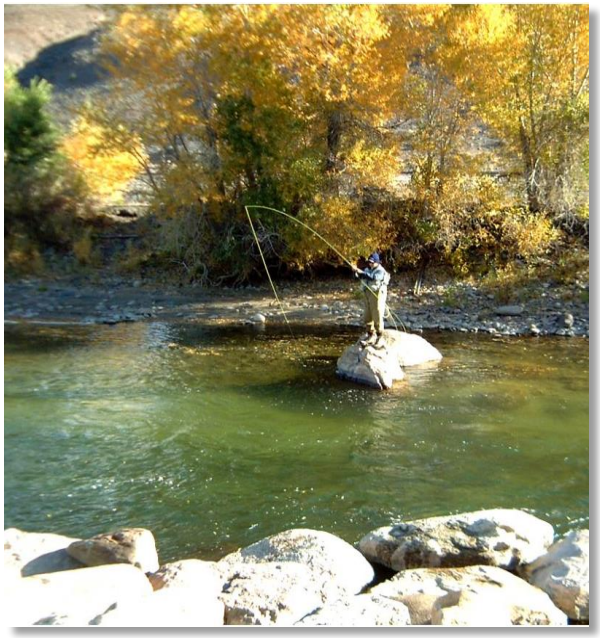
City of Salida

2021 Whitewater Park Maintenance and Improvements Report

By Mike Harvey



August, 2021

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Salida Whitewater Park History

The earliest genesis of the Salida Whitewater Park project began in the 1960's when enterprising paddlers moved boulders around in the Arkansas River to enhance the slalom course for FIBArk. The Arkansas, as it passes through Salida, is a channel heavily impacted by the historic activities of the railroad and private landowners. The modern version of the whitewater park started over a pitcher of beer at the Vic in the winter of 1999. The Arkansas River Trust was formed at that first meeting as a non-profit vehicle to raise money and create a vision to re-invigorate the river corridor in downtown Salida.

Salida in 1883. The activities of the Denver & Rio Grande railroad, along with private land owners in Salida, heavily impacted the Arkansas River through the City of Salida.

By 1999 the Arkansas River had been straightened and channelized with concrete riprap on the banks of the Union Pacific property, and private landowners and the City reinforcing their banks with all manner of materials, from the old ceramic block from the old Safeway, to car parts and other "historic" detritus. In 1988 the boat chute was completed at the CPW dam upstream of Salida and the boat ramp was built, which opened a new era where boaters were encouraged to float to town.

While boaters began using the boat ramp, the Community was literally cut off from the river corridor. A low concrete wall sat atop the bank in Riverside Park to keep people away from the river and a chain link fence ran along the bank behind the Steam Plant. The river was literally and figuratively out our back door.

Riverside Park in 1999 before the first phase of the Whitewater Park in the Spring of 2000.

In 1996 the first public whitewater park in the US was completed in Golden, Colorado and this gave river towns all over Colorado and the US a vision for a revitalized river corridor that combines elements of restoration, recreation and economic development. In the Spring of 2000, the Arkansas River Trust secured a donation of equipment time and materials from Fred Lowry to build the first modern whitewater park feature and the Salida Whitewater Park as we know it today began in earnest.

The Park has gone through multiple phases as fundraising efforts, City budgets and GOCO grants have allowed. The following is a summary of the various phases of development of the Whitewater Park.

1999: Mike Harvey, PT Wood, Jerry Mallett and Ray Kitson founded the Arkansas River Trust (ART) to raise money for river improvements in Salida.

2000: Fred Lowry and Lowry Contracting donate material and time for the first whitewater feature at the boatramp.

2001: Recreation Engineering and Planning (REP) completes the engineering for the Whitewater Park. Phase one is completed with City funds and private money raised by ART.

2003: REP and Lowry complete the largest phase of the Whitewater Park project to date funded by a GOCO grant written by the Arkansas River Trust, which includes improvements in Riverside Park.

2004-2009: REP project manager Mike Harvey and Larry Sherwood of Lowry complete many smaller improvements and maintenance activities within the Whitewater Park.

2010: REP and Lowry complete two new drop structures, climbing wall and new section of river walk. This phase was completed through another private fund-raising effort by ART, the City of Salida budget allocation and a GOCO Grant.

2014: REP completes the engineering and construction oversight on trail improvements to the Touber Building and upstream at Marvin Park. Funded by the City of Salida and a GOCO trails grant.

