

ALTERNATIVE TRANSFER METHODS

FLEXIBLE & INNOVATIVE WATER SUPPLY
ALTERNATIVES

A GUIDE FOR LOCAL LEADERS IN COLORADO

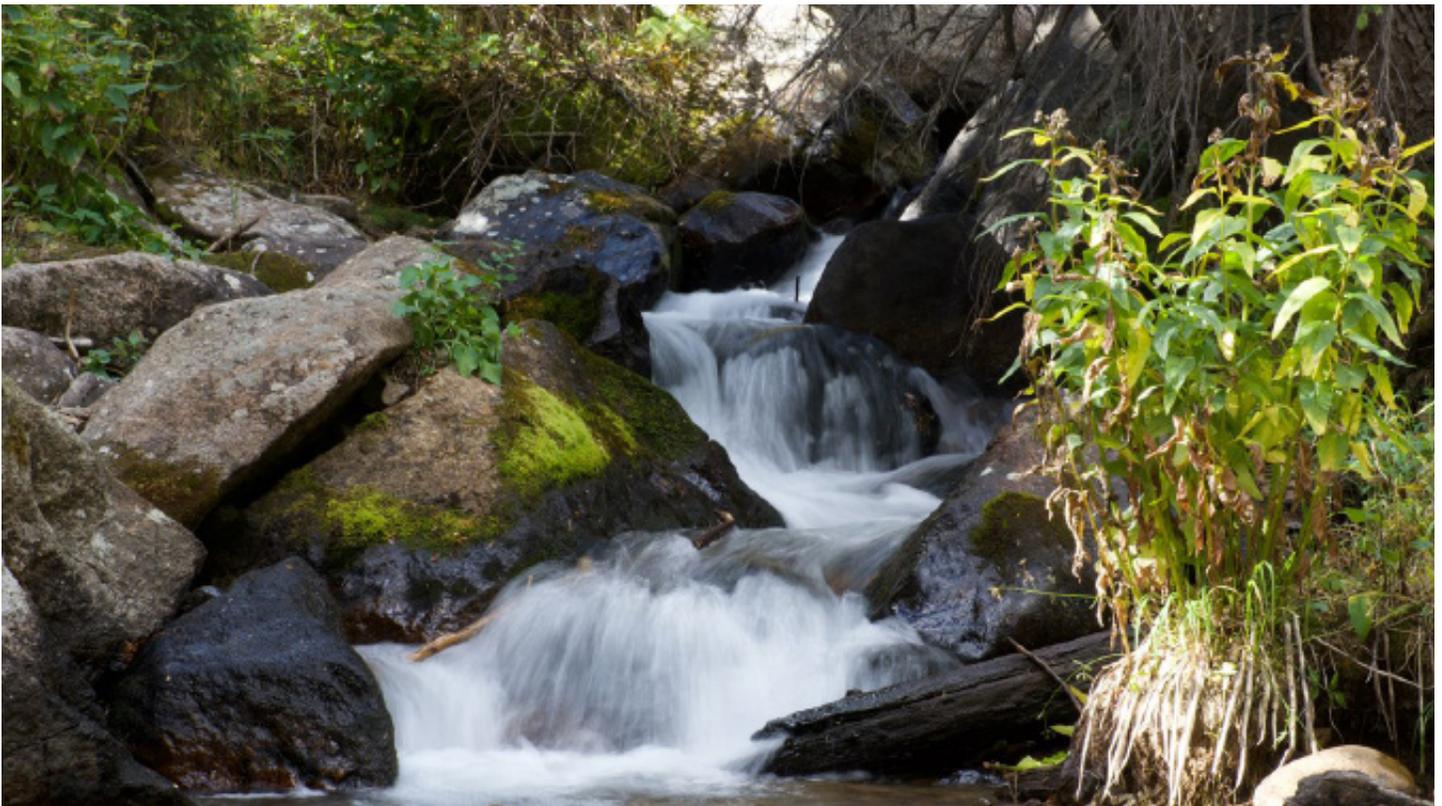
EXECUTIVE SUMMARY

Colorado, like other states across the West, is challenged by water scarcity coupled with high population growth. Colorado's Water Plan (the Plan), published in 2015, projects that by midcentury, demand for water will exceed available supplies by about 500,000 acre-feet annually. Alternative Transfer Methods have been identified in the Plan as one viable strategy for improving urban water supply reliability without negatively impacting the State's other water users, primarily agriculture and the environment.

Alternative Transfer Methods (ATMs) are water sharing agreements between two water users, typically agriculture to municipal or environmental users. ATMs are a farm-friendly alternative to traditional "buy and dry" transactions where cities purchase farmland and associated water rights, change their use under formal Water Court proceedings, and permanently remove water from the farmland. ATMs are flexible and are established on a temporary or intermittent basis.

Colorado has taken important steps in recent years to remove legal, financial, and technical barriers to ATMs in order to support their practicality among water users.

A number of laws have been enacted to streamline the ATM process, making them faster to execute than permanent water rights transfers. These laws have allowed ATMs to be implemented through Interruptible Water Supply Agreements (IWSA), Substitute Water Supply Plans (SWSPs), Lease-Following Pilot Programs, water banks, and other agreements. Public financial resources, including grants from the Colorado Water Conservation Board and Bureau of Reclamation, have also been made available to support ATM studies and implementation. Academic institutions and non-profits across Colorado have published valuable technical reports and other resources to explain and unpack the potential for alternative water transfers.



A small but growing number of Colorado cities are turning to ATMs to improve their community's water security in response to drought, for long-term supplemental supplies, or to efficiently share surplus water supplies. In the Arkansas Basin, municipalities and farmers on the Catlin Canal came together to craft an agreement to maintain agricultural production and provide up to 500 AF of water per year for urban needs. The City of Aurora secured vital water supplies to augment its depleted reservoirs during an extended drought, which led to a long-term agreement. Larimer County and Broomfield pioneered a perpetual lease to preserve a working farm and share water for municipal use in three out of every ten years. And Fort Collins and area farmers have reached a mutually beneficial agreement to share Fort Collins' surplus water.

ATMs are a new concept for many local water decision makers. This guide includes important considerations and an eligibility checklist to help determine whether an ATM is right for your community. Additional information about public financial resources, agencies and organizations, and reports is also included.

ATMs are a powerful option for cities to meet their water supply needs. Not only can they improve a community's water supply flexibility and security, but they can also protect active farmland and all of its broader benefits.



SETTING THE STAGE

WaterNow Alliance is pleased to present this guide to farm-friendly water transfers for Colorado municipal water leaders.

Colorado's dynamic communities and beautiful scenery attract thousands of visitors and new residents each year. While new development helps make the state an exciting place to live and bolsters the local economy, growth along the Front Range urban corridor can strain the region's most valuable natural resource — water. Over the next several decades, Colorado faces the challenge of meeting the water needs of an urban population projected to double by 2050.¹ By midcentury, demand for water may exceed available supplies by about 500,000 acre-feet.²

To address this projected supply gap, in 2015 the Colorado Water Conservation Board (CWCB) published Colorado's first ever statewide Water Plan establishing measurable water supply reliability objectives to be met by 2050.³ Crafted with input from regional stakeholder groups and state planners, the Water Plan makes clear that Coloradans must implement innovative strategies to balance the future water needs of cities, farmers, and the environment. One of the Water Plan's central strategies is to share 50,000 acre-feet (AF) of agricultural water with growing cities using **Alternative Transfer Methods (ATMs)** by 2030.⁴

The goal is to provide additional resilience and water supply security for Colorado communities, while maintaining a strong and vibrant agricultural economy. Creative water transfers can play a key role in helping urban centers meet the needs of their consumers and avoid permanently removing agricultural land from production.

As the case studies in this guide demonstrate, ATMs are a valuable supply opportunity for urban water providers to understand and consider when developing their water supply portfolios. This guide is intended to be an informational tool for Colorado's urban water decision makers about ATMs that describes how to determine whether and when using ATMs can help meet their communities' water supply needs.

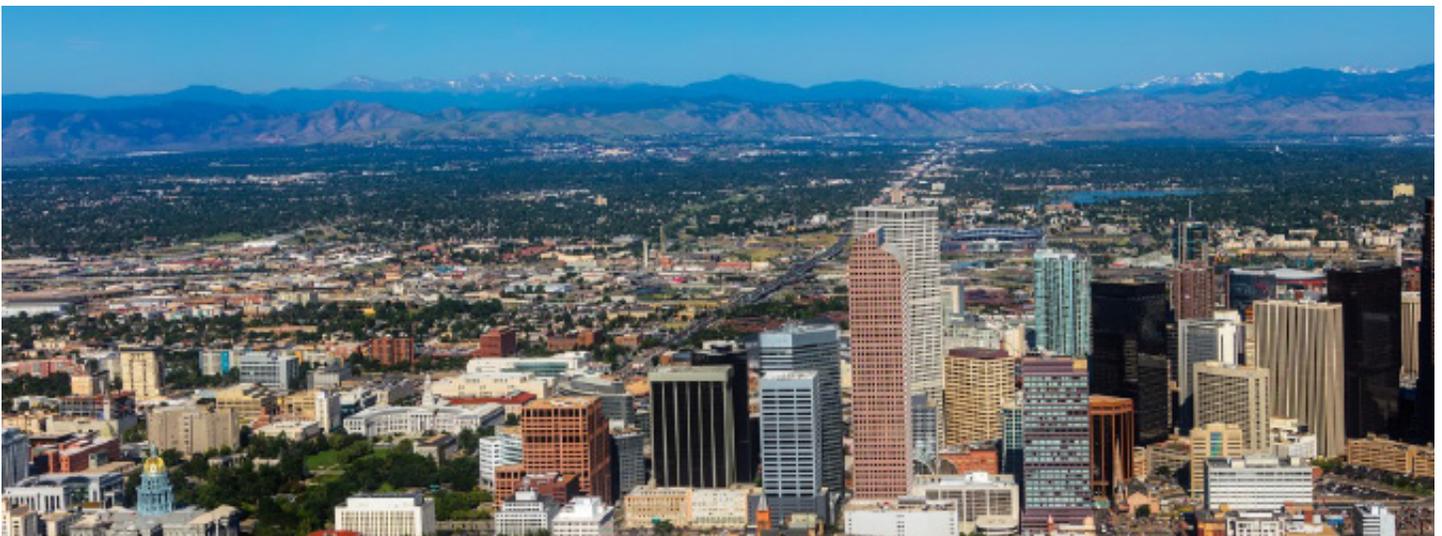


TABLE OF CONTENTS



<u>Section I: Introduction to Alternative Transfer Methods</u>	6
<ul style="list-style-type: none">• Introduction and definition of ATMs• Elements of an ATM agreement• Drivers for ATM transactions	
<u>Section II: Background on Water Rights and Water Transfers</u>	17
<ul style="list-style-type: none">• Water rights and water transactions• Sources of water for transfer• Transfer structures	
<u>Section III: ATM Case Studies</u>	25
<ul style="list-style-type: none">• Snapshots of successful ATM transactions and various transactional strategies	
<u>Section IV: Is an ATM Right for Your Community?</u>	35
<ul style="list-style-type: none">• Steps that municipal decision-makers can take to learn more about the feasibility of ATMs in their region and to catalyze future deals	
<u>Section V: Conclusions and Next Steps</u>	41
<ul style="list-style-type: none">• ATM Eligibility Checklist• Resources• Acknowledgements	

SECTION I: INTRODUCTION TO ATMS

Done right, agricultural to urban ATMs can balance urban and agricultural water and economic needs in an environmentally sustainable manner.

Traditionally, many Colorado municipalities have engaged in “buy and dry” transactions. Cities purchase farmland and associated water rights, change their use under formal Water Court proceedings, and permanently remove water from the farmland. If continued, under current trends, buy-and-dry transactions would take up to 700,000 acres, or 20%, of irrigated agricultural land out of production statewide by 2050.⁵

The widespread loss of farmland negatively impacts rural communities, regional economies, and the natural resources that contribute to Colorado’s high quality of life. In areas where buy and dry has occurred, the loss of agricultural industry has reverberated throughout the region leading to unemployment in farm-dependent businesses, reduced tax revenue, and environmental impacts like wind erosion on fallowed land.⁶

This section provides a brief overview of the benefits of ATMs, what they are, and the types of entities that may be eligible to participate in these agreements.





