

Appendix D

Original CAAP Action
Implementation Matrix

Columbia CAAP Priority Action Matrix

Columbia Climate Action and Adaptation Plan

Updated May 23, 2019

This document presents implementation details for the Priority strategies and actions of the Columbia Climate Action and Adaptation Plan (CAAP). This document includes the following sections:

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Acronyms

CATSO	Columbia Area transit Study Organization	PedNet	PedNet Coalition
MODOT	Missouri Department of Transportation	MEEA	Missouri Environmental Education Association
FHWA	U.S. Federal Highway Administration	HBA	Home Builders Association
NHTSA	National Highway Transportation and Safety Administration	W&L	Columbia Water and Light
GF	General Fund	MDNR	Missouri Department of Natural Resources
CMCA	Central Missouri Community Action	PHHS	Public Health and Human Services
REDI	Regional Economic Development	MO DHSS	Missouri Department of Health and Social Services
DOE	U.S. Department of Energy	ONS	Office of Neighborhood Services
CHA	Columbia Housing Authority	USDN	Urban Sustainability Directors Network
STL	The City of St Louis has implemented a benchmarking program	APPA	American Public Power Association
CDBG	Community Development Block Grant	MPUA	Missouri Public Utilities Alliance
MMSWMD	Mid-Missouri Solid Waste Management District	ESCO	Energy service company
EPA	Environmental Protection Agency	HR	Human Resources
EEC	Environment and Energy Commission	BCCC	Building construction and Codes Commissions

Transportation

#	Action	Lever	Timeframe ¹	Lead entity ²	Potential partners	Cost	Potential Funding strategies	Key next steps
T-1.1.1	Prioritize transportation funding for Vision Zero engineering improvement projects to create safe streets for people walking, biking, and riding transit.	Policy, infrastructure	Long term	City Manager's Office	Public Works, Community Relations, Community Development, PedNet, CATSO, Bike Ped Commission, Disability Commission, MODoT, Parking, Transit	\$\$\$	TBD	Planning for deployment in 2020, need to identify funding sources.
T-1.1.2	Revise street design standards to create streets that prioritize people walking, biking, and riding transit while also accommodating vehicles.	Policy and Infrastructure	Ongoing and Long term	Public Works	Business districts and associations, PedNet	\$	Current Funding	Identify and prioritize changes to design standards, quantify cost impact. Evaluate existing CIP list for "quick win" scenarios, identify longer range, higher-impact projects.
T-1.1.3	Prioritize transportation funding to achieve mode share goals.	Policy and infrastructure	Short term	Public Works	PedNet, Bike Ped Commission, CATSO	\$\$\$\$	Green Bonds, reprioritization, Grants	Evaluate funding gaps for "quick win" scenarios, work with community and municipal partners to emphasize multiple benefits of shifting modes.
T-1.2.1	Improve efficiency, convenience, and reliability of bus service and infrastructure (e.g., increase frequency, shorten wait times, construct bus stop shelters).	Infrastructure	ongoing	Public Works	MU, CPS, CoC	\$\$\$\$	Traffic Demand Management (redirect parking fees create an active transportation fee for parking), Reprioritize current funding, development fees, grants, changes to state gas tax.	Continue evaluation of funding and design options to maximize efficiency, develop educational materials and programs to improve public awareness of benefits and extent of transit services.
T-1.3.1	Build and maintain a network of on-street protected bike lanes on streets with speed limits above 30 mph. Build other bike facilities (bike boulevards, etc.) on streets with lower traffic/speed.	Infrastructure	Long term	Public Works, Parks and Rec	PedNet, Bike Ped Commission, CATSO, Office of Sustainability, MODoT, FHWA, NHTSA	\$\$\$\$	Traffic Demand Management (redirect parking fees create an active transportation fee for parking), Reprioritize current funding, development fees, grants, changes to state gas tax.	Link updates of Sidewalk Master Plan and Bike Master Plan with current funding and future renewals of the Parks Sales Tax (2021) and CIP Sales Tax (2025). Develop a Traffic Demand Management Plan/Program to fund and promote mode share.
T-1.4.1	Accelerate building sidewalks, crosswalks, and other walking infrastructure in high-need areas and to fill connectivity gaps as identified in Sidewalk Master Plan.	Infrastructure	long term	Public Works, Parks and Rec	PedNet, Bike Ped Commission, CATSO, Office of Sustainability, MODoT, FHWA, NHTSA	\$\$\$\$	Traffic Demand Management (redirect parking fees, create an active transportation fee for parking); reprioritize current funding; development fees; grants; changes to state gas tax.	Link updates of Sidewalk Master Plan and Bike Master Plan with current funding and future renewals of the Parks Sales Tax (2021) and CIP Sales Tax (2025). Develop a Traffic Demand Management Plan/Program to fund and promote mode share.

¹ Short term is less than or equal to 5 years; Long term is 5 to 10 years, or Ongoing

² Could include a City department, community organization, or partnership

#	Action	Lever	Timeframe ¹	Lead entity ²	Potential partners	Cost	Potential Funding strategies	Key next steps
T-1.4.2	Install universal design accessibility features at crossing locations to ensure the crossing is accessible for everyone (e.g., pedestrian traffic signals, audible signals).	Infrastructure	Ongoing	Public Works	PedNet, Bike Ped Commission, CATSO, Office of Sustainability, MODOt, FHWA, NHTSA, Disability Commission	\$\$\$	Current Budgets	Evaluate current rate at which intersections are updated and ADA upgrades are made and determine if additional funding is needed to accelerate that rate.
T-1.5.1	Revise zoning codes to favor walkable, connected neighborhoods in the existing built environment, near schools, and new development.	Policy	Short term	Community Development	PedNet, CATSO, CPS	\$	Current Budgets	Revise Unified Development Code.
T-1.5.2	Incentivize infill and mixed-use development (e.g., through alternative code compliance, fee waivers, density bonuses, investment prioritization, development impact fees, tax benefits).	Policy	Short term	Community Development	PedNet, CATSO, CPS, Apartment Association	\$\$	Reprioritize existing funding, development fee structure, grants	Revise Unified Development Code; reprioritize/restructure current development fee structures.
T-1.5.3	Revise zoning codes to encourage Accessory Dwelling Units (i.e., mother-in-law units).	Policy	Short term	Community Development		\$	Current Budgets	Revise Unified Development Code.
T-1.5.4	Preserve and enhance affordable housing, especially near bus service, to prevent displacement of vulnerable populations.	Policy, management practice	Short term	Community Development	Sustainability, community housing organizations	\$	Reprioritize existing funding, CDBG	Revise Unified Development Code.
T-2.1.1	Introduce a policy to replace City fleet vehicles and buses with electric and hybrid options at time of replacement, and require emissions standards, testing, and biofuel preference for any combustion vehicles remaining in the fleet.	Policy and infrastructure	Long term	Purchasing and Fleet	Water and Light, Public Works, Transit/Parking All City departments, commercial and residential developers and managers	\$\$\$-\$\$\$\$	Current budgets, use of projected savings, leasing, grants, utility rates, private funding	Determine allowable emissions standards for remaining combustion vehicles, evaluate staff and facility capacity required for EV maintenance. Develop strategic planning group for fleet transformation.
T-2.1.2	Create EV roadmap to increase the number of electric charging stations in public parking areas (e.g., schools, parks, libraries, city-owned parking garages, near city hall) and in commercial and high-density residential areas.	Policy/Infrastructure	Long term	Water & Light	Parking Utility, Large employers, regional electric utilities, Division of Energy, Office of Sustainability	\$\$\$	PPP, electric rate revenue, Green Bonds	Engage stakeholders to solidify priorities and structure of local charging network.
T-2.1.3	Encourage installation of EV charging capacity in single family and multifamily residences (e.g., how to address residences that lack garage access).	Policy	long term	Water & Light	Community Development, Office of Sustainability, property managers	\$\$	TBD	Identify market barriers and potential to address. Evaluate peer cities'

Housing, Building & Development

#	Action	Lever	Timeframe	Lead entity	Potential partners	Cost	Funding strategies	Key next steps
H-1.1.1	Promote and offer incentives for improving residential energy efficiency during retrofit projects that exceed existing building energy code requirements. For example, using higher performance insulation materials in order to meet new construction energy code standards.	Policy	Short term	W&L, Sustainability	MEEA, consultants, Smart Energy Solutions, HBA, W&L, Architects, Builders, Design firms, Lumberyards	\$\$	W&L Utility Rebates/Loans	Evaluate building codes to determine retrofit projects provide GHG benefit and exceed building codes. Develop a promotional plan.
H-1.1.2	Increase energy efficiency funding options for income-qualified families (low-interest financing, on bill financing, Pay As You Save, PACE, etc.).	Policy	Short term	Utility Services	OS, Energy Efficiency for All, REnew Missouri	\$	Rates, taxes, third party financing	Evaluate billing software needs, policy changes and market potential.
H-1.1.5	Require all rental housing to meet basic energy efficiency standards when license is renewed.	Policy	Short term	Offices of Sustainability and Neighborhood Services	Health Department, CMCA, Utility Services	\$\$	W&L Utility Rebates/Loans and CDBG funds, Community Cost Share, Green banks Inspection fees	Gather Baseline data Determine what "basic" might mean Work with Stakeholder groups Educate on examples of existing programs elsewhere.
H-1.1.7	Develop and test an energy performance rating/labelling program for homes listed for sale or upon rental license renewal.	Information/ Education Policy	Ongoing	State of MO Utility Services	Health, OS, RE Professionals, property managers, appraisers	\$\$	In kind promotion, PPP Customer Fee Rates (if internalized completely to Utility Services)	Promote existing program to develop market awareness/acceptance. Measure number of public scores on GBR, Number of scores used in sales, number of times scores accessed.
H-1.2.1	Provide assistance to commercial buildings above a minimum gross floor area to track energy and water usage. Require all such commercial buildings to disclose their energy and water use.	Policy	Short term Short term (voluntary/size req) Medium term (required)	Sustainability Utility Services	DOE, energy professionals, REDI, Chamber of Commerce, NRDC Sustainability Commercial Partners/Champions	\$ staff \$ incentives/assistance \$-Internal \$\$-external	Revenue from rates W&L Utility Rebates/Loans Grant?	Create inventory of buildings, determine ft2 characteristics, EE and EUI. Engaging key stakeholders & potential commercial champions on engagement Measure ft2 audited, benchmarked, improved. Change in EUI.
H-1.2.2	Develop specific energy efficiency programs for hard-to-reach segments of commercial properties (e.g. commercial rental, restaurants, large scale manufacturing, offices, affordable multi-family housing).	Policy	Short/Long term	Utility Services, Sustainability	MEEA, DOE, REDI, business associations Advocacy Groups, Business associations, Ameren	\$ staff \$\$\$ incentives/assistance	Revenue from rates W&L Utility Rebates/Loans Grants Rates, Green Bonds, ESPC	Market study to define "hard-to-reach" segment and their improvement potential, identify and address barriers to participation. Define programs accordingly. Measure cost of project, amount of (energy reduction, \$\$ saved, GHG impact).
H-1.2.3	Promote and offer incentives for improving energy efficiency (e.g., insulation, energy-efficient windows, electric heat pumps) in <u>newly constructed</u> commercial properties. New construction incentives shall support measures for projects that exceed code requirements.	Policy, Education	Short term and ongoing	Utility Services, Sustainability	Local builders, Design/architecture firms, Sustainability Ameren	Staff - \$ incentives - \$\$	Revenue from rates W&L Utility Rebates/Loans (Possible impact to rates) Rates, Green Bonds, ESPC	Consider implementation along with new construction residential incentives. Long term success might include increasing code requirements. Examine market and emissions reduction potential new v. existing construction. Measure: cost of enhanced project, amount of (energy reduction, \$\$ saved, GHG impact) compared to code built.

#	Action	Lever	Timeframe	Lead entity	Potential partners	Cost	Funding strategies	Key next steps
H-1.2.4	Identify funding strategies to ensure rebate budgets are sufficient to meet expanded offers and goals.	Business Practice	Short term	Sustainability, Finance, Utility Admin	Finance, REDI, Chamber of Commerce USDN, MPUA, APPA, Advocacy Groups	\$	Existing funding for staff	Utility Services would need to evaluate current rebate programs and the funding available to ensure they meet expanded offers and goals.
H-1.3.1	Create a policy that all City buildings shall reduce energy usage by 20% over the next five years.	Policy, Management Practice, Education	Short term	Public Works,	W&L, ESCO, Sustainability	\$\$\$ upfront \$ ongoing staff Ongoing OpEX 0\$	ESCO or other financing	Consider collective 20% rather than 20% for each building. Identify top five opportunities for energy improvement, look for crossover with other strategies. Measure using Portfolio Manager or similar metrics.
H-1.3.2	Create a policy, to be part of assigned duties and presented during new employee orientation, that City employees shall turn off lights and equipment when they are done using them.	Policy, Education	Short term	Sustainability	HR, City Manager	\$ or less (Staff)	GF	Develop standards/expectations and orientation material. Measure through regular employee survey instrument regarding behavior change.
H-1.3.3	Introduce a policy that requires all new and existing municipal buildings to meet and maintain energy and resource efficiency standards (ENERGY STAR, LEED, HES or other).	Policy	Short term	Public Works	Sustainability, W&L	Upfront/Capital \$\$\$ Staff \$ Ongoing 0 <\$>	ESCO, Green Bond, Reallocation	Focus on benchmarking first and consider using defined collective energy goal for all City buildings or evaluating based on asset potential and cost.
H-1.3.4	Introduce a policy that requires all municipal buildings to be benchmarked with the current ES rating, the energy use intensity (kBTU/sqft) and the energy reduction goal. These benchmarks and goals shall also be posted on the City's website.	Policy	Short term	Public Works	Sustainability, Engineering Interns, DOE	\$	Existing funding for staff	Verify building characteristics, build data management and reporting process.
H-1.4.1	Require that the City adopts the International Building Energy Conservation Codes for municipal, commercial and residential buildings as written.	Policy	Short term	BSD	BCCC and EEC, W&L, Sustainability	\$	GF	Draft memorandum of understanding between BCCC and EEC. Propose collaborative project to look at implementing incentives for stretch codes.
H-1.5.1	Incentivize switching space and water heating from fossil fuel-based to electric heat pumps.	Policy, Education	Long Term	W&L	Sustainability, CHA, tenants	\$ staff \$\$ incentives	Rates, Green Bonds	Conduct a market study, evaluate impact to customers. Measure cost of project.

Waste

#	Action	Lever	Timeframe	Lead entity	Potential partners	Cost	Funding strategies	Key next steps
W-1.1.1	Create a reuse program for curbside collection and purchase a warehouse to store and sell items that are not accepted by local non-profit groups.	Infrastructure	Long term then ongoing	Solid Waste	MMSWMD, Sustainability Non-profits, Volunteers, community service	\$\$\$\$ Capital for purchase or build a warehouse/building Ongoing staff \$\$\$, some ROI	Utility fees Grants, income from resale, Grants/Co-partnerships/Small Rate Increase	Determine what items would be considered for a reuse program by contacting local non-profit groups to determine what they don't accept. Determine a location to purchase or build a warehouse/building to store and sell the items. This would have to be staffed by City employees and would be an on-going cost, so a cost analysis would need to be done Research properties find non-profits already doing it (see 1.5.3) and coordinate long term plan.
W-1.1.2	Partner with local organizations for demolition waste pickup and reuse.	Policy	Long term	Community	Solid Waste, Historic Preservation	\$	Grants, re-prioritization	Offer consultation to groups willing to divert construction and demolition waste from the landfill.
W-2.1.2	Restructure all solid waste rates to reduce the amount of waste sent to the landfill.	Policy	Short term	Solid Waste	MMSWMD, MORA	\$\$ \$ to revenue neutral with ROI	Re-prioritization of existing revenue from Utility rates and fees	Establish planning goals, research best practices and review current rates to determine how to restructure. Conduct rate impact study, possibly with the assistance of an outside firm.
W-2.1.3	Require multi-family homes to offer on-site recycling for residents.	Policy	Short term	Solid Waste	Housing Authority	\$ (most cost to developer)	Grants, re-prioritization	Draft and pass ordinance hold community workshop with developers, research other models .
W-2.2.1	Study the short- and long-term costs and benefits of a City composting program.	Information, Education	Short term then ongoing	Solid Waste	U.S. Compost Council, private composters, University, Sustainability	\$-\$	Re-prioritization of existing utility fees, grants	Conduct a study (hire consultant) to review and establish a possible composting program.
W-2.3.1	Research management practices of construction and demolition waste diverted from the landfill.	Information, Education	Short term	Solid Waste	private developers	\$	Re-prioritization	Learn more.
W-2.4.1	Offer positive reinforcement and indirect financial incentives to encourage businesses and residents to divert material from the landfill.	Information, Education	Short term and ongoing	Solid Waste	MMSWMD, MORA, Chamber of Commerce, Better Business Bureau	\$	Grants, re-prioritization	Develop educational materials and incentive program.
W-2.4.2	Develop and enforce ordinances requiring commercial customers to recycle material streams like cardboard, paper, beverage containers, etc.	Policy	Long term	Solid Waste	Local law enforcement	\$	Landfill disposal rates, citation revenue	Research best practices determine enforcement process and feasibility, draft and pass ordinance.
W-3.1.1	Research and add best practices for recycling hydrofluorocarbons (potent GHG used in refrigeration and air conditioning) in next CAAP update.	N/A	Short term	Solid Waste	MDNR, EPA, trade associations, private companies	\$	Re-prioritization	Research develop education materials.
W-3.2.1	Remodel and upgrade the City's Material Recovery Facility to increase processing capacity, add sortation technology, and provide space for additional material types to be recycled, including (but not limited to) e-waste, mattresses, cartons, and household hazardous wastes.	Infrastructure	Short term	Solid Waste	MMSWMD, The Recycling Partnership, Resource Recycling, Carton Council	\$\$\$	Grants, Capital Improvement Fund	Staff visit to other municipalities with a similar operation, hire a consultant to provide recommended technologies and facility design, find material end markets and build partnerships.
W-3.3.1	Conduct a comprehensive waste composition study every five years.	Information, Education	Long term and ongoing	Solid Waste	MDNR, private sector	\$ (30 to 60k per year)	Landfill disposal rates	Determine material types to measure, hire a consultant or use staff to conduct waste composition study.

Energy

#	Action	Lever	Timeframe	Lead entity	Potential partners	Cost	Funding strategies	Key next steps
E-1.1.1	Offer community solar program through W&L.	Policy, Infrastructure	Short term	W&L/Utility Services Division (USD)	Housing developers, Solar contractors, Sustainability	\$\$	Utility Fees, Revenue Bond, Rates Utility fees for maintenance and staffing support of the project. The debt service payments can be met through energy payments.	Integrate into billing software, test billing process, define community and utility solar goals. Measure: subscription rate, renewable % met and GHG reduced, progress to local solar goals.
E-1.1.2	Develop and implement virtual/aggregate net metering policies and procedures with W&L to allow privately developed community solar.	Policy, Infrastructure	Short term	W&L	Sustainability, solar developers, large employers	\$	Cost may be recovered through rate structure/fees.	Conduct market study, evaluate similar projects in peer cities, develop pilot → permanent program, rate structure, etc. Integrate into billing software, test billing process, define community and utility solar goals.
E-1.1.3	Install solar panels on all City buildings and sites, where feasible.	Policy, Infrastructure	Ongoing	City (Public Works)	3rd Party Lessor W&L, Sustainability, building occupant	\$\$/year \$\$\$\$ total project	Green Bonds Utility Fees if W&L owns/installs Part of ESCO project for existing buildings.	Formalize Council directive to Complete suitability analysis, establish "feasibility" criteria. Evaluate funding options Measure: renewable energy offset achieved, % of suitable sites developed, progress to local solar goals.
E-1.1.4	Streamline and offer expedited permitting for renewable energy installations.	Policy, Management Practice	Short term	BSD	EEC, contractors, advocates Fire/USD	\$	General Fund permit fees	Complete staff review of current process. Propose improvements from internal BSD/W&L staff analysis, verify if GIS modelling can replace onsite shade analysis. Measure: Time to process/approve applications. Time for rebate check/loan closing.
E-1.1.5	Make it easier for large multi-family, commercial, and industrial customers to maximize the benefit of using their space for photovoltaics (e.g., feed-in tariff, third-party lease agreements, roof space rental).	Policy	Short term	W&L	Industrial and Large General Service Customers; Environmental Groups; 3 rd party installers, Sustainability	\$	Private Capital, Rates	Develop/modify policy and ordinance as needed. Establish local solar goal using IERMP guidance. Evaluate and identify large commercial and industrial customers. Measure: increase in the rate of non-residential PV installs and number of PV deals with new structure.
E-1.1.6	Require production meters on all new net-metered photovoltaic installations.	Policy, Infrastructure	Short term	W&L	MPUA	\$	solar application fee	Deploy meters to support current modelling of interconnected PV systems and justify REC's. Develop a policy or ordinance to require meters on all new Net-Metered photovoltaic installations.
E-1.1.7	Determine the true value and potential of customer-owned photovoltaics to the infrastructure, economics, and renewable goals of W&L. Analysis	Policy	Short term	W&L	Customers MPUA		Rates, grants, PPP	Look at relevant findings in IERMP, if any. Develop RFP for additional

#	Action	Lever	Timeframe	Lead entity	Potential partners	Cost	Funding strategies	Key next steps
	should include time of generation, capacity credit, distribution circuit support, customer characteristics, technical and market potential, etc.				Division of Energy	\$\$\$		information needed.
E-1.2.1	Include Climate Action and Adaptation Plan priorities in Columbia Water & Light's long-range electric planning goals.	Policy	Short term	WLAB	IERMP TF & Council Climate Commission Sustainability	\$	Rates	Map the alignment of W&L utility priorities, IERMP findings and CAAP goals. Identify opportunities for collaboration and areas of difference. Measure: progress in IERMP updates (2 years?).
E-1.2.2	Consider all renewable energy sources on a cost per metric ton of CO ₂ equivalent basis reduction in the City's integrated electric resource plan.	Policy	Short term	W&L	IERMP TF, Sustainability, CCC	\$	Existing funding	Establish system and criteria by which new energy sources/contracts under consideration are evaluated. Review may include W&L, Office of Sustainability, WLAB and CCC.
E-1.3.1	Remove 3% rate cap to allow for increased investment by Water & Light in renewable energy resources.	Policy	Short term	W&L	Legal, Finance, WLAB, Sustainability	\$	Existing funding	Draft ordinance language.
E-1.3.2	Codify through ordinance Columbia Water & Light's responsibility to meet 100% renewable energy generation or purchase by 2035, including parameters for the use of Renewable Energy Credits (RECs) and equity and cost impacts.	Policy	Short term	W&L	Legal., Finance, WLAB, CCC, Sustainability, City Council	\$\$\$\$	Increase in rates as needed, securitization of contract obligations.	Examine options for meeting 100% by 2035 goal, develop H/M/L cost scenarios including rate impact, externalized cost of carbon emissions. Draft ordinance to include review of market conditions, equity considerations, definition of "renewable", use of RECs.
E-2.1.1	Develop energy storage (battery) programs for all customers to reduce peak demand, to increase electricity reliability, to improve the effectiveness of solar and other Renewable Energy options, and to establish microgrids with smart meters.	Policy, Infrastructure	Ongoing	W&L (Engineering and USD)	MPUA, NREL, interconnected PV customers, vendors.	\$\$ per year \$\$\$\$ - upfront \$ Staff	Small projects: Private Capital, Rate funded Loan Program Large Projects: Revenue Bonds, Private Capital Some costs can be offset from income derived through ancillary grid services provided by the asset.	Investigate program options, benefit to utility, market potential. Look at possibility to revise energy storage rider program to apply to all customers and include dispatchability as benefit. Measure: peak power and energy reduced, GHG reduction, outage frequency and duration.
E-2.1.2	Ensure equitable implementation of grid resilience actions by partnering with vulnerable neighborhoods and non-governmental organizations to develop resilience hubs—community facilities that offer power and other community services during times of need. Establish criteria to screen and select locations for community microgrids to support grid and community resilience.	Policy, Infrastructure, Education	Long term	Health, Sustainability	W&L, community organizations	\$\$	Grant Funding, PPP, ESCO, FEMA	Develop indicators for vulnerability, engage stakeholders, develop potential action strategies.
E-2.2.1	Install meters that allow for rate structures that incentivize lower electricity use at peak hours.	Policy, Infrastructure, Education	Ongoing	W&L	Sustainability, transit, EV stakeholders	\$\$\$\$	Rates or Bond Funded Rates	Develop and implement TOU rate structure/test project to guide implementation of final, comprehensive TOU.

Health

#	Action	Lever	Timeframe	Lead entity	Potential partners	Cost	Funding strategies	Key next steps
HS-1.1.1	Develop and implement a plan to monitor climate change related illnesses. Utilize results in resource and policy planning, with particular focus on neighborhoods. Communicate results on a periodic basis to the public.	Management Practice	ongoing with short-term phases Short term	Public Health and Human Services	Fire Dept, hospitals, medical facilities, MU Public Health Dept., Health Care System, MO DHSS	\$\$	Grant to get program started and short-term funding, possibly a health foundation Existing PHHS staff could likely do the surveillance using existing resources.	Research grants and partnership opportunities. Align with CHIP. Determine if this level of health data can be monitored at the neighborhood level. PHHS staff will lead a process with appropriate partners to determine what data is available / appropriate and will draft a plan to monitor data and report results.
HS-1.1.2	Coordinate with community health improvement teams to incorporate climate change and CAAP goals into the Community Health Improvement Plan and Health Impact Assessment.	Management Practice	short-term (within 5 mo.) and ongoing	Public Health and Human Services, OS,	Health Care System, social services agencies	\$ Staff Time	Existing funding	Schedule meeting with CHIP teams to exchange progress and opportunity reports. 2019 CHIP is being finalized now with CAAP goals incorporated where applicable. Five-year update would be the time the see about additional inputs.
HS-1.1.3	Review and effectively communicate emergency and evacuation plans on a regular basis to update for climate change forecasted data, paying particular attention to flooding, extended heat waves, and tornadoes.	Management Practice, Information, Education	Short term	Office of Emergency Management	Public Safety agencies, Public Health & Human Services, health care system partners, and other traditional first responders		Existing funding	Identify tool for climate change forecasted data. Work with Boone County Office of Emergency Management.
HS-1.1.4	Build City staff capacity to support community-led, neighborhood-focused resilience actions (e.g. identifying best practices, establishing resilience hubs, and implementing neighbor-based emergency response).	Management Practice, Information, Education	Short and long term	ONS (Bill Cantin), PHHS	OEM PHHS First Response Agencies Non-profits (Red Cross/Sal Army etc.	\$-for training/Education programs \$\$\$ -for physical structures/capital improvements	Grants, CIP,	Review model programs. Engage with existing ONS and Health staff working on neighborhood and resilience issues (Strategic Neighborhoods, trauma informed community/services for families and children.)
HS-1.1.5	Partner with outside agencies to offer community resilience model training.	Management Practice, Information, Education	Short term	Sustainability	PHHS, community organizations, health professionals, Neighborhood Associations, Public safety	\$\$	TBD	Identify existing programs, groups, neighborhood leaders. Assess needs and opportunities for integration of related CAAP priorities.
HS-1.2.1	Identify a sustainable funding source for increased utility assistance for low-income residents, including support for energy efficiency projects such as weatherization.	Policy	Short term	PHHS – Steve Hollis	Office of Sustainability, City Utility/W&L, Finance, UCS/Community Relations, CMCA	\$ (costs for solely marketing CASH/HELP could be low. New utility rate/discount based on income could be much higher)	TBD	Form a work group to review possible models and prepare a report for Council consideration (currently underway).
HS-1.3.1	Create anti-idling policies and enforcement plans.	Policy	Ongoing	Sustainability	CPS, business areas	\$ - Staff time,	TBD	We would need to determine if this is

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			Municipal policy exists	Office/City Manager's Office	(i.e. The District), city and county government	\$ - communication and education materials		meant to be community-wide, internal to city, school drop-offs, etc.
HS-1.3.2	Update property maintenance code to manage and mitigate mold or fungus.	Policy, Education	Short term	ONS	PHHS, OS, MU Extension ³	\$\$		Would first need to find model programs. Staff would need guidance on how to measure, what are acceptable levels, how to determine who's responsible (tenant or property owner). Education could be done anytime with Healthy Homes.
HS-1.4.1	Form a team to develop action plans to address climate-related mental health resilience at the individual, neighborhood, and community level.	Management Practice	Long term	PHHS/OS	MU	\$	Grants, existing funding.	Current priority is getting families and children access to trauma informed services. Would need to identify who would make up this team. Might be tied into HS - 1.1.4,5 where someone goes into neighborhoods and works with community to increase resiliency all around – with more than a climate related focus.
HS-2.1.1	Support organizations and schools promoting local food production and community gardens, through partnerships, funding, and educational programs including the benefits of a plant-based diet.	Information, Education	Short term	Sustainability	Columbia Public Schools, Columbia Center for Urban Agriculture, farmer's market, private schools, local farms, local chefs, local grocery stores, Health Department	\$\$	TBD	Expand programming at community gardens, hire garden coordinator, hire Americorps members to administer programming at community gardens and schools including agro-ecology (pollinators, water quality, etc.).
HS-2.2.1	Continue to provide enrollment assistance for participation in the Supplemental Nutrition Assistance Program (SNAP), the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) Program, and other food assistance programs.	Management Practice, Information, Education	Short term	CHIP Basic Needs Action Team	VAC, CMCA, Food Banks, CHA	\$	Existing funding	This is already being done through local agencies and is a component of the CHIP Basic Needs Action Team – (one door access for <u>local</u> programs). SNAP and WIC are federally funded with stringent income limits that will not take into account rising costs of utilities, etc. Determine best ways to support the action already being taken by CHIP Basic Needs Action Team.

³ <http://extension.missouri.edu/hes/housing/healthyhomes.htm>.

Natural Resources

#	Action	Lever	Timeframe	Lead entity	Potential partners	Cost	Funding strategies	Key next steps
NR-1.1.1	Manage publicly-owned natural areas to enhance and maintain diverse native communities.	Management Practice	Short term	Sustainability	Public Works, Stormwater Utility, Parks & Recreation, W&L	\$\$\$	Reprioritization Grants Partnerships	Conduct a detailed natural resources inventory that assesses land uses and map these areas. Assess current habitat quality of natural areas. Conduct cost-benefit analysis of native habitat management.
NR-1.1.2	Establish and effectively manage native habitat corridors along trails and utility easement areas to restore and maintain landscape connectivity.	Management Practice	Long term	Water and Light	Sustainability, National Wild Turkey Federation, Missouri Department of Conservation, Quail/Pheasants Forever, all utilities, U.S. Fish and Wildlife Service	\$\$\$\$	In lieu of mowing/tree removal	Analyze current mowing/maintenance costs, acreage, and staff time required. Map areas that need maintained.
NR-1.1.3	Create an ordinance that establishes a Transfer of Development Rights program to protect undeveloped lands for land conservation and/or agriculture.	Policy	Short term	City of Columbia & Boone County Community Development – Planning	Office of Sustainability, Green-belt Land Trust, Boone County Commission	\$\$\$\$	TBD	Conduct an economic study of the county land market in order to Right-size incentives for local land economics and preservation priorities. Perhaps Green-belt Land Trust administers the program and city financially supports. The City and County may work with outside land trusts and agencies to develop an acquisition and Preservation strategy for prime farmland and sensitive land using existing NRI mapping resources and plans. Develop a TDR bank for credits and a conservation and preservation easement program to allow for a robust TDR program.
NR-1.1.4	Support the Urban Forest Master Plan to identify programs and suitable locations to maintain and expand Columbia's urban tree canopy.	Management Practice	Long term	Community Development	Parks and Recreation, Sustainability, Public Works	\$\$\$	TBD	Work with Tree Advisory Board to implement Columbia Forest Master Plan.
NR-1.1.5	Update current tree preservation requirements to protect tree root systems and large legacy trees during construction.	Policy	Short term	Community Development - Planning	Sustainability	\$	Existing funding	Explore similar initiatives in peer cities (i.e. City of Springfield, MO tree preservation ordinance protects large trees during construction. Work with City Arborist, building engineers and development community to develop a best practices program.
NR-2.1.1	Complete change to rate structure to encourage reduced water use.	Policy	Ongoing	Water and Light		\$\$	Water rate increase for irrigation	Monitor and evaluate impacts of rate structure on usage and cost. Continue delivery and development of educational programs for residential, commercial, and industrial customers.

#	Action	Lever	Timeframe	Lead entity	Potential partners	Cost	Funding strategies	Key next steps
NR-3.1.1	Implement strategies to mitigate stormwater impacts due to development and redevelopment of properties currently exempted from stormwater management requirements.	Infrastructure	Short term-research and pilot phase Long term-permanent implementation	Stormwater Utility	Sustainability Community Development	\$\$\$	Stormwater rates, sales tax	- Examine current incentive effectiveness (Sec. 26-169 to 176) and revise as appropriate. - Identify redeveloping neighborhoods for potential projects and develop a plan to prioritize work, - Evaluate successful incentive-based programs for pilot and permanent implementation of small-scale distributed stormwater incentive programs. - Based on pilot results determine appropriate financial incentive (SW credits, fee reduction, etc.) to build a rain garden, bioswale, plant natives, etc. - Investigate potential funding sources for property acquisition and management practices within redeveloping neighborhoods.
NR-3.2.1	Mine existing data sources (e.g., FEMA Risk Maps) to identify areas prone to flooding.	Information, Education	Short term	Stormwater Utility	Community Development	\$	Within current funding structure	Assign staff to compile risk maps and identify at-risk properties and infrastructure. Establish criteria that improve existing regulations Sec 29-2.3(d)(4).
NR-3.2.2	Perform detailed studies to identify areas that are at high risk for flooding and may be prospect for property acquisition or mitigation.	Information, Education	Short term	Stormwater Utility	Community Development	\$	Within current funding structure	Continue to work to revise FEMA maps; budget for flood by-outs, including Matching grant funding. Assign staff to compile risk maps and identify at-risk properties and infrastructure.
NR-3.2.3	Increase stream buffer requirements to provide additional flood water storage and minimize property damage due to erosion and flooding.	Policy	Long term	Stormwater Utility	Community Development	\$	Rate increase	Assess the impact of the benefits of the existing stream buffer ordinance and areas. Include climate projections in flood risk mapping. Where environmental return on investment is high consider revising stormwater regulations, including scenario mapping. Prioritize projects such as property acquisition, infrastructure improvements and mitigation efforts to minimize risks, as funding allows. Ballot Issue.
NR-3.2.4	Perform a flood risk assessment using historical data and future precipitation forecasts to identify areas and critical infrastructure vulnerable to flooding.	Management Practice	Short term	Stormwater Utility	GIS, MU, OEM, FEMA	\$	Reprioritization, Grants	Explore similar modelling efforts in peer cities, evaluate internal capacity to complete or develop RFP for external firm.