm employment income as a fraction of the regional total is very low.

Implications

While the economic health of area farmers is important to both counties, it is more important in Fremont County. Another consideration to understand, however, is that farmers have extensive supply chain linkages that create relatively rich multiplier effects in local economies. These linkages are baked into the regional production structure – they occur every year without fail – so the full value of agriculture to the region considering all of its supply linkages is substantially larger than the values listed in Table 11.

The next section reveals that despite the flood disaster, there were substantial insurance and governmental payments to further support Fremont and Mills County ag economies.

Agriculture: Flood Related Consequences

Data describing Fremont County and Mills County total flood-related agricultural losses are incomplete at present. However, information on crop plantings and insurance payments can be obtained from the USDA, and on average 90 percent of Iowa crop acres are covered by insurance. Information, though, on acres harvested from the USDA are incomplete. It is therefore reasonable to use the USDA crop insurance data to provide an initial estimate of the value of crop losses even though it will not be complete.

Additional information on total subsidies to both counties is available from the dataset maintained by the Environmental Working Group (EWG). These two data sets provide a reasonably good estimate of the amount of USDA-related assistance or indemnity flows into the two counties as compared to previous years.

Indications

Corn and soybeans are mostly rotated annually in Iowa, and the annual values reported for each county for acres covered by crop insurance indicate that is primarily the case. For the three years prior to the flooding event of 2019, Fremont County averaged 112,160 acres of insurance covered corn and 107,150 acres of soybeans (see Table 12). Mills County averaged 89,087 acres of covered corn and 88,242 acres of covered soybeans.

Into 2019, however, the acres enrolled in corn in Fremont County jumped by 8.1 percent over that three year average, and Mills County corn enrollment rose 2.2 percent. Soybean acres decreased by 9.2 percent in Fremont County, and 3.2 percent in Mills County. As the flooding began at the beginning of the crop planting season, and corn was planted first, farmers who had already planted or who were ultimately prevented from planting would have been the recipients of insurance payments. Soybeans can be planted much later in the spring, but as the flooding both continued and progressed, there were considerably reduced plantings.

TABLE 12

Planted Acres Enrolled in Crop Insurance

	Corn		Soybeans	
Year	Fremont	Mills	Fremont	Mills
2016	116,498	93,994	102,837	83,249
2017	109,561	84,327	110,664	93,586
2018	110,421	88,939	107,948	87,890
2019	121,241	91,068	97,252	85,437

Source: USDA Risk Management Agency database

For the 2016-2018 period, Fremont County averaged $2.67 million in insurance indemnity payments for corn and soybeans. Mills County average $1.88 million. The 2019 payment realized in Fremont County of $15.335 million was 474 percent greater ($12.66 million) than that three year average. Mills County 2019 payments were 209 percent higher ($3.94 million) than their recent average (see Table 13).

TABLE 13

Total Crop Insurance Payments for Corn and Soybean Production

	Fremont	Mills
2016	$ 2,547,638	$ 1,175,377
2017	$ 621,734	$ 740,537
2018	$ 4,849,590	$ 3,732,756
2019	$ 15,335,351	$ 5,824,483

Source: USDA Risk Management Agency database

Farmers in both counties receive a range of subsidies from the USDA, to include conservation, crop insurance subsidies, targeted disaster relief, and commodity support. In Table 14, the sum of all of these programs is reported. As is evident, the amounts for 2019 were much higher than the previous three years. Fremont County averaged $9.85 million in support over the 2016-2018 period; Mills County averaged $8.77 million. Those amounts jumped to $25.3 million and $20.3 million, respectively, for 2019. Those gains were driven specifically by commodity support payments directly linked to corn and soybeans, not by large increases in earmarked disaster aid, according to the Environmental Working Group data set.

TABLE 14

Total Farm Subsidies All Programs ($Millions)

	Fremont		Mills	
2016	$	10.20	$	9.93
2017	$	10.90	$	9.99
2018	$	8.45	$	6.40
2019	$	25.30	$	20.30

Source: Environmental Working Group database, found at: https://farm.ewg.org

Implications

Via insurance indemnity payments as well as apparent robust commodity support payments, there was a substantial flow of resources into both counties to offset losses. Damage was done to farm structures and equipment, and those losses were substantial. Private insurance would cover those losses to some extent, but what insurance did not or cannot cover would be counted as private and irrecoverable losses. Whether those losses result in a decline in the number of farmers will be borne out over time.

Much remains to be learned about agricultural land and recovery, which is also the case for the two key communities. If flood maps change, then the costs of crop insurance and farm property insurance may become prohibitive. It may also make it desirable for some of the land to be considered for alternative uses or, if possible, to be enrolled in conservation programs if farming risk is considered too high for underwriting.

ECONOMIC IMPACT OPPORTUNITIES FOR FREMONT AND MILLS COUNTY

Supporting research for the:

Comprehensive Regional Land-Use Planning for Mills and Fremont Counties in Response to the 2019 Missouri River Flooding Project

Dave Swenson[1]
November 2021

[1] Consulting contributor. Author is also a research scientist in the Department of Economics, Iowa State University.

POST RECOVERY ECONOMIC IMPACT OPPORTUNITIES FOR FREMONT AND MILLS COUNTY

Introduction and Overview

This report considers potential positive economic outcomes that might accrue to both Fremont and Mills County in light of post-flood reconstruction as well as expected infrastructure improvements in both counties. Normal economic restoration is not the focus here – basic recovery, restoration, and rehabilitation, for example – instead, the analysis looks at the worth of potential growth opportunities that seem reasonable given both counties' economies and recent circumstances. The categories chosen were gleaned from conversations with residents and leaders in the affected communities as well as with other project consultants.

The growth categories analyzed are basic. In Fremont County, expanded manufacturing, the addition of travel-related businesses, and general warehousing opportunities were chosen. Mills County, too, is a candidate for additional travel-related businesses, but it envisions more specific opportunities in the warehousing category. Due to its proximity to major highways and to the Omaha – Council Bluffs metropolitan region, it considers itself a candidate for larger warehousing and distribution facilities. In addition, owing to the planned addition of meat processing in the county, a cold-storage facility was added to the list of likely growth industries.

There is new housing construction occurring in Fremont County and Mills County. A table will also be presented that shows, for each county, the short-term economic effects of these projects.

Finally, there were discussions in both counties involving the conversion of now undevelopable land into local food production. This report will present the regional economic gains that would accrue for each 50 acres of local production of fruits and vegetables cultivated in the area economies.

Understanding Economic Impact Terminology

Before describing the results, a short primer on interpreting economic impact tables is in order.[2]

There are four types of economic activity summarized in conventional economic impact analysis tables:

- Output is the value that is produced annually by the industry scrutinized.
- Labor income is the amount of earnings and benefits paid to workers as well as the salary that proprietors pay themselves for the management of their businesses.
- Value added is composed of the just mentioned labor income, plus all payments that are made to investors – i.e., dividends, interests, and rents – along with indirect tax payments that are a cost of doing business. Value added is the same thing as Gross Domestic Product (GDP), the standard measure of economic activity at the national, state, and metropolitan levels.

[2] Input-output models are used to produce economic impact tables and were constructed separately for Fremont County and for Mills County using the IMPLAN, Inc., local data and modeling system. Each subsequent scenario is run through the respective county model to arrive at projections of local economic outcomes.

- Jobs are the number of positions in the economy, not the number of employed persons or full-time equivalencies. As many people hold more than one job, there are always more jobs in an economy than there are employed persons.

There are four levels of economic activity that are summarized for all of the items just listed:

- Direct activity refers to the firm type that we are measuring – in the examples below a truck stop is analyzed, then a hotel, and so on.
- Indirect activity refers to the supplying sectors to the direct sector. All firms require locally sourced goods and services to operate.
- Induced activity happens when the workers in the direct sector and those in the indirect sectors convert their labor incomes into household spending. This induced activity is sometimes called the Main Street effect, but it involves all manner of household spending.
- The total effect is the sum of the preceding three economic dimensions.

Fremont County Scenarios

The first two scenarios involve travel-related development opportunities. Anticipated highway improvements and flood prevention projects suggest that there are good prospects for a new travel center and for a new hotel. The following results were based on statewide average employment levels for truck stops and for hotels, but run through a Fremont County economic impact model.

First is a new truck stop / travel center. All of the elements of this first table will be explained to help the reader with interpretation. For all remaining tables, just the direct and the total values will be highlighted.

The truck stop / travel center will have $3.62 million in economic output, and employ 35 jobholders making a total of $1.18 million in labor income. [3] The firm will require $586,448 in locally supplied inputs supporting 5 jobholders making $162,966 in labor income. This is the indirect effects row. When the direct workers and the indirect workers convert their paychecks into household spending, they will likely stimulate $549,118 in induced output, which in turn will support 4.1 jobholders making $137,524 in labor income. Summed, the truck stop would support a total of $4.75 million in total output and $2.4 million in value added, of which $1.48 million would be labor income paid to a total of 44 jobholders.

Scenario: New Travel Center

	Jobs	Labor Income	Value Added	Output
Direct Effect	35.0	$1,177,260	$1,881,643	$3,615,112
Indirect Effect	5.0	$162,966	$231,914	$586,448
Induced Effect	4.1	$137,524	$282,345	$549,118
Total Effect	44.0	$1,477,750	$2,395,903	$4,750,678

[3] For retail and wholesale firms, output does not include the full value of all sales at the cash register. The cost of the goods sold is subtracted from that total to arrive at the output amount used for retail and wholesale economic impact accounting. Therefore, the output listed in the direct effect line of this first table only counts those other costs of operation (overhead, labor, etc.) as a truck stop / travel center is a retail establishment.

The next travel-related scenario for Fremont County is for a new hotel or motel. Using statewide averages, a new hotel would have $1.64 million in total output and require 18 jobholders making $483,870 in total labor income. After all multiplied through effects are accounted for, a new motel would add $2.04 million in output to the regional economy and $1.11 million in value added, of which $595,329 would be labor income to 21.2 jobholders.

Scenario: New Hotel / Motel

	Jobs	Labor Income	Value Added	Output
Direct Effect	18.0	$483,870	$917,929	$1,644,510
Indirect Effect	1.6	$55,975	$79,268	$179,239
Induced Effect	1.6	$55,484	$113,806	$221,153
Total Effect	21.2	$595,329	$1,111,004	$2,044,902

The third scenario is a general warehousing operation. In this example, the statewide average number of employees per warehousing establishment was used. That state average warehouse located in Fremont County would have $2.9 million in total output produced by the labor of 38.6 jobholders making $1.48 million in labor income. After all multiplied through effects are tallied, this warehouse would have $3.9 million in total output and generate $2.14 million in value added, of which $1.74 million would be labor income to 46.5 jobholders.

Scenario: New Warehouse

	Jobs	Labor Income	Value Added	Output
Direct Effect	38.6	$1,475,714	$1,669,472	$2,899,449
Indirect Effect	3.1	$100,488	$140,523	$354,210
Induced Effect	4.8	$162,578	$333,654	$648,606
Total Effect	46.5	$1,738,781	$2,143,650	$3,902,265

The last scenario involves manufacturing expansion in the county. Here, the top three food-related manufacturers in the county – wet corn milling, animal slaughter, and spices and extracts – were allowed to each increase employment by 25 percent. The results below reflect the combined effects were this growth to be uniformly realized by all three sectors.

Growth in these three food processing industries would yield $44.14 million in new output in Fremont County requiring 48.5 more jobholders making $3.36 million in labor income. After all multiplied through effects were considered, this scenario would see $53.2 million in output and $10.96 million in value added generated, of which $6.3 million would be labor income to nearly 109 jobholders.

Scenario: Expanded Manufacturing

	Jobs	Labor Income	Value Added	Output
Direct Effect	48.5	$3,363,687	$6,530,608	$44,136,304
Indirect Effect	42.9	$2,338,082	$3,220,059	$6,709,720
Induced Effect	17.4	$587,553	$1,207,041	$2,348,504
Total Effect	108.8	$6,289,321	$10,957,708	$53,194,527

Mills County Scenarios

Economic opportunities in Mills County are both similar and distinct from Fremont County. It too is a potential site for travel related businesses, but it also believes that its proximity to the greater metropolitan region means it has an enhanced potential for larger warehouses or distribution businesses.

New or expanded truck stop / travel center investments in Mills County would have $3.62 million in output and would be staffed by 35 jobholders making $1.18 million in labor income. After all multiplied through effects are considered, it would yield $4.9 million in total county output and $2.49 million in value added, of which $1.53 million would be labor income to 43 jobholders.

Scenario: New Travel Center

	Jobs	Labor Income	Value Added	Output
Direct Effect	35.0	$1,177,260	$1,881,643	$3,615,112
Indirect Effect	5.7	$233,031	$356,827	$880,919
Induced Effect	2.3	$118,695	$248,766	$416,116
Total Effect	43.0	$1,528,986	$2,487,236	$4,912,147

A new hotel or motel in Mills County would produce $1.64 million in output and employ 18 workers making $483,870 in labor income. When all multiplied through relationships are considered, a new lodging facility would generate $2.17 million in output and $1.21 million in value added, of which $648,510 would be labor income to 21.2 workers.

Scenario: New Hotel / Motel

	Jobs	Labor Income	Value Added	Output
Direct Effect	18.0	$483,870	$917,929	$1,644,510
Indirect Effect	1.6	$80,784	$116,689	$236,725
Induced Effect	1.6	$83,856	$175,783	$294,048
Total Effect	21.2	$648,510	$1,210,401	$2,175,283

Mills County officials believe they could host larger warehouse operations than is the state norm. This analysis used the Henry County, Iowa, economy, home to two large warehouse and distribution centers, to provide employment, labor income, and output factors with which to adjust the Mills County model for this scenario. Such a facility, were it to be located in Mills County, would have $22.67 million in annual output and employ 225 persons making $7.71 million in labor income. Once all subsequent relationships are tallied in the economy, the county would see a boost of output by $32.49 million and value added boosted by $13.22 million, of which $9.96 million would be labor income to 284 workers.

Scenario: New Warehouse /Distribution Center

	Jobs	Labor Income	Value Added	Output
Direct Effect	225.0	$7,714,383	$9,047,644	$22,668,994
Indirect Effect	43.1	$1,424,892	$2,461,092	$6,969,698
Induced Effect	15.9	$823,702	$1,708,359	$2,851,777
Total Effect	284.1	$9,962,972	$13,217,100	$32,490,473

Mills County also considers itself a candidate for a cold storage facility. Using state averages, if that kind of facility were located in the county, it would have $6.85 million in annual output and would require 68 workers making $2.33 million annually. Once all multiplied through relationships were considered, a cold storage facility would account for $9.82 million in annual output and $3.99 million in value added, of which $3.01 million would be labor income payments to 86 workers.

Scenario: Cold Storage

	Jobs	Labor Income	Value Added	Output
Direct Effect	68.0	$2,331,458	$2,734,399	$6,851,074
Indirect Effect	13.0	$430,634	$743,797	$2,106,398
Induced Effect	4.8	$248,941	$516,304	$861,870
Total Effect	85.9	$3,011,032	$3,994,501	$9,819,343

Short Term Effects: Recovery-Related Housing Construction

Both Fremont County and Mills County have post-flood related housing construction either ongoing or planned. This analysis looks at the short-term local economic consequences of that construction. These economic outcomes are short-term because they only last during the construction period, they do not represent permanent additions to these counties' economies.

Fremont County Construction Projects

A total of $13.85 million in spending for new housing and for related infrastructure is planned for Fremont County. That much construction spending would support 159 jobs making $9.89 in labor income for the duration of the construction projects.[4] After all supply and household spending relationships are considered, new construction in Fremont County would, during the construction period, boost output by $19.11 million and value added by $13.02 million, of which $11.25 million would be labor income payments to 198 total workers.

[4] Economic impact analysis when applied to construction assumes the activity will be completed within one year. If this activity takes more than one full year to complete, then the economic impacts presented in these tables must be apportioned on a pro rata basis to the years in which the construction takes place.

Scenario: Recovery-Related Housing Construction

	Jobs	Labor Income	Value Added	Output
Direct Effect	158.9	$9,888,105	$10,322,097	$13,854,366
Indirect Effect	7.1	$280,073	$461,676	$901,425
Induced Effect	32.1	$1,083,336	$2,233,898	$4,356,541
Total Effect	198.1	$11,251,514	$13,017,671	$19,112,333

Mills County Construction Projects

Recovery related housing and infrastructure construction activity in Mills County is anticipated to cost $33.67 million and directly require 457.6 workers making $18.62 million in labor income. After all supply and consumption relationships are tallied, the construction would stimulate $43.54 million in total local output and $25.81 million in value added, of which $21.61 million would be total labor income to 511 jobholders.

Scenario: Recovery-Related Housing Construction

	Jobs	Labor Income	Value Added	Output
Direct Effect	457.6	$18,622,731	$20,160,980	$33,674,674
Indirect Effect	18.1	$1,176,972	$1,851,674	$3,497,999
Induced Effect	35.6	$1,807,050	$3,801,169	$6,362,810
Total Effect	511.2	$21,606,753	$25,813,823	$43,535,484

A Local Foods Scenario

Some of the flooded land in both Fremont County and Mills County cannot be used for residential or non-agricultural commercial purposes in the future. A portion of that land, however, might be suitable for horticultural crop development or the annual production of fruits and vegetables. Existing research by this author on local foods potential in Iowa is used to estimate the job and income producing potential of this option were it to eventuate.[5]

The table below is for both Fremont and Mills County. On this topic, there are negligible production costs differences between the two counties. Efficiently growing 50 acres of some mix of regionally-desired fruits and vegetables in either county would generate $432,302 in wholesale sales at the farm gate, the growing of which would require 1.1 jobholders making $66,933 in labor income. Considering all regionally-supplied inputs and all other consumption from labor, this scenario would generate $567,447

[5] See: Swenson, David. Measuring the Economic Impacts of Increased Fresh Fruit and Vegetable Production in Iowa Considering Metropolitan Demand. Leopold Center for Sustainable Agriculture, Iowa State University, 2011. Found here: http://lib.dr.iastate.edu/cgi/viewcontent.cgi?article=1092&context=leopold_pubspapers

in total output in the counties per 50 acres cultivated and $409,804 in value added, of which $109,642 would be labor income to 2 job holders.[6]

Scenario: Local Foods Production Per 50 Acres of Cultivation[7]

	Jobs	Labor Income	Value Added	Output
Direct Effect	1.1	$66,933	$251,886	$432,302
Indirect Effect	0.5	$22,948	$82,222	$74,886
Induced Effect	0.5	$19,761	$75,696	$60,260
Total Effect	2.0	$109,642	$409,804	$567,447

[6] The direct output value here reflects the price received at the farm gate as if all sales were made to a wholesaler. If the farmers were directly selling their produce in a farmers' market scenario, the output would be higher by the increment to cost in doing so and the extra profit generated from direct sales.

[7] Estimates for different acreages are straightforward because input-output results are linear and fixed. For 25 acres, all values in this table would be divided by 2. For 100 acres, all values in this table would be multiplied by 2.

A.4 Iowa Green Streets Criteria

2020 IOWA GREEN STREETS CRITERIA QUICK REFERENCE

This checklist provides an overview of the technical requirements within the Iowa Green Street Criteria.

To achieve Iowa Green Streets Criteria Certification, all projects must achieve compliance with the Criteria Baseline measures applicable to that project type. Additionally, New Construction projects must achieve 40 optional points, Substantial Rehab projects must achieve 35 optional points, and Moderate Rehab projects must also achieve 35 optional points.