WHAT ARE ATMS?

ATMs are water sharing agreements between two or more entities, which can include municipalities, farmers, state and federal agencies, or industry. These agreements can result in water transfers for urban, agricultural, industrial, or environmental uses. This guide focuses on water sharing transactions between urban and agricultural water users.

Basic components of all ATMs include:

1. An agricultural water user with historical consumptive use, which defines the quantity of a water right and the portion of the right that can be transferred²
2. An interested party, e.g., an urban water provider, in a position to pay for the use of water for near or longer term purposes
3. Legal transfer structure and approval for the transfer, e.g., through statutory, water court, and/or State Engineer processes
4. Appropriate infrastructure to store and deliver water, e.g., pipes to move water from the particular agricultural water user to the specific municipality, other means of delivery such as river channels, and/or a reservoir for storage. Water treatment is also essential since in most cases the water to be transferred is raw or relatively untreated water
5. Agreed upon price for the transferred water

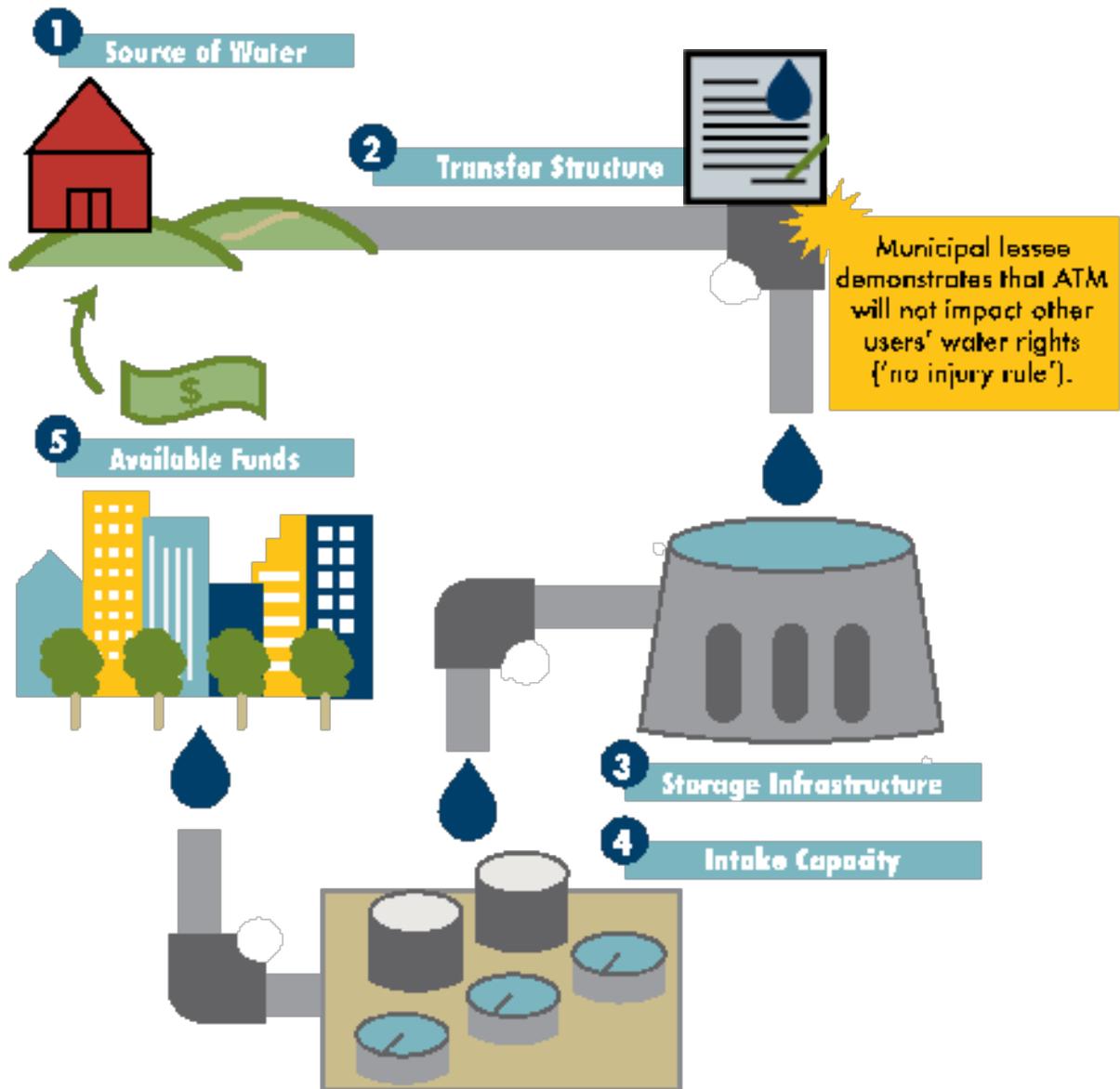


DID YOU KNOW?

There are at least 4 types of legal structures for carrying out an ATM, including leases, interruptible water supply agreements, substitute water supply plans, and water banks. The type of transaction can be tailored to your community's needs.

NECESSARY CONDITIONS FOR ATMS

Certain conditions are necessary for any ATM agreement to be successful. See page 42 to complete an ATM eligibility criteria checklist for your community.



- 1 Municipal buyer identifies a willing agricultural water right owner to lease from.
- 2 Transfer structure (i.e., agreement) is available to move water from lessor to municipality.
- 3 Storage or other infrastructure provides municipal lessee flexibility of use.
- 4 The municipality (or partner agencies) has capacity to intake and treat raw water supplies.
- 5 Funding is available for innovative water supply projects.

STRUCTURING AN ATM

ATM transactions can be structured in different ways, allowing agreements to be tailored to the specific needs of the parties involved. The critical issues for both parties include:

1. Source of water, a **method for reducing agricultural consumptive water use** making water available for transfer, and
2. **Legal transfer structure**, including the contract and conditions.



SOURCES OF WATER

ATM agreements require agricultural water users to temporarily reduce their use to free up water for transfer. Strategies for doing this include, but are not limited to:

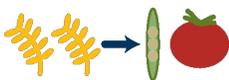
TEMPORARY FALLOWING



ROTATIONAL FALLOWING



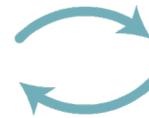
CROP SWITCHING



DEFICIT IRRIGATION



For more details about these water sources and transfer structures, see Section IV.



TRANSFER STRUCTURES

ATM agreements require a legal structure to govern the exchange of water between participating parties. These are contractual agreements, laying out how and when the water is shared, and can take various forms:

LEASE AGREEMENTS



SUBSTITUTE WATER SUPPLY PLANS



PURCHASE-AND-LEASE BACK



WATER BANKS



INTERRUPTIBLE WATER SUPPLY AGREEMENTS (IWSAS)



ATMS VS. BUY AND DRY

ATMs are an alternative to “buy and dry” transactions and offer the following benefits over the permanent transfer of water away from agriculture:

PRESERVE OPEN SPACE



ATMs can protect Colorado’s open landscapes and wildlife habitat.

MAINTAIN REGIONAL ECONOMIES



ATMs protect farmers and the numerous jobs and industries that depend on them.

ACCESS TO LOCAL FOOD



ATMs support continued local agricultural production providing access to local food.

COMMUNITY BUFFER ZONES



ATMs support Coloradans’ interest in keeping agricultural land between neighboring communities.

ENVIRONMENTAL PRESERVATION



By keeping farmland in production, ATMs prevent environmental impacts such as non-native weeds, lack of pollinators, and erosion.

MAKE AGRICULTURE FINANCIALLY VIABLE



ATMs can provide critical financial support to local farmers to upgrade systems and equipment and to provide revenue during drought.



MULTI-BENEFITS OF ATMS



ATMs can also provide additional benefits for urban water providers compared with other water supply options:

SHORTER TIMELINES



ATM transactions may be completed faster than many conventional water infrastructure projects.

REDUCED COST



ATMs can be more cost-effective than conventional alternatives.

FLEXIBLE WATER SUPPLY OPTIONS



ATMs present municipalities with opportunities to address different types of water supply problems.

ENVIRONMENTAL AMENITIES



ATMs avoid adverse environmental impacts often associated with water supply projects.

COLLABORATIVE PROBLEM SOLVING VIA MULTI-PARTY ATMs



Regional collaboration and a willingness to evaluate solutions to both land and water use concerns at the same time can create win-win agreements for water providers and irrigators and provide certainty between the parties.



DID YOU KNOW?

The Colorado Water Conservation Board developed an Alternative Agricultural Water Transfer Methods Grant Program, which since 2008 has funded over \$4 million in ATM studies and pilot projects. This program is on-going and is now solely funding on-the-ground ATM projects.

WHEN TO USE ATMS?

ATM water sharing arrangements will make sense for different Colorado communities in different ways. ATMs can be particularly useful in addressing these 4 common challenges facing Front Range cities:

- **Responding to Immediate Drought**
- **Planning for Long-term Supplemental Supply**
- **Providing Bridge Supplies**
- **Enabling Efficient Sharing of Surplus Urban Water**

When to use ATMs as a water supply depends on the supply need facing your community.



ATMS FOR IMMEDIATE DROUGHT RESPONSE



Responding to Drought

ATMs can provide municipalities with opportunities to access additional supplies to mitigate emergency shortages and avoid the costly, time-consuming Water Court process. The Aurora case study, detailed below, is an excellent example of how this can work. In 2003, Aurora experienced a severe drought and worked with area farmers to temporarily transfer water to the city to immediately fill its almost empty reservoirs.

Potential Transfer Structures

Several legal transfer structures are available when implementing an ATM for immediate drought response. These include:

1. Leases with farmers with fallowed land through the Lease-Fallowing Pilot Program
2. Substitute water supply plans (SWSP)
3. Leases with local farmers who have shares in the Colorado Big Thompson Project (C-BT)



DID YOU KNOW?

The Colorado Big Thompson Project (C-BT) consists of tunnels, canals, and reservoirs that deliver 200,000 AF of water annually to irrigate 640,000 acres of farmland and ranch land and to provide 960,000 people in eight different Colorado counties with drinking water supplies.

ATMS FOR LONG-TERM SUPPLEMENTAL SUPPLIES



Long-term Planning

ATMs may also be used when planning long-term for shortages under future drought conditions, for dry year resiliency, or for intermittent supply needs. Cities seeking to replenish water supplies following drought may also use an ATM agreement to meet this need. The City of Broomfield case study, detailed below, is an example of this scenario. In 2015, Broomfield entered into a permanent lease agreement to transfer water from Little Thompson farm to the City during dry years, and for supplemental supplies to address water quality impacts or during infrastructure repairs.

Potential Transfer Structures

There are two potential legal transfer structures when implementing an ATM for drought resilience. These include:

1. Long-term leases of C-BT shares, or
2. Interruptible water supply agreements (IWSA).

For example, an IWSA structure would be suitable for a city engaged in planning for intermittent needs.

ATMS FOR BRIDGE WATER SUPPLIES

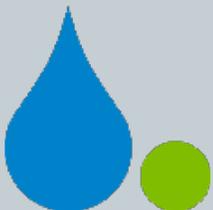


Interim Supply to Bridge the Gap

An ATM agreement can be used as a temporary or “bridge” water supply until a long-term supply project can be completed. Communities that are part of new supply projects, such as the Windy Gap Firming Project or Northern Integrated Supply Project (NISP), may use ATMs for bridge supplies since these projects are not estimated to be completed until 2021 and 2030, respectively.⁸

Potential Transfer Structures

When implementing an ATM for bridge supplies, potential transfer structures could include short- and longer term leases or water banks. For example, a 12-year lease structure would be suitable for a city with an immediate water need that is planning to participate in the NISP.



DID YOU KNOW?

While no Colorado community has done an ATM for bridge water supply yet, the strategy could be a strong option for municipalities looking for immediate expansion in their water supplies using proven ATM structures while other projects are in the pipeline.

