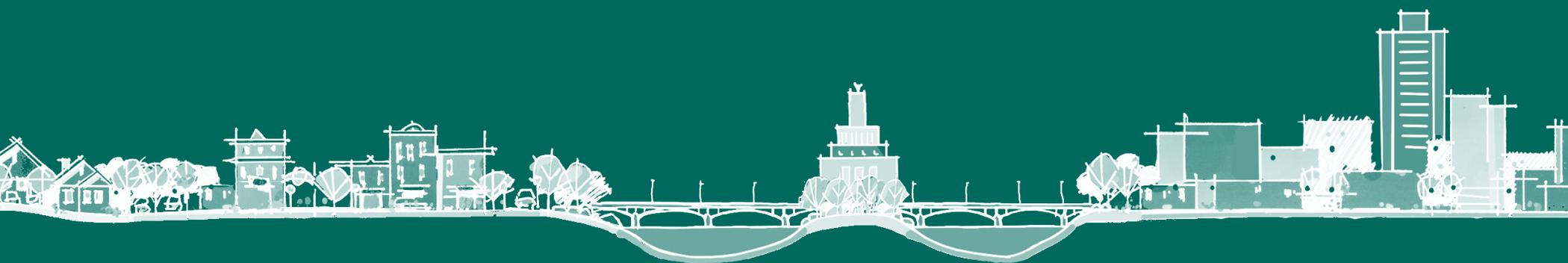
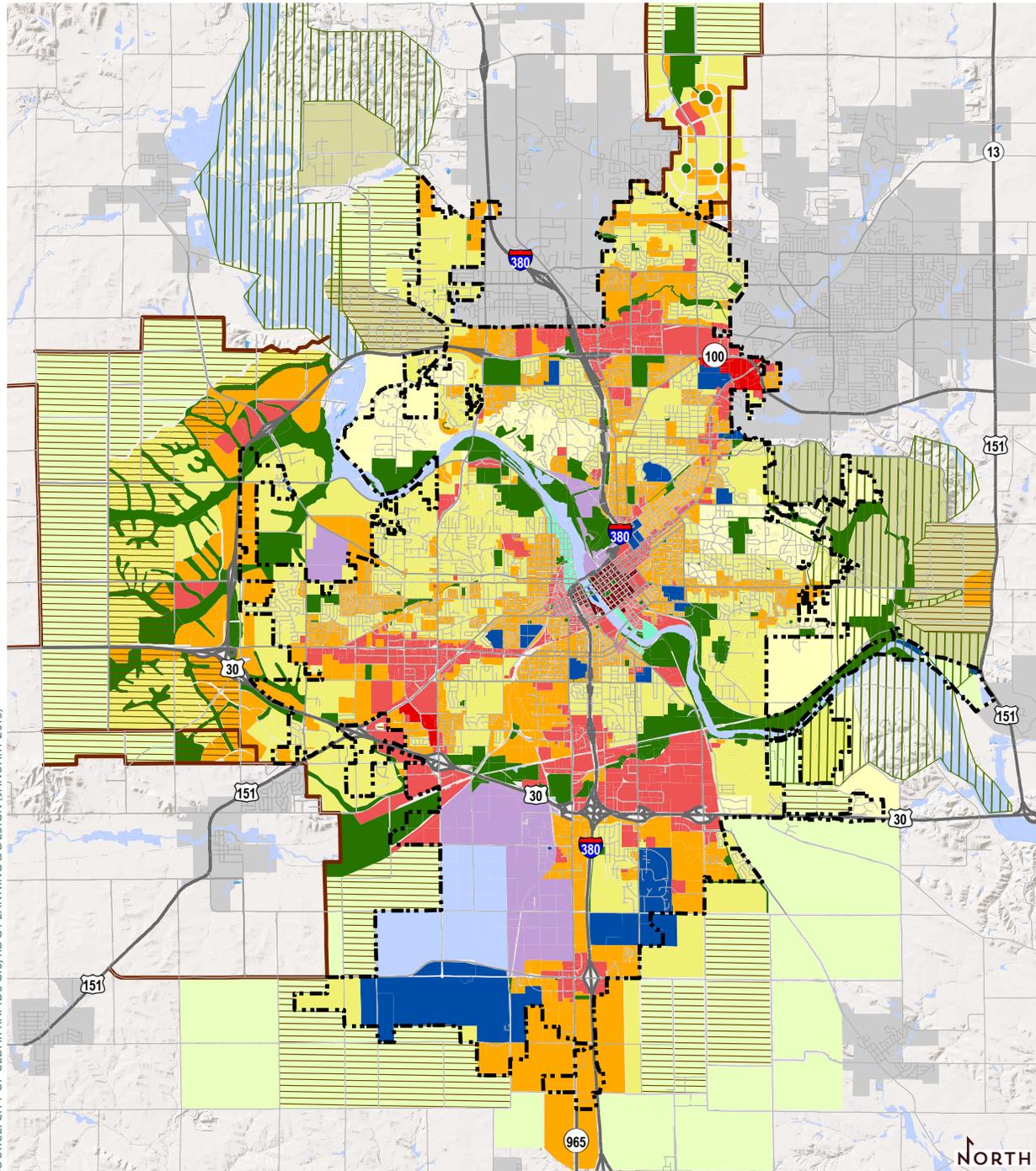


