

LARIMER COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN 2019 ANNUAL REPORT

CRS Activity 510

The following is a summary document of updates and progress related to mitigation actions identified in the 2016 Larimer County Multi-Jurisdictional Hazard Mitigation Plan was adopted by the City in June 2016. This annual report was completed as part of a requirement of the City of Fort Collins' participation in the Federal Emergency Management Agency's (FEMA's) Community Rating System (CRS).

CITY OF FORT COLLINS ACTION PLANS – PROGRESS SUMMARIES

The following are summaries of progress on each of the applicable Action Plans over the previous year. Please see **Appendix B** for the original Action Plans from the 2016 Larimer County Multi-Jurisdictional Hazard Mitigation Plan.

ACTION PLAN: BOXELDER BASIN REGIONAL STORMWATER

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

All original projects have been completed. An IGA was executed in 2018 between the stakeholders that outlines funding and responsibilities for operations and maintenance of the facilities. Member entities are currently working with the State Engineer's Office to address exposed groundwater in the East Side Detention Facility (ESDF) in early 2020.

ACTION PLAN: FLOODWARNING SYSTEM ENHANCEMENTS

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

Project was completed in 2019.

ACTION PLAN: EAST VINE DRIVE PROPERTY ACQUISITION

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

The City acquired four properties on East Vine and demolition has been completed.

ACTION PLAN: GREEN INFRASTRUCTURE POLICIES AND OUTREACH

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

Policies have been updated and a new Green Infrastructure Implementation Manual has been adopted by the Fort Collins Council. Green Infrastructure policies will continue to be updated as need arises as part of the City's continual improvement process.

ACTION PLAN: LOW IMPACT DEVELOPMENT RETROFITS

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

We continue to implement retrofits to existing infrastructure as the City builds Capital projects where Green Infrastructure is incorporated into project design and construction.

ACTION PLAN: WATER RECLAMATION AND BIOSOLIDS - IMPROVEMENT IN PROCESSES AND INFRASTRUCTURE

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

The WRB Division is currently designing and planning for construction of two new centrifuges which will provide more reliable dewatering capability. The WRB Division is also evaluating all processes related to solids management and working through process improvements to address on-site storage capability and emergency response plans.

ACTION PLAN: WATER RECLAMATION AND BIOSOLIDS - IMPROVEMENT IN TECHNOLOGY

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

The WRB Division is working closer with Utility Collections Department to align master planning efforts to improve monitoring, communication, and strategy alignment going forward. Perimeter security is ongoing. Cameras have been updated but training and operationalizing the cameras still needs to be improved.

ACTION PLAN: UTILITIES - PUBLIC EDUCATION AND AWARENESS

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

On track with education and outreach for drought, flood, severe storm, severe winter weather, and wildfire. More coordination on extreme temperatures is needed due to staff turnover.

ACTION PLAN: COMPREHENSIVE PLAN (CITY PLAN) UPDATE

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

City Plan adopted by City Council Spring 2019. The implementation chapter (attached) anticipates a long-time horizon to complete all or most items (10-20 years).

ACTION PLAN: CACHE LA POUFRE RIVER LEVEES – OXBOW, TIMBERLINE AND DRAKE

WASTEWATER PLANT

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

Oxbow Levee project was completed in 2018. Timberline and Drake Levees are currently under design.

ACTION PLAN: OAK STREET EXTENSION STORM SEWER IMPROVEMENTS

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

Old Town Optimized Plan was completed in 2019. The Oak Street Extension is the highest priority project. City will look at funding this project in the next 10 years.

ACTION PLAN: MAGNOLIA STORMWATER OUTFALL

This Action Plan combines two projects that were separate in the original report, the Magnolia Storm Sewer and Myrtle Street Stormwater Outfall Action Plans.

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

Magnolia Street Stormwater Outfall was the City's highest priority project, but now it is the fifth priority based on the 2019 Old Town Optimized Plan.

ACTION PLAN: DOWNTOWN RIVER DISTRICT STORM SEWER IMPROVEMENTS

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

This project was completed in 2016 and was called the Lincoln and Willow Outfall project. The 2nd phase of this project called the Jefferson Street project was rolled into the Old Town Optimized Plan that was completed in 2019.

ACTION PLAN: MULBERRY-RIVERSIDE STORMWATER PROJECT

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

This project was completed in 2016.

ACTION PLAN: NORTH EAST COLLEGE CORRIDOR OUTFALL (NECCO)

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

This project was completed in 2017.

ACTION PLAN: DRAINAGE SYSTEM MAINTENANCE

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

Stormwater maintenance continues to be funded for \$1.5M per year to construct small capital stormwater improvement projects.

ACTION PLAN: ELECTRIC SUPPLY

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

Will be updating in 2020.

ACTION PLAN: ELECTRIC DISTRIBUTION

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

Will be updating in 2020

ACTION PLAN: OPEN SPACE PRESERVATION

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

Since 2016, Natural Areas acquired a 70+/- acre conservation easement in the floodplain next to Shields. Natural Areas is currently under contract to acquire a 5.4 acre parcel adjacent to the Poudre River and Kingfisher Point NA. In the same time period, Parks acquired four properties on East Vine along the Poudre River. Both departments are still actively seeking additional lands along the river from willing sellers.

ACTION PLAN: PUBLIC OUTREACH - FLOODPLAIN

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

The City will continue implementing numerous public information and education projects to increase the community's awareness of flood hazards and safety. In 2020 the City will redo our Program for Public Information (PPI) plan with the cooperation of stakeholders and other departments.

ACTION PLAN: REGULATORY PROGRAMS - STORMWATER/FLOODPLAIN

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

The City continues to enforce development regulations in the 100-year floodplain.

ACTION PLAN: POUDDRE FIRE AUTHORITY: TRAINING IN DISASTER MANAGEMENT LARGE SCALE INCIDENTS

Project on Track: yes

Project Completed: yes

Summary of Progress or of Why the Plan Has Not Been Implemented

On June 5, 2019, Poudre Fire Authority, Fort Collins Police Services, UC Health EMS, City of Fort Collins, and Larimer County participated in a large-scale disaster exercise at the Justice Center in Fort Collins. This was the culmination of almost two years of planning, training, and exercising. An after-action report will be completed in the next two to three months.

ACTION PLAN: WATER TREATMENT UTILITIES - WATER TREATMENT PROCESS IMPROVEMENTS (STORAGE TANK)

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

This is a long-term Capital Project that will be implemented within the next 10 years, depending upon funding.

ACTION PLAN: WATER TREATMENT UTILITIES - WATER TREATMENT PROCESS IMPROVEMENTS (SODIUM HYPOCHLORITE)

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

This is a long-term Capital Project that will be implemented within the next 10 years, depending upon funding.

ACTION PLAN: WATER TREATMENT UTILITIES - WATER TREATMENT PROCESS IMPROVEMENTS (SUPPLY LINE)

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

This is a long-term Capital Project that will be implemented within the next 10 years, depending upon funding.

ACTION PLAN: WATER TREATMENT UTILITIES - WATER TREATMENT PROCESS IMPROVEMENTS (PROCESS)

Project on Track: no

Project Completed: no

Summary of Progress or of Why the Plan Has Not Been Implemented

This is a long-term Capital Project that will be implemented within the next 10 years, depending upon funding.

ACTION PLAN: WATER TREATMENT UTILITIES - REDUNDANT SECOND OUTLET INSTALLATION

Project on Track: no

Project Completed: no

Summary of Progress or of Why the Plan Has Not Been Implemented

This is a long-term Capital Project that will be implemented within the next 10 years, depending upon funding.

ACTION PLAN: WASTEWATER COLLECTION - SEWER BY-PASS PUMPING

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

This project is on track from the standpoint that in an emergency we are prepared to rent/hire the assembly or placement of emergency bypass.

ACTION PLAN: WATER DISTRIBUTION - TEMPORARY WATER SYSTEM

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

Temporary water distribution line can be constructed in the event of an emergency.

NEW AND REVISED ACTION PLANS

The following action plans either required revisions or are for projects that have been newly identified or reprioritized. The new and revised action plans are available in **Appendix A**.

ACTION PLAN: STORMWATER MASTER PLANNING

Project on Track: yes

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

Updated the plan to update two stormwater master plans per year for the next 10 years.

ACTION PLAN: STREAM REHABILITATION AND ENHANCEMENT PROGRAM

Project on Track: no

Project Completed: ongoing

Summary of Progress or of Why the Plan Has Not Been Implemented

Updated the action plan.

CRS PROGRAM

The CRS program is a voluntary incentive program that provides flood insurance discounts to citizens and businesses based on a community's floodplain management activities that go above and beyond minimum floodplain management standards. The Northern Colorado Regional Hazard Mitigation Plan and Larimer County Multi-Jurisdictional Hazard Mitigation Plan address not only flood issues but other natural and man-made hazards. It is credited under the Flood Damage Reduction Activities section of the CRS program. The City of Fort Collins was presented with a Class 2 award at a City Council Meeting in June 2016 putting the City in the top 5 communities nationwide that participate in the CRS program. Citizens and businesses receive up to a 40% discount on their flood insurance premiums due to the City's progressive floodplain management program.

ADDITIONAL INFORMATION

To review a copy of the Larimer County Multi-Jurisdictional Hazard Mitigation Plan or obtain additional information about the Plan, please contact the Mike Gavin, Office of Emergency Management, Poudre Fire Authority, Phone: 970-416-2878.

To obtain additional information on the Community Rating System, please contact Marsha Hilmes-Robinson, Floodplain Administrator, Fort Collins Utilities, Phone, 970-224-6036.

APPENDIX A

NEW & REVISED ACTION PLANS

City of Fort Collins: Boxelder Basin Regional Stormwater (Fort Collins – 1)

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|---------------------------------|--|
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Project location | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 08/31/2009 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards; Continue to collaborate with area partners through mutual aid agreements and long-term planning efforts |

TARGET COMPLETION DATE: 04/30/2016

ISSUE: Early in 2005, stormwater planners in northern Larimer County took a holistic approach to addressing flood hazard and stormwater drainage problems in the Boxelder Creek watershed. The current BBRSA members have been working together for over 8 years. This watershed or basin encompasses over 265 square miles and extends from just north of the Wyoming border to the Poudre River on the south. Because the Boxelder Creek floodplain affects many property owners and several local governments, intensive efforts were made to develop a regional flood hazard mitigation plan. It should be noted that Coal Creek and Indian Creek both feed into Boxelder Creek near the Town of Wellington. The communities of Fort Collins, Wellington, Timnath, Windsor, and Larimer County all shared a common goal in mitigating the flood hazard posed by Boxelder Creek. The Alliance was formed in early 2005 to develop a “regional” solution that is more efficient, wide ranging and cost effective than the entities could develop independently.

It was determined that the best approach to basin wide flood hazard mitigation would be to prepare a common plan for flood mitigation improvements within the Basin. Members of the Alliance pooled funding to prepare a storm water Master Plan for the Boxelder Basin. The resulting Boxelder Creek Regional Stormwater Master Plan (Master Plan) was completed in October 2006.

RECOMMENDATION: The Boxelder Creek Master Plan developed a list of conceptual regional stormwater improvement projects and recommended the formation of a Stormwater Authority to fund and implement the regional stormwater improvements.

ACTION: The original Master Plan recommended the following Boxelder Creek Regional Stormwater Master Plan Phase I regional stormwater projects:

- Diversion of Coal Creek to Clark Reservoir
- Edson (East Side) Detention Reservoir
- Middle Boxelder Creek Stream Improvements
- Larimer and Weld Crossing Structure.

The Diversion of Coal Creek to Clark Reservoir (later known as the Coal Creek Flood Mitigation Project) was designed and construction completed by the BBRSA in cooperation with Larimer County in 2011. The project diverts stormwater flows from Coal Creek (which is tributary to Boxelder Creek) into the Clark Reservoir Inlet Canal and ultimately into Clark Reservoir.

Revisions were necessary to the master plan improvements due to site constraints and location of the detention facility, improvements to County Road 52 and the addition of the Town of Timnath as a financial partner to the BBRSA. The updated regional stormwater projects consist of:

- East Side Detention Facility



- Larimer Weld Canal Crossing Structure
- County Road 52 Improvements

Construction of the projects is phased. The East Side Detention Facility/County Road 52 Improvements began construction in August 2015 at a total cost of approximately \$7.5 million. The Larimer Weld Canal Crossing Structure construction will begin in October 2015 at a cost of approximately \$650,000. All construction is scheduled for completion by early 2016.

LEAD AGENCY: Boxelder Basin Regional Stormwater Authority (BBRSA) – Established by IGA between Fort Collins, Larimer County and Wellington.

EXPECTED COST: Total of \$19 million.

SUPPORT AGENCIES: N/A

POTENTIAL FUNDING SOURCES: BBRSA stormwater service and system development fees, FEMA grant funding, Timnath financial contributions toward the ESDF and CR52 Improvements, and some CR 52 Improvements funding from Fort Collins, Larimer County and Timnath.

PROGRESS MILESTONES:

Construction of ESDF began in August, 2015. Construction of LWCCS is targeted to begin after the irrigation season ends in October. Construction of County Road 52 Improvements began in September, 2015. All construction is targeted to be completed by early 2016. Letter of Map Revisions (LOMR's) will be submitted to FEMA in early 2016.



Boxelder Creek at 12.5
Upstream face of culvert

City of Fort Collins - Comprehensive Plan (City Plan) Update (Fort Collins – 11)

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| PRIORITY: High | HAZARDS ADDRESSED: Drought, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
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|---------------------------------------|------------------------------------|
| LOCATION: City of Fort Collins | GOALS ADDRESSED: 1, 2, 3, 5 |
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| RECOMMENDATION DATE: 01/01/2017 | OBJECTIVES ADDRESSED: A C D E |
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TARGET COMPLETION DATE: 06/31/2018

ISSUE: Align updated City Plan policies and recommendations with the Hazard Mitigation Plan

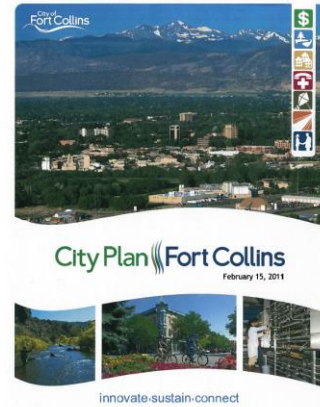
RECOMMENDATION: City Plan update process as part of Plan Fort Collins, which also includes the Transportation Master Plan update

ACTION: Develop new City Plan policies and implementation action recommendations relating the Hazard Mitigation Plan


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| LEAD AGENCY: City of Fort Collins – all Service areas | EXPECTED COST: \$600,000 for consultant services, public outreach and administrative expenses |
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| SUPPORT AGENCIES: NA | POTENTIAL FUNDING SOURCES: General Fund |
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PROGRESS MILESTONES: Review of Plan draft sections including policy and implementation in 2018.



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| City of Fort Collins: Training in Disaster Management Large Scale Incidents (Fort Collins – 8) | |
| PRIORITY: High | HAZARDS ADDRESSED: All |
| LOCATION | GOALS ADDRESSED: 1,2,3 |
| RECOMMENDATION DATE: 1/1/2016 | OBJECTIVES ADDRESSED: B C D |
| TARGET COMPLETION DATE: On Going | Continual Training |
| ISSUE: Poudre Fire Authority needs to expand their disaster management training from fire and wildland to all hazards. As an emergency response and rescue organization, expanding their scope in areas other than response will increase the community’s capability to be more resilient. | |
| RECOMMENDATION: Increase training and knowledge in disaster management | |
| ACTION: | |
| <ul style="list-style-type: none"> • Additional training in ICS (Command Staff Positions) • Additional training in EOC Operations G775 • Additional training in Disaster Management Operations MGT 317, 343, 345 • Command and Control of Major Emergency Operations | |
| LEAD AGENCY: PFA Training Division | EXPECTED COST: \$5000 |
| SUPPORT AGENCIES: Fort Collins OEM | POTENTIAL FUNDING SOURCES: Annual Budget, EMPG |
| PROGRESS MILESTONES: Project is dependent on scheduling courses. All training will be captured and documented and followed up with exercises for feedback and retention of skills. | |

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| City of Fort Collins: Drainage System Maintenance (Fort Collins – 17) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm |
| LOCATION: Citywide | GOALS ADDRESSED: Protect people, property and natural resources |
| RECOMMENDATION DATE: Ongoing | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: Ongoing | |
| ISSUE: Ongoing maintenance of the City drainage system to prevent failures and | |
| RECOMMENDATION: Assessment and maintenance plan with projects prioritized by need and funding availability. | |
| ACTION: Replacing and repairing sections of the City drainage system as necessary. | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: 1.45 million/year |
| SUPPORT AGENCIES: None | POTENTIAL FUNDING SOURCES: Residential and Business Stormwater Rates |
| PROGRESS MILESTONES: |  |

City of Fort Collins: Downtown River District Storm Sewer Improvements (Fort Collins – 9)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Downtown Fort Collins area between Jefferson Avenue and the Cache la Poudre River | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: December 2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: June 2016 | |
| ISSUE: This area of Fort Collins has old undersized storm sewers that do not meet current drainage standards nor have a proper outfall to the River. | |
| RECOMMENDATION: Install a new storm sewer system to improve the drainage and reduce flooding for storms up to and including the 100-year event and improve water quality for smaller more frequent storm events (2-year and below). | |
| ACTION: Flooding in the streets and downtown properties | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$3M to construct |
| SUPPORT AGENCIES: | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |

PROGRESS MILESTONES: This project is in the final design phase and scheduled for construction in January 2016



Fort Collins Utilities – Public Education and Awareness (Fort Collins – 10)

City of Fort Collins: East Vine Drive Property Acquisition (Fort Collins – 3)

PRIORITY: High **HAZARDS ADDRESSED:** Flood

LOCATION: East Vine Drive, Fort Collins **GOALS ADDRESSED:** Protect people, property and natural resources; Improve capability to reduce disaster losses

RECOMMENDATION DATE: 9/2015 **OBJECTIVES ADDRESSED:** Reduce the vulnerability of local assets to the impact of hazards

TARGET COMPLETION DATE: 9/2018

ISSUE: Structures in the Poudre River Floodway

RECOMMENDATION: Acquisition, Deconstruction and Removal of Structures

ACTION: The City of Fort Collins is proposing to purchase, demolish or relocate four (4) properties located along East Vine Drive in north Fort Collins, CO. The properties are located within the 100-year 1-foot floodway (Zone AE) floodplain for the Cache la Poudre River, and were subject to flooding in the September 2013 flood on the Poudre River.

LEAD AGENCY: City of Fort Collins – Stormwater Utility **EXPECTED COST:** \$1.1 million

SUPPORT AGENCIES: FEMA, Colorado DHSEM **POTENTIAL FUNDING SOURCES:** FEMA HMGP grant award, 12.5% match from CO DHSEM, 12.5% match from City of Fort Collins

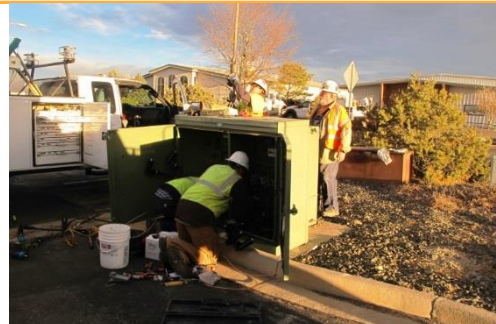
PROGRESS MILESTONES: Property Acquisition by spring of 2016, property deconstruction completed by spring of 2017, site restoration and final completion in spring of 2018.



City of Fort Collins: Electric Distribution (Fort Collins – 16)

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| PRIORITY: High | HAZARDS ADDRESSED: Outages to the electric distribution, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
| LOCATION: City of Fort Collins | GOALS ADDRESSED: 1, 2 |
| RECOMMENDATION DATE: 11/01/2015 | OBJECTIVES ADDRESSED: C, D, E |
| TARGET COMPLETION DATE: Unknown | Dependent on financing. |
| ISSUE: Enhanced coverage of infrastructure maintenance of the City of Fort Collins L&P. (Add another full time maintenance crew) | |
| RECOMMENDATION: Fully staff another full-time maintenance crew within L&P to perform maintenance and follow up to resolve issues encountered. | |
| ACTION: Request through BFO within the city another crew and equipment to perform maintenance of the electric infrastructure. | |
| LEAD AGENCY: City of Fort Collins L&P | EXPECTED COST: \$200,000 |
| SUPPORT AGENCIES: Be specific | POTENTIAL FUNDING SOURCES: Within L&P budget |

PROGRESS MILESTONES: Major project milestones and reporting of current project status




City of Fort Collins: Electric Supply (Fort Collins – 15)

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| PRIORITY: Medium | HAZARDS ADDRESSED: Outages to the electric supply, Drought, Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
| LOCATION: Areas throughout County and on city/county vehicles | GOALS ADDRESSED: 1, 2, 3, 4, 5 |
| RECOMMENDATION DATE: 11/012015 | OBJECTIVES ADDRESSED: : A, D, E |
| TARGET COMPLETION DATE: Continual | |
| ISSUE: Communication and Information shared with citizens within the area. | |
| RECOMMENDATION: Utilize banners hanging in cities and surrounding area to spread the information of potential risks. Also utilize vehicles such as buses and work trucks to spread the word. Information could contain things such as where to go to get information on suggested items for a “Go Bag”, (banners are hung in Fort Collins yearly for reminders such as “Flood Awareness Week”, “Mosquitos”, other potential risks could be advertised to make people aware. | |
| ACTION: Coordination of hanging of banners in different areas and/or making of signs for use on vehicles. | |
| LEAD AGENCY: Larimer County | EXPECTED COST: \$50,000 |
| SUPPORT AGENCIES: City of Loveland, City of Estes Park, City of Fort Collins, Wellington, Timnath, Red Feather | POTENTIAL FUNDING SOURCES: Grants, future budgets. |

PROGRESS MILESTONES:



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| City of Fort Collins: West Vine – Forney Pond (Fort Collins – 25) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Northwestern Fort Collins area south of Vine Drive and east of Taft Hill Road | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2017 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 2018 | |
| ISSUE: This area of Fort Collins was the historic flow path of Solider Creek that has been covered up or redirected by development over the years. | |
| RECOMMENDATION: This detention pond we capture runoff from upstream contributing area and detain it so reduced flooding downstream. | |
| ACTION: Flooding in downstream properties and homes | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$4M |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
| PROGRESS MILESTONES: The City purchased this property and it is on the 5-year master plan priority list |  |

City of Fort Collins: Flood Warning System (FWS) Enhancements (Fort Collins – 2)

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|-----------------------|---|
| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm, Wind & Tornado |
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| LOCATION: Poudre River, Halligan reservoir, City USC Facility, PFA EOC Facility | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses; Strengthen communication and coordination among public agencies, non-governmental organizations, businesses, and citizens |
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| RECOMMENDATION DATE: 06/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
|-------------------------------------|--|

TARGET COMPLETION DATE: 05/2016

ISSUE: Updating and expanding the technology component of the City’s real-time flood recognition and response FWS solution

RECOMMENDATION: Gage and communications infrastructure upgrades and new data management software acquisition

ACTION: The City will upgrade its FWS telemetry and base station data management software and adding three gages to further expand its existing network of 75 locations.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$142,900 for hardware and software |
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|---|---|
| SUPPORT AGENCIES: FEMA, Colorado DHSEM | POTENTIAL FUNDING SOURCES: FEMA HMGP grant award, 12.5% match from CO DHSEM, 12.5% match from City of Fort Collins |
|---|---|

PROGRESS MILESTONES: Software acquisition, installation and setup, telemetry upgrading, and three new gage installations to be completed by May 2016.



City of Fort Collins: Green Infrastructure policies and outreach (Fort Collins – 4)

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| PRIORITY: High | HAZARDS ADDRESSED: Flooding |
| LOCATION: City of Fort Collins | GOALS ADDRESSED: Protect people, property, and natural resources; Increase public awareness of natural hazards and mitigation options; |
| RECOMMENDATION DATE: 1/1/2015 | OBJECTIVES ADDRESSED: Incorporate risk reduction principles into policy documents and initiatives; Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 12/31/2019 | |
| ISSUE: Reduce Flooding by widening the policies that require green infrastructure, improving technologies used, increasing alternatives that can be used, improving available incentives, increasing awareness and mitigation by City agencies and the public | |
| RECOMMENDATION: Improved specifications, better technical details, easier access | |
| ACTION: Enhancement of Green Infrastructure policies through incentives, outreach, and technical support for implementation | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$300,000/year |
| SUPPORT AGENCIES: City of Fort Collins Customer Connections Department | POTENTIAL FUNDING SOURCES: Fort Collins Utilities, EPA, Grants |

PROGRESS MILESTONES: New construction details by end of 2016, new incentives in 2017, ongoing outreach efforts.



City of Fort Collins: Boxelder Basin Regional Stormwater (Fort Collins – 1)

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|---------------------------------|--|
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Project location | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 08/31/2009 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards; Continue to collaborate with area partners through mutual aid agreements and long-term planning efforts |

TARGET COMPLETION DATE: 04/30/2016

ISSUE: Early in 2005, stormwater planners in northern Larimer County took a holistic approach to addressing flood hazard and stormwater drainage problems in the Boxelder Creek watershed. The current BBRSA members have been working together for over 8 years. This watershed or basin encompasses over 265 square miles and extends from just north of the Wyoming border to the Poudre River on the south. Because the Boxelder Creek floodplain affects many property owners and several local governments, intensive efforts were made to develop a regional flood hazard mitigation plan. It should be noted that Coal Creek and Indian Creek both feed into Boxelder Creek near the Town of Wellington. The communities of Fort Collins, Wellington, Timnath, Windsor, and Larimer County all shared a common goal in mitigating the flood hazard posed by Boxelder Creek. The Alliance was formed in early 2005 to develop a “regional” solution that is more efficient, wide ranging and cost effective than the entities could develop independently.

It was determined that the best approach to basin wide flood hazard mitigation would be to prepare a common plan for flood mitigation improvements within the Basin. Members of the Alliance pooled funding to prepare a storm water Master Plan for the Boxelder Basin. The resulting Boxelder Creek Regional Stormwater Master Plan (Master Plan) was completed in October 2006.

RECOMMENDATION: The Boxelder Creek Master Plan developed a list of conceptual regional stormwater improvement projects and recommended the formation of a Stormwater Authority to fund and implement the regional stormwater improvements.

ACTION: The original Master Plan recommended the following Boxelder Creek Regional Stormwater Master Plan Phase I regional stormwater projects:

- Diversion of Coal Creek to Clark Reservoir
- Edson (East Side) Detention Reservoir
- Middle Boxelder Creek Stream Improvements
- Larimer and Weld Crossing Structure.

The Diversion of Coal Creek to Clark Reservoir (later known as the Coal Creek Flood Mitigation Project) was designed and construction completed by the BBRSA in cooperation with Larimer County in 2011. The project diverts stormwater flows from Coal Creek (which is tributary to Boxelder Creek) into the Clark Reservoir Inlet Canal and ultimately into Clark Reservoir.

Revisions were necessary to the master plan improvements due to site constraints and location of the detention facility, improvements to County Road 52 and the addition of the Town of Timnath as a financial partner to the BBRSA. The updated regional stormwater projects consist of:

- East Side Detention Facility



- Larimer Weld Canal Crossing Structure
- County Road 52 Improvements

Construction of the projects is phased. The East Side Detention Facility/County Road 52 Improvements began construction in August 2015 at a total cost of approximately \$7.5 million. The Larimer Weld Canal Crossing Structure construction will begin in October 2015 at a cost of approximately \$650,000. All construction is scheduled for completion by early 2016.

LEAD AGENCY: Boxelder Basin Regional Stormwater Authority (BBRSA) – Established by IGA between Fort Collins, Larimer County and Wellington.

EXPECTED COST: Total of \$19 million.

SUPPORT AGENCIES: N/A

POTENTIAL FUNDING SOURCES: BBRSA stormwater service and system development fees, FEMA grant funding, Timnath financial contributions toward the ESDF and CR52 Improvements, and some CR 52 Improvements funding from Fort Collins, Larimer County and Timnath.

PROGRESS MILESTONES:

Construction of ESDF began in August, 2015. Construction of LWCCS is targeted to begin after the irrigation season ends in October. Construction of County Road 52 Improvements began in September, 2015. All construction is targeted to be completed by early 2016. Letter of Map Revisions (LOMR's) will be submitted to FEMA in early 2016.



Boxelder Creek at 12.5
Upstream face of culvert

City of Fort Collins: Flood Warning System (FWS) Enhancements (Fort Collins – 2)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm, Wind & Tornado |
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| LOCATION: Poudre River, Halligan reservoir, City USC Facility, PFA EOC Facility | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses; Strengthen communication and coordination among public agencies, non-governmental organizations, businesses, and citizens |
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| RECOMMENDATION DATE: 06/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
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TARGET COMPLETION DATE: 05/2016

ISSUE: Updating and expanding the technology component of the City’s real-time flood recognition and response FWS solution

RECOMMENDATION: Gage and communications infrastructure upgrades and new data management software acquisition

ACTION: The City will upgrade its FWS telemetry and base station data management software and adding three gages to further expand its existing network of 75 locations.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$142,900 for hardware and software |
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| SUPPORT AGENCIES: FEMA, Colorado DHSEM | POTENTIAL FUNDING SOURCES: FEMA HMGP grant award, 12.5% match from CO DHSEM, 12.5% match from City of Fort Collins |
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PROGRESS MILESTONES: Software acquisition, installation and setup, telemetry upgrading, and three new gage installations to be completed by May 2016.



City of Fort Collins: East Vine Drive Property Acquisition (Fort Collins – 3)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood |
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| LOCATION: East Vine Drive, Fort Collins | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
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| RECOMMENDATION DATE: 9/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
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TARGET COMPLETION DATE: 9/2018

ISSUE: Structures in the Poudre River Floodway

RECOMMENDATION: Acquisition, Deconstruction and Removal of Structures

ACTION: The City of Fort Collins is proposing to purchase, demolish or relocate four (4) properties located along East Vine Drive in north Fort Collins, CO. The properties are located within the 100-year 1-foot floodway (Zone AE) floodplain for the Cache la Poudre River, and were subject to flooding in the September 2013 flood on the Poudre River.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$1.1 million |
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| SUPPORT AGENCIES: FEMA, Colorado DHSEM | POTENTIAL FUNDING SOURCES: FEMA HMGP grant award, 12.5% match from CO DHSEM, 12.5% match from City of Fort Collins |
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PROGRESS MILESTONES: Property Acquisition by spring of 2016, property deconstruction completed by spring of 2017, site restoration and final completion in spring of 2018.



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| City of Fort Collins: Green Infrastructure policies and outreach (Fort Collins – 4) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flooding |
| LOCATION: City of Fort Collins | GOALS ADDRESSED: Protect people, property, and natural resources; Increase public awareness of natural hazards and mitigation options; |
| RECOMMENDATION DATE: 1/1/2015 | OBJECTIVES ADDRESSED: Incorporate risk reduction principles into policy documents and initiatives; Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 12/31/2019 | |
| ISSUE: Reduce Flooding by widening the policies that require green infrastructure, improving technologies used, increasing alternatives that can be used, improving available incentives, increasing awareness and mitigation by City agencies and the public | |
| RECOMMENDATION: Improved specifications, better technical details, easier access | |
| ACTION: Enhancement of Green Infrastructure policies through incentives, outreach, and technical support for implementation | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$300,000/year |
| SUPPORT AGENCIES: City of Fort Collins Customer Connections Department | POTENTIAL FUNDING SOURCES: Fort Collins Utilities, EPA, Grants |
| PROGRESS MILESTONES: New construction details by end of 2016, new incentives in 2017, ongoing outreach efforts. |  |

City of Fort Collins: Low Impact Development Retrofits (Fort Collins – 5)

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| PRIORITY: High | HAZARDS ADDRESSED: Flooding |
| LOCATION: City of Fort Collins | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 12/2013 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 12/2018 | |
| ISSUE: Improve water quality, Reduce Urban Flooding and Enhance community resiliency by retrofitting green infrastructure into existing City regional drainage facilities | |
| RECOMMENDATION: Incorporated into Drainage Master Plan Updates approved by Water Board and City Council | |
| ACTION: Retrofitting of Green Infrastructure facilities into existing regional facilities pub | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: Varies from project to project can range from \$25 K to \$200K |
| SUPPORT AGENCIES: City of Fort Collins Parks, City of Fort Collins Natural Areas | POTENTIAL FUNDING SOURCES: Fort Collins Utilities, City of Fort Collins Parks and Recreation, Fort Collins Sustainability Services, Grants |

PROGRESS MILESTONES: Adoption of Master Plan Updates in 2013, construction as budget allows.



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| City of Fort Collins: Water Reclamation and Biosolids- Improvement in Processes and Infrastructure (Fort Collins – 6) | |
| PRIORITY: Medium | HAZARDS ADDRESSED: All |
| LOCATION: Drake Water Treatment Facility-3036 Environmental Dr. | GOALS ADDRESSED: 1 |
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
| TARGET COMPLETION DATE: 12/31/2018 | |
| ISSUE: Critical operations of the Fort Collin’s Water Reclamation and Biosolids Facilities could be disrupted in the case of unplanned environmental emergencies, critical equipment failures, or loss of power. | |
| RECOMMENDATION: Improvements to facility processes that would help ensure critical operations are maintained | |
| ACTION: | |
| <ul style="list-style-type: none"> • Increase on-site process water and biosolids storage capacity • Dewatering redundancy • On-site backup power generation unit. | |
| LEAD AGENCY: City of Fort Collins: Water Reclamation and Biosolids Division | EXPECTED COST: 30 million dollars for all three items. Backup power may be significantly higher. |
| SUPPORT AGENCIES: CDPHE, EPA, FEMA | POTENTIAL FUNDING SOURCES: Rate increased, Grants, Bonds, Third Party Financing |
| PROGRESS MILESTONES: | |
| <ul style="list-style-type: none"> • Design and build additional sludge holding tank capacity. • Design and build additional dewatering systems which may include additional centrifuges or screw presses. • Scope, design, and build additional redundancy back up power supply. | |

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| City of Fort Collins: Water Reclamation and Biosolids- Improvement in Technology (Fort Collins – 7) | |
| PRIORITY: Medium | HAZARDS ADDRESSED: All |
| LOCATION: Drake Water Treatment Facility-3036 Environmental Dr. | GOALS ADDRESSED: 1 |
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
| TARGET COMPLETION DATE: 12/31/2018 | |
| ISSUE: Critical operations of the Fort Collin’s Water Reclamation and Biosolids Facilities could be disrupted in the case of unplanned environmental emergencies, critical equipment failures, or loss of power. | |
| RECOMMENDATION: Improvements to facility processes that would help ensure critical operations are maintained | |
| ACTION: | |
| <ul style="list-style-type: none"> • Improve collection system instrumentation and monitoring • Improve perimeter and building security technology | |
| LEAD AGENCY: City of Fort Collins: Water Reclamation and Biosolids Division | EXPECTED COST: 30 million dollars for all three items. Backup power may be significantly higher. |
| SUPPORT AGENCIES: CDPHE, EPA, FEMA | POTENTIAL FUNDING SOURCES: Rate increased, Grants, Bonds, Third Party Financing |
| PROGRESS MILESTONES: To be determined after more planning. | |

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| City of Fort Collins: Training in Disaster Management Large Scale Incidents (Fort Collins – 8) | |
| PRIORITY: High | HAZARDS ADDRESSED: All |
| LOCATION | GOALS ADDRESSED: 1,2,3 |
| RECOMMENDATION DATE: 1/1/2016 | OBJECTIVES ADDRESSED: B C D |
| TARGET COMPLETION DATE: On Going | Continual Training |
| ISSUE: Poudre Fire Authority needs to expand their disaster management training from fire and wildland to all hazards. As an emergency response and rescue organization, expanding their scope in areas other than response will increase the community’s capability to be more resilient. | |
| RECOMMENDATION: Increase training and knowledge in disaster management | |
| ACTION: | |
| <ul style="list-style-type: none"> • Additional training in ICS (Command Staff Positions) • Additional training in EOC Operations G775 • Additional training in Disaster Management Operations MGT 317, 343, 345 • Command and Control of Major Emergency Operations | |
| LEAD AGENCY: PFA Training Division | EXPECTED COST: \$5000 |
| SUPPORT AGENCIES: Fort Collins OEM | POTENTIAL FUNDING SOURCES: Annual Budget, EMPG |
| PROGRESS MILESTONES: Project is dependent on scheduling courses. All training will be captured and documented and followed up with exercises for feedback and retention of skills. | |

City of Fort Collins: Downtown River District Storm Sewer Improvements (Fort Collins – 9)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood |
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| LOCATION: Downtown Fort Collins area between Jefferson Avenue and the Cache la Poudre River | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
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| RECOMMENDATION DATE: December 2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
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TARGET COMPLETION DATE: June 2016

ISSUE: This area of Fort Collins has old undersized storm sewers that do not meet current drainage standards nor have a proper outfall to the River.

RECOMMENDATION: Install a new storm sewer system to improve the drainage and reduce flooding for storms up to and including the 100-year event and improve water quality for smaller more frequent storm events (2-year and below).

ACTION: Flooding in the streets and downtown properties

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$3M to construct |
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| SUPPORT AGENCIES: | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
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PROGRESS MILESTONES: This project is in the final design phase and scheduled for construction in January 2016



Fort Collins Utilities – Public Education and Awareness (Fort Collins – 10)

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| PRIORITY: Low - Medium | HAZARDS ADDRESSED: Drought, Extreme Temperatures, Flood, Severe Storm, Severe Winter Weather, Wildfire |
| LOCATION: Fort Collins, Colorado | GOALS ADDRESSED: 1, 3, 4 |
| RECOMMENDATION DATE: December 2015 | OBJECTIVES ADDRESSED: A, D |
| TARGET COMPLETION DATE: Ongoing | |
| ISSUE: To enhance our overall preparedness, City staff and the residential and business community members need access to ongoing education through awareness campaigns, events, public outreach, website, social media and education workshops. | |
| RECOMMENDATION: Continue to identify, promote and present education workshops, awareness campaigns and training opportunities for City staff, residents, non-profit organizations and business owners. | |
| <p>ACTION(s):</p> <p>Drought:</p> <p>The Water Conservation Program provides the following to achieve optimal conservation:</p> <ul style="list-style-type: none"> • Rebates for low-flow showerheads, toilets, dishwashers, clothes washer and sprinkler equipment • Sprinkler system irrigation audits • Home efficiency and conservation tips on website, social media and web portal • Low Income retrofit program • Continuous Consumption program in collaboration with Leak Detection • Raw water irrigation at City parks • Home Water Reports • Partnering on graywater legislation to use graywater in homes to encourage water reuse • Public information campaign on conservation • Adult and youth (schools) education programs • Business programs • Water conservation giveaways and awards • Xeriscape rebates, plant lists, clinics and garden design assistance <p>Extreme Temperatures:</p> <ul style="list-style-type: none"> • Formalize guidance around actions the public can take to prepare for and respond to extreme heat • Identify and characterize vulnerable areas and populations of Fort Collins • Develop and implement a public awareness and outreach campaign that notifies citizens on how to get information, prepare for and respond to extreme temperatures, specifically heat. • Promote low income assistance program to assist with utility bill payments • Educate homeowners and builders on energy and water efficiency (e.g., how to protect water pipes by locating them on the inside of building insulation or keeping them out of attics, crawl spaces and vulnerable outside walls) • Provide conservation and maintenance information for homeowners (e.g., by allowing a faucet to drip during extreme cold weather, you can prevent the buildup of excessive pressure in the pipe and avoid bursting) • Promote web programmable thermostats for remote control of heat to prevent frozen pipes <p>Flood:</p> | |

- Use outreach activities to share and collaborate with technical assistance programs that address measures that citizens can take to be safe and prepared
- Facilitate and manage funding for mitigation measures
- Encourage homeowners to install backflow valves to prevent reverse-flow flood damage
- Encourage residents in flood-prone areas to elevate new homes or flood-proof their home
- Educate community about the need, value and reduced premiums for flood insurance (due to the City’s high Community Rating System level)
- Educate the public about securing debris, propane tanks, yard items or stored objects that may be swept away, damaged or pose a hazard if picked up and washed away by floodwaters
- Advise residents that keeping storm drains clear of debris during storms (not to rely solely on City maintenance crews) could help prevent flooding of their property
- Actively promote Flood Awareness Week during flood season with various messaging tactics, including bus benches, posters, flyers, brochures, website and social media campaigns
- Educate community about our two water sources and how we can close intakes into the treatment plant when water quality is affected thanks to early warning from sensors in the Poudre Canyon
- Use stormwater construction project communications as opportunities to educate the community about our stormwater infrastructure and long-range flood protection planning

Severe Storm:

- Use appropriate outreach tactics to share important updates and contact information
- Provide messaging on service outages and restore times on website and social media

Severe Winter Weather:

- Provide messaging on service outages and restore times on website and social media
- Promote web portal where utility customers can monitor their water use (check for leaks)
- Educate homeowners about how to prevent frozen pipes

Wildfire:

- Provide messaging on website and social media, as well as youth education in schools, about how watersheds are managed to minimize wildfires in order to protect water quality
- Educate community about our two water sources and how we can close intakes into the treatment plant when water quality is affected by debris and runoff from a fire with early warning from sensors in the Poudre Canyon
- Facilitate and manage funding for mitigation measures

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| <p>LEAD AGENCY: City of Fort Collins</p> | <p>EXPECTED COST: Most costs will be absorbed within existing annual budgeted line items, which currently supports 24 x 7 on-call communications support.</p> |
| <p>SUPPORT AGENCIES: Larimer County, Poudre Fire Authority, Fort Collins Police, LETA, United Way, American Red Cross, FEMA and other identified stakeholders and community response agencies as required to enhance overall knowledge and preparedness.</p> | <p>POTENTIAL FUNDING SOURCES: Annual budgets and mitigation grant opportunities.</p> |
| <p>PROGRESS MILESTONES: Continue to identify educational opportunities; pursue awareness campaigns; enhance the use of consumption data with our customers; enhance website and social media effectiveness; and track attendance at events.</p> | |



City of Fort Collins - Comprehensive Plan (City Plan) Update (Fort Collins – 11)

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| PRIORITY: High | HAZARDS ADDRESSED: Drought, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
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| LOCATION: City of Fort Collins | GOALS ADDRESSED: 1, 2, 3, 5 |
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| RECOMMENDATION DATE: 01/01/2017 | OBJECTIVES ADDRESSED: A C D E |
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TARGET COMPLETION DATE: 06/31/2018

ISSUE: Align updated City Plan policies and recommendations with the Hazard Mitigation Plan

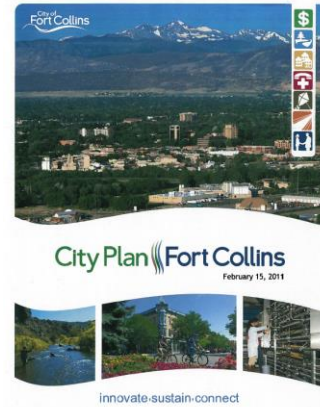
RECOMMENDATION: City Plan update process as part of Plan Fort Collins, which also includes the Transportation Master Plan update

ACTION: Develop new City Plan policies and implementation action recommendations relating the Hazard Mitigation Plan

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| LEAD AGENCY: City of Fort Collins – all Service areas | EXPECTED COST: \$600,000 for consultant services, public outreach and administrative expenses |
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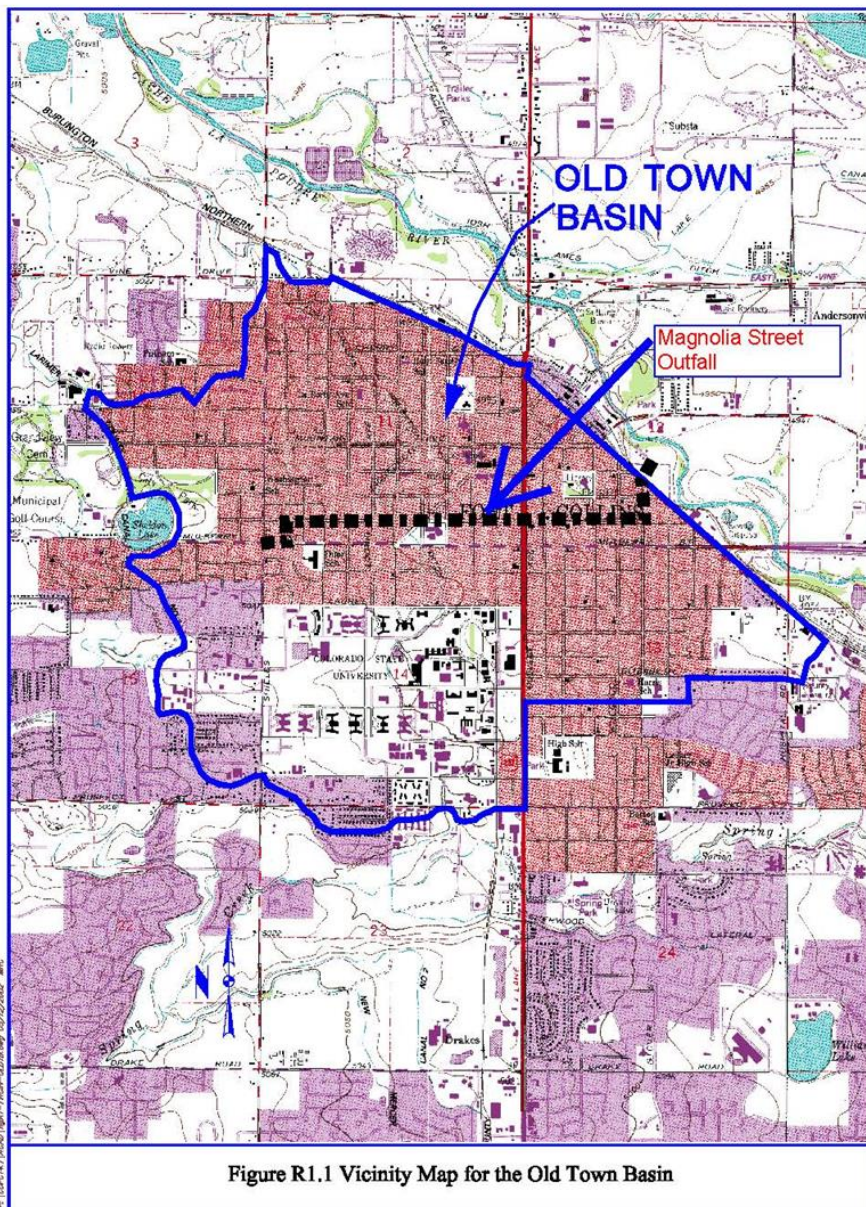
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| SUPPORT AGENCIES: NA | POTENTIAL FUNDING SOURCES: General Fund |
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PROGRESS MILESTONES: Review of Plan draft sections including policy and implementation in 2018.



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| City of Fort Collins: Magnolia Storm Sewer (Fort Collins – 12) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Old Town Fort Collins area along Magnolia Street to the Cache la Poudre River | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2017 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 2019 | |
| ISSUE: This area of Fort Collins has old undersized storm sewers that do not meet current drainage standards nor have a proper outfall to the River. | |
| RECOMMENDATION: Install a new storm sewer system to improve the drainage and reduce flooding for storms up to and including the 100-year event and improve water quality for smaller more frequent storm events (2-year and below). | |
| ACTION: Design and construct new storm sewer | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$22M |
| SUPPORT AGENCIES: CDOT, CWCB, FEMA | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
| PROGRESS MILESTONES: Start design of this project in 2016 so that construction can be begin in 2017. This is a two phase project that will start at the downstream end (outfall to the Cache la | |

Poudre River) then work its way upstream.



R-2

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| City of Fort Collins: Stormwater Master Planning (Fort Collins – 13) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Throughout the City | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses; Integrate hazard mitigation into other planning mechanisms |
| RECOMMENDATION DATE: 2015 | OBJECTIVES ADDRESSED: Incorporate risk reduction principles into policy documents and initiatives, other institutional plans; Reduce the vulnerability of local assets to the impact hazards |
| TARGET COMPLETION DATE: 2020 (ongoing) | |
| ISSUE: The majority of the City’s Master Plans were modeled using MODSWM software. This software is outdate and does provide robust dynamic hydrologic modeling. | |
| RECOMMENDATION: The City is updating the hydrology in all the Master Plans to be converted to EPA SWM. | |
| ACTION: Update master plans to EPA SWM. | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$1M over a 5 year period |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee |
| PROGRESS MILESTONES: Revise one basin per year until all the master plans are updated. | |

City of Fort Collins: Mulberry-Riverside Stormwater Project (Fort Collins – 14)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Riverside Avenue & Myrtle Street, Fort Collins | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 09/15/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |

TARGET COMPLETION DATE: 09/15/2018

ISSUE: The purpose of this stormwater collection system is to mitigate flooding, property damage, and threats to life and infrastructure caused by rainfall driven flood events in the Old Town Basin in Fort Collins, CO.

RECOMMENDATION: Feasibility study and infrastructure emplacement to be performed by City of Fort Collins Stormwater Utility and Capital Projects Group

ACTION: New collection and conveyance structures, piping, and outfall improvements will reduce the number of homes subject to floodwaters in the area.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$2.5 Million |
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| SUPPORT AGENCIES: FEMA, Colorado DHSEM | POTENTIAL FUNDING SOURCES: FEMA HMGP Grant Award, CO-DHSEM 12.5% match, City of FC 12.5% match |
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PROGRESS MILESTONES: Grant Award for Project Received September 2015, Phase I Feasibility April 2016, Project Construction complete Major project milestones and reporting of current project status.



City of Fort Collins: Electric Supply (Fort Collins – 15)

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| PRIORITY: Medium | HAZARDS ADDRESSED: Outages to the electric supply, Drought, Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
| LOCATION: Areas throughout County and on city/county vehicles | GOALS ADDRESSED: 1, 2, 3, 4, 5 |
| RECOMMENDATION DATE: 11/012015 | OBJECTIVES ADDRESSED: : A, D, E |
| TARGET COMPLETION DATE: Continual | |
| ISSUE: Communication and Information shared with citizens within the area. | |
| RECOMMENDATION: Utilize banners hanging in cities and surrounding area to spread the information of potential risks. Also utilize vehicles such as buses and work trucks to spread the word. Information could contain things such as where to go to get information on suggested items for a “Go Bag”, (banners are hung in Fort Collins yearly for reminders such as “Flood Awareness Week”, “Mosquitos”, other potential risks could be advertised to make people aware. | |
| ACTION: Coordination of hanging of banners in different areas and/or making of signs for use on vehicles. | |
| LEAD AGENCY: Larimer County | EXPECTED COST: \$50,000 |
| SUPPORT AGENCIES: City of Loveland, City of Estes Park, City of Fort Collins, Wellington, Timnath, Red Feather | POTENTIAL FUNDING SOURCES: Grants, future budgets. |

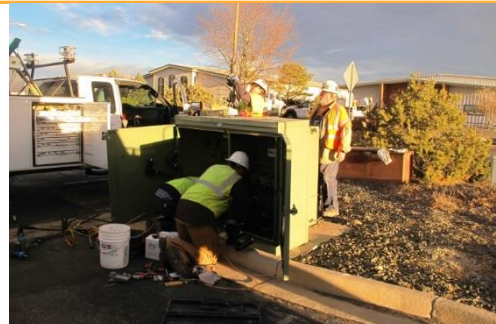
PROGRESS MILESTONES:





City of Fort Collins: Electric Distribution (Fort Collins – 16)

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| PRIORITY: High | HAZARDS ADDRESSED: Outages to the electric distribution, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
| LOCATION: City of Fort Collins | GOALS ADDRESSED: 1, 2 |
| RECOMMENDATION DATE: 11/01/2015 | OBJECTIVES ADDRESSED: C, D, E |
| TARGET COMPLETION DATE: Unknown | Dependent on financing. |
| ISSUE: Enhanced coverage of infrastructure maintenance of the City of Fort Collins L&P. (Add another full time maintenance crew) | |
| RECOMMENDATION: Fully staff another full-time maintenance crew within L&P to perform maintenance and follow up to resolve issues encountered. | |
| ACTION: Request through BFO within the city another crew and equipment to perform maintenance of the electric infrastructure. | |
| LEAD AGENCY: City of Fort Collins L&P | EXPECTED COST: \$200,000 |
| SUPPORT AGENCIES: Be specific | POTENTIAL FUNDING SOURCES: Within L&P budget |

PROGRESS MILESTONES: Major project milestones and reporting of current project status



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| City of Fort Collins: Drainage System Maintenance (Fort Collins – 17) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm |
| LOCATION: Citywide | GOALS ADDRESSED: Protect people, property and natural resources |
| RECOMMENDATION DATE: Ongoing | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: Ongoing | |
| ISSUE: Ongoing maintenance of the City drainage system to prevent failures and | |
| RECOMMENDATION: Assessment and maintenance plan with projects prioritized by need and funding availability. | |
| ACTION: Replacing and repairing sections of the City drainage system as necessary. | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: 1.45 million/year |
| SUPPORT AGENCIES: None | POTENTIAL FUNDING SOURCES: Residential and Business Stormwater Rates |
| PROGRESS MILESTONES: |  |

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| City of Fort Collins: Open Space Preservation (Fort Collins – 18) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Citywide | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: Ongoing | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: Ongoing | |
| ISSUE: Ideal use of the floodplain allows for natural flooding while limiting development to protect people and property. | |
| RECOMMENDATION: Protect as much of the floodplain as possible by preserving it as open space. Work to protect and maintain the quality of streams, rivers and other vital water resources. | |
| ACTION: Floodplain parcels owned and acquired by the City will be permanently preserved as riparian open space to reduce the flood hazard in the City. | |
| LEAD AGENCY: City of Fort Collins - Natural Areas | EXPECTED COST: \$4M over 5 years |
| SUPPORT AGENCIES: City of Fort Collins-Stormwater Utility | POTENTIAL FUNDING SOURCES: Natural Areas Budget; Grants |
| PROGRESS MILESTONES: |  |

City of Fort Collins: Public Outreach (Fort Collins – 19)

| | |
|------------------------------|--|
| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm |
| LOCATION: Citywide | GOALS ADDRESSED: Protect people, property and natural resources; Strengthen communication and coordination among public agencies, non-governmental organizations, businesses and citizens; Increase public awareness of natural hazards and mitigation options |
| RECOMMENDATION DATE: Ongoing | OBJECTIVES ADDRESSED: Continue to develop and expand public awareness and information programs |

TARGET COMPLETION DATE: Ongoing

ISSUE: Lack of public awareness concerning flood hazards.


RECOMMENDATION: A comprehensive public outreach program outlined by the City’s Program for Public Information (PPI) Committee to provide targeted outreach for flood hazards in the community.

ACTION: Utilizing the eleven Community Message Topics developed by the PPI committee the City will continue implementing numerous public information and education projects to increase the community’s awareness of flood hazards and safety.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$15,000/year |
| SUPPORT AGENCIES: FEMA, Red Cross, LETA911. OEM | POTENTIAL FUNDING SOURCES: Commercial and Residential Stormwater Rates , OEM Budget, Grants |

PROGRESS MILESTONES:



| | |
|---|---|
| City of Fort Collins: Regulatory Programs (Fort Collins – 20) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Citywide | GOALS ADDRESSED: Protect people, property and natural resources; Strengthen communication and coordination among public agencies, non-governmental organizations, businesses, and citizens; Integrate hazard mitigation into other planning mechanisms |
| RECOMMENDATION DATE: Ongoing | OBJECTIVES ADDRESSED: Incorporate risk reduction principles into policy documents and initiatives; Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: Ongoing | |
| ISSUE: Unregulated development in the floodplain is unsafe for people and structures. | |
| RECOMMENDATION: Develop and enforce safe development in the floodplain. | |
| ACTION: Enforce current regulations for development in the floodplain and update regulations as necessary. | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$300,000/year |
| SUPPORT AGENCIES: FEMA, CWCB | POTENTIAL FUNDING SOURCES: Utilities – Stormwater Budget |
| PROGRESS MILESTONES: n/a |  |

City of Fort Collins: Myrtle Street Stormwater Outfall (Fort Collins – 21)

| | |
|--|--|
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Old Town Collins area along Myrtle Street | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2019 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |

TARGET COMPLETION DATE: 2020

ISSUE: Properties and structures are flooded in the vicinity of Myrtle Street

RECOMMENDATION: This project involves the enlargement of the existing storm sewer along Myrtle Street from Remington Street west to Sherwood Street, and directing this storm sewer into the proposed Magnolia Street Outfall at Remington and Magnolia.

ACTION: This project will reduce flood flows along Myrtle Street east of Sherwood Street, including overtopping of College Avenue. This reduction in flows along Myrtle Street will also serve to reduce surface flow diversions that direct runoff north to Mulberry Street along Peterson Street.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$15M |
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| SUPPORT AGENCIES: CDOT | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
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PROGRESS MILESTONES: Design for this project will begin in 2019 and construction in 2020

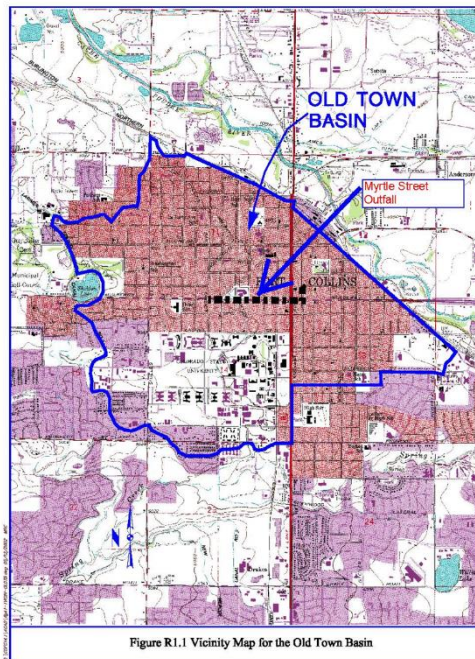


Figure R.1.1 Vicinity Map for the Old Town Basin

R-2

City of Fort Collins: North East College Corridor Outfall (NECCO) (Fort Collins – 22)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Northern Fort Collins area generally north of East Vine Drive, west of Lemay Avenue, south of the Larimer and Weld Canal, and east of College Avenue | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |

TARGET COMPLETION DATE: 2016

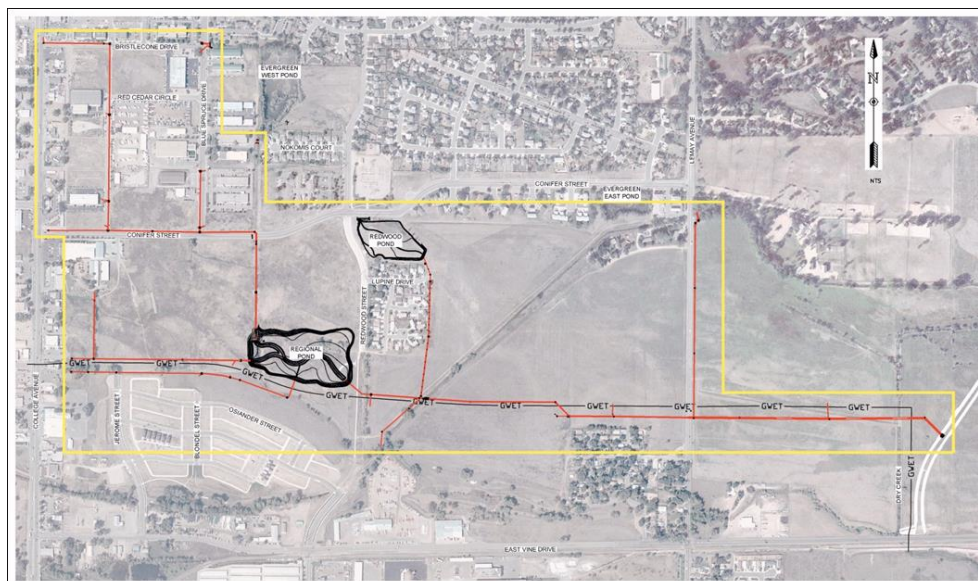
ISSUE: Flooding occurs to properties along the Dry Creek flow path especially upstream of the RR

RECOMMENDATION: The project includes a storm sewer system to mitigate local flooding (during a 100-year storm) in the area generally north of East Vine Drive, west of Lemay Avenue, south of the Larimer and Weld Canal, and east of College Avenue. The project incorporates a combination of storm sewer and increased detention to convey local storm runoff to the future East Vine Diversion Channel. The storm drainage design coordinates with the design efforts of the East Vine Drive realignment. The project also includes the construction of a stormwater detention pond and a pond outlet under Vine Drive and the Railroad Yard north of Vine Drive at Dry Creek.

ACTION: Install storm sewer and detention ponds

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$15M |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |

PROGRESS MILESTONES: Design and permitting are underway and construction is expected for mid-2016



| | |
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| Poudre Fire Authority: Training in Disaster Management Large Scale Incidents (Fort Collins – 23) | |
| PRIORITY: High | HAZARDS ADDRESSED: All: Drought, Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
| LOCATION: Poudre Fire Authority, Training Center | GOALS ADDRESSED: 1,2,3 |
| RECOMMENDATION DATE: 1/1/2016 | OBJECTIVES ADDRESSED: B, C, D |
| TARGET COMPLETION DATE: On Going | Continual Training |
| ISSUE: Poudre Fire Authority needs to expand their disaster management training from fire and wildland to all hazards. As an emergency response and rescue organization, expanding their scope in areas other than response will increase the community’s capability to be more resilient. | |
| RECOMMENDATION: Increase training and knowledge in disaster management | |
| ACTION: <ul style="list-style-type: none"> • Additional training in ICS • Additional training in EOC Operations • Additional training in Disaster Management Operations | |
| LEAD AGENCY: PFA Training Division | EXPECTED COST: \$2000 |
| SUPPORT AGENCIES: Fort Collins OEM | POTENTIAL FUNDING SOURCES: Annual Budget, EMPG |
| PROGRESS MILESTONES: Project is dependent on scheduling courses. All training will be captured and documented. | |

City of Fort Collins: Stream Rehabilitation and Enhancement Program (Fort Collins – 24)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm |
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| LOCATION: Throughout the City | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
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| RECOMMENDATION DATE: 2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
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TARGET COMPLETION DATE: 2020
(ongoing)

ISSUE: In 2012, The City of Fort Collins’ Stormwater Master Plan was updated to include stormwater quality and stream restoration projects. The Master Plan update utilized results and information obtained from the Stormwater Utility Repurposing program in conjunction with basin- and stream-specific recommendations obtained from the following two program efforts:
A. Basin-Specific Stormwater Quality Best Management Practices (BMP) Selected Plans; and,
B. Stream Restoration and Stability Study and Prioritization with the Multi Criteria Decision Analysis (MCDA) Tool.

RECOMMENDATION: Stream restoration projects were identified in an extensive study by Colorado State University (CSU). The study indicated that many of the City’s streams suffer from severe bank erosion, impediments to fish passage, and have poor aquatic habitat. A Multi Criteria Decision Analysis (MCDA) Tool was utilized to prioritize the identified stream reaches for future restoration. The results of the MCDA Tool analysis are presented below for the 2nd through the 6th ranked stream reaches. The 1st ranked stream reach, Fossil Creek at Lemay Avenue is currently under construction.


ACTION: Install WQ BMPs and construction stream enhancements throughout the City.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$9M over a 5 year period |
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| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
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PROGRESS MILESTONES: Construct one major stream rehabilitation project every other year and one minor project every year.



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| City of Fort Collins: West Vine – Forney Pond (Fort Collins – 25) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Northwestern Fort Collins area south of Vine Drive and east of Taft Hill Road | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2017 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 2018 | |
| ISSUE: This area of Fort Collins was the historic flow path of Solider Creek that has been covered up or redirected by development over the years. | |
| RECOMMENDATION: This detention pond we capture runoff from upstream contributing area and detain it so reduced flooding downstream. | |
| ACTION: Flooding in downstream properties and homes | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$4M |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
| PROGRESS MILESTONES: The City purchased this property and it is on the 5-year master plan priority list |  |

**City of Fort Collins: Water Treatment Utilities-Water Treatment Process Improvements
(Fort Collins – 26)**

| | |
|-------------------------|---|
| PRIORITY: Medium | HAZARDS ADDRESSED: Drought, Flood, Fire, Public Health |
|-------------------------|---|

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| LOCATION: Fort Collin’s Water Treatment Facility-4316 Laporte Ave | GOALS ADDRESSED: 1 |
|--|---------------------------|

| | |
|--|--------------------------------|
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
|--|--------------------------------|

TARGET COMPLETION DATE: 2022

ISSUE: Additional treated water storage is required to serve the citizens of Fort Collins in case of drought, flood, fires, or public health emergencies.

RECOMMENDATION: Improvements to the water treatment process

ACTION: Construct a new 10 million gallon treated water storage tank at the Water Treatment Facility.

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| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: \$14 million |
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| SUPPORT AGENCIES: CDPHE | POTENTIAL FUNDING SOURCES: Utilities reserves, State DWRP |
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PROGRESS MILESTONES: Future demand will affect the timeline of this project.



City of Fort Collins: Water Treatment Utilities-Water Treatment Process Improvements (Fort Collins – 27)

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| PRIORITY: High | HAZARDS ADDRESSED: Drought, Public Health, Hazmat |
| LOCATION: Fort Collin’s Water Treatment Facility-4316 Laporte Ave | GOALS ADDRESSED: 1,2 |
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
| TARGET COMPLETION DATE: 01/01/2024 | |

ISSUE: The Water Treatment Facility currently provides secondary disinfection to the City’s water supply through the addition of chlorine. The chlorine is delivered to the Water Treatment Facility via truck on a weekly basis. The chlorine supply is extremely hazardous and is a threat to public safety in the event of an accident during transportation or in the case of a leak at the Water Treatment Facility. The City’s water supply is also vulnerable to contamination due to an interruption in the delivery of chlorine. A mitigation strategy is to construct a sodium hypochlorite generation facility at the Water Treatment Facility in lieu of chlorine gas. This will ensure a safe and reliable supply of bleach with which to disinfect the City’s drinking water supply.

RECOMMENDATION: Improvements to the reliability and safety of the water treatment process

ACTION:

- Replacement of Chlorine gas with on-site generation of Sodium hypochlorite

| | |
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| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: \$12 million |
| SUPPORT AGENCIES: CDPHE | POTENTIAL FUNDING SOURCES: Utilities reserves , State DWRF |

PROGRESS MILESTONES: Approval of the process change from the Colorado Department of Health and funding of the project are 2 major milestones.

(Photo: Hazardous Materials training for a Chlorine Gas release)



City of Fort Collins: Water Treatment Utilities-Water Treatment Process Improvements (Fort Collins – 28)

| | |
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| PRIORITY: High | HAZARDS ADDRESSED: Drought, Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
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| | |
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| LOCATION: Fort Collin’s Water Treatment Facility-4316 Laporte Ave | GOALS ADDRESSED: 1,2 |
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| | |
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| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E: |
|--|---------------------------------|

TARGET COMPLETION DATE: 01/01/2018

ISSUE: Rehabilitation of the existing Poudre River 24” Pipeline. This pipeline serves the City of Fort Collins with the majority of its drinking water. The line is almost 100 years old is a potential weakness in the City’s supply system. The line is susceptible to failure from forest fires, land subsidence, and hazmat spills in the river.

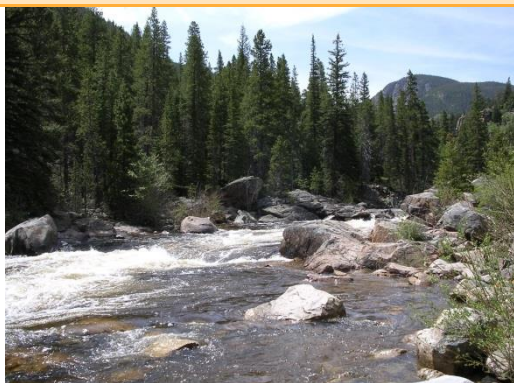
RECOMMENDATION: Improvements to the drinking water supply process

ACTION: Rehabilitate the Poudre River 24” water supply line

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| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: \$12 million |
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| SUPPORT AGENCIES: None | POTENTIAL FUNDING SOURCES: Utilities Reserves, State DWRP |
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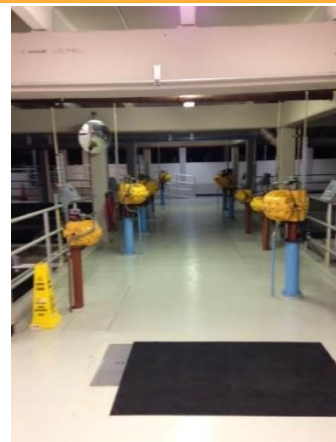
PROGRESS MILESTONES: Complete evaluation of pipeline condition prior to design
 (Photo: Cache la Poudre River, CO – source of water in the 24 inch Poudre pipeline)



**City of Fort Collins: Water Treatment Utilities-Water Treatment Process Improvements
(Fort Collins – 29)**

| | |
|---|---|
| PRIORITY: Medium | HAZARDS ADDRESSED: [delete those not applicable] Drought, Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
| LOCATION: Fort Collin’s Water Treatment Facility-4316 Laporte Ave | GOALS ADDRESSED: 1 |
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
| TARGET COMPLETION DATE: 01/01/2030 | |
| ISSUE: Water Quality in the Cache la Poudre River watershed and the Colorado-Big Thompson water system can be degraded due to Fires (drought and extreme high temperatures create a potential for fire hazards) and Pine Beetle deforestation. | |
| RECOMMENDATION: Improvements to the water treatment process | |
| ACTION: <ul style="list-style-type: none"> • Installation of a UV Disinfection system • Installation of Granular Activated Carbon filters • Installation of Biologically Active Carbon filtration | |
| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: \$27 million-\$100 million depending on the severity of the degradation in source water quality |
| SUPPORT AGENCIES: CDPHE | POTENTIAL FUNDING SOURCES: Utilities Reserves, State DWRP |

PROGRESS MILESTONES: Projects are dependent upon future water quality in the watershed.
(Photo: Filter bays at Water Treatment Facility)



City of Fort Collins: Water Treatment Utilities: Redundant Second Outlet Installation (Fort Collins – 30)

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| PRIORITY: Low | HAZARDS ADDRESSED: Drought, Extreme Temperatures, Flood, Fire, Public Health, |
|----------------------|--|

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| LOCATION: City of Fort Collins: Water Treatment Utilities | GOALS ADDRESSED: 1 |
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| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: D,E |
|--|----------------------------------|

TARGET COMPLETION DATE: 01/01/2025

ISSUE: A second outlet from Horsetooth Reservoir to the Water Treatment Facility would provide an alternate drinking water supply to the City of Fort Collins in the case of a wildfire or a flood in the Colorado-Big Thompson watershed. The City currently has an outlet from the Reservoir at a single depth. The new outlet would allow for diversion for a different location and at multiple depths to mitigate the water quality effects of a fire in the watershed.

RECOMMENDATION: Redundant second outlet form Horsetooth Reservoir to the Water Treatment Facility

ACTION: Installing a new outlet and pipeline (redundant second outlet) from Horsetooth Reservoir to the Water Treatment Facility. This would need to be a joint project working with Bureau of Reclamation and the Northern Colorado Water Conservancy District.

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| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: The City of Fort Collin’s Cost share would be ~\$5 million |
|---|--|

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| SUPPORT AGENCIES: Bureau of Reclamation, Northern Colorado Water Conservancy District | POTENTIAL FUNDING SOURCES State of Colorado Drinking Water Revolving Fund, Fort Collins Utilities Reserves |
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PROGRESS MILESTONES: Coordination and approval of project from Northern Water and Bureau of Reclamation is required.



City of Fort Collins: Wastewater Collection, Sewer By-Pass Pumping (Fort Collins – 31)

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| PRIORITY: Medium | HAZARDS ADDRESSED: Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
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| LOCATION: City of Fort Collins: Wastewater Collection System | GOALS ADDRESSED: Protect people and natural resources |
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| RECOMMENDATION DATE: 10/27/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
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TARGET COMPLETION DATE: TBD

ISSUE: Loss of a portion of the wastewater collection system.

RECOMMENDATION: Sewer by-pass pumping.

ACTION: Setup a temporary by-pass for sewer flows using pumps and surface piping. Construction of up to a quarter mile of temporary surface pipe to downstream manhole. By-pass pump for up to 30 days until permanent sewer line is restored.

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| LEAD AGENCY: City of Fort Collins: Wastewater Collection | EXPECTED COST: The City of Fort Collins’s Cost share would be ~\$100,000 |
|---|---|

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| SUPPORT AGENCIES: City of Fort Collins Traffic Operations; Other Wastewater Districts (Boxelder and South Fort Collins) | POTENTIAL FUNDING SOURCES: Potential Federal Grants. |
|--|---|

PROGRESS MILESTONES: Project planning, design, and acquisition of temporary water system.



City of Fort Collins: Water Distribution: Temporary Water System (Fort Collins – 32)

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|-------------------------|---|
| PRIORITY: Medium | HAZARDS ADDRESSED: Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
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| LOCATION: City of Fort Collins: Water Distribution System | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses. |
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| RECOMMENDATION DATE: 10/27/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards. |
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TARGET COMPLETION DATE: TBD

ISSUE: Loss of a portion of the water distribution system.

RECOMMENDATION: Temporary water system.

ACTION: Construct up to a mile of temporary water main with services until permanent service is restored. Temporary system would be constructed on the surface and connected to a fire hydrant located outside of the damaged zone.

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| LEAD AGENCY: City of Fort Collins: Water Distribution | EXPECTED COST: The City of Fort Collins' Cost share would be ~\$100,000 |
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| SUPPORT AGENCIES: City of Fort Collins Traffic Operations; Other Water Districts (ELCO, North Weld, FCLWD) | POTENTIAL FUNDING SOURCES: Potential Federal Grants. |
|---|---|

PROGRESS MILESTONES: Project planning, design, and acquisition of temporary water system.



City of Fort Collins: Low Impact Development Retrofits (Fort Collins – 5)

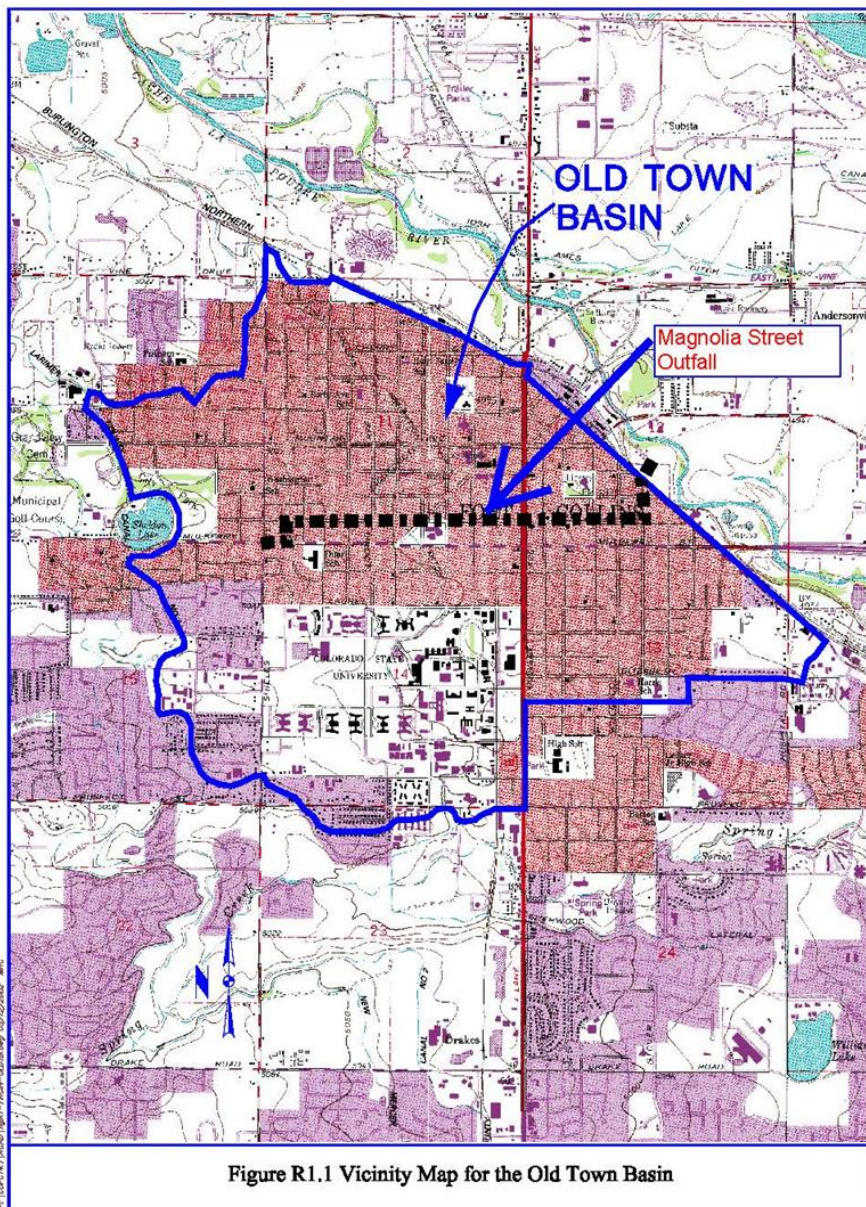
| | |
|--|---|
| PRIORITY: High | HAZARDS ADDRESSED: Flooding |
| LOCATION: City of Fort Collins | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 12/2013 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 12/2018 | |
| ISSUE: Improve water quality, Reduce Urban Flooding and Enhance community resiliency by retrofitting green infrastructure into existing City regional drainage facilities | |
| RECOMMENDATION: Incorporated into Drainage Master Plan Updates approved by Water Board and City Council | |
| ACTION: Retrofitting of Green Infrastructure facilities into existing regional facilities pub | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: Varies from project to project can range from \$25 K to \$200K |
| SUPPORT AGENCIES: City of Fort Collins Parks, City of Fort Collins Natural Areas | POTENTIAL FUNDING SOURCES: Fort Collins Utilities, City of Fort Collins Parks and Recreation, Fort Collins Sustainability Services, Grants |

PROGRESS MILESTONES: Adoption of Master Plan Updates in 2013, construction as budget allows.



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| City of Fort Collins: Magnolia Storm Sewer (Fort Collins – 12) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Old Town Fort Collins area along Magnolia Street to the Cache la Poudre River | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2017 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 2019 | |
| ISSUE: This area of Fort Collins has old undersized storm sewers that do not meet current drainage standards nor have a proper outfall to the River. | |
| RECOMMENDATION: Install a new storm sewer system to improve the drainage and reduce flooding for storms up to and including the 100-year event and improve water quality for smaller more frequent storm events (2-year and below). | |
| ACTION: Design and construct new storm sewer | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$22M |
| SUPPORT AGENCIES: CDOT, CWCB, FEMA | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
| PROGRESS MILESTONES: Start design of this project in 2016 so that construction can be begin in 2017. This is a two phase project that will start at the downstream end (outfall to the Cache la | |

Poudre River) then work its way upstream.



R-2

City of Fort Collins: Mulberry-Riverside Stormwater Project (Fort Collins – 14)

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|-----------------------|---------------------------------|
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
|-----------------------|---------------------------------|

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| LOCATION: Riverside Avenue & Myrtle Street, Fort Collins | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
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| RECOMMENDATION DATE: 09/15/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
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TARGET COMPLETION DATE: 09/15/2018

ISSUE: The purpose of this stormwater collection system is to mitigate flooding, property damage, and threats to life and infrastructure caused by rainfall driven flood events in the Old Town Basin in Fort Collins, CO.

RECOMMENDATION: Feasibility study and infrastructure emplacement to be performed by City of Fort Collins Stormwater Utility and Capital Projects Group

ACTION: New collection and conveyance structures, piping, and outfall improvements will reduce the number of homes subject to floodwaters in the area.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$2.5 Million |
|---|-------------------------------------|

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|---|---|
| SUPPORT AGENCIES: FEMA, Colorado DHSEM | POTENTIAL FUNDING SOURCES: FEMA HMGP Grant Award, CO-DHSEM 12.5% match, City of FC 12.5% match |
|---|---|

PROGRESS MILESTONES: Grant Award for Project Received September 2015, Phase I Feasibility April 2016, Project Construction complete Major project milestones and reporting of current project status.



City of Fort Collins: Myrtle Street Stormwater Outfall (Fort Collins – 21)

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|--|--|
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Old Town Collins area along Myrtle Street | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2019 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |

TARGET COMPLETION DATE: 2020

ISSUE: Properties and structures are flooded in the vicinity of Myrtle Street

RECOMMENDATION: This project involves the enlargement of the existing storm sewer along Myrtle Street from Remington Street west to Sherwood Street, and directing this storm sewer into the proposed Magnolia Street Outfall at Remington and Magnolia.

ACTION: This project will reduce flood flows along Myrtle Street east of Sherwood Street, including overtopping of College Avenue. This reduction in flows along Myrtle Street will also serve to reduce surface flow diversions that direct runoff north to Mulberry Street along Peterson Street.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$15M |
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|-------------------------------|--|
| SUPPORT AGENCIES: CDOT | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
|-------------------------------|--|

PROGRESS MILESTONES: Design for this project will begin in 2019 and construction in 2020

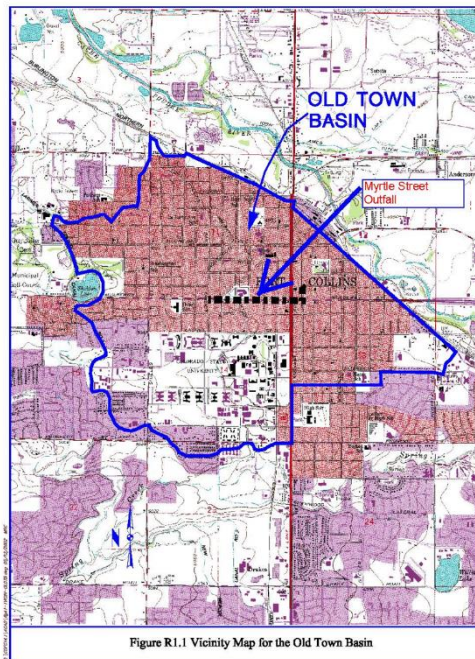


Figure R.1.1 Vicinity Map for the Old Town Basin

R-2

City of Fort Collins: North East College Corridor Outfall (NECCO) (Fort Collins – 22)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Northern Fort Collins area generally north of East Vine Drive, west of Lemay Avenue, south of the Larimer and Weld Canal, and east of College Avenue | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |

TARGET COMPLETION DATE: 2016

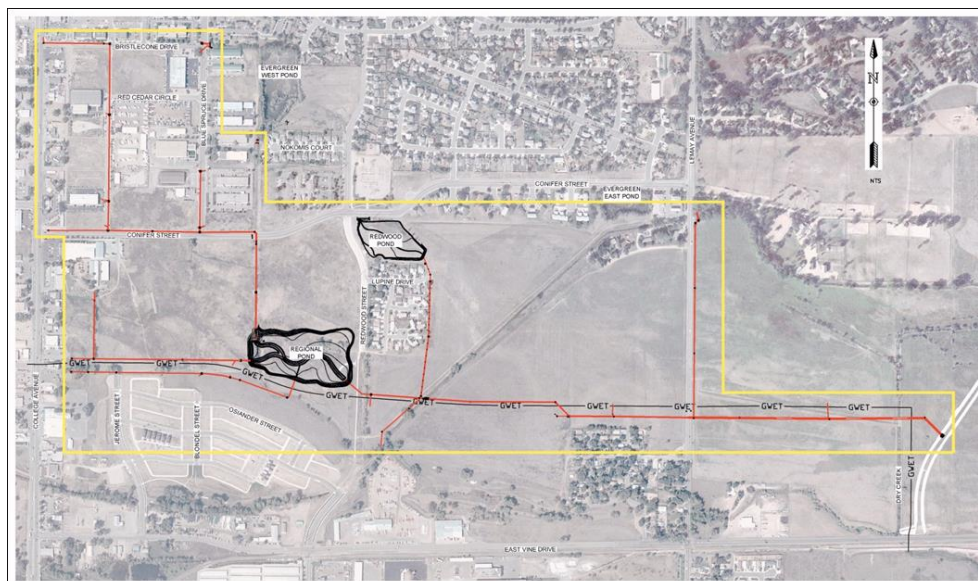
ISSUE: Flooding occurs to properties along the Dry Creek flow path especially upstream of the RR


RECOMMENDATION: The project includes a storm sewer system to mitigate local flooding (during a 100-year storm) in the area generally north of East Vine Drive, west of Lemay Avenue, south of the Larimer and Weld Canal, and east of College Avenue. The project incorporates a combination of storm sewer and increased detention to convey local storm runoff to the future East Vine Diversion Channel. The storm drainage design coordinates with the design efforts of the East Vine Drive realignment. The project also includes the construction of a stormwater detention pond and a pond outlet under Vine Drive and the Railroad Yard north of Vine Drive at Dry Creek.

ACTION: Install storm sewer and detention ponds

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$15M |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |

PROGRESS MILESTONES: Design and permitting are underway and construction is expected for mid-2016



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| City of Fort Collins: Open Space Preservation (Fort Collins – 18) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Citywide | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: Ongoing | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: Ongoing | |
| ISSUE: Ideal use of the floodplain allows for natural flooding while limiting development to protect people and property. | |
| RECOMMENDATION: Protect as much of the floodplain as possible by preserving it as open space. Work to protect and maintain the quality of streams, rivers and other vital water resources. | |
| ACTION: Floodplain parcels owned and acquired by the City will be permanently preserved as riparian open space to reduce the flood hazard in the City. | |
| LEAD AGENCY: City of Fort Collins - Natural Areas | EXPECTED COST: \$4M over 5 years |
| SUPPORT AGENCIES: City of Fort Collins-Stormwater Utility | POTENTIAL FUNDING SOURCES: Natural Areas Budget; Grants |
| PROGRESS MILESTONES: |  |

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| Poudre Fire Authority: Training in Disaster Management Large Scale Incidents (Fort Collins – 23) | |
| PRIORITY: High | HAZARDS ADDRESSED: All: Drought, Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
| LOCATION: Poudre Fire Authority, Training Center | GOALS ADDRESSED: 1,2,3 |
| RECOMMENDATION DATE: 1/1/2016 | OBJECTIVES ADDRESSED: B, C, D |
| TARGET COMPLETION DATE: On Going | Continual Training |
| ISSUE: Poudre Fire Authority needs to expand their disaster management training from fire and wildland to all hazards. As an emergency response and rescue organization, expanding their scope in areas other than response will increase the community’s capability to be more resilient. | |
| RECOMMENDATION: Increase training and knowledge in disaster management | |
| ACTION: <ul style="list-style-type: none"> • Additional training in ICS • Additional training in EOC Operations • Additional training in Disaster Management Operations | |
| LEAD AGENCY: PFA Training Division | EXPECTED COST: \$2000 |
| SUPPORT AGENCIES: Fort Collins OEM | POTENTIAL FUNDING SOURCES: Annual Budget, EMPG |
| PROGRESS MILESTONES: Project is dependent on scheduling courses. All training will be captured and documented. | |

City of Fort Collins: Public Outreach (Fort Collins – 19)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm |
| LOCATION: Citywide | GOALS ADDRESSED: Protect people, property and natural resources; Strengthen communication and coordination among public agencies, non-governmental organizations, businesses and citizens; Increase public awareness of natural hazards and mitigation options |
| RECOMMENDATION DATE: Ongoing | OBJECTIVES ADDRESSED: Continue to develop and expand public awareness and information programs |

TARGET COMPLETION DATE: Ongoing

ISSUE: Lack of public awareness concerning flood hazards.


RECOMMENDATION: A comprehensive public outreach program outlined by the City’s Program for Public Information (PPI) Committee to provide targeted outreach for flood hazards in the community.

ACTION: Utilizing the eleven Community Message Topics developed by the PPI committee the City will continue implementing numerous public information and education projects to increase the community’s awareness of flood hazards and safety.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$15,000/year |
| SUPPORT AGENCIES: FEMA, Red Cross, LETA911. OEM | POTENTIAL FUNDING SOURCES: Commercial and Residential Stormwater Rates , OEM Budget, Grants |

PROGRESS MILESTONES:



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| City of Fort Collins: Regulatory Programs (Fort Collins – 20) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Citywide | GOALS ADDRESSED: Protect people, property and natural resources; Strengthen communication and coordination among public agencies, non-governmental organizations, businesses, and citizens; Integrate hazard mitigation into other planning mechanisms |
| RECOMMENDATION DATE: Ongoing | OBJECTIVES ADDRESSED: Incorporate risk reduction principles into policy documents and initiatives; Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: Ongoing | |
| ISSUE: Unregulated development in the floodplain is unsafe for people and structures. | |
| RECOMMENDATION: Develop and enforce safe development in the floodplain. | |
| ACTION: Enforce current regulations for development in the floodplain and update regulations as necessary. | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$300,000/year |
| SUPPORT AGENCIES: FEMA, CWCB | POTENTIAL FUNDING SOURCES: Utilities – Stormwater Budget |
| PROGRESS MILESTONES: n/a |  |

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|---|---|
| City of Fort Collins: Stormwater Master Planning (Fort Collins – 13) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Throughout the City | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses; Integrate hazard mitigation into other planning mechanisms |
| RECOMMENDATION DATE: 2015 | OBJECTIVES ADDRESSED: Incorporate risk reduction principles into policy documents and initiatives, other institutional plans; Reduce the vulnerability of local assets to the impact hazards |
| TARGET COMPLETION DATE: 2020 (ongoing) | |
| ISSUE: The majority of the City’s Master Plans were modeled using MODSWM software. This software is outdate and does provide robust dynamic hydrologic modeling. | |
| RECOMMENDATION: The City is updating the hydrology in all the Master Plans to be converted to EPA SWM. | |
| ACTION: Update master plans to EPA SWM. | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$1M over a 5 year period |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee |
| PROGRESS MILESTONES: Revise one basin per year until all the master plans are updated. | |

City of Fort Collins: Stream Rehabilitation and Enhancement Program (Fort Collins – 24)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm |
| LOCATION: Throughout the City | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |

TARGET COMPLETION DATE: 2020
(ongoing)

ISSUE: In 2012, The City of Fort Collins’ Stormwater Master Plan was updated to include stormwater quality and stream restoration projects. The Master Plan update utilized results and information obtained from the Stormwater Utility Repurposing program in conjunction with basin- and stream-specific recommendations obtained from the following two program efforts:
A. Basin-Specific Stormwater Quality Best Management Practices (BMP) Selected Plans; and,
B. Stream Restoration and Stability Study and Prioritization with the Multi Criteria Decision Analysis (MCDA) Tool.

RECOMMENDATION: Stream restoration projects were identified in an extensive study by Colorado State University (CSU). The study indicated that many of the City’s streams suffer from severe bank erosion, impediments to fish passage, and have poor aquatic habitat. A Multi Criteria Decision Analysis (MCDA) Tool was utilized to prioritize the identified stream reaches for future restoration. The results of the MCDA Tool analysis are presented below for the 2nd through the 6th ranked stream reaches. The 1st ranked stream reach, Fossil Creek at Lemay Avenue is currently under construction.

ACTION: Install WQ BMPs and construction stream enhancements throughout the City.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$9M over a 5 year period |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |

PROGRESS MILESTONES: Construct one major stream rehabilitation project every other year and one minor project every year.



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| PRIORITY: Low - Medium | HAZARDS ADDRESSED: Drought, Extreme Temperatures, Flood, Severe Storm, Severe Winter Weather, Wildfire |
| LOCATION: Fort Collins, Colorado | GOALS ADDRESSED: 1, 3, 4 |
| RECOMMENDATION DATE: December 2015 | OBJECTIVES ADDRESSED: A, D |
| TARGET COMPLETION DATE: Ongoing | |
| ISSUE: To enhance our overall preparedness, City staff and the residential and business community members need access to ongoing education through awareness campaigns, events, public outreach, website, social media and education workshops. | |
| RECOMMENDATION: Continue to identify, promote and present education workshops, awareness campaigns and training opportunities for City staff, residents, non-profit organizations and business owners. | |
| ACTION(s): | |
| Drought: | |
| The Water Conservation Program provides the following to achieve optimal conservation: | |
| <ul style="list-style-type: none"> • Rebates for low-flow showerheads, toilets, dishwashers, clothes washer and sprinkler equipment • Sprinkler system irrigation audits • Home efficiency and conservation tips on website, social media and web portal • Low Income retrofit program • Continuous Consumption program in collaboration with Leak Detection • Raw water irrigation at City parks • Home Water Reports • Partnering on graywater legislation to use graywater in homes to encourage water reuse • Public information campaign on conservation • Adult and youth (schools) education programs • Business programs • Water conservation giveaways and awards • Xeriscape rebates, plant lists, clinics and garden design assistance | |
| Extreme Temperatures: | |
| <ul style="list-style-type: none"> • Formalize guidance around actions the public can take to prepare for and respond to extreme heat • Identify and characterize vulnerable areas and populations of Fort Collins • Develop and implement a public awareness and outreach campaign that notifies citizens on how to get information, prepare for and respond to extreme temperatures, specifically heat. • Promote low income assistance program to assist with utility bill payments • Educate homeowners and builders on energy and water efficiency (e.g., how to protect water pipes by locating them on the inside of building insulation or keeping them out of attics, crawl spaces and vulnerable outside walls) • Provide conservation and maintenance information for homeowners (e.g., by allowing a faucet to drip during extreme cold weather, you can prevent the buildup of excessive pressure in the pipe and avoid bursting) • Promote web programmable thermostats for remote control of heat to prevent frozen pipes | |
| Flood: | |

- Use outreach activities to share and collaborate with technical assistance programs that address measures that citizens can take to be safe and prepared
- Facilitate and manage funding for mitigation measures
- Encourage homeowners to install backflow valves to prevent reverse-flow flood damage
- Encourage residents in flood-prone areas to elevate new homes or flood-proof their home
- Educate community about the need, value and reduced premiums for flood insurance (due to the City’s high Community Rating System level)
- Educate the public about securing debris, propane tanks, yard items or stored objects that may be swept away, damaged or pose a hazard if picked up and washed away by floodwaters
- Advise residents that keeping storm drains clear of debris during storms (not to rely solely on City maintenance crews) could help prevent flooding of their property
- Actively promote Flood Awareness Week during flood season with various messaging tactics, including bus benches, posters, flyers, brochures, website and social media campaigns
- Educate community about our two water sources and how we can close intakes into the treatment plant when water quality is affected thanks to early warning from sensors in the Poudre Canyon
- Use stormwater construction project communications as opportunities to educate the community about our stormwater infrastructure and long-range flood protection planning

Severe Storm:

- Use appropriate outreach tactics to share important updates and contact information
- Provide messaging on service outages and restore times on website and social media

Severe Winter Weather:

- Provide messaging on service outages and restore times on website and social media
- Promote web portal where utility customers can monitor their water use (check for leaks)
- Educate homeowners about how to prevent frozen pipes

Wildfire:

- Provide messaging on website and social media, as well as youth education in schools, about how watersheds are managed to minimize wildfires in order to protect water quality
- Educate community about our two water sources and how we can close intakes into the treatment plant when water quality is affected by debris and runoff from a fire with early warning from sensors in the Poudre Canyon
- Facilitate and manage funding for mitigation measures

LEAD AGENCY: City of Fort Collins

EXPECTED COST: Most costs will be absorbed within existing annual budgeted line items, which currently supports 24 x 7 on-call communications support.

SUPPORT AGENCIES: Larimer County, Poudre Fire Authority, Fort Collins Police, LETA, United Way, American Red Cross, FEMA and other identified stakeholders and community response agencies as required to enhance overall knowledge and preparedness.

POTENTIAL FUNDING SOURCES: Annual budgets and mitigation grant opportunities.

PROGRESS MILESTONES: Continue to identify educational opportunities; pursue awareness campaigns; enhance the use of consumption data with our customers; enhance website and social media effectiveness; and track attendance at events.

City of Fort Collins: Wastewater Collection, Sewer By-Pass Pumping (Fort Collins – 31)

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|-------------------------|---|
| PRIORITY: Medium | HAZARDS ADDRESSED: Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
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| LOCATION: City of Fort Collins: Wastewater Collection System | GOALS ADDRESSED: Protect people and natural resources |
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| RECOMMENDATION DATE: 10/27/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
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TARGET COMPLETION DATE: TBD

ISSUE: Loss of a portion of the wastewater collection system.

RECOMMENDATION: Sewer by-pass pumping.

ACTION: Setup a temporary by-pass for sewer flows using pumps and surface piping. Construction of up to a quarter mile of temporary surface pipe to downstream manhole. By-pass pump for up to 30 days until permanent sewer line is restored.

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| LEAD AGENCY: City of Fort Collins: Wastewater Collection | EXPECTED COST: The City of Fort Collins's Cost share would be ~\$100,000 |
|---|---|

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| SUPPORT AGENCIES: City of Fort Collins Traffic Operations; Other Wastewater Districts (Boxelder and South Fort Collins) | POTENTIAL FUNDING SOURCES: Potential Federal Grants. |
|--|---|

PROGRESS MILESTONES: Project planning, design, and acquisition of temporary water system.



City of Fort Collins: Water Distribution: Temporary Water System (Fort Collins – 32)

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| PRIORITY: Medium | HAZARDS ADDRESSED: Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
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| LOCATION: City of Fort Collins: Water Distribution System | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses. |
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| RECOMMENDATION DATE: 10/27/2015 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards. |
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TARGET COMPLETION DATE: TBD

ISSUE: Loss of a portion of the water distribution system.

RECOMMENDATION: Temporary water system.

ACTION: Construct up to a mile of temporary water main with services until permanent service is restored. Temporary system would be constructed on the surface and connected to a fire hydrant located outside of the damaged zone.

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| LEAD AGENCY: City of Fort Collins: Water Distribution | EXPECTED COST: The City of Fort Collins' Cost share would be ~\$100,000 |
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| SUPPORT AGENCIES: City of Fort Collins Traffic Operations; Other Water Districts (ELCO, North Weld, FCLWD) | POTENTIAL FUNDING SOURCES: Potential Federal Grants. |
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PROGRESS MILESTONES: Project planning, design, and acquisition of temporary water system.



City of Fort Collins: Water Reclamation and Biosolids- Improvement in Processes and Infrastructure (Fort Collins – 6)

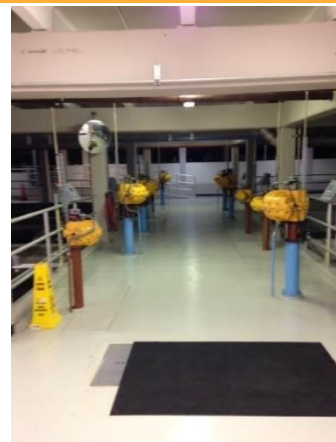
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| PRIORITY: Medium | HAZARDS ADDRESSED: All |
| LOCATION: Drake Water Treatment Facility-3036 Environmental Dr. | GOALS ADDRESSED: 1 |
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
| TARGET COMPLETION DATE: 12/31/2018 | |
| ISSUE: Critical operations of the Fort Collin’s Water Reclamation and Biosolids Facilities could be disrupted in the case of unplanned environmental emergencies, critical equipment failures, or loss of power. | |
| RECOMMENDATION: Improvements to facility processes that would help ensure critical operations are maintained | |
| ACTION: <ul style="list-style-type: none"> • Increase on-site process water and biosolids storage capacity • Dewatering redundancy • On-site backup power generation unit. | |
| LEAD AGENCY: City of Fort Collins: Water Reclamation and Biosolids Division | EXPECTED COST: 30 million dollars for all three items. Backup power may be significantly higher. |
| SUPPORT AGENCIES: CDPHE, EPA, FEMA | POTENTIAL FUNDING SOURCES: Rate increased, Grants, Bonds, Third Party Financing |
| PROGRESS MILESTONES: <ul style="list-style-type: none"> • Design and build additional sludge holding tank capacity. • Design and build additional dewatering systems which may include additional centrifuges or screw presses. • Scope, design, and build additional redundancy back up power supply. | |

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| City of Fort Collins: Water Reclamation and Biosolids- Improvement in Technology (Fort Collins – 7) | |
| PRIORITY: Medium | HAZARDS ADDRESSED: All |
| LOCATION: Drake Water Treatment Facility-3036 Environmental Dr. | GOALS ADDRESSED: 1 |
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
| TARGET COMPLETION DATE: 12/31/2018 | |
| ISSUE: Critical operations of the Fort Collin’s Water Reclamation and Biosolids Facilities could be disrupted in the case of unplanned environmental emergencies, critical equipment failures, or loss of power. | |
| RECOMMENDATION: Improvements to facility processes that would help ensure critical operations are maintained | |
| ACTION: | |
| <ul style="list-style-type: none"> • Improve collection system instrumentation and monitoring • Improve perimeter and building security technology | |
| LEAD AGENCY: City of Fort Collins: Water Reclamation and Biosolids Division | EXPECTED COST: 30 million dollars for all three items. Backup power may be significantly higher. |
| SUPPORT AGENCIES: CDPHE, EPA, FEMA | POTENTIAL FUNDING SOURCES: Rate increased, Grants, Bonds, Third Party Financing |
| PROGRESS MILESTONES: To be determined after more planning. | |

**City of Fort Collins: Water Treatment Utilities-Water Treatment Process Improvements
(Fort Collins – 29)**

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| PRIORITY: Medium | HAZARDS ADDRESSED: [delete those not applicable] Drought, Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
| LOCATION: Fort Collin’s Water Treatment Facility-4316 Laporte Ave | GOALS ADDRESSED: 1 |
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
| TARGET COMPLETION DATE: 01/01/2030 | |
| ISSUE: Water Quality in the Cache la Poudre River watershed and the Colorado-Big Thompson water system can be degraded due to Fires (drought and extreme high temperatures create a potential for fire hazards) and Pine Beetle deforestation. | |
| RECOMMENDATION: Improvements to the water treatment process | |
| ACTION: <ul style="list-style-type: none"> • Installation of a UV Disinfection system • Installation of Granular Activated Carbon filters • Installation of Biologically Active Carbon filtration | |
| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: \$27 million-\$100 million depending on the severity of the degradation in source water quality |
| SUPPORT AGENCIES: CDPHE | POTENTIAL FUNDING SOURCES: Utilities Reserves, State DWRP |

PROGRESS MILESTONES: Projects are dependent upon future water quality in the watershed.
(Photo: Filter bays at Water Treatment Facility)



City of Fort Collins: Water Treatment Utilities: Redundant Second Outlet Installation (Fort Collins – 30)

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| PRIORITY: Low | HAZARDS ADDRESSED: Drought, Extreme Temperatures, Flood, Fire, Public Health, |
|----------------------|--|

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| LOCATION: City of Fort Collins: Water Treatment Utilities | GOALS ADDRESSED: 1 |
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| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: D,E |
|--|----------------------------------|

TARGET COMPLETION DATE: 01/01/2025

ISSUE: A second outlet from Horsetooth Reservoir to the Water Treatment Facility would provide an alternate drinking water supply to the City of Fort Collins in the case of a wildfire or a flood in the Colorado-Big Thompson watershed. The City currently has an outlet from the Reservoir at a single depth. The new outlet would allow for diversion for a different location and at multiple depths to mitigate the water quality effects of a fire in the watershed.

RECOMMENDATION: Redundant second outlet form Horsetooth Reservoir to the Water Treatment Facility

ACTION: Installing a new outlet and pipeline (redundant second outlet) from Horsetooth Reservoir to the Water Treatment Facility. This would need to be a joint project working with Bureau of Reclamation and the Northern Colorado Water Conservancy District.

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| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: The City of Fort Collin’s Cost share would be ~\$5 million |
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| SUPPORT AGENCIES: Bureau of Reclamation, Northern Colorado Water Conservancy District | POTENTIAL FUNDING SOURCES State of Colorado Drinking Water Revolving Fund, Fort Collins Utilities Reserves |
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PROGRESS MILESTONES: Coordination and approval of project from Northern Water and Bureau of Reclamation is required.



City of Fort Collins: Water Treatment Utilities-Water Treatment Process Improvements (Fort Collins – 27)

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| PRIORITY: High | HAZARDS ADDRESSED: Drought, Public Health, Hazmat |
| LOCATION: Fort Collin’s Water Treatment Facility-4316 Laporte Ave | GOALS ADDRESSED: 1,2 |
| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |

TARGET COMPLETION DATE: 01/01/2024

ISSUE: The Water Treatment Facility currently provides secondary disinfection to the City’s water supply through the addition of chlorine. The chlorine is delivered to the Water Treatment Facility via truck on a weekly basis. The chlorine supply is extremely hazardous and is a threat to public safety in the event of an accident during transportation or in the case of a leak at the Water Treatment Facility. The City’s water supply is also vulnerable to contamination due to an interruption in the delivery of chlorine. A mitigation strategy is to construct a sodium hypochlorite generation facility at the Water Treatment Facility in lieu of chlorine gas. This will ensure a safe and reliable supply of bleach with which to disinfect the City’s drinking water supply.

RECOMMENDATION: Improvements to the reliability and safety of the water treatment process

ACTION:

- Replacement of Chlorine gas with on-site generation of Sodium hypochlorite

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| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: \$12 million |
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| SUPPORT AGENCIES: CDPHE | POTENTIAL FUNDING SOURCES: Utilities reserves , State DWRF |
|--------------------------------|---|

PROGRESS MILESTONES: Approval of the process change from the Colorado Department of Health and funding of the project are 2 major milestones.
(Photo: Hazardous Materials training for a Chlorine Gas release)



City of Fort Collins: Water Treatment Utilities-Water Treatment Process Improvements (Fort Collins – 28)

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| PRIORITY: High | HAZARDS ADDRESSED: Drought, Earthquake, Land Subsidence, Extreme Temperatures, Flood, Severe Storm, Wind & Tornado, Fire, Public Health, Hazmat |
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|--|-----------------------------|
| LOCATION: Fort Collin’s Water Treatment Facility-4316 Laporte Ave | GOALS ADDRESSED: 1,2 |
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| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E: |
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TARGET COMPLETION DATE: 01/01/2018

ISSUE: Rehabilitation of the existing Poudre River 24” Pipeline. This pipeline serves the City of Fort Collins with the majority of its drinking water. The line is almost 100 years old is a potential weakness in the City’s supply system. The line is susceptible to failure from forest fires, land subsidence, and hazmat spills in the river.

RECOMMENDATION: Improvements to the drinking water supply process

ACTION: Rehabilitate the Poudre River 24” water supply line

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| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: \$12 million |
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| SUPPORT AGENCIES: None | POTENTIAL FUNDING SOURCES: Utilities Reserves, State DWRF |
|-------------------------------|--|

PROGRESS MILESTONES: Complete evaluation of pipeline condition prior to design
 (Photo: Cache la Poudre River, CO – source of water in the 24 inch Poudre pipeline)



**City of Fort Collins: Water Treatment Utilities-Water Treatment Process Improvements
(Fort Collins – 26)**

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|-------------------------|---|
| PRIORITY: Medium | HAZARDS ADDRESSED: Drought, Flood, Fire, Public Health |
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| LOCATION: Fort Collin’s Water Treatment Facility-4316 Laporte Ave | GOALS ADDRESSED: 1 |
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| RECOMMENDATION DATE: 10/09/2015 | OBJECTIVES ADDRESSED: E |
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TARGET COMPLETION DATE: 2022

ISSUE: Additional treated water storage is required to serve the citizens of Fort Collins in case of drought, flood, fires, or public health emergencies.

RECOMMENDATION: Improvements to the water treatment process

ACTION: Construct a new 10 million gallon treated water storage tank at the Water Treatment Facility.

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| LEAD AGENCY: City of Fort Collins: Water Treatment Utilities | EXPECTED COST: \$14 million |
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| SUPPORT AGENCIES: CDPHE | POTENTIAL FUNDING SOURCES: Utilities reserves, State DWRP |
|--------------------------------|--|

PROGRESS MILESTONES: Future demand will affect the timeline of this project.



APPENDIX B

ACTION PLANS FROM THE 2016 LARIMER COUNTY
MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN

City of Fort Collins: Magnolia Stormwater Outfall

PRIORITY: High

HAZARDS ADDRESSED: Flood

LOCATION: Old Town Fort Collins area along Magnolia Street to the Cache la Poudre River

GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses

RECOMMENDATION DATE: 2019-20

OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards

TARGET COMPLETION DATE: 2025

ISSUE: This area of Fort Collins has old undersized storm sewers that do not meet current drainage standards nor have a proper outfall to the River.

RECOMMENDATION: Install a new storm sewer system to improve the drainage and reduce flooding for storms up to and including the 100-year event and improve water quality for smaller more frequent storm events (2-year and below).

ACTION: Design and construct new storm sewer

LEAD AGENCY: City of Fort Collins – Stormwater Utility

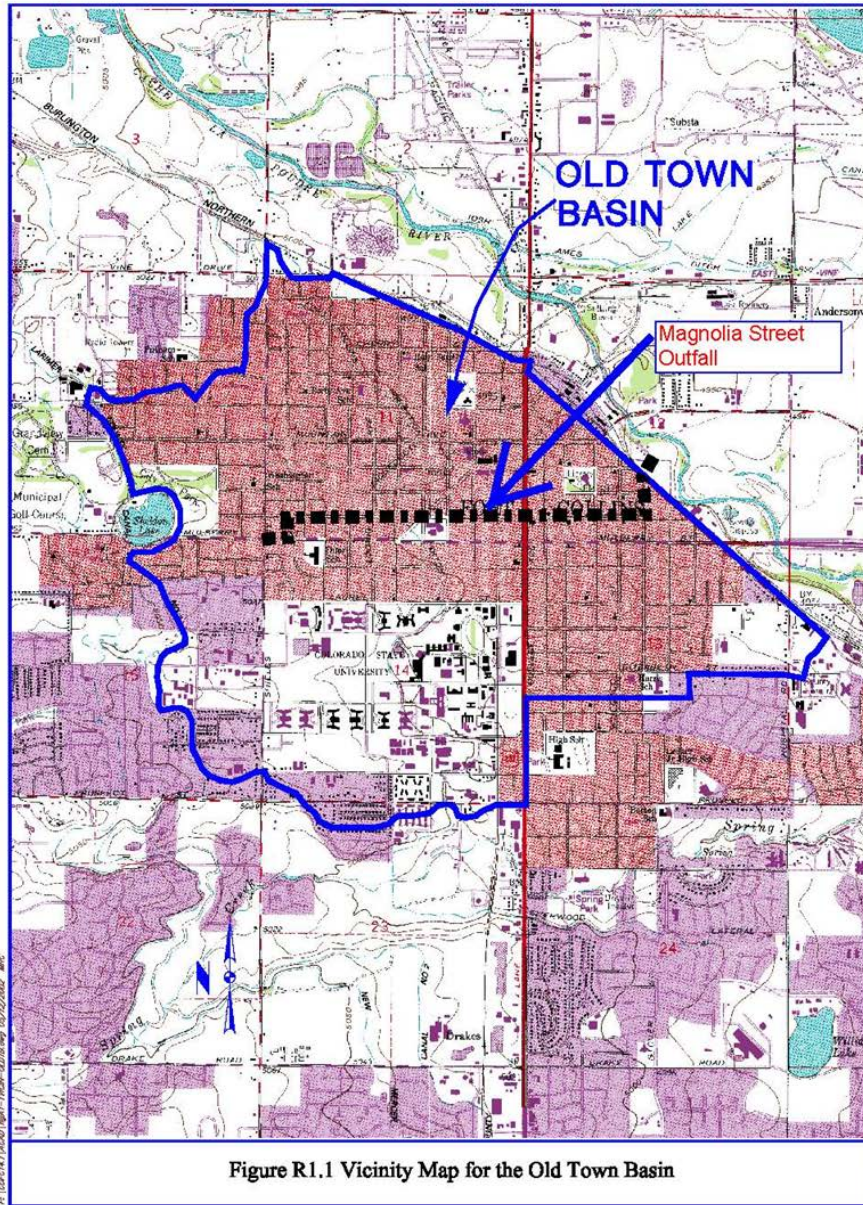
EXPECTED COST: \$80M

SUPPORT AGENCIES: CDOT, CWCB, FEMA

POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants

PROGRESS MILESTONES: Start design of this project in 2019-20 so that construction can be begin in 2021. This is multi-phase project that will start at the downstream end at the Cache la Poudre River

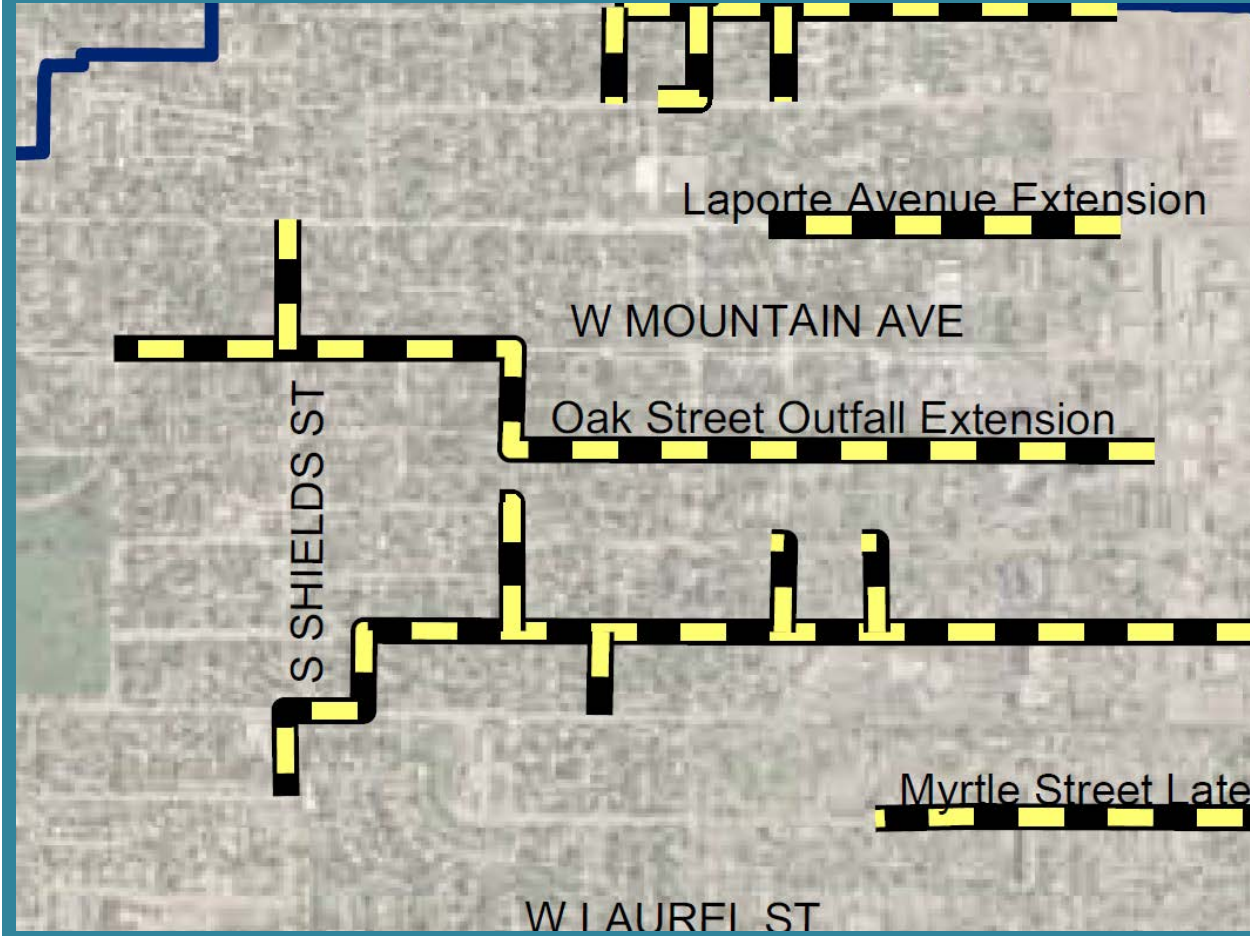
then work its way upstream. This project also includes a lateral over to Myrtle Street.



City of Fort Collins: Oak Street Extension Storm Sewer Improvements

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| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Old Town Fort Collins area along Oak Street from Mason to Shield Street | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2025 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 2028 | |
| ISSUE: This area of Fort Collins has old undersized storm sewers that do not meet current drainage standards. The Oak Street Outfall was completed in 2001, and has not been extend up to Shields per the Old Town Master Plan. | |
| RECOMMENDATION: Install a new storm sewer system to improve the drainage and reduce flooding for storms up to and including the 100-year event and improve water quality for smaller more frequent storm events (2-year and below). | |
| ACTION: Flooding in the streets and downtown properties | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$17M to construct |
| SUPPORT AGENCIES: Streets and Water/WW Utility | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |

PROGRESS MILESTONES:



City of Fort Collins: Cache La Poudre River Levees – Oxbow, Timberline, and Drake WW Plant

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| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Cache La Poudre River Floodplain - Oxbow (between Linden and Lincoln, Timberline (upstream of Timberline Road), Drake WW Plant (from end of Sharp Point Dr to the Plant) | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2019 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |
| TARGET COMPLETION DATE: 2021 | |

ISSUE: The City owns three levees along the Cache La Poudre River. These levees were constructed from early 1990's to the mid 2000's. Because of the recent release of the RiskMAP floodplain, FEMA has declared them to be Provisionally Accredited Levees (PALs) meaning all of them do not meet freeboard requirements. To remedy this condition, all of the three levees need to be upgraded.

RECOMMENDATION: Oxbow levee needs to be raised in a couple of locations and a new overflow channel constructed; Timberline levee needs to be raised at the downstream end and extended toward the east; Drake WWTP levee requires a floodwall at the upstream end as well as raised in one area.

ACTION: If the levees are not upgraded, then properties and structures protected by these levees will be mapped back into the floodplain.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$3M |
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| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |
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PROGRESS MILESTONES: There is already a design for the Oxbow Levee, as well as a CLOMR. Final designs and permitting still needs to be done for Timberline and Drake WW Plant levees.



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| City of Fort Collins: Stormwater Master Planning (Fort Collins – 13) | |
| PRIORITY: High | HAZARDS ADDRESSED: Flood |
| LOCATION: Throughout the City | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses; Integrate hazard mitigation into other planning mechanisms |
| RECOMMENDATION DATE: 2020 | OBJECTIVES ADDRESSED: Incorporate risk reduction principles into policy documents and initiatives, other institutional plans; Reduce the vulnerability of local assets to the impact hazards |
| TARGET COMPLETION DATE: 2030 (ongoing) | |
| ISSUE: The hydrology for the City’s Stormwater Master Plans were modeled using MODSWMM software. This software is outdated and does not provide robust dynamic hydrologic modeling. | |
| RECOMMENDATION: The City is updating the hydrology in all the Stormwater Master Plans by converting all the MODSWMM model to EPA-SWMM. | |
| ACTION: Update master plans to EPA SWM. | |
| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$500k per year over the next 10 years. |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee |
| PROGRESS MILESTONES: Revise two basins per year until all the master plans are updated. | |

City of Fort Collins: Stream Rehabilitation and Enhancement Program (Fort Collins – 24)

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| PRIORITY: High | HAZARDS ADDRESSED: Flood, Severe Storm |
| LOCATION: Throughout the City | GOALS ADDRESSED: Protect people, property and natural resources; Improve capability to reduce disaster losses |
| RECOMMENDATION DATE: 2020 | OBJECTIVES ADDRESSED: Reduce the vulnerability of local assets to the impact of hazards |

TARGET COMPLETION DATE:
2030 (ongoing)

ISSUE: In 2012, The City of Fort Collins’ Stormwater Master Plan was updated to include stormwater quality and stream restoration projects. The Master Plan update utilized results and information obtained from the Stormwater Utility Repurposing program in conjunction with basin- and stream-specific recommendations obtained from the following two program efforts:
A. Basin-Specific Stormwater Quality Best Management Practices (BMP) Selected Plans; and,
B. Stream Restoration and Stability Study and Prioritization with the Multi Criteria Decision Analysis (MCDA) Tool.

RECOMMENDATION: Stream restoration projects were identified in an extensive study by Colorado State University (CSU). The study indicated that many of the City’s streams suffer from severe bank erosion, impediments to fish passage, and have poor aquatic habitat. A Multi Criteria Decision Analysis (MCDA) Tool was utilized to prioritize the identified stream reaches for future restoration. The City has completed three stream rehabilitation projects: Fossil Creek Park, Spring Creek at Edora, and McCleelands Creek at Twin Silo Park over the past six years.

ACTION: Install WQ BMPs and construction stream enhancements throughout the City.

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| LEAD AGENCY: City of Fort Collins – Stormwater Utility | EXPECTED COST: \$15M over a 10 year period |
| SUPPORT AGENCIES: Larimer County | POTENTIAL FUNDING SOURCES: Stormwater Utility Fee, Grants |

PROGRESS MILESTONES: Construct one major stream rehabilitation project every other year and one minor project every year.