2019: REP donates the engineering on a renovation of the "Office Wave" in order to create a wave for surfing on surfboards and body boards. Construction is completed in the Fall of 2019 and funded through a City budget allocation.

Over the past 20 years a true community park has grown along the banks of the Arkansas in downtown Salida with an appealing blend of private and public spaces…all oriented towards the river. Where we once had discussions about the wisdom in removing the concrete wall at the top of the bank in Riverside Park, today local kids ride their bikes to the river wearing a PFD with a body board in hand. We are no longer having conversations about the value of the River corridor in downtown Salida; the value is self-evident.

Kids playing in the river in downtown Salida.

Along with this evolution comes the responsibility of maintaining the park as a world class resource for locals and visitors alike. In addition to maintenance, the purpose of this report is to suggest additional capital improvements that consider shifting trends in use and accommodate the many new river users that come to Salida every year. Over the past 20 years, maintenance has happened in a more ad-hoc fashion with local REP Project Manager Mike Harvey keeping a close eye on park elements and suggesting to the City project elements that require attention. Recent additions to the park like the new Office Wave (2019) and the trail to City Hall (2015) have been wildly popular additions.

The Arkansas River has defined our community since its founding and continues to energize the vitality of Salida. The Whitewater Park is a valued resource that has become our community's gathering place and a valuable driver of economic vitality. The following report presents a maintenance plan for the Salida Whitewater Park that will enable City Staff to monitor and maintain the park going forward and a multi-year plan for capital improvements to the park.

Maintenance Plan

In-Stream Features in the Salida Whitewater Park

In-stream features are any park element that is located below the ordinary high water mark of the river and is subject to the normal hydraulic forces of the river's flow. These features include the following:

Drop Structures: These are the bank to bank features that create hydraulic jumps, or standing waves. They include (from upstream to downstream) The Office Wave, The Boat Ramp Hole, The Bridge Hole and The Scout Wave.

The Office Wave is an example of a drop structure.

Current Deflectors: Deflectors are jetty like structures of rock that function to deflect the flow and create a velocity shelter, or eddy, on the downstream side.

Kids jumping off a current deflector.

Random Boulders: The large boulders set in the river throughout the whitewater park were set intentionally to create eddies and mid-stream features for park users as well as fish habitat.

Inspections of In-Stream Features

The in-stream features mentioned above are engineered to withstand the typical forces that come with being located within a river the size of the Arkansas. These include erosion, deposition, floods, woody debris and ice. In addition to the instream structures themselves, the streambed above and below each of the features has a large impact on the performance of each of the in-stream elements. To assess the impacts of these forces, regular inspections are required. These inspections should take place at low flows in September following the end of the voluntary flow program. Photographs from similar perspectives can provide a visual log of the changes in the park over the course of years. These photos are the baseline from which to determine if additional, more thorough inspections are required.

Rivers do change, and on normal years with high flows one would expect to see areas of deposition and scour change in minor, but noticeable ways. These normal changes are not reasons in and of themselves to trigger maintenance activities, but rather the City should take note of these changes and track their impacts on the performance of the features.

The inspection should include photo documentation. These photos should capture the in-stream features and be taken from the same locations every year. The date and flowrate should be included with the photos and a summary memo of the inspection detailing the condition of the park elements. Photos should be archived so that changes to the patterns of deposition and scour can be noted over time. REP staff can accompany City staff to select appropriate locations for photo documentation.

If there are impacts that are apparent in the photos or from visual observation, a more detailed, in-stream inspection may be required. Please note that any in-stream inspections should be performed by qualified professionals with proper training and safety equipment. These inspections should never be performed by one individual, but rather in teams where the inspector has a safety backup prepared to perform a rescue should it be required.

Physical inspection of the instream project elements should be done by wading along the upstream edge and downstream toe of all the features and banks and probing with a staff, ski pole or walking stick. The toe of all improvements should be keyed into the bed of the Arkansas River. Inspectors should feel for undercut areas where a void can be felt under the upstream most stone in the wing or downstream most stone in the toe of the wing.

If an undercut area is discovered the inspector should note the location of the undercut by measuring a distance to the undercut from a fixed point (for example the edge of the trail). The depth of the undercut can be estimated by reaching the probe into the undercut area and noting where the probe finds a solid foundation. The location and depth of any undercutting should be noted. Any undercutting greater than 1 ft in depth and 2 ft in width may require maintenance.

A visual inspection of the wings should also be performed, noting any displaced cracks or settling in the grout or large voids in un-grouted areas. Cracking or large voids may indicate that a large stone has shifted. If any movement of large stones is noted in the wings, the area should be documented with photos and the location noted by measuring a distance to the area from a fixed point.