APPENDIX



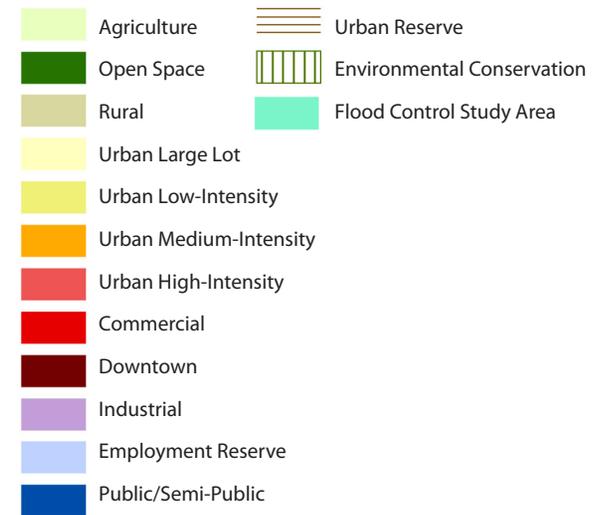
GROWCR - MAP 1: Future Land Use Map



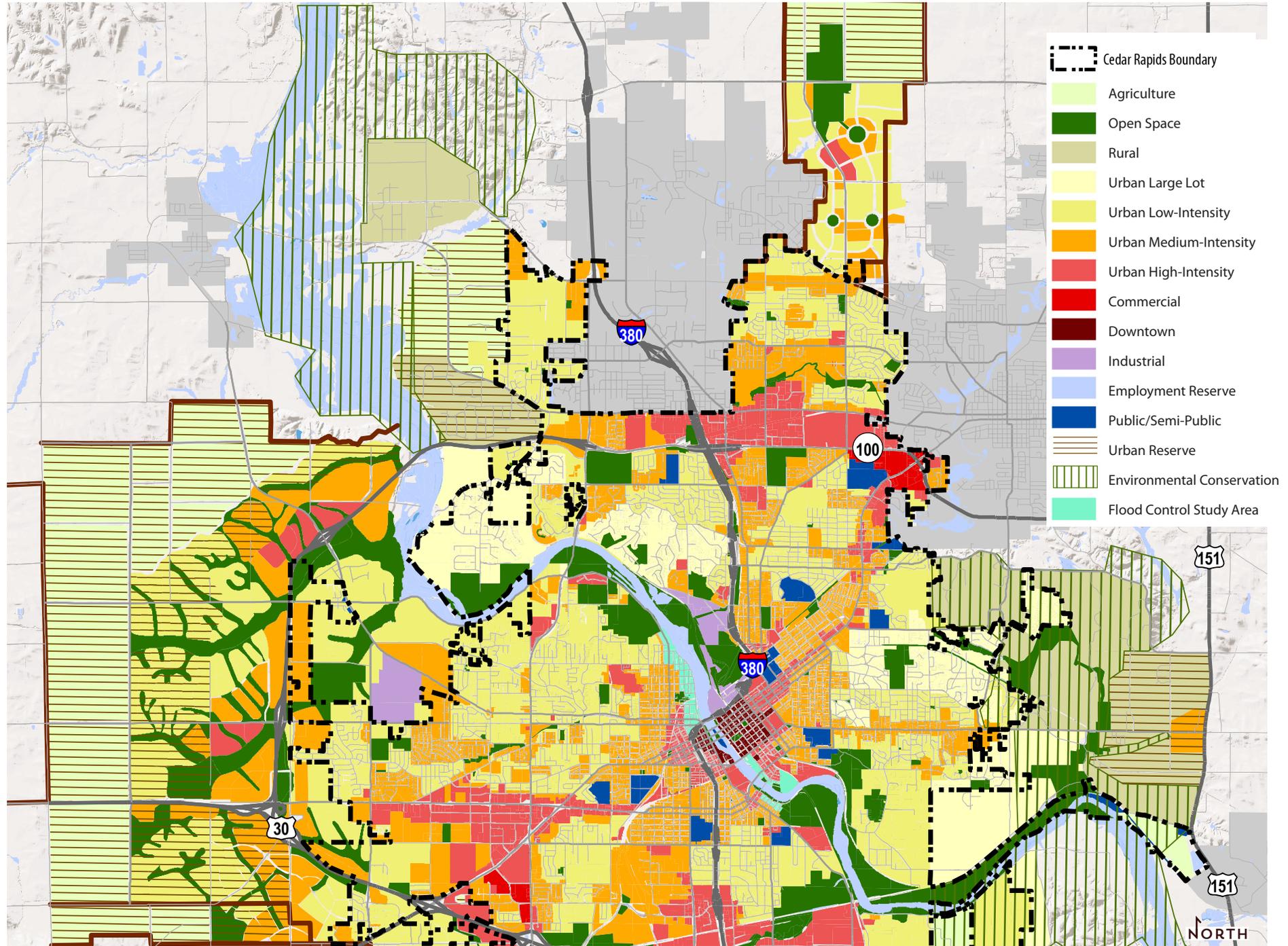
SOURCE: CITY OF CEDAR RAPIDS GIS, RDG PLANNING & DESIGN (JANUARY 2015)