Projects proposing to achieve a higher quantity of optional points may be scored more favorably during the application review process. To assist you in evaluating your project, a fillable form is available here: iowaeda.com/userdocs/programs/2020iowagreenstreetscriteriachecklistform.pdf

	B = Baseline # = OPTIONAL POINTS	
		1. INTEGRATIVE DESIGN
○YES ○NO ○MAYBE	B	**1.1 Integrative Design: Project Priorities Survey** Complete the Project Priorities Survey in Appendix K.
○YES ○NO ○MAYBE	B	**1.2 Integrative Design: Charrettes and Coordination Meetings** Develop an integrative design process that moves the outputs of the Project Priorities Survey into action through a series of collaborative meetings. Prioritize multi-benefit strategies. Assign responsibility within your design and development teams for accountability.
○YES ○NO ○MAYBE	B	**1.3 Integrative Design: Documentation** Include Iowa Green Streets Criteria information in your contract documents and construction specifications (Division 1 Section 01 81 13 Sustainable Design Requirements) as necessary for the construction team to understand the requirements and how they will be verified. Ensure, and indicate that the drawings and specifications have been generated to be compliant and meet the certification goals.
○YES ○NO ○MAYBE	B	**1.4 Integrative Design: Construction Management** Create, implement, and document your contractor/subcontractor education plan to ensure that all persons working on-site fully understand their role in achieving the project objectives. Include a summary of the Project Priorities Survey (Criterion 1.1), the sustainability goals, and anticipated roles of each party regarding performance expected of the project. Attach and reference this training plan to Division 1 Section 01 81 13 Sustainable Design Requirements. Include timeline estimates for performance testing and verification schedules in the overall construction schedule. As relevant, review requirements for Criteria 8.1, 8.2, and 8.3, and begin populating these documents with relevant information from design and construction.
○YES ○NO ○MAYBE	12 or 15	**1.5 Design for Health and Well-Being: Health Action Plan** Follow Steps 1–6 of the Health Action Plan framework per the full criterion. [12 points with extra 3 points for Step 7] This includes: 1) Commit to embedding health into the project lifecycle; 2) Partner with a project health professional; 3) Collect and analyze community health data; 4) Engage with community stakeholders to prioritize health data and strategies; 5) Identify strategies to address those health issues; 6) Create an implementation plan; and 7) Create a monitoring plan.

	B = Baseline # = OPTIONAL POINTS	
○YES ○NO ○MAYBE	10	**1.6 Resilient Communities: Multi-Hazard/Vulnerability Assessment** Conduct a four-part assessment (social, physical, functional, strategy) to identify critical risk factors of your property and implement at least two sets of strategies to enable the project to adapt to, and mitigate, climate related or seismic risks. See full criterion for more guidance.
○YES ○NO ○MAYBE	8	**1.7 Resilient Communities: Strengthening Cultural Resilience** Integrate community and resident participation in the development processes so that the built environment honors cultural identities, resident voices, and community histories. **Option 1:** Complete a Cultural Resilience Assessment OR **Option 2:** Convene a Cultural Advisory Group
○YES ○NO ○MAYBE	B 10	**1.8 Resilient Structures** **Baseline:** New residential construction projects without a basement construct a safe room to protect against wind forces and wind debris from events such as a tornado. **Optional:** New construction projects with a basement and rehab projects construct a safe room to protect against wind forces and wind debris from events such as a tornado.
		SUBTOTAL OPTIONAL POINTS
	B = Baseline # = OPTIONAL POINTS	
		2. LOCATION + NEIGHBORHOOD FABRIC
○YES ○NO ○MAYBE	B	**2.1 Sensitive Site Protection** All projects must: 1. Protect floodplain functions (e.g., storage, habitat, water quality) by limiting new development within the 100-year floodplain of all types of watercourses. 2. Conserve and protect aquatic ecosystems, including wetlands and deepwater habitats, that provide critical ecosystem functions for fish, other wildlife, and people. 3. Protect ecosystem function by avoiding the development of areas that contain habitat for plant and animal species identified as threatened or endangered. 4. Conserve the most productive agricultural soils by protecting prime farmland, unique farmland, and farmland of statewide or local importance. If your site contains any of these ecologically sensitive features, follow the specific Requirements under that subheading.

B = Baseline # = OPTIONAL POINTS		
OYES ONO OMAYBE	B	**2.2 Connections to Existing Development and Infrastructure** Locate the project on a site with access to existing roads, water, sewers, and other infrastructure and within or contiguous to (having at least 25% of the perimeter bordering) existing development. Connect the project to the existing pedestrian network. For sites over 5 acres, provide connections to the adjacent street network at least every 800 feet. Tie all planned bike paths to existing bike paths.
OYES ONO OMAYBE	B	**2.3 Compact Development** *(Baseline for New Construction)* At a minimum, build to the residential density (dwelling units/acre) of the census block group where the project is located. In Rural/Tribal/Small Town locations that do not have zoning requirements: Build to a minimum net density of 5 units per acre for single-family houses; 10 units per acre for multifamily buildings, single and two-story; and 15 units per acre for multifamily buildings greater than two-stories.
OYES ONO OMAYBE	5 or 7	**2.4 Compact Development** Exceed the residential density (dwelling units/acre) of the census block group in which your project is located. Exceed by 2x for [5 points]; exceed by 3x for *[7 points]*. In Rural/Tribal/Small Towns that do not have zoning requirements, build to a minimum net density of 7.5 units per acre for single-family houses; 12 units per acre for multifamily buildings, single and two-story; and 20 units per acre for multifamily buildings greater than two stories. *[5 points]*
OYES ONO OMAYBE	B	**2.5 Proximity to Services and Community Resources** *(Baseline for New Construction)* Locate the project within a 0.5-mile walk distance of at least four, or a 1-mile walk distance of at least seven, of the listed services.
OYES ONO OMAYBE	B	**2.6 Preservation of and Access to Open Space for Rural/Tribal/Small Town** *(Baseline for New Construction Rural/Tribal/Small Town)* **Option 1:** Locate the project within a 0.25-mile walk distance of dedicated public open space that is a minimum of 0.75 acres; at least 80% of which unpaved. OR **Option 2:** Set aside a minimum of 10% (minimum of 0.25 acres) of the total project acreage as open and accessible to all residents; at least 80% of which unpaved.
OYES ONO OMAYBE	6 Max	**2.7 Preservation of and Access to Open Space** **Option 1:** Locate the project within a 0.25-mile walk distance of dedicated open space that is a minimum of 0.75 acres; at least 80% of which unpaved. OR **Option 2:** Set aside a percentage of permanent open space for use by all residents; at least 80% of which unpaved. 20% *[2 points]*; 35% *[4 points]*; 45% + written statement of preservation/conservation policy *[6 points]*.

B = Baseline # = OPTIONAL POINTS		
OYES ONO OMAYBE		**2.8 Access to Transit** (Baseline for New Construction projects that do not qualify as Rural/Tribal/Small Town; Optional for all other project types)
	B	Baseline: **New Construction, not Rural/Tribal/Small Town** Locate projects within a 0.5-mile walk distance of transit services (bus, rail and/or ferry), constituting at least 45 or more transit rides per weekday, with some type of weekend service.
	2	Optional: **New Construction, not Rural/Tribal/Small Town** Locate the project along dedicated bike trails or lanes (Class I, II, or IV) that lead to high-quality transit services (100 trips per day) within 3 miles. *[2 points]*
	2, 6, 8	Optional: **Rehabilitation, not Rural/Tribal/Small Town** Locate projects within a 0.5-mile walk distance of public transit services (bus, rail and/or ferry), constituting at least 45 or more transit rides per weekday, with some type of weekend service. [6 points] Locate the project along dedicated bike trails or lanes (Class I, II, or IV) that lead to high-quality transit services (100 trips per day) within 3 miles. *[2 points]*
	6	Optional: **New Construction and Rehabilitation, Rural/Tribal/Small Town** Locate the project within 0.5 mile walk distance of public transit services with at least 45 rides per weekday and some weekend service. OR, Install at least two charging stations for electric vehicles. OR, Locate the project with 5 miles of one of the following transit options: 1) vehicle share program; 2) dial-a-ride program; 3) employer vanpool; 4) park-and-ride; 5) public/private regional transportation.
OYES ONO OMAYBE	2-8	**2.9 Improving Connectivity to the Community** Improve access to community amenities through at least one of the options incentivizing biking mobility or improving access to transit.
OYES ONO OMAYBE	5 Max	**2.10 Passive Solar Heating/Cooling** Design and build with passive solar design, orientation, and shading that meet the guidelines specified.
OYES ONO OMAYBE	10	**2.11 Adaptive Reuse of Buildings** Rehabilitate and adapt an existing structure. Design the project to adapt, renovate, or reuse at least 50% of the existing structure and envelope.
OYES ONO OMAYBE	6	**2.12 Access to Fresh, Local Foods** Provide residents and staff with access to fresh, local foods through one of the following options: **Option 1:** Neighborhood Farms and Gardens **Option 2:** Community-Supported Agriculture **Option 3:** Proximity to Farmers Market
OYES ONO OMAYBE	8	**2.13 Advanced Certification: Site Planning, Design, and Management** Locate building(s) within a community that is certified in LEED for Neighborhood Development, LEED for Cities and Communities, Living Community Challenge, or SITES.

	B = Baseline # = OPTIONAL POINTS	
OYES ONO OMAYBE	2 3 3	**2.14 Local Economic Development and Community Wealth Creation** Demonstrate that local preference for construction employment and subcontractor hiring was part of your bidding process, and how it functioned during construction. **OR** Demonstrate that you achieved at least 20% local employment. **OR** Provide physical space for small business, nonprofits, and/or skills and workforce education.
OYES ONO OMAYBE	B	**2.15a Access to Broadband: Broadband Ready** *(Baseline for New Construction and Substantial Rehab Projects in Rural/ Tribal/Small Town Locations)* Incorporate broadband infrastructure so that when broadband service comes to a community, the property can be easily connected. Include a network of mini-ducts or conduit throughout the building, extending from the expected communications access point to each network termination point in the building.
OYES ONO OMAYBE	6	**2.15b Access to Broadband: Connectivity** *(Optional for Rural/Tribal/Small Town)* Ensure all units and common spaces in the property have broadband internet access with at least a speed of 25/3 mbs.
		SUBTOTAL OPTIONAL POINTS
	B = Baseline # = OPTIONAL POINTS	
		3. SITE IMPROVEMENTS
OYES ONO OMAYBE	B	**3.1 Environmental Remediation** Determine whether there are any hazardous materials present on the site through one of the four methods listed. Mitigate any contaminants found.
OYES ONO OMAYBE	B	**3.2 Minimization of Disturbance During Staging and Construction** For sites >1 acre, implement EPA's National Pollutant Discharge Elimination System Stormwater Discharges from Construction Activities guidance, or local requirements, whichever is more stringent. For sites with an area ≤1, follow guidance in full criterion.
OYES ONO OMAYBE	B	**3.3 Ecosystem Services/Landscape** *(Baseline, if providing landscaping)* If providing plantings, all must be native or climate-appropriate (adapted) to the region and appropriate to the site's soil and microclimate. Do not introduce any invasive plant species. Plant, seed, or xeriscape all disturbed areas.
OYES ONO OMAYBE	B	**3.4 Surface Stormwater Management** *(Baseline for New Construction; Baseline for all Rehab projects if land disturbed is ≥1,000 sq.ft.)* Through on-site infiltration, evapotranspiration, and rainwater harvesting, retain the 1.25" rain event on site.

	B = Baseline # = OPTIONAL POINTS	
○YES ○NO ○MAYBE	10	**3.5 Surface Stormwater Management: Channel Protection Volume** *(Baseline to manage 2.5" rain event for Iowa Green Streets Certification Plus)* Through on-site infiltration, evapotranspiration, and rainwater harvesting, retain the 1.25" rain event on site (rehab projects) or 2.5" rain event on site (new construction or projects disturbing ≥ 1,000 square feet.
○YES ○NO ○MAYBE	B	**3.6 Efficient Irrigation and Water Reuse** *(Baseline, if permanent irrigation is utilized)* At least 50% of the site's irrigation satisfied by water use from the sources listed. If irrigation is utilized, install an efficient irrigation system per the requirements listed.
○YES ○NO ○MAYBE	6	**3.7 Efficient Irrigation and Water Reuse** *(for systems grandfathered-in in 3.6)* At least 50% of the site's irrigation satisfied by water use from the sources listed.
		SUBTOTAL OPTIONAL POINTS
	B = Baseline # = OPTIONAL POINTS	
		4. WATER CONSERVATION
○YES ○NO ○MAYBE	B	**4.1 Water-Conserving Fixtures** Install water-conserving fixtures meeting the specifications in the criterion. For all single-family homes and all dwelling units in buildings three stories or fewer, the static service pressure must not exceed 60 psi.
○YES ○NO ○MAYBE	6 Max	**4.2 Advanced Water Conservation** *[Baseline for Iowa Green Streets Certification Plus]* Reduce total indoor water consumption by at least 30% compared to baseline indoor water consumption chart. Any new toilet, showerhead, and/or lavatory faucet must be WaterSense certified.
○YES ○NO ○MAYBE	B / 3 B 8	**4.3 Water Quality** Baseline/***Optional:*** Baseline for Substantial Rehabs of buildings built before 1986; Optional for all other building types: Replace lead service lines. *[3 points]* **Baseline:** For multifamily buildings with either a cooling tower, a centralized hot water system, or 10+ stories: Develop a Legionella water management program. **Optional:** Test and remediate as indicated for lead, nitrates, arsenic, and coliform bacteria.

B = Baseline # = OPTIONAL POINTS		
OYES ONO OMAYBE	4	**4.4 Monitoring Water Consumption and Leaks** Conduct pressure-loss tests and visual inspections to determine if there are leaks; fix leaks. **AND** Install an advanced water monitoring and leak detection system capable of identifying and shutting water off during anomalous water events. **OR** Install a device to separately monitor water consumption of each cold branch off the apartment line riser for each dwelling unit or each cold water riser and the domestic hot water cold water feed for each building or each toilet that allows remote monitor readings; common laundry facilities; boiler makeup water; outdoor water consumption; and water consumption in any non- residential space.
OYES ONO OMAYBE	4	**4.5 Efficient Plumbing Layout and Design** Store no more than 0.5 gallon of water in any piping/manifold between the fixture and the water heating source or recirculation line. No more than 0.6 gallon of water shall be collected from the fixture before a 10-degree Fahrenheit rise in temperature is observed. Recirculation systems must be demand-initiated.
OYES ONO OMAYBE	6 Max	**4.6 Non-Potable Water Reuse** Harvest, treat, and reuse rainwater and/or greywater to meet a portion of the project's non-potable water needs: 10% reuse *[3 points]*; 20% reuse *[4 points]*; 30% reuse *[5 points]*; 40% reuse *[6 points]*.
OYES ONO OMAYBE	8	**4.7 Access to Potable Water During Emergencies** Provide residents with ready access to potable water in the event of an emergency that disrupts normal access to potable water, including disruptions related to power outages that prevent pumping water to upper floors of multifamily buildings or pumping of water from on-site wells, per one of the three options listed.
		SUBTOTAL OPTIONAL POINTS
B = Baseline # = OPTIONAL POINTS		
		5. OPERATING EFFICIENCY
OYES ONO OMAYBE	B	**5.1 Building Performance Requirements** Follow the Air Barrier and Insulation Inspection Component Guide and Energy Performance Table for measures applicable to your project.
OYES ONO OMAYBE	B	**5.1a Building Performance Standard** (New Construction: single-family and low-rise multifamily) Certify dwelling units in the project meet or exceed the Energy Performance Requirements in Criterion 5.1 or certify the project through the ENERGY STAR New Homes program.
OYES ONO OMAYBE	B	**5.1b Building Performance Standard** (Substantial and Moderate Rehab: Single Family and Multifamily) Certify dwelling units in the project meet or exceed the Energy Performance Requirements in Criterion 5.1 and the air infiltration, insulation, and HVAC performance guidelines in the criterion.

B = Baseline # = OPTIONAL POINTS		
○YES ○NO ○MAYBE	B	**5.1c Building Performance Standard** (New Construction: Commercial, Nonprofit and Mixed-Use) Follow all applicable requirements and best practices in Criterion 5.1. Projects must exceed the performance of the current state of Iowa adopted Energy Code at the time of submittal for plan review by at least 10 percent. Commission the building.
○YES ○NO ○MAYBE	B	**5.1d Building Performance Standard** (Substantial and Moderate Rehab: Commercial, Nonprofit and Mixed-Use) Follow all applicable requirements and best practices in Criterion 5.1. Substantial rehab projects must exceed the performance of the current state of Iowa adopted Energy Code at the time of submittal for plan review by at least 10 percent. Moderate rehab projects must meet or exceed the current state of Iowa adopted Energy Code at the time of submittal for plan review. Commission the building.
○YES ○NO ○MAYBE	12 Max	**5.2a Moving to Zero Energy: Additional Reductions in Energy Use** *[Baseline for Disaster Recovery Housing Projects to Achieve ≥5 points]* (Not available for projects using prescriptive path for Criterion 5.1a or for projects following Criterion 5.2b or 5.4.) Design and construct a building that is projected to be more efficient than what is required by Criteria 5.1a-5.1d. Achieve HERS score of 5 points lower than required by 5.1a-5.1d OR 5% greater efficiency than required if following ASHRAE path for 5.1a-5.1d compliance *[5 points]*. Additional 1 point for each additional 2-point decrease in HERS score required by Criteria 5.1a-5.1d OR for 1% greater efficiency if following ASHRAE path for Criteria 5.1a-5.1d, up to a maximum of 12 optional points.
○YES ○NO ○MAYBE	12-15	**5.2b Moving to Zero Energy: Near Zero Certification** *[5.2b* **or** *5.4 Baseline for Iowa Green Streets Certification Plus]* (Not available for projects following Criterion 5.2a or 5.4.) Certify the project in a program that requires advanced levels of building envelope performance such as DOE ZERH *[12 points]* and/or PHI Classic or PHIUS+ *[15 points]*.
○YES ○NO ○MAYBE	3-6	**5.3a Moving to Zero Energy: Photovoltaic/Solar Hot Water Ready** *[Baseline for Disaster Recovery Housing Projects]* (Not available for projects following Criterion 5.3b or 5.4.) Orient, design, engineer, wire, and/or plumb the development through the Photovoltaic Ready pathway or Solar Hot Water Ready Pathway to accommodate installation of photovoltaic (PV) or solar hot water system in the future.
○YES ○NO ○MAYBE	8 Max 4-8 1-5	**5.3b Moving to Zero Energy: Renewable Energy** *(Not available for projects following Criterion 5.3a or 5.4)* Install renewable energy source to provide a specified percentage of the project's estimated source energy demand. See full criterion for allowable sources. **Option 1:** For percentage of total project energy consumption provided by renewable energy. OR **Option 2:** For percentage of common area meter energy consumption provided by renewable energy.