The low flow (center of the structure) should be visually inspected by looking for displaced cracks and other signs of settling. Additionally, if flows allow, a snorkeling mask can be used to view the toe of the low flow and interface of the low flow and wing.

The fish passages should be physically inspected by feeling along the longitudinal edges of the fish passage, along the interface between the fish passage and the wings. The inspector should feel for undermining along the edges of the fish passage. Additionally, the fish passages should be kept clear of woody debris.

Bank Improvements in the Salida Whitewater Park

Bank improvements are any park feature located above the normal high water mark of the river that facilitates access to the river or stabilizes the bank. This includes bank terracing, access areas, trails, and vegetation.

Bank terracing in the Salida Whitewater Park.

Bank terracing serves the dual function of providing bank stabilization as well as access to the river and seating along the river. The stability of the toe of the bank terracing will determine the stability of the uphill boulders, so the toe should be inspected annually in a manner like that which was described for the in-stream features. Large voids may be created in areas below the ordinary high water line and may need to be filled or “chinked” with clean cobble.

Most of the bank improvements require the same type of maintenance required by more typical park improvements: trash collection, weeding, mowing and trimming. On occasion it might be necessary to erect temporary fencing to keep the public out of an area in order to protect vegetation or allow new vegetation to get established.

Trees are an important feature of the park as they provide shade as well as habitat along the river corridor. The Salida Tree Board should be enlisted to monitor the trees in the whitewater park and strategic replacement should be undertaken in advance of losing mature trees.

Annual Maintenance Budget

The City of Salida should budget funds annually for repairs and maintenance to be utilized on an "as needed" basis. These funds should be separate from capital improvements and the regular budget allocation of the public works department.

Recommended Estimated Annual Allocation: $30,000-$50,000

Capital Improvements Plan

In the 21 years since the whitewater park project began, there have been several phases of development, as described earlier in this report. In addition, use has increased dramatically, particularly in the past three years. There are several improvements that have been identified that will improve the park for users as well as create a more robust and durable park for the future. These improvements are largely driven by changing use trends as well as more advanced technologies related to Whitewater Park design.

When the park was first developed the primary users were kayakers and rafters. Today the numbers of river surfers and tubers far outweighs kayakers and rafters. Although kayakers and rafters remain important users to consider in the design of the park, the point is simply that river surfers and tubers were not at all a consideration in the original design of the park, so future improvements must consider this growing group of users. The Office Wave was reworked in 2019 with a particular focus on river surfing and has quickly become the most heavily used feature in the park.

River surfing at the re-worked Office Wave

Boogie boarding has become an extremely popular activity in the Whitewater Park.

Signage

The Whitewater Park needs more uniform and logical signage to educate users. The current signage is an ad-hoc mixture of signs placed over the years for various purposes. The primary need for improved signage is due to the increase of tubers. There should be signs at the top of the Whitewater Park near the Office Wave that directs users to put-in off the wing of the drop and paddle upstream to start their run. Too often users walk along the bank upstream of the

park, trespassing on private property to start their run through the park. In addition, this put in sign should have a basic map that describes put-in and take-out options, including where the downstream most point of public access is located (City Hall). Additional signage should be placed at the boat ramp and the City Hall take out point.

Signage Estimated Cost: < $10,000

Memorials

The Whitewater Park has become a popular place for people to place memorials for their loved ones. While it speaks to the value of the park to the local community that citizens wish to memorialize their loved ones along the river corridor, there is obviously limited space to place additional memorials. It is recommended that the City develop a policy for future placement of memorials. This policy should be developed by the appropriate City staff and approved by the Council, but the goal should be to identify if there is additional space for memorials along the river corridor, and if so where those memorials should be located. If there is in fact additional locations appropriate for memorials, an application system should be developed and implemented.

Memorials Estimated Cost: $0

Raft Tie Off Anchors

Rafts continue to float through Salida, and the traffic creates a significant economic impact on the downtown. While it has become increasingly difficult to put-in and take-out in Salida, there is the opportunity to create tie off points along the bank in strategic locations to encourage rafts to stop in town for lunch or to linger in the downtown area before proceeding downstream.

Concrete anchors with large hangers can be place in the boulders along the bank at key locations that are convenient for the rafters while not blocking access for swimmers and tubers. These anchors could be placed in three locations: along the bank in front of the Steamplant below the large eddy, river right immediately above the F Street Bridge, and along the bank in Riverside Park. Offering sponsorship of tie off anchors to local businesses might be a way to offer downtown businesses a way to support the park while also marketing to boaters.