EFFICIENT WATER SHARING



Leasing Water Back to Farmers

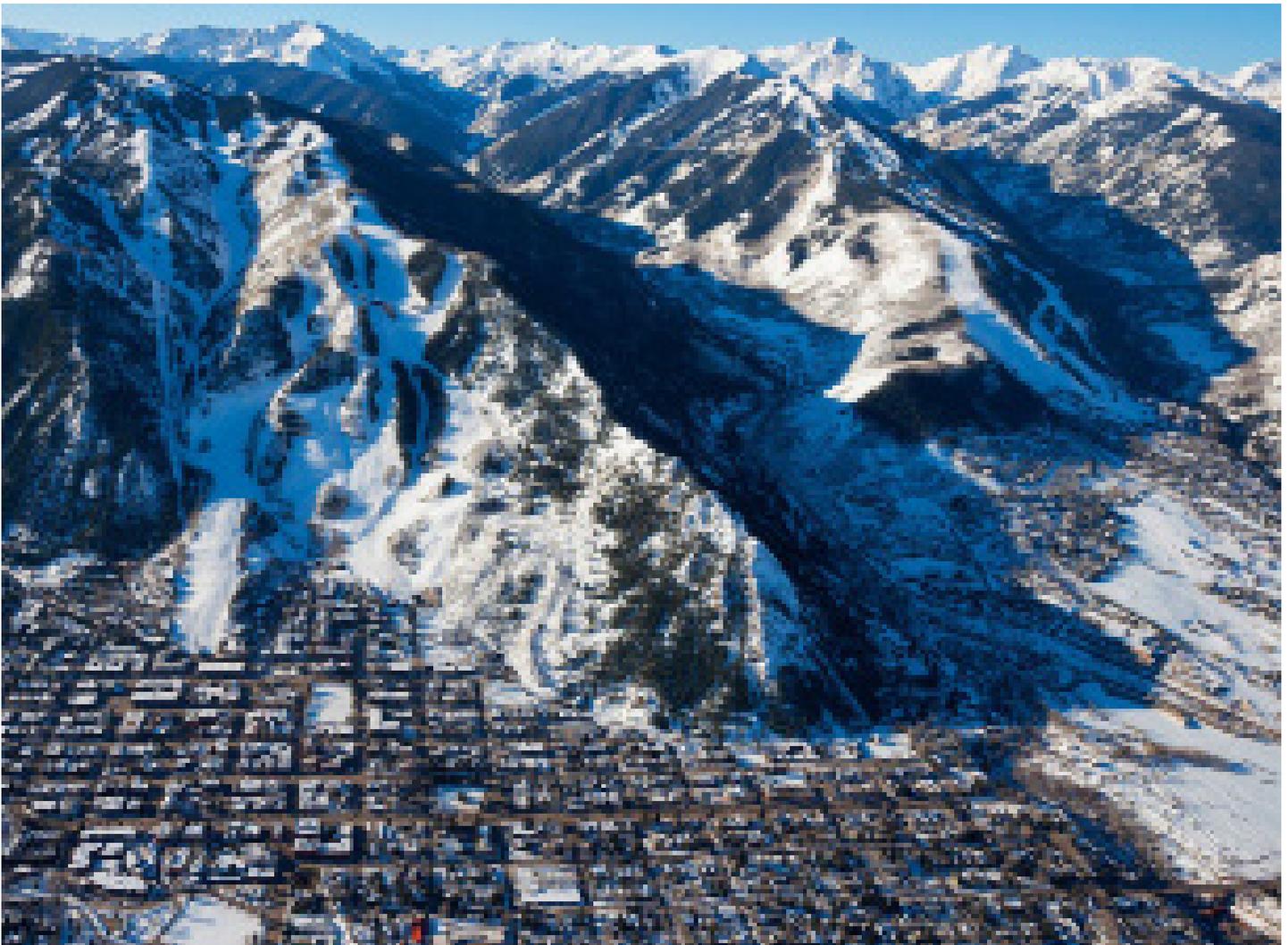
While most ATMs involve the transfer of water from irrigators to municipalities, agreements can be structured in the reverse format as well. In that instance, municipalities share surplus water on a temporary basis with nearby irrigators. Cities can also share water with the environment as part of an ATM. This may work for cities that have large water supply portfolios to meet their long-term projected demand but do not currently use all of those supplies on a regular basis. In such scenarios, municipalities can maintain their long-term supply while leasing a portion of that water to irrigators in the short-term. The City of Fort Collins case study, detailed below, is an example of this type of water sharing agreement.

Potential Transfer Structures

When implementing an ATM for leasing back water, potential transfer structures include short- and long-term leases. For example, a short-term lease structure would be suitable for a city with surplus supply and neighboring farmers without sufficient water.

SECTION II: BACKGROUND ON WATER RIGHTS, WATER TRANSFERS & ATMS

Water transfers can appear to be intimidating, but this section offers a layperson's guide, breaking down key elements of water rights law, ATM basics, water sources, and transfer structures.



WHAT IS A WATER RIGHT?

In Colorado, a water right grants its owner the right to **use** water for a beneficial purpose, such as irrigation, municipal, or industrial use. Water rights are a form of private property, and, subject to certain restrictions, can be sold or leased to others. Administered by the State, a water right details:

1. How much water can be diverted from a surface water body
2. In what location(s)
3. During what time of the year
4. For what purposes

The first users to appropriate water from a surface water body are considered “senior” rights holders. They have priority over later, or more “junior” rights holders. This means that during shortages, junior water users may not be able to obtain their full water right, or even any water, until the more senior rights have been met. Therefore the oldest, most senior water rights are more reliable during periods of scarcity, which makes them very valuable. Farms and ditch companies have a long history of diverting water in Colorado and often hold senior water rights that are attractive to municipalities interested in obtaining more secure water supplies.

A water right can be held by private individuals, partnerships, corporations, or by public entities such as local, state, or federal agencies.



WHO PARTICIPATES IN A WATER TRANSFER?

Cities, counties, water districts, irrigators, industrial users, energy companies, state and federal government agencies, and environmental organizations can all participate in water transfers, including ATMs. Transfers involve either selling or leasing the right to use water. Because irrigated agriculture accounts for up to 89% of Colorado's consumptive water use each year and typically farmers hold more senior water rights, agricultural users are in most cases the seller or lessor in a water transfer.⁹ Urban, industrial, and environmental stakeholders, are typically the buyers or lessees in a water transfer agreement.



WHO BENEFITS FROM ATMS?



Ideally, urban water providers, agricultural communities, and the public all benefit from ATMs.

For **Urban Water Providers**, ATMs:

- Secure a reliable source of dry-year or “bridge” water supplies
- Can be cheaper and faster to implement than conventional infrastructure projects
- Avoid the need to go to water court in some cases
- Avoid emergency drought response scenarios

For **Agricultural Communities**, ATMs:

- Create revenue sources to buffer against low commodity prices or dry-year losses
- Minimize or avoid negative impacts from buy and dry transactions
- Incentivize temporary fallowing or infrastructure upgrades that can improve soil health and increase crop yields

For **Water Ratepayers and the Public**, ATMs:

- Keep water rates affordable
- Maintain agricultural and ranching operations to support regional economies
- Protect desirable open space aesthetics and preserve cultural values
- Help maintain environmental flows for instream beneficial uses

See [Section III](#) for case studies of how ATMs have provided tangible benefits to different parties.

SOURCES OF WATER FOR TRANSFER

Modifications in on-farm irrigation practices and efficiency measures can “create” water that is then available for transfer. Methods for generating these water savings include:

FALLOWING



Temporary fallowing agreements provide that farmers temporarily stop irrigating farmland to make water available for transfer. This includes full-season fallowing where no irrigation occurs for an entire year. This method has been utilized in multiple completed ATM agreements, including in the Larimer County case study below.

ROTATIONAL FALLOWING



Rotational fallowing agreements provide that farmers annually rotate fallowed fields so that no single field lays bare for consecutive years. This is particularly effective for ATMs with multiple farms joining into a collaborative agreement. This is shown by the Catlin Canal case study where several farmers are part of a multi-party agreement with three urban water providers. Under this particular agreement, no one farmer’s land is fallowed for more than 3 out of 10 years.

DEFICIT IRRIGATION



Deficit irrigation (or split season agreements) means that the grower provides less-than optimal volumes of water to a crop. Farmers irrigate land for a portion of the growing season - typically in the spring to mid-summer - before halting irrigation in order to transfer water normally used later in the season to municipalities. A study on test plots near Greeley showed that a 50% reduction in water applied may still produce 75% of corn yield, if applied during the drought-sensitive stage of the crop.¹⁰

CROP SWITCHING



Farmers can reduce consumptive water use by **switching to less water-intensive crops**, e.g., summer corn to winter barley.¹¹ Crop switching as a source of water for transfer is complex and would involve considerations of the market, equipment needs, and knowledge related to the new crop.



DID YOU KNOW?

ATM lease agreements can be structured to provide greater stability for municipalities through “right of first refusal” and other contractual stipulations, and can last from one to 10+ years.

TRANSFER STRUCTURES

The diversity and flexibility of transfer structures makes it possible for municipalities and irrigators to tailor agreements to fit their mutual needs.

LEASES



Water can be transferred from an agricultural water user to a municipal water provider under short or long-term lease agreements. At the end of each lease period, the water right reverts back to its original use.

Legal Authorization: Because a water right defines the specific type of beneficial use allowed under that right, most leases transferring water from agricultural to municipal use must be approved by decree in Water Court.¹² There are exceptions, however. First, lease agreements based on fallowing can be administratively authorized without court approval through the CWCB Lease-Fallowing Pilot Program until 2023.¹³ Second, because C-BT shares are not subject to water court requirements, leases transferring C-BT water from agricultural to municipal use do not require water court approval.¹⁴

Works well for: drought relief, “bridge” supplies, intermittent needs

SUBSTITUTE WATER SUPPLY PLANS (SWSPs)



A substitute water supply plan is a legal mechanism that allows junior water rights holders (e.g., cities) to temporarily divert water out of priority while protecting the rights of the senior water right holder (e.g., growers).¹⁵ The substitute supply must protect historical return flows, which a city could meet by contributing funds for agricultural infrastructure improvements and/or new projects such as groundwater recharge.

Legal Authorization: The State Engineer is authorized to approve SWSPs without a water court proceeding if: (1) the plan is limited to 5-years, (2) there is an “emergency situation,” e.g., extreme drought, and (3) it renews an SWSP that was approved before 2002.¹⁶ SWSPs may also be approved while permanent change-of-use applications are pending in water court. All SWSPs must be renewed annually.¹⁷

Works well for: drought relief

INTERRUPTIBLE WATER SUPPLY AGREEMENTS (IWSA)



Interruptible water supply agreements are basically option contracts, which transfer water between specific urban and agricultural users under pre-set conditions negotiated by the parties.¹⁸ IWSAs provide certainty because the circumstances that trigger the transfer are negotiated before a shortage occurs, and create the potential for water transfers to municipalities in 9 out of 30 years.

Legal Authorization: IWSAs were authorized by the Colorado legislature in 2003. The statute provides that water can be transferred in a maximum of 3 years during a 10-year period, subject to approval by the State Engineer.¹⁹ IWSAs can be renewed, if desired, up to two times, or for a total of 30 years.²⁰

Works well for: drought relief, intermittent needs

TRANSFER STRUCTURES, CONT'D

WATER BANKS



Water banks can take many forms. In the ATM context, the term refers to aggregating available water supplies, providing more reliability and choice to prospective borrowers.²¹ To achieve this aggregation, water banks for ATMs require multiple buyers and sellers. They may also function as a facilitator to reduce transaction time and costs associated with administrative review.

Legal Authorization: Colorado law directs the State Engineer to issue regulations establishing the legal parameters for water banks in Colorado.²² The State Engineer has issued rules governing a pilot water bank program for transfers in the Arkansas River Basin.²³ Rules governing additional water banks have not yet been established.