B = Baseline # = OPTIONAL POINTS		
OYES ONO OMAYBE	24	**5.4 Achieving Zero Energy** *[5.2b* **or** *5.4 Baseline for Iowa Green Streets Certification Plus]* (Not available for projects following Criterion 5.2a, 5.2b, 5.3a, or 5.3b.) Achieve Zero Energy performance through one of the following: **Option 1:** Certify each building in the project to DOE Zero Energy Ready Home program or PHI Plus AND Either install renewables and/or procure renewable energy, which in sum will produce as much, or more, energy in a given year than the project is modeled to consume. OR **Option 2:** Certify each building in the project in a program that requires zero energy performance such as PHIUS_ Source Zero, PHI Plus, PHI Premium, ILFI's Zero Energy Petal, Zero Carbon Petal, or Living Building Certification.
OYES ONO OMAYBE	5 Max	**5.5a Moving to Zero Carbon: All-Electric Ready** *[Baseline for Disaster Recovery Housing Projects]* (Not available for projects following Criterion 5.5b) Ensure the project has adequate electric service and has been designed and wired to allow for a seamless switch to electricity as a fuel source in the future for the following uses: space heating *[1 point]*, space cooling *[1 point]*, water heating (DHW) *[1 point]*, clothes dryers *[1 point]*, equipment for cooking *[1 point]*.
OYES ONO OMAYBE	15	**5.5b Moving to Zero Carbon: All Electric** *[Disaster Recovery Projects seeking Iowa Green Streets Certification Plus may request additional funding with proof of additional costs]* (Not available for projects following Criterion 5.5a) No combustion equipment used as part of the building project; project is all-electric.
OYES ONO OMAYBE	B	**5.6 Sizing of Heating and Cooling Equipment** *(Baseline for Substantial and Moderate Rehabs that include replacement of heating and cooling equipment.)* Size and select heating and cooling equipment in accordance with ACCA manuals J, S, and D OR in accordance with the ASHRAE Handbook of Fundamentals.
OYES ONO OMAYBE	B	**5.7 ENERGY STAR Appliances** *(Baseline if providing appliances.)* Install ENERGY STAR clothes washers, dishwashers, and refrigerators. If appliances will not be installed or replaced at this time, specify that at the time of installation or replacement, ENERGY STAR models must be used via Criterion 8.1 and Criterion 8.4.
OYES ONO OMAYBE	B	**5.8 Lighting** *(Baseline for all lighting within New Construction and Substantial Rehab projects. Baseline for new lighting in Moderate Rehab projects.)* Follow the guidance for high-efficacy permanently installed lighting and other characteristics for recessed light fixtures, lighting controls, lighting power density, and exterior lighting.
OYES ONO OMAYBE	8	**5.9 Resilient Energy Systems: Floodproofing** *(Not relevant for Rehab projects in Special Flood Hazard Areas)* Conduct floodproofing of lower floors, including perimeter floodproofing (barriers/shields). Design and install building systems as specified by the full criterion so that operation of those systems will not be grossly affected in a flood.

	B = Baseline # = OPTIONAL POINTS	
O YES O NO O MAYBE	8	**5.10 Resilient Energy Systems: Critical Loads** Provide emergency power to serve at least three critical energy loads as described by the full criterion. **Option 1:** Islandable PV system OR **Option 2:** Efficient generator
O YES O NO O MAYBE	5-10	**5.11 Electric Vehicle Charging** *[Disaster Recovery Projects seeking Iowa Green Streets Certification Plus may request additional funding with proof of additional costs].* **Option 1** *[5 points]* Install panel capacity and raceway (≥ size 1) to support future build-out of EV charging with 208/240 V, 40-amp circuits. Identify the overcurrent protective device space(s) on circuit directory as "EV CAPABLE." **Option 2** *[10 points]* Residential projects ≥ 2 units install ≥ 1 active electric vehicle charging station. For multifamily and commercial projects install ≥ 2 active charging stations for first 25 parking spaces and 10% of all parking spaces > 25 (round up).
O YES O NO O MAYBE	B	**5.12 Advanced Framing and Resilient Design** Use advanced framing (optimum value engineering) best practices for all framing.
		SUBTOTAL OPTIONAL POINTS
	B = Baseline # = OPTIONAL POINTS	
		6. MATERIALS
O YES O NO O MAYBE	8 Max	**6.1 Ingredient Transparency for Material Health** Install products that have publicly disclosed inventories characterized and screened to 1,000 ppm or better: · 1 point per 5 installed Declare or HPD products from at least three different product categories. · 1 point per 2 installed Declare or HPD products in any of these categories: adhesives, sealants, windows. · 1 point per each product with third-party verified HPD or third party verified Declare label. · 2 points per each product with third-party verified HPD or third party verified Declare label in any of these categories: adhesives, sealants, windows.
O YES O NO O MAYBE	3 Max	**6.2 Recycled Content and Ingredient Transparency** Use building products that feature, and disclose, their recycled content. The building product must make up 75% by weight or cost of a project category for the project and be composed of at least 25% post-consumer recycled content.
O YES O NO O MAYBE	8 Max	**6.3 Chemical Hazard Optimization** Install products that have third-party verification of optimization to 100 ppm or better per the options listed within the full criterion.

B = Baseline # = OPTIONAL POINTS		
OYES ONO OMAYBE	B 15 Max	**6.4 Healthier Material Selection** Select all interior paints, coatings, primers, and wallpaper; interior adhesives and sealants; flooring; insulation; and composite wood as specified. Optional points also available.
OYES ONO OMAYBE	12 Max	**6.5 Environmentally Responsible Material Selection** Select concrete, steel, or insulation with a publicly disclosed EPD *[3 points]*, Install a green or cool roof *[3 points]*, use reflective paving *[3 points]*, and/or use FSC certified wood *[3 points]*. Refer to criterion for specifics.
OYES ONO OMAYBE	B	**6.6 Bath, Kitchen, Laundry Surfaces** *(Baseline for New Construction and Substantial Rehab. Moderate Rehabs that do not include work in the shower and tub areas are exempt from the shower and tub enclosure requirement.)* Use materials that have durable, cleanable surfaces throughout bathrooms, kitchens, and laundry rooms. Use moisture-resistant backing materials per ASTM # D 6329 or 3273 behind tub/shower enclosures, apart from one-piece fiberglass enclosures which are exempt.
OYES ONO OMAYBE	4 Max	**6.7 Regional Materials** *[Baseline for Iowa Green Streets Certification Plus]* Use products that were processed and manufactured regionally. Select any or all of these options (every two compliant materials can qualify for 1 point): · Framing · Cladding (e.g. siding, masonry, roofing) · Flooring · Concrete/cement and aggregate · Drywall/interior sheathing
OYES ONO OMAYBE	B	**6.8 Managing Moisture: Foundations** *(Baseline for all New Construction projects and for all Rehab projects replacing/modifying basement or crawl space)* Install capillary breaks and vapor retarders that meet specified criteria appropriate for the foundation type.
OYES ONO OMAYBE	B	**6.9 Managing Moisture: Roofing and Wall Systems** *(Baseline for all Rehab projects that include deficiencies in or replacing assemblies called out below.)* Provide water drainage away from walls, window, and roofs by implementing the list of techniques.
OYES ONO OMAYBE	B 6 Max	**6.10 Construction Waste Management** Develop and implement a waste management plan that reduces non-hazardous construction and demolition waste through recycling, salvaging, or diversion strategies through one of the three options. Achieve optional points by going above and beyond the requirement.
OYES ONO OMAYBE	12 Max	**6.11 Recycling Storage** For projects with municipal recycling infrastructure and/or haulers, provide separate bins for the collection of trash and recycling for each dwelling unit and all shared community rooms. **OR** For projects without that infrastructure, advocate to the local waste hauler or municipality for regular collection of recyclables.
		SUBTOTAL OPTIONAL POINTS

	B = Baseline # = OPTIONAL POINT	
		7. HEALTHY LIVING ENVIRONMENT
○YES ○NO ○MAYBE	B	**7.1 Radon Mitigation** *(Baseline for New Construction and Substantial Rehab)* For New Construction in EPA Zone 1 areas, install passive radon-resistant features below the slab and a vertical vent pipe with junction box within 10 feet of an electrical outlet in case an active system should prove necessary in the future. For Substantial Rehab projects in EPA Zone 1, test before and after the retrofit and mitigate per the specified protocols.
○YES ○NO ○MAYBE	B	**7.2 Reduce Lead Hazards in Pre-1978 Buildings** *(Baseline for Substantial Rehab of Buildings Constructed Before 1978)* Conduct lead risk assessment or inspection to identify lead hazards. Control identified lead hazards using lead abatement or interim controls, using lead-safe work practices that minimize and contain dust.
○YES ○NO ○MAYBE	B	**7.3 Combustion Equipment** **For New Construction and Rehab projects:** Specify power-vented or direct-vent equipment when installing any new combustion appliance for space or water heating that will be located within the conditioned space. If there are any combustion appliances within the conditioned space, install one hard-wired carbon monoxide (CO) alarm with battery backup function for each sleeping zone, placed per National Fire Protection Association (NFPA) 72. **For Rehabs:** If there is any combustion equipment located within the conditioned space for space or water heating that is not power-vented or direct-vent and that is not scheduled for replacement, conduct combustion safety testing prior to and after the retrofit; remediate as indicated.
○YES ○NO ○MAYBE	B	**7.4 Garage Isolation** · Provide a continuous air barrier between the conditioned space and any garage space to prevent the migration of any contaminants into the living space. Visually inspect common walls and ceilings between attached garages and living spaces to ensure that they are air-sealed before insulation is installed. · Do not install ductwork or air handling equipment for the conditioned space in a garage. · Fix all connecting doors between conditioned space and garage with gaskets or make airtight. · Install one hard-wired CO alarm with battery backup function for each sleeping zone of the project, placed per NFPA 72 unless the garage is mechanically ventilated or an open parking structure.
○YES ○NO ○MAYBE	B	**7.5 Integrated Pest Management** Seal all wall, floor, and joint penetrations with low-VOC caulking or other appropriate nontoxic sealing methods to prevent pest entry.
○YES ○NO ○MAYBE	B 10	**7.6 Smoke-Free Policy** *(Baseline and Optional)* ***Baseline:*** Implement and enforce a smoke-free policy in all common area and within a 25-foot perimeter around the exterior of all residential buildings. Lease language must prohibit smoking in these locations and provide a graduated enforcement policy. Make the smoke-free policy readily available. ***Optional:*** Expand the policy above to include all indoor spaces in the property.

B = Baseline # = OPTIONAL POINT		
OYES ONO OMAYBE	B 12 Max	**7.7 Ventilation** *(Baseline for New Construction and Substantial Rehab; Optional for Moderate Rehab)* For each dwelling unit in full accordance with the current version of ASHRAE 62.2 or 62.1 as coordinated with the adopted edition of the IECC for the State of Iowa, install: · A local mechanical exhaust system in each bathroom *[3 points if Moderate Rehab]* · A local mechanical exhaust system in each kitchen *[3 points if Moderate Rehab]* · A whole-house mechanical ventilation system *[3 points if Moderate Rehab]* Verify these flow rates are either within +/– 15 CFM or +/– 15% of design value. Each multifamily building ≥ 4 stories, in accordance with the current version of ASHRAE 62.2 or 62.1 as coordinated with the adopted edition of the IECC for the State of Iowa, install: · A mechanical ventilation system for all hallways and common spaces *[3 points if Moderate Rehab]* For all project types, in addition to the above requirements: · All systems and ductwork installed per manufacturer's recommendations · All bathroom fans ENERGY STAR-labeled and wired for adequate run-time. · If using central ventilation systems with rooftop fans, each fan must be direct-drive and variable-speed with speed controller mounted near the fan. Fans with design CFM 300-2000 must also have an ECM motor.
OYES ONO OMAYBE	B	**7.8 Dehumidification** **Option 1:** Design, select, and install supplemental dehumidification equipment to keep relative humidity <60%. OR **Option 2:** Equip all dwelling units with dedicated space, drain, and electrical hook-ups for permanent supplemental dehumidification systems to be installed if needed and install interior RH monitoring equipment as described.
OYES ONO OMAYBE	3	**7.9 Construction Pollution Management** **Option 1:** Earn the EPA Indoor airPlus label OR **Option 2:** In all dwelling units, seal all heating, cooling, and ventilation return and supply floor ducts and returns throughout construction to prevent construction debris from entering. Flush all dwelling units after completion of construction and prior to occupancy for either 48 hours or with at least 14,000 ft3 per ft2 of floor area, then replace all air handling equipment filters.
OYES ONO OMAYBE	3	**7.10 Noise Reduction** **Option 1:** Test and demonstrate that noise levels in bedrooms meet 30 dB LAeq (continuous) and 45 dB LAmax, (single sound). OR **Option 2:** Provide a noise abatement plan specific to the site covering general noise mitigation techniques in accordance with 24 CFR 51B. OR **Option 3:** Ensure all exterior wall and party wall penetrations are sealed with acoustical sealant, all party walls and floor/ceiling assemblies have an STC rating of at least 55, and exterior windows and doors in projects near a significant exterior noise source have an STC rating of at least 35.

	B = Baseline # = OPTIONAL POINT	
OYES ONO OMAYBE	9	**7.11 Active Design: Promoting Physical Activity** **Option 1:** Encouraging Everyday Stair Usage (buildings that include stairs as the only means to travel from one floor to another are not eligible for this option.) Provide a staircase that is accessible and visible from the main lobby and is visible within a 25-foot walking distance from any point in the lobby per the specifications listed. Place point-of-decision signage. OR **Option 2:** Activity Spaces. Provide on-site dedicated recreation space with exercise or play opportunities for adults and/or children that is open and accessible to all residents; see criterion for specifics.
OYES ONO OMAYBE	B 10	**7.12 Beyond ADA: Universal Design** **Baseline (Residential Projects Only):** Implement Division 1, Required Best Practices, of the Iowa Green Streets Criteria Universal Design Required and Bonus Best Practices Checklist. **Optional [10 points]:** Implement Division 2, Best Practices, of the Iowa Green Streets Criteria Universal Design Required and Bonus Best Practices Checklist.
OYES ONO OMAYBE	8	**7.13 Healing-Centered Design** Select and implement at least two of the Options with at least two different strategies listed in at least 75% units. **Option 1**: Provide an environment that promotes feelings of real and perceived safety. **Option 2:** Create flexible spaces that allow for personalization and/or manipulation to meet individual and community needs. **Option 3:** Connect residents and staff to a living landscape and the natural environment. **Option 4:** Utilize art and culture in project design and programming and promote social connectedness.
		SUBTOTAL OPTIONAL POINTS
	B = Baseline # = OPTIONAL POINT	**8. OPERATIONS, MAINTENANCE + OCCUPANT ENGAGEMENT**
OYES ONO OMAYBE	B	**8.1 Building Operations & Maintenance Manual and Plan** *(For all Multifamily, Commercial and Mixed-Use projects)* Develop a manual with thorough building operations and maintenance (O&M) guidance and a complementary plan. The manual and plan should be developed over the course of the project design, development, and construction stages, and should include sections/chapters addressing the list of topics.

B = Baseline # = OPTIONAL POINT		
OYES ONO OMAYBE	B	**8.2 Emergency Management Manual** (For all Multifamily, Commercial and Mixed-Use projects) Provide a manual on emergency operations targeted toward operations and maintenance staff and other building-level personnel. The manual should address responses to various types of emergencies, leading with those that have the greatest probability of negatively affecting the project. The manual should provide guidance as to how to sustain the delivery of adequate servicesg throughout an emergency and cover a range of topics, including but not limited to: · communication plans for staff and residents · useful contact information for public utility and other service providers · infrastructure and building "shutdown" procedures · plan for regular testing of backup energy systems, if backup systems exist
OYES ONO OMAYBE	B	**8.3 Occupant Manual** Provide a guide for building tenants and residents that explains the intent, benefits, use and maintenance of their building's green features and practices. The Occupant Manual should encourage green and healthy activities per the list of topics.
OYES ONO OMAYBE	B	**8.4 Walk-Throughs and Orientations to Property Operation** Provide a comprehensive walk-through and orientation for all residents, property manager(s), and buildings operations staff.
OYES ONO OMAYBE	B	**8.5 Energy and Water Data Collection and Monitoring** For rental properties, upload project energy and water performance data in an online utility benchmarking platform annually for at least five years from time of construction completion per one of the four methods provided; grant IEDA view access for that period. For owner-occupied units, collect and monitor utility data in a manner that allows for easy access and review.
		SUBTOTAL OPTIONAL POINTS
		TOTAL OPTIONAL POINTS

A.5 IEDA Certified Site Program Green Guidebook

IEDA Certified Site Program Green Guidebook

2019 - Round II

IOWA economic development

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IMPORTANCE OF SITE CERTIFICATION

One of the fastest growing trends in the site location business is the demand for project-ready industrial sites. Companies continue to reduce the time allowed for making a location decision as well as the time required to start construction and complete the project. As such, the location decision process demands available sites, and those sites need to be ready for development. Companies looking to build new facilities want sites that are ready to go and relatively "risk free."

As a result, communities who are seeking to recruit projects need to be prepared to market their sites with a wealth of site-related information and data on their community. Companies are not willing to wait for a community to find an appropriate site and determine its suitability for development. Recognizing this trend, the Iowa Economic Development Authority (IEDA) initiated a Certified Site Program in 2012. To assist with this endeavor, IEDA has retained Quest Site Solutions (Quest), a site selection consulting firm. The program is designed with questionnaires and required support documentation similar to that which is required on a site selection project.

MINIMUM CRITERIA FOR GREEN CERTIFICATION

The desire for ready-to-go sites is not limited to the industrial sector. Companies seeking to build new office facilities also value speed and seek to avoid risks associated with development. Additionally, there is a growing recognition of the importance of environmentally sensitive design in both office and industrial development. IEDA initiated the Green Certification Program in an effort to proactively prepare property for users that are committed to reducing their environmental impact of development.

The Green Certification Program consists of one category, Green Business Park, with criteria designed for multiple users and ancillary park activities. Similar to the rigorous standards of the existing industrial certification program, stringent due diligence requirements must be met in order to achieve certification. However, the Green Certification Program is unique in its recognition of and requirements to protect what might traditionally be viewed as impediments to development, such as floodplains and wetlands. A focal point of the Green Certification Program is the requirement to develop and adopt covenants that will provide strong guidance for the future development of the Green Business Park.

Note that the criteria listed in the following section are only the minimum criteria. The documentation that is required for each criterion begins on page 7 (Required Attachments).

PROGRAM CONTACTS

If there are any questions regarding the materials or the application process, please contact:

Lindsey Cannon
Quest Site Solutions
(864) 551-0349
lcannon@questsitesolutions.com

Sarah White
Quest Site Solutions
(864) 420-6291
swhite@questsitesolutions.com

Amy Kuhlers
Iowa Economic Development Authority
(515) 348-6250
amy.kuhlers@iowaEDA.com

Property Availability

1. The park must be available for sale or lease (with a documented price and terms) to prospective industrial investors. If the property is available for purchase, the availability period must be a minimum of three years.[1] If the park is only available for lease, the lease term must be a minimum of 25 years.

Property Developability

2. A park must meet the following requirements for available acreage and minimum contiguous, developable acreage to be considered for Green Certification.

Category	Available Acreage	Developable Acreage
Green Business Park	50+ acres with two sites ≥ 5 acres	5 contiguous, developable acre sites; 60% of remaining park acreage; All sites within park must be ≥ 1 acre

3. The park's developable acreage must be located outside of the 100-year flood zone. Filling of area(s) located within the flood zone is prohibited for certification.

4. The park must be free of recognized environmental conditions or have recognized environmental conditions remediated and/or resolved prior to certification.

