

Appendix D – Mitigation Actions & Projects

Backup Generators

Backup generators provide critical facilities with electricity in the event a community's electrical transmission grid is either damaged by a disaster or overloaded by excessive use during an event.

Specifically, plan stakeholders have requested backup generators at:

- Cedar County – Secondary Roads Shops #1, #2, #3, #4, and #5
- Mechanicsville – East Water Tower
- Mechanicsville – Memorial Building

Hazard/s Addressed	Floods, Severe Storms, Winter Storms, Tornadoes, Wildfires, Winter Storms
Effectiveness	Medium
Timeframe	1 – 2 Years
Lead Organization	Cedar County (Relevant Department Operating Facility), CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Bury & Secure Utility Lines, Pipes, and Tanks

Transferring existing utilities lines, pipes, and chemical storage tanks from above ground to below ground will significantly reduce the amount of property damage incurred from wind, ice, and snow related events. Alternatively, anchoring them or securing them will have a similar effect.

Hazard/s Addressed	Severe Storms, Tornadoes, Winter Storms
Effectiveness	Medium
Timeframe	1 – 5 Years
Lead Organization	Cedar County Secondary Roads, CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Debris & Natural Fuels Reduction

Reducing the amount of debris and natural fuels in a community will deprive wildfires of the material it requires to spread and prevent high winds from launching deadly and damaging debris around during a severe storm or tornado. This project will be implemented in high risk areas as identified in this plan's WUI maps and well-known to burn areas as determined by the participating jurisdictions and appropriate local agencies.

Hazard/s Addressed	Severe Storms, Tornadoes, Wildfires
Effectiveness	Medium
Timeframe	1 Year
Lead Organization	Cedar County EMA, CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Defensible Spaces & Buffer Zones

Creating defensible spaces and buffer zones void of vegetative fuel and covered with gravel or rock helps prevent the spread of wildfire as well as creating an area in which local emergency response serviced can safely operate. This 2-pronged approach directly mitigates damage to property and protects lives, but also indirectly mitigates the threat to life and property in the area at large. This project will be implemented in high risk areas as identified in this plan's WUI maps and well-known to burn areas as determined by the participating jurisdictions and appropriate local agencies.

Hazard/s Addressed	Wildfires
Effectiveness	Medium
Timeframe	1 Year
Lead Organization	Cedar County EMA, CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Elevate Structures

Structures located within identified flood zones can be elevated above base flood elevation or predicted other predicted flood inundation levels.

Hazard/s Addressed	Floods
Effectiveness	High
Timeframe	1 – 3 Years
Lead Organization	Cedar County EMA, CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, FMA, HMGP, Local Budgets

FEMA Code 361 Safe Rooms

FEMA Code 361 regulations ensure a structure is capable of withstanding wind speeds greater than 200 miles per hour. Additionally, these anti-tornado regulations also ensure the structure is protected against hail, lightning, high and strong winds. This project can be implemented as a retrofit of a current structure or the construction of a new facility. Any critical facility is a potential target for this, but realistically location will be determined by which participating jurisdictions have the want and resources to accomplish this project.

Hazard/s Addressed	Severe Storms, Tornadoes
Effectiveness	High
Timeframe	1 – 3 Years
Lead Organization	Cedar County (Relevant Department Operating Facility), Cedar County Zoning Office, CSD Facilities Departments, Municipal Public Works & Zoning Offices
Funding Sources	BRIC, HMGP, Local Budgets

Floodproofing

This technique is often used when relocation or buying out is not an option as is the case with a historic building or it would require astronomical funding that is not available. Floodproofing projects constitute any combination of structural and non-structural additions, changes, or adjustments to structures which reduce or eliminate flood damage. Wet floodproofing reduces property damage counteracting hydrostatic pressure on walls or other support structures by equalizing the pressure between the interior and exterior of a structure.

Hazard/s Addressed	Floods
Effectiveness	Medium
Timeframe	1 – 3 Years
Lead Organization	Cedar County (Relevant Department Operating Facility), Cedar County Zoning Office, CSD Facilities Departments, Municipal Public Works & Zoning Offices
Funding Sources	BRIC, FMA, HMGP, Local Budgets

Flood Level Monitoring System

Strategically installing water monitoring stations will assist in measuring the severity of an existing or impending drought, the real-time and historical levels of flooding, as well as dam failures. Accurately measuring water levels will allow the community to take the necessary conservation and regulatory measures to mitigate the droughts, flood, and dam failure effects. This project should be implemented in all major basins and water retention, rivers and streams prone to flooding, natural and man-made, areas throughout the planning area. Additionally, having precise historical data from past floods will enhance the planning area's ability to develop future mitigation planning actions and projects.

Hazard/s Addressed	Droughts, Floods
Effectiveness	Low
Timeframe	1 – 3 Years
Lead Organization	Cedar County EMA
Funding Sources	BRIC, FMA, HMGP, Local Budgets

Insulation & Energy Efficiency

Upgrading a facility's windows, windows frames, roofing, and insulation will allow it to better maintain a desired warm or cool temperature during prolonged extreme heat or winter storms. Additionally, it decreases the energy load necessary to do so, decreasing the burden on the local energy grid.

Hazard/s Addressed	Winter Storms
Effectiveness	Low
Timeframe	1 – 3 Years
Lead Organization	Cedar County (Relevant Department Operating Facility), CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Irrigation Storage Tanks

Storage tanks can significantly increase the water supply available to rural communities. They are instrumental in providing relief to agricultural sectors in places without sizable water delivery infrastructure during drought events. Further, they help enhance and maintain the ability of local responders to fight wildfires during drought periods.

Hazard/s Addressed	Droughts
Effectiveness	High
Timeframe	1 – 2 Years
Lead Organization	Cedar County (Relevant Department Operating the Facility), Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Looped Grid Power Systems

Linear power grids have single points of failure that are vulnerable to a number of hazards. Looped power grids operate in parallel and are thus significantly more resistant to damage allowing the utilities to maintain power after an event.

Hazard/s Addressed	Floods, Severe Storms, Tornadoes, Winter Storms
Effectiveness	Medium
Timeframe	1 – 5 Years
Lead Organization	Cedar County (Relevant Department Operating the Facility), Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Low Flow Utilities

To decrease water usage before, during, and after a drought, communities can install low water flow utilities throughout its critical facilities and infrastructure. This will not only decrease water usage, but also decrease water demands. The planning area should implement this project in conjunction with their school districts and critical facilities standard maintenance cycles.

Hazard/s Addressed	Droughts
Effectiveness	Low
Timeframe	1 – 2 Years
Lead Organization	Cedar County (Relevant Department Operating the Facility), Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Public Awareness & Education

A campaign will inform and educate the public on hazard risks, allowing them to better protect their property through preparation and their lives through appropriate evacuation and survival procedures.

Hazard/s Addressed	Droughts, Floods, Severe Storms, Tornadoes, Wildfires, Winter Storms
Effectiveness	Low
Timeframe	1 Year
Lead Organization	Cedar County EMA
Funding Sources	Local Budgets

Rainwater Retention Basins

Rainwater retention basins are artificial basins built in strategic locations to protect against floods and droughts by collecting and holding rainwater for an extended period of time. The participating jurisdictions should implement these installations in areas where the water can be used during a drought, for agricultural or urban use, or in areas where poor functioning, outdated, or old stormwater drainage systems are in place. Construction of these basins will occur in conjunction with local and regional irrigation districts to multiply their effectiveness and benefit.

Hazard/s Addressed	Droughts, Floods
Effectiveness	Low
Timeframe	1 – 4 Years
Lead Organization	Cedar County (Relevant Department Operating the Facility), Municipal Public Works
Funding Sources	BRIC, FMA, HMGP, Local Budgets

Raise Transportation Infrastructure

To combat uncontrollable waters emanating from a dam or levee failure, flash flood, or riverine flood, transportation infrastructure may be raised to allow its continued use in a disaster as well as a partial earthen berm to protect a neighboring lower elevation area. Additionally, the increased elevation of road or railway bridges can prevent the buildup of debris during incidents of high floodwaters and preventing further water buildup.

Specifically, plan stakeholders have requested backup generators at:

- Mechanicsville – East Cedar Street

Hazard/s Addressed	Floods
Effectiveness	High
Timeframe	1 – 5 Years
Lead Organization	Cedar County Secondary Roads, Municipal Public Works
Funding Sources	BRIC, FMA, HMGP, Local Budgets

Relocate or Buyout Vulnerable Structures

Some structures may be able to be relocated from identified floodplains or dam inundation zones. Removing them from identified hazard area will eliminate their risk.

Hazard/s Addressed	Floods
Effectiveness	High
Timeframe	1 – 5 Years
Lead Organization	Cedar County EMA, Municipal Public Works
Funding Sources	BRIC, FMA, HMGP, Local Budgets

SKYWARN Storm Spotter Training

The NWS' SKYWARN Storm Spotter training program educates and delivers basic weather identification, spotting, and reporting information to any concerned citizens. Educating citizens in this program helps increase specific awareness and creates a skillset that helps the NWS create more accurate and timely warnings for tornadoes, severe storms, flash flooding, and other severe weather.

Hazard/s Addressed	Floods, Severe Storms, Tornadoes, Winter Storms
Effectiveness	Low
Timeframe	1 – 2 Years
Lead Organization	Cedar County EMA
Funding Sources	Local Budgets

Snow Fences

Snow fences force drifting snow to accumulate in a desired place minimizing the amount of snowdrift on roads and railways. Controlling snow accumulation decreases the danger to a jurisdiction's citizens traveling during and after a winter storm. This project should be implemented along major transportation routes throughout the planning area.

Hazard/s Addressed	Winter Storms
Effectiveness	Low
Timeframe	1 – 2 Years
Lead Organization	Cedar County Secondary Roads, CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Storm Water Drainage System Upgrade

Significant flood damage in developed communities can be prevented by upgrading their storm water drainage system by way of increasing culvert sizes, installing debris blocking grates, and weir dams. This mitigation measure will allow flood waters to drain quicker and prevent excess accumulation. This project should be implemented in older drainage systems and any expanding areas throughout the planning area.

Specifically, plan stakeholders have requested drainage improvements at:

- Mechanicsville – Crestview Drive
- Tipton CSD – Football Stadium

Hazard/s Addressed	Floods
Effectiveness	Medium
Timeframe	1 – 4 Years
Lead Organization	Cedar County EMA, Cedar County Roads Department, CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, FMA, HMGP, Local Budgets

Storm Water Pump Stations

Storm water pump stations help protect areas by pumping away large volumes of water therefore preventing or decreasing the level of a flood. Pump stations can vary in size and design, allowing them to be tailored to the needs of a specific floodplain, region, or site-specific facility.

Hazard/s Addressed	Floods
Effectiveness	Medium
Timeframe	1 – 4 Years
Lead Organization	Cedar County (Relevant Department Operating Facility), CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, FMA, HMGP, Local Budgets

StormReady Accreditation

The NWS' StormReady helps arm communities with the communication and safety skills needed to save lives and property before, during, and after an event. Communities who have achieved this accreditation are better prepared to save lives from severe weather through advanced planning, education, and awareness.

Hazard/s Addressed	Floods, Severe Storms, Tornadoes, Winter Storms
Effectiveness	Low
Timeframe	1 – 2 Years
Lead Organization	Cedar County EMA
Funding Sources	Local Budgets

Water Line Insulation

Insulating a facility's water pipes helps prevent them from freezing and bursting due to sudden and prolonged low temperatures during winter storms. The planning area should implement this project in conjunction with their school districts and critical facilities standard maintenance cycles.

Hazard/s Addressed	Winter Storms
Effectiveness	Low
Timeframe	1 Year
Lead Organization	Cedar County Secondary Roads, CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets

Wildfire Structural Retrofit

Retrofitting structures with screened vent enclosures, double paned glass, and spark arrestors will reduce the chances of a structure igniting from a wildfire as well as a wildfire's chance of spreading.

Hazard/s Addressed	Wildfires
Effectiveness	Medium
Timeframe	1 – 2 Years
Lead Organization	Cedar County (Relevant Department Operating Facility), CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, Local Budgets, PDM

Wind Resistance Structural Retrofit

Enhancing a structure's wind resistance according to FEH bronze, silver, or gold specifications will significantly reduce probability of a structure incurring damage and potentially hurting its occupants during a wind related event. Efforts to do so are, but not limited to, strengthening gable anchorages, soffits, roof sheathing, anchoring attached structures such as porches or carports, replacing thin windows, enhancing the integrity of building openings, and developing continuous load paths throughout a structure.

Specifically, plan stakeholders have requested retrofit at:

- North Cedar CSD – Rooftop Reinforcement

Hazard/s Addressed	Severe Storms, Tornadoes
Effectiveness	Medium
Timeframe	1 – 5 Years
Lead Organization	Cedar County Secondary Roads, CSD Facilities Departments, Municipal Public Works
Funding Sources	BRIC, HMGP, Local Budgets