Works well for: “pooling” available supplies, connecting interested parties, creating frameworks for leases and option contracts

ROTATIONAL CROP MANAGEMENT CONTRACT (RCMC)



Rotational Crop Management Contracts are written contracts in which irrigators agree to change a portion of their water right to allow for a new use by foregoing irrigation of a portion of land historically irrigated. The freed up water can then be transferred to municipal or other users. RCMCs must provide that irrigators involved in the transfer may rotate the lands that will not be irrigated as long as there is no injurious effect to downstream users.²⁴

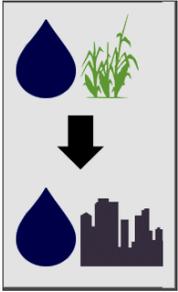
Legal Authorization: RCMCs were first authorized by Colorado statute in 2006.²⁵ Water transfers structured as RCMCs must go through water court proceedings. The statute does not place time limits on how long an RCMC can last.²⁶

Works well for: drought relief, “bridge” supplies, intermittent needs



TRANSFER STRUCTURES, CONT'D

SOUTH PLATTE OR ARKANSAS RIVER BASIN AGRICULTURE PROTECTION WATER RIGHT



In the South Platte or Arkansas River basin, an agricultural protection water right is a decreed irrigation water right that may be temporarily transferred to other uses.²⁸ The owner of an agricultural protection water right with a one-year renewable substitute water supply plan may lease, loan, or trade up to 50% of the historical consumptive use water to other uses such as municipal use.²⁹ The balance of the consumptive use water must continue to serve originally irrigated land or another property served by the same ditch system.³⁰ The one-year substitute water supply plan may be renewed twice without reapplying if the terms and conditions of the plan remain unchanged.³¹ A new application is required every 3 years to maintain the substitute water supply plan.³²

Legal Authorization: In 2016, the Colorado General Assembly authorized agricultural protection water rights in HB16-1228. To obtain an agricultural protected water right, an irrigator must go to Water Court.³³ Then, to transfer the water, the irrigator must get annual approval for a substitute water supply plan from the State Engineer.³⁴

Works well for: drought relief, “bridge” supplies, intermittent needs.

REVERSE WATER TRANSFERS

LEASE-BACK



Water lease-back is an agreement in which a municipality purchases (or already owns) agricultural water rights, and leases surplus water back to irrigators to maintain production on the land until the water is needed for urban use. If it owns the land in addition to the water right(s), a municipality may put a conservation easement on the property to restrict development, and/or structure the agreement as an IWSA to ensure adequate supplies for the city during droughts.

Legal Authorization: When agricultural water is owned by a city but is not “decreed” as municipal water, it can be leased back to farmers without Water Court approval, as there is no change in beneficial use.²⁷ If the lease-back agreement includes options for the city to make use of the water under agreed circumstances the city must meet Colorado water law requirements for changes in use, e.g., IWSAs or a water court change decree.

Works well for: efficient water sharing



DID YOU KNOW?

A decreed water right is a water right that has been adjudicated by Water Court to define the priority, point of diversion, rate of diversion, and type of use.

SECTION III: ATM CASE STUDIES

Each ATM is unique to the needs and opportunities of each region or municipality. Section III details four successful ATM transactions undertaken by communities along the Front Range. These case studies illustrate what ATMs look like in practice, how different types of transfers can be structured, and specific outcomes for each of these agreements for both cities and irrigators.

Catlin Canal Pilot Program

Water Source: Rotational Fallowing | **Transfer Method:** Lease

Pilot Program Enrollment: More than 900 acres enrolled; each farm fallows a portion of land area each year for a maximum of 3 out of 10 years.

Aurora Water & Rocky Ford Highline Canal

Water Source: Fallowing, Infrastructure Development | **Transfer Methods:** Substitute Water Supply Plans, Purchase-and-Lease Back, Lease

Multiple Party ATMs: Success of initial lease agreements encouraged Rocky Ford farmers to engage in more unique ATMs with Aurora, as well as Colorado Springs.

Larimer County & Broomfield

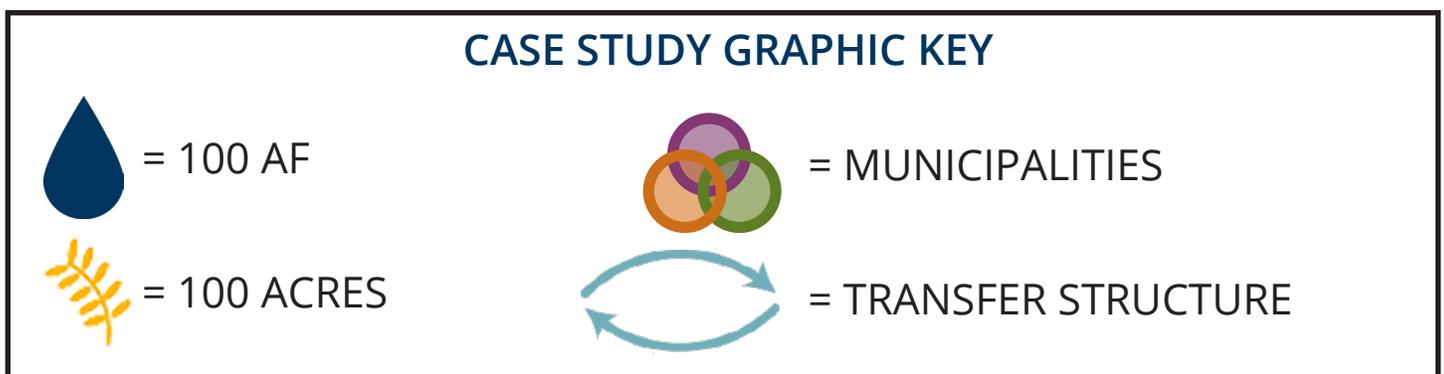
Water Source: Fallowing | **Transfer Method:** Perpetual Water Sharing Agreement

Innovative Price Composite Index: Future valuation of rented shares of Colorado-Big Thompson Project (C-BT) water.

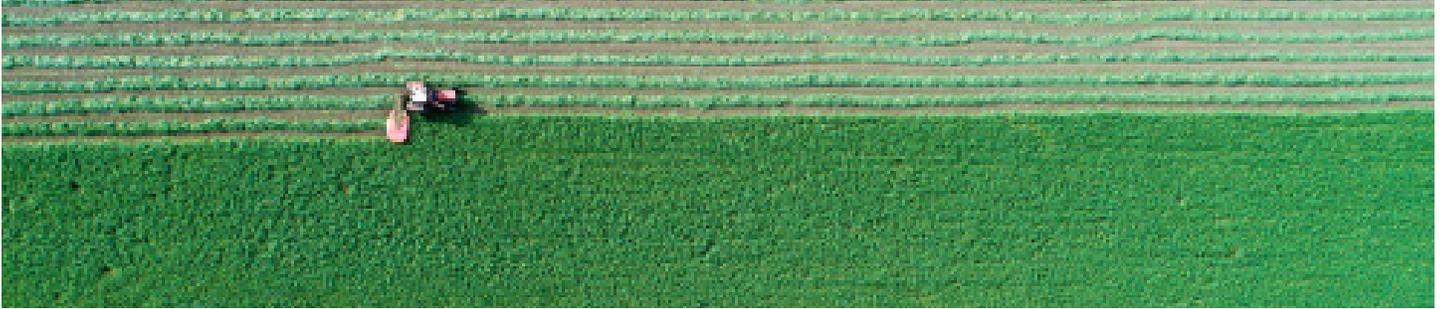
City of Fort Collins Purchase-and-Lease Back Program

Water Source: Lease-back water | **Transfer Method:** Lease

Water Right Conversion: City of Fort Collins purchased senior irrigation rights, converted rights to municipal use to reserve for future growth, and leased rights back to farmers until needed for development.



CATLIN CANAL PILOT PROJECT



Transfer driver: Secure Water Supplies & Preventing “Buy and Dry”

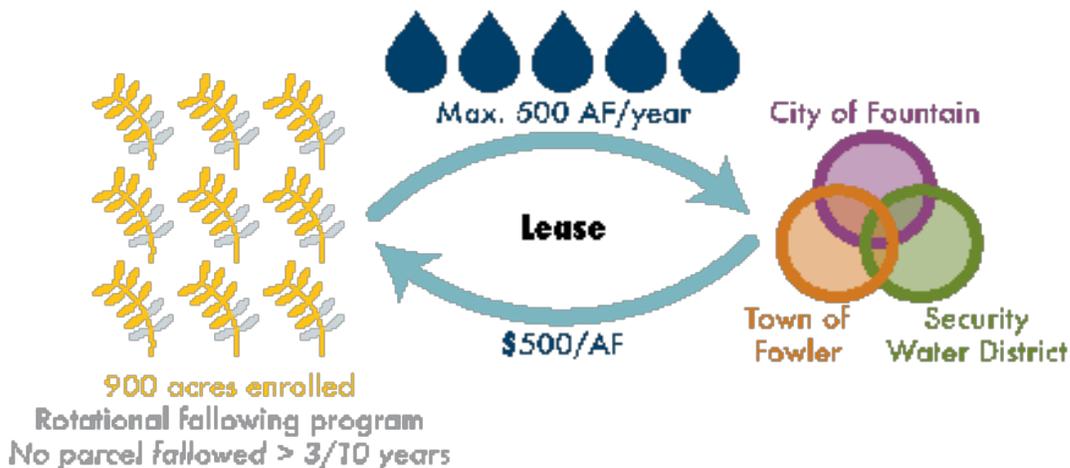
Water Source: Rotational Fallowing | **Transfer Method:** Lease | **Year:** 2015 - 2025



Resisting Buy-and-Dry: In the early 2000s, a group of farmers in the lower Arkansas Valley recognized that powerful market forces were making it difficult for individual growers in their region to resist buy-out offers during tough economic times.³⁵ To avoid the negative impacts of permanently removing agricultural water from the basin, these farmers came together to develop alternatives to buy and dry transactions.³⁶ Seven participating ditch companies created the Lower Arkansas Super Ditch Company, Inc. (Super Ditch).³⁷ The Super Ditch is not an actual ditch.³⁸ It’s a corporation set up to lease agricultural water to cities.³⁹

The Pilot Project: In 2015 the CWCB approved the Catlin Canal Pilot Project, a **10-year rotational fallowing-lease agreement** to supply municipal needs without injuring downstream users and in accordance with interstate compact agreements.⁴⁰ The project was set up as a demonstration to evaluate the efficacy of the rotational fallowing method.

How It Works: Under the Super Ditch rotational fallowing agreement, a portion of each of the participating farms is **fallowed**, i.e., not irrigated, in a rotation so that no parcel is fallowed for more than 3 out of the 10 years.⁴¹ Three municipal water providers – the City of Fountain, Town of Fowler, and Security Water District – then lease up to 500 AF of water per year (depending on hydrologic conditions).⁴²



How It Works (cont'd): Over **900 acres** of land are enrolled in the program as of 2017.⁴³ However, **no more than 30% of the total acres** are fallowed in a single year, ensuring that a viable level of farm production continues to occur.⁴⁴ In 2017, approximately 1/4 of the total land was fallowed.⁴⁵ The aggregation of land across farms ensures that sufficient supplies of conserved water are available for lease.



To ensure downstream water users are not harmed, a portion of the saved water is dedicated to **recharge ponds** where water is allowed to infiltrate into the ground.⁴⁶ This mimicks the historic groundwater flows that returned to the Arkansas River under the typical irrigation schedule.⁴⁷ Pueblo Reservoir and the Fountain Valley Conduit facilitated the exchange and delivery of the wet water.⁴⁸



Project Success to Date: The first 3 years of the program have been successful according to participants. The municipalities have received over **400 AF of water annually** at a total cost of **~\$240,000/year**, (i.e., \$650/AF/year; \$500/AF plus a \$150 payment from the Lower Arkansas Valley Water Conservancy District per acre fallowed).⁴⁹ Participating farmers have a new revenue source to mitigate the risk of low-commodity prices or poor harvests.⁵⁰ Weeds have been controlled and when irrigated again the fallowed land is productive.⁵¹

LESSONS LEARNED

Rotational fallowing ATMs are feasible. The pilot demonstrates the viability of rotational fallowing as an ATM and provides a template for other Colorado municipalities.

Collaborative ATMs achieve multiple benefits. By engaging multiple irrigators and municipalities in the pilot, larger benefits were realized. The municipalities secured more water than would have been possible in contracts with individual farms. Participating irrigators received a new, reliable source of income while continuing to irrigate most of their land. This pilot could lead to a long-term ATM agreement well past the 2025 project end date. And, due to the early success of the Catlin Canal project, Colorado Springs and the City of Fountain have entered into new lease-fallowing agreements as additional pilots.