5. Areas within the park with a Floristic Quality Index (FQI) of 35 or higher or Mean C of 3.5 or higher must be designated as "undevelopable" within the Master Development Plan and integrated into the park's permanent open space area for preservation. Efforts should be made for ongoing ecological restoration and stewardship of these areas.

6. The park's developable acreage must be free of wetlands. Remnant ecosystems and high quality wetlands must be preserved. Efforts should be made to preserve all wetlands within the park.

7. The park's developable acreage must be free of federal threatened and endangered species. Existing habitat for endangered species must be preserved. Efforts should be made to preserve existing habitat for threatened species.

8. The park's developable acreage must be free of areas of archaeological or historical significance or be able to be mitigated within 90 days. If the schedule for mitigation is longer than 90 days, mitigation must be completed prior to certification

9. The park's developable acreage must have soils compatible with industrial development.

10. The topography of the park must be demonstrated, as well as a proposed building pad. Critical slope areas should be integrated into the Master Development Plan.

[1] If the applicant intends to pursue certification lasting for the maximum possible duration (five years), then the applicant must document that the property will be available for a period of at least five years. Certifications will not be issued for a duration longer than the period of property control. For example, options with annual renewals will not be accepted.

Zoning

11. The park must be zoned appropriately or be able to be rezoned for Green Business Park uses within 90 days (if applicable). If an appropriate zoning category does not already exist within the jurisdiction, then a new zoning category must be developed and enacted or necessary modifications to an existing zoning category must be completed prior to certification. The surrounding properties must also be compatible with Green Business Park uses.

Transportation

12. The park must be directly served or be able to be served within six months by a road(s) that is compatible with standards for tractor-trailer access (80,000 pounds and 16 feet minimum clear height). The property must be 15 miles of an interstate or four-lane highway.

13. To market the park as rail-served, the property must be served or be able to be served within 12 months by rail. Rail is not required for Green Business Parks.

Utilities

14. The park must be served or be able to be served by three-phase electric infrastructure that can provide at least 2 MW of capacity to the park. At least 1 MW (50% of the required capacity) must be provided within six months. The additional required 1 MW must be available within the following six months.

15. If the applicant intends to market the park as served by natural gas, the park must be served or be able to be served within six months by natural gas. (Natural gas service is not required for Green Business Parks.) In order to market the park as served by natural gas, the park must be served or be able to be served by natural gas infrastructure that can provide 8,000 mcf per month. At least 4,000 mcf per month (50% of the required capacity) must be provided within six months. The additional required 4,000 mcf per month must be available within the following six months.

16. The park must be served or be able to be served by water infrastructure and a water system with excess capacity of at least 150,000 gpd. At least 75,000 gpd of excess capacity (50% of the required capacity) must be provided within six months. The additional required 75,000 gpd of excess capacity must be available within the following six months.

17. The park must be served or be able to be served by wastewater infrastructure and a wastewater treatment plant with excess capacity of at least 100,000 gpd. At least 50,000 gpd of excess capacity (50% of the required capacity) must be provided within six months. The additional required 50,000 gpd of excess capacity must be available within the following six months.

18. The park must be served or be able to be served by telecommunications fiber within six months.

Other Requirements

19. The applicant must determine and enact provisions for an entity to oversee the development and maintenance of the park.

20. Protective covenants for the park must be developed and enacted prior to certification. The covenants must include all six required items. The covenants must also include at least six of the nine additional items.

Step 1: Kick-off and Qualification

Kick-off Webinar	July 10, 2019
Deadline to Submit **Qualification Application**	**August 1, 2019**
Applicant Receives Notification to Proceed	August 15, 2019

Step 2: Site Evaluation

Deadline to Submit **Step 2 Evaluation Application**	**September 26, 2019**
Applicant Receives Feedback	October 2019
Site Visit	**Week of November 4th or 11th, 2019**
Applicant Receives Notification to Proceed	December 2019

Step 3: Site Certification

The following is the timeframe once the applicant is invited to Step 3. It is recommended that the applicant get their certification application in as soon as possible. This will allow the applicant to have multiple rounds for follow-up items as needed within the allotted time. **Deadlines are firm and extensions will not be granted unless discussed and approved prior to deadline.**

	Timeframe (Maximum Length)
Certification Application	Nine months from invitation to proceed letter
Quest review of Certification Application	30 days
Applicant completes follow-up items	90 days
Quest reviews follow-up items	30 days
Applicant completes follow-up #2	30 days
Quest final decision	30 days
Maximum Length of Certification Phase	**16 months**

Note: If a certification application is submitted before the nine months allotted, then the extra time will be added to the time allotted for follow-up items, but under no circumstances will the maximum length of the certification phase be longer than 16 months.

CERTIFICATION EXPIRATION AND RECERTIFICATION

An expiration date for each property that reaches certification will be indicated in the certification letter provided to each applicant. The maximum duration of certification will be five years. The certification will never be longer than the duration of property control. (For example, if a three-year option is provided, then the certification will only be valid for three years.) The documentation submitted with the certification application must meet the acceptable timeframes described in the next section.

In order for a property to remain certified upon expiration, the property will have to be recertified. All properties will have to be recertified under the program guidelines and minimum criteria in place at the time of recertification.

Step 1: Qualification

- Complete the Step 1 Qualification Application Required Attachments (Attachments 1-7). Submit the items in the order requested. The items should be saved as separate files and not submitted as one large PDF. **Please upload an electronic copy of the submission by August 1, 2019 via Sharefile: IEDA Certified Site Program - 2019 Round II.**

- Quest will review the Qualification Application and notify each applicant by August 15, 2019 if they are invited to proceed with Step 2: Site Evaluation.

Step 2: Site Evaluation

- Complete the Step 2 Site Evaluation Required Attachments. Submit the items in the order requested. The items should be saved as separate files and not submitted as one large PDF. If any Step 3 items have already been completed, please also provide these items with your Step 2 application. **Please upload an electronic copy of the submission by September 26, 2019 via Sharefile (link provided in email invitation sent at the end of Step 1).**

- **Submit a check for $500 payable to IEDA** to Amy Kuhlers, IEDA, 200 East Grand Avenue, Des Moines, IA 50309.

- Quest will conduct a desktop evaluation of the questionnaire and the required attachments. Approximately two weeks prior to the site visit, Quest will issue a letter to the applicant requesting additional information or clarification of certain items. Additional follow-up information may be requested at the site visit as well.

Step 3: Site Certification

- The applicant will receive an invitation to participate in Step 3 from Quest in December 2019. For those applicants invited to proceed, Quest will schedule a monthly 30-minute check-in call.

- Complete the Step 3 Certification Application Required Attachments. Submit the items in the order requested. The items should be saved as separate files and not submitted as one large PDF. For any Step 1 or Step 2 items that have been updated, please also provided the new version of these documents. **Please upload an electronic copy of the submission by the deadline stated in the invitation to proceed letter via Sharefile (link provided in invitation to proceed letter sent at the end of Step 2).**

- Upon receipt of the information, Quest will conduct a desktop evaluation of the application. Quest will issue a letter to the applicant requesting additional information or clarification of certain items, if needed. A deadline to complete the requested additional information will be provided in the Follow-Up Letter.

- If the applicant has completed all criteria within the allotted timeframe, Quest will deliver a letter indicating that the site is certified as ready for development. This letter will also state the certification expiration date. A report on the site or park's strengths and weaknesses will also be provided.

Please submit items in the order listed at the corresponding steps of the program. The file name for each attachment should correspond to the same numbering as listed below.[2]

Although the Required Attachments for all three steps are listed below, please note that you are proceeding at your own risk if you complete Step 2 or 3 items before being invited to each of those steps.

GUIDELINES

All maps should show a title, a scale, a directional arrow, clear boundaries of the property, and a date. Hand drawn maps are not acceptable.

All letters must be on the appropriate letterhead and include a date and a signature.

All due diligence studies must be conducted on the entire acreage that you are seeking to certify. If you have a previously conducted study that only covers a portion of the acreage that you are seeking to certify, a study on the additional acreage is required.

STEP 1 REQUIRED ATTACHMENTS

Attachment #		Step 1 Required Attachments
1		Qualification Checklist.
2		General location map.
3		Aerial Photograph with property boundaries identified.
4		Documentation that ensures that the property will be offered for a period of at least three years. This could be: • An appropriate real estate listing agreement authorizing an agent to offer the property for sale • An exclusive option to purchase • A contingency contract to purchase or lease • *If the property owner is also the applicant,* a letter from the owner (or authorized representative) indicating the intent to sell the property.
5		Map illustrating the current zoning for the property and surrounding parcels with property boundaries identified.
6		Utility infrastructure map(s) with property boundaries identified (must show all utilities including electric, natural gas, water, wastewater, and telecommunications).
7		If any environmental due diligence studies have been conducted (Phase I ESA, geotechnical assessment, wetlands delineation, endangered species, archaeological / historical report), provide a copy of each study (executive summary or findings/conclusion are acceptable for Step 1).

[2] For example, the file name for the general location map (#2 on this list) should read "2 – General Location Map".

Please note that you are proceeding at your own risk if you complete Step 2 or 3 items before being invited to each of those steps.

STEP 2 REQUIRED ATTACHMENTS

Attachment #		Step 2 Required Attachments
8		Questionnaire.
9		Transportation network map (all highways, rail, and commercial service airports within 45 miles of the property).
10		Neighborhood access map that shows all assets (residential, parks, restaurants, retail areas, etc.) located within ½ mile of the property and all transportation paths to the assets.
11		USGS quadrangle map with property boundaries identified.
Property Availability		
12		Letter from the owner or controlling entity stating a price and the conditions of a sale or lease. Letter must also indicate that the property is subdividable. (Can be combined with documentation in Attachment 4 above, if applicable.)
13		Copy of any active lease agreements. If the property owner maintains lease(s) on the property (i.e. hunting, timber, farming, etc.), documentation must include a clause which allows a buyer (or long-term lessee) to take possession of the property no more than 90 days following deed transfer (or signing of a long-term lease). A reasonable buyout for potential loss revenue to the current lessee is acceptable.
14		Present deed(s) indicating the current ownership of the property.
15		County tax map, with tax parcel identification numbers shown, depicting the location and property boundaries.
Developability		
16		FEMA flood map(s) with panel number indicated and property boundaries identified.
17		National Wetlands Inventory (NWI) map with property boundaries identified.
18		A Species Report from U.S. Fish and Wildlife's Information, Planning, and Conservation System (IPaC) using the Initial Project Scoping feature.
19		County soil survey with property boundaries identified.
Zoning		
20		Map(s) illustrating the current zoning for the property and surrounding area with property boundaries identified. If there is no zoning in the jurisdiction, attach a comprehensive or long-range plan and/or map (if applicable).
21		Property's current zoning description including acceptable uses (if there is zoning in the jurisdiction).

Attachment #		Step 2 Required Attachments
Zoning (continued)		
22	a	If the property needs to be rezoned for Green Business Park uses, submit a letter of willingness from authorized personnel to consider a change to property's zoning, create a new zoning category, or make necessary modifications to an existing zoning category, (whichever is applicable). This letter should also include an outline of the rezoning process and a timeline. The rezoning process must be able to be completed within 90 days.
	b	The zoning description, including acceptable uses, of what the property would be rezoned to for Green Business Park uses.
Transportation		
23		Map indicating the route from the property to the closest interstate.
24		Map of existing rail infrastructure with property boundaries identified. *(if applicable)*
25		Rail Questionnaire. *(if applicable)*
Utilities		
26		Infrastructure map(s) with property boundaries identified indicating the following: • Location and voltage of the electric infrastructure serving the property. • Location and size of the natural gas infrastructure serving the property. • Location and size of the water infrastructure serving the property. • Location and size of the wastewater infrastructure serving the property. • Location and type of the telecommunication infrastructure serving the property.
27		Electric Questionnaire.
28		Natural Gas Questionnaire.
29		Water Questionnaire.
30		Wastewater Questionnaire.
31		Telecommunications Questionnaire.

Attachment #		Step 2 Required Attachments
Park Development		
32		Documentation of a draft plan for a development entity to oversee the development and maintenance of the park.
33		A draft set of protective covenants that include the following six required items: • Tenants must utilize green infrastructure practices to infiltrate, evapotranspire, capture, and reuse the water quality volume (runoff from up to 2.25" of rain per 24 hours) to maintain or restore natural hydrologies. • Tenants must maintain a 100-foot buffer around existing high-quality wetlands from parking and building development in order to protect the quality of the wetlands. • Tenants must incorporate into their site plan the pedestrian and bike access ways that are planned throughout the interior of the park and to the park boundaries (as shown in the Master Development Plan for the park) or seek a variance to incorporate an alternative routing that achieves a similar outcome. • Tenants must design and construct facilities to LEED certification standards. • Tenants must meet the standards of the Model Lighting Ordinance (MLO) as designed by the International Dark-Sky Association (IDA) and the Illuminating Engineering Society of North America (IESNA). • Incorporate charging stations for electric vehicles into site layout, and build the utility conduits for the infrastructure at the time of facility construction, to proactively prepare for installation as demand grows The covenants must also include at least six of the following nine additional items as requirements for locating and operating in the park: • Harvest, treat, and reuse rainwater and/or greywater to meet a portion of the project's water needs • Avoid conventional irrigation (drip irrigation is allowed) • Require the use of native vegetation that minimizes water usage • Use integrated pest management • Provide access to shower/locker areas and bike parking/storage (onsite or participate in shared) • Provide priority parking for carpooling • Participate in a renewable energy purchase program offered by the electric service provider OR use onsite renewable energy systems to offset 5% of facility energy costs • Institute recycling program • Adopt measures to reduce heat islands either through non-roof methods (provide shade with plants or architectural structures) or roof methods (highly reflective or vegetated roofs)

Attachment #		Step 2 Required Attachments
Park Development (continued)		
34		A letter from each property owner indicating that they: • Have reviewed the draft plan for a development entity and protective covenants • Understand the content of the draft plan and covenants • Are willing to participate in the enactment of the plan and have the covenants be put in place for their property
Public Transportation *(if applicable)*		
35		Map of existing public transportation routes with property boundaries identified.
36		Documentation of the process and requirements for altering routes and adding stops along the route.
Other *(if applicable)*		
37		If any due diligence has been completed on the property, please provide a copy. This includes but is not limited to Phase I ESA, Wetlands Delineation, Threatened and Endangered Species Survey, Archaeological and Historical Investigation, or Geotechnical Assessment.
38		Provide a copy of any additional documentation that has been completed and would be helpful in the evaluation of the property. This includes but is not limited to Master Concept Plan, Property Marketing Materials, Boundary Survey, Title Search, etc.

Please note that you are proceeding at your own risk if you complete Step 2 or 3 items before being invited to each of those steps

STEP 3 REQUIRED ATTACHMENTS

Depending on the results of the due diligence studies and/or necessary utility improvements, additional follow-up may be required as outlined in the list below.

Also submit any items from Step 1 or 2 (including questionnaires) that have been updated.

Attachment #		Step 3 Required Attachments
Property Availability		
39		IEDA Reimbursement Agreement(s) signed by applicant(s).
40		Title opinion or title insurance must be submitted that shows clear title to the property. Documentation must indicate: • The owner has a saleable interest in the property • Any restrictions on the use of the property (covenants or easements) • Any liens that may exist against the property. *Additional details and requirements are outlined in the Due Diligence Overview starting on page 18.*
41		Recordable survey for the property that at a minimum shows property boundaries, easements, and rights-of-way and corresponding acreages. *Additional details and requirements are outlined in the Due Diligence Overview starting on page 18.*
Developability		
42		If existing impediments (structures, roads, etc.) are present on the developable acreage, provide a cost and schedule estimate to have the impediments removed. The property's developable acreage must be free of existing impediments or be able to be removed within 90 days.
43		If existing structures are present within the boundaries of the Green Business Park and will be marketed as redevelopment opportunities, then a Property Condition Assessment conducted in accordance with ASTM Standard E2018-08, must be completed for each structure.
44	a	Topographic survey or topographic analysis of the property indicating the two-foot contours of the property. Critical slope areas should be identified on the topographic survey.
	b	If critical slopes exist on the property and will be preserved, a restoration plan must be provided.

Attachment #		Step 3 Required Attachments
Developability (continued)		
45	a	Engineer's itemized cost and schedule estimate of the clearing, grubbing, and grading of a building pad on one of the two primary sites in the park. To complete this estimate, the applicant should assume a square or rectangular graded pad that is 50% of the total size of the primary site. (If the primary site is 5 acres, the estimate will be for the clearing, grubbing, and grading of a 2.5-acre pad.)
	b	A visual indicating the location of the proposed pad on the property.
46		Phase I Environmental Site Assessment (ESA), conducted in accordance with ASTM Standard E1527-13. *Additional details and requirements are outlined in the Due Diligence Overview starting on page 18.*
47		Floristic Quality Assessment (FQA) of the property including report(s) and map(s) indicating the property characteristics must be completed. The report(s) should include a summary of each vegetation unit, with the FQI and Mean C clearly noted for each vegetation unit.
48		Wetlands Delineation and approved Jurisdictional Determination letter from the U.S. Army Corps of Engineers. *Additional details and requirements are outlined in the Due Diligence Overview starting on page 18.*
49		Threatened and Endangered Species report. *Additional details and requirements are outlined in the Due Diligence Overview starting on page 18.*
50		Cultural Resources Identification Survey (CRIS) and concurrence letter from the State Historic Preservation Office (SHPO). *Additional details and requirements are outlined in the Due Diligence Overview starting on page 18.*
51		Geotechnical Investigation. *Additional details and requirements are outlined in the Due Diligence Overview starting on page 18.*
Roads – External (outside the park) ***If the route does not completely allow for tractor-trailer access, the applicant must submit the following documentation:***		
52	a	Letter of Intent from an appropriate authority stating access will be upgraded to required standards when the property is developed. This letter should contain specific details about all road improvements necessary to allow access to the property.
	b	A plan including itemized cost and schedule estimates for making all necessary upgrades to the property access. All necessary upgrades must be able to be completed within the timeframes listed above.
	c	A written plan to finance all necessary upgrades to the property access.

