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City of Davis Climate Action and Adaptation Plan Update

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Memo

Subject: Action Evaluation and Prioritization Process Memo

Introduction

The purpose of the City of Davis Climate Action and Adaptation Plan (CAAP) update is to develop actions that will help the City reach carbon neutrality by 2040 and enhance climate resiliency. The CAAP will identify a pathway to meet these goals through measurable, enforceable, and equitable community actions.

Action prioritization is a crucial step in creating a CAAP because it results in a more implementable and impactful plan. An action prioritization process that reflects the priorities of the city is more likely to be embraced by the users, and therefore more successful in meeting the City's and community's objectives around achieving ambitious greenhouse gas (GHG) emissions reduction and climate adaptation goals.

Beyond GHG emissions reduction and climate risk reduction, implementation of climate actions often provides additional co-benefits that may not be accounted for in a typical GHG analysis. For example, actions designed to address climate change can also improve local air quality, enhance the natural environment, and have equitable outcomes. Additionally, many actions will vary in their levels of feasibility. Factors influencing feasibility include the cost of implementation, available staff capacity and perceived level of public support. Assessing the impact of actions, whether positive or negative, against a customized set of evaluation criteria helps ensure a community's priorities and preferences are considered

The CAAP project team used the Action Selection and Prioritization (ASAP) tool (a freely available tool created by the C40 Cities Climate Leadership Group for city climate action planning) to evaluate actions for their impact on multiple evaluation criteria and prioritize actions for the CAAP. To enhance the evaluation process, the City selected specific co-benefit and feasibility criteria it determined would best represent community priorities and municipal decision-making considerations.

Action Selection and Prioritization Tool

The Action Selection and Prioritization (ASAP) tool is an excel-based program designed to help cities with an action prioritization process that reflects best practices in climate action planning and the unique context and priorities of the city. The tool allows users to evaluate long lists of potential actions through a multi-criteria assessment that considers primary benefits, co-benefits, and feasibility. The process allows the user to determine priority actions by offering various points of comparison between actions. The ASAP tool is designed to *support* decision-making, and not to make decisions, as different stakeholders can reach different conclusions when assessing the impact and utility of specific actions. The subjective and

qualitative assessments facilitated through the ASAP tool are not intended to be perfect or absolute but are helpful in highlighting important action impacts to consider during the CAAP development process.

The ASAP tool allows users to select their own evaluation criteria to tailor the prioritization process to community values. Criteria are selected so that they reflect a variety of benefits that climate actions can provide yet are not so specific that they apply to only a few actions. The City of Davis selected three co-benefit and three feasibility evaluation criteria that it determined would best reflect community priorities and the City's primary decision-making concerns. The project team then used ASAP to evaluate the actions' relative emissions and climate risk reduction potential, their impact on the selected co-benefit and feasibility criterion.

Evaluation Criteria and Process

Primary Evaluation Criteria

ASAP provides a framework to estimate the relative GHG emissions reductions for actions, based on their relationship to the City's inventory and using some high-level implementation assumptions. The tool assigns each action a score which can be used to compare the primary benefits of each action to other potential actions, and to allow primary benefits to be considered alongside action co-benefits and feasibility. Additionally, ASAP allows for the weighting of evaluation criteria in order to reflect the relative importance of criteria within their score area. The project team assessed actions for their GHG emissions reduction potential and climate risk reduction potential by using City data, relevant studies, and results from similar actions.

GHG Emissions Reduction

To estimate an action's relative GHG emissions reduction potential, each action was rated in ASAP for the following:

- **Extent of Reach**: the proportion of GHG emitters within the subsector that will be targeted by this action
- **Reduction Potential**: the potential for the technology, behavior change, or other change encouraged by the action to reduce emissions
- **Uptake Potential**: the proportion of targeted GHG emitters that will likely implement the technological/behavior change that the action promotes

Estimates of GHG mitigation impact typically result in a range of emissions reductions that vary according to the anticipated extent of reach (e.g., number of targeted emitters) and uptake potential (e.g., likelihood of adoption) of each action. Considering the variability, emissions reduction scores were developed using a specific set of tiered inputs for each impact (for example, 0-19% or 80-100%) to account for unknowns and variability in emissions impact. This results in an overall GHG Reduction Score, which is a relative measure of the potential for an action to reduce emissions based on its relationship to the City's GHG emissions inventory. A bonus "Interaction Score" is given if the action reduces both GHG emissions and climate risk. Table 1 shows how an electrification action was rated in the tool, and its resulting Emissions Reduction Score:

Table 1. Electrification Action Evaluation Example

Action	Emissions Sector Addressed	Extent	Reduction Potential	Uptake Potential	Emissions Reduction Score
Adopt requirements for electrification of building systems at end of useful life.	All Stationary Energy	40-59%	80-100%	80-100%	12.5

Prior to action evaluation, the CAAP team established “rating rules and assumptions” to ensure consistency when applying action ratings to similar action types. Examples of these rules are as follows:

- Total GHG Emissions Reduction Potential is considered cumulative until 2040 (the City’s carbon neutral target year).
- New construction actions represent a small amount of additional emission growth until 2040, and therefore receive low emissions reduction scores.
- Incentives and voluntary actions have a 0-19% uptake potential due to the unpredictable nature of individual behavior.
- It is assumed by 2040 the electric grid will be powered by 100% clean energy. Therefore, electrification actions will have an 80-100% reduction potential.
- EV charging actions will support additional electric vehicle purchases, so have an indirect emissions reduction impact.
- Inorganic waste does not impact GHG emissions because waste products do not produce GHG emissions as they decay (they only produce GHG Emissions if combusted).
- Water conservation actions reduce water conveyance emissions but not wastewater emissions.
- Actions such as pursuing grant funding, updating plans, or performing studies were not rated for GHG emissions reduction.

Climate Risk Reduction

To assess the climate risk reduction of actions to support climate adaptation, the consultant team first developed scores from 1 (low) to 5 (high) for each of the City’s four major climate hazards (extreme heat, drought, wildfires/air quality, and precipitation and flooding) for:

- **Likelihood**: frequency at which the hazard is expected to occur (e.g., how often heat waves will happen and/or the duration of extreme heat days)
- **Impact**: severity of consequence anticipated to people, assets, or services when the climate hazard occurs

The likelihood scores were based on how frequently a particular hazard is expected to occur compared to the other hazards analyzed in the City. The impact scores reflected a high-level analysis of the effects of the project hazards. Multiplied together, the likelihood and impact scores result in an overall Climate Risk Score by hazard and approximate the maximum magnitude of risk that an adaptation action can reduce.

For each of the priority climate adaptation actions, the team then developed scores from 0-19% (low) to 80-100% (high) for:

- **Coverage**: proportion of people, assets, or services impacted by the climate hazard that could be addressed by the action
- **Effectiveness**: degree to which the action will alleviate climate hazard impacts on the people, assets, or services addressed by the action

Multiplied together, the coverage and effectiveness scores result in an overall Climate Risk Reduction potential score by action. A bonus “Interaction Score” was given if the action would reduce both GHG emissions and climate risk. Table 2 shows how a green space action was rated in the tool, and its resulting score:

Table 2. Green Space Action Evaluation Example

Action	Climate Hazard Addressed	Coverage	Effectiveness	Risk Reduction Score
Develop policies that require new green spaces in residential, multi-family housing, and commercial private developments.	Extreme Heat	0-19%	20-39%	2.6

The CAAP team established "rating rules and assumptions" for climate adaptation actions, too. Examples of these rules are as follows:

- Due to their unpredictable uptake, incentives and voluntary actions have a 0-19% effectiveness.
- Research and technical experience show that:
    - Shading actions have 0-19% effectiveness addressing extreme heat
    - Additional green space actions have a 20-39% effectiveness addressing extreme heat
    - Drought tolerant planting actions have a 20-39% effectiveness on drought
    - Graywater actions have a 60-79% effectiveness on drought.
- Total City water consumption is 50% indoor and 50% outdoor
- Actions such as pursuing grant funding, updating plans, or performing studies were not rated for climate risk reduction

Secondary Evaluation Criteria: Co-Benefits & Feasibility

Secondary evaluation criteria include co-benefits and implementation feasibility. The City of Davis selected three co-benefit and three feasibility criteria that reflect community values, primary municipal concerns, and which would apply to multiple CAAP areas (e.g., Energy as well as Natural Resources).

Co-Benefits

Co-benefits are benefits generated by actions beyond the primary benefits of GHG emissions reduction and climate risk reduction. Table 3 summarizes the co-benefit criteria selected by the City of Davis.

Table 3. Co-benefit Criteria Definitions

Evaluation Criteria	Definition
Air Quality & Public Health	Improve public health through reduced incidents of diseases and/or death attributed to improved air quality (indoor and outdoor), water quality, or increased physical activity.
Environmental Stewardship	Promote natural resources, environment, and/or greenspace conservation, creation, or regeneration.
Equity & Inclusion	Address an existing inequity in the community, such as disproportionate poor air quality, lack of access to transit, energy burden, flood risk, etc.

For a given action, each of the chosen co-benefits was rated on a qualitative ranking scale based on the degree to which implementation of the action will positively or negatively impact the co-benefit. Using a five-point rating scale allows numerous potential actions to be evaluated in a consistent and comparative manner. Each action and co-benefit pair received one of the five impact ratings shown in the Table 4. As shown, the same rating definitions were applied to the Air Quality and Public Health and the Environmental Stewardship co-benefits; the Equity and Inclusion rating definitions were modified slightly to better fit the criteria **Error! Reference source not found.**.

Table 4. Co-benefit Criteria Scoring Rubric

Rating	Score	Air Quality & Public Health and Environmental Stewardship Co-Benefit Impact	Equity & Inclusion Co-Benefit Impact
Very Positive	2	The action has a positive impact across the community	The action has a positive impact on and specifically targets vulnerable groups
Somewhat Positive	1	The action has a positive impact across a small portion of the community or a slightly positive impact across the entire community	The action has indirect positive impact on vulnerable groups
Neutral	0	The action has no impact, the impact is unknown, or the positive and negative impacts may negate each other	The action has no impact, the impact is unknown, or the positive and negative impacts may negate each other
Somewhat Negative	-1	The action has a negative impact across a small portion of the community or a slightly negative impact across the entire community	The action has a negative impact on vulnerable groups
Very Negative	-2	The action has a negative impact across the community	The action has a large and disproportionate negative impact on vulnerable groups compared to non-vulnerable groups

Actions were rated for their *potential* impact on Equity and Inclusion in the absence of any additional equity-enhancing measures, unless the action language specifically stated that it addresses vulnerable populations. For example, the action of "Require energy-efficiency upgrades at the time of sale or lease for residential and commercial properties" received a Somewhat Negative Equity and Inclusion score as it has the potential to place a disproportionately greater financial burden on low-income residents seeking to sell or lease their property. The action "Develop financing/incentives for purchasing or using bicycles, electric bikes, or scooters and include specific provisions for vulnerable populations" received a Very Positive score, as it specifically targets benefitting vulnerable populations. The criteria of Equity & Inclusion was given a weight of 2, essentially doubling its relative importance compared to the other co-benefit criteria. This change was made to elevate the importance of Equity & Inclusion in the action prioritization process and better reflect the City's values.

Table 5 shows how an action's co-benefit impact was rated and its corresponding Co-Benefit Score:

Table 5. Example of Impact Rating and Corresponding Co-Benefit Score

Action	Air Quality & Public Health	Environmental Stewardship	Equity & Inclusion	Co-Benefit Score
Develop incentives for ventilation upgrades and indoor air quality filters to improve indoor air quality in buildings and include specific provisions for vulnerable populations.	Somewhat Positive (1)	Neutral (0)	Very Positive (2)	5*
*Equity and Inclusion was weighted x2, therefore total score is 5				

Using a five-point rating scale allows numerous potential actions to be evaluated in a consistent and comparative manner.

Feasibility Criteria

Feasibility criteria describe how easy or difficult it will be to implement an action. Assessing action feasibility provides important context for decision-makers as they contemplate things like optimal launch timing, the need to pursue funding, and gauging capacity. These feasibility criteria will influence the likelihood of successful implementation. The City of Davis selected the three feasibility criteria to reflect its primary concerns and considerations regarding implementation. Each feasibility criterion has specific rating options that were defined by the project team. The feasibility and criteria rating options are listed in Table 6.

Table 6. Feasibility Criteria Scoring Rubric

Evaluation Criteria	Definition	Rating Guide	Score
City Authority[1]	Does the City have the legal authority to implement this action, or would it need to be implemented by another entity, such as the national government, a utility or agency outside of the city, or the private sector?	Yes, under existing policy	2
		Yes, but would require new policy	1
		No, joint authority	-1
		No, outside City authority	-2
Additional Capital Required to Implement	Beyond any funding that is currently secured or identified, how much additional capital would be required to implement the action (capital expenditure)?	No cost: $0	2
		Very low cost: $0-59k	1
		Some cost: $60k-499k	0
		Large cost: $500k-999k	-1
		Very large cost: >$1mil	-2
Public Support	Is the behavior or technology change encouraged by this action favored or disfavored based on public opinion?	Majority positive	2
		Minor positive	1
		Neutral/mixed	0
		Minor negative	-1
		Majority negative	-2

[1] No zero rating was defined for this evaluation criterion

Table 7 shows how an action's feasibility impact was rated and its corresponding Feasibility Score.

Table 7. Example of Feasibility Impact and Corresponding Feasibility Score

Action	City Authority	Additional Capital Required to Implement	Public Support	Feasibility Score
Convert the municipal off-road vehicle and equipment fleet to electric and/or alternative fuel options	Yes, under existing policy (2)	Large Cost (-1)	Minor Positive (1)	2

Prior to action evaluation, the City and its consultant team established rating rules and assumptions to ensure consistency when applying the action ratings to similar action types, such as the following:

- For actions that involve the creation of new policies, the Additional Capital rating only considers internal staff time for policy development. Therefore, these actions are rated at either Very Low or Some Cost.
- For actions that involve developing financing/incentive options, the City will obtain outside funding and will not directly finance these options. Therefore, the Additional Capital rating is related to staff time and/or private consultant work to find grant funding.

- Actions that do not need approval from City Council are typically rated as Very Low Cost.
- Public Support ratings are based on the City's collective experience with the community.

Additional Prioritization Factors

The project team received more than 900 comments during the public outreach process, including suggestions for many CAAP action ideas. These comments were consolidated with the recommendations made by the CAAP consultant team into 95 discrete actions and assessed using the ASAP tool. Most of the outreach, education, and advocacy actions were not included in the ASAP evaluation, as these are voluntary actions that typically do not result in significant direct GHG emissions reduction or climate risk reduction impacts. This set of ideas was included as a CAAP Appendix to serve as a menu of potential engagement ideas the City can use to support future CAAP implementation.

The goal of the project team was to prioritize 25 of the 95 actions evaluated through ASAP. To narrow down the prospective action list, the actions were filtered according to the following criteria:

1. Top scoring GHG emissions reduction potential
2. Top scoring climate risk reduction potential
3. Top scoring in all categories (GHG reduction, risk reduction, co-benefit, feasibility)
4. Top scoring in Equity & Inclusion
5. Top sector-specific actions (e.g., waste, carbon removal)
6. Top transportation sub-sector specific actions (e.g., Electric Vehicles, mode shift, land use change, Transportation Demand Management)

This iterative process allowed the project team to identify which actions produced the highest primary benefits but also achieved high scores across other criteria. The process also allowed for each sector and sub-sector to be included, as primary impacts from other sectors may have otherwise dominated the top scoring lists. This Action Selection and Prioritization process resulted in the draft list of 29 prioritized actions.

The series of figures on the following pages provide graphic outputs from the ASAP tool that were referenced during the draft prioritization process, illustrating the action evaluation results for GHG reduction potential (Figure 1), climate risk reduction (Figure 2), action co-benefits (Figure 3), and implementation feasibility (Figure 4).

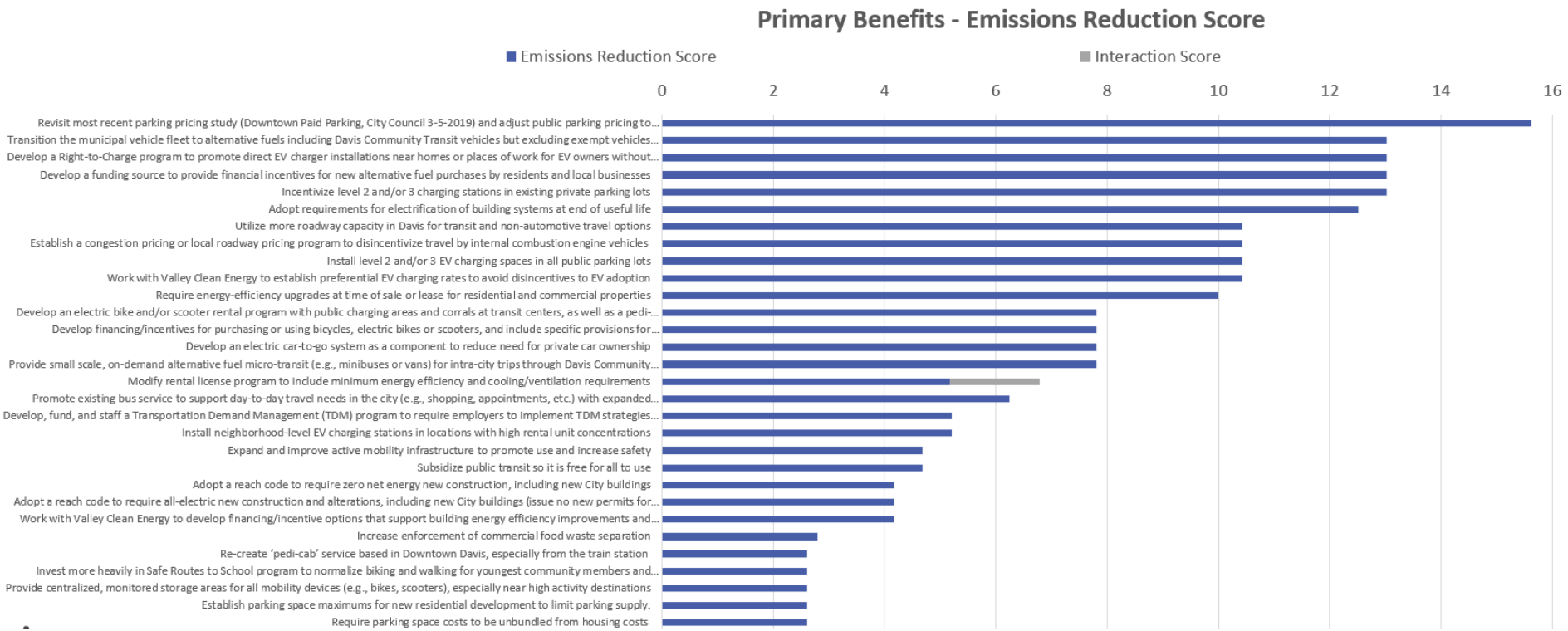

Figure 1. Emissions Reduction ASAP Chart

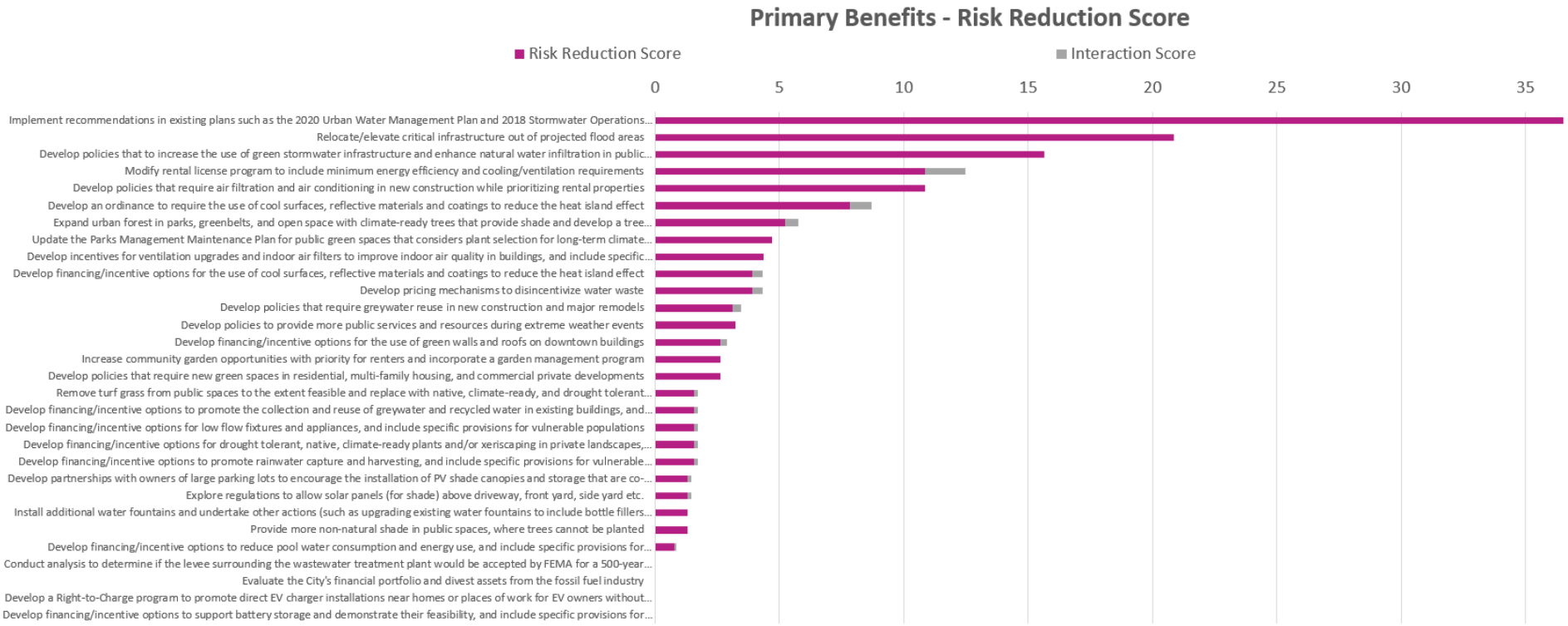

Figure 2. Climate Risk Reduction ASAP Chart

Figure 3. Co-benefits ASAP Chart

Figure 4. Feasibility ASAP Chart