AURORA WATER & THE ROCKY FORD HIGHLINE CANAL

Transfer Motivation: Drought Resiliency & Secure Water Supplies

Water Source: Fallowing, Infrastructure Development | **Transfer Methods:** SWSP, Purchase-and-Lease Back, Lease | **Year:** 2004 - 2024



Responding to Prolonged Drought: In the early 2000's Colorado experienced a multi-year drought. By March 2003, the City of Aurora's reservoirs were only 1/4 full -- the lowest level the reservoirs had ever been.⁵² Faced with the prospect of running out of water, Aurora turned to the option of leasing water from farmers who are part the Rocky Ford Highline Canal Company (Highline) in the neighboring Arkansas Basin.⁵³ The result was a highly successful two phase ATM.

PHASE I: SUBSTITUTE WATER SUPPLY PLAN (SWSP)

Aurora approached Highline shareholders about leasing water, and over **80% of the shareholders** voted to accept the offer.⁵⁴ This allowed Aurora to enter into 124 individual short-term agreements with Highline Canal shareholders to lease water historically used on **8,200 acres**, or about 40% of the canal service area.⁵⁵

Aurora agreed to pay **\$5,280 every year per share** plus an annual fee of \$1,000 per share to offset the agricultural yields on fallowed land.⁵⁶ Aurora funded development of the SWSP and went through the State Engineer approval process. Under the terms of the SWSP, Aurora was required to prevent injury to downstream users and to install specified water monitoring infrastructure.⁵⁷

In return, farmers transferred **~7,600 AF** to Aurora.⁵⁸ The transfer was viewed as a success, and in 2005, Colorado Springs joined the agreements and the two municipalities equally divided **10,000 AF** of transferred water.⁵⁹

PHASE II: PURCHASE-AND-LEASE BACK/ SHARED INFRASTRUCTURE

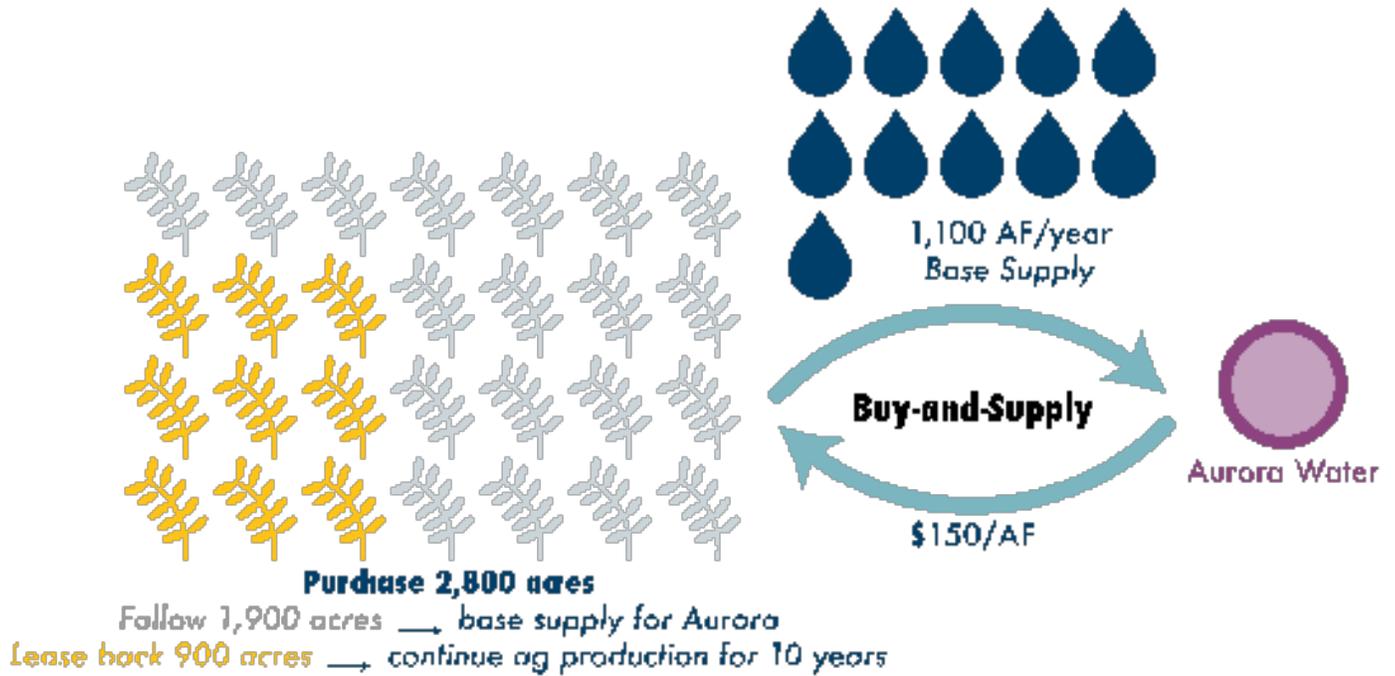
Following the success of Phase I, in 2008 Aurora entered into a renewable long-term agreement with Highline shareholders to mitigate against future shortages. The current agreement expires in 2024. The terms include:

- Aurora purchased **2,800 acres** of irrigated land outright;
- Approximately **900 acres** is leased back to farmers under **10-year lease agreements** where water is leased at approximately \$150 per acre-foot per year;
- Aurora makes an annual payment of **\$50/acre** for **1.25 AF per year per acre**;
- Aurora provides **0.5 AF per year to the farmer** to supplement a well pumping augmentation plan;
- Aurora also financed one-time **irrigation system improvements** of \$1,400/acre.⁶⁰

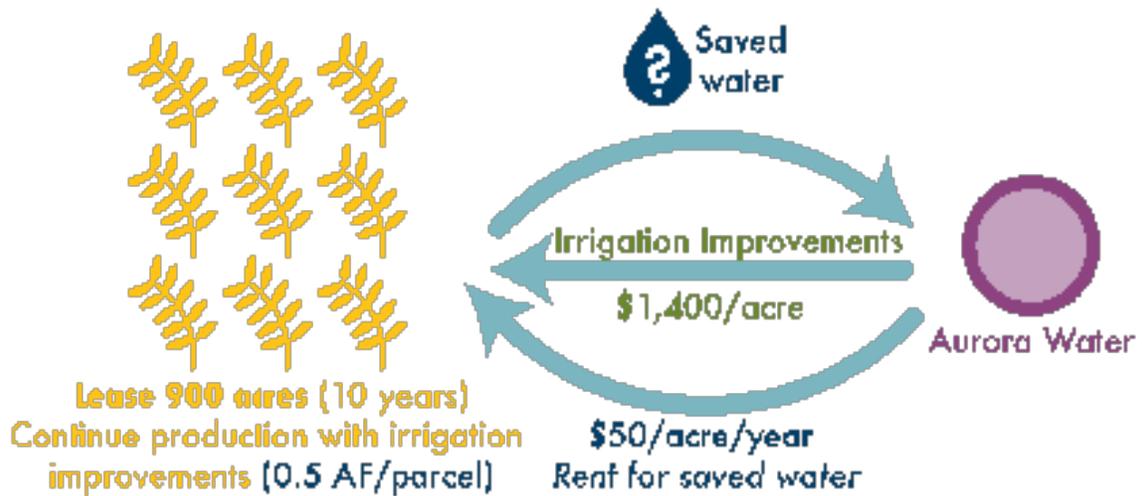
The mechanics of the Phase II agreement are detailed in the two graphics on page 27.

Aurora Water & The Rocky Ford Highline Canal ATM Cont'd

PHASE II: PURCHASE-AND-LEASE BACK



PHASE II: SHARED INFRASTRUCTURE DEVELOPMENT



LESSONS LEARNED

Multi-phase agreements provide flexibility. The two phase approach allowed the parties to test concept viability and lay the groundwork for a longer partnership.

Initial successes build trust for long-term agreements. Developing strong relationships through short-term successful ATMs encourages trust among stakeholders to support longer-term agreements that provide necessary water supplies and preserve farmland.

LARIMER COUNTY AND BROOMFIELD ATM

Transfer Motivation: Open-Space Protection & Secure Water Supplies

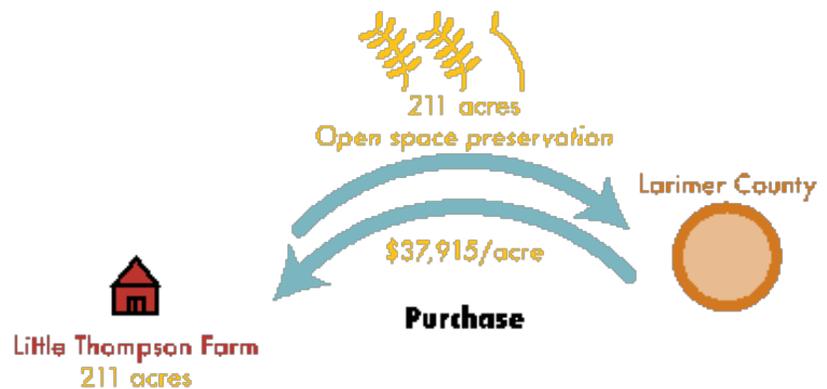
Water Source: Following | **Transfer Method:** Perpetual Water Sharing Agreement | **Year:** 2016



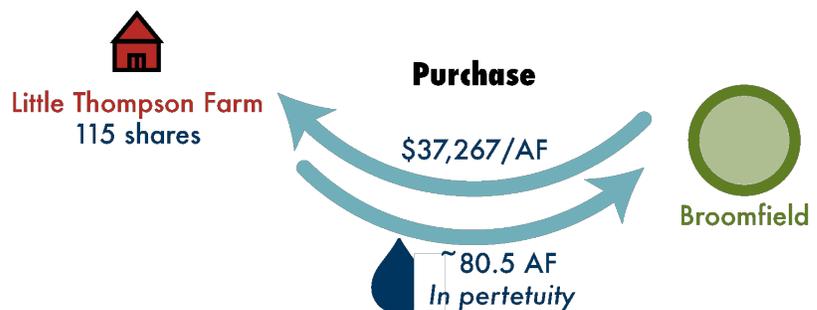
Growing Larimer County & Preserving Open-Space: Larimer County was historically an agricultural community in a large, primarily rural area at the northern end of the Front Range. Growing quickly and losing local farm land at a rate of roughly **4,500 acres per year**, in 2016 the County decided to purchase the 211-acre Little Thompson Farm to preserve the farm and open-space.⁶¹ Little Thompson Farm came with substantial water rights from local ditch shares and multi-use shares in the Colorado Big Thompson (C-BT) project. To offset the over **\$8 million dollar** cost of acquiring and maintaining a working farm, Larimer County approached the City and County of Broomfield, which was in need of additional water supplies because they were also experiencing rapid population growth. This provided an opportunity for Larimer County, in the role of irrigator, to keep some water on the farm and to transfer surplus water to Broomfield.⁶²

The resulting agreement, funded by the CWCB's Alternative Transfer Method Grants Program, was the first permanent ATM in Colorado.⁶³ It achieved two major objectives:

OBJECTIVE I: Larimer County nearly halved the cost of its land acquisition allowing it to preserve valuable land as open space.