Attachment #		Step 3 Required Attachments
Rail *(if applicable)*		
53	a	Potential rail layout for the property with property boundaries identified.
	b	Plan (including the route, a cost, and a schedule) for providing rail service to the property. Rail extension must be able to be completed within 12 months.
	c	If rail is not to the property boundary, proof that rights-of-way for a rail extension are under control with either a Letter of Intent from the owner(s) or an option.
Electric ***If the infrastructure to provide the required level of service (MW) is not at the property, the applicant must submit the following documentation:***		
54	a	An engineer's detailed plan for extending infrastructure to provide the required level of service to the property. The plan must include a visual indicating the proposed extension, an itemized cost estimate, and detailed schedule. Electric infrastructure extension must be able to be completed within the required timeframe, including permitting.
	b	Proof that rights-of-way for the extension are under control with either a Letter of Intent from the owner or an option. *No documentation is needed if proposed extension is within a public right-of-way (i.e., state or county roads).*
Natural Gas *(if applicable)* ***If the infrastructure to provide the required level of service (mcf per month) is not at the property, the applicant must submit the following documentation:***		
55	a	An engineer's detailed plan for extending natural gas infrastructure to the property. The plan must include a visual indicating the proposed extension, an itemized cost estimate, and detailed schedule. The extension must be able to be completed within the required timeframe, including permitting.
	b	Proof that rights-of-way for the extension are under control with either a Letter of Intent from the owner or an option. *No documentation is needed if proposed extension is within a public right-of-way (i.e., state or county roads).*

Attachment #		Step 3 Required Attachments
Water Infrastructure ***If the infrastructure to provide the required level of service (gallons per day) is not at the property, the applicant must submit the following documentation:***		
56	a	An engineer's detailed plan for extending water infrastructure to the property. The plan must include a visual indicating the proposed extension, an itemized cost estimate, and detailed schedule. The extension must be able to be completed within the required timeframe, including permitting.
	b	Proof that rights-of-way for the extension are under control with either a Letter of Intent from the owner or an option. *No documentation is needed if proposed extension is within a public right-of-way (i.e., state or county roads).*
	c	A written plan to finance the water extension upon request for service.
Water System ***If the system to provide the required level of service (gallons per day) is not at the property, the applicant must submit the following documentation:***		
57	a	An engineer's detailed plan for expanding the existing water treatment system. The plan must include an itemized cost estimate and detailed schedule. The water system expansion must be able to be completed within the required timeframe, including permitting.
	b	A written plan to finance the water system upgrade upon request for service.
Wastewater Infrastructure ***If the infrastructure to provide the required level of service (gallons per day) is not at the property, the applicant must submit the following documentation:***		
58	a	An engineer's detailed plan for extending wastewater infrastructure to the property. The plan must include a visual indicating the proposed extension, an itemized cost estimate, and detailed schedule. The extension must be able to be completed within the required timeframe, including permitting.
	b	Proof that rights-of-way for the extension are under control with either a Letter of Intent from the owner or an option. *No documentation is needed if proposed extension is within a public right-of-way (i.e., state or county roads).*
	c	A written plan to finance the wastewater extension upon request for service.

Attachment #		Step 3 Required Attachments
Wastewater Treatment Plant ***If the <u>wastewater treatment plant</u> is not capable of providing the required level of treatment capacity (gallons per day), the applicant must submit the following documentation:***		
59	a	An engineer's detailed plan for expanding the existing wastewater treatment system. The plan must include an itemized cost estimate and detailed schedule. The wastewater treatment plant expansion must be able to be completed within the required timeframe, including permitting.
	b	Written plan to finance the wastewater system upgrades upon request for service.
Telecommunications ***If the infrastructure to provide the required level of service (fiber) is not at the property, the applicant must submit the following documentation:***		
60	a	An engineer's detailed plan for extending telecommunications infrastructure to the property. The plan must include a visual indicating the proposed extension, an itemized cost estimate, and detailed schedule. The extension must be able to be completed within the required timeframe, including permitting.
	b	Proof that rights-of-way for the extension are under control with either a Letter of Intent from the owner or an option. *No documentation is needed if proposed extension is within a public right-of-way (i.e., state or county roads).*
Park Development		
61		Documentation that a development entity is in place to oversee the development and maintenance of the park.
62		Documentation that the covenants have been adopted and cover all of the acreage within the Green Business Park.

Attachment #		Step 3 Required Attachments
Master Development Plan		
63		A Master Development Plan (map) that shows: • Proposed lot locations and sizes (including the total and developable acreage for each lot) • Potential building pad on one of the primary (largest) sites • Any existing structures considered "Redevelopment Opportunities" (if applicable) • Proposed location(s) and extents of stormwater management structure(s) to control runoff from the proposed developable areas for storm events greater than 2.25" of rain per 24 hours, per the ISWMM Unified Sizing Criteria (stormwater can be provided by the Development Entity or tenant) • Road access points and proposed roads within the park • Pedestrian and bike access ways throughout the park and to the boundaries of the park • Potential rail layout (if applicable) • Location of utilities (existing and proposed) to serve the potential building pad on one of the primary (largest) sites, with utility line sizes labeled The Master Development Plan should take into consideration the results of all of the due diligence studies and note the location of development limitations and special features, such as: • Areas within the park with a Floristic Quality Index (FQI) of 35 or higher or Mean C of 3.5 or higher • Floodplains • Existing high-quality wetlands and 100-foot buffer areas • Critical slope areas • Easements
Public Transportation (if applicable)		
64		Letter from the public transportation entity indicating its feasibility and willingness to provide service to the property and an estimated cost and schedule for extending service to the property.

The following section provides additional detail on the due diligence required for certification. The entire property being considered for certification must be included in the documentation.

Title Opinion or Insurance (Attachment 40)

- **Title opinion or title insurance** must be submitted that shows clear title to the property. Documentation must indicate:
  - The owner has a saleable interest in the property
  - Any restrictions on the use of the property (covenants or easements)
  - Any liens that may exist against the property.
- Guidelines:
  - The title search must encompass at least the prior 40-year history.
  - Title opinion or insurance that has been completed in the past five years is acceptable as long as there have been no changes in ownership.
  - If an opinion or insurance is more than five years old, the interim gap must be covered.
  - Quest may require that item(s) identified within the documentation, such as outstanding liens, be resolved prior to certification.

Property Survey (Attachment 41)

- **Recordable survey** for the property that at a minimum shows property boundaries, easements, and rights-of-way and corresponding acreages.
- Guidelines:
  - There must be no changes (sale of parcel, etc.) since the latest survey, and survey must be up to current standards (shows rights-of-way, etc.).
  - We recommend providing the title search to the surveyor in order to ensure all easements and legal impediments are captured in the survey.

Geotechnical (Attachment 51)

- **Geotechnical investigation.**
- Guidelines:
  - A minimum of four borings or soundings for properties less than 200 acres is required. One boring or sounding per 50 developable acres is required for properties larger than 200 acres. Borings must be to a depth of at least 25 feet.
  - The study should also indicate a specific Seismic Site Class per current International Building Code. If a geotechnical study has already been completed, an addendum or separate letter can be provided that indicates the Seismic Site Class.
  - We will accept geotechnical studies that have been completed in the past **15 years**. The time period is from the date of certification. (Example: If the property is certified in January 2020, the study must have been conducted during or after January 2005.) The geotechnical assessment must include the required number of soundings or borings to the required depths and Seismic Site Classification.

Phase I Environmental Site Assessment (Attachment 46)

- **Phase I Environmental Site Assessment** (ESA), conducted in accordance with ASTM Standard E1527-13.
- Additional items that may be required depending on report/results:
  - If not included in the Phase I ESA, a letter from the Environmental Professional that conducted the Phase I ESA outlining any recommendations for further assessment of the property.
  - If a recognized environmental condition (REC) is identified or recommendations are for further study or remediation, then the further assessment and/or work must be completed to resolve the issue and documentation must be provided.
- Guidelines:
  - Phase I ESAs that have been completed in the past **five years** are acceptable. The time period is from the date of certification. (Example: If the property is certified in January 2020, the study must have been conducted during or after January 2015.)
  - It is not acceptable to simply cut out an area that contains an REC from the acreage being certified. All environmental issues must be remediated and/or resolved prior to certification.

Wetlands (Attachment 48)

- **Wetlands Delineation and approved Jurisdictional Determination letter** from the U.S. Army Corps of Engineers.
- Additional items that may be required depending on report/results:
  - If low-quality or isolated wetlands exist and will be disturbed, a plan for mitigation, including costs and a schedule. Mitigation must be able to be completed within 90 days. If the schedule for mitigation is longer than 90 days, mitigation must be completed prior to certification.
- Guidelines:
  - Wetlands Delineation should include report(s) and map(s) indicating the location of wetlands and other waters of the U.S.
  - An approved Jurisdictional Determination letter from the U.S. Army Corps of Engineers verifying the Wetlands Delineation.
  - The approved Army Corps of Engineers Jurisdictional Determination letter must be valid/active.
  - If all other criteria have been met successfully, the property will be certified contingent upon receiving the approved Jurisdictional Determination letter from the U.S. Army Corps of Engineers. Proof that a request for an approved Jurisdictional Determination letter has been submitted to the Corps must be provided.

Threatened & Endangered Species (Attachment 49)

- **Threatened and Endangered Species** report**.**
- Additional items that may be required depending on report/results:
    - Correspondence from the U.S. Fish and Wildlife Service (USFW) should accompany the documentation that was completed. Correspondence is not required if a determination of "no effect" is found for all listed species as the USFW does not issue letters on determinations of "no effect."
    - If any species are part of or will impact the acreage to be developed, a plan for mitigation, including costs and a schedule, must be submitted. Mitigation must be able to be completed within 90 days. If the schedule for mitigation is longer than 90 days, mitigation must be completed prior to certification.
- Guidelines:
    - The report should provide an effect determination for each federal threatened or endangered species listed in the USFW IPaC Report. The effect determinations are normally "no effect" or "may affect." For the "may affect" species, this is further broken down into "likely to adversely effect" or "not likely to adversely effect."
    - For any species where an effect of "may effect" is determined, then additional study should be conducted to determine the presence and location of the species on the property.
    - We will accept species studies/USFW concurrence letters (if applicable) that have been completed in the past **five years**. The time period is from the date of certification. (Example: If the property is certified in January 2020, the study must have been conducted during or after January 2015.)

Cultural Resources (Attachment 50)

- **Cultural Resources Identification Survey (CRIS) and concurrence letter** from the State Historic Preservation Office (SHPO).
- Additional items that may be required depending on report/results:
    - If any areas of concern are part of or will impact the acreage to be developed, a plan for mitigation, including costs and a schedule, must be submitted. Mitigation must be able to be completed within 90 days. If the schedule for mitigation is longer than 90 days, mitigation must be completed prior to certification.
- Guidelines:
    - CRIS and concurrence request should follow the *Memorandum of Understanding (Revised September 2018)* between IEDA and the Iowa State Historic Preservation Office. This MOU is included on the following page.
    - SHPO completes a preliminary review of each property during Step 2 and feedback is provided to applicants. These SHPO comments should be provided to the consultant completing the CRIS.
    - We will accept SHPO concurrence letters that have been completed in the past **five years**. The time period is from the date of certification. (Example: If the property is certified in January 2020, the SHPO letter must have been issued during or after January 2015.)
    - A recorded webinar on the Site Certification Cultural Resources process that the contracted consultants should review is available at https://youtu.be/CtqdOx60bi0.
    - Additional tips for completing the archaeological study are included on page 24.
- Submission:
    - A hard copy should be sent to:
        - State Historic Preservation Office
          Iowa Department of Cultural Affairs
          RE: IEDA Certified Site Program
          600 E. Locust Street
          Des Moines, IA 50319
    - In addition to the mailed copy, an electronic copy should be emailed to IEDA:
        - certsites@IowaEDA.com

MEMORANDUM OF UNDERSTANDING

REVISED SEPTEMBER 2018

BETWEEN THE IOWA ECONOMIC DEVELOPMENT AUTHORITY AND THE IOWA STATE HISTORIC PRESERVATION OFFICE REGARDING THE IMPLEMENTATION OF GUIDELINES FOR CULTURAL RESOURCE IDENTIFICATION SURVEYS CONDUCTED FOR THE IOWA ECONOMIC DEVELOPMENT AUTHORITY SITE CERTIFICATION PROGRAM

Introduction and Intent

The purpose of the Iowa Economic Development Authority Site Certification Program is to identify and clarify issues pertaining to the potential development of a specific commercial or industrial site. To that end, the Iowa Economic Development Authority (IEDA) and the State Historic Preservation Office, Department of Cultural Affairs (SHPO) have developed guidelines for collecting information regarding cultural resources that may be affected by potential development at Certification Sites.

Definitions

Certification Site: a specifically defined geographic area consisting of a site of at least 50 acres that can support a minimum of 50,000 square feet of building space on a single level and meets the standards of the Iowa Economic Development Authority Site Certification Program as set forth in the Iowa Economic Development Authority Site Certification Program Description and Instructions.

Defined Area: the geographic area or areas within which a Certification Site may directly or indirectly cause alterations in the character, use, authenticity or interpretation of cultural resources, if any such properties exist in or near the Certification Site. The area will initially include the Certification Site for all cultural resources and a buffer of 0.25 miles surrounding the Certification Site, for above-ground resources that could be potentially impacted by development within the Certification Site. The area is influenced by the scale and nature of the intended use of a Certification Site and the final size may be made larger or smaller with appropriate justification for different kinds of uses intended at any given Certification Site.

Cultural Resources Consultant: an individual or a firm with a principal investigator or other duly authorized individual who meets the Secretary of the Interior's Professional Qualification Standards (36 CFR 61) in Archaeology, History, and/or Architectural History (as appropriate) and who will prepare a cultural resource identification survey (CRIS) for the purpose of this Memorandum of Understanding.

Cultural Resources: Buildings, structures, objects, sites, and districts and related materials associated with a culture's history or prehistory. Resources can also include less tangible attributes, such as plantings, landscapes, settlement patterns, transportation networks, and other associations important to the identity of cultural groups.

Significant Cultural Resource: includes both properties formally determined as eligible for the state inventory and those that could be certified for the same inventory in accordance with Iowa Code and/or standards set by the Secretary of the Interior as well as types of property or materials with special protection under Iowa Law. Examples provided in Iowa Code include any property listed on, the National Register of Historic Places or found to be eligible for such listing, any property designated as of historic significance to a district listed in the National Register of Historic Places or eligible for such designation by being located in an area surveyed and evaluated as eligible for the National Register of Historic Places, any property or district designated as a local landmark by a city or county ordinance, any barn constructed prior to 1937, or any human burial.

I-Sites Pro: A web-based mapping application that contains data indicating the location of known structural and archaeological cultural resources in Iowa from the OSA (Office of the State Archaeologist) and SHPO. Contact the OSA Site Records Manager for more information http://www.uiowa.edu/~osa/focus/information/isf.htm

Significance: Cultural resources are significant if they meet or appear to meet set criteria as eligible on the State Inventory or the National Register of Historic Places.

State Inventory: The body of information maintained by the State Historical Society of Iowa or the State Archaeologist in the form of records and documents under the title Iowa Site Inventory and Iowa Site File.

Project Coordination

The entity requesting site certification will hire a Cultural Resources Consultant who meets the Secretary of the Interior's Professional Qualification Standards (36 CFR 61) in Archaeology, History, and/or Architectural History, as appropriate, to prepare a CRIS that is minimally equivalent to a Phase I Intensive Archaeological Survey and an Intensive Historic Architectural Survey of the Certification Site, as appropriate, and at least a Reconnaissance Historic Architectural Survey, as appropriate, within the buffer of the Defined Area. The purpose of a CRIS is to provide identification of significant Cultural Resources on or near the Certification Site and within the Defined Area. In some cases, a CRIS may show that it is so unlikely that significant cultural resources are likely to be present that there is no need for additional investigation, and the Cultural Resources

Consultant who prepares the CRIS will make a recommendation consistent with this finding. In other cases, a CRIS may indicate that additional surveys focus only on particular subareas or types of resources. The SHPO is directed to advise and provide consultation regarding the eligibility of properties for listing on the National Register of Historic Places (NRHP). This MOU is developed to best meet the goals of local communities and IEDA for economic growth in the State of Iowa while taking into consideration the presence of any cultural resources for sites that may become locations of future developments or federal undertakings.

Cultural Resource Identification Survey

A CRIS will contain background historical research on the Certification Site and a summary report with recommendations of the likelihood with which the entity requesting Site Certification would encounter significant cultural resources on the site. In addition to the guidance below, all archaeological investigations shall be conducted in conformance with the *Association of Iowa Archaeologists Guidelines (2017)* and all standing structure evaluations shall conform with the Secretary of the Interior (SOI) Standards for Historical Documentation and any documentation guidelines established by the Iowa SHPO.

Background Research

Background research will include the entire site certification area. The Cultural Resources Consultant may utilize addition sources but shall utilize all of the sources listed below as part of the background research:

- I-Sites Pro database at the subscriber level maintained as the online Iowa Site File
- Historic maps of the project area including, but not limited to, historic atlases and plat maps, topographic maps, historical soil maps, Sanborn Fire Insurance maps and, as appropriate, historic aerial photographs
- Current aerial photographs
- Soil mapping, topographic and geomorphic data (USDA-NRCS and I-Sites Pro LANDMASS)
- Other historical records, including but not limited to, county and municipal records and histories, business directories, and/or newspapers

If a search of the I-Sites Pro database indicates that previously identified cultural resources are present, the Cultural Resources Consultant shall review the following additional sources of information, as appropriate:

- Archaeological site files at the Iowa Office of the State Archaeologist, The University of Iowa (OSA)
- State Inventory files at the Iowa State Historic Preservation Office, Department of Cultural Affairs (SHPO)
- Statewide survey files at OSA and SHPO

Previous Cultural Resources Surveys

In general, a Cultural Resources Consultant may use previous surveys for cultural resources and documented areas of previous disturbance to eliminate relevant portions of the area from further review. If a previous archaeological survey exists for only a portion of a Certification Site, the Cultural Resources Consultant hired to assist in this site certification will use any previous surveys to inform the CRIS finding and will conduct a CRIS for the remainder of the Certification Site. The use of previous surveys within the Certification Site will be noted in the written discussion of the CRIS and copies of previous reports completed within the Certification Site should be included with the submittal of the CRIS to the SHPO. Typically, if a Cultural Resources Consultant conducted the prior survey after 1999 or the previous fieldwork otherwise meets the criteria of identification and evaluation and is consistent with the MOU, no additional survey in the previously surveyed area should be necessary. However, if a previous survey was completed before 1999 or a copy of a qualified report is not available for SHPO review, then the Cultural Resources Consultant must complete a CRIS for the entire Certification Site. SHPO will recommend if additional fieldwork is necessary. The Cultural Resources Consultant should set out in the CRIS any previous research as part of the results of background information review as well as the findings of any required new fieldwork.

As a guide, the Cultural Resources Consultant should consider if the area contains previously surveyed above-ground properties that have been determined as not eligible for listing in the NRHP. This can be accomplished by contacting the SHPO and requesting a list of previously evaluated resources within the area of the Certification Site. The Cultural Resources Consultant need not resurvey ineligible properties as documented in the SHPO inventory within the last five years unless those resources have achieved significance since the time they were last evaluated. The Cultural Resources Consultant should take current photographs and document location of all above-ground resources and submit them with the CRIS. The Cultural Resources Consultant should include a survey or resurvey of any resources that have not been adequately previously evaluated by SHPO. Evaluations for above-ground resources should be documented on the Iowa Site Inventory Form available through the SHPO. The Cultural Resources Consultant shall include in the CRIS copies of all previous documentation such as prior Iowa Site Inventory Forms that were used to inform the findings of the CRIS and shall supplement them to meet current documentation standards, if necessary.

Certification Site Field Work

The Cultural Resources Consultant will conduct a survey of the area to identify any cultural resources that may be altered by future activity at the Certification Site. Review should be broad based but concise. Consideration for a wide range of potential uses at the Certification Site should be made. Provide photographs in the amount sufficient to convey the general character of the setting and location surrounding the Certification Site. For any

individually eligible properties, include at least two photos labeled to indicate subject and cardinal direction to orient a cold viewer. Provide a historic context of the site certification area and a description of any eligible building or structure in the area. Include an Iowa Site Inventory Form/Site Record Form with recommendation of eligibility as appropriate for any resources.

The field work will also include an assessment of the physical condition and on-site soil characteristics and geomorphology of the Certification Site and an assessment of whether there are or are likely to be any significant cultural resources in the area that would be altered by activity at the Certification Site. The Cultural Resources Consultant will use field-testing of the Certification Site consistent with the stated level of investigation where previously not surveyed to examine the likely presence or absence of potentially significant cultural resources and to identify areas that are not likely to contain significant cultural resources.