Raft Tie Off Anchors Estimated Cost: $5,000-$10,000

Permanent Slalom Course

Whitewater Slalom is the Olympic form of kayaking and has deep roots in Salida. FIBArk has hosted one of the oldest kayak slaloms in the US and still hosts multiple races throughout the year. Colorado has a robust high school slalom racing contingent and local enthusiast and slalom racer, Ali Gober hosts a race in the Fall and another in the Spring for high school teams.

Steel slalom posts with longitudinal wires in Canon City.

The Whitewater Park offers one of the only year-round slalom courses in Colorado and slalom enthusiasts travel to Salida to train and race throughout the year. However, the posts and wires that hold the gates across the river are in inadequate and require frequent maintenance. The wires are fixed, meaning they can't be moved up and downstream which makes it more difficult to adjust the gates. In addition, the posts are a mix of old wood posts and telephone poles; the constant tension of the wires causes the posts to bow and eventually fail. These posts and wires should be replaced with steel posts and heavier gauge wires running longitudinally along the bank so that gate wires can be easily adjusted up and downstream as well as being pulled to the side when the course is not being used or periods of high flow.

Permanent Slalom Course Estimated Cost: $15,000-$20,000

Bank Improvements

The banks of the Arkansas through downtown Salida were heavily impacted by historic activities of the railroad on the north side and private property owners on the south bank. In some places in downtown native soils are not found until you are nearly 15 ft below the current bank elevation. Concrete debris and all manner of historic trash dominates. This historic condition combined with the heavy use means that traditional bank restoration is not possible in the Whitewater Park. Instead, native stone boulders act to both stabilize the banks and create access and seating areas along the river corridor. Over the past 20 years, established use patterns have developed. People tend to access the river in same places so it makes sense to encourage access at those locations with hardened banks, while planting vegetation in other areas to both discourage access and create trees that will eventually succeed older, larger trees along the bank now. In areas where access is encouraged the bank terracing should be re-set with shallower slopes and smaller steps between rocks. In areas where access should be discouraged the bank terracing should be placed to create steeper slopes with larger steps. Several key areas where the banks require attention have been identified on the overall plan that is located in the Appendix. Included in the bank improvements is the construction of a pedestrian trail connection behind the amphitheater stage to allow people to move through the river corridor when events are being held in Riverside Park.

Bank Improvements Estimated Cost: $30,000-$50,000

Bridge Hole Reconstruction

The Bridge Hole

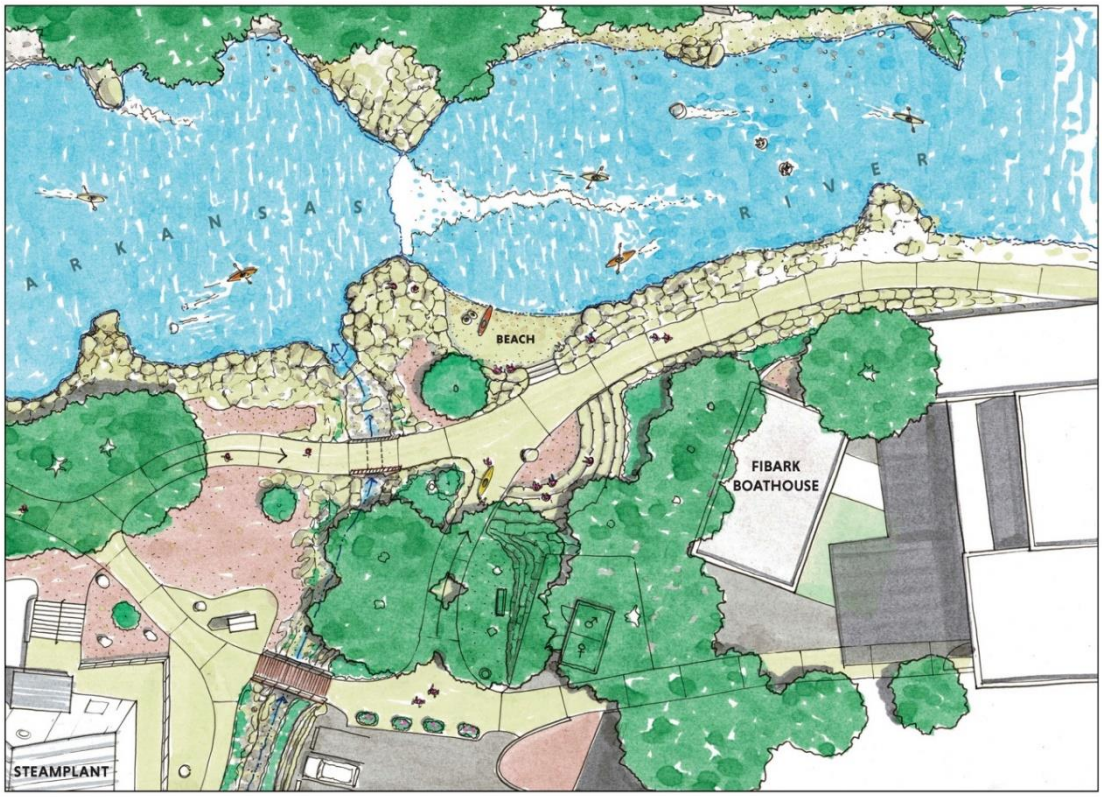
The Bridge Hole is a much beloved beginner friendly playwave located immediately below the F Street Bridge. Originally built in 2003, it has served as a location that many kayakers have enjoyed their first surfing experience and more recently has become very popular with kids learning to body board in a less intimidating environment. The Bridge Hole has less vertical fall and is wider than the other drops in the park and thus creates a gentler hydraulic. The Bridge Hole is reaching the end of its effective economic lifespan because of erosion on the crest of the structure. Additionally, the drop has proven to be over-width causing the plunge pool to fill with sediment on a regular basis. Dredging has been performed on different occasions and the river has not maintained the depth required for optimal safety and performance. This drop structure should be replaced with more modern technology that will address these issues while not losing the beginner friendly character of the hydraulic.