OBJECTIVE II: Broomfield received secure base-year and drought-resilient water supplies.⁶⁴

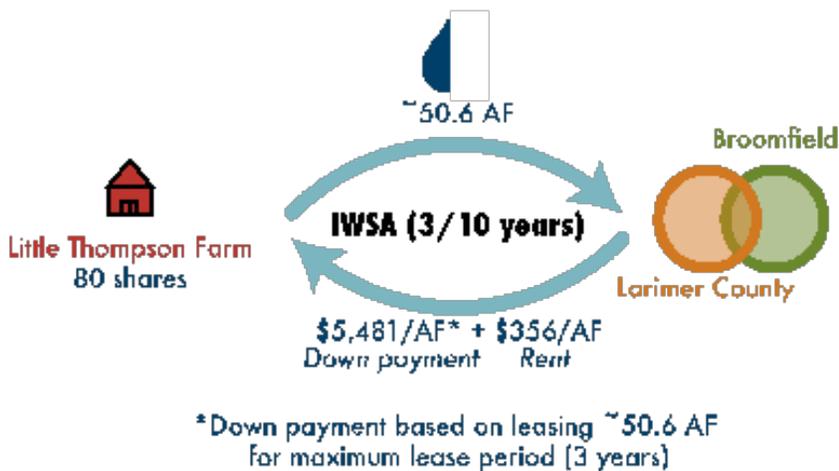


Larimer County & Broomfield: The first perpetual ATM agreement

These objectives were achieved through a 2-part agreement:

- 1. Permanent Transfer of C-BT shares for secure base-year supplies:** Broomfield purchased 115 shares (~80 AF) of C-BT water for \$3 million to provide a reliable source of water to meet future demands.⁶⁵ Because it owns these 115 shares outright,⁶⁶ Broomfield's ability to use the ~80 AF of water every year is secure.
- 2. Permanent Lease Agreement for drought response and/or supplemental supplies:** Broomfield can option an additional 80 shares (~56 AF) of C-BT water in perpetuity.⁶⁷ Broomfield paid 40% of the assessed value of the additional shares upfront (\$832,000).⁶⁸ In return, it received the right to rent the 80 shares at an initial cost of \$225/share in up to 3 out of every 10 years until 2028.⁶⁹ In exceptionally dry years, Broomfield may rent more often, subject to regulatory approval. Access to this supplemental supply helps Broomfield bolster resilience in the face of temporary shortages caused by droughts, water quality impacts, or infrastructure repairs.

Larimer County can also fund the purchase and/or lease of less costly native Handy Ditch rights for use on Thompson farm, which, in average or wet years, will ensure the farm has sufficient water to irrigate a full crop even with the transfer of CB-T rights to Broomfield.



Larimer County & Broomfield: Ensuring Lease Price Certainty

The Larimer County & Broomfield ATM includes what the parties termed a "lease price escalator." This pricing mechanism helps ensure that the price to lease the water will be based on mutually agreed upon third-party indices. By using these indices, Broomfield has more certainty about what the future lease price will be compared to the current \$225 per share lease price.

The annual per-share rental price will be based on USDA's corn commodity prices and the cost of providing city services using the American City and County Magazine's Municipal Cost Index. This "lease price escalator" uses a rolling five-year average of both indexes.⁷⁰



LESSONS LEARNED

ATMs can be perpetual. The creative agreement and the lease price escalator pioneered here demonstrates the potential for ATMs to provide long-term, reliable water supplies.

ATMs can be cost-effective. In 2015, the average sale price of C-BT shares on the water market was \$36,300/AF.²¹ Until 2028, if Broomfield exercises its rental option by purchasing all 80 shares, it will pay approximately \$322/share or \$474/AF/year.



DID YOU KNOW?

In 2018, Colorado Springs Utilities entered into an ATM agreement with the Lower Arkansas Water Association.²² It is expected to bring new supplies for a city that's projected to grow by some 200,000 residents in the next 30 years. If approved, the agreement will transfer about 2,100 AF of water to the utility in 5 out of 10 years in perpetuity.

CITY OF FORT COLLINS WATER LEASE-BACK PROGRAM



Transfer motivation: Water Sharing to Support Local Agriculture
Water Source: Lease-back water | **Transfer Method:** Lease | **Year:** 2014



Sharing Water Resources: Over time, Fort Collins has acquired a water rights portfolio that includes water historically used for agriculture.⁷³ The City projects that it can meet its residents' needs even during a **1-in-50 year drought**.⁷⁴ In many years, however, Fort Collins has more water than it needs, particularly in average to above average precipitation years.⁷⁵ As a result, the City is positioned to share its water supplies.

While Fort Collins' program is not a typical ATM, it is included here because it is an important consideration for cities that have excess water and want to preserve and support the local agricultural industry. It is an example of a reverse ATM where a city leases water to agricultural users rather than the other way around.



DID YOU KNOW?

ATMs can also transfer water from cities or farmers to the environment. Environmental transfers in particular can support in-stream flows, habitat restoration, and watershed health.

Details of Fort Collins' Lease-Back Program



Fort Collins' Lease-Back Program recognizes the value of supporting local agriculture. As the city grows, it will periodically seek Water Court approval to **convert** water rights designated for agricultural use to municipal use. However, the City will **prioritize the conversion of agricultural rights in a way that minimizes negative impacts to irrigators.**

This means that converted water rights will first come from places where irrigation has already stopped. The City will also actively avoid converting water rights associated with productive farmland to municipal use if other water supplies are available. ⁷⁶

Fort Collins has also committed to leasing surplus water back to irrigators at the market rate.⁷⁷ Between 2006 and 2017, the city leased approximately **20,000 AF of water per year** to irrigators at approximately **\$30/AF.**⁷⁸



LESSONS LEARNED

Reverse ATMs can be cost-effective. Municipalities that currently own, or expect to own, water rights can generate revenue and also prioritize the protection of agricultural land. Fort Collins' ATM provides the city with revenue to offset utility costs and prioritizes maintaining productive farms while securing water supplies for the future.

SECTION IV:

IS AN ATM RIGHT FOR YOUR COMMUNITY?

ATMs are a new concept for many local water decision makers. This section identifies specific questions to ask when considering an ATM.

Project Objectives: What local goals are you trying to meet?

Technical Feasibility: Does your community have the water infrastructure necessary to participate in an ATM?

Capacity & Resources: Does your agency have access to relevant knowledge, resources, and capacity?

Experts and Stakeholders: How can you engage local experts and communicate with stakeholders?

Financial Resources: What options are available for financing your ATM?



PROJECT OBJECTIVES

The first step is identifying the specific need you want to address and the benefits you hope to achieve by participating in an ATM.

WATER SUPPLY QUESTIONS:

1. How much additional water does your agency require?
2. Does your agency need additional water every year, most years, or only during dry years?
3. At what time of year is the water needed?
4. Are you trying to bridge a supply gap?
5. Do you need supplemental water for only a few years or indefinitely?

Answering these questions will begin to flesh out a clear picture of volume, reliability, timing, and quality of water supply requirements in your community. This will allow you to tailor project plans to meet specific deliverables.



LAND USE QUESTIONS:

1. Has your region experienced significant declines in irrigated agriculture or open-space?
2. Does your community have specific land-protection or agricultural objectives?
3. Is there a funding mechanism in place to preserve open space or agricultural land?
4. Are there independent land protection organizations working in your watershed?
5. How could water resilience and land use goals be jointly achieved?

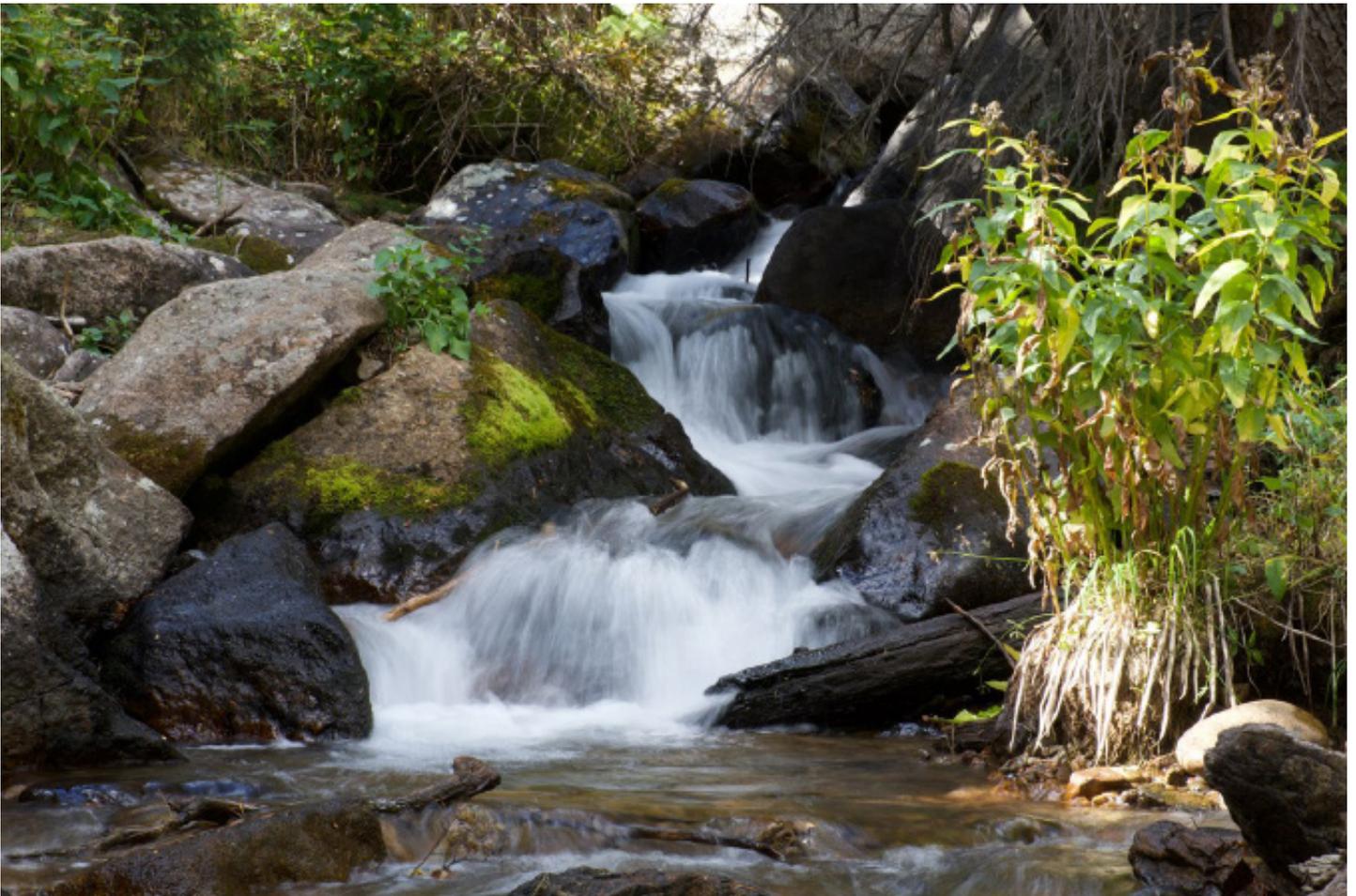
Answering these questions will start to identify land-use objectives in your community and potential funding sources. These objectives might include agricultural preservation or other conservation goals, such as protecting parcels with desirable qualities like scenic views, valuable habitat, or recreation opportunities.



TECHNICAL FEASIBILITY

In considering whether your community has, or could reasonably obtain, the infrastructure necessary to support an ATM you may want to begin by exploring the following issues:

1. Does your community have conveyance and storage infrastructure to transport water from its current diversion point to your system?
2. Can you partner with other nearby urban water providers to convey, store, or treat raw water?
3. If the answer to both questions above is 'no', can the necessary infrastructure be economically constructed?
4. Does your agency have the capacity to treat raw water?
5. Does your agency have the technical proficiency to implement monitoring and reporting requirements likely to be part of an ATM deal?



CAPACITY & RESOURCES

Does your agency have access to relevant knowledge, resources & capacity?

Like all complex projects, implementing successful ATM transactions requires specialized areas of expertise. It is not necessary to have all of these areas covered by internal city or utility staff since many outside resources are available. However, as a first step it's useful to assess internal resources to identify gaps in expertise or capacity. You'll want to ask, for example, whether your team has experience and/or technical proficiency with:

- Purchasing or leasing water rights
- Colorado Water Court proceedings
- Irrigated agricultural operations and economics
- Municipal water distribution and treatment systems
- Monitoring and reporting requirements
- Contract negotiations
- Relationships with local irrigators and/or ditch companies
- Stakeholder engagement and public outreach

Once the internal proficiencies are identified, you can then assess the availability of outside resources to fill any gaps necessary to facilitating ATM transactions including state agencies, consultants, law firms, and of course nonprofit organizations like WaterNow Alliance.



EXPERTS & STAKEHOLDERS

How can you engage local experts & communicate with stakeholders?

Water transactions often require engagement with stakeholders in your community. Initial considerations for building support include:

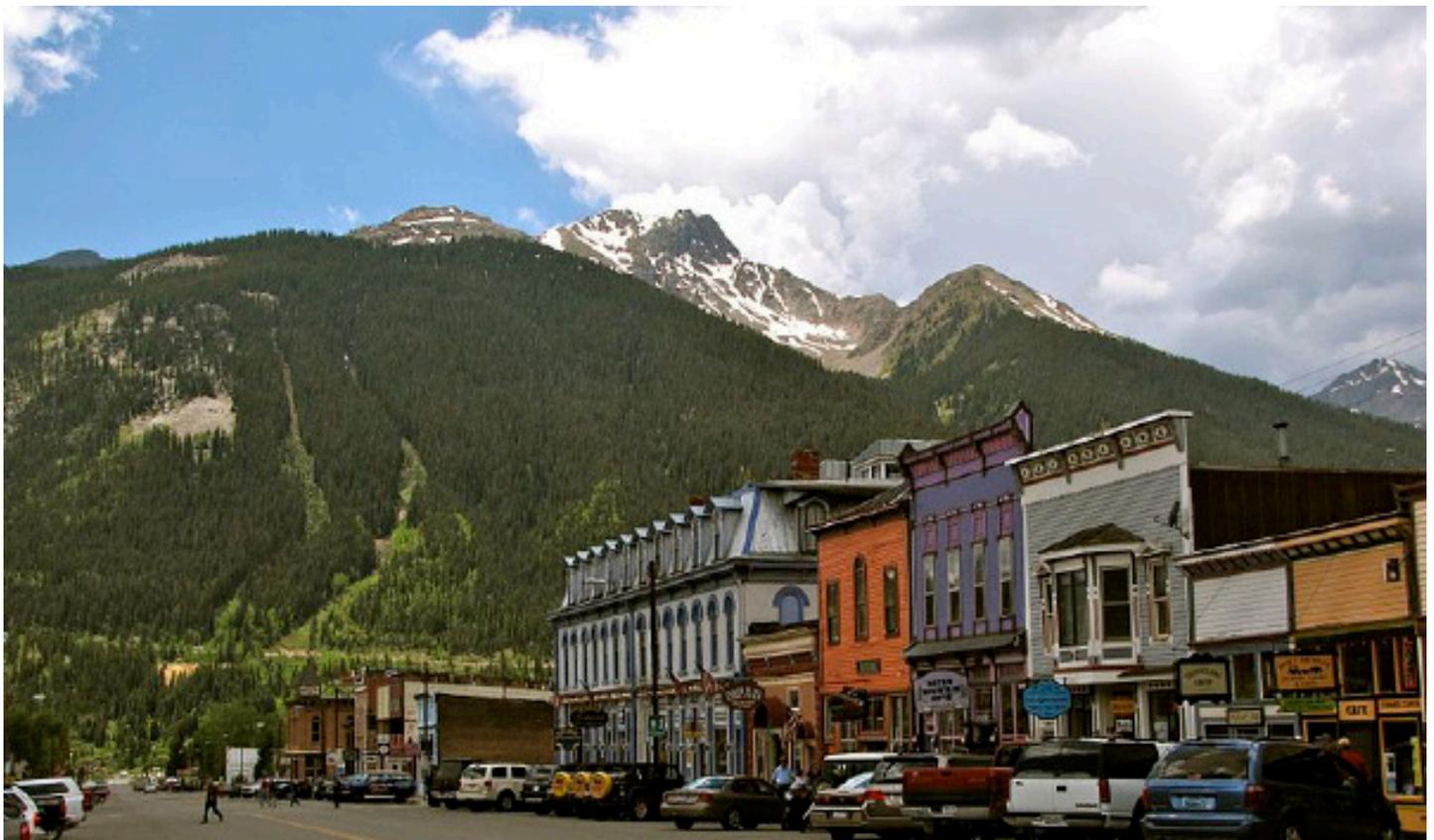
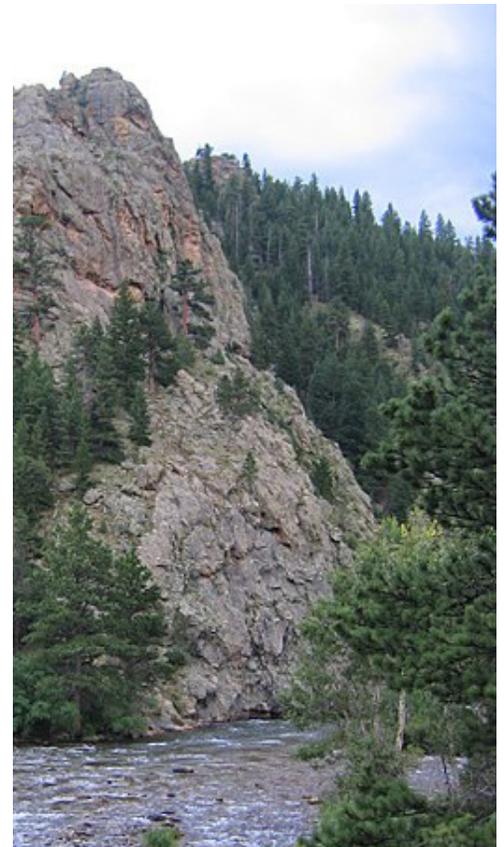
1. What groups and individuals would be impacted by a potential ATM agreement? How would they be impacted without such an agreement?
2. How can you ensure key stakeholders are included in the process from the beginning?
3. How has your agency communicated with consumers about new water supply options in the past?
4. What opportunities exist for your agency to work collaboratively with nearby water providers and irrigators to develop a multi-party transaction?
5. How can you best leverage local on-the-ground knowledge from individuals or entities with experience working on water transactions?
6. What are the academic experts or state agency employees that could provide support and guidance?



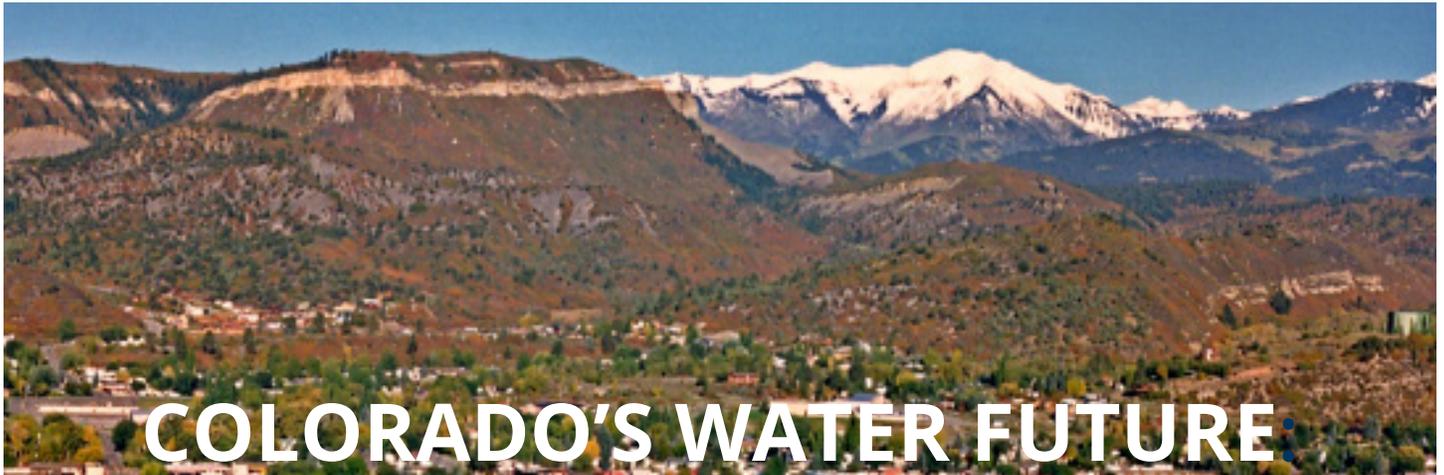
FINANCIAL RESOURCES

As with all water supply options for cities, towns and other public water agencies, water transfers are generally paid for with rate revenue and/or municipal bond proceeds. That being said, the case studies demonstrate that there are a number of creative options available:

- 1. Collaborative Agreements:** By joining forces, municipal water lessees may be able to achieve economies of scale in structuring water transfers.
- 2. Leasebacks:** Various municipalities have been able to offset the cost of ATM transactions by leasing some amount of water back to growers under various circumstances.
- 3. Grants:** The Colorado Water Conservation Board's Alternative Agricultural Water Transfer Methods Grant Program, among others, provides financial assistance to develop and implement creative ATM options discussed in this guide.⁷⁹
- 4. Philanthropy:** Finally, various non-profit and philanthropic organizations are able to at least partially support ATM development through technical and legal assistance. See Pg. 43 for agencies and organizations.



SECTION V: CONCLUSIONS & NEXT STEPS



COLORADO'S WATER FUTURE: VIBRANT CITIES, VIABLE AGRICULTURE

Colorado faces the challenge of developing and reallocating water supplies to meet the needs of an urban population projected to double by 2050 while maintaining viable agricultural economies and valuable open space. ATMs can be part of the solution.

Multiple Colorado water providers have already successfully utilized ATMs. In the Arkansas Basin, municipalities and farmers on the Catlin Canal came together to craft an agreement to maintain agricultural production and provide up to 500 AF of water per year for urban needs. Aurora was able to secure vital water supplies to augment its depleted reservoirs during an extended drought, which led to a long-term agreement. Larimer County and Broomfield pioneered a perpetual lease to preserve a working farm and share water for municipal use in three out of every ten years. And Fort Collins and area farmers have reached a mutually beneficial agreement to share the city's surplus water.

In building this guide, WaterNow identified some important principles for achieving widespread adoption of ATM agreements in Colorado moving forward:

1. Increasing regional collaboration can allow for flexible multi-party agreements that create reliable water sources;
2. Transparent agreement terms and water prices will foster trust between stakeholders; and
3. Implementing the currently unused statutory authority for water banks could help to expand the portfolio of ATMs in Colorado.

We hope that the materials in this guide will provide a useful jumping off point. Together cities and farmers can generate water transfers that benefit all. The next ATM agreement is waiting to be made!

ATM ELIGIBILITY CHECKLIST

Certain conditions are common to all successful ATM agreements. This checklist is designed to help you start to think through the key issues in exploring whether an ATM could be a viable option for addressing your community's water needs.

CRITERIA 1: IRRIGATORS IN PROXIMITY TO YOUR COMMUNITY OWN THEIR WATER RIGHTS.

Individual farmer with clear title to water right.

OR

Irrigation district or ditch company with clear title to water right.

CRITERIA 2: INFRASTRUCTURE EXISTS, OR CAN BE ECONOMICALLY CONSTRUCTED, TO SUPPORT WATER TRANSFER.

- Irrigators can physically deliver agricultural water to municipality or participate in a water bank
- Municipality has access to storage infrastructure with available capacity to intake new supplies, &
- Municipality has access to water treatment facilities and capacity to intake raw water supplies, &
- Distribution infrastructure has capacity for new supplies.

CRITERIA 3: LOCAL INSTITUTIONS HAVE INTERNAL CAPACITY AND/OR ACCESS TO OUTSIDE RESOURCES NECESSARY TO SUPPORT ATM TRANSACTIONS.

- Irrigators have accurate accounting of on-farm water use and savings, &
- Municipality has capacity to quantify and evaluate savings, &
- Municipality has adequate access to funding for project, &
- Project team, or outside support organizations, have appropriate knowledge of legal, technical, and financial aspects of ATM agreements.

ADDITIONAL RESOURCES

Many resources are available to assist with the legal, financial, and technical elements of a specific transfer.

Public Financial Resources

- [Alternative Agricultural Water Transfer Methods Grants](#), Colorado Water Conservation Board
- [Colorado's Water Plan Grants](#), Colorado Water Conservation Board
- [Water Marketing Strategy Grants](#), Bureau of Reclamation

Agencies & Organizations

- Colorado Water Conservation Board, <http://cwcb.state.co.us/Pages/CWCBHome.aspx>
- Colorado Water Trust, www.coloradowatertrust.org/
- Colorado Department of Local Affairs, www.colorado.gov/pacific/dola/community-development-planning
- Colorado Agricultural Water Alliance, www.coagwater.org
- Colorado Open Lands, www.coloradoopenlands.org
- Colorado Water Institute, Colorado State University, www.cwi.colostate.edu
- Ducks Unlimited, www.ducks.org
- Rio Grande Headwater Land Trust, www.riograndelandtrust.org
- The Nature Conservancy, www.nature.org/en-us/
- WaterNow Alliance, www.waternow.org
- Water Education Colorado, www.watereducationcolorado.org
- Western Water Partnerships, www.westernwaterpartnerships.com/

Reports

- [Agricultural Water Conservation in the Colorado River Basin: Alternative to Permanent Fallowing Research Synthesis and Outreach Workshops](#), Colorado Water Institute, 2017.
- [Alternative Water Transfers in Colorado](#), Environmental Defense Fund, 2016.
- [Alternative Agricultural Water Transfer Methods Grant Program Summary and Status Update](#); Colorado Water Conservation Board, 2012.
- [An Enhanced Water Bank for Colorado](#), Getches-Wilkinson Center for Natural Resources, Energy, and the Environment, 2016.
- [Case Studies For Those Considering Agricultural Water Conservation in the Colorado River Basins](#), Colorado State University, 2016.
- [Colorado Water Plan, Section 6.4 Alternative Transfer Methods](#), Colorado Water Conservation Board, 2015.
- [Meeting Colorado's Future Water Supply Needs](#), Colorado Agricultural Alliance, 2008.
- [Sharing Water to Save the Farm](#), Colorado Open Lands, 2018.
- [Where Now with Alternative Transfer Methods in Colorado](#), Colorado State University, 2017.

ACKNOWLEDGMENTS

This guide was written and produced by WaterNow Alliance with the support of Vivon Crawford and Alina Werth, Bren School, University of California, Santa Barbara.

Special thanks to our reviewers:

Matt Appelbaum, City of Boulder Councilmember (ret.)
Anne Castle, Getches-Wilkson Center at CU Boulder
Aaron Citron, The Nature Conservancy
Todd Doherty, Western Water Partnerships
Alex Funk, Colorado Water Conservation Board
Gerry Horak, City of Fort Collins Councilmember
Brian Jackson, Environmental Defense Fund
Mary Lou Smith, Colorado Water Institute
Mitch Tobin, Sea to Snow Consulting
Dick White, City of Durango Councilmember
Peter Nichols, Berg Hill Greenleaf & Ruscitti LLP
Greg Peterson, Colorado Ag Water Alliance

This guide is available online at: <https://waternow.org/project/colorado-atms/>

© May 2019 - Permission is granted to use or reproduce in whole or in part information in this report free of charge conditional on citation or attribution indicating that the source of the information is WaterNow Alliance.

About WaterNow Alliance

WaterNow Alliance is a network of public water utility leaders who want to champion sustainable, affordable, and climate resilient water strategies in their communities.

For more information contact:
WaterNow Alliance, www.waternow.org
(415)-360-2999, info@waternow.org



ENDNOTES

- 1 Colorado State Demography Office, 2017, <https://demography.dola.colorado.gov/population/population-totals-colorado-substate/#population-totals-for-colorado-and-sub-state-regions>.
- 2 Colorado Water Conservation Board, Colorado State Water Plan p. 1-9, 2015 (Water Plan), available at: <https://www.colorado.gov/pacific/sites/default/files/CWP2016.pdf>.
- 3 Water Plan, available at: <https://www.colorado.gov/pacific/sites/default/files/CWP2016.pdf>.
- 4 Water Plan, p. 6-10 and Section 6.4, available at: <https://www.colorado.gov/pacific/sites/default/files/CWP2016.pdf>.
- 5 Water Plan, p. 6-115, available at: <https://www.colorado.gov/pacific/sites/default/files/CWP2016.pdf>.
- 6 What We Lose When We Buy and Dry, Colorado Open Lands, p. 7, 2018, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/What-We-Lose-When-We-Buy-and-Dry.pdf>
- 7 The Colorado Revised Statutes set out specific legal and administrative requirements that must be met before a water right can be transferred, including [C.R.S. §§ 37-92-302, 37-92-305](#). The details on these requirements is beyond the scope of this guide; Sharing Water to Save the Farm: A Guide to Agricultural-Municipal Water Sharing for Colorado's Land Conservation Community, Sarah Parmar, Colorado Open Lands, Todd Doherty, Western Water Partnerships, Peter Nichols, Berg Hill Greenleaf Ruscitti, LLP, Jessica Jay, Conservation Law, P.C., Kevin McCarty, McCarty Land and Water Valuation, Inc., Colorado Open Lands, p. 13, 2018 (Sharing Water to Save the Farm), available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>
- 8 Alternative Water Transfers in Colorado: A Review of Alternative Transfer Mechanisms for Front Range Municipalities, Environmental Defense Fund & WestWater Research, p. 17, 2016 (Alternative Water Transfers), available at: <https://www.edf.org/sites/default/files/alternative-water-transfers-colorado.pdf>.
- 9 Water Plan, pp. 5-10 - 5-11, available at: <https://www.colorado.gov/pacific/sites/default/files/CWP2016.pdf>.
- 10 Sharing Water to Save the Farm, p. 13, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>
- 11 There has not yet been a practical application of this water source in Colorado that demonstrates its success as part of an ATM, but this method has been demonstrated as a viable ATM water source through the Nature Conservancy's Sinagua Malt program. Saving Water by Making Beer, The Nature Conservancy, March 2018, available at: <https://www.nature.org/en-us/explore/newsroom/saving-water-by-making-beer/>.
- 12 Citizen's Guide to Colorado Water Law, 4th Edition, Water Education Colorado, p. 16, 2015, available at: https://issuu.com/cfwe/docs/wl4_r9_web.
- 13 Sharing Water to Save the Farm, p. 14, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>; Colorado General Assembly, Bill Summary, HB17-1219, available at: <https://leg.colorado.gov/bills/hb17-1219>.
- 14 Sharing Water to Save the Farm, p. 11, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>.
- 15 [Colorado Revised Statutes § 37-92-308](#)
- 16 All We Really Need to Know We Learned in Kindergarten: Share Everything (Agricultural Water Sharing to Meet Increasing Municipal Water Demands), Peter Nichols, Leah Martinsson, & Megan Gutwein, p. 214, 2016; [Colorado Revised Statutes § 37-92-308](#)
- 17 [Colorado Revised Statutes § 37-92-308](#)
- 18 [Colorado Revised Statutes § 37-92-309](#)
- 19 [Colorado Revised Statutes § 37-92-309](#)
- 20 [Colorado Revised Statutes § 37-92-309](#)
- 21 [Colorado Revised Statutes § 37-80.5-101 et seq.](#); An Enhanced Water Bank for Colorado, Anne J. Castle and Lawrence J. MacDonnell, Getches-Wilkinson Center for Natural Resources, Energy and the Environment, p. 3, March 2016, available at: <https://www.colorado.edu/law/sites/default/files/An%20Enhanced%20Water%20Bank%20for%20Colorado.pdf>
- 22 [Colorado Revised Statutes § 37-80.5-101 et seq.](#); Sharing Water to Save the Farm, p. 14, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>.

- 23 Rules Governing the Arkansas River Water Bank Pilot Program, 2 CCR § 402-12, available at: <https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=1287>
- 24 [Colorado Revised Statutes § 37-92-103\(10.6\).](#)
- 25 [Colorado Revised Statutes § 37-92-103\(10.6\).](#)
- 26 ___ No RCMCs had been put into operation prior to this publication. Sharing Water to Save the Farm, p. 16, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>
- 27 See, e.g., Fort Collins, p. 29, available at: https://www.fcgov.com/utilities/img/site_specific/uploads/Final_Fort_Collins_Policy_Report_April_2014_w_Appendices.pdf.
- 28 Sharing Water to Save the Farm, p. 15, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>; Colorado General Assembly, Bill Summary, HB16-1228, available at: <https://leg.colorado.gov/bills/hb16-1228>.
- 29 Sharing Water to Save the Farm, p. 15, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>; Colorado General Assembly, Bill Summary, HB16-1228, available at: <https://leg.colorado.gov/bills/hb16-1228>.
- 30 Sharing Water to Save the Farm, p. 15, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>; Colorado General Assembly, Bill Summary, HB16-1228, available at: <https://leg.colorado.gov/bills/hb16-1228>.
- 31 Sharing Water to Save the Farm, p. 15, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>; Colorado General Assembly, Bill Summary, HB16-1228, available at: <https://leg.colorado.gov/bills/hb16-1228>.
- 32 Sharing Water to Save the Farm, p. 15, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>; Colorado General Assembly, Bill Summary, HB16-1228, available at: <https://leg.colorado.gov/bills/hb16-1228>.
- 33 Sharing Water to Save the Farm, p. 15, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>; Colorado General Assembly, Bill Summary, HB16-1228, available at: <https://leg.colorado.gov/bills/hb16-1228>.
- 34 Sharing Water to Save the Farm, p. 15, available at: <http://coloradoopenlands.org/wp-content/uploads/2018/07/SHARING-WATER-TO-SAVE-THE-FARM-digital.pdf>; Colorado General Assembly, Bill Summary, HB16-1228, available at: <https://leg.colorado.gov/bills/hb16-1228>.
- 35 The Super Ditch: Can Water Become a Cash Crop in the West, Lincoln Institute of Land Policy, pp. 13-15, October 2015 (The Super Ditch), available at: <https://www.lincolnst.edu/publications/articles/super-ditch>.
- 36 The Super Ditch, pp. 13-15, available at: <https://www.lincolnst.edu/publications/articles/super-ditch>.
- 37 The Super Ditch, pp. 13-15, available at: <https://www.lincolnst.edu/publications/articles/super-ditch>.
- 38 The Super Ditch, p. 11, available at: <https://www.lincolnst.edu/publications/articles/super-ditch>.
- 39 The Super Ditch, p. 11, available at: <https://www.lincolnst.edu/publications/articles/super-ditch>.
- 40 H.B. 13-1248 Catlin Canal Company Rotational Land Following-Municipal Leasing Pilot Project 2017 Annual Report, Lower Arkansas Valley Water Conservancy District and Lower Arkansas Valley Super Ditch Company, p. 4, January 2018 (Catlin Canal), available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf; Catlin Canal, pp. 1-2, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 41 Catlin Canal, p. 7, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 42 Catlin Canal, pp. 6, 10-15, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 43 Catlin Canal, p. 1, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 44 Catlin Canal, p. 7, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 45 Catlin Canal, p. 7, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.

- 46 Catlin Canal, pp. 19-21, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 47 Catlin Canal, p. 20, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 48 Catlin Canal, pp. 11-12, 39, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 49 Catlin Lease-Following Pilot Project Progress Report, Jack Goble, P.E., Lower Arkansas Valley Water Conservancy District, p. 12, 2017, available at: https://leg.colorado.gov/sites/default/files/images/committees/2017/catlin_pilot_project.pdf.
- 50 Catlin Canal, pp. 32-35, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 51 Catlin Canal, pp. 34-35, 40, 42, available at: http://www.lavwcd.com/uploads/2/4/3/4/24349268/18_01_11_2017_annual_report_-_catlin_pilot_project_4823-9203-3882_v.2-1.pdf.
- 52 At that point, Aurora had only enough water for nine months of normal demand. Aurora Water History Timeline, Aurora Water, February 2012, available at: https://www.auroragov.org/UserFiles/Servers/Server_1881137/File/Residents/Water/Water%20System/Aurora%20Water%20Facts/002340.pdf; Water Supply Fact Book, Aurora Water, p. 2, available at: https://www.auroragov.org/UserFiles/Servers/Server_1881137/File/Residents/Water/Water%20System/Aurora%20Water%20Facts/001772.pdf.
- 53 Agricultural Water Conservation in the Colorado River Basin: Alternatives to Permanent Following Research Synthesis and Outreach Workshops, Part 3 of 5 (CWI Completion Report No. 232), Brad Udall & Greg Peterson, pp. 21-22, 2017 (Agricultural Water Conservation), available at: <http://www.cwi.colostate.edu/media/publications/cr/232.pdf>.
- 54 "Flex Time for Colