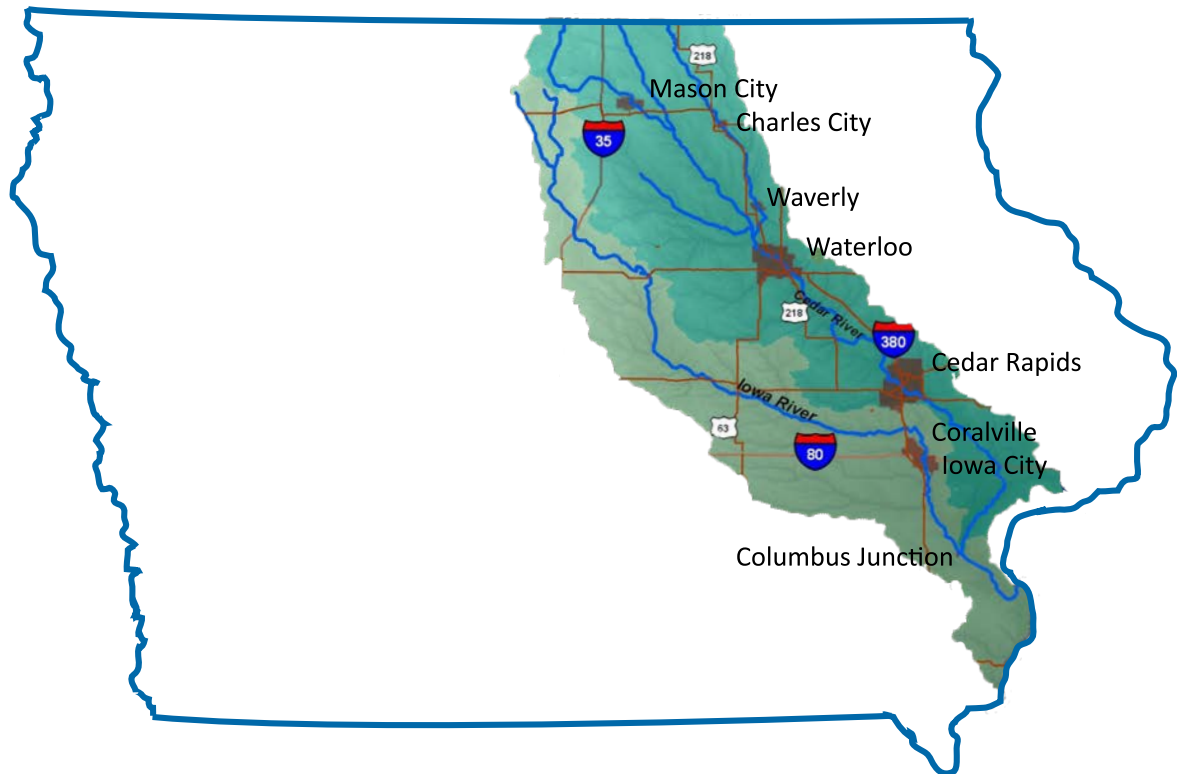




## Housing Needs Assessment After a Local Disaster

### A Final Report on Housing Recovery Research Conducted in Eight Iowa Cities Two Years Following the Iowa Floods of 2008

#### Study Synopsis



Prepared for the Iowa Department of Economic Development

By Iowa State University Extension and Outreach  
Community and Economic Development

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**IOWA STATE UNIVERSITY**  
Extension and Outreach  
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### Part One: Economic Impact Evaluation of a Natural Disaster

### Part Two: Qualitative and Quantitative Analyses Results

### Part Three: Review of Archival Documentary Materials

### Part Four: Geospatial Analysis



# Housing Needs Assessment After a Local Disaster

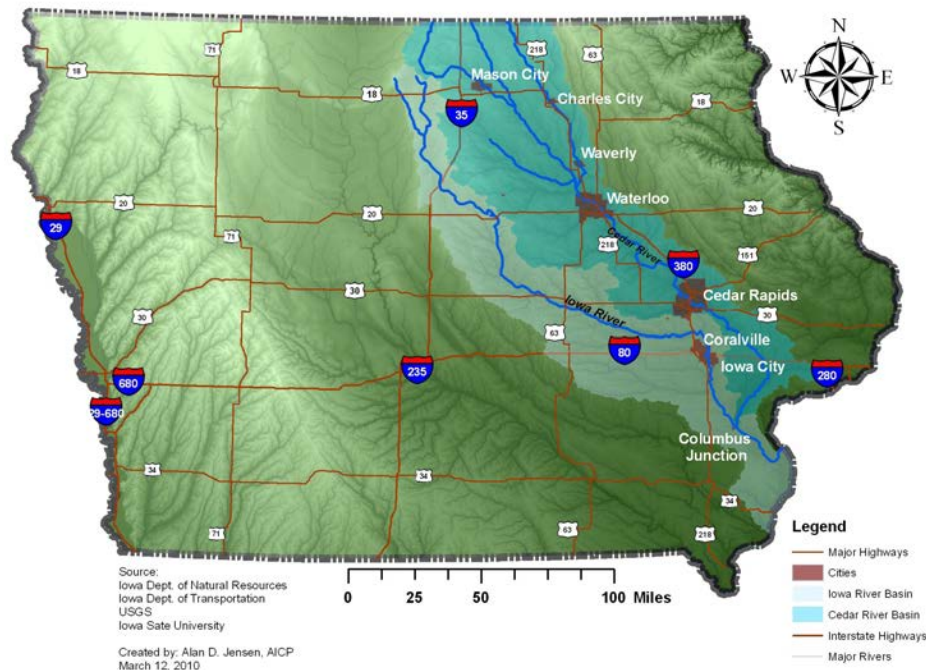
## A Final Report on Housing Recovery Research Conducted in Eight Iowa Cities Two Years Following the Iowa Floods of 2008

### Study Synopsis

#### Introduction

On June 8, 2008, waterways in the Cedar and Iowa River watersheds began to flood. For more than a month the waters rose, breached the riverbanks and inundated the homes, businesses and lives of thousands of Iowa citizens in dozens of eastern Iowa communities. The flooding was unprecedented, as were the state's response to the emergency itself and the long-term recovery process these communities faced. This study focuses on eight communities of different sizes—four metropolitan areas, one micropolitan community and three rural towns—to determine the effectiveness of state and federal assistance programs on the ability of communities to replace the housing that was lost in this natural disaster. The intent of this study is to create a housing needs assessment model with which communities can evaluate their long-term demand for affordable, decent and safe housing for all ranges of income, family size, and special needs within their populations.

**Figure 1. Map of study area**



#### The Eight Communities

The Iowa Department of Economic Development (IDED), in partnership with the Iowa Finance Authority (IFA) and the Rebuild Iowa Office (RIO), engaged the services of Iowa State University and Iowa State University Extension and Outreach Community and Economic Development to undertake a study of eight communities that were heavily impacted by the Iowa floods of 2008. IDED, IFA and RIO selected the cities to gain an understanding of how program implementation differed by the size and type of community being served and to identify the unique challenges these communities encountered in their recent experiences with the housing loss caused by a natural disaster. Table 1 is the list of cities studied and their populations as of 2010. Figure 1 shows the location of the eight study communities in eastern Iowa.

Each city experienced the 2008 floods. Each city had access to some of the same recovery resources, but they had varying levels of human capital to use, target and manage those resources. These differing capacities have led to different intermediate outcomes toward the eventual goal of full recovery.

**Table 1. Cities studied by population size as of 2010**

Cedar Rapids	125,951
Iowa City	67,067
Waterloo	66,351
Mason City	27,489
Coralville	18,330
Waverly	9,207
Charles City	7,467
Columbus Junction	2,136

## Resources Available for Housing Flood Recovery

After the floods, it became immediately apparent that flood recovery would be a complicated endeavor. The amount of money, the number of entities providing assistance, the multiple levels of government involved—each of whom had their own processes, rules, regulations and limited area of focus—became the primary challenge communities faced. According to RIO, \$4.37 billion in federal and state assistance was allocated for eastern Iowa flood recovery through December 2010. This funding came from 27 different programs sponsored by 14 government agencies, nine of which are federal and five of which are state agencies. Of the allocated \$4.37 billion, a total of \$1,666,210,745 has been spent (RIO, January 7, 2011). The funds have been allocated for a variety of recovery efforts: buyout of flood-damaged homes and businesses, construction of replacement housing, repair of damaged public infrastructure, flood mitigation projects, job creation in impacted areas, public assistance to special needs populations, and compensation for agricultural losses. For the purposes of this report, public investments directed toward housing recovery are considered. Table 2 shows the public resources and amounts of funding that have been primarily used for housing recovery.

Table 2. Public resources for housing recovery	
FEMA housing	\$135,350,656
FEMA buyouts	\$31,045,290
Community Development Block Grants	\$127,968,311
IDED Jumpstart	\$34,515,738
IFA	\$96,848,869
USDA Rural Development	\$241,800,000
<b>TOTAL:</b>	<b>\$667,528,861</b>

## Organization of this Report

This document summarizes the results of a research project that included quantitative and qualitative elements conducted by a team of researchers consisting of economists, architects, planners, community developers and geographic information systems (GIS) specialists. The research components of the study include economic benchmarks and impact analysis; focus groups, key informant interviews and online survey results; a review of archival documentary materials that represented the various plans, codes, and ordinances each city had in place at the time of the 2008 floods; and geospatial analysis of changes in housing units lost in each community. This Study Synopsis details the purpose of the project, the

methodologies used in each research component, what was learned from the process, and observations that may be useful for future disaster recovery programs. Detailed reports on four research components will be included in the full housing needs assessment report. Each component stands alone as an independent piece of research that together informs this report and the conclusions it draws.

## Purpose of the Project

The purpose of this project was to extract the best practices and thinking about the key elements that had the greatest impact on post-flood housing recovery at the community level. One element was how well prepared the community was for disaster recovery—did comprehensive plans, land use ordinances and floodplain management strategies protect properties at higher risk for flooding? Another element was leadership capacity of individuals with an understanding of housing needs—did inclusive community structures exist to mobilize and facilitate rapid response to a range of sudden housing problems? Economic resilience was an element to consider—to what extent were negative economic impacts the result of the 2008 floods versus the nationwide recession? What impact did issues like the national foreclosure crisis play on attempts to maintain housing affordability in flood-impacted communities? In researching these key elements and answering the associated questions, this project generated eight general areas of investigation:

- Identification of best practices for gauging the extent of housing loss and community impact following the 2008 floods.
- Use of economic data analysis to isolate the economic impacts caused by the 2008 floods from those caused by the national recession.
- Use of geospatial analysis to determine the number and value of housing units gained by each municipal jurisdiction from 2008 to 2010 and to calculate the net difference in housing units lost in the floods.
- Development of a model for community application in assessing long-term housing needs through use of available statistics.
- Review and assessment of the extent to which pre-existing community plans aided in the flood response and recovery.
- An assessment of the extent to which local leaders engaged with stakeholders to address identified housing and community development needs after the flood.
- An assessment of the extent to which policies and programs were effective in meeting local needs.



- Identification of best practices for future disaster recovery policies and programs based on key stakeholders' experiences administering state, federal and local programs following the 2008 floods.

## Methodology

This study was structured as a mixed-methods research project. Some of the data used for the study came from available secondary sources such as public documents, program reports, plans, maps, budgets, websites and other previously published materials. A variety of economic statistics was available, including data from the US Census, the Bureau of Labor Statistics, retail trade reports and tax receipts. Other statistical data were created by developing an input-output model to analyze data and estimate impacts based on formulae that aid in predicting how an economic change will affect a specific geographic area over a particular period of time. Data on the number of housing units lost were generated using GIS mapping. The study also used primary source data gathered from focus groups, interviews with key stakeholders who had specific knowledge of housing issues in their communities, and an online survey. What follows is a brief description of the various methodologies the research team used for this project. The individual research reports provide more detailed descriptions regarding how data were collected and analyzed.

## Economic Benchmarks and Impact Analysis

Available statistical data were collected from declarations of damages filed by each of the cities studied. These declarations, used for federal assistance, included initial estimates of loss. Retail trade and tax receipt data were collected and analyzed for a period of time prior to the floods until the end of 2010 to identify changes in economic activity. Economic models were constructed based on changes in statistically determined relationships within the local economy. This report describes three types of post-disaster economic assessment: (1) compilation of damages, losses and costs; (2) trend analysis of local and regional economic indicators; and (3) estimation of economic impacts using statistical models.

## Focus Groups

Focus groups were conducted in seven cities (Iowa City and Coralville were combined due to overlap in agencies serving the metro area). Fifty people participated in the focus groups. The participants were drawn from a list provided by IDED, IFA and RIO of individuals meeting a set of criteria representative of specific entities with influence on housing policy and development. These

included city administrators, city planners, economic developers, school district officials, public housing authorities, public works superintendents, realtors, bankers, county and city elected officials, councils of governments, community action agencies, consumer credit counseling, nonprofit agencies working in disaster relief efforts, county emergency management officials and neighborhood groups. Participants in each focus group were asked six questions concerning the availability of housing, populations in need of housing, areas of their community experiencing growth or decline, gaps in housing programs, how their community dealt with the collective grief brought on by the floods and what they would do differently if faced with a similar natural disaster in the future. The sessions were digitally recorded, transcribed, coded for key themes, analyzed by the frequency of response and charted.

## Key Informant Interviews

One-on-one key informant interviews were conducted with 44 individuals representing all eight cities in the study. The participants were selected using the same criteria that were used for the focus groups, but did not include focus group participants. The interviews were conducted by phone and in person between October 2010 and January 2011. Interviewees were asked nine questions concerning the largest challenges in their current housing situations; the types of housing, neighborhoods and specific price points that have failed to recover following the floods; the populations they had the most difficulty serving; the problems they were unable to help people address; the effectiveness of pre-flood plans, ordinances and building codes; the effectiveness of local leadership; the use of public processes; barriers encountered working with insurance companies, businesses, and flood recovery programs; and advice they would give another community dealing with a similar natural disaster. The interviews were digitally recorded, transcribed, coded for key themes, analyzed by the frequency of response and charted. The interview subjects received masked identifiers such as "Banker 1" or "Realtor 2" to provide confidentiality and to elicit more candid responses.

## Online Survey

The online survey was administered using Survey Monkey, a commercially available software program. The survey was sent to residents of the eight study communities who were identified by the key informant and focus group participants as persons with specialized knowledge of their communities' housing markets. The online survey was also sent to all parties for whom an e-mail address was available from the initial list provided by IDED, IFA and RIO and whom were not reached through focus group

sessions or key informant interviews. Additionally, the survey was administered to a selection of individuals who were not tied to a specific community, but functioned in a more regional or statewide capacity and therefore served multiple communities. A total of 48 individuals returned surveys. The survey was composed of 38 questions related to participants' perceptions of housing issues before and after the 2008 floods. Questions asked pertained to the availability of housing since the 2008 floods, recovery efforts made by the community, city housing codes and their effect on the community's ability to construct replacement housing, effects/impacts of flooding on communities and businesses, presence and roles of neighborhood groups/coalitions, state and federal assistance in the recovery effort, and housing gaps and barriers to rebuilding communities after the flood. The online survey was electronically distributed on December 16, 2010 with a follow-up e-mail on January 3, 2011. The overall response rate was 50% (41.9% for the local group and 53.8% for IFA, RIO and IDED stakeholders). Due to the difference in available sample sizes from each city, the data were weighted to minimize underrepresentation of the smaller communities. Weighting was based on having at least 10 samples from each of the eight cities; that is, each response was weighted as if it had been answered by 10 respondents in order to equalize the communities statistically. The results were analyzed and a series of charts were constructed from the data to visually represent the findings.

### Archival Documentary Review of Pre-Existing Planning Materials

Internet searches and in-person visits to city halls, county courthouses and councils of governments yielded a variety of planning documents, ordinances and reports dating from before the 2008 floods to the post-flood recovery period through mid-2011. These documents guided disaster planning, housing needs assessment, housing codes, zoning and land use, hazard mitigation and comprehensive community planning in each of the eight cities. A total of 63 documents were reviewed as part of the documentary analysis: 13 from Cedar Rapids; five from Charles City; five from Columbus Junction; six from Coralville; seven from Iowa City; six from Mason City; seven from Waterloo; and 14 from Waverly. The analysis judged how well cities had been following their own guidelines for housing and businesses located in floodplains, how well their pre-existing plans predicted the extent of the flooding, and whether existing codes and ordinances match each community's hazard mitigation strategies and national standards for disaster preparedness.

### Geospatial Analysis of Housing Data

A geospatial analysis was conducted using data from the respective county assessors' offices. The year 2008 was utilized as a base period, with changes through 2010 documented for each parcel in the affected cities. A major function of the county assessor's office is to assess the value of real property for the purposes of levying property tax. These data over time allowed the team to document the locations of homes lost from floods based on major declines in value within the floodplain from 2008 to 2010.

Properties with homes damaged in excess of 50% of their assessed valuation from 2008 to 2010 were considered lost. The vast majority of parcels with a more than 50% loss in value had buildings with property values assessed at \$0. Using GIS mapping, parcels were cross-referenced with zoning maps to identify parcels with multifamily dwellings. These potential parcels were referenced on each county assessor's website to determine the number of housing units lost on each multifamily-zoned parcel. All eight assessors had these data available online. There may be a slight underestimate of units lost due to errors in assessor data collection. For example, rental units in single-family homes would not be reflected in these data if the units were not recorded with the city.

The study was commissioned however, to identify the impact of the 2008 flood on housing in the eight study communities. Therefore, a measure of the economy was needed to determine if it sustained new construction to replace housing units. This measure was calculated for the total number of units, and value of the replacement units was compared with that of the lost units.

To determine housing impacts of a natural disaster in each community, a measure of housing units lost, a measure of new units built, and a measure of the local economy's ability to influence housing demand is needed. The following formula was constructed:

$$X=(UL-P)+D$$

Whereas:

$X$  = Net housing need in community

$UL$  = Units lost due to natural disaster

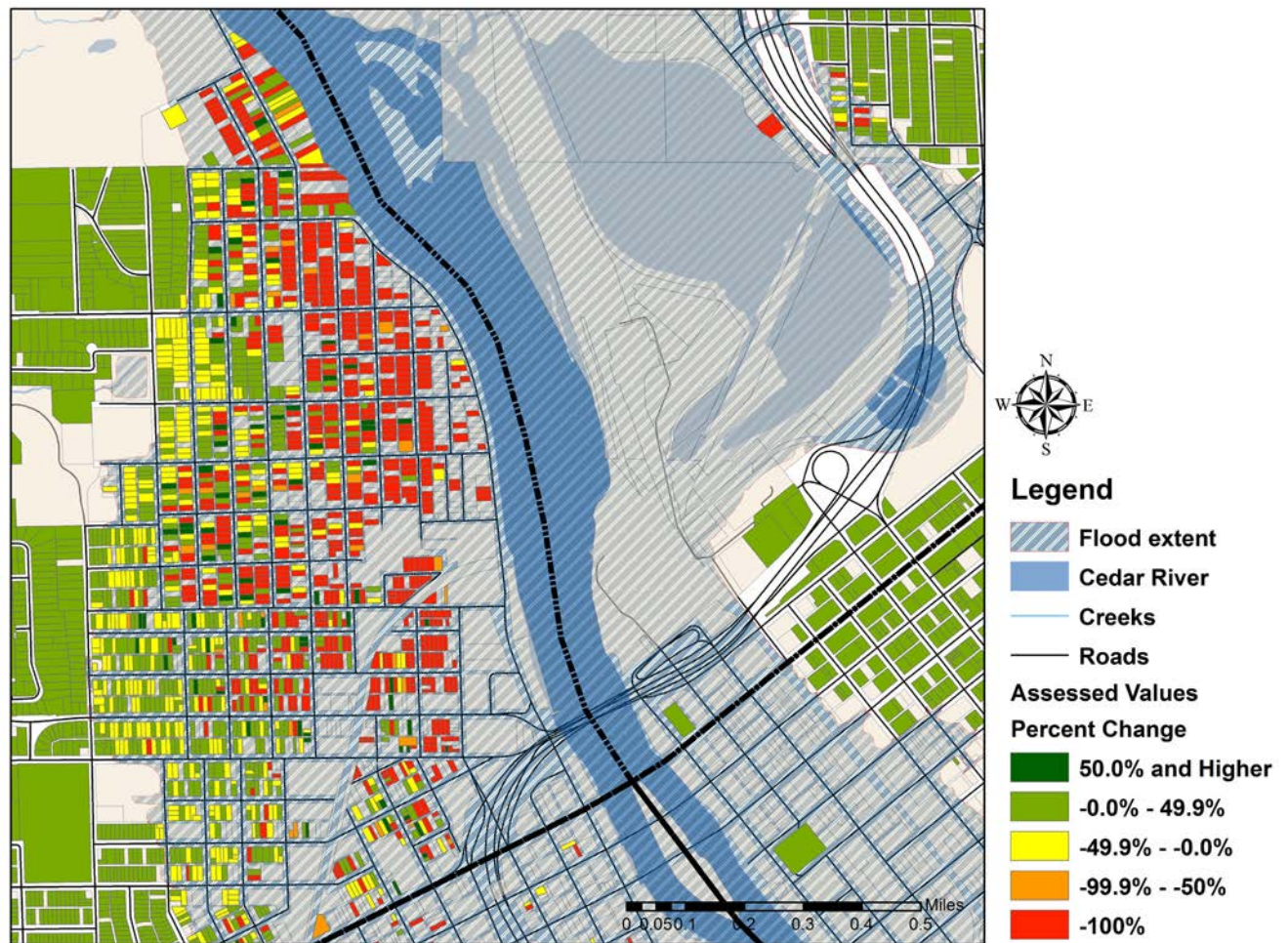
$P$  = New housing units constructed

$D$  = Housing demand from local economic performance

In other words, the net housing need in a community after the 2008 floods was calculated based upon the total number of units lost in the flood minus the total number of units built within the past two years. Housing permit data from the US Census Bureau were utilized to determine the number and value gained by each



**Figure 2. Percent change in assessed property values for Cedar Rapids, 2008–2010**



municipal jurisdiction (except Waverly) from 2008 to 2010. The total number of units built or building permits issued was deducted from the total units lost according to the county assessors' data to determine a net difference in housing units lost due to the flood (see the "Net difference" column in table 3).

Then housing demand based upon job creation over the past two years was calculated to determine the overall need for housing units. This calculation assumes a unit-to-unit replacement without considering the values of those replacements. It does, however, takes into account whether a local economy has recovered and is growing post-disaster (see the "Economic housing demand (2008–2010)" column in table 3).

City	Units lost (2008 flood)	Permits for new units	Net difference	Economic housing demand (2008–2010)	Net difference (total housing demand)
Cedar Rapids	1,533	1,665	-132	1,616	1,484
Charles City	12	6	6	0	6
Columbus Junction	6	10	-4	6	2
Coralville	36	221	-185	215	30
Iowa City	154	701	-547	789	242
Mason City	50	111	-61	0	-61
Waterloo	52	180	-128	0	-128
Waverly*	44	47	-3	0	-3

\*Waverly data was generated through geospatial analysis of 2008 and 2010 county assessor's data.

Thus, the changes in housing units within the municipalities are adjusted for both the 2008 flood and subsequent economic conditions (see the “Net difference (total housing demand)” column in table 3).

## Study Results

The project sponsors (IDED/IFA/RIO) hoped to answer two primary questions through this study:

1. How can the negative economic impacts attributable to the 2008 floods be separated from the negative economic impacts of the nationwide recession?
2. What are the remaining gaps in the housing markets of the flood-impacted communities that the private housing market has not satisfied to date?

The following information emerged from the ISU research team’s endeavor to resolve those questions:

1. The flood-impacted communities have experienced greater negative economic impacts from the nationwide recession than from the 2008 flooding. The floods affected only part of the local economy, and a negative impact to part of a local economy does not impact all parts of the economy equally. The floods of 2008 did not result in a permanent loss of population, employment or incomes in the eastern Iowa region. Additionally, the state, federal and private spending associated with flood recovery provided a temporary stimulus to parts of the region’s economy.
2. The available excess housing capacity in four of the study communities was able to absorb a level of household demand equal to their current population and workforce needs. Economically, only the cities of Cedar Rapids, Iowa City, Coralville and Columbus Junction statistically demonstrate a need for additional housing units. Projections based on the study data are that Cedar Rapids will need 1,616 new units, Iowa City will need 789 new units, Coralville will need 215 new units and Columbus Junction will need six new units to satisfy local housing demand. The housing gaps that remain are those that existed prior to the 2008 floods—housing affordable to low-income populations, senior citizens and special needs populations.
3. Municipal and nonprofit capacity in case management and outreach services is needed for recovery programs to operate effectively. This study shows that local entities charged with implementing the state’s recovery programs experienced difficulties identifying flood-impacted households and tracking contact information when flood-impacted households relocated. Local entities also experienced trouble marketing available relief programs to eligible populations; explaining program rules and regulations and assisting clients in assembling necessary documentation; bundling multiple forms of assistance to meet household needs; and dealing with complicating factors such as upside-down mortgages, unemployment, or unusual household circumstances.
4. Disaster recovery programs can be created before a natural disaster and legislatively funded when it is time to implement a disaster response. Relief and recovery programs associated with the 2008 floods suffered from federally imposed regulatory barriers and local implementation problems. State agencies were bound by the rules of program funding designed for use under ordinary circumstances. Given that those rules are unlikely to change, a better option may be to develop materials and deliver training on these rules to core constituencies the state relies upon to interact on its behalf with disaster-impacted citizens.
5. Accurate and accessible data are needed for local decision making and long-term planning. There is a significant need to address the collection of local housing and economic data at the county assessor level. Changes in technology in the last decade have rendered many local governments dependent on third-party providers for maintenance of complicated recordkeeping systems, GIS, mapping and querying capacity. Data are not collected in a consistent fashion, making it difficult to assess issues on a regional basis. This data problem leaves local leaders with fewer mechanisms to quantify their local needs and greater dependence on often inaccurate and anecdotal perceptions of need. Additionally, the quality of data and access to data inform long-range community plans for both hazard mitigation and housing.
6. The housing market gap in disaster communities should be evaluated not only in terms of units lost but also in terms of the value of the housing lost versus that of replacement housing. Geospatial analysis of housing capacity shows that three of the eight study communities are experiencing levels of housing demand in excess of units lost as a result of the 2008 flood. In the cases of Iowa City, Coralville and Cedar Rapids, local economic growth has created a housing demand beyond the units lost from the flood. Economic conditions in Charles City and Columbus Junction added no real growth in housing demand; the overall housing impacts derived from either the flood or the local economies remain negligible. Waterloo and Mason City actually realized more new housing units in the past two years than would have been predicted by flood losses and the economic

growth and therefore have a slight excess of housing. In the five communities for which data are available, there is a significant discrepancy between the value of the housing lost and the value of the housing built since the flood. In each city, the more affordable housing lost in the flood is being replaced with significantly more expensive housing.

The remainder of this Study Synopsis will provide examples of how these lessons were learned. These lessons are highlighted in far greater detail in the research component reports.

### Study Result 1: Economic Impact Analysis Reveals Larger Impact from Recession than the 2008 Floods

#### Observation 1: Initial flood impact data are not predictive of long-term negative impact.

Compilations of direct damages, losses and costs associated with a disaster should not be confused with the economic impact of the disaster on the local economy. Most post-disaster data collection efforts are focused on disaster-affected individuals, households, businesses and governments. They do not survey the broader population or capture offsetting economic activity. Relying on these

data alone may lead to exaggerated local perceptions about the scale of the disaster in terms of the broader economy. That said, a greater understanding of what defines and constitutes damages, losses, costs and economic impacts would be greatly enhanced with standardization of data collection. A good place to start such standardization is through adoption of The National Research Council's Disaster Accounting Measures as shown in table 4.

