



**CITY OF BOULDER
CITY COUNCIL AGENDA ITEM**

MEETING DATE: January 11, 2024

AGENDA TITLE

Update on Facilities Plan Implementation

PRESENTERS

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EXECUTIVE SUMMARY

The city's first Facilities Master Plan (FMP) was accepted by City Council in October 2021. The FMP represents a holistic approach to the management of the city's entire building portfolio and offers a strategic framework to guide investments that provide environmental sustainability, social responsibility, and financial stewardship in city buildings. The purpose of this study session is to provide an overview of the FMP and implementation strategies which include the Long-Term Financial Strategy (LTFS) specific to city facilities that was presented to council in May of 2023. Policy direction provided at that study session to dispose of vacated properties and apply savings to future building projects has informed essential steps forward in the specific funding approach to key projects that will be presented as part of the 2025 budget process.

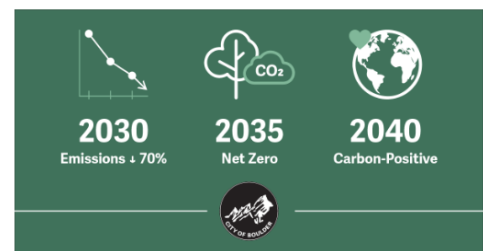
Staff will also share developments on three key projects being advanced in 2024: Fire Stations 2 and 4 replacements; East Boulder Community Center Renovation and Deep Energy Retrofit; and Alpine-Balsam redevelopment, including creation of a centralized Western City Campus. These key projects respectively ensure *safety*, support a *healthy and socially thriving community* and enable *good governance* of city infrastructure.

Achieving and sustaining meaningful outcomes with energy conservation, resiliency and social equity in buildings is embedded in their on-going operation and maintenance. The analysis provides further inspection of the FMP's Maintain Well key initiative and its impacts on lowering costs and achieving these goals.

Lastly, staff will provide an update on opportunities for a Public-Private Partnership (P3). The city is exploring how a private partner could help deliver building projects to achieve initial climate and social equity goals and four principal outcomes of the Maintain Well key initiative identified in the FMP over the course of a building's lifespan. The update to council will include background, information on the market sounding performed over the summer, and the process ahead including future key decision points.

KEY ISSUES IDENTIFIED

1. The city's building infrastructure is old and does not align with the city's climate, social or financial goals. Significant investments in equipment and systems replacement are needed to prevent failures let alone meet ongoing service delivery needs and community expectations. Despite ongoing efforts to increase energy efficiency in city buildings, many require significant investment. Further, city buildings currently rely heavily on natural gas for heating and cooling; planning and funding for transitions to cleaner fuel sources is necessary. Many buildings no longer support current models for service delivery, they do not meet current accessibility standards and are not welcoming to the community.
2. The city historically has underfunded operations and maintenance in buildings resulting in a large, deferred maintenance backlog. Not making equipment replacements when they are at the end of their life cycle has resulted in failures in systems and very costly emergency repairs. Implementing and funding a proper operations and maintenance plan following initial large capital investments is critical to not repeating the past and letting new buildings fall into disrepair in the future, losing the value of those initial investments.
3. A well-funded preventative maintenance program is essential to reaching the city's Climate Action Plan goals and reducing operational carbon emissions from buildings over its long lifespan. Furthermore, as climate change brings rising temperatures, weather extremes, and increasing poor air quality, indoor environments will be increasingly more critical to provide comfort, health and well-being.



The City of Boulder's GHG emissions reduction targets

The Maintain Well Key Initiative results in four principal outcomes that are at the heart of addressing the key issues within city facilities:

1. Lower Total Cost of Ownership (TCO) – By lowering the total cost of owning and operating buildings, funds may be directed towards other programs and services.
2. Achieve climate action targets and decarbonize the building stock - Buildings are very expensive to build, operate and maintain. New low and zero energy buildings are complex and *preventative maintenance is essential to preserving low energy usage over time.*
3. Providing resiliency to the community - Buildings support emergency and essential response to the community. Ensuring buildings are fully operational when a threat or crisis arises is paramount to providing a resilient response.
4. Addressing equity - Many of the services offered and received in-person in the city serve the historically marginalized. The care, cleanliness and state of the buildings is a direct reflection of the importance of the community accessing services.

The city is maintaining an aging infrastructure and simultaneously looking to the future with aggressive goals and massive investments in new buildings. **Investing in building operations, maintenance and planning for periodic renewal is how to drive these principal outcomes over the long life of these critical assets.**

Questions for Council

1. Does the City Council have questions on the Facilities Master Plan and the Long-Term Financial Strategy regarding city facilities?
2. Does the City Council have any questions on the importance and impact of the Maintain Well Key Initiative and the specific capital construction projects currently in design?
3. Does the City Council have any immediate questions on the P3 exploratory work?
4. Is there additional information council needs to inform a future decision on entering a P3 relationship?

BACKGROUND

The first [Facilities Master Plan](#) was accepted by City Council in October 2021. The plan depicted a history of acquiring buildings and properties over time as the city responded to growth in population and programs to support the community. The acquisition of buildings has traditionally been opportunistic in nature and did not consider a holistic “future-looking” approach to the city’s building portfolio. This has led to a current building portfolio of just under 80 buildings, with just under two million square feet. The average age of the building portfolio at the time the FMP was presented was 47 years with most buildings well over 30 years of age – the age when the costs associated with owning and operating buildings begins to escalate significantly.

The FMP recommended two key initiatives to strategically guide policy and funding decisions in city facilities. The first of those is to maintain buildings well; this applies

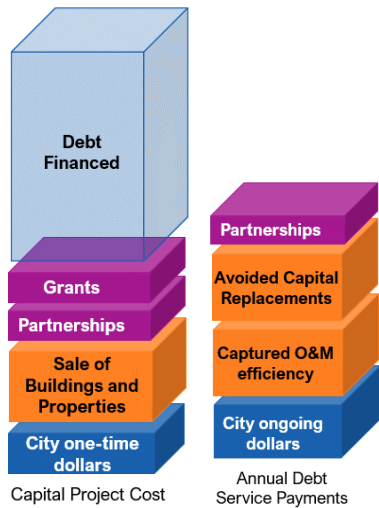
universally to every city facility and there are many paths to achieving this across the building portfolio. One strategic path that addresses roughly one-quarter of the city’s buildings is to consolidate services, which is the second key initiative recommended in the plan.

Three groups of buildings are being addressed in the first phase of implementation of the FMP. Community input alongside facilities data such as Facility Condition Indexing (FCI), and energy assessments support the prioritization of projects which address Fire Stations, Recreation Centers and consolidation of staff to the new Western City Campus at Alpine-Balsam.

Implementing the FMP and specific building projects requires a comprehensive financial strategy that leverages some of the specific qualities of our built environment to its advantage. At the [May 25th 2023 Council Study Session](#), staff presented a Long-Term Financial Strategy (LTFS) that identified two key policy decisions which are specific to buildings and essential ingredients to future investments:

1. Disposal of vacated city properties to create social, environmental, and financial value in pursuit of new building projects.
2. Ring-fencing (providing a virtual barrier that segregates these funds from the rest) savings generated through efficiency to be directed towards new building projects and not spread elsewhere across the city’s budget to fund unrelated work.

FMP Implementation and the Long-Term Financial Strategy



The Long-term Financial Strategy presented in May relies on creating efficiency and economy across the city’s building stock. Buildings are very costly to renovate or build new and even more costly to operate, maintain and periodically refresh and adapt to current needs.

The financial strategy for implementing large capital building projects relies on stacking “source blocks” of funding on top of existing city capital. That stacking is applied in two ways, first as funding sources for **Capital Project Costs** and then on-going funding sources for **Annual Debt Service Payments** assuming some part of the initial project cost is debt financed.

This model of layering funding source blocks is applicable to all building projects, but the contribution of a specific source varies depending on the project. To fund the needs of the city’s building portfolio it is essential to maximize the value of each of these sources.

Applying this LTFS to the Western City Campus (WCC) at Alpine-Balsam relies on vacating existing buildings when staff and services consolidate to unlock several million annually in the current budget directed towards these buildings. Following the May 2023

policy direction related to the LTFS, staff began to work towards closing the funding gap related to WCC financing and exploring options to address other funding and capital maintenance needs on all key projects. Since May, the following steps have been taken:

- Additional ongoing funding applied during annual budget process to fund debt service or partnership (\$6.2 million total)
- Application of one-time dollars to cash finance initial infrastructure costs at WCC (\$18.3 million).
- Initial valuing of 9 buildings considered as part of the consolidation initiative at either the WCC or Eastern City Campus referenced in the FMP.
- Planned investment totaling \$90.0 million in Community, Culture, Resilience and Safety (CCRS) funds to advance critical building projects, including the East Boulder Community Center and Fire Stations 2 and 4.
- Further exploration of P3 financing model to support portfolio (discussed below).

Once existing buildings are vacated, **there is no funding to maintain these buildings for other purposes.** Allowing the private market to achieve community goals through redevelopment of buildings the city vacates could result in proceeds in the tens of millions which would be leveraged towards initial capital reduction of construction projects. The Civic Area work includes a further market analysis of certain properties to uncover various opportunities for redevelopment that results in both funding for city projects and achievement of community goals in the area.

Public-Private Partnership (P3)

Historically the city has been underfunded and understaffed maintaining buildings at the level required to prevent those buildings from falling into disrepair. As the city makes significant investments in capital building projects it is critical to also put in place a proper strategy to operate and maintain well for decades to come. One strategic option may be to engage with a Private Partner and form a Public-Private Partnership, or P3 to ensure city goals are met and performance is maintained over the life of the building. The potential value of a P3 was first mentioned in the FMP and then discussed in depth at the May Study Session. **Council agreed with staff's recommendation to investigate this option further through direct engagement with the private industry.** Since that time, staff have conducted market soundings with the private industry to gauge interest and better understand scope, process and other specific details of a P3 to inform a formal procurement process and future decision making. This has led to the development of a Request for Information (RFI) that is planned to be released in Q1 of 2024.

With respect to the FMP, the specific projects identified and the P3 exploration has historically involved council in the decision making. **Attachment A** provides an overview of this process.

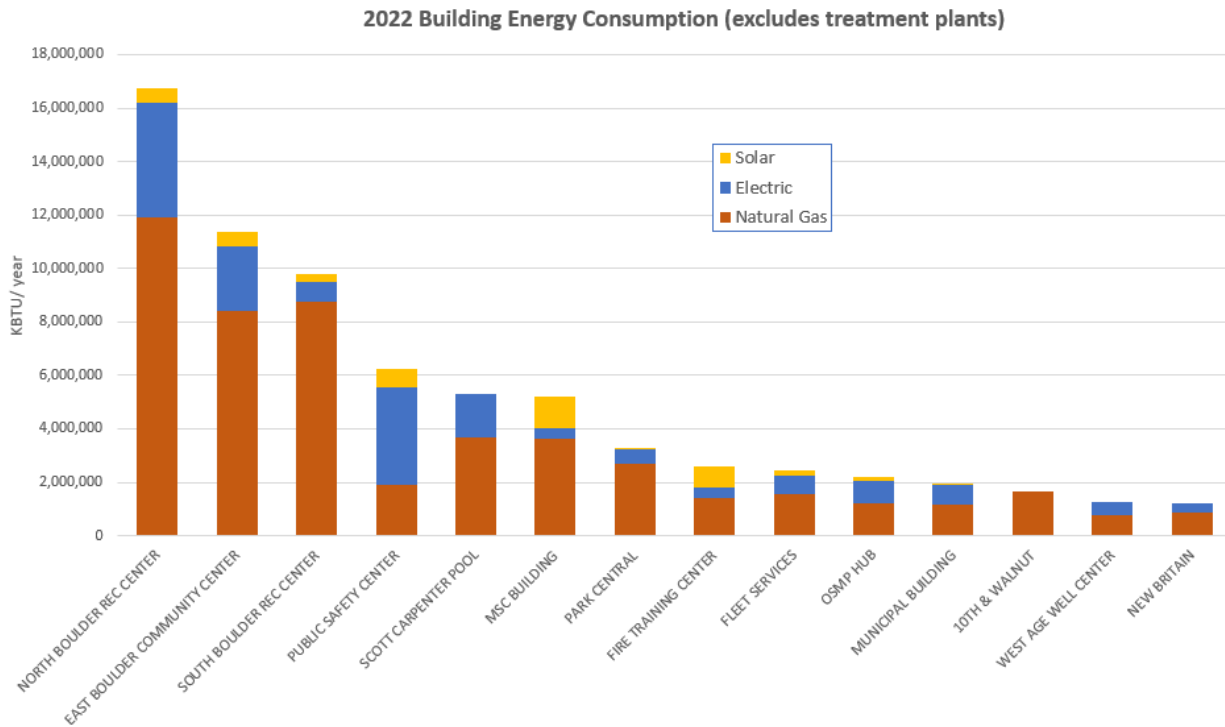
ANALYSIS

Key Projects Advancing in 2024

There are several capital building projects funded in 2024 that will address challenges with our current building portfolio. The specific buildings being renovated or replaced

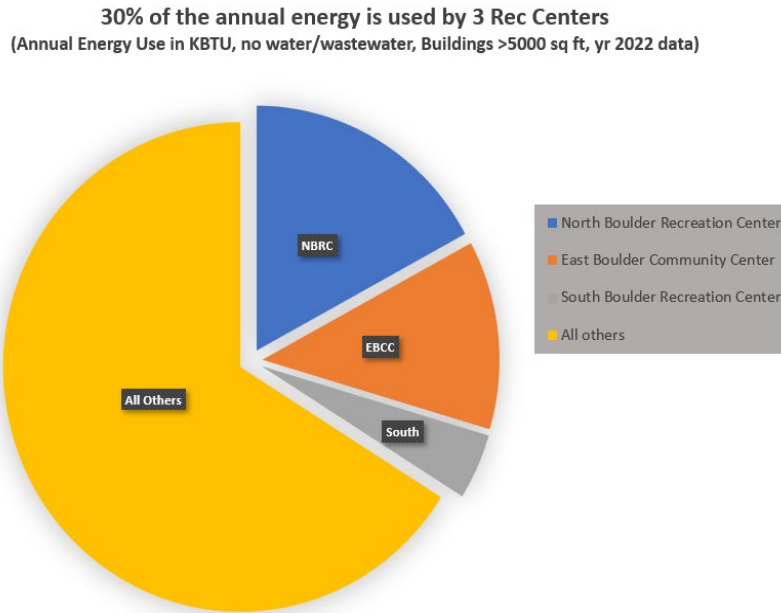
are part of a larger system of buildings that support the overall delivery of services in these specific areas. These projects have been prioritized by our community to meet program and service needs, to address sustainability, and provide resilience and safety.