The Cultural Resources Consultant will record all archaeological sites with the Iowa Archaeological Site File using I-Sites Pro following instructions provided by OSA. If preparation of a CRIS results in revisiting a previously identified archaeological site, then the Cultural Resources Consultant will complete a supplemental site form. Documentation of previous and newly identified historic resources is required for the summary report.

All identified artifacts must be thoroughly documented in accordance with the *Association of Iowa Archaeologists Guidelines (2017)*. Any artifacts recovered through this CRIS should be returned to the owner of the property or cataloged and curated at an SOI qualified curation facility, such as the Office of the State Archaeologist (OSA). The exact location of all curated or returned artifacts must be fully documented in the CRIS along with contact information, in case further evaluation of such artifacts by interested parties in the future would be required.

Summary Report

The Cultural Resources Consultant will prepare a summary report for review by the IEDA and SHPO. Final archaeological reports resulting from field investigation and data recovery must be responsive to contemporary professional standards described in the Iowa Guidelines. The report should follow the format provided in *Association of Iowa Archaeologists Guidelines (2017)* and all other federal or state standards as appropriate such as National Park Service guidance on conducting surveys. Buildings or Structures or other above-ground resources 45 years of age or older should be reported on Iowa Site Inventory Forms. Archaeological sites are reported on the Iowa Archaeological Site Form. The IEDA and SHPO will not accept CRIS reports without the appropriate state site numbers. Reports will not reveal to the public information relating to the location or character of historic resources and archaeological sites when it has been determined that disclosure of such information may create a substantial risk for harm, theft, or destruction to such resources or to the area or place where such resources are located.

Review, Comment, and Objection

The consultation between the entity requesting site certification and the SHPO will be entered as a Technical Assistance request to the SHPO, and the SHPO will provide comments based on the sufficiency of the CRIS to meet the terms of this agreement and the recommendations made by the consultant. Once a CRIS is completed, the Cultural Resources Consultant will provide the entity requesting site certification a hard copy of the completed report and an electronic copy with supplemental data files, such as shapefiles, as applicable. The report will then be provided to IEDA and SHPO for review. SHPO will respond, in writing, to the entity requesting site certification and IEDA within forty-five (45) days from the date of receipt of the report and will:

(1) Render an opinion as to whether the report was completed in accordance with state and federal guidelines for such a survey and meets the MOU requirements, and
(2) Provide comments on the consultant's recommendations, including whether identified resources meet the criteria for inclusion on the NRHP. If there is sufficient information, SHPO will issue a statement that it either agrees or disagrees with the Cultural Resources Consultant's recommendations regarding the probability that the Certification Site contains significant cultural resources, and that it agrees or disagrees with the provided recommendations for future cultural resources surveys, if warranted.

SHPO may require the Cultural Resources Consultant to reissue the report if it does not meet MOU requirements. If SHPO requires the Cultural Resources Consultant to reissue the report, SHPO shall clearly articulate the way(s) in which the CRIS report does not meet the MOU requirements and the specific actions that the Cultural Resources Consultant can take in order for SHPO to find the CRIS report acceptable. In any cases in which SHPO is requiring reissuance of a report, SHPO will, at the request of IEDA, participate in a conference call with the entity requesting certification and the Culture Resources Consultant to answer any questions about the necessary actions the Cultural Resources Consultant must take for the CRIS report to be acceptable to SHPO.

SHPO may also indicate, in writing, that it disagrees with some or all of the Cultural Resources Consultant's recommendations and provide specific objections. Any written comments by SHPO will be included as part of the site certification package.

Any necessary document revisions or subsequent reviews of further recommended survey work will be subject to the same forty-five (45) day review and comment period by SHPO. The site shall not be certified until the entity requesting site certification receives written correspondence from SHPO indicating the report was completed in

accordance with state and federal guidelines for such a survey and meets the MOU requirements. Additionally, resources that may meet the criteria for inclusion on the NHRP or areas that have a high probability to contain significant cultural resources will not be considered as developable acreage within the certification program.

Re-Certification
Site Certification is valid for five years. The entity seeking Site Certification may apply for Re-Certification five years after initial certification. As this re-certification process will occur after the five year period during which historical evaluations are considered valid, the entity seeking Site Certification will be required to submit to the SHPO for review and comment a Supplemental CRIS Report as part of the Re-Certification process in which any changes to the site since the previous CRIS was completed are documented along with any revised evaluations for resources which may have achieved significance since the CRIS was completed. In general, this Supplemental CRIS Report must be completed by an SOI qualified consultant, unless the entity seeking site certification can sufficiently convey that there have been no changes to the site and there are no resources within the area to be re-evaluated.

Limitations
Completion of a CRIS does not fulfill the requirements of Section 106 of the National Historic Preservation Act (NHPA). The IEDA will make site certification applicants aware that compliance with these or other applicable federal, state, or local laws is required for certain types of projects. Additional consultation with the appropriate agencies, State Historic Preservation Officer, Indian tribes, and other interested parties may be required if future projects on the Certification Site receive federal funding or require federal permitting.

Amendment and Modification
Either party to this MOU may request that it be amended or modified at any time, at which point the parties will consult with each other to consider such amendment or modification. No amendment or modification shall take effect unless and until it has been approved in writing by both parties.

Duration
This MOU will remain valid until December 31, 2022 with annual reviews (e.g., e-mail, phone calls, or meetings, as appropriate) by the IEDA and SHPO for possible modifications, termination, or extension.

The parties to this MOU agree to its terms as of the last date signed.

IOWA ECONOMIC DEVELOPMENT AUTHORITY:

By: _____ Date: 9/24/18
Deborah V. Durham, Director

DEPARTMENT OF CULTURAL AFFAIRS:

By: Chris Kramer Date: 9-28-18
Chris Kramer, Acting Director

Helpful Tips when hiring a Consultant to conduct your Cultural Resources Identification Survey (CRIS)

- Provide the MOU to the consultant so they know the level of investigation required for Site Certification.

- Ask the consultant to provide recommendations of National Register eligibility for all cultural resources identified during the survey. If additional research is required to provide definitive recommendations of National Register eligibility, ask that they discuss this with you before completing the report. Anything within the Site Certification Area or the buffer area must be evaluated for National Register Eligibility. Anything left inconclusive will only delay the consultation with the State Historic Preservation Office (SHPO).

- A recorded webinar on the Site Certification Cultural Resources process that the contracted consultants should review is available at https://youtu.be/CtqdOx60bi0.

Helpful Tips to SHPO Consultation for Site Certification.

Once you have complied with the Site Certification MOU and you have had your Cultural Resources investigation completed and are ready to submit that information to the SHPO, here are some tips to ensure a successful consultation process:

Submittal to the State Historic Preservation Office should include:

- A cover letter from the entity seeking Site Certification. Within that letter you should include the following text:
    - *"Enclosed please find two copies of this completed Phase I Cultural Resources Investigation (or reconnaissance survey, or whatever the name of the document is that was produced as a result of compliance with the MOU). (Entity Seeking Site Certification) is requesting technical assistance from your office in the form of a review of the attached report and to provide comments on whether or not the report was completed in accordance with the guidelines for archaeological investigations in Iowa (or "standard investigation guidelines" if not for archaeology), and if you agree with the recommendations made by the archaeologist (or consultant depending on the type of report). This information will assist the City of ____ to determine future uses for this parcel, and allow the City of ____ to submit documentation to the Iowa Economic Development Authority's Site Certification Program. Please note that if a future project is proposed for this site that may use federal funding or require federal permitting, we are aware that further consultation with your office will be required in accordance with Section 106 of the National Historic Preservation Act. Thank you for taking the time to review and comment on the enclosed report, and we await your response. Should you have any questions or concerns regarding this submittal please contact (NAME) and (PHONE NUMBER) at your convenience."*

- Reports prepared by the consultant including any Iowa Site Inventory Forms and/or Archeological Site Forms – a form should be provided for each structure or site that has been identified in the survey area.

Submittal to the State Historic Preservation Office should NOT include:

- Request for SHPO Comment Form – this is not a Section 106 consultation, therefore this form should not be used.

- Any text that states "*No Historic Properties Affected*" or "*No Adverse Effect*" either in the consultant's report or in your cover letter. There is no formal "undertaking" at this time, so it is impossible to assume a finding in accordance with Section 106 of the National Register of Historic Places (NRHP). This technical assistance submittal should be focused on investigation and Determinations of Eligibility of any historic or cultural resources identified during investigation.

When submitting your cover letter and report:

- A hard copy should be sent to:
  - State Historic Preservation Office
    Iowa Department of Cultural Affairs
    RE: IEDA Certified Site Program
    600 E. Locust Street
    Des Moines, IA 50319

- In addition to the mailed copy, an electronic copy should be emailed to IEDA:
  - certsites@IowaEDA.com

How long does it take to complete the process?

Step 2 takes approximately four months. Step 3 can take up to sixteen months to complete, but can take as few as four or five months if materials are submitted quickly and completely. Applicants who participate in Step 2 will receive notification if they are eligible to proceed Step 3 at the conclusion of Step 2. Applicants selected to move forward will then be given up to nine months to complete their Step 3 Application. We encourage applicants to complete their Step 3 Application as soon as possible as we evaluate the applications as soon as we receive them. Therefore, applicants who apply early can reach certification sooner.

How long does certification last?

An expiration date for each site or park that reaches certification will be indicated in the certification letter provided to each applicant. The maximum duration of certification will be five years. If property availability documentation expires before the five years, then the certification expiration will be based on the date of property availability documentation. For example, if a three-year option is provided, then the certification will expire in three years on the option expiration date.

Once the Certification Deliverable is issued, Quest Site Solutions will only update the deliverable to remove the contingency.

What do I get (deliverable) if the site is not asked to move forward with certification?

If your property is not selected to move forward Step 3, you will receive a letter that clearly states why your property is not moving forward. For example, "The water requirement for Large Site is 300,000 gallons per day of excess capacity available within nine months, but ABC Industrial Site only has 200,000 gallons per day. The ABC Industrial Site is not able to increase their capacity within nine months." In addition, you will receive a strengths and weaknesses assessment of your property.

My property is really two sites – not a fully subdivided industrial park. Can I submit under the site category?

The site category is for single user properties, and the industrial park category is for more than one user. Therefore, you would need to submit either in the industrial park category or choose one of the two sites to submit under the site category.

Does the timeframe for infrastructure mean the infrastructure has to be in place from the date of certification or from the time a company commits?

The timeframe for infrastructure is from the time a company commits.

Are Aerial LIDAR surveys acceptable for the topo map?

Yes, aerial LIDAR surveys are acceptable.

Can septic tanks or on-site treatment facilities be used to meet the wastewater requirement?

Septic tanks are not an acceptable wastewater treatment solution. For the site categories, we will accept on-site treatment facilities as long as they are able to meet the acceptable timeframe. An on-site treatment facility is usually not acceptable for the park category. The exception would be if the entire industrial park was using a centralized on-site treatment facility, and it was being run by a central organization (not one of the tenants in the park).

Is it acceptable to cut out an area that contains a recognized environmental condition from the acreage being certified?

No, simply cutting out an area with an environmental condition from the acreage will not be acceptable. All environmental issues must be remediated and/or resolved prior to certification.

Rural Housing Readiness Action Plan
Pacific Junction

In partnership with

IOWA economic development

Mills County, IA economic development foundation

IOWA STATE UNIVERSITY
Extension and Outreach
Community and Economic Development

www.extension.iastate.edu/communities

Pacific Junction Rural Housing Readiness Action Plan

Introduction

Mills County Economic Development Foundation requested assistance with visioning and action planning around issues of improving housing access, affordability, and quality in Pacific Junction with a specific eye towards identifying projects and steps necessary for Pacific Junction to apply for CDBG-Disaster Relief funds. In 2019, Pacific Junction was devasted by the historic flooding when levees broke on the Missouri River. The majority of Pacific Junction was underwater, resulting in total damage and devastation of homes. The city was evacuated and residents were forced to relocate. Given the degree of property destruction and the extended period of being underwater, emergency housing gave way to many households finding long-term solutions that did not include rebuilding in Pacific Junction. Many property owners took the option of a FEMA buyout. As of June 2021, 40 households of the approximately 200 that were in existence before the floods had decided to rebuild on their property. For the remaining 160 properties, selecting the buyout carries with it the stipulation that a home can never be built on a buyout lot. The City, through financing provided through state resources, purchased approximately 36 contiguous lots near the city center from owners preemptively to save them from the buyout restrictions. It is envisioned that these city-owned lots will become the core of a rebuilt Pacific Junction.

The RHRA workshop in Pacific Junction focused solely on the utilization of the 36 city-owned lots. The process was modified to address the necessary steps to move these lots to being buildable and attractive to builders, developers, and future residents. After reviewing the process engaged with in Pacific Junction, the report lays out three potential courses of action.

The Rural Housing Readiness Assessment program in Pacific Junction provided by Iowa State University Extension and Outreach—Community and Economic Development (ISUEO-CED) consisted of the following facilitated process:

1. An educational workshop with members of the housing steering committee (offered in conjunction with other communities in Mills County)

2. A site visit and consultation to learn more about the specific context and challenges of rebuilding in Pacific Junction.

3. Facilitation of an action planning session.

4. Preparation of a final report.

Steering Committee

Given the unique challenges Pacific Junction has faced, initial engagemment for the process centered on representatives of the city government (city clerk, mayor, and members of council). Mayor Andrew Young and City Clerk Korrena Neppl participated in a virtual workshop on housing decisions tht included other stakeholders from Mills County. The mayor, clerk, and members of council, along with Mills County Economic Development Foundation, participated in the site visit and consultation held in Pacific Junction on April 26th. At that meeting the scope of the action planning session was determined. ISUEO-CED suggested that Pacific Junction's capacity to complete housing projects will depend upon the involvement of additional county and state allies. It was decided that participants in the action planning process should include current residents of Pacific Junction, former residents who are still invested in the recovery of the community, and Mills County entities that could offer further resources and support.

The action planning session was held on June 22nd. The participants at the final meeting included:
Andrew Young, Pacific Junction Mayor
Korrena Neppl, City Clerk
Richard Crouch, Mills County Supervisor
Catie Nuss, resident of Pacific Junction
Sandi Winton, real estate agent with Jim Hughes Real Estate
Heather Jenneman, housing developer
Larry Winum, Glenwood State Bank
Rachel Reis, Glenwood Area Chamber of Commerce
Abby Sorensen, Mills County Extension
Henry Clark, Owner, Clark Storage

RHRA Community Self-Assessment

Based on conversations with city representatives, the following portrait of Pacific Junction's housing readiness emerged.

1. At the time of the engagement in April 2021, the City was in the middle of the processing buyout requests in coordination with FEMA. This was still going on at the end of June 2021. This took the majority of the city clerk's time and energy to accomplish. Demolition of existing structures cannot take place until a buyout is complete, leaving Pacific Junction with an abundance of abandoned, derelict houses that psychologically weigh on residents and make it nearly impossible to attract investment or interest in a future.
2. The community is waiting for FEMA to make the determination of whether the city sits in a 500 or 100 year flood plain. Without the determination, builders are less likely to take the risk because of issues qualifying for insurance and financing. Community members are frustrated and unclear as to the process, timeline, and significance of FEMA's ultimate decision. As such, there is a lot of ambiguity which has led to inertia. For instance, community members remained uncertain if the

flood plain determination had to wait for the levee evaluations being conducted or if they would even have to wait until levees were reconstructed, a process which could take years.

3. In the meantime, the city is operating on reduced revenue, since the number of homes on the property tax rolls has dipped from 200 to 40. The valuations on those 40 homes are not enough for the city to maintain many of its basic functions, such as paying the company they contract with for sewer maintenance. Building more homes on the 36 lots bought by the city is needed for the financial viability of the city. ***However, the city will not be able to financially weather the years it will take for home construction to begin on the identified parcels. Without financial assistance from county or state resources in the form of a grant or loan, Pacific Junction will not be able to function as a city.***
4. The floods caused massive losses to property, but also in community knowledge. The only copy of the city zoning map was lost in the flood; an additional copy has not been found. Likewise, it is known that survey pins exist for parcels but their specific locations are often unknown. In addition, city ordinances are consolidated but not updated and not made available to the public as there is no official city web presence. Thus, items such as minimum lot sizes and setback requirements are not easily recovered and may be recalled erroneously from memory. Finally, the consolidated knowledge among a few city officials has led to a diminished leadership capacity and a heavy reliance on the Mayor and City Clerk for most things to be accomplished. As such, capacity is stretched thin and the inability to attend to all of the needed action items and inquiries. In other words, the city is overwhelmed.

   Because of these observations, Pacific Junction is currently not in a in a space where they are ready for constructing new single-family housing, even as there is a strong desire to do so. Indeed, the hope of Pacific Junction's continued existence as a municipality depends on new housing being built. It will require sustained partnerships and investment by county, state, and federal entities to make this happen as the city does not have the capacity to do so on its own.

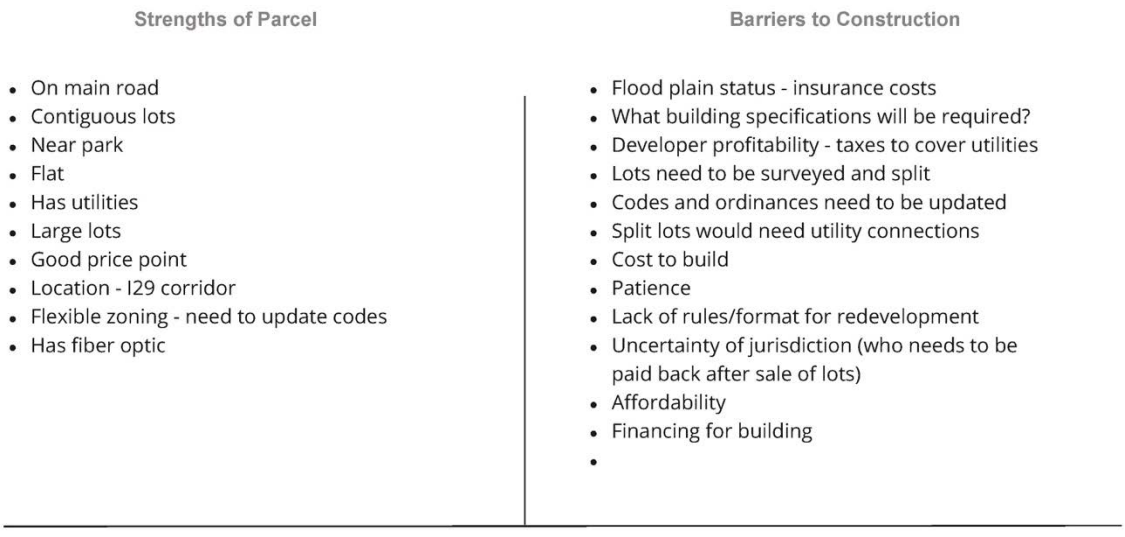
Action Planning Workshop

The purpose of the action planning workshop on June 22nd was to center the discussion on the city-purchased lots as the most viable option for the quickest construction to occur. It is also in the least ambiguous situation, not contingent on the FEMA buyout process; as the lots are under city control they will be clear of the building restrictions placed on the buyout lots. The workshop consisted of two main components: identifying strengths of the parcel and potential barriers to construction and identifying actions needed to prepare the parcel for construction, including finances and partner support.

Strengths and Barriers

Workshop participants first identified the strengths of the parcel and the potential barriers to construction. There are several key reasons as to why these lots would be attractive to developers. Chief among them are the large size, a location close to the I-29 corridor, and that the lots have utility access (many with utility hookups), including fiber optic. Additionally, the lots are contiguous to one another. Building homes in this location would begin to return to Pacific Junction the feeling of a town with a center, especially considering the vast swathes of green space created by the buyouts.

These strengths, however, are offset by several barriers to construction. As mentioned above, the flood plain status, flood insurance costs, and the uncertainty of whether unique building specifications and designs will be required for structures to be eligible for insurance loom large. Mostly, this is due to the fact that these determinations are out of the control of the local community and are not actionable by the community in order to bring about the beneficial change they seek. There are, however, several barriers that could be acted upon by the community. For instance, the lots need to be surveyed and split; the split lots will need utility connections. Codes and ordinances could be updated and redevelopment guidelines or format could be drafted. Finally, the city could seek clarity on the lot sales process, since the lots were bought with funding from the state the question remains whether the city needs to pay back the money with proceeds from the sale of the lots when cleared for construction. In general, though, the most frustrating barrier to construction is patience with a process that could take several more years to complete.



Parcel Preparation

The workshop participants were asked to brainstorm the work that needs to prepare the site for building and the order in which these tasks should be accomplished (see Appendix). The identified items were not intended to be comprehensive, but rather be the items that the stakeholders in the room could identify and take ownership of in the process. Doubtless, other steps are needed to move the existing lots along to the point of construction. However, much of the site preparation process is technical and would need someone to take on the role of project manager to see it be built. These can be broadly categorized into three areas of action.

1. *Prepare the physical site for construction*
    a. surveying and plotting the lots
    b. making sure utilities are available to all lots
    c. Putting in sidewalks, paving streets
    d. Grading lots
    e. Removing all existing foundations from removed buildings

2. *Legal and administrative items*
    a. Codify ordinances
    b. Update building codes
    c. Covenant for driveways, culverts, dead trees
    d. Enhance adjacent park
    e. Define construction styles
    f. Set minimum lot size requirements
    g. Define compatible development and land uses
        i. Thinking specifically of items that would set Pacific Junction apart from surrounding communities, such as allowing more pets, home-based businesses, RV and extra vehicle parking, etc.
    h. Become an Arbor Day community

3. *Communicate the value of the parcel*
    a. Foster relationships with builders
    b. Define target market of buyer at the desirable price range of homes
        i. Previous residents get first choice
        ii. Other potential markets include seniors, first time homebuyers, families with children and military personnel associated with Offut Air Force Base
    c. Create marketing materials for developers, builders, and home buyers

Several of the items that must be completed before it makes sense to accomplish the other items. In particular, surveying and plotting the lots, establishing building code and zoning requirements, and codifying city ordinances are first-order of business items. These must all be

initiated by the city, even if accomplished by other agencies (such as SWIPCO and MAPA, Mills County Economic Development Foundation, and the County Board of Supervisors.)

Two items, in particular stand out in terms of spearheading specific efforts. First, the City should work to secure CDBG funds to be earmarked for site preparation. This would be applied for through the COG. Second, there may be a possibility for Pacific Junction to qualify for CARES or ARPA dollars that would go towards facilities and planning. However, CARES or ARPA funding would likely have to use the County as the conduit for funds, meaning that the County would have to prioritize and direct funding to Pacific Junction.

Courses of Action

The scope and trajectory of disaster recovery for a community, especially one with the degree of destruction as Pacific Junction, is a long arc. Based on the workshop and our conversations with stakeholders and city officials, it has become evident that the limited task at hand of site development and construction of housing on the city-owned lots is, in and of itself, a large undertaking for a community the size of Pacific Junction, let alone one in the throes of disaster recovery. This report provides three pragmatic courses of action that Pacific Junction must consider as they continue. It is not hyperbole to state that the future of Pacific Junction depends upon the construction of new houses. If they are unable to be built because resources, technical ability, or political willpower are missing, alternative futures for Pacific Junction must be discussed. The three courses of action explored briefly below are 1). Building homes on the lots, 2). Entering into an administrative agreement with Glenwood, and 3). Disincorporation.

Course of Action #1: Building Homes on the Lots

This is the path on which Pacific Junction residents and city officials currently hope to embark, as evidenced from the energy and resources spent on purchasing the 36 contiguous lots for rebuilding. However, this path is not a clear one and has appeared to stall out because of bureaucratic and financial uncertainty and staff capacity. The original intention of this process was to provide Pacific Junction with step-by-step guidance to take the existing parcels and transform them into buildable lots ready for development. It became clear that there is a significant amount of pre-work that needs to be accomplished by the city in order for this to be accomplished. ***Given current capacity and recovery fatigue, it is ill advised for the City of Pacific Junction to attempt the work of preparing the lots for development themselves.*** Even initial steps, such as surveying the land, are fraught decisions given the straitened fiscal condition of the city. Doubt hovers over every decision: is the action worth the expense and effort without knowing the outcome of the flood plain designation?

The following recommendations are essential to build Pacific Junction's financial and human capital in preparation of building homes on the city-purchased lots.

Recommendation #1

Consult with an analyst on the financial health of Pacific Junction.

The number of residential homes in Pacific Junction is around 40, down from the nearly 200 households pre-flood. The revenue earned from property taxes has dropped off precipitously, impacting the fiscal health of the city. Indeed, comments during the workshop indicated that the city has been unable to cover some responsibilities, including paying the contractor for sewer maintenance. Questions remain as to the short-term fiscal viability of Pacific Junction, especially given that the fiscal health depends upon increasing the property tax base. However, it will take a minimum of two years or more for construction to begin on new homes. ***It is uncertain whether Pacific Junction will be able to meet their financial obligations over the next several years before the homes are built.*** City officials need to sit down with a municipal finance specialist to review detailed projections about operations, debt servicing, obligations and revenue to determine how long the city can function on current revenue streams.

- Reach out to the Iowa League of Cities and/or the Iowa Government Finance Initiative (IGFI) program at Iowa State University Extension and Outreach

Recommendation #2

Engage with county and state officials about short-term operating loans or grants for city services.

Once the budget projections are available, discussions need to occur with Mills County Board of Supervisors and State of Iowa officials about securing bridge operating funds that will cover the basic services and salary obligations for Pacific Junction. The loan or grant needs to be of significant size and duration to offset the uncertain short-term viability of the city. Stakeholders must be aware that while planning and recovery is the long game, Pacific Junction will not be able to play in the short term without immediate financial support. All future planning efforts are worthless if the city cannot meet its current obligations.

Recommendation #3

The City must administratively prepare for new housing development.

The flooding caused significant loss of institutionalized knowledge for Pacific Junction. City staff and elected officials have been relying on memory and long familiarity with the city to recreate or interpret administrative details. These need to be verified, where possible, with existing documentation or re-introduced to Council for approval. Administrative details in need of verification include:

- Locating a copy of the zoning map for Pacific Junction
- Define compatible development and land uses and connect to the zoning map
- Review and codify existing ordinances and make them available virtually

- Review and/or adopt building code, including adopting and summarizing the flood plain building ordinance for prospective builders

Recommendation #4

Contract with the COG or another (private or public) entity to serve as the project manager for the building process.

City capacity is low. Managing the building process (serving as a general contractor) the financial processes and bureaucratic processes (such as grant writing and management, evaluating environmental risks, and reporting) could well be overwhelming given city resources. A wise use of CDBG or other state or federal funding would be to hire a project manager specifically for this project. The project manager's role would be to shepherd the lots from demolition and clearing to being readied for redevelopment. In this regard, the professional staff would act as the housing developer for site preparation and project bidding. This would include finding funds for, and the management of, the following preparatory steps: surveying and plotting the lots, checking utilities availability to all lots, putting in sidewalks and paving streets, removing existing foundations from removed buildings, and grading the lots.

- Open discussion with MAPA or SWIPCO about contracting their staff to act as project manager. Ask what grants or funds would be available for the city to hire out this role and would the COG be willing to apply for those funds

Course of Action #2: Enter into an administrative agreement with Glenwood

The city boundaries for Pacific Junction and Glenwood are in close proximity to one another, quite possibly meeting at the two-mile annexation boundary of Glenwood. The long-term vision for the lots left vacant by the FEMA buy outs includes ample green space, including potential urban farming sites. Pacific Junction is also home to several industrial sites located near the US-34 and I-39 interchanges. Finally, the existing fire district is funded and operational, with newer equipment and building located in the center of Pacific Junction. These three assets could make the existing city boundaries of Pacific Junction attractive as a point of expansion for Glenwood. In this scenario, Glenwood would assume the administrative, governmental, and legal responsibilities of Pacific Junction and be better able to manage operational costs over the duration of the wait period until final flood map and levee determinations are made by FEMA. Once these are determined, Glenwood could potentially increase the property tax base through new housing and the benefit of the industrial sites. Such a move would take patience and long-range planning on the part of Glenwood. It would also take considerable political capital to accomplish, as the long-term pay off and vision may be too ambiguous to imagine in the short-term.

This option would essentially preserve "Pacific Junction" as a place on the map, a place with a unique history and trajectory, by becoming a satellite neighborhood of Glenwood. Pacific Junction would lose administrative autonomy and financial and political independence. On the

other hand, the burdens of their current financial situation would be cleared and they would be able to increase their capacity to continue the rebuilding process. They may still require or desire a project manager to succeed in the implementation of building new residential units.

Recommendation #1:

Enter into a preliminary conversation with Glenwood about Glenwood assuming administrative responsibilities for, and annexation of, Pacific Junction.

This initial conversation would identify if there would be any appetite for such a move on the part of both parties. The outcome of the conversation(s) would be the next recommendation.

Recommendation #2

Bring in an outside party to negotiate the administrative merger of Pacific Junction with Glenwood.

This is a process that would require consensus around expectations, benefits, and agreement of the overall outcomes. The process should require ample public input and be accomplished as transparent as possible.

Course of Action #3: Discontinuance

In the event that Pacific Junction can no longer meet its financial obligations and is unable to provide the energy and human power to embark on building the new homes on the identified lots, the city should consider discontinuance. While this may seem a drastic position, consider that the current tax base from the valuations of 40 extant homes may not be enough to cover the cost of operations. Even if in the long term it appears additional homes will be built, in the short term it may be impossible for Pacific Junction to be economically self-sustaining.

Discontinuance is the process by which a city ceases to be a self-governing entity, usually resulting in public services being taken over by the county in which the city is located. The process of discontinuance is covered in Iowa Code Chapter 368 – City Development. Discontinuance can be either a passive or an active process on the part of the city.

In all cases, the process is overseen by the state's City Development Board (CDB), a 5-member committee appointed by the governor housed within the Iowa Economic Development Authority. The CDB handles all petitions for municipal boundary changes, including discontinuances, annexations, and incorporations.

A city can be passively discontinued if the CDB [receives knowledge/is informed of the fact that] the city has held no city election or caused any tax to be levied for at least six years. In this case, the CDB takes control of the city's property and makes the necessary arrangements for providing public services and selling off the city's assets and accounting for any outstanding liabilities.

Alternatively, a city can take a more active role by petitioning the CDB to allow its discontinuance. Either the city council, the board of supervisors of the county in which the city is located, the regional planning authority of the region in which the city is located, or at least 5% of the registered voters of the city can petition the CDB requesting discontinuance.

If discontinuance is proposed, the city council must call a public hearing on the proposal. After hearing public comments, the council votes on a resolution of discontinuance or a resolution abandoning the process. If the resolution of discontinuance is approved, the resolution is filed with the county clerk within 30 days, and a request for a special election may be made to the county election commissioner by a petition of eligible electors in the city equal to at least 10% of the persons who voted in the most recent regular city election. If a special election is decided in favor of discontinuance or if no request for a special election is filed, the results of the process are conveyed to the CDB, who reviews the city's petition.

The petition must contain:

- The action being proposed (discontinuance, annexation, or incorporation)
- A map of the area of the city
- The assessed value of all platted and unplatted land in the city
- The names of all property owners
- The population density of the city
- A description of the city's topography
- Plans for the disposal of all the city's assets and the assumption of any liabilities
- Plans for any municipal service provision such as water, sewer, fire, and emergency services
- Plans for agreements with any special services districts

Petitions are only dismissed if they fail to contain the details above, or a previous petition by the same city was disapproved by either the board or was voted down by the city's residents in the two years prior to the filing of the current petition. See Iowa Administrative Code Rule 263-8.3 – Contents of the petition, for the introductory statement required for this petition.

Consequences of Discontinuance:

Any community considering discontinuance should carefully weigh the consequences and benefits of such a decision. Seeing this process through requires a significant investment of time, energy, and effort; and the effects of discontinuance will greatly vary based on local factors, regional decision-making, and other large scale macroeconomic factors well outside the control of any one community.

Potential consequences of discontinuance include losses in employment, administrative hurdles, and community dissatisfaction. A city considering this process should begin by determining whether these consequences, among others, would cause irreparable harm to its residents that outweigh the benefits of such a course of action.

When a city opts for discontinuance, its government is dissolved, meaning that any government employees, contractors, or other sub-contractors can no longer be paid by city tax dollars. Depending on the community's size and economic base, this can result in a substantial hit to the residents who rely on the city government for their livelihood. It also means that the city government is no longer the "most local" form of government. Without a city council or mayor or other city staff, residents will have to turn to more "distant" government officials, some of whom will undoubtedly be less familiar with the specific needs and histories of the area's community.

Administrative hurdles resulting from discontinuance can be thought of as a question of, "What are we going to do about [x]?". For instance, as mentioned above, any petition to discontinue must have a plan for the assumption of the city's liabilities, including any debts outstanding at the time of discontinuance or any legitimate claims made against the city within six months after it ceases to exist as a self-governing entity. State code stipulates that whatever governing body assumes a former city's debts can levy a tax exclusively within the geographic confines of the former city to pay off those debts. So, while it may be in a city's residents' long term fiscal interests to discontinue, it is not an immediate remedy. This reality can, in turn, translate to lower property values and discourage new businesses or residents from moving into the area. Other administrative issues to consider include coordinating the transfer of city services like utilities and emergency response, as well as the legal process of discontinuation itself.

In the case of Pacific Junction, there are a number of potential financial entanglements as a result of the flood recovery process that could complicate dissolution. These include questions such as:

- What happens to the buyout process if discontinuance is initiated?
- Would the current residents be financially responsible for the purchase of the city-owned lots that were bought with state dollars or does this responsibility transfer to the county along with the ownership?
- Would discontinuance ultimately facilitate the construction of new housing on the lots currently owned by the city because action could be taken by county authorities? For instance, it may be more feasible and financially sound for the county to build RV parking on these lots in the short term while waiting for the flood plain determination from FEMA.

If a city opts for discontinuance, what becomes of the community that makes up that city? Some would argue that the relationships that held the place together, the ties that bound individuals and families to one another, would be weakened or destroyed entirely if the city ceased to exist. Would Pacific Junction still be Pacific Junction if it disincorporated? How could current and former residents memorialize Pacific Junction as place? Yet, an equally resonant question for those that remain residing within city limits: *Is Pacific Junction still Pacific Junction given the significant population loss and disaster damage to the city?*

Benefits of Discontinuance

Discontinuance's benefits include efficiency improvements, lower taxes, and community (re)cohesion. If city government in Pacific Junction ceased to exist, its duties would most likely devolve to Mills County. This devolution would increase the land under the direct control of the county, which could lead to more efficient service provision and land-use planning, in addition to less administrative overhead in the long term. Discontinuance does not *create* an additional layer of government or apply a new set of regulations on a community-rather, it removes a structure which may no longer serve its intended purpose.

With no more city government or city services to pay for, Pacific Junction residents could see a decrease in their tax bills. As noted above, the governing body (likely Mills County) would have the authority to levy a tax on those living within what was Pacific Junction to pay off any outstanding debts, but that would simply be a continuance of whatever tax revenues are currently going towards paying off the city's debts. In the long run, residents would no longer be paying the salaries of local government officials, contractors, or other workers employed at the municipal level, or would be sharing those types of expenses with a larger constituency.

While the negative consequences to a city's sense of community were touched on above, it is equally valid to explore the potential benefits of discontinuance on the area's sense of community. Would such a course of action allow residents to focus their efforts and energy elsewhere? It is clear that residents are interested in the future of their community and in seeing their community bounce back from the events of 2019. Discontinuance could free up the community's resources, allowing current residents of Pacific Junction to work on applying pressure at the county and state levels to attract the resources necessary to rebuild and to manage to process? Again, this is a question that will require a fair amount of introspection on the part of this group, and all Pacific Junction residents, and is not one that we would try to resolve here.

Overall, discontinuance is an involved, lengthy process with a lot of room for error. It is no easy undertaking, but it *is* an option to consider, given the specifics of your city's circumstances.

Recommendation #1:

After a review of the city's financial obligations, discuss internally the viability of the city operating budget for the next five years.

Recommendation #2

Consult with Iowa League of Cities to navigate the legal and financial complexities of discontinuance. Maintain open lines of communication with state and county authorities about intention to administratively dissolve.

Final Comments

The effects of the 2019 floods in Pacific Junction continue to be felt throughout the county. Many displaced community members sought shelter in surrounding communities; many have made a life for themselves there. The residents who returned to Pacific Junction face daily reminders of the flood aftermath in the form of abandoned buildings and empty lots. The floods eroded social support networks and community leadership capacity that comes from a sudden depopulation. Building new housing will signal the turning point for the community and lighten the emotional and psychological toll of living with daily reminders of the trauma associated with the floods. The community is in an exceptionally difficult position currently. Media attention and the initial surge of assistance post-flood have waned. Reconstruction progress has slowed due to factors outside the control of the local community.

The options laid out in this report are stark. The future of Pacific Junction is not solely reliant on the will of its residents. Their vision for the community is clear: they want to rebuild but do not have the capacity to do so. External agencies and government at the county and state level have provided some resources and technical assistance, but the scale and time horizon for the proposed projects have left residents feeling lost in the here and now. State and county officials need to shift some of the long-term investment to more near-term goals that will help Pacific Junction be a viable community into the future.

A.7 Levee Information

MILLS COUNTY

Levee System	Segment Name	Segment ID	Levee Sponsor / Maintenance Agency	(NLD)[1] Federal / Local Levee	Non-Project?	(NLD)[1] USACE Rehabilitation Status	Overtopping AEP	Risk Level
L-611-614-MoRiv LB & Upr Pony Creek LB & L1B LB	Lower Pony Creek RB - Non-Project Local Levee	4704100002	Pony Creek (Glenwood) Drainage District	Locally constructed, locally operated and maintained.	Yes	Active	0.002	Low (4)
	L-611-614 - MoRiv LB & Upper Pony Creek LB & Lateral 1B LB	4704000047	Mills & Pottawattamie Missouri River Levee District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No		0.002	
MILLS COUNTY AG LEVEES	MILLS COUNTY AG LEVEES	1704000770	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened
MILLS COUNTY AG LEVEES 2	MILLS COUNTY AG LEVEES 2	1705100630	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened
MILLS COUNTY AG LEVEES 3	MILLS COUNTY AG LEVEES 3	1704700770	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened
PACIFIC JUNCTION LEVEE PROJECT 1	PACIFIC JUNCTION LEVEE PROJECT 1	1704100768	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened
PACIFIC JUNCTION LEVEE PROJECT 2	PACIFIC JUNCTION LEVEE PROJECT 2	1704200768	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened
L-601 - Watkins Ditch RB - Watkins DD	L-601 - Watkins Ditch RB - Watkins DD	4704000046	Watkins Drainage District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Inactive	0.002	Low (4)
	Lower Pony Creek LB - Non-Project Local Levee	4704100001	Unknown Non-Project Sponsor	Locally constructed, locally operated and maintained.	Yes	Inactive	0.002	
PRIVATE LEVEES	PRIVATE LEVEES	1704000767	Mills County	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened
L-594-601	L-601 - Watkins Ditch LB - Watkins DD Segment	4704000041	Watkins Drainage District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Inactive	-	Moderate (3)
	L-601 - Missouri River LB - Bartlett Segment	4704000043	Missouri River LD-1 of Freemont and Mills Counties	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Inactive	-	
	L-601 - Missouri River LB - Miller-Sturgeon Segment	4704000042	Miller-Sturgeon Levee District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Inactive	-	
	L-594 - Waubonsie Creek RB - Waubonsie DD Segment	4704000044	Waubonsie Drainage District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Inactive	-	
	L-594 - Waubonsie Creek RB - Non-Project Segment - Bluff Road Tie-back	4704100045	Unknown Non-Project Sponsor	Locally constructed, locally operated and maintained.	Yes	Inactive	-	
MRLS L-601 WATKINS-LD	MRLS L-601 WATKINS-LD-A	1704100425	Watkins Drainage District	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened
MRLS L-601 WATKINS-LD	MRLS L-601 WATKINS-LD-B	1704200425	Watkins Drainage District	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened

Footnotes:

*Data in columns without reference footnotes was taken from the National Levee Database

1. Data taken from the National Levee Database
2. Data taken from the USACE district website for Levee Sponsors dated 2019
3. Contact information received from Sandy Graybill in email dated 10/27/2020

Breach Locations: https://www.nwo.usace.army.mil/Omaha-District-System-Restoration-Team/

Questions/Comments: PJ is in area of I

Accredidation Status	FEMA Regions	Breach Names	Levee District Contact[3]	Company	Phone Number	Email	Notes
Accredited	7		Jay Christensen, Chair Rodney Bents Ron Sargent		(402) 677-5609 (402) 616-1296 (402) 690-2527	prositecompany@gmail.com bentsrodney@gmail.com rpsargent@yahoo.com	This is system covered by M&P Levee District levee accreditation study. Lower Pony Creek LB is not covered
		L-611-614_A_I L-611-614_B_I L-611-614_C_O	John Poore Dennis Lincoln Del Husz Matt Woods	Woods & Wyatt, PLLC Attorneys at Law	402-306-6795 (JP cell) (402) 679-1764 (402) 651-7604 712-527-4877 (MW office)	JohnPoore@msn.com lincolnridgeview@hotmail.com dhusz@hotmail.com matt.woods@woodswyattlaw.com	
Non-Accredited	7						
Non-Accredited	7						
Non-Accredited	7						
Accredited	7						Seems to be same levee as Lower Pony Creek LB (4704100001) in Watkins DD
Accredited	7		Jay Christensen, Chair Rodney Bents Ron Sargent		(402) 677-5609 (402) 616-1296 (402) 690-2527	prositecompany@gmail.com bentsrodney@gmail.com rpsargent@yahoo.com	Seems to be same levee as Lower Pony Creek RB (4704100002) in M&P DD
Accredited	7		Ron Sargent, Chair Wayne Stouder Larry Lincoln		402-690-2527 (RS) 402-306-5878 (WS) 712-310-1212 (LL)	RPSargent@yahoo.com StouderWL@gmail.com	This system system is necessary to protect PJ from flooding from Watkins Creek (also called Keg Creek), from Pony Creek, and from Missouri. Since it's rehab status is inactive, it would seem its accreditation might be in jepordy. However, the Watkins RB segment is not non-segment while the Pony LB segment is non-project so unclear. Seems to be same levee as PJ Levee Project 1 (1704100768)
Accredited	7						
Accredited	7						
		L-601_A1_I L-601_A_I L-601_B_I L-601_B1_I L-601_C_I	Christopher Dashner, Chair Wayne Souder Ron Sargent		(712) 880-0057 (402) 306-5878 (402) 690-2527	dashnerc@gmail.com stouderwl@gmail.com rpsargent@yahoo.com	
			Christopher Dashner, Chair Wayne Souder Ron Sargent		(712) 880-0057 (402) 306-5878 (402) 690-2527	dashnerc@gmail.com stouderwl@gmail.com rpsargent@yahoo.com	
		L-601_C1_O L-601_D_O	Jim Shepherd Mary King-Bateman Logan Beer				
Non-Accredited	7						
Non-Accredited	7						

FREMONT COUNTY

Levee System	Segment Name	Segment ID	Levee Sponsor / Maintenance Agency	(NLD)[1] Federal/Local Levee	Non-Project?	(NLD)[1] USACE Rehabilitation Status	Overtopping AEP	Risk Level	Accredidation Status
L-594-601	L-601 - Missouri River LB - Bartlett Segment	4704000043	Missouri River LD-1 of Freemont and Mills Counties	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Inactive	-	Moderate (3)	Accredited
	L-594 - Waubonsie Creek RB - Waubonsie DD Segment	4704000044	Waubonsie Drainage District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Inactive	-		
	L-594 - Waubonsie Creek RB - Non-Project Segment - Bluff Road Tie-back	4704100045	Unknown Non-Project Sponsor	Locally constructed, locally operated and maintained.	Yes	Inactive	-		
L-594-575 (BW-PV-Waubonsie)	L-594 - Waubonsie Creek Ditch LB - Waubonsie DD Segment	4704000032	Waubonsie Drainage District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	0.002	Low (4)	Accredited
	L-594 - Missouri River LB - Pleasant Valley Segment	4704000033	Pleasant Valley Levee District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	0.002		
	L-575 - Plum Creek RB - Benton-Washington Segment	4704000034	Benton-Washington Levee District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	0.002		
	L-575 - Plum Creek RB - Benton-Washington Segment - Tie-back	4704100041	Unknown/Private	Locally constructed, locally operated and maintained.	Yes	Active	-		
L-575 (BW-McKissock-Buchanan-Atchison-Hamburg)	L-575 - MO River LB & Plum Creek LB - Benton-Washington Segment - Tie-back	4704100040	Unknown Non-Project Sponsor	Locally constructed, locally operated and maintained.	Yes	Active	-	Low (4)	Accredited
	L-575 - MO River LB & Plum Creek LB - Benton-Washington Segment	4704000039	Benton-Washington Levee District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	0.01		
	L-575 - MO River LB & Nishnabotna River RB - NW Atchison LD Segment	4704000038	Northwest Atchison County Levee District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	0.02		
	L-575 - MO River LB - Buchanan DD#1 Segment	4704000040	Buchanan Drainage District No 1	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	0.002		
	L-575 - Nishnabotna RB - McKissock Island D&LD Segment	4704000037	McKissock Island Precinct Dike and Levee District	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	0.02		
	L-575 - Nishnabotna RB - Hamburg D&LD Segment	4704000035	Fremont County	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	0.01		
Hamburg-Main Ditch 6 LB	Hamburg - Main Ditch 6 LB - Interstate 29 Tie-Off	4704100012	Unknown Non-Project Sponsor	Locally constructed, locally operated and maintained.	Yes	Active	-	Low (4)	Non-Accredited
	Hamburg - Main Ditch 6 LB	4704000036	City of Hamburg, Iowa	USACE Federally constructed, turned over to public sponsor operations and maintenance.	No	Active	-		
MAIN DITCH NO. 6(ATCHISON COUNTY) 1	MAIN DITCH NO. 6(ATCHISON COUNTY) 1	1704000525	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened	Non-Accredited
MAIN DITCH NO. 6(ATCHISON COUNTY) 2	MAIN DITCH NO. 6(ATCHISON COUNTY) 2	1705700290	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened	Non-Accredited
Riverton - Winslow - East Nis	Riverton - Winslow - East Nishnabotna LB (NF)	4704000164	Fremont County	Locally constructed, locally operated and maintained.	No	Inactive	-	Not Screened	No Regulatory Flood Hazard Informamtion Published by FEMA
IAFREM0141 - East Nishnabotna RB & West Nishnabotna LB	IAFREM0141 - East Nishnabotna RB & West Nishnabotna LB	4704000181	Fremont County	Locally constructed, locally operated and maintained.	No	Inactive	-	Not Screened	No Regulatory Flood Hazard Informamtion Published by FEMA
WHITEHEAD	WHITEHEAD	1704000460	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened	No Regulatory Flood Hazard Informamtion Published by FEMA
WINSLOW SEGMENT 1	WINSLOW SEGMENT 1	1704000461	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened	No Regulatory Flood Hazard Informamtion Published by FEMA
WINSLOW SEGMENT 2	WINSLOW SEGMENT 2	1704100461	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened	No Regulatory Flood Hazard Informamtion Published by FEMA
WINSLOW SEGMENT 3	WINSLOW SEGMENT 3	1704700461	Undefined	Locally constructed, locally operated and maintained.	No	Not Enrolled	-	Not Screened	No Regulatory Flood Hazard Informamtion Published by FEMA

Footnotes:

*Data in columns without reference footnotes was taken from the National Levee Database

1. Data taken from the National Levee Database
2. Data taken from the USACE district website for Levee Sponsors dated 2019
3. Contact information received from Sandy Graybill in email dated 10/27/2020 & "2020 Drainage District Officials" roster provided by Dee Owen, Fremont County Auditor's office

Breach Locations: https://www.nwo.usace.army.mil/Omaha-District-System-Restoration-Team/

Questions/Comments: How come protected area in Hamburg is larger than 100-year floodplain but NLD says the system has SEP that is only 20-year

FEMA Regions	Breach Names	Levee District Contact[3]	Company	Phone Number	Email	Notes
7		Christopher Dashner, Chair Wayne Souder Ron Sargent				
7		Jim Shepherd Mary King-Bateman Logan Beer				
7						
7	L-594_A_I	Jim Shepherd Mary King-Bateman Logan Beer				
7	L-594_B_I L-594_D_O L-594_C_I	Jim Shepherd John Askew Tony Donahue				
7	L-594_E_O	Pat Sheldon Mike Woltemath Wayne Clark Nancy Hudnall, Secretary				
7						
7		Pat Sheldon Leo Ettleman		712-370-0481 712-313-0287	leo_ettleman@hotmail.com	Non-Project segment that appears necessary to protect Hamburg
7	L-575_A_I L-575_B_I	Pat Sheldon Mike Woltemath Wayne Clark Nancy Hudnall, Sec. Leo Ettleman		712-370-0481 712-313-0287	leo_ettleman@hotmail.com	
7	L-575_D_O L-575_E_O	Robert Woltemath (President) Sandy Graybill (Secretary)			SndyGra@gmail.com	
7	L-575_C_O	Robert Woltemath (President) Sandy Graybill			SndyGra@gmail.com	
7	L-575_F_O L-575_G_O	Michael Stenzel (President)				
7		Mayor, Hamburg Alan Dovel (Supervisors)	City of Hamburg Fremont Co Supervisors			
7		Unknown Non-Project Sponsor				Non-Project segment necessary to protect Hamburg. Also non-accredited
7		Mayor	City Hamburg			Being raised approximately 8 feet based on conversation with Lowel Blankers from USACE
7						
7						
7						
7						
7						
7						
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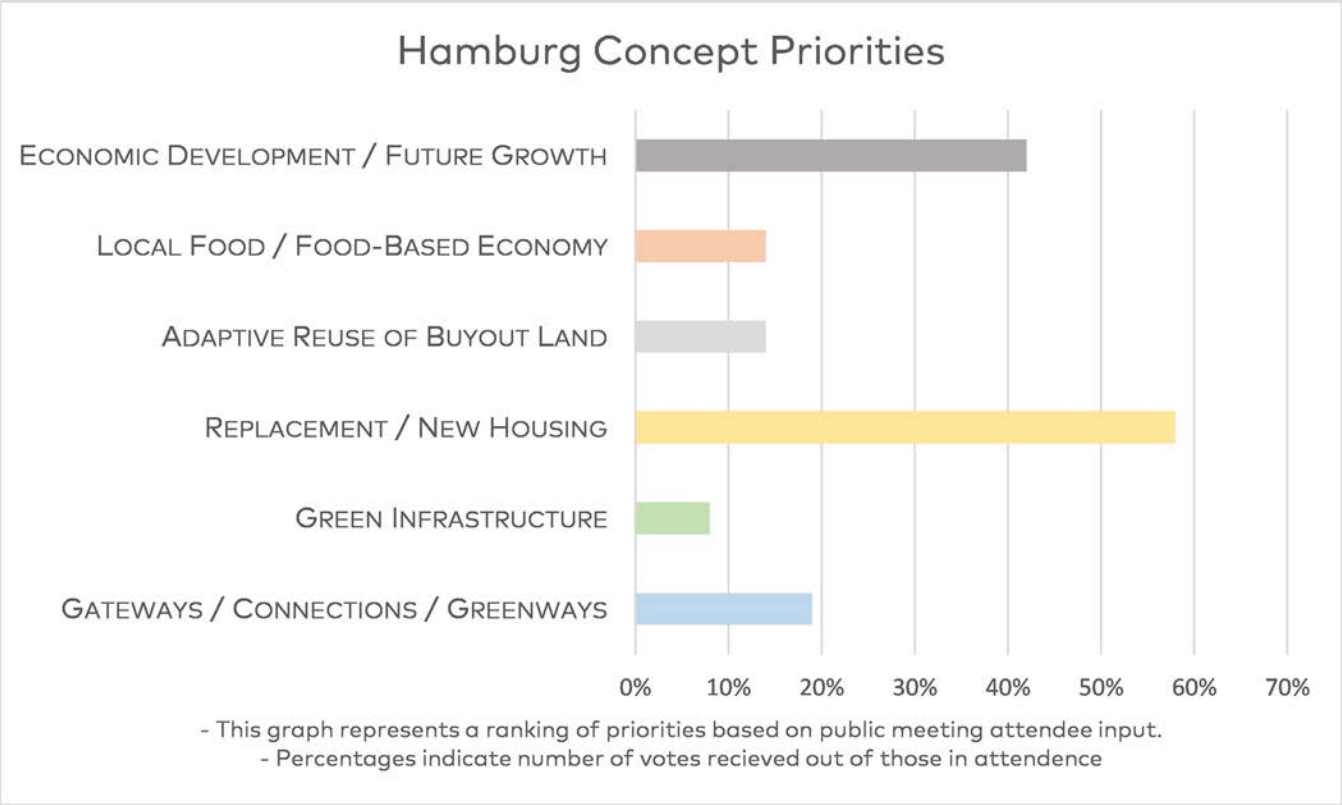
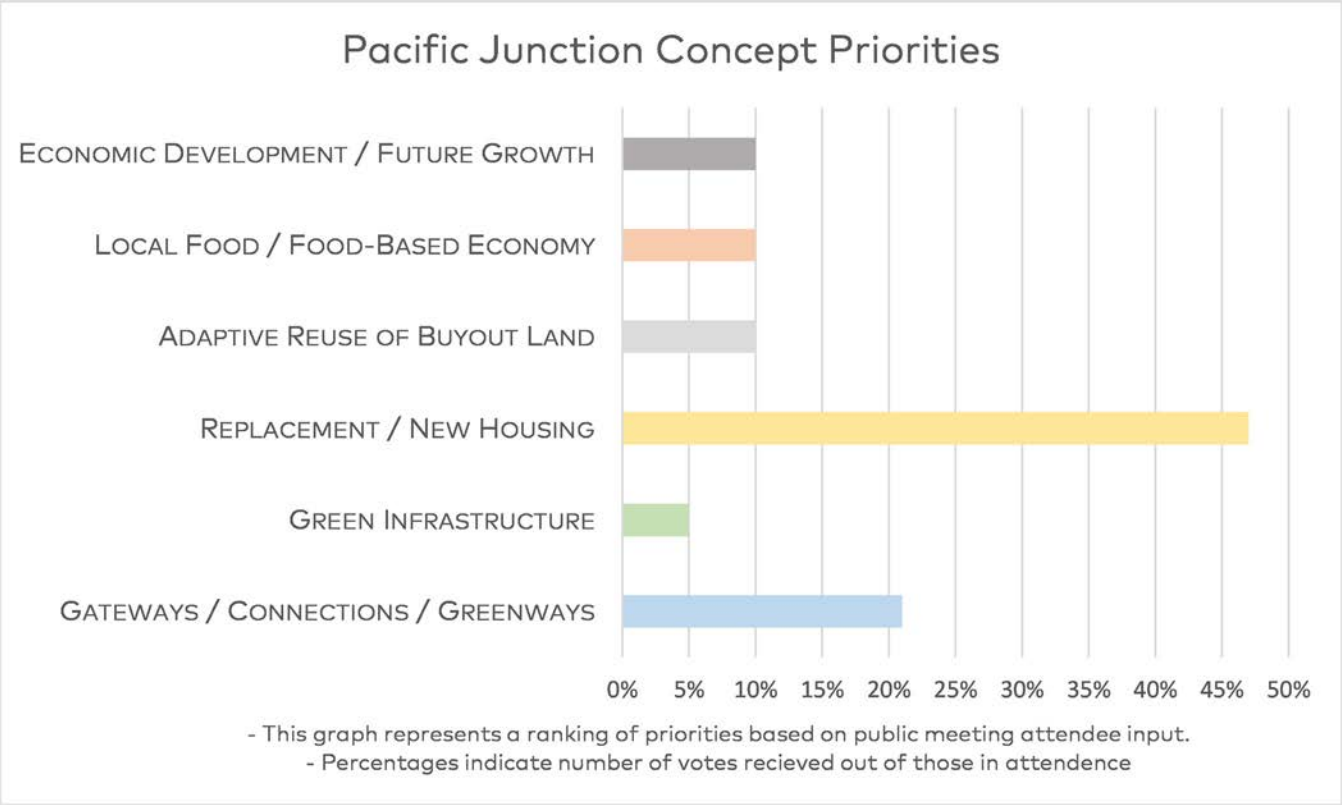
7						

A.8 Community Survey Results




Pacific Junction Concept Priorities
Economic Development / Future Growth
Local Food / Food-Based Economy
Adaptive Reuse of Buyout Land
Replacement / New Housing
Green Infrastructure
Gateways / Connections / Greenways
0%
5%
10%
15%
20%
25%
30%
35%
40%
45%
50%
- This graph represents a ranking of priorities based on public meeting attendee input.
- Percentages indicate number of votes recieved out of those in attendence

"LOESS HILLS MORNING"
PHOTOGRAPHER MICHAEL LELAND, 2015
VIA FLICKR.COM (CROPPED)

COMPREHENSIVE REGIONAL LAND-USE PLAN

FOR MILLS AND FREMONT COUNTIES
IN RESPONSE TO
2019 MISSOURI RIVER FLOODING

PREPARED FOR:
IOWA ECONOMIC DEVELOPMENT AUTHORITY

PREPARED BY:
BNIM
SOLUTIONS IN THE LAND
ENVIRONMENTAL CONSULTING & TECHNOLOGY
JIM SCHWAB CONSULTING
THE BILL MENNER GROUP
DAVE SWENSON - ECONOMIST