Bridge Hole Reconstruction Estimated Cost: $70,000-$90,000

Boat Ramp Beach

In many ways the 1988 construction of the boat ramp paved the way for the Whitewater Park project 12 years later. The boat ramp was completed along with the boat chute at the Salida low head dam in order to encourage river users to float down to town. Over the years the boat ramp has served as the central feature of the river corridor in town, literally and figuratively. However, at this point in time the boat ramp has outlived its utility. With the number of park users, the boat ramp has simply become too busy to safely back trailers down. Park users now would be better served with a more pedestrian friendly area that could become a signature feature of the park.

The below concept plan envisions an area that improves pedestrian flow through the area as well as creates a beach and seating area at the boat ramp hole. This concept envisions a lively swimming and sunbathing area while allowing people to move from the upper trail to the trail along the river and vice versa. Maintaining ADA compliant access at this location is critical as mobility challenged park users utilize the boatramp for access to the river.



Concept rendering of the Boat Ramp Beach. Full scale rendering located in the Appendix.

If the boat ramp is removed from downtown, there are options to explore for both a long term and more temporary solution to allow rafts to continue to put-in and take-out near downtown Salida. In the long term, the parking lot behind the T-Ball field at Marvin Park at the corner of Sackett and M Street has long been identified as a location for boat ramp and access point. It has several advantages including being City owned property and located in a slow section of river, which makes putting-in and taking-out much easier at a range of flows. This plan has been detailed in previous studies and most recently included in the Salida Recreation Master Plan.

On a short-term basis a boat ramp could be placed on the Union Pacific property, at the lower end of the parking area, at the existing access ramp. This ramp was cut in 2003 for construction access for the whitewater park and remains in place to this day. Modifying the ramp to allow trailers to back in is a relatively simple undertaking. Placing the ramp in this location will necessitate changing the traffic flow in the parking lot so that trailers can back down the ramp. See the figure below.

Changed traffic pattern in parking lot to facilitate use of temporary boat ramp. Larger version of this figure located in the Appendix.

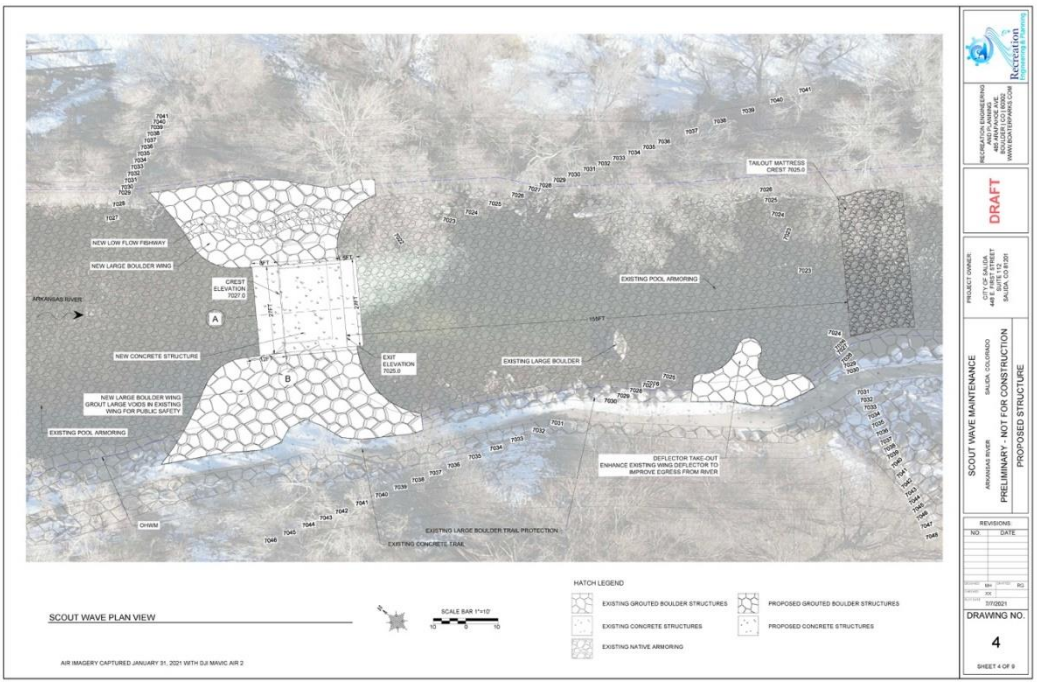
Boat Ramp Beach Estimated Cost: $125,000

Temporary boat ramp/Parking Area Estimated Cost: $15,000-$20,000

Scout Wave Re-Work

The Scout Wave was built in 2010 and was the first river feature in the State of Colorado intentionally designed for river surfing. The Scout Wave (named after its proximity to the Scout Hut) has been successful, however its performance and functionality have declined in the past few years due to the installation of the Riverwalk to City Hall. Additionally, the Scout Wave was an experimental design, and the technology has improved dramatically over the past few years, as evidenced by the success of the recent Office Wave improvements. In addition to replacing the drop structure, the plan includes a grade control mattress, a structure that improves the plunge pool below the Scout Wave and improves egress from the river for tubers, surfers and boaters alike. The Scout Wave project is underway and construction is planned for 2022. US Army Corps of Engineers permits have been submitted and the preliminary design is complete.

The goal of the Scout Wave re-construction is to create another surf wave like the Office Wave to spread out use and offer another surfing venue for this fast-growing segment of whitewater sports. Next steps include final design and floodplain permitting. Construction is tentatively slated for fall of 2022.



Plan view sheet from the preliminary design of the Scout Wave re-work.

Scout Wave Re-Work Estimated Cost: $80,000

Proposed Timeline

Whitewater Park Capital Improvements

Proposed Timeline

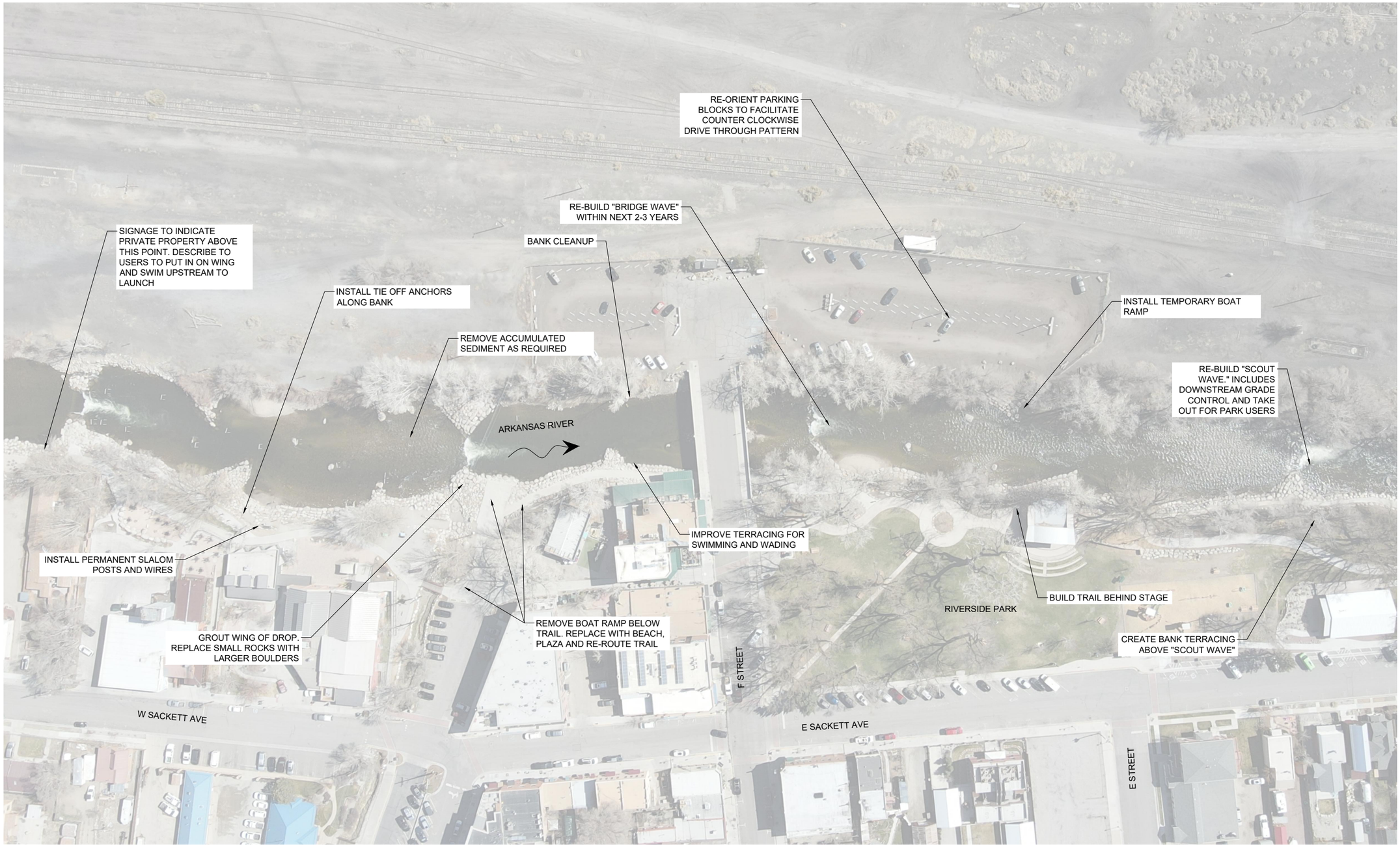
TASK	2022	2023	2024	2025
Scout Wave Re-Work	Final Design/Permit-Construction			
Boat Ramp Beach		Design/Permit-Construction		
Bank Improvements		Design/Permit-Construction	Construction	
Bridge Hole Reconstruction			Design/Permit	Construction
Slalom Course		Design/Construction		
Raft Tie Off Anchors		Install		
Signage	Planning/Install			
Memorials	Ongoing			

The proposed improvements can be phased in as budgets and funding opportunities arise. This proposed schedule envisions all the improvements being completed by 2025.

Conclusion

The City of Salida was founded on the Arkansas River and the river remains our defining natural feature. The Arkansas is a source of economic vitality and a place where our community gathers. The Whitewater Park has reshaped Salida's downtown business district in the past 20 years. The Whitewater Park has served to reconnect our community to the Arkansas River and a whole generation of Salida's children have grown up along its banks and playing in its waters. The Whitewater Park is unique in its maintenance requirements and while many aspects of the park are self-maintaining, paying close attention to park elements will keep the park functioning as intended. Future improvements will ensure that the park continues to adapt to changing use patterns and add exciting new features that continue to attract both visitors and local residents.

Appendix



OVERALL PLAN FOR FUTURE RIVER CORRIDOR IMPROVEMENTS

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SCALE BAR 1"=50'

50 0 50

AIR IMAGERY CAPTURED APRIL 19, 2021 WITH DJI MAVIC AIR 2

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FUTURE RIVER CORRIDOR IMPROVEMENTS
SALIDA, COLORADO
ARKANSAS RIVER

PRELIMINARY - NOT FOR CONSTRUCTION

OVERALL PLAN

REVISIONS:

NO.	DATE

DESIGNED: MH DRAFTED: RG
CHECKED: XX
PLOT DATE: 8/4/2021

DRAWING NO.

1

SHEET 1 OF 1

SALIDA – BOATHOUSE BEACH

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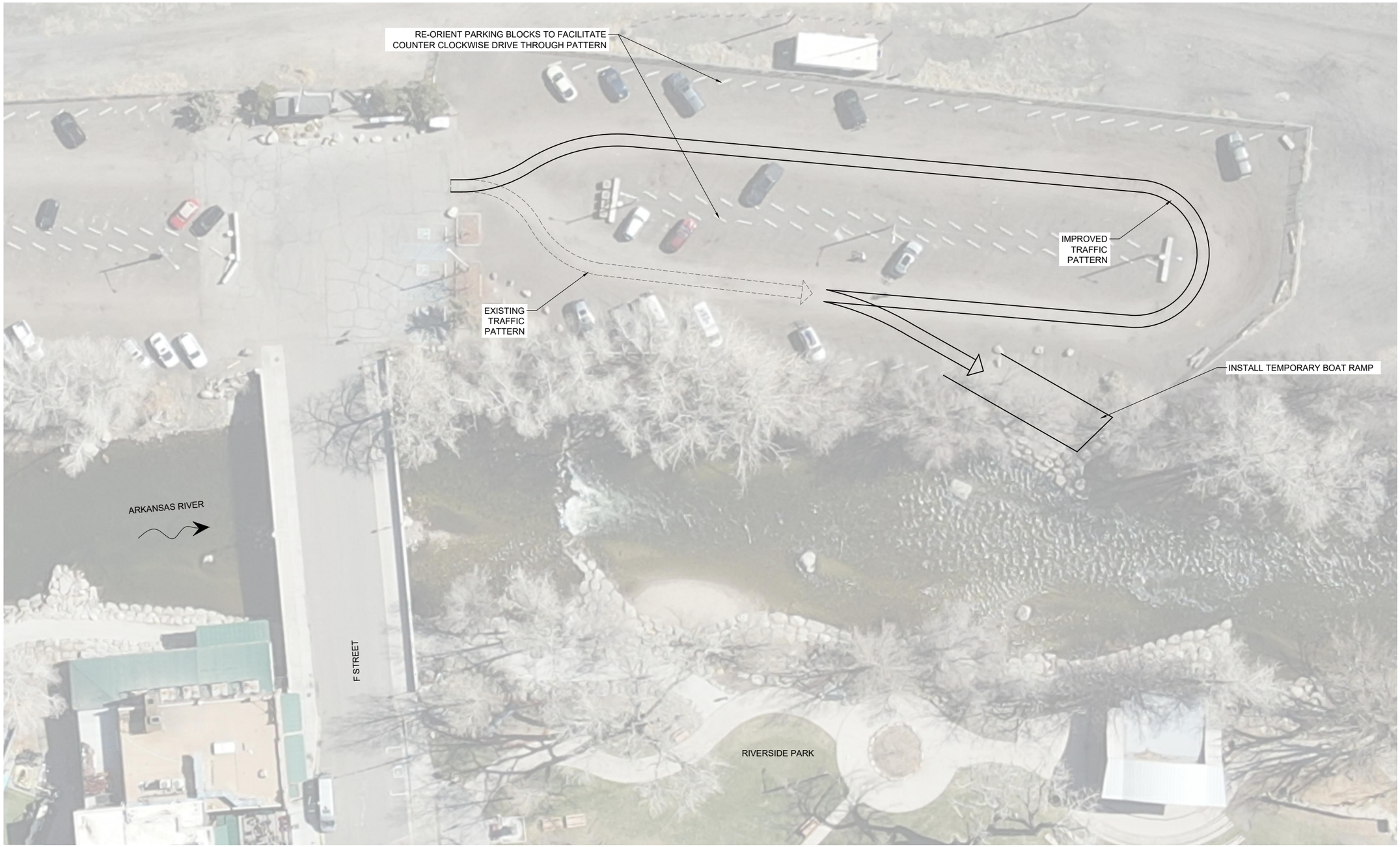

NEW BOAT RAMP TRAFFIC FLOW IMPROVEMENTS

SCALE BAR 1"=20'

20 0 20

AIR IMAGERY CAPTURED APRIL 19, 2021 WITH DJI MAVIC AIR 2

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FUTURE RIVER CORRIDOR IMPROVEMENTS
ARKANSAS RIVER
SALIDA, COLORADO

PRELIMINARY - NOT FOR CONSTRUCTION

BOAT RAMP TRAFFIC FLOW

REVISIONS:

NO.	DATE

DESIGNED:	MH	DRAFTED:	RG
CHECKED:	XX		
PLOT DATE:	8/27/2021		

DRAWING NO.

1

SHEET 1 OF 1