Due to the dynamic nature of the Future Land Use Map, all instances of this map shown in this document are intended to be representative. The official Future Land Use Map shall be maintained by the City and made available online or upon request.

Map available online. Visit: www.cedar-rapids.org/government/departments/community-development

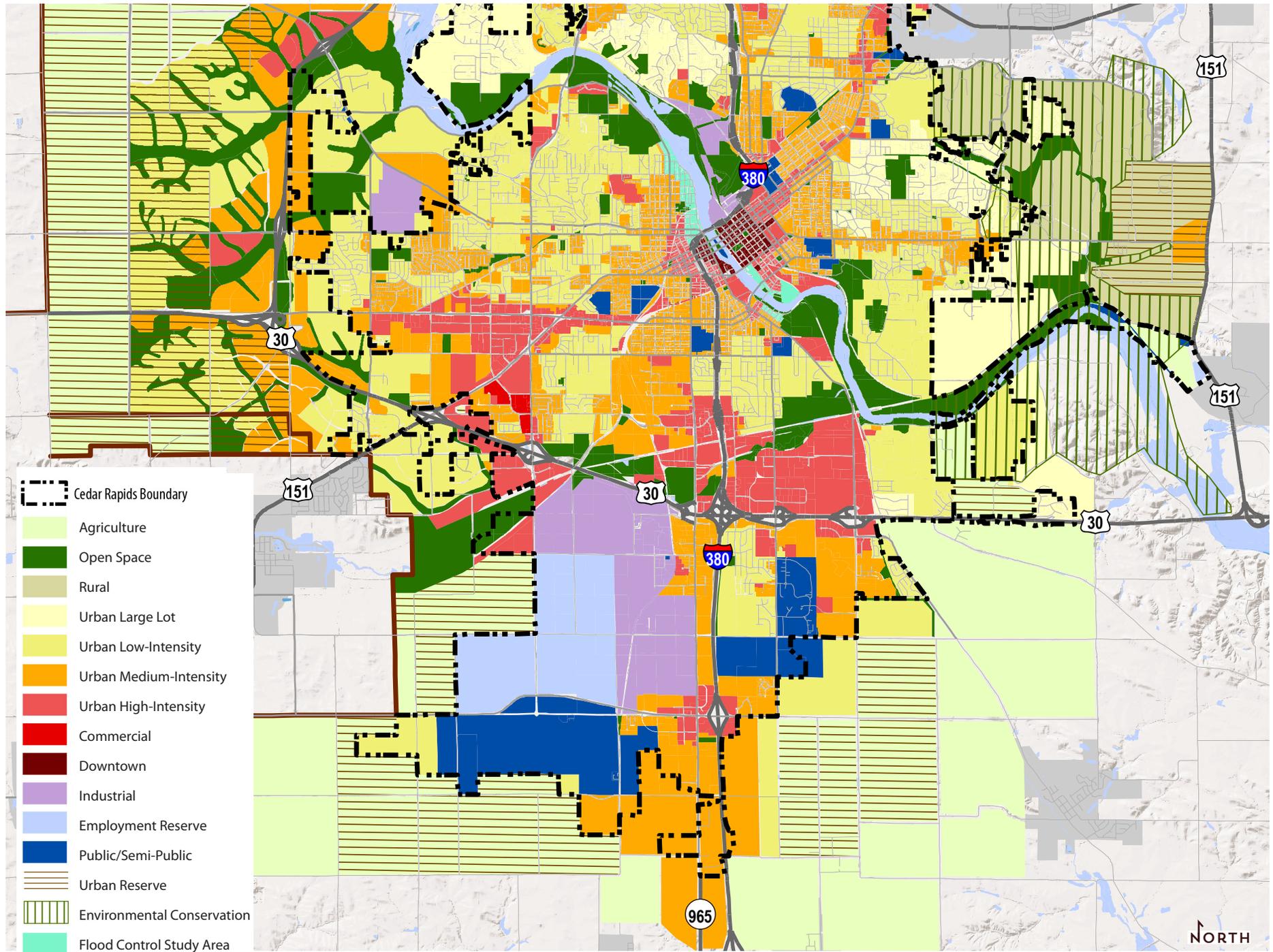


GROWCR - MAP 1: Future Land Use Map - North and Central



SOURCE: CITY OF CEDAR RAPIDS GIS, RDG PLANNING & DESIGN (JANUARY 2015)

GROWCR - MAP 2: Future Land Use Map - South and Central



SOURCE: CITY OF CEDAR RAPIDS GIS; RDG PLANNING & DESIGN (JANUARY 2015)

PROTECTCR - TABLE 1: Hazards Addressed by Cedar Rapids Operations (Table 10 of Linn County Multi-Jurisdictional Hazard Mitigation Plan)

Hazard	Justification
Infrastructure Failure	<ul style="list-style-type: none"> Public Works regularly inspects, maintains, and improves infrastructure. For submerged infrastructure like the 5 in 1 Dam, diver inspections are completed regularly. The city enforces buildings codes, and the fire and police departments are trained to respond to structural failure or fire. The Eastern Iowa Airport, which is owned by the city, has fire suppression equipment specific to aircraft and trained personnel. In addition, the majority of the city's critical facilities have backup power generation.
Hazardous Materials Incident	<ul style="list-style-type: none"> City employees are trained to properly handle hazardous materials, and the city maintains safety plans. The fire and police departments are trained to immediately respond to hazard material incidents, and the Cedar Rapids Fire Department includes the hazardous materials response team for the area. In addition, Tier II hazard material listings are maintained for the area.
Terrorism	The fire and police departments are trained to respond to terrorist events and complete training at local institutions such as schools.
Levee and Dam Failure	Public Works regularly inspects, maintains, and improves infrastructure. For submerged infrastructure like the 5 in 1 Dam, diver inspections are completed regularly. Flood protection failure may become a higher priority after the city constructs a comprehensive flood protection system.
Human Disease	The city maintains a clean secure water supply, wastewater treatment, and coordinates with Linn County Public Health.
Animal, Plant, Crop Disease	The city maintains vegetation in public areas. Due to the urban nature of the city, the risk of animal and crop disease directly impacting the city is minimal.
Earthquake	The risk of an earthquake severe enough to cause damage occurring in the area is minimal. Buildings codes are enforced and increase the likelihood structures can withstand a minor event.
Grass and Wildland Fire	The city maintains vegetation in public areas, and the fire and police departments are trained to respond to grass and wildland fire events.
Sinkholes	Geological hazards are mitigated in the infrastructure design and construction process.
Landslide	Geological hazards are mitigated in the infrastructure design and construction process.
Expansive Soils	Geological hazards are mitigated in the infrastructure design and construction process.

SOURCE: LINN COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, JUNE 2014

PROTECTCR - TABLE 2A: Cedar Rapids Hazard Mitigation STRATEGY (Table 11 of Linn County Multi-Jurisdictional Hazard Mitigation Plan)

Proposed Mitigation Action	Hazard(s) Addressed	Goal(s) Addressed	Inclusion in Previous Plan	Notes
Install flood warning system on Indian Creek	Flood	1, 2, 3	X	Coordinating with the Army Corps of Engineers, adjacent cities, and the East Central Iowa Council of Governments was in the "Current Mitigation Activities" category in the previous plan. The Indian Creek Watershed Management Authority was created. The multi-jurisdictional and multi-disciplinary group is developing a watershed management plan and coordinating with the Silver Jackets to develop a warning system.
Develop and implement a response plan for Indian Creek flooding	Flood	1, 2, 3		
Construct berm at Ellis Boulevard	Flood	1, 2, 3	X	The previous plan included an alternative mitigation action to study the feasibility of constructing and maintaining flood protection structures.
Complete backflow protection project	Flood	1, 2, 3		
Add detention basins to increase stormwater management capability	Flood	1, 2, 3		This project may be a component of the Indian Creek Watershed Management Plan, which is currently in progress.
Install backup power sources for traffic lights	Flood	1, 2, 3		This project will increase public safety during a major power outage and during an evacuation.
Reconstruct Public Works facility above the 2008 flood level	Flood	2, 3, 4		This project is in progress.
Add additional sump pits and epoxy flooring at City Hall	Flood	2, 3, 4		This project is in progress.
Construct ring levee at the Water Pollution Control facility	Flood	2, 3, 4	X	The previous plan included an alternative mitigation action to study the feasibility of constructing and maintaining flood protection structures. This project is in progress.
Install berm at Q Avenue and 8th Street NW for interim flood protection	Flood	1, 2, 3, 4		The previous plan included an alternative mitigation action to study the feasibility of constructing and maintaining flood protection structures. This project is in the design phase.
Reroute sewer in the Sun Valley Neighborhood	Flood	2, 3, 4	X	The previous plan included an alternative mitigation action to continue the replacement of old sewer lines to prevent inflow and infiltration. This project is in progress.
Construct berm in the Sun Valley Neighborhood along Cottage Grove Parkway	Flood	1, 2, 3, 4	X	The previous plan included an alternative mitigation action to study the feasibility of constructing and maintaining flood protection structures. This project is in progress.
Install new pump and return sewer to protect wastewater infrastructure	Flood	2, 3, 4	X	The previous plan included an alternative mitigation action to continually review and modify plans to reduce sewer backups. This project is in progress.
Complete Cedar River Siphon Project	Flood	2, 3, 4		This project is in progress.
Replace damaged sections of the sanitary sewer with flood resilient materials	Flood	2, 3, 4		The previous plan included an alternative mitigation action to continue the replacement of old sewer lines to prevent inflow and infiltration and to continually review and modify plans to reduce sewer backups. This project is in progress.

PROTECTCR - TABLE 2B: Cedar Rapids Hazard Mitigation STRATEGY (...continued - Table 11 of Linn County Multi-Jurisdictional Hazard Mitigation Plan)

Proposed Mitigation Action	Hazard(s) Addressed	Goal(s) Addressed	Inclusion in Previous Plan	Notes
Mitigate Valley Brook Drive erosion	Flood	2, 3, 4		This project is in the design process.
Improve two major water detention basins	Flood	2, 3, 4	X	Maintaining detention basins was in the "Current Mitigation Activities" category in the previous plan. This project is in progress.
Complete Vinton ditch improvements	Flood	2, 3, 4	X	Maintaining drainage channels is an alternative mitigation action in the previous plan. This project is in progress.
Complete the city's Permanent Flood Protection Project which includes the following phases: <ul style="list-style-type: none"> • Cargill to I-380, which includes the existing Quaker Oats flood protection • I-380 to 8th Avenue SW • I-380 to 8th Avenue SE • I-380 to Ellis Park • 8th Avenue SE to Alliant Substation • 8th Avenue to the Cedar/Rapids Linn County Solid Waste Agency Site 1 • Alliant Substation to Cargill • 21 gate closures and 11 pump stations • Edgewood bridge improvements 	Flood	1, 2, 3, 4	X	The previous plan included an alternative mitigation action to study the feasibility of constructing and maintaining flood protection structures.
Relocate the Sac and Fox Trail	Flood	2, 3, 4		
Property acquisition and relocation, elevation, and/or demolition in the special flood hazard area	Flood	1, 2, 3, 4	X	The previous plan includes an alternative mitigation action to study the feasibility of the acquisition of properties that are vulnerable to flood damage
Expand the city's warning siren system	Flood	1, 2, 3		
Construct safe rooms in public facilities and recreation areas	Flood	1, 2, 3, 4		
Harden public facilities to withstand wind and other severe weather damage	Flood	1, 2, 3, 4		
Install lightning rods on large critical facilities	Flood	1, 2, 3, 4		
Add additional shallow water wells to the city's water supply	Flood	2, 3, 4		

SOURCE: LINN COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, JUNE 2014

PROTECTCR - TABLE 3A: Complete Mitigation ACTIONS (Table 12 of Linn County Multi-Jurisdictional Hazard Mitigation Plan)

Mitigation Action	Hazard(s) Addressed	Goal(s) Addressed	Inclusion in Previous Plan	Notes
Coordinate with the Army Corps of Engineers to complete the Flood Risk Management Feasibility Report and Environmental Assessment	Flood	1, 2, 3, 4	X	This mitigation action was included in the "Current Mitigation Activities" in the previous plan.
Complete planning process to determine a flood management system for the Cedar River	Flood	1, 2, 3, 4	X	This mitigation action encompasses several alternative mitigation actions in the previous plan.
Install gauges on Indian Creek	Flood	1, 2, 3	X	
The Central Fire Station was permanently relocated outside the floodplain	Flood	1, 2, 3, 4		
The Police Department's emergency generator, mechanical, and electrical systems were raised.	Flood	1, 2, 3, 4		
The Main Library was relocated and constructed above the 2008 flood level.	Flood	2, 3, 4		The facility includes a cistern to manage stormwater on the library site.
Animal Care and Control was relocated because the previous location had access points located in the special flood hazard area.	Flood	2, 3, 4		
Manhattan Park Pavilion was converted to open air facility.	Flood	2, 3, 4		
Check valves were installed to reduce backflow.	Flood	2, 3, 4	X	The previous plan included the alternative mitigation action "Continually review and modify plans to reduce sewer backups."
The city purchased HESCO barriers, tiger dams, and additional water pumps for flood protection	Flood	1, 2, 3, 4		
The city completed construction of the amphitheater and levee protection.	Flood	2, 3, 4		
Implement voluntary property acquisition program	Flood	1, 2, 3, 4	X	1,341 parcels were acquired, and 1,153 parcels were cleared of flood damaged structures.
Complete flood mitigation project at the Morgan Creek and May's Island lift stations	Flood	2, 3, 4		
Raise water collector well above the 2008 flood level	Flood	2, 3, 4		
Create a backwater valve reimbursement program	Flood	2	X	The previous plan included the alternative mitigation action "Continually review and modify plans to reduce sewer backups."

PROTECTCR - TABLE 3B: Complete Mitigation ACTIONS (...continued - Table 12 of Linn Co. Multi-Jurisdictional Hazard Mitigation Plan)

Mitigation Action	Hazard(s) Addressed	Goal(s) Addressed	Inclusion in Previous Plan	Notes
Begin participation in the Community Rating System, update the city's Floodplain Management Ordinance, and adopt new insurance rate maps	Flood	1, 2, 3, 4	X	The city's floodplain management program was enhanced in 2010 to participate in the Community Rating System.
Install berm at Q Avenue and 8th Street NW for interim flood protection	Flood	2, 3, 4	X	The previous plan included an alternative mitigation action to study the feasibility of constructing and maintaining flood protection structures.
Relocate the Sac and Fox Trail	Flood	2, 3, 4		
The greenhouse at Noelridge Park was retrofitted to withstand severe weather.	Tornado and Windstorm, Thunderstorm, Lightning, and Hail, Sever Winter Storm	1, 2, 3, 4		
A lightning rod was installed on the City Services Building.	Thunderstorm, Lightning, and Hail	1, 2, 3, 4		
Added 3 wells to the water supply	Drought	3, 4		
Added flow channel in Mohawk Park to increase well field infiltration	Drought			
Secured offsite computer server storage facility	All hazards	2, 3, 4		
Fire Station #3 was added on Crestview Drive to decrease response time	All hazards	1, 2, 3		

SOURCE: LINN COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, JUNE 2014

PROTECTCR - TABLE 4: Benefit vs. Cost Criteria (Table 13 of Linn Co. Multi-Jurisdictional Hazard Mitigation Plan)

Type	Benefit	Cost
High	Results are likely immediate and/or widespread reduction of risk from hazard(s) addressed; generally supported by the community; lead agency has capabilities.	Existing funding is not adequate to complete the project; funding may only be available through grants/assistance; anticipated to cost greater than \$100,000.
Medium	Results are likely a long-term reduction of risk from hazard(s) addressed and/or results are not widespread; potential community opposition; lead agency has capabilities.	Requires amending the budget and/or requires a bond to complete the project; anticipated to cost between \$10,000 and \$100,000.
Low	Results are difficult to determine and/or may not result in long-term reduction of risk from hazard(s) addressed; definite community opposition; lead agency may encounter capability issues.	Existing funding is adequate or the project can be completed through volunteer and/or staff time; anticipated to cost less than \$10,000.

SOURCE: LINN COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, JUNE 2014

PROTECTCR - TABLE 5: Mitigation Action Priority Level (Table 14 of Linn Co. Multi-Jurisdictional Hazard Mitigation Plan)

Priority Level	Potential Timeline	
1	1-5 Years	The mitigation action will be addressed during the current plan period.
2	5-10 Years	The mitigation action may become a higher priority in the plan update.
3	10-15 Years	The mitigation action maybe become a higher priority in the plan update or will not be completed until higher priority mitigation actions are complete.

SOURCE: LINN COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, JUNE 2014

Benefit vs. Cost Criteria

"To determine how a mitigation strategy should be completed, an action plan and timeline for mitigation actions was determined through a prioritization process that considered local priorities, local operations, potential benefit, and estimated cost. Ultimately, mitigation actions were assigned a priority level, which determines the potential timeline for completion. Refer to Tables 13 and 14."

Priority Level

"For most jurisdictions, not all mitigation actions considered in the prioritization process met exact criteria. The planning committee in Cedar Rapids developed the final action plan to ensure the priority level for each mitigation actions reflects local risks, priorities, and operations. See Table 15 for Cedar Rapid's action plan.

PROTECTCR - TABLE 6A: Cedar Rapids Action Plan (Table 15 of Linn Co. Multi-Jurisdictional Hazard Mitigation Plan)

Priority Level	Proposed Mitigation Action	Lead Party	Potential Partners	Benefit	Cost	Potential Funding
1	Complete the city's Permanent Flood Protection Project phase from Cargill to I-380 and includes the existing Quaker Oats flood protection	Army Corps of Engineers and Public Works	---	High	High	Army Corps of Engineers, CDBG, Iowa Flood Mitigation Award, City
1	Complete the city's Permanent Flood Protection Project phase from I-380 to 8th Avenue SW	Public Works	---	High	High	Iowa Flood Mitigation Award, City
1	Complete the city's Permanent Flood Protection Project phase from I-380 to 8th Avenue SE	Army Corps of Engineers and Public Works	---	High	High	Army Corps of Engineers, Iowa Flood Mitigation Award, City
1	Design and begin the construction of the city's Permanent Flood Protection Project phase from I-380 to Ellis Park	Public Works	---	High	High	Iowa Flood Mitigation Award, City
1	Design and begin the construction of the city's Permanent Flood Protection Project phase from 8th Avenue SE to Alliant Substation	Army Corps of Engineers and Public Works	---	High	High	Army Corps of Engineers, Iowa Flood Mitigation Award, City
1	Design and begin the city's Permanent Flood Protection Project phase from 8th Avenue to the Cedar/Rapids Linn County Solid Waste Agency Site 1	Public Works	---	High	High	Iowa Flood Mitigation Award, City
1	Complete the addition of 21 gate closures and 11 pump stations	Army Corps of Engineers and Public Works	---	High	High	Army Corps of Engineers, Iowa Flood Mitigation Award, City
1	Property acquisition and/or demolition for implementation of Permanent Flood Protection Project		---	High	High	City, Army Corps of Engineers, Iowa Flood Mitigation Award
1	Complete Levee/Floodwall construction at the Water Pollution Control facility	Utilities	IHSEMD, Iowa DNR	High	High	HMGP, PDM, City
1	Install new pump and return sewer to protect wastewater infrastructure	Utilities	FEMA	High	High	FEMA
1	Install flood warning system on Indian Creek	Army Corps of Engineers	Iowa DNR, Indian Creek Watershed Management Authority	High	Medium	Army Corps of Engineers
1	Develop and implement a response plan for Indian Creek flooding	Public Works	Indian Creek Watershed Management Authority	High	High	Stormwater Utility Enterprise Fund, HMGP, PDM
1	Complete backflow protection project	Public Works	---	High	Medium	City Sewer Utility
1	Add detention basins to increase stormwater management capability	Public Works	---	Medium	Medium-High	Stormwater Utility Enterprise Fund
1	Complete reconstruction of City Services Center facility above the 2008 flood level	Public Works	---	High	High	FEMA, I JOBS, Local Options Sales Tax, City, Sewer Utility, Solid Waste Utility
1	Add additional sump pits and epoxy flooring at City Hall	Facilities Maintenance	---	High	Medium	City

PROTECTCR - TABLE 6B: Cedar Rapids Action Plan (Table 15 of Linn Co. Multi-Jurisdictional Hazard Mitigation Plan)

Priority Level	Proposed Mitigation Action	Lead Party	Potential Partners	Benefit	Cost	Potential Funding
1	Construct berm at Ellis Boulevard	Public Works	---	High	Medium	Local Option Sales Tax
1	Reroute storm sewer in the Sun Valley Neighborhood	Public Works	---	High	High	Local Option Sales Tax
1	Construct berm in the Sun Valley Neighborhood along Cottage Grove Parkway	Public Works	---	High	High	Local Option Sales Tax
1	Complete Vinton ditch improvements	Army Corps of Engineers and Public Works	---	High	High	CDBG, Local Option Sales Tax
1	Complete Cedar River Siphon Project	Public Works	---	High	High	CDBG, City, Army Corps of Engineers
1	Replace damaged sections of the sanitary sewer with flood resilient materials	Public Works	---	High	High	FEMA, IHSEMD, City
1	Mitigate Valley Brook Drive erosion	Public Works	---	High	High	CDBG, City
1	Improve two major water detention basins		---	High	High	CDBG, City
1	Install backup power sources for traffic lights		Iowa DOT	High	Low-High	City, others to be identified
1	Expand the city's warning siren system	City Manager	Linn County EMA	High	Medium	City, HMGP, PDM
1	Construct safe rooms in public facilities and recreation areas	City Manager and Parks and Recreation	Linn County EMA	High	High	City, HMGP, PDM
1	Harden public facilities to withstand wind and other severe weather damage	City Manager and Public Works	---	High	Medium - High	City, HMGP, PDM
1	Develop and implement a residential fan program	Fire Department and Building Services	Hawkeye Area Community Action Program and other organizations that provide assistance	High	Low - Medium	City, others to be identified
1	Develop and implement a residential wellness check program	Fire Department and Police	Hawkeye Area Community Action Program and other organizations that provide assistance	High	Low - Medium	City, others to be identified
1	Add additional signage for emergency routes and evacuation routes	Public Works	Iowa DOT, adjacent cities, Linn County, and Linn County EMA	Medium	Medium	City, others to be identified
2	Install lightning rods on large critical facilities	Public Works	---	Medium	Low	City, others to be identified
2	Add salt storage facility in the northwest area of the city	Public Works	Iowa DOT	Low	Medium	City, others to be identified
3	Design and construct ring levee at Water Plant	Utilities	---			Iowa Flood Mitigation Award, City
3	Edgewood bridge improvements	Public Works	---	High	Medium - High	Iowa Flood Mitigation Award, City

SOURCE: LINN COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, JUNE 2014