- Fire Stations 2 and 4 have been identified for replacement and new buildings are funded through the CCRS tax extension. These Fire Stations are part of a system of stations that deliver emergency services to the entire community to keep it *safe*. Design of the new fire stations will happen following acquisition of property for each.
- The East Boulder Community Center will undergo an extensive renovation and deep energy retrofit, again funded by the CCRS tax extension. This center is part of a larger system of recreation centers that deliver a wide array of services to support a *healthy and socially thriving community*. Programming efforts on the EBCC renovation will be informed by an initial engagement “The Future of Recreation Centers” that will look comprehensively at how programs and services are delivered across all three rec centers in an efficient, effective and equitable way. This effort will kick off in early 2024 with issuance of an RFP for design and engagement services.
- Consolidation of staff from several existing buildings, primarily in the downtown area will achieve numerous benefits by serving the community better in one centralized location, meeting climate action plan goals, enabling further activation and re-imagining of the civic area, providing healthy productive workspace for staff and enabling *good governance* of expensive city assets and infrastructure.



The key projects identified above are further supported as priorities when evaluating their energy consumption shown in the graph above. The existing buildings being renovated, replaced or disposed of are among the highest energy consumers in the city’s building portfolio, excluding the treatment plants.

When looking at annual energy use, the three recreation centers make up a 1/3rd of all energy use across the city building portfolio, excluding only the treatment plants. These charts have been generated from the city’s Building Performance Ordinance data that is collected annually.



All three projects are either in design or expected to be in 2024 and the city anticipates being in construction on all of them by 2026. **Attachment C** shows a timeline for these projects including council opportunities for review outside of the annual budget cycle.

Collectively, the city is investing roughly \$250M in these projects alone and while this work will make significant progress towards meeting our Sustainability, Equity and Resilience objectives and address current infrastructure failures there are still more buildings in poor to critical condition, like these, that need to be planned for in the near future. Once these buildings are renovated or constructed, they must be operated and maintained in a way that maximizes energy performance, ensuring a welcoming, equitable, healthy indoor environment at the lowest total cost.

Applying the Maintain Well Key Initiative

Maintaining buildings well is essential following major capital investments in new infrastructure. Capital investments represent only 10% of the total cost of owning and operating buildings. Annual funding of at least 2% of the current replacement value (CRV) is an established industry standard to efficiently support the on-going maintenance

and infrastructure renewal needs of the building over its lifetime and keep TCO as low as possible. Additional funding up to 2% CRV is highly recommended to plan for necessary adaptations in buildings such as renovations like those in design at the EBCC to modernize the facility and meet community expectations. Adaptations also respond to updated building codes, accessibility standards, and to address social equity and inclusivity in the built environment such as renovations to provide all-inclusive restroom. This level of funding, between 3% to 4% CRV helps ensure all principal outcomes can be achieved.

Between 2015 and 2021 the city has invested **\$36.7 million on four buildings** in capital costs and for the first time in 2024 has budgeted for the ongoing maintenance and renewal of these buildings, but still not at the minimum 2% CRV recommendation. Without full annual recommended funding, these buildings are headed back on the path of our current portfolio – unfunded equipment replacement, drift in energy conservation, unreliability and disrepair.

- Fire Station 8 (2015) - \$3,996,947
- Brenton Building (2018) - \$8,000,000
- Scott Carpenter Pool (2020) - \$17,327,691
- Reservoir Main Building (2021) - \$7,307,368

The city will spend another **\$280 million** on five additional buildings by 2029.

- Golf Pro Shop (2024) - \$9,100,000
- Fire Station 3 (2024) - \$26,400,000
- Western City Campus (2024 Budget) - \$168,300,000
- East Boulder Community Center (2024 Budget) - \$51,500,000
- Fire Stations 2 and 4 (2024 Budget) - \$24,000,000

The total cost of owning and operating these nine buildings, when *properly funded* for maintenance over a 30-year lifespan will reach upwards of **\$2.7 billion** and costs will be exponentially higher, and at a loss of achieving the desired outcomes if the city continues current practices of underfunding on-going annual maintenance. **Capital construction projects must be accompanied by a well-funded, on-going operations and maintenance budget to not lose the value and desired outcomes these projects bring to the community.**

Maintain Well – An Energy Story

The FMP largely presented the importance of the Maintain Well key initiative in financial terms and lowest TCO. **But maintaining buildings well is furthermore essential to decarbonization.** Buildings that are designed to be low or zero energy consuming can only sustain that level of energy conservation over the course of the lifetime if properly maintained. These buildings rely on complex systems and are fine tuned to achieve energy efficiency when initially constructed. Maintaining that level of performance requires continuous monitoring, adjusting, commissioning, predictive and preventative maintenance.

According to the World Green Building Council, “Buildings are currently responsible for 39% of global energy related carbon emissions: **28% from operational emissions, from energy needed to heat, cool and power them**, and the remaining 11% from materials and construction.” Numerous other sources also cite the high percentage of emissions attributed to operating buildings and more specifically the equipment inside used to heat and cool them.

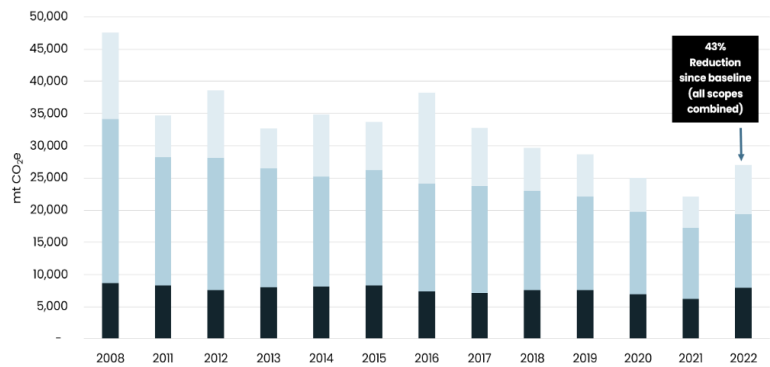
In the building industry new recommendations and processes are being developed that acknowledge the critical importance of ensuring newly designed net zero or low-energy building are equally ready to be maintained in such a way to operate at those low-energy design levels. One such recommendation is to incorporate an *extended transition to operations* or ETOP plan. As a new building nears the end of construction, an extended period of time is required to determine the nature and frequency of all preventative maintenance items that will be required to ensure ongoing zero or low-energy performance. This ranges from daily monitoring of set points to annual inspections and parts replacements to equipment replacements in 10 to 25-year life cycles. “All buildings should have this [preventative maintenance] cost planned – it is critical to make the building work as-designed and optimize the performance in the long-term” according to the American Institute of Architects (AIA) Advanced Energy Design Guide.

Another strategic way to achieve carbon reduction goals and maintain them into the future is through the approach of Zero Over Time or ZOT. There are two ways Facilities staff are implementing this in a fiscally responsible way:

- Any time a gas-fired piece of equipment is due for replacement, it is made with an all-electric alternative. Facilities staff take this approach to replacing boilers and other mechanical equipment when possible. Energy efficiency is further driven through building controls and automation upgrades.
- When examining new mechanical systems as part of a new construction or major renovation project, staff balance the tradeoffs in complexity of the system to achieve zero versus a possibly simpler more cost-effective system to install and maintain that may be low-energy but not net zero on day one.

In both cases, there is reliance on the continual greening of the utility grid to help buildings achieve zero carbon emissions over time. Priority in specific equipment and system selections is given to those that are easy to operate and maintain as again, it is the on-going O&M that is critical to maintain optimized energy performance over a 50+ year lifespan of a building.

The graph, taken from the City’s 2022 Greenhouse Gas Inventory shows in medium blue Xcel’s grid getting cleaner over time, but the dark blue – city building use of a gas fuel sources remaining flat. By Colorado statute, Xcel will reduce their grid emissions by at least 80% (from their 2005 baseline) by 2030. Xcel has committed to going farther and faster than this. We are on a trajectory to have zero or near-



zero emission electricity in less than 20 years. Conversion of fuel source from natural gas to electric in buildings should be prioritized along with on-going maintenance and operations that preserve energy efficiency. **Electric, low-energy consuming buildings will migrate to net-zero over time if well maintained.**

In new construction or major renovations, priority should be given to providing superior building envelopes, electrifying equipment and ensuring a predictive and preventative maintenance plan is in place. Electrifying existing infrastructure as we replace equipment in many buildings will contribute to decarbonizing the building stock over the next decade as equipment comes due for replacement.

A well-maintained building achieves lower total costs, continuously operates in an energy efficient way, which is resilient, and meets social responsibility by providing an ongoing healthy and welcoming indoor environment. A building that falls into disrepair, is unreliable, cannot maintain occupant comfort or energy efficiency. Buildings that look uncared for and neglected become a poor reflection on who they serve and support.

Lastly, a word on embodied carbon:

According to the World Green Building Council (GBC), “towards the middle of the century, as the world’s population approaches 10 billion, the global building stock is expected to double in size.” Total carbon emissions from the design and construction sector are considered in terms of “upfront carbon” (what it takes to build) and “operational carbon” (what it takes to operate and maintain). Between now and 2050, upfront carbon will be responsible for roughly half the entire carbon footprint. In a report “Bringing Embodied Carbon Upfront” the WorldGBC has issued bold targets that:

- By 2030, all new buildings, infrastructure and renovations will have at least 40% less embodied carbon and net zero operational carbon.
- By 2050, all new buildings and renovations will be net zero carbon and existing buildings will be net zero operational carbon.

The development of the Western City Campus is leading edge towards these goals starting with the highly successful deep energy retrofit of the Brenton Building. The adaptive reuse of the concrete structure preserved a large percentage of upfront carbon and the conversion of the building systems to very efficient, all electric, and construction

of superior envelope has resulted in an EUI reduction from over 100 to well in the mid 20's, representing significant reduction in operational carbon. This renovation succeeded not only on the sustainability front, but also as a fiscally responsible renovation as at this point the city has already realized the return on investment when compared to the alternative it was pursuing for leasing space. It also provided a welcoming customer service area and healthy work environment for staff, achieving all priority outcomes.

The next trailblazing approach taken on the site to preserve embodied carbon was initiated by council with direction to sustainably deconstruct the hospital. The outcome has resulted in a 94% diversion rate of materials from the landfill and direct reuse of the steel in the old hospital building on new city building projects like in the new Fire Station 3. This work has caught attention of [The Colorado Sun](#), [Denver News 7](#) and many industry professionals. In February city staff will be presenting the hospital deconstruction project at the Deconstruction and Reuse Conference 2024.

The total redevelopment of the Alpine-Balsam site and Western City Campus is on track to be a demonstration project for sustainable redevelopment, specifically around low-carbon redevelopment. Equally, it looks to set a high new standard for accessibility and inclusivity. A recent analysis at this stage of design was captured in a white paper submission "Boulder West City Campus: A Glimpse into a Decarbonized Future and High Performing Design" to the ASHRAE International Building Decarbonization Conference 2024. The white paper is included as **Attachment B**. Following completion of the entire redevelopment, a full analysis of the preserved embodied carbon and innovative approaches taken at all stages of the project will be generated.

This work at Alpine-Balsam and in the Facilities & Fleet Department to consider upfront and operational carbon more thoroughly in buildings is just one of many perspectives and work efforts being taken across the city by many departments to examine embodied carbon.

Public-Private Partnership (P3) Exploratory Work

One approach many municipalities are taking to address the same large infrastructure needs in an effective way is through Public-Private Partnerships. The FMP surfaced this as part of a financial toolkit laying a foundation to various ways building projects could be implemented. Continued work on how to implement the FMP has highlighted the potential value in entertaining a P3 relationship and **particularly to the benefit of maintaining our buildings well.**

In the May Council Study Session memo and presentation staff presented what a P3 relationship could look like, specific benefits to the city alongside the challenges of obligating to a partnership. To summarize: a P3 assumes the risk associated with maintaining buildings through *performance guarantees* ensuring operations continue to meet energy, sustainability, social and financial goals. This approach provides transparency and predictability in the budgeting process and avoids risks of failure in buildings, both of which strengthen city resiliency in delivering services to the community. This comes at a higher cost than if the city delivered and maintained projects

in the ideal manner, but at much lower cost than the city’s historic performance funding and maintaining city infrastructure. The other trade-off is a perceived loss of control in how buildings are maintained and in decision making, however this can largely be overcome by creating a strong collaborative working team, and solid agreements at the outset of the partnership. The key is acknowledging and celebrating mutually beneficial objectives and goals.

The recommendation in May was to continue exploring a P3 opportunity through Market Sounding that was conducted over the summer and then develop a procurement strategy to meet city goals and market requirements.

Market Sounding & Procurement Strategy

In July, city staff supported by the Ernst & Young Infrastructure Advisors (EYIA or EY) consultant team conducted a market sounding through issuance of a Request for Industry Feedback shown in **Attachment D**. The team met with eleven potential industry partners that represent experience with over 120 P3 transactions with total capital costs over \$12 Billion. Key insights from those discussions are as follows:



Project Size / Competitiveness

- Partners seeking projects of at least \$150M initial capital cost (prefer \$200M+) for long-term Design Build Finance Operate Maintain (DBFOM) arrangements like the city is considering.
- Project is well-aligned with investor interests given (i) city's values and FMP pillars and (ii) city’s holistic and proactive commitment to asset management and maintenance.



Value of P3 Approach

- Bundling multiple assets into the partnership offers construction and operational efficiencies.
- Both environmental and social values can be embedded into the contractual requirements with deductions and incentives for the investors
- Long-term DBFOM agreements incentivize proactive maintenance and lifecycle thinking.



Risk Considerations

- Significant O&M performance risk transfer can be achieved for facilities built by partner; partial risk transfer may be possible for renovations.
- Fixed design and construction pricing will be available at end of predevelopment agreement (PDA) period for initial phase; pricing cannot be locked in for future phases.



Procurement Approach

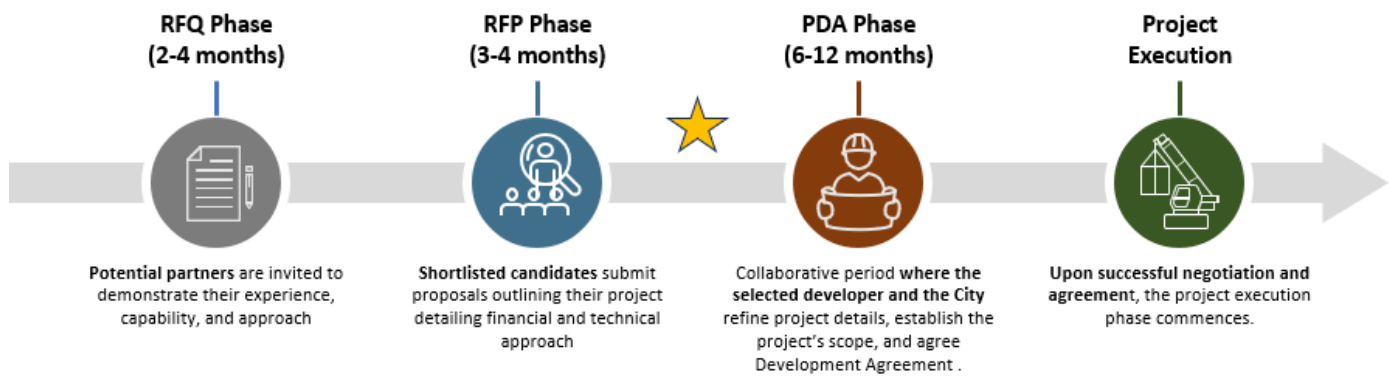
- A qualifications-based selection leading to a predevelopment period to finalize project scoping and approach aligns with Boulder goals for the project.

- Private partners interested in continuing collaboration with ZGF (designer of the WCC) either as their designer or owner's side technical advisor.
- The city team will need to take an active role in the process to achieve the full value of the partnership.

Direct conversation with market participants continued to support the notion that a P3 could provide great value to the city to deliver many building projects along with a method for maintaining them well in line with goals of the FMP and priority outcomes.

A P3 also can provide further efficiency through economy of scale when we standardize equipment, routines, schedules across building systems, such as across the Fire Stations or Recreation Centers. The potential to bring additional stations or centers into the partnership could drive more economy, performance and achievement of city goals and desired outcomes.

A process to continue exploration of a P3 was developed in the fall of 2023 and outlined below are the key phases.



The first two phases, release of Request for Qualifications (RFQ) and release of Request for Proposals (RFP) following a shortlisting of RFQ respondents continues the exploratory work. In these phases proposals will be submitted in response to criteria being developed by the city team to compare proposals to each other and against how the city would proceed in a more conventional way by self-performing financing, construction, operation and maintenance on its own.

The RFQ is planned to be released by early February. In advance of this formal solicitation the city held an Industry Information Session in December to share more details about the opportunity that will be presented in the RFQ and to provide time for teams to be formed, ideas to be generated to create the best responses. **Attachment E** is the presentation provided at the December 2023 industry event.

At the midpoint of this process (star) and following shortlisting of candidate's responses to the RFP, the exploratory work is complete. The city will review the RFP responses and formulate a recommendation to City Council on whether to proceed to a Predevelopment

Agreement (PDA) with a preferred partner. This go, no-go decision point is likely to come to Council in Q3 2024.

Predevelopment Agreement (PDA)

This is an agreement which governs the phase from selection of the preferred partner (aka developer) until signing of a Master Development Agreement (MDA). During this phase, the city is negotiating the terms of the MDA, availability payment approach, and other related items. The developer would also join the project team and start informing on the overall design. The developer/contractor would help drive down capital project costs and inform on elements they would ultimately be responsible for providing performance guarantees on. At the end of the PDA process, the developer will provide a **Guaranteed Maximum Price on both the capital construction AND the long-term operations and maintenance** of the project according to standards, key performance indicators and other criteria set by the city.

Initial PDA terms, issued in RFQ include:

- Agreed responsibilities of preferred partner and city during negotiations
- Initial Key Performance Indicators (KPI's) and guarantees
- Pre-defined progress milestones for preferred partner to meet
- Process for transparent pricing for construction and operations
- Terms and timing for city payment of predevelopment costs
- Termination provisions
- Mandatory City T&Cs to be included in DBFOM agreement

During the PDA phase, the city will further negotiate with a selected partner:

- Initial and future phases and scopes that could be included in the Master Development Agreement
- Define clear and measurable KPI's, Standards and Guarantees from Partner through integration into design process for the Phase 1 projects.
- Gross Maximum Price on Phase 1 projects, both construction and operations and define final availability payment
- Mechanism for incorporation of future phases and scopes
- Commercial terms (termination process and conditions, relief events, etc.) for inclusion in the Master Development DBFOM
- Risk allocation mechanism (including which costs/rates can be committed upfront versus bid at the time of executing each additional scope area)

Master Development Agreement (MDA)

This is the long-term (20-years +/-) agreement spanning through construction and operations period of all projects in the agreement, incorporating the terms that were negotiated during the PDA phase. This Master Development structure would include design, construction financing, and O&M for the initial scope areas, as well as mechanisms for designing and incorporating the future scope areas into that Master Development structure.

Future Recommendations brought for Council Decision

The city staff team working on the P3 effort reflects a highly collaborative cross departmental approach to initiating, evaluating and exploring potential execution of a P3. The team is led by the Facilities and Fleet Department and has several key staff developing the technical criteria related to building design and construction, energy and systems management, operations and maintenance. Central Finance and the City Attorney's Office are co-collaborators on the funding strategy, procurement approach and contracts development. Key staff from Parks & Rec and Fire are involved in decision making specific to those buildings being included in the Phase 1 projects. Representation from the City Manager's Office to provide an equity lens on procurement and implementation has recently been added to the team.

This team will assess proposals through the RFQ and RFP phases and develop a recommendation to council on whether to proceed with a partnership or not. The recommendation will be supported by detailed and specific building, financial, legal and program analysis that again compares the P3 with the city self-performing the work. Should staff make a recommendation to proceed with a P3 and enter a PDA, Council will be asked to make a motion to that effect. This is anticipated by mid-2024.

NEXT STEPS

Work on the projects identified as well as others will initiate or continue in 2024.

Alpine-Balsam and Western City Campus –

- In mid-2024, infrastructure construction will begin across the site. This will include greenway construction with limited construction in North Boulder Park at the 9th Street inlet, right-of-way improvements on Balsam Ave., 9th Street, Broadway and Alpine Ave. Underground utility work will take place across the site and the new 11th Street will be constructed.
- Design will continue on buildings with anticipated Planning Board hearing in Q2 with council call-up option on all Form Based Code and site review applications that have been made. Following approval, design work will continue with technical documents and building permitting in anticipation of a construction start in early 2025.
- Funding for the construction of the Western City Campus will be brought forward through the 2025 budgeting process in September 2024.

East Boulder Community Center (EBCC) Renovation and Deep Energy Retrofit

- A request for proposals (RFP) for design services will be issued in January. The first phase of this work will involve community engagement on “The Future of Recreation Centers” and will directly inform the program and planning of the EBCC. Energy retrofit design will take place in parallel with community engagement to ensure the project is advancing in a timely manner.
- The project is anticipated to be ready for construction by early 2026. A thorough analysis of construction phasing that results in the least disruption to services will inform exact timing of construction.
- Funding for the project is largely supported by the CCRS tax. Refined costs and funding requests will be made through the 2025 and 2026 budgeting process.

Fire Stations 2 and 4

- The city is in the process of finding and acquiring land for these replacement stations. RFPs for design services will be issued immediately following land acquisition to advance design and construction on the new stations as soon as possible. Information will be shared when it becomes available.
- Funding for the new stations is largely supported by the CCRS tax. Refined costs and funding requests will be made through the 2025 and 2026 budgeting process.

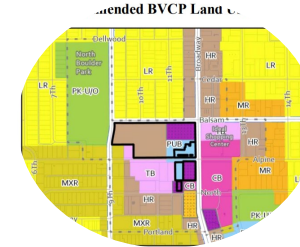
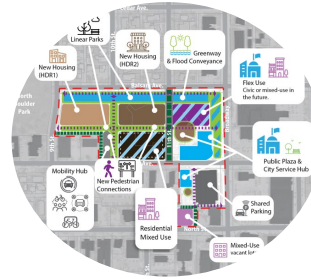
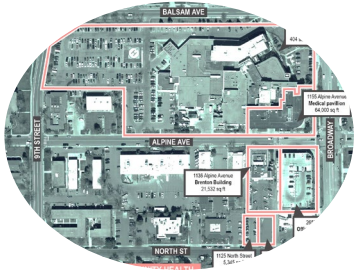
P3 Exploratory Work

The city is finalizing the Request for Qualifications for a Public-Private Partnership and anticipates issuing this by early February. The next steps are those identified in the discussion of P3. The most immediate next step will be shortlisting candidates responding to the RFQ and an update on the process will be made to council at that time, likely as an Information Packet item.

Property Acquisitions and Disposals to Support Further Consolidation of Services

City staff involved in the work described in this memo are also heavily engaged in other related planning processes such as the Civic Area work. Specifically, staff are continuing to evaluate community needs alongside strategic property acquisitions and disposals that support the collective goals of development of the Western City Campus as well as Civic Area development and specific community services provided in buildings that are at highest risk of failure and need to be prioritized for either heavy investment or replacement elsewhere.

Alpine-Balsam Milestones



Brenton Building Deep Energy Retrofit
May, 2019

Council decision to deconstruct hospital
May, 2019

Land Use Changes Adopted Dec 2020

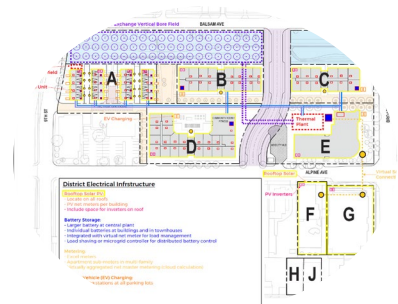
Form-Based Code Approved IGA with BHP signed
Oct, 2021

Vision Plan Adopted
June, 2017

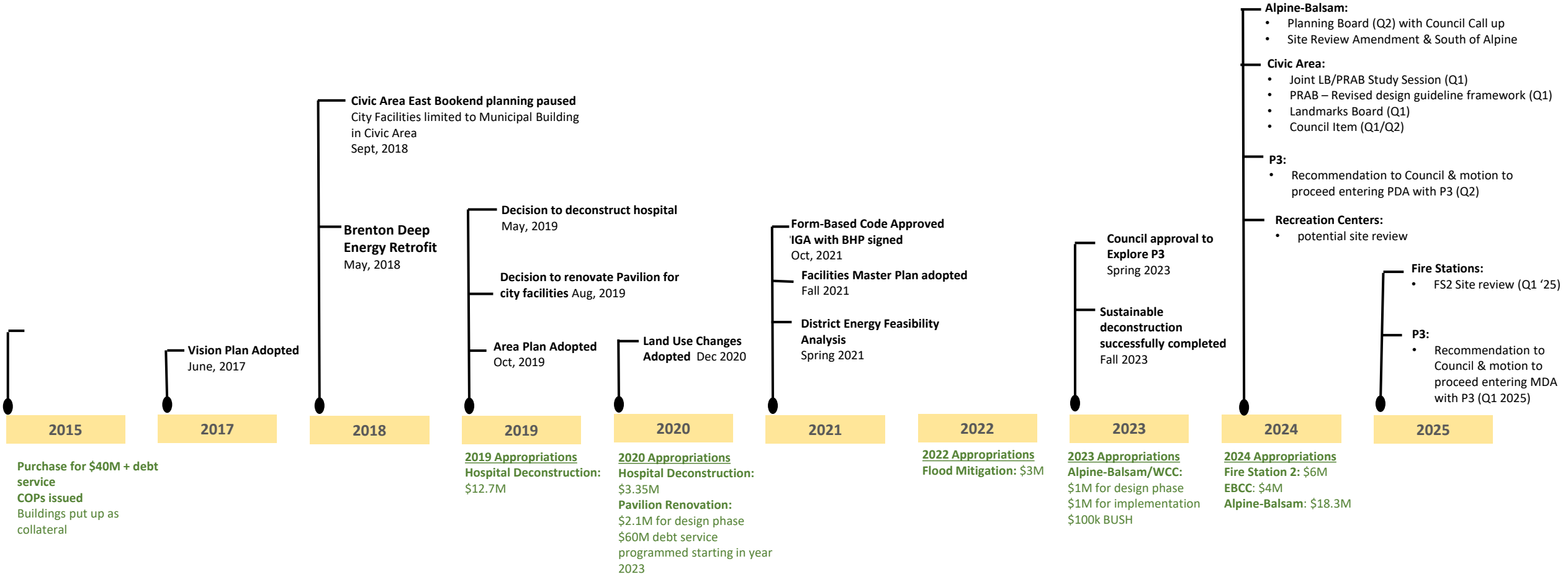
Pavilion Reuse Analysis

Decision to renovate Pavilion for city facilities
Aug, 2019

District Energy Feasibility Analysis
Spring 2021



Council Decisions & Appropriations



Boulder West City Campus – a Glimpse into a Decarbonized Future and High-Performance Design

Chris Chatto

ZGF – Sustainability Principal

Carlos Kelly

BranchPattern – Building Performance

Michele Crane

City of Boulder – Chief Architect

CITY OF BOULDER’S 2030 VISION

The City of Boulder purchased what is now called the Alpine-Balsam site in 2015 from Boulder Community Health, who up until this time had been operating a hospital and medical office facilities across the 8.8-acre site. In the following years, informed by extensive engagement with the community and guided by the city’s climate action plans a new vision for the redevelopment of this site emerged to create *“a vibrant multi-generational hub for community life and local government services – a welcoming and inclusive new model for equitable, affordable and sustainable living.”* With this vision, the city proceeded with redevelopment, and in addition to other goals set out to maximize the preservation of embodied energy on the site.

Concurrent with the redevelopment, the City of Boulder’s City Council accepted the first Facilities Master Plan (FMP) in October 2021. The FMP encompasses a holistic view of the city’s entire building portfolio and provides a strategic framework to guide investments that provide environmental sustainability, social responsibility, and financial stewardship in city buildings. One Key Initiative of the plan is to consolidate city services currently scattered across the community to one welcoming and accessible location. New investments in building infrastructure are to align with the city’s climate action plan which calls for elimination of natural gas usage where possible and is further guided by the goals to reduce emissions across the city by 70% by 2030, be net zero by 2035 and Carbon-Positive by 2040. The city wants to lead by example in how it redevelops its own buildings and sites to achieve these aggressive goals across the community.

INTRODUCTION

The new Western City Campus (WCC) that is being developed on a portion of the Alpine-Balsam site will adaptively reuse three existing structures to consolidate city services to this one location. The fourth building on the site that was part of the original purchase was [sustainably de-constructed](#). The goals of the hospital sustainable deconstruction project were to maximize reuse over recycling and recycling over landfilling. The project completed in late 2023 and achieved a 94% diversion rate from landfills – the most in city history. The project also carefully dismantled the steel structure and directly reused much of that steel in building new buildings in other areas of the city. Remaining steel on the site has been organized for easy reuse on more projects including those being redeveloped back on the Alpine-Balsam site. The concrete and brick portions of the hospital that remained were crushed on site to fill the large hole left behind when the 60,000sf+ basement was removed. This approach preserved this material on site and greatly reduced truck transport of old material away from the site and new material being brought back as fill. This will aid in making significant progress towards the preserved embodied energy goal and to date the city can quantify progress towards this goal through sustainable deconstruction alone.

Chris Chatto is a Sustainability Principal at ZGF, Portland, Oregon. **Carlos Kelly** is a Building Performance Modeler at BranchPattern, Pittsburgh, PA. **Michelle Crane** is Chief Architect, Facilities Capital Projects Manager at City of Boulder, Boulder, CO.

EXISTING PORTFOLIO

There are seven buildings that could be vacated through consolidation of staff and community services moving to the Western City Campus on the Alpine-Balsam site. Two buildings must be de-constructed because they are in the High Hazard Flood Zone. Seven buildings are in the city's Civic Area and by vacating them, can enable other city priorities to proceed. One building is leased and the other nine buildings are in poor to critical condition as rated on the FCI scale. Together, they represent \$15.3M in current unfunded liability which is projected to expand to \$32.8M by 2030. This expense is not currently budgeted but presents a real risk of failures in building systems. Vacating these buildings and properties will allow for future redevelopment of those sites to comply with current and future building and energy codes. All buildings currently use gas-fired equipment and depend on a range of mostly antiquated infrastructure.

Table 1. Existing Building Portfolio Details

Building	Area (sf)	Electric (kBtu/yr)	Gas (kBtu/yr)	Total	EUI (kBtu/sf/yr)
Park Central*	18,889	584,353	890,000	1,474,353	78
New Britain	13,310	369,150	856,100	1,225,250	92
Atrium	12,952	339,460	533,000	872,460	67
Iris*	14,959	483,499	452,400	935,899	63
Spruce Street	5,215	44,591	227,600	272,191	52
1301 Arapahoe	1,886	37,850	123,100	160,950	85
OSMP Hub	30,000	979,480	1,200,200	2,179,680	73
Age Well West	15,751	491,875	790,000	1,281,875	81
Total Existing Portfolio	97,211	2,838,383	4,282,400	7,120,783	73

*Includes renewables (pv) into energy records

BOULDER WEST CITY CAMPUS

The three existing structures that remain on the site are the Brenton Building, the Parking Garage and the Pavilion Building.

Brenton

Shortly after the purchase of the hospital in 2015 design work proceeded on the 21,000 sf Brenton Building to renovate the current Medical Office Building into a new city office building and consolidate a department that was currently fragmented across several existing city facilities. Design was guided by the newly established climate goals initiatives group and a guiding principle for City buildings to be more welcoming, inclusive and better support staff collaboration and work. At the time the renovation began, the Brenton Building had just scored an Energy Star rating of 1 and was one of the worst energy performing buildings in the city's building portfolio. The city advanced with its first deep energy retrofit of an existing building; the interior was gutted back to the concrete structure with systems and interior elements removed. The exterior walls were re-constructed to achieve high performing R values rating through new foam and board insulation and the envelope was completely sealed to exceed Army Corps of Engineers tightness ratings. The gas service was disconnected and a new VRF system was installed, and the building became the first all-electric building in the city's portfolio. The EUI went from 116 kBtu/sf/yr to 26 kBtu/sf/yr (366 kWh/m²/yr to 82 kWh/m²/yr) and the building went from one of the worst energy performers to one of the best. This smaller renovation became a blueprint for the larger Pavilion Building that would be renovated along the same lines.

The Pavilion

The existing 67,000sf Medical Office Building, known as the Pavilion, is being renovated in a similar manner as the Brenton Building. The existing structure has been stripped to its concrete shell with all interior systems and elements removed through the hospital sustainable deconstruction project and process. The renovation, currently in the middle of design, will use the existing four-story structure and add an additional floor on top and expand on all sides the building itself to roughly a 116,300 sf building (10,800 m²). The newly renovated building will provide centralized customer services to the community and house most city departments, centralizing many currently scattered offices to one location to enhance collaboration among staff and provide a healthy work environment.

Parking Garage

The existing five story parking structure is being reused and improved to provide parking to all of the redeveloped properties on the site with the exception of a small amount of market-rate housing. The goals for the total sites redevelopment are to provide access to myriad of alternative modes of transportation to reduce reliance on personal vehicles.

FRAMEWORK FOR SUCCESS

The city's Climate Action Plan has established climate reduction targets of being Carbon-Positive by 2040. The redevelopment of this site is envisioned to serve the community for the next century. The project is doing all that it can to meet this aggressive 2040 goal and lead redevelopment by example. This goal may be hit in stages and should be viewed in light of the total redevelopment. The sum of reuse of existing structures and the preservation of materials that were part of the deconstruction of the hospital all contribute to an enormous reduction in total carbon used to redevelop the site.

Net Zero Energy

The Western City Campus is committed to achieving Net Zero Energy, a feat that demands a strategic and comprehensive approach. While traditional approaches to Net Zero Energy involves lowering the energy use to its minimum, this project took another -yet more aggressive- approach. Early in design, the project team worked on several PV Layout options to maximize on site campus generation. Ultimately, four PV arrays are designed to be deployed on campus with a total estimated generation of 1,394 MWh/yr (4,749 MBtu). Details of the PV arrays are presented in table 2.

Table 2. Energy Generation Breakdown per Building

	MWh-yr	MBtu-yr
Pavilion	761	2,598
Parking Garage	437	1,492
Brenton	45	153
Carpports	150	512
Total	1,394	4,759

Under this assumption, to achieve Net Zero Energy, the overall energy consumption of the campus shall not exceed the energy generated on site. The team kept track of this target in different ways:

- **Total Energy Use vs Total Energy Generation.** Provided the total energy use is lower than the total energy generated, the campus is assumed to be Net Zero Energy.
- **Energy Budget.** The team developed an “Energy Budget”, under the assumption the Campus shall not exceed the energy consumption of given production. The energy budget is expressed as Campus EUI and then calculated as follows:

$$\text{Campus EUI Budget} = \text{Total Energy Generation} / \text{Total Campus Area}$$

$$\text{Campus EUI Budget} = 1,394 \text{ MWh (4,759 MBtu)} / 13,177 \text{ m}^2 \text{ (141,826 sf)}$$

$$\text{Campus EUI Budget} = 91.8 \text{ kWh/m}^2\text{/yr (29.09 kBtu/sf/yr)}$$

This formula can be modified and individual buildings of the campus can be isolated to estimate a “Building EUI Budget”. i.e: the following alternate formula shows the calculations for the Pavilion EUI Budget:

$$\text{Pavilion EUI budget} = (\text{Total Energy Generation} - (\text{Parking Garage Consumption} + \text{Brenton Consumption})) / \text{Pavilion Area}$$

$$\text{Pavilion EUI budget} = (1,394 \text{ MWh/yr} - (128 \text{ MWh/yr} + 146 \text{ MWh/yr})) / 10,800 \text{ m}^2$$

$$\text{Pavilion EUI budget} = 104 \text{ kWh/m}^2/\text{yr} \text{ (33 kBtu/sf/yr)}$$

This method proved to be helpful for the team to understand the individual impact for building level decision making, as referring to the Campus EUI Budget can present challenges to keep track of individual ECM's applied to each building. During the design phases, the team referred to these metrics interchangeably depending on if it was a Campus level decision or a Building level decision. Once the Energy budget was established, the team started to perform energy modeling to estimate each building's energy consumption while simultaneously deploying several active and passive strategies to get below the threshold. The following table summarizes the strategies implemented in each building and its predicted energy consumption. Note that for the purpose of this analysis, existing utility data was used for Brenton in lieu of modeled energy, both the Pavilion and Parking Garage data comes from energy modeling.

By harnessing renewable energy sources, implementing energy-efficient technologies, and incorporating innovative design strategies like natural ventilation, the campus aims to balance its energy consumption with the generation of clean, renewable energy. This not only contributes to the reduction of greenhouse gas emissions but also positions the campus as a model for sustainable energy practices.

Table 3. BWCC Energy Consumption Breakdown

	Pavilion	Parking Garage	Brenton
Estimated energy consumption: MWh-yr (MB Tu-yr)	935 (3,192)	128 (437)	146 (498)
Strategies Implemented:	-High performing envelope -Low Lighting Power Density & Daylight sensors -Natural Ventilation -Thermal Storage	-Low Lighting Power Density & Daylight sensors	-High performance envelope. -Simplified all electric Mechanical systems (DOAS + VRF's + Fan & Coils)

Net Zero Carbon

The City of Boulder's dedication to sustainability extends to achieving Net Zero Carbon, aligning with the imperative to mitigate climate change. This commitment reflects a proactive stance in combating climate change and showcases the campus as a pioneer in the drive towards a decarbonized future. Two components were analysed to estimate the carbon impact of the campus, embodied carbon, understood to be the upfront emissions for new building areas, and operational carbon, which refer to the emissions emitted due to building operations.

Embodied Carbon

Understanding upfront emissions is critically important to consider when planning and designing towards decarbonization. The City makes significant efforts to de-construct and retrofit existing infrastructure to mitigate the impact of embodied carbon for new buildings. During early stages of development, the project team has used references from Carbon Forum Leadership and Structural Engineering Institute to estimate the carbon impact of the new Pavilion's addition and Parking Garage façade intervention in addition to PV Life-Cycle Assessments to consider the impact of renewable embodied emissions.

The following table summarizes embodied carbon emissions for the campus:

Table 4. Scenarios Comparisons

	Brenton	Pavilion	Parking Garage
Embodied carbon (MT CO ₂ e)	N/A	Building: 982 PV: 631	Building: 1,495 PV: 976*
Scope:		-Building addition (49,300 sf, 4,580 m ²) -PV Support structure -PV Systems	-New roof -New façade -PV support structure -PV systems -Carport PV systems
Low carbon strategies:		-Building adaptive reuse -CLT structural system -Low carbon materials -Low carbon PV	-Building adaptive reuse -Low carbon materials -Low carbon PV
Total Embodied carbon (MT CO₂e)			4,085

*Includes carport PV systems.

Operational Carbon

The City of Boulder pushed for detailed calculation methodologies to estimate operational carbon emissions. While helpful, traditional methodologies using fixed rates fail to capture the real impact carbon emissions, given carbon emissions are closely tied to point in time grid emissions (or TDV, Time Dependent Valuation) as opposed to yearly Fixed Rate expressed in kg CO₂e/MWh (lb CO₂e/MWh). This essentially means that in order to claim “Carbon neutrality”, a similar methodology to Net Zero Energy calculations can be acceptable and should be superseded by Time Dependent Valuation, which provides further insight into variations. Simply put, a kWh of energy during the summer is essentially the same as a kWh of energy consumed during the winter, but the carbon footprint of that kWh can widely vary as the grid may be cleaner during summer when more renewable energy is available in the grid, whereas in winter that same kWh may be coming from a more coal-based energy source due to the lack of renewable resources.

With the campus featuring significant PV arrays to achieve Net Zero Energy, Time Dependent Valuation becomes increasingly important, as even with overproduction of energy, it doesn’t necessarily mean that the campus automatically achieves carbon neutrality. The following sections elaborate on discrepancies found when performing the two approaches.

Fixed Rates. Following this calculation method, projects calculate Carbon emissions by multiplying the energy consumption of a project by a fixed carbon emission rate. Projects frequently are allowed to use data from the Environmental Protection Agency, National Renewable Energy Laboratory (NREL) Cambium, or can use those outlined by standards like ASHRAE 189.1. The following equation shows the calculation for carbon emissions when using fixed rates:

$$\text{Carbon Emissions} = (\text{Energy Consumption} - \text{Energy Generation}) * \text{Carbon Emission Rate}$$

The following table shows the Carbon Emissions breakdown:

Table 5. Annual Carbon Emissions/Avoidance per Building using Fixed Rates

	Energy Consumption	Carbon Emissions	Energy Generation	“Avoided” Carbon Emissions
	MWh (MBtu)	MT CO ₂ e/yr	MWh (MBtu)	MT CO ₂ e/yr

Pavilion	935 (3,190)	145	761 (2,598)	118
Parking Garage	128 (437)	20	437 (1,492)	68
Brenton	146 (498)	23	45 (153)	7
Carport	0	0	150 (512)	23
Total	1,209 (4,125)	188	1,394 (4,756)	216

As shown, when following Fixed Rates methodology, the project could potentially claim to be carbon neutral, given it simply produces more energy than it consumes. The following section uses the same energy information but considers the TDV of energy consumed and produced.

Time Dependent Valuation (TDV). This methodology presents similarities with Fixed Rates, in a sense, it is essentially the same principle of multiplying a unit of energy by a carbon emission rate. The difference comes from the fact that as opposed to doing it to the sum of energy over a year, each hour is multiplied by a different carbon emission rate. This means that not only is 8760 data required from the energy modeling software, but 8760 data for carbon emissions rates is required as well. This same principle can also be applied to energy generation, which provides greater insight to carbon “offsetting” from on-site renewables. The following table summarizes TDV calculations for energy consumption and generation and compares the results obtained from Fixed Rate.

Table 6. Annual Carbon Emissions/Avoidance per Building using TDV

	Energy Consumption	Carbon Emissions (TDV)	Carbon Emissions (Fixed Rates)	Energy Generation	“Avoided” Carbon Emissions (TDV)	“Avoided” Carbon Emissions (Fixed Rates)
	MWh (MBtu)	MT CO ₂ e/yr	MT CO ₂ e/yr	MWh (MBtu)	MT CO ₂ e/yr	MT CO ₂ e/yr
Pavilion	935 (3,190)	124	145	761 (2,598)	5	118
Parking Garage	128 (437)	19	20	437 (1,492)	37	68
Brenton	146 (498)	22	23	45 (153)	6	7
Carport	0	0	0	150 (512)	13	23
Total	1,209 (4,125)	165	188	1,394 (4,756)	121	216

As observed, when following this calculation method, we arrive to a different conclusion; the campus is not carbon neutral. This reinforces the theory that the impact of renewables is less significant given they produce energy and avoid emissions when the grid is the cleanest, while the impact during winter periods is less impactful. Thus, a discrepancy between energy and carbon emissions is evident.

Grid Scenarios. Traditionally, as mentioned in Fixed Rate section, when performing carbon calculations project teams refer to references like EPA, ASHRAE 189.1 or NREL. Referring to both EPA and ASHRAE 189.1 carbon rates however, implies referring to static -potentially old- carbon rates. When performing long run projections for carbon emissions it is critical to account for changes in the grid over time. This can bring certainty and scrutiny to decisions like decarbonization and more accurate predictions for operational carbon overtime. While there is also uncertainty about how the grid is going to be in the future, NREL Cambium data sets contain modeled hourly emission, cost, and operational data for a range of possible futures of the U.S. electricity sector through 2050, with metrics designed to be useful for forward-looking analysis and decision support. For this project, it was critical to use future grid modeled data to determine if the campus would, within a reasonable timeframe, be cleaner than to keep operating the existing portfolio. After analyzing the differences between the different grid scenarios, the project team decided to use the 95% Decarbonized by 2050, Long-run marginal emissions rates

for the state of Colorado for the purpose of the analysis. This allowed the team two things:

- Perform adjusted emissions estimates over time from 2030-2050.
- Perform Time Dependent valuation calculations for both energy consumption and generation.

For the analysis, 2030 was selected as the first year the Campus is expected to start operations. The following Figure 1 shows the heat map of given grid scenario for 2030.

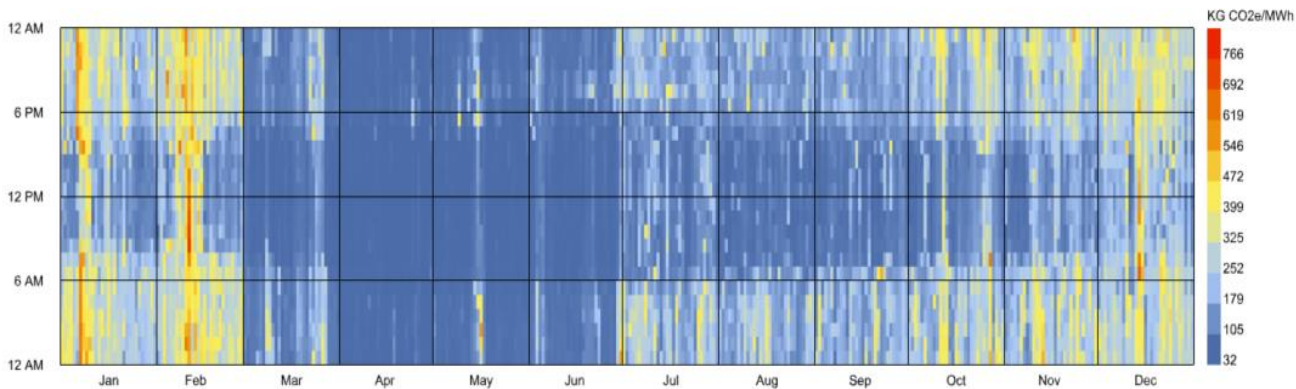


Figure 1: NREL_95% Decarb by 2050_2030_LRMER_Colorado (KG CO2/MWh)

RESULTS

Once both analyses were performed for both embodied and operational carbon, the team decided to compare the long run emissions of three different scenarios detailed in the following table:

Table 6. Scenarios Comparisons

	Existing City buildings portfolio	Business as Usual (BAU)	BWCC
Embodied carbon	N/A	<p>Complete new buildings:</p> <ul style="list-style-type: none"> • Pavilion: 116,300 sf (10,800 m2) • Parking Garage: 125,700 sf (11,680 m2) • Brenton: N/A 	<p>Building adaptive reuse:</p> <ul style="list-style-type: none"> • Pavilion extension: 49,300 sf (4,580 m2) • Parking Garage: Façade intervention + new roof • Brenton: N/A
Operational Carbon	<p>All buildings: Projected emissions per utility bill record from 2022.</p> <p>Renewables: Some buildings include PV systems.</p>	<p>Pavilion & Parking Garage: Projected emissions modeled per ASHRAE 90.1-2019. Including electric and natural gas for heating.</p> <p>Brenton: Projected emissions per utility bill records from 2022.</p> <p>Renewables: No renewables.</p>	<p>Pavilion & Parking Garage: Projected emissions modeled as designed systems.</p> <p>Brenton: Projected emissions per utility bill records from 2022.</p> <p>Renewables: As designed in all campus.</p>

Unlike traditional Life Cycle Assessments, which typically feature a analysis timeframe of 50-60 years, the project team decided to only perform calculations from 2030 to 2050. This timeframe was selected because NREL Cambium scenarios only predict grid data until 2050, hence, estimating beyond 2050 could lead to unrealistic results. The following graphic visualizes the embodied and operational carbon emissions over the course of 20 years for each of the three presented scenarios. Note operational carbon emissions decrease overtime as the grid gets cleaner, this data was obtained from NREL Cambium projections for 95% Decarb by 2050, Long Run Marginal Emission Rates for the state of Colorado.

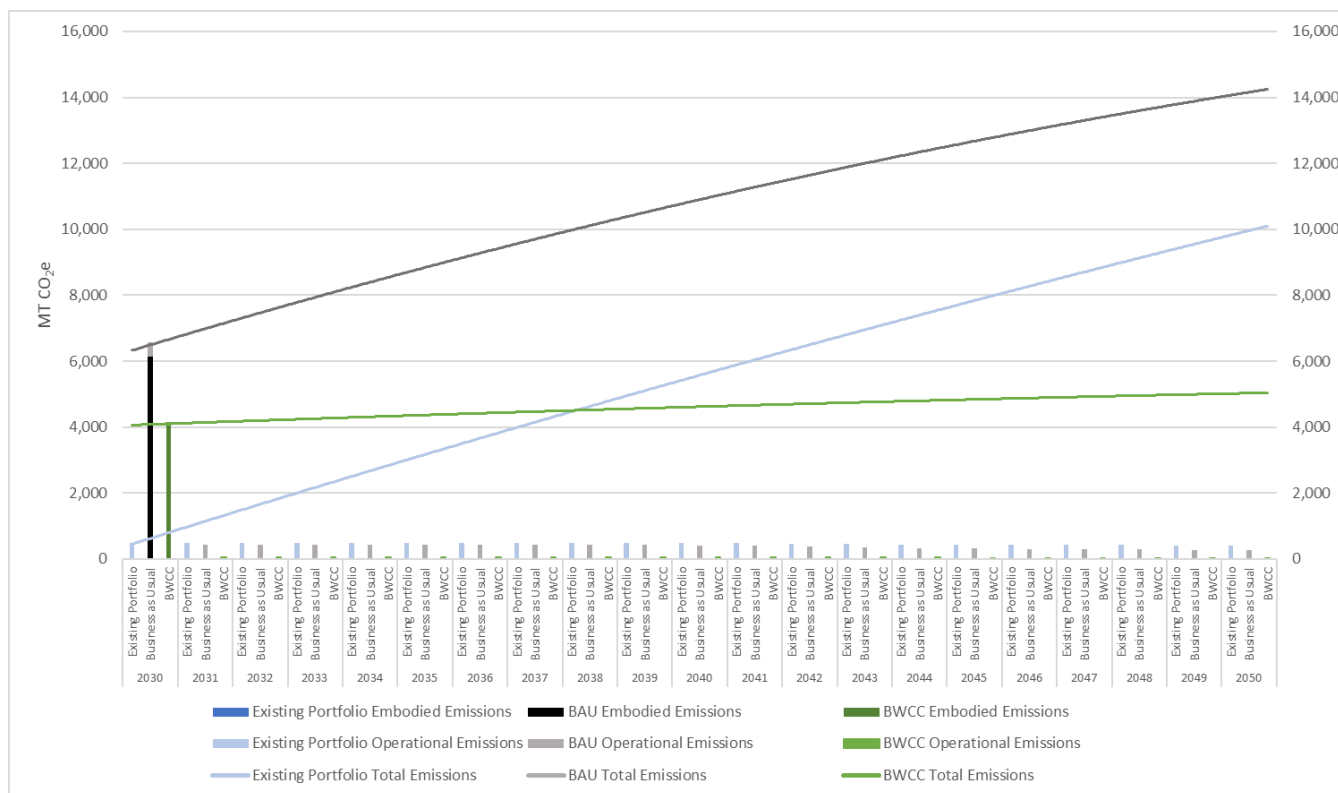


Figure 2: Scenarios Total Emissions Overtime.

The previous graphic compares the total emissions (Embodied & Operational) for three scenarios. Shown in blue, we can observe how even tho not producing up-front emissions, operating the existing portfolio is the most energy demanding thus incurring in significant operational emissions overtime. Shown in black, it can be observed that developing a complete new campus with code compliant energy performance can potentially lead to even greater emissions than to keep operating the existing portfolio. Finally, shown in green, a combination of readaptive reuse and high performing systems play a significant role in reducing both embodied and operational carbon emissions, potentially achieving a breakeven point against the existing portfolio after 8 years of full operation.

CONCLUSION & FINDINGS

Strategic Urban Redevelopment for Environmental Sustainability: The redevelopment of Boulder West City Campus serves as a compelling case study for strategic urban planning and redevelopment with a focus on environmental sustainability. By reusing existing structures, adopting innovative design strategies, and incorporating renewable energy sources, the campus not only meets ambitious climate reduction targets but also sets a benchmark for future sustainable developments.

Net Zero Energy and Net Zero Carbon Achievement through Comprehensive Planning: The commitment to achieving Net Zero Energy and Net Zero Carbon at the Western City Campus underscores the importance of a comprehensive and forward-thinking approach. The meticulous consideration of energy budgets, the strategic placement of photovoltaic arrays, and the integration of energy-efficient technologies showcase a commitment to not only reducing energy consumption but also mitigating the carbon impact of the campus. This dual focus positions the campus as a leader in comprehensive sustainability practices.

Critical Examination of Carbon Calculation Methodologies and Future Grid Emissions: The study sheds light on a critical aspect often overlooked in sustainability assessments – the methodology used for calculating carbon emissions. By comparing Fixed Rates and Time Dependent Valuation (TDV) and incorporating future grid emissions for long-run projections, it becomes evident that a nuanced, refined approach is essential to avoid misleading results. This highlights the need for the industry to adopt more sophisticated methodologies that consider the dynamic nature of grid emissions, ensuring accurate assessments for informed decision-making.

Decarbonized Design: A Blueprint for Future Sustainability: The emphasis on decarbonized design principles in the redevelopment of the Boulder West City Campus not only reflects a commitment to environmental responsibility but also establishes a blueprint for future sustainability. The integration of low carbon materials, high-performing envelope systems, and renewable energy sources showcases a holistic approach that extends beyond energy efficiency. This design philosophy, considering both energy and carbon aspects, positions the campus as a model for creating resilient, eco-friendly spaces for future generations.

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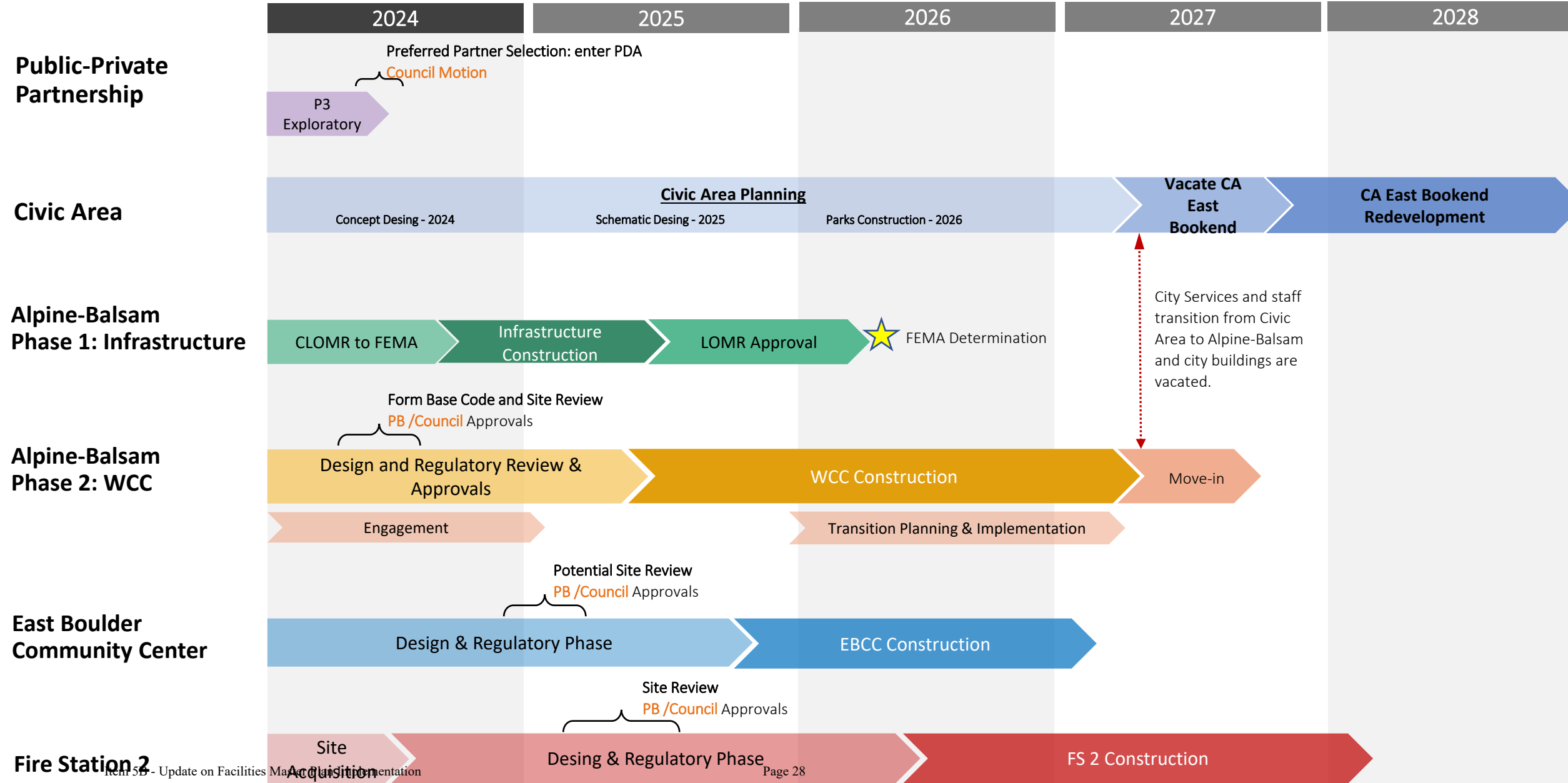
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Key Project Schedules





REQUEST FOR INDUSTRY FEEDBACK FOR FACILITIES MASTER PLAN PARTNERSHIP WITH THE CITY OF BOULDER

DISTRIBUTION DATE

June 30, 2023



INTRODUCTION & GOALS



With the publication of its Facilities Master Plan (FMP) in 2021, the City of Boulder recognized it was at an inflection point in the life of its existing building portfolio to think strategically and holistically about how the City will continue to deliver services – and the facilities it will deliver those services from – for the next 10, 30, and 50 years. The majority of the City’s 76 buildings are over 30 years old and preventative maintenance spending has not kept pace with the portfolio’s maintenance needs, leading to deferred maintenance of \$55m today, anticipated to grow to \$175m by 2030.

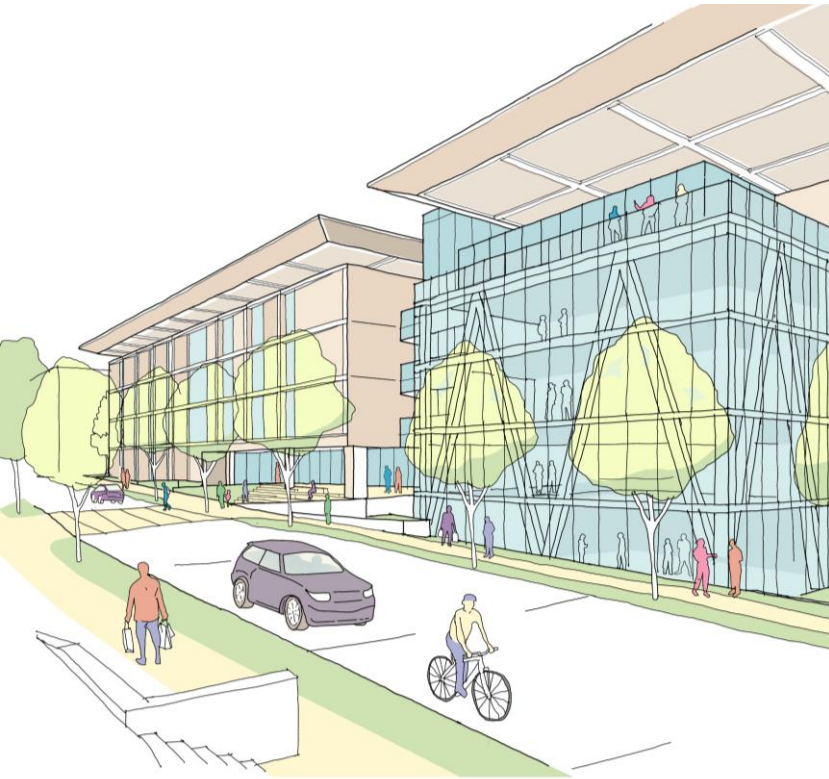
The FMP envisions a strategic shift by which the City adapts its asset portfolio to an environmentally, socially, and fiscally sustainable **consolidated portfolio of new and retrofitted facilities** that help the City efficiently and effectively deliver core public services.

Boulder is prepared to invest proactively and has identified its highest impact, top priority initial projects coming out of the FMP. The City is in the process of determining the preferred implementation approach to procure individual projects or bundles of projects. If proceeding as one or multiple **availability payment DBFOM P3s**, implementation could involve:

- Design, build, finance, operate and maintain the **Western City Campus**, a centralized City services and community engagement hub co-located with City-led affordable housing development;
- Design, build, finance, operate and maintain the **Eastern City Campus**, a 30+ acre site for consolidation of City services;
- Design, build and finance **two new fire stations** to replacing existing aging facilities and renovations across the other six stations; and
- Design, finance and limited operations for deep energy retrofits for **three of the City’s existing Recreation Centers**.



THE OPPORTUNITY



We are seeking industry feedback on how P3 partnerships can help Boulder advance its FMP, in particular for the Western City Campus, Eastern City Campus, Fire Stations and Recreation Centers with an opportunity to define and participate in future phases.

How the City delivers on the FMP will be based on the approach that can best meet its sustainability, fiscal, and social objectives and achieve the vision of the FMP, and your input is crucial. This Request for Industry Feedback (“RFIF”) is intended to secure feedback from **investors, developers, contractors, and operators** who may wish to participate as part of a P3 development team to inform transaction structuring, procurement approach and other key strategic considerations.



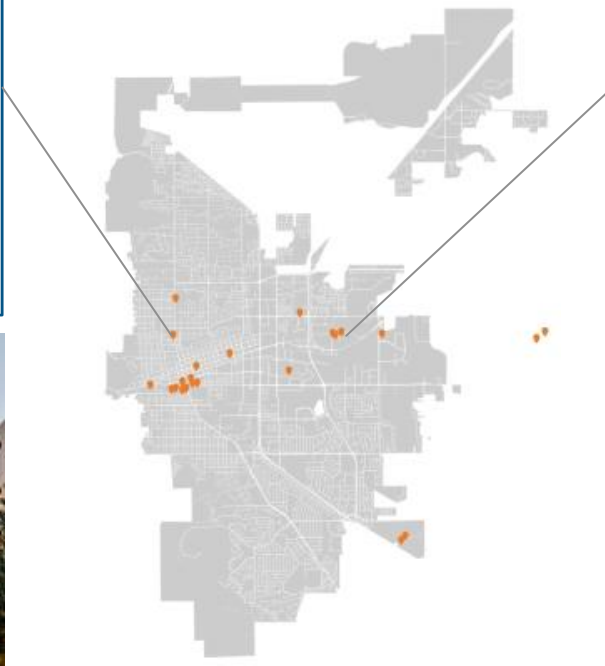
FMP PRIORITY PROJECTS

Out of its portfolio of 76 buildings, the City is prioritizing in a first phase the projects below to help achieve the City’s financial, social, and environmental metrics and objectives. These projects largely involve consolidation and disposal of aging existing facilities, and in cases where facilities are purposely decentralized for citizen services, targeted replacement or deep retrofits.

Western City Campus (WCC)
 By consolidating key City services into a 130k+ GSF office building, the new WCC will result in financial savings, operational efficiencies, and progress towards climate and social goals.
Indicative cost: \$150-200m
Current status: Design



Potential Buildings for Consolidation



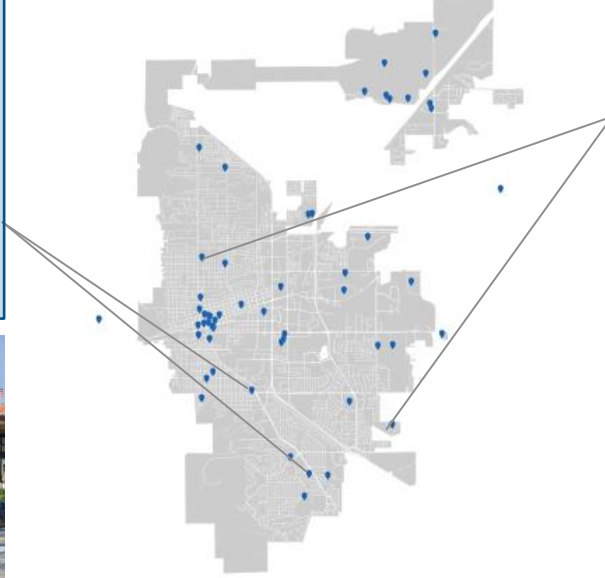
Eastern City Campus (ECC)
 The ECC would consolidate 10+ buildings – new facilities would include a 100k GSF Public Safety Building, new Fleet and Municipal Services facilities, and related parking.
Indicative cost: TBD
Current status: Site Master Planning and Scoping



Fire Stations
 The City is planning to replace two fire stations with durable, long lasting, and energy efficient facilities, along with renovations to six existing stations.
Indicative cost: \$40m
Current status: Scoping



Purposefully Decentralized Buildings



Recreational Centers
 The City has North, East, and South Boulder Rec Centers. To optimize financial savings and climate goals, the City is considering deep retrofits and consolidation.
Indicative cost: \$60-150m
Current status: Pre-Design and Scoping



PROCESS & SCHEDULE



ONE-ON-ONE MEETINGS

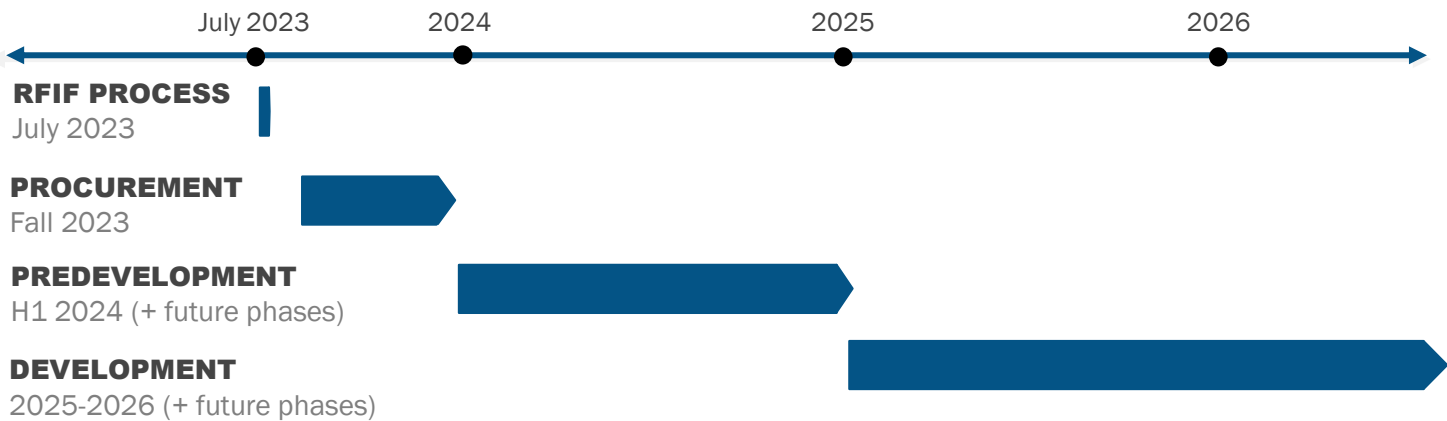
We invite future potential industry partners to participate in individual meetings with the City staff. The City welcomes firms with experience meeting one or more of the criteria below to request a meeting. **Meetings will occur July 17, 19, and 21**, and will be conducted virtually.

Experience in at least one of the following:

- Designing and/or constructing publicly-operated facilities
- Developing 100,000+ SF public service facilities via partnerships
- Operating and maintaining public buildings in support of energy efficiency goals
- Improving, retrofitting, building new facilities to achieve social and environmental outcomes

Boulder holds itself to high standards regarding the City services it delivers and the social and environmental goals it has committed to – the City would expect any future partner to hold itself to a similar set of standards and values and demonstrate these values on previous projects.

POTENTIAL FMP IMPLEMENTATION TIMELINE (for initial bundle of projects)



The City will incorporate feedback from this RFIF process into a procurement strategy for the Project and expects to procure a development partner for the initial project or bundle of projects (anchored with the WCC) in the Fall of 2023, with a goal to begin delivering the initial priority projects from the FMP no later than 2026. The City has begun design for the WCC already and is proceeding with pre-construction over the next six months; prospective development teams should consider the potential to work directly with the City’s existing architect (ZGF) and any pre-construction partner brought on board prior to a P3 procurement.



PROCESS & SCHEDULE

NEXT STEPS

If your firm is interested in scheduling a meeting, this can be done at [this link](#). Please provide an indication of interest in a meeting no later than July 11, 2023 so time slots can be finalized. More information on the FMP implementation and current project status can be found [here](#). Firms will be able to submit questions for the City ahead of meetings.

After concluding these initial industry feedback discussions, the City plans to share an updated Project overview and approach ahead of procurement documents to allow firms to partner to create development teams.

In parallel to this industry process, the City is also undertaking community engagement processes for certain scope components (in particular for the Recreation Centers) to inform the Project development process. Feedback from this process will also be incorporated into the procurement process and the ultimate project goals and structure.

RFIF RELEASE	June 30, 2023
MEETING REQUEST DEADLINE	July 11, 2023
NOTICE OF MEETING TIME	July 13, 2023
ONE-ON-ONE MEETINGS	July 17, 19, 21, 2023
PROJECT UPDATE ISSUED	September 2023

ADDITIONAL INFORMATION

This document is provided for informational purposes only and is not a solicitation. Any questions may be submitted by email to Michele Crane (CraneM@bouldercolorado.gov).

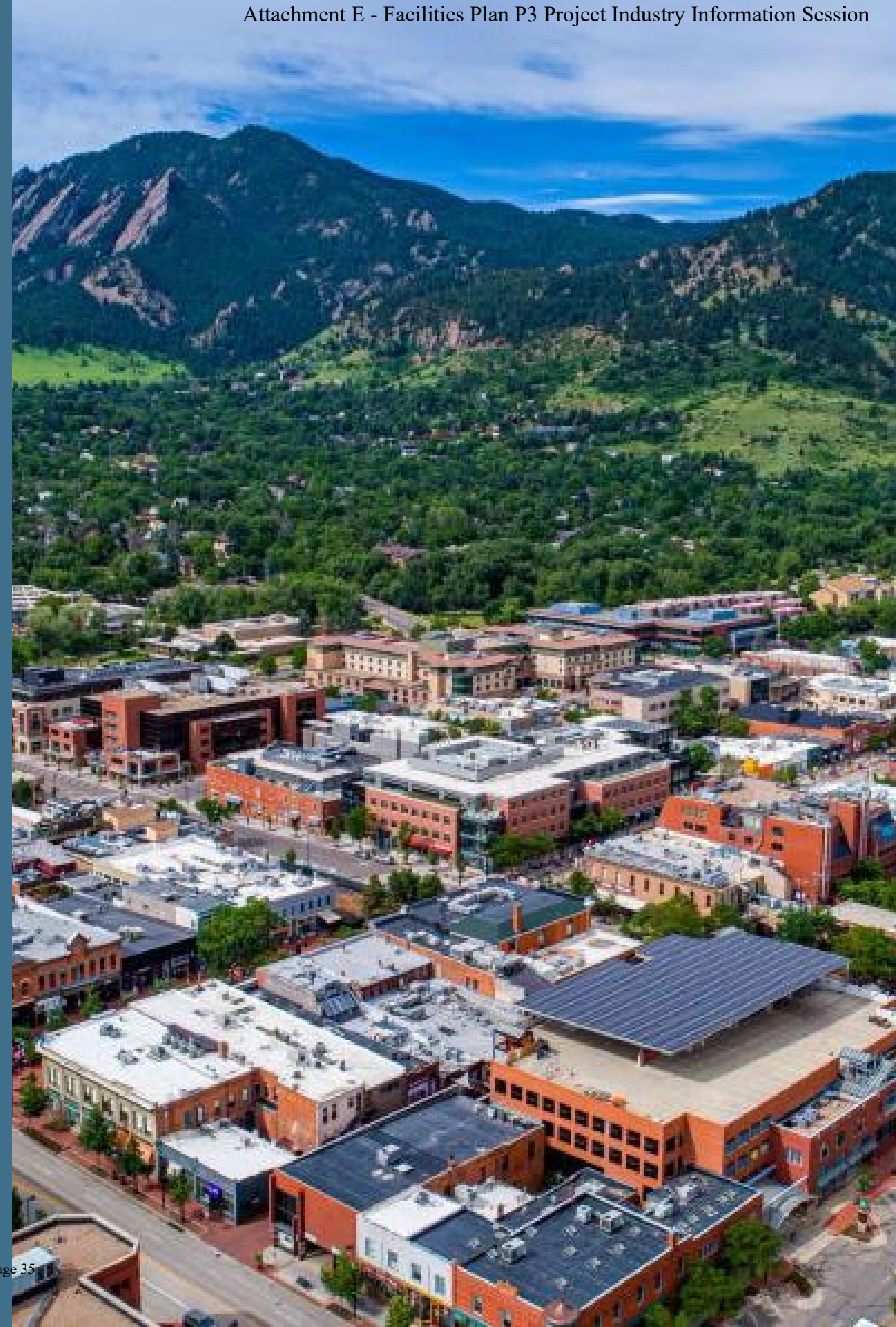




City of Boulder
Facilities Plan P3 Project

Industry Information Session

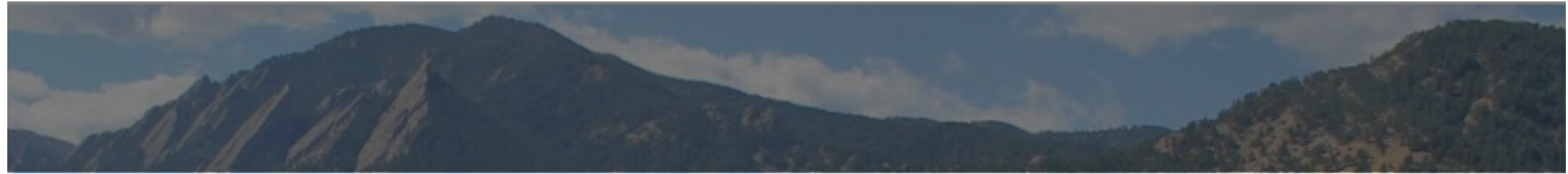
December 2023



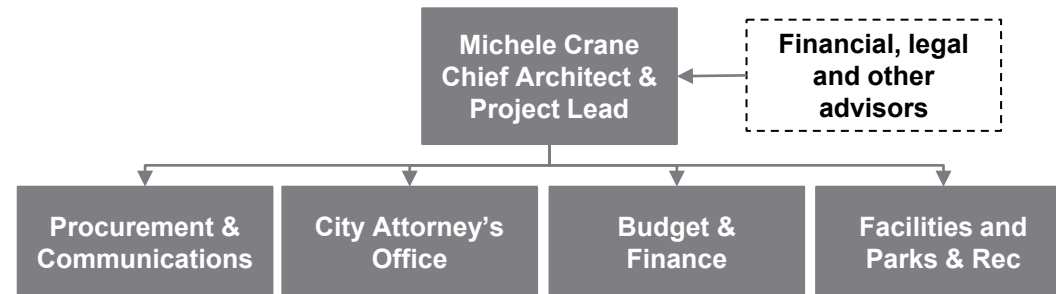


1	Welcome Message from the City of Boulder
2	Introduction to the City of Boulder
3	Project Overview and Procurement Approach
4	Planned Scope and Design Development
5	Key Commercial Elements
6	The Investment Opportunity

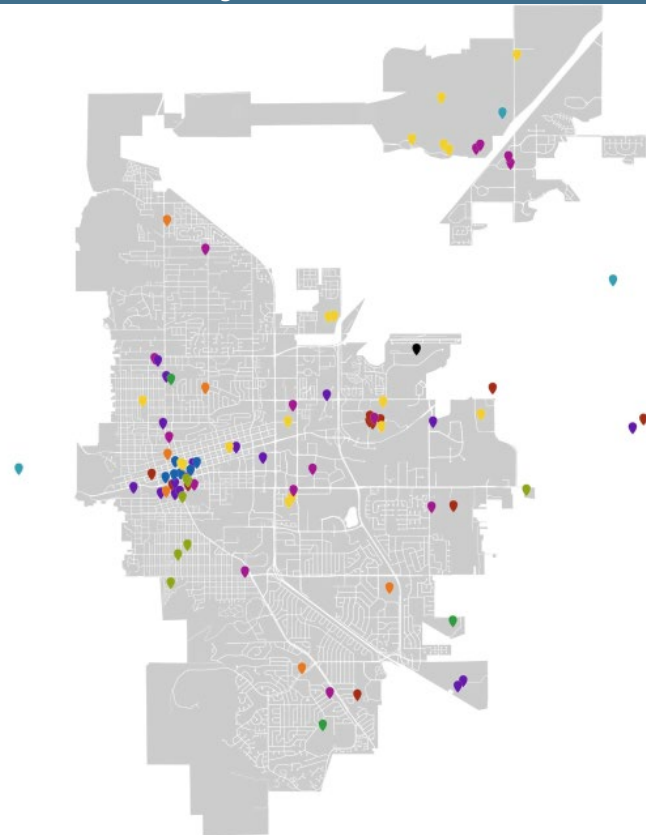




Meet the Project Team



About the Project



General Overview

- Boulder launching transformative Facilities Implementation Plan
- Opportunity to collaboratively shape 3 foundational projects:
 - Western City Campus, Fire Station 2, East Boulder Recreation Center
- Innovation, equity & sustainability at forefront
- Partners will help establish scalable framework for future projects
- Ensure ongoing development meeting:
 - Climate and equity goals
 - Community needs
- Supported by Availability Payment revenue structure

Key takeaways for industry from this session:

Engage in a landmark P3 opportunity to shape Boulder's sustainable and equitable infrastructure projects.

Be at the forefront of innovation with a city committed to environmental excellence, social equity and community-centric development.

Secure a long-term investment with a visionary partner, leveraging a collaborative Pre-Development Agreement (PDA) model with the potential of additional projects.





Boulder thrives at the intersection of nature, culture, and community values.

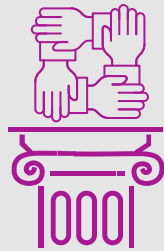
Boulder boasts a dynamic economy and a rich history of environmental leadership, responsible governance, innovation and economic growth.

Governance Pillars and Guiding Principles



Environmental Sustainability

- **Resilient:** Strengthening community to thrive in the face of change. Reduce vulnerability to flood, wildfire and other disasters
- **Sustainable:** Healthy, resource-conservative built environments. Contribute to net-zero city by 2035, carbon positive by 2040



Social Responsibility

- **Accessible & Equitable:** Serve all equitably; ADA compliance, inclusivity, accessibility
- **Experiential:** Enhance engagement; improve experience & interaction



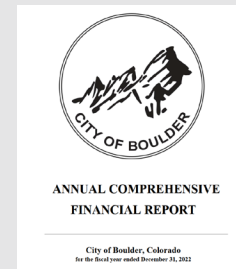
Financial Stewardship

- **Economical:** Efficiently meet city & community needs
- **Functional:** Facilities that are easy to Maintain Well; durable, flexible, adaptable, maintainable; safe

City of Boulder in Numbers

Community, population and growth:

- Population of about 108k
- Median age of 29
- 76% with Bachelor's degree or higher
- 40+ years of environmental stewardship

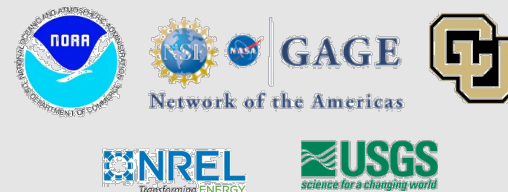


Governance and Public Finance Stability

- Credit rating is Aaa (Moody's), AAA (S&P)
- Strong financial flexibility & discretionary spending for city initiatives (Independent Auditor's Report, 2022).

Economic prosperity:

- Income per capita of ~\$80k (2020)
- Unemployment of ~3.2 %, below state and national level
- High-skilled technical and professional sectors as main employers



Education, Innovation and Tourism

- Home to federal research labs and a world-class university
- More than 3m visits per year



Project Overview



Boulder is **at a pivotal moment**, seeking partners to invest in a future of the city's facilities that aligns with our climate goals, social equity values and community needs.

This partnership offers a unique chance to shape the city's legacy through responsible stewardship of its facilities plan, while developing a long-term synergistic relationship.



Investing for impact

- Direct investment towards modernizing infrastructure that's nearing its end-of-life.
- Continued investment to maintain buildings over time.



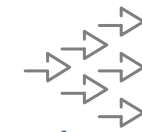
Collaborative partnership

- Engage early in the procurement process with the city to jointly develop final design and development



Building a long-term relationship

- Partner will have the 'first bite of the apple' for new projects from the city's Facilities Plan



Creating a new legacy

- Become part of a strategic move towards a vibrant, equitable and sustainable urban form, built on sound financial principles

Anticipated Delivery Model:

Phased Predevelopment Agreement (PDA): After completion of an RFQ/RFP process, assuming the city decides to pursue a P3 route, the city and preferred proposer would enter into a one-on-one PDA phase

Expanding Opportunities: The PDA phase will finalize the overall Development Agreement for three core projects and the process to bring other buildings into the P3 agreement over time

The proposer's role throughout the procurement process is to demonstrate alignment with Boulder's strategic goals, showcase expertise, and collaborate on detailed project planning to secure a long-term partnership for the Facilities Implementation Plan.



Planned Scope and Design Development

Phase 1 (Near-Term Execution)

By consolidating key city services into a 130k+ GSF office building, the new WCC will result in financial savings, operational efficiencies, and progress towards climate and social goals.
Current status: Design



Fire Station 2

The city is planning to replace an existing fire station with a new, durable, modern, and energy efficient facility that aligns with goals in the Fire Plan.
Current status: Pre-Design

East Boulder Recreational Center

To optimize financial savings, climate goals, and meet the communities needs, the city is planning to modernize the East Boulder Community Center.
Current status: Pre-Design

Anticipated indicative cost = \$ 230m+
 Milestones before financial close include: i) finalizing PDA, ii) establishing a framework for future projects to be included in the PDA

Phase 2 (Added Medium-Term)

Fire Station 4

The city is planning to replace an additional existing fire stations with durable, modern, and energy efficient facility, along with renovations to six existing stations.
Current status: Scoping



South/North Boulder Recreational Centers

To optimize financial savings and climate goals, the city is considering deep retrofits, renovations and transitions for South and North Boulder Recreational Centers.
Current status: Pre-Design and Scoping



Phase 3 (Longer Term)

Eastern City Campus (ECC)

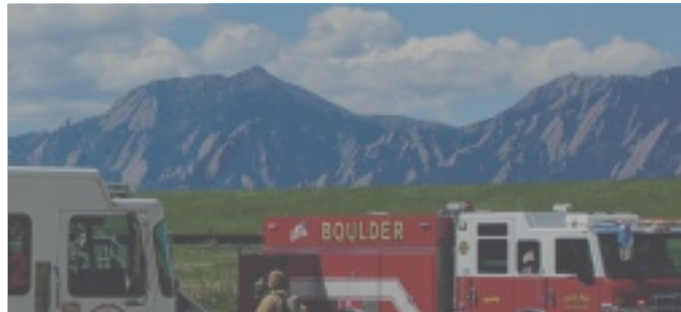
The ECC would consolidate several more buildings – new facilities would could include a new Public Safety Building, Fleet and Municipal Services facilities, and related parking.
Current status: Site Planning and Scoping



P3 Developer would reach Financial Close for Phase 1 in 2025 under the PDA



Key Commercial Elements



Development DBFOM Agreement:

The city would select a Developer for implementing an initial phase and potential future phases of Facilities Plan projects.

Anticipated Agreement Components

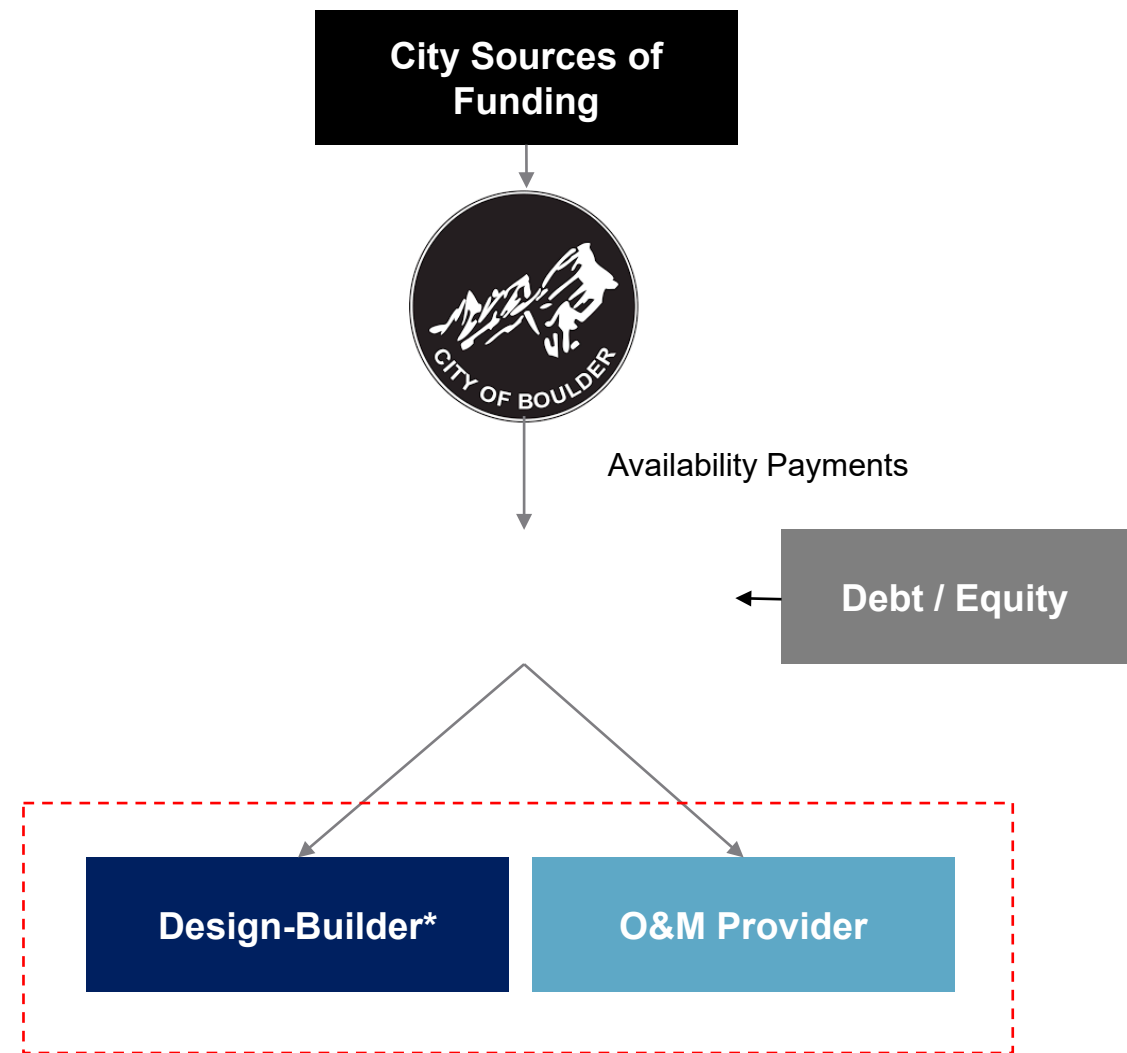
- Clear, performance-based KPIs (including environmental and social)
- Agreed design/construction approach and anticipated timeline for future scope areas
- Mechanism for incorporating future scopes – guaranteed soft costs / returns, open book estimates, competitive subcontracts
- Termination process and conditions

Financing Approach

- Developer will finance the majority of project costs
- City will make Availability Payments for capital and O&M costs and also potentially buying down capital payments
- Funding will come from the city's general fund and other sources including the Community, Culture, Resilience and Safety (CCRS) tax, grants and earmarks

Proposer Team Composition

- Developer experienced in similar P3 projects
- Anticipated Developer, Contractor, and O&M Provider
- City currently intends to jointly select Designer with the Developer (WCC designer already identified)



**Designer to be jointly selected between city and Developer
Potential for new subcontractors by phase, if desired*



Summary and Concluding Remarks



Boulder invites strategic partners to join a pioneering Facilities Implementation Plan, embarking on projects essential to the city's future.

Investment Highlights:



A Collaborative Path Forward:

Combines community needs with environmental stewardship, seeking partners ready to invest in resilience, equity and innovation.



Opportunity for Impactful Investment:

Be part of Boulder's transformation through a long-term integration of more projects, with the promise of stable returns under an Availability Payment model.



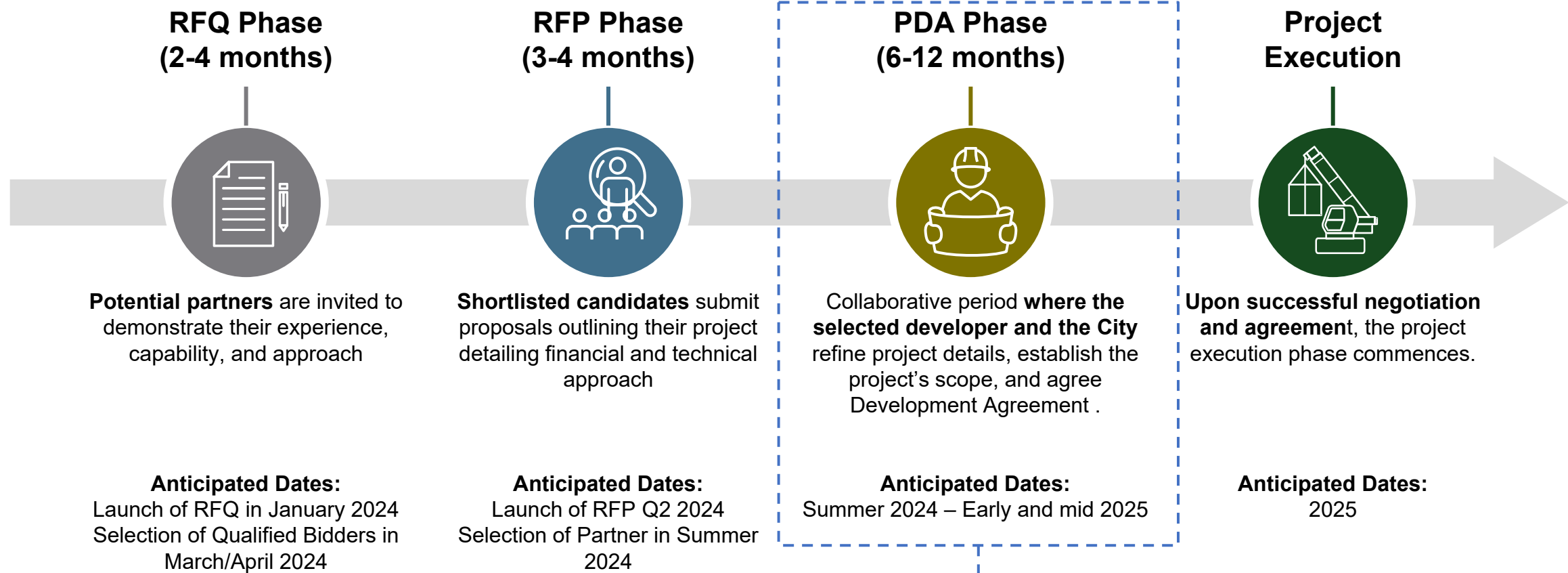
Long-term Vision and Partnership:

An invitation to build a lasting relationship with a city deeply committed to its climate goals and community well-being



The Time is Now:

We seek partners who are poised to act, innovate, and grow with us, contributing to a legacy that will stand the test of time.



PDA key elements

- Design and Planning:** Progressive detailing of design, schedule, and cost estimates for phase 1 projects
- Financing Strategy:** refining the financing approach to reach financial close
- Negotiation of Terms:** development and negotiation of a comprehensive long-term Development Agreement
- Characteristics:** Agreed price envelope, transparency of partner approach, potential off-ramps.
- Agreement Finalization:** Execution of the Development Agreement and GMP for Availability Payments



Thank you

City of Boulder
Facilities Plan P3 Project

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December 2023