#### Observation 2: A negative impact on part of a local economy does not impact all parts of the economy equally.

Analysis of secondary economic indicators can help to identify notable changes in area economic trends before and after a natural disaster. Indicators that may be useful for assessing local housing needs include changes in population, public school enrollment, workers' commuting rates, taxable retail sales, unemployment rates, total employment and the composition of local employment. In this study, a detailed analysis of these indicators failed to find conclusive evidence of lasting effects of the floods on the study communities, although this does not mean the floods had no effects. In the absence of data collected directly from all disaster-affected businesses and households, local officials may rely upon

Table 4. Disaster accounting measures	
Damages	Physical outcomes of the events: houses destroyed, miles of roads damaged, number of bridges washed out, acres of cropland flooded or eroded, households affected, and businesses disrupted, as examples.
Losses	Estimates of the market or financial value of damages or disruption to area households, businesses and governments. Losses may be direct or indirect.
	<ul style="list-style-type: none"> <li>Direct losses describe the value of destroyed or damaged homes, lost personal belongings, business machinery or inventory, and other assets. Direct loss estimates should measure the fair market value of the lost or damaged items, not the replacement cost of those items.</li> </ul>
	<ul style="list-style-type: none"> <li>Indirect losses include incomes derived from businesses that were affected, lost wages to displaced workers, and increased costs to households, commuters, or firms due to displacement or disruption. Some of these indirect consequences can be extremely difficult to measure, and may be best estimated using economic impact models.</li> </ul>
Costs	Payments to repair damages and/or compensate persons, firms, or public entities for losses. Costs include all payments by insurers, to the extent that the natural disaster losses were insured; payments by the public at large through state and federal disaster assistance programs; and payments and costs associated with the disaster-assistance activities of private, nonprofit organizations or charities. Emergency response, overtime pay and other municipal expenses associated with the disaster would also be considered costs.
Economic Impacts	Net changes in the region's ongoing productivity. Economic impacts are generally described either in terms of jobs or regional value added, which includes labor income, returns to area proprietors and payments to government. Impact assessments can measure short-term disruptions as well as permanent alterations in the size and configuration of the area economy. Economic impacts may include both negative and positive elements.
Other Impacts	Other direct or indirect consequences of the disaster, including nonmarket as well as market effects. Examples include changes in area commuting patterns, environmental impacts, psychological effects on individuals and others.
Source: <i>The Impacts of Natural Disasters: A Framework for Loss Estimation</i> (1999), National Research Council	



these kinds of secondary data sources to estimate changes in area economic activity after a disaster. There are five key challenges in using secondary data sources to measure the economic consequences of a natural disaster:

1. There is typically a substantial lag time between the collection and publication of data measuring local employment, income and population.
2. The availability of data for small areas such as neighborhoods or cities is quite limited, with much data produced only at the county level or higher.
3. Many economic measures are produced only on an annual or quarterly basis, which prohibits the detection of any immediate or short-term effects of the disaster.
4. A natural disaster may affect only a fraction of a region's economy, making it very difficult to isolate its effects from the fluctuations associated with ordinary (or extraordinary) business cycles.
5. Sampling and other types of errors associated with survey data might obscure any real changes in the indicators being measured.

**Figure 3. Employment trends in Cerro Gordo and Floyd Counties**

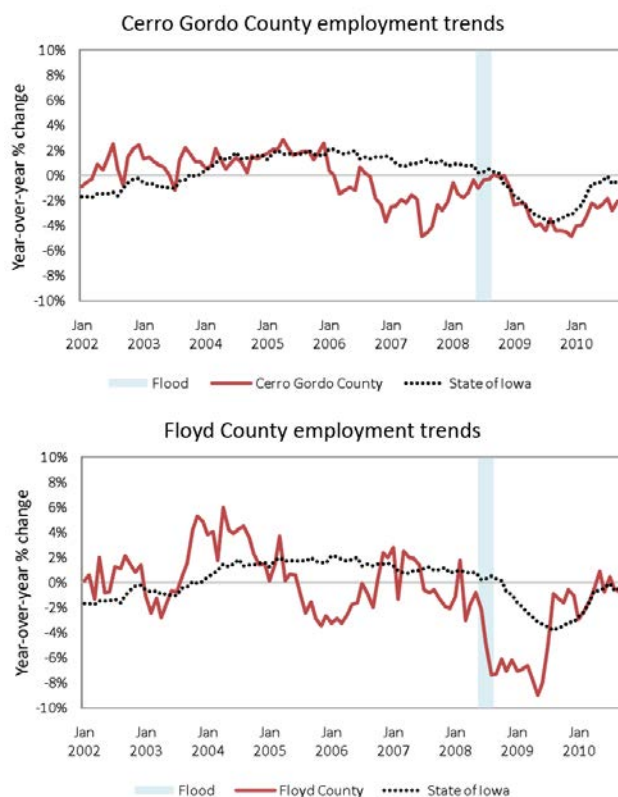


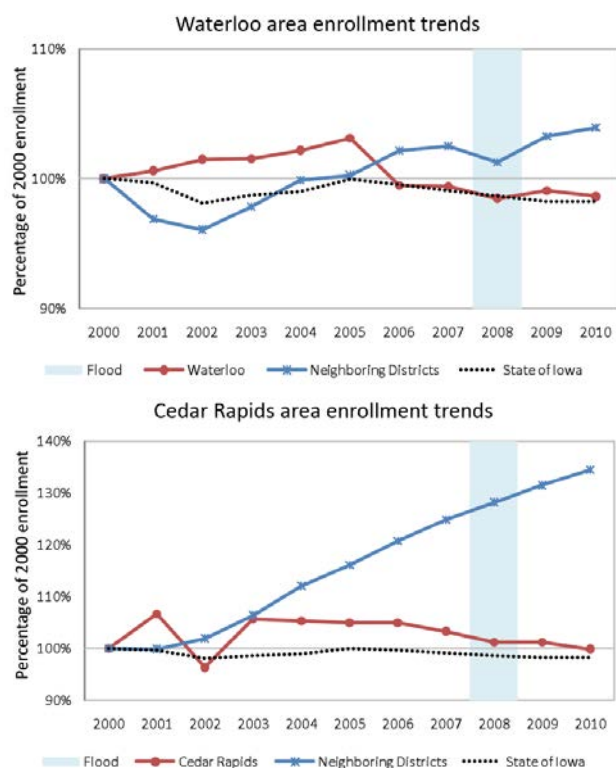
Figure 3 provides an example of how secondary economic indicators tell a story and the difficulty in determining what that story is in the absence of other explanatory information. Figure 3 shows the employment trends for Cerro Gordo and Floyd Counties from January 2002 to January 2010 with the period of the 2008 floods highlighted in blue. Does it show a greater loss of jobs in Floyd County than in Cerro Gordo County at the time of the floods of 2008? Or would it help to know that the Winnebago Plant in Charles City closed the week before the flood event?

In figure 4 comparing school enrollment trends for Waterloo and Cedar Rapids, a small dip and recovery is clearly evident for Waterloo, while Cedar Rapids continued a trend of bleeding students to neighboring school districts that has been present since 2001.

**Observation 3: The Iowa floods of 2008 did not result in permanent loss of population, employment or incomes.**

It is not possible, using visual inspection of trends, to identify the economic effects of the 2008 disasters in Iowa distinctly from the effects of the severe national recession that began in December 2007. Due in part to the data issues related in the first two observations, an analysis of secondary economic indicators in the subject communities failed to identify measurable changes in area population,

**Figure 4. Enrollment trends in the Waterloo and Cedar Rapids areas**



employment or incomes resulting from the disasters. This is not to say that there were not individual businesses that were unable to reopen after the flood or individual households that moved away from impacted communities. The data nevertheless suggest that the incidence of population shifts, business closures and unemployment directly attributable to the 2008 floods was not statistically significant in the overall economy of the region.

**Observation 4: Economic models are a practical way for local officials to predict industry and community specific impacts.**

Another option for estimating long-term economic impacts of a disaster is to use economic modeling techniques. An economic model, once constructed, lessens the need for local officials to compile and analyze large amounts of local data. Instead, these models rely upon sets of statistically determined relationships among economic measures of interest to local officials. There are three types of models that local officials can use to answer specific questions about their local economies:

1. Input-output models may be used to estimate how a temporary or permanent reduction in local employment or household income might impact the remainder of the economy regardless of whether the source of decline is disaster-related or related to the overall national economy.
2. Econometric models may be used to assess how changes in area household composition or household income might impact local housing needs.
3. Other models may be used to simulate changes in local government revenues and expenditures that might result from a loss of households or loss of household incomes.

The following is an example of how an input-output model answers the question of what happens to the local economy if 10 jobs are lost for any reason—flood, plant closure, recession—and 10 households move away.

- Scenario 1 models the estimated direct, indirect and induced job losses that would result from a loss of 10 jobs in manufacturing firms that might typically be found in areas at higher risk for flooding. The mix of firms used for this modeling exercise includes printing, concrete manufacturing firms, machine shops and related fabricated metals firms.
- Scenario 2 models the estimated direct, indirect and induced job

losses resulting from a loss of 10 jobs in the local trade and services sector. The mix of firms for this scenario includes motor vehicle and parts suppliers, automotive repair firms, and food and drinking establishments.

- Scenario 3 models the estimated direct, indirect and induced job losses that would occur if 10 typical households moved away from the region. The resulting loss in local income and spending by those households would mean lower sales by local firms and related impacts on supplying firms and workers. For this scenario, the typical household was defined as a family with an annual household income at the median value for the county.

The differences in multiplier values across the study communities can be explained by differences in the sizes and complexity of their economies. The larger counties have a greater diversity of firms and stronger supply linkages among firms and households within the county. Multiplier values in these counties tend to be higher than in smaller counties where there is a greater likelihood that economic activity leaks out to supplying firms outside the county.

The results from these three scenarios are not additive. They have been presented side by side only to illustrate the differential impacts across industries and county economies of varying sizes and complexity. Also, these scenarios assume that the initial economic shock represents net losses after accounting for any offsetting activity or interregional shifting that would likely occur.

Table 5 shows the estimated job impacts for these three loss scenarios in the seven study counties. The job losses reflect the total number of jobs that would be lost in each scenario considering its direct, indirect and induced effects. In scenario 1, for example, the total impact of losing 10 manufacturing jobs in Benton County would be those 10 jobs plus an additional 7.8 linked jobs.

**Table 5. Estimated job loss impacts for three flood-related scenarios**

Study Area	Scenario 1: Loss of 10 mfg jobs	Scenario 2: Loss of 10 trade/ service jobs	Scenario 3: Loss of 10 typical households
Benton County	17.8	13.1	4.0
Black Hawk County	16.8	12.6	3.7
Cerro Gordo County	17.7	13.0	4.2
Floyd County	13.0	11.6	2.3
Johnson County	17.9	13.3	3.9
Linn County	19.1	13.5	4.5
Louisa County	14.9	11.2	1.8

The expected impacts in Benton County would be lower in scenario 2, in which the loss of 10 retail and service jobs would result in losses of just 3.1 additional linked jobs. The values are lower in the retail/service scenario than in the manufacturing scenario because the selected types of retail/service firms typically have weaker linkages with local suppliers and they tend to pay lower wages.

Scenario 3 differs slightly from the first two scenarios because it begins with a reduction in local consumer spending rather than an initial job loss. In Benton County, the model estimates local spending by a typical household in the community supports .4 jobs. Losing 10 households would translate to an expected loss of four jobs in the local economy.

**Observation 5: The Iowa floods of 2008 provided a temporary stimulus to certain parts of the regional economy.**

Disaster assistance payments and rebuilding activity can stimulate the local economy. This is an offset to some of the economic activity that was lost as a direct consequence of the flood. In particular, household and business spending to replace or rebuild lost assets can provide a temporary, but substantial, boost to the local construction and retail sectors. Some local establishments may benefit from increased sales as they capture sales lost

by disaster-affected businesses. When economic activity merely shifts from one location to another within the region, there may not be a measurable economic impact associated with that shift. This is not to say, however, that households experience a stimulus when they have to replace household furnishings, clothing, vehicles and homes. At the household level, this spending represents a loss of wealth, equity, disposable income and the potential for long-term family credit and finance issues.

An example of how a community can temporarily benefit from increased retail spending following a natural disaster is shown in figure 5. Cedar Rapids, with its larger number of retail firms, experienced a jump in sales compared to Columbus Junction, where retail sales likely leaked to the larger metropolitan area of nearby Burlington.

**Study Result 2: Only Four Study Communities Have a Statistical Need for More Housing Units**

A housing model was developed for this project to explore how post-flood job losses or gains in the eight study communities may have affected the number of housing units required to satisfy local housing demand. Two key factors are important in explaining the demand for housing in a region: the number of people who desire housing and the amount of income they can spend on housing. Either or both of those factors could be affected by an event that “shocks” or alters the local economy, especially an event involving local job losses.

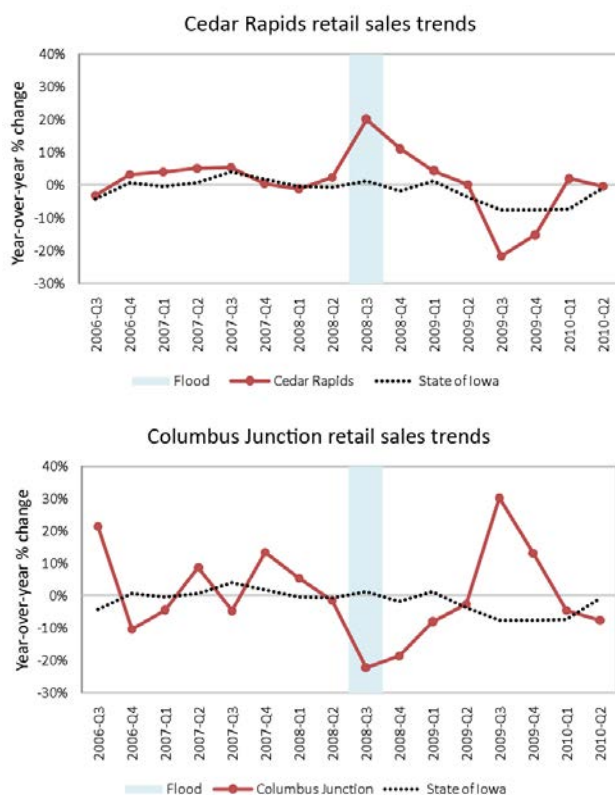
The model estimates the expected change in housing units demanded as a function of local workforce size and other local economic characteristics. Workforce size was selected as the key independent variable because it measures local employment considering net commuting flows. As such, it best describes how economic conditions in a broader region might translate into changes in demand for housing units within a community. Two equations were constructed to make this calculation:

Equation 1 predicts the expected change in occupied housing units given a change in the local workforce size, with the number of occupied units serving as a proxy for local housing demand. A positive relationship between occupied housing units and workforce size is expected.

Equation 2 predicts a change in the housing vacancy rate given a local workforce change. Here, a negative relationship is expected. If the local workforce size increases, at least some fraction of currently vacant housing units could be occupied by the new worker households. Conversely, if the workforce size decreases, the local housing vacancy rate should increase.

Table 6 shows the results of the modeling scenario for the study communities. In this scenario, each community’s

**Figure 5. Retail sales trends in Cedar Rapids and Columbus Junction**





## Equation 1

### Occupied units

=  $f$  (resident workforce size, vacancy rate, population density, median household income, median housing value, recent population growth rate and percentage of residents 65 years or older)

## Equation 2

### Vacant units

=  $f$  (resident workforce size, population density, median household income, median rent, unemployment rate, worker out-commuting rate, recent population growth rate and percentage of housing units built before 1940)

workforce size was changed by an amount equal to their actual workforce gain or loss from 2007 to 2009. These values, obtained directly from US Census Bureau Local Employment Dynamics data, are shown in column 1. Column 2 shows the predicted change in vacant housing units obtained from equation 2. Subtracting the change in vacant units from the overall demand change yields the expected net demand for new housing units, shown in column 4.

The expected demand for new housing units was positive in four of the study communities: Cedar Rapids, Columbus Junction, Coralville and Iowa City. The model predicted that a fraction of the new demand would be met by available vacant units; however, some new construction was expected in all four communities. The highest level of activity was expected in Cedar Rapids, where strong employment growth led to an estimated demand for 1,616 new housing units. The model predicted that six new units would be required to meet new housing demand in Columbus Junction. Growth in Iowa City and Coralville translated into an expected demand for 1,315 new units in that combined metropolitan area.

The estimated net demand for new housing units in Charles City, Mason City and Waverly was zero. These cities experienced workforce declines from 2007 to 2009, resulting in lower overall demand for housing and expected increases in the number of vacant units.

The results of the modeling exercise suggest that the effects of the national recession may have mitigated post-disaster housing needs in the study communities. Workforce declines in several communities likely reduced local occupancy rates, thus increasing the supply of housing units available to absorb residents displaced by flooding.

It is also possible that weaker housing market conditions related to the recession put downward pressure on housing prices in the study communities, although this was not explicitly addressed within the model. The model could be enhanced by allowing housing prices and rents to vary within the system of equations and feed back into the demand equation, thus acknowledging the two-way relationship between demand level and prices.

The housing model might also be expanded to explore other dimensions of housing need. For example, the model as specified does not recognize the possible mismatch between the cost of available units and the incomes of residents who require housing. This might be addressed by estimating the demand for low-income or affordable housing separately from all other housing units. Similarly, it might be desirable to distinguish between the demand for rental properties versus the demand for owner-occupied properties.

Other components of this research project capture what local housing stakeholders perceive to be some of the specific housing needs in their communities in terms of populations in need of housing and types of housing that may match the local need. Forty-eight knowledgeable housing stakeholders in the eight study cities responded to a 38-question online survey. In question 12, respondents were asked to indicate which groups' housing needs were not met by their respective communities following the floods. Choices included lower income, young families, elderly, renters, ethnic minority, middle class, affluent, persons with disabilities, single-family owners, and other. Figure 6 shows the aggregated responses to the question and figure 7 breaks the answers down by the city. In the aggregated results, low-income households and renters were the two highest categories. When responses are examined by city, however, differences in urban and rural perceptions of the gap in housing for their specific community reveal specific

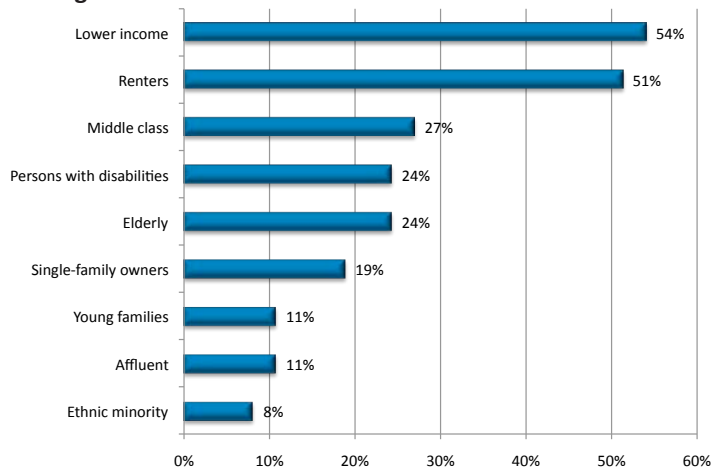
Table 6. Results of modeling scenario by city

Study City	Change in number of employed residents	Change in housing units demanded	Change in number of vacant units	Net new housing demand
Cedar Rapids	2,272	1,767	(151)	1,616
Charles City	(26)	(25)	25	–
Columbus Junction	7	7	(1)	6
Coralville	312	235	(20)	215
Iowa City	1,003	862	(73)	789
Mason City	(1,047)	(810)	810	–
Waterloo	(437)	(353)	353	–
Waverly	(48)	(35)	35	–

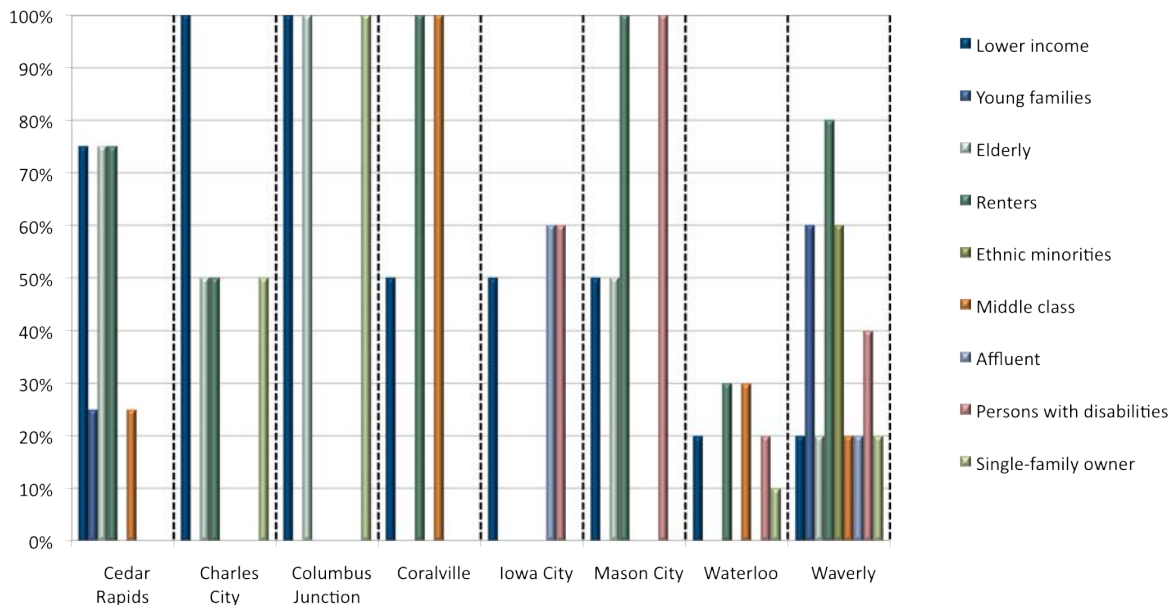
situations such as Mason City's high ranking of a need for housing for young families; Coralville's equal ranking of a need for middle-class housing and rental units; and Columbus Junction as the only city to rank housing for single-family homeowners as the highest need.

Question 13 broke these categories down into specific types of housing. For example, "rental market" in question 12 is divided into multifamily housing units or single-family homes that can be rented. Respondents indicated whether or not the following types of housing were able to be replaced: single-family owned, single-family rental, multifamily rental, condominium/townhouse, senior housing including assisted living, housing for persons with disabilities,

**Figure 6. Populations perceived to have the highest post-flood housing needs**

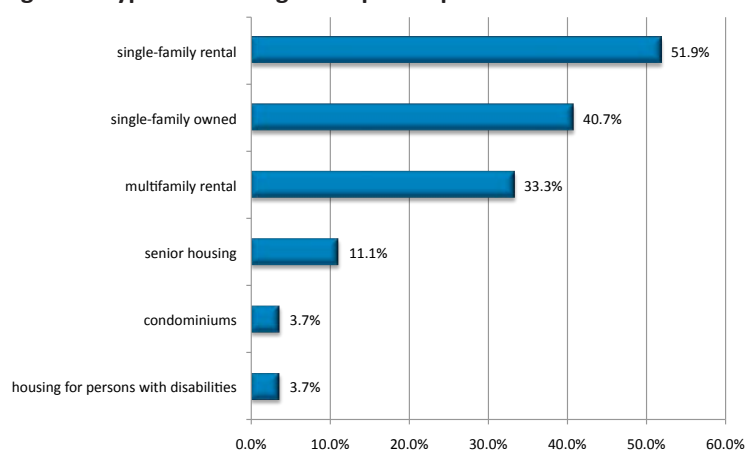


**Figure 7. Populations perceived to have the highest post-flood housing needs by city**

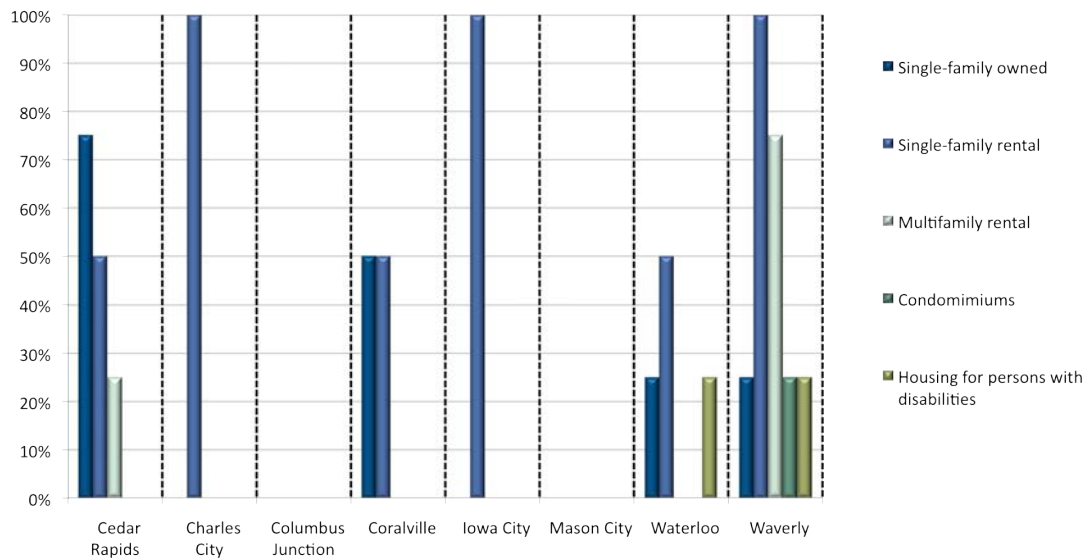


and other. Again, results are presented in the aggregate (figure 8) and then broken down by city (figure 9). In the aggregate results, 51.9% of respondents identified single-family rental as the type of housing most likely to have not been replaced post-flood, 40.7% said that single-family owned homes were the second most likely housing type that has not been replaced, and 33.3% identified multifamily rental units as a type of housing that hasn't been replaced post-flood. Figure 10 makes clear that the majority of communities define rental as single-family homes that can be rented from multifamily housing complexes.

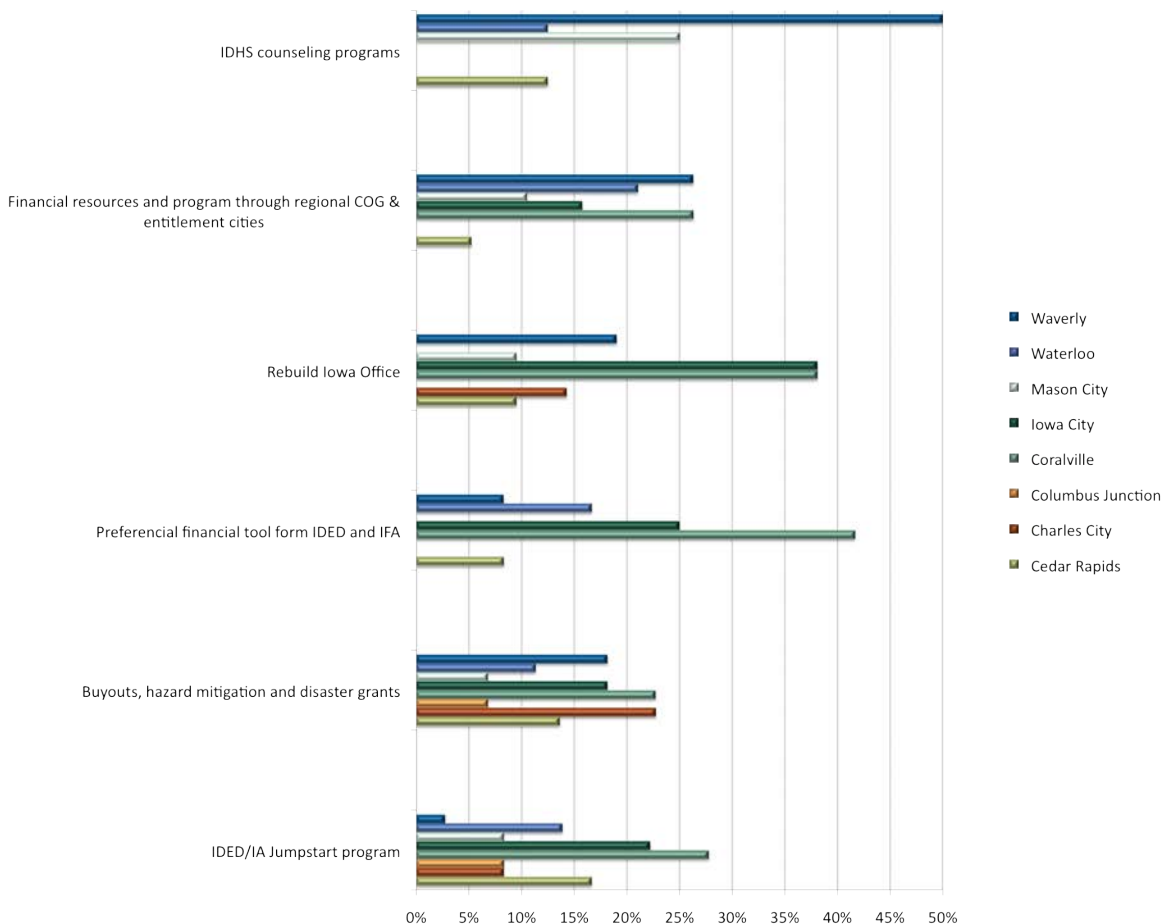
**Figure 8. Types of housing not replaced post-flood**



**Figure 9. Types of housing not replaced post-flood by city**



**Figure 10. Awareness of state programs for flood recovery by city**



The survey data were confirmed by participants' responses in the focus groups held in each of the study communities. The top three responses to the question "What populations have had the hardest time replacing the housing they lost?" were the low-income, the elderly and people who didn't know how to seek assistance. Additional confirmation regarding the types of housing that have not been replaced following the 2008 floods comes from the 44 key informant interviewees. The most frequent responses to the question "Are there particular types of housing, specific neighborhoods, or certain price points which have failed to develop through the private market to date?" were older, lower-priced housing; affordable rental; and affordable single-family rental.

### Study Result 3: Municipal and Nonprofit Capacity in Case Management and Outreach Services Is Needed for Recovery Programs to Operate Effectively

A significant portion of the research for this project was conducted in the form qualitative and quantitative public input processes. Focus groups were held in seven cities and attended by 50 local leaders, 44 key informant one-on-one interviews were conducted with government and nonprofit leaders, and an online survey was sent to key stakeholders with 48 respondents. The purpose of this portion of the research was to discover if there were any differences between the statistical data regarding economic impact and housing need versus the perception of these impacts and needs within the communities. The research team also wanted to better understand how well disaster recovery programs worked in the community context and what barriers local leaders encountered in using the programs that were made available to them.

The focus group sessions and key informant interviews yielded numerous responses indicative of issues and situations that effective case management and outreach capacity could have alleviated. Examples included the emotional strain on flood-impacted citizens and the burnout and stress experienced by service providers trying to help them, the number of people who did not apply for program assistance because they didn't know it was available, the frequent citations of service providers and community leaders who did not know where their local population had resettled either temporarily or permanently, and the repeated difficulties municipal staff and service providers mentioned connected with providing assistance to special needs populations such as the elderly and mentally ill. A strong argument for case management was the number of clients needing flood recovery assistance who were also facing home foreclosures or had upside-down mortgages that needed to be resolved during the buyout procedures.

For disaster recovery programs to actually spur recovery, people must know they exist and make use of them. The primary pre-existing requirement for ensuring that residents know about available recovery programs is for someone to tell them. Outreach capacity and communication are required to market and explain programs.

Question 15 dealt with state programs. The first part of the question was a list of state and federal programs that were used to help communities recover from the 2008 floods and asked respondents to choose all the programs they knew were being used in their community. Choices included:

- IDED/IFA Jumpstart programs for households, businesses and communities
- Buyouts, hazard mitigation and disaster grants from the Homeland Security/Emergency Management Division
- Preferential financial tools from the Iowa Department of Economic Development and the Iowa Finance Authority
- Rebuild Iowa Office coordination of available multiagency assistance resources
- Financial resources and programs available through Regional Councils of Governments or Entitlement Cities
- Iowa Department of Human Services counseling programs
- Other

Table 7 shows the percentages of respondents who were aware of the variety of programs available. To determine if there were certain communities that were more aware of programs or accessed programs to a greater or lesser extent, the research team isolated the responses to Question 15 generated from each community (see figure 10). The difference in awareness between the larger metropolitan cities and the smaller rural communities is significant in some cases.

Table 7. Awareness of state programs for flood recovery	
Buyouts, hazard mitigation and disaster grants	97.8
IDED/IA Jumpstart program	80.0
Rebuild Iowa Office	46.7
Financial resources and program through regional COG and entitlement cities	42.2
Preferential financial tool form IDED and IFA	26.7
IDHS counseling programs	17.8
Other: IUNDGP funds and project recovery	2.2

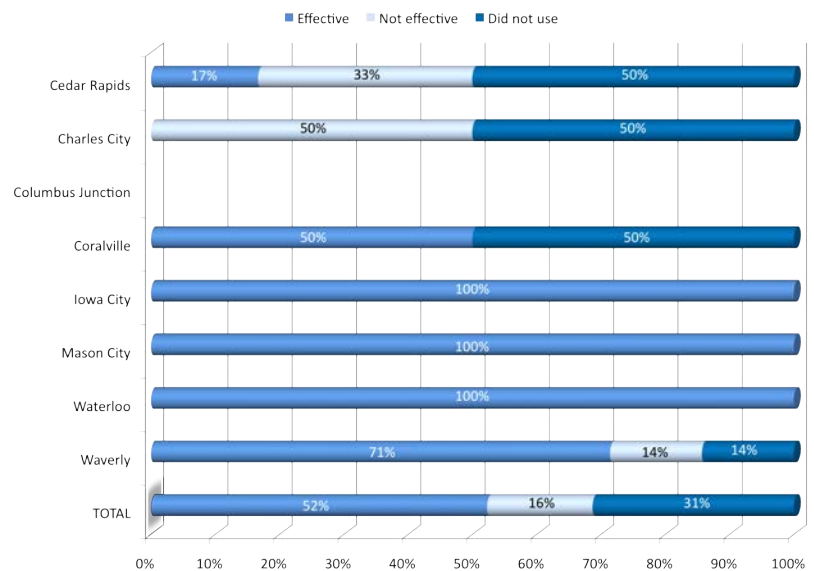
The second part of question 15 asked whether or not the state programs that were available were effective in meeting housing needs. Fifty-two percent of the respondents indicated state programs were effective, 17% said the programs were not effective and 31% did not use any state programs (figure 11).

Part of the problem in providing effective case management and outreach in flood-impacted communities may have been the reliance on the types of public interactions more commonplace within formal governmental structures than best practices gleaned from effective social work. As figure 12 shows, community leaders relied on passive forms of one-way communication such as television (94%), newsletters (89%), and radio (85%) combined with public meetings, and town hall events and forums (91%) that are in and of themselves “in-reach” because the citizen has to come to the event of their own volition.

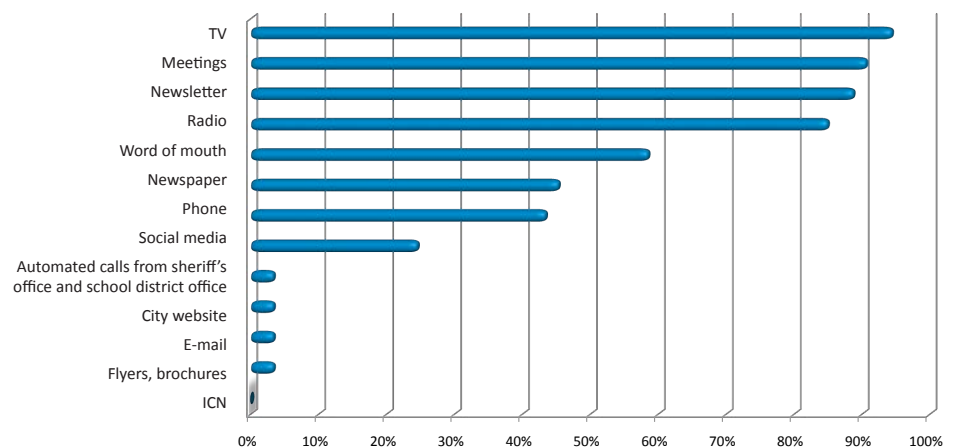
How programs are delivered greatly impacts their efficacy. There are a variety of excellent resources available for municipalities, nonprofits and state agencies to build their capacity to provide outreach in extraordinary circumstances such as natural disasters when traditional forms of communication are often of limited usefulness. Three excellent resources are described below that may provide a tool for more effective marketing, implementation and delivery of disaster recovery programming in the future.

The Administration for Children and Families (ACF) of the US Department of Health and Human Services has published *Disaster Case Management: Implementation Guide* by Roberta Lavin and Dr. Sylvia Menefee. (*Disaster Case Management: Implementation Guide*. Lavin, R. & Menefee, S. (eds.) Washington, DC: Administration for Children and Families. November 2009.) This superb disaster case management manual provides valuable information on how to coordinate a disaster response that is sensitive to the needs of individual households and special needs populations. It can be downloaded at:

**Figure 11. Use of state programs for flood recovery**



**Figure 12. Methods used to communicate with the public post-flood**



[http://www.acf.hhs.gov/ohsepr/dcm/docs/Draft\\_DCM\\_ImplementationGuide.pdf](http://www.acf.hhs.gov/ohsepr/dcm/docs/Draft_DCM_ImplementationGuide.pdf).

The manual would be particularly useful for state agencies, municipalities and nonprofit service providers. The manual includes a taxonomy of needs that households may typically be facing in a disaster situation, training needed for volunteers, information on how to do program intake and how to interview disaster-impacted households to gather information on their needs, and outreach methods for identifying disaster-impacted families and linking them to available resources.

The cities in the study area did not have the same capacity to implement a case management or outreach project. For those smaller communities, a good example of a community- and



volunteer-based system was used by Jamestown, ND. The Resources Agencies Flood Team (RAFT), a multiagency coalition, developed a simple intake form that could be administered by citizens and organizations such as churches and service clubs. The form can be downloaded at: <http://www.lrrnd.org/pics/Spring%2009%20flooding/Application%20form%20-%20Central.pdf>.

The University of Minnesota also has a simple, one-page form for gathering contact information from disaster-impacted households either in door-to-door efforts or at disaster resource fairs. This form could be a useful tool in identifying impacted households and establishing an outreach and case management relationship with the families. It can be downloaded at: <http://www.extension.umn.edu/family/tough-times/disaster-recovery/docs/sample-intake-form.pdf>.

#### **Study Result 4: Disaster Recovery Programs Can Be Created Before a Natural Disaster and Legislatively Funded When It Is Time to Implement a Disaster Response**

Focus group and key informant interview participants strongly expressed their wishes that the disaster recovery programs had been available before the disaster and that they could have received training in how to implement them correctly. Perhaps the greatest frustration expressed by interviewees dealt with several regulatory barriers that slowed the distribution of aid to flood-impacted households. Here are the most frequently cited issues:

- Slowness of making programs available
- Slowness of the buyout processes
- Eligibility requirements
- Constantly changing rules
- Duplication of benefits process
- Historic review process
- Amount of paperwork required
- Ineligible expenses
- Lack of receipts documenting expenses
- Lack of inspectors to meet inspection requirements
- Lead-based paint
- Floodplain regulations

Specific examples cited in the key informant interviews that support these opinions include the various rules that were perceived as barriers such as lead-based paint, State Historic Preservation Office (SHPO) requirements, federally required duplication of effort documentation, and building inspection requirements and criteria. The

inequities created when assistance programs changed caused one neighbor to receive a \$60,000 settlement while the next-door neighbor in a different program only received \$24,999. Establishing contractor requirements for firms wanting to bid on rehabilitation and demolition work and never receiving determinations on eligibility for certain special situations, such as contract buyers or spec buildings, were also sources of frustration. Admittedly, many of the rules that focus group participants characterized as barriers (e.g., lead-based paint, duplication of effort) were not imposed specifically on the flood recovery projects but came attached to the funding sources under existing programs operating under less challenging circumstances.

While state agencies have very little control over the vagaries of federal programming, staffs within state agencies are aware of the rules and regulations that govern their program funding. Jumpstart now exists and can be used as a model disaster recovery program if it is frequently modified to accommodate rule changes and eligibility requirements. One suggestion is to thoroughly evaluate the Jumpstart program to identify what elements worked best for communities and what changes stakeholders would recommend to make them more effective. An advisory council with representatives from IDED, IFA, Iowa Homeland Security, the Governor's Office and the Department of Transportation, for example, could meet annually to review rule changes or income eligibility that may impact Jumpstart and codify those changes. This can also be a very cost-effective means of maintaining working relationships between agencies who will in all likelihood be asked to mobilize quickly to respond to future disasters similar to the 2008 floods.

#### **Study Result 5: Accurate and Accessible Data Are Needed for Local Decision Making and Long-term Planning**

In key informant interviews and focus groups, community leaders expressed frustration with the quality of information available to them for decision making. Many were not able to answer questions put to them regarding their housing needs or were only able to respond within the context of their own agency's programs and focus. Respondents from government agencies and planning organizations related their concerns with the accuracy of floodplain maps in light of the fact that their pre-flood maps did not prepare them for the extent of damage they experienced in 2008.

The GIS component of the research team preparing this study encountered numerous problems accessing accurate data from county assessors' offices. The researchers found that counties are collecting data in an inconsistent fashion.



Information regarding property values; tax base; building permits; water, sewer and other utility connections; demolition permits; building occupancy; tax classifications; and other data relevant to determining housing need were often collected using different definitions both among communities and within the same community. Additionally, counties did not have the same ability to query their own data to answer questions about local housing and economic conditions. Changes in technology have placed more responsibility on third-party providers to maintain complicated databases and GIS functions. The impact, however, is on the quality of available data on which local leaders base their decision making and on which they depend to construct accurate long-term plans.

The accuracy of long-range plans was such a concern that 40% of online survey respondents reported that their communities had amended existing plans post-flood to address inaccuracies and that 73.1% think the changes they have made to their plans will make their communities safer in the future.

#### **Study Result 6: The Housing Market Gap Should Be Evaluated by Units Lost and by the Difference in the Value of Replacement Housing**

In the cases of Iowa City, Coralville and Cedar Rapids, local economic growth has created a housing demand beyond the units lost from the flood. In all three of these locations, more housing units have been built or issued building permits than were lost in the floods. The economies of Iowa City and Cedar Rapids are driving the housing market to create a greater demand than could be expected by just the amount of housing lost in 2008. Cedar Rapids is generating the need for an estimated 1,484 units beyond what has been permitted and lost in the flood.

Iowa City and Coralville combined need an estimated 272 units. Again, most of this additional need is based on economic conditions. Although economic trends may indicate the need for additional housing, they may also reflect increased commuting to these three cities.

Data for the remaining locations tell a much different story. Charles City and Columbus Junction lost a total of 18 housing units—much less than the aforementioned locations. Economic conditions in Charles City and Columbus Junction added no real growth in housing demand; the overall housing impacts derived from either the flood or the local economies remain negligible.

Waterloo and Mason City actually realized more new housing units in the past two years than would have been predicted by flood losses and the economic growth. Since no additional housing demand from economic growth was indicated and housing permits exceeded the loss of units from the flood, a slight excess of housing is indicated for these two cities.

Finally, replacement housing is often not the equivalent of the housing lost through flooding. Table 8 provides information on the average value of the housing units lost through the 2008 flood and the average value of the housing that has been built in each respective city since. A great discrepancy between the value of the housing lost and the value of the housing built since the flood exists in the five communities for which data are available. The discrepancy in pre- and post-flood housing values ranges from nearly \$30,500 in Cedar Rapids to more than \$125,000 in Coralville. In each city, the more affordable housing lost in the flood is being replaced with significantly more expensive housing. It would appear that one housing impact of the flood of 2008 is the need for more affordable housing in the affected communities.

City	Average value per unit lost	Average value per unit built	Net difference
Cedar Rapids	\$51,925	\$82,415	\$30,490
Charles City	n/a	\$269,902	n/a
Columbus Junction	\$33,682	\$134,364	\$100,682
Coralville	\$84,559	\$210,716	\$126,157
Iowa City	\$154,805	\$190,158	\$35,353
Mason City	n/a	\$184,011	n/a
Waterloo	\$57,061	\$126,305	\$69,244
Waverly*	\$64,533	\$182,436	\$117,893

\* Waverly data was generated through geospatial analysis of 2008 and 2010 county assessor's data.

## Conclusion

The project sponsors (IDED/IFA/RIO) hoped to answer two primary questions through this study:

1. How can the negative economic impacts attributable to the 2008 be separated floods from the negative economic impacts of the nationwide recession?
2. What are the remaining gaps in the housing markets of the flood-impacted communities that the private housing market has not satisfied to date?

These questions closely mirror concerns expressed by local participants in the focus groups, key informant interviews and online survey, shown on table 9.

The research team hopes that the project sponsors' questions have been answered and that issues identified by the study communities have been addressed.

All the issues identified in this synopsis are explored in far greater depth in the full housing needs assessment

report, which includes detailed reports of the results from the various research methods employed in this study. An economic analysis has been prepared for each of the study communities and can be found in Part One: "Economic Analysis Data for Each Community Studied." Part Two: "Qualitative Analysis of Focus Groups, Key Informants and Online Survey" provides an in-depth look at how participants responded to questions regarding housing and post-flood recovery presented in their own words. Part Three: "Qualitative Review of Archival Documentation for Each Community Studied" provides a synopsis of the long-range plans that were in effect at the time of the floods of 2008 and recommendations for how those plans can better address hazard mitigation and housing in the future. The geospatial analysis of housing units lost in the eight study communities is provided in Part Four: "Geospatial Analysis of Housing Data."

City	Issue 1	Issue 2	Issue 3
Cedar Rapids	Lack of assistance for landlords	Increase in mobile homes	Elderly impacted the most
Charles City	Frequently changing program rules	Loss of population	People who received no assistance
Columbus Junction	Loss of housing	People didn't know how to access assistance	Needed to get money in peoples' hands
Iowa City/ Coralville	Elderly/handicapped housing hardest to replace	Need long-term vision for mitigation	Floodplain management needed
Mason City	Few quality rental units available now	Vacancy rate	Timing of Winnebago plant closing impacts before flood
Waterloo	Lack of knowledge about what programs were available	Duplication of effort (HUD rule) decreased ability to use JumpStart	Need for training to be in place before disasters
Waverly	Shortage of rental housing	Training for responders is needed	Need to keep emergency response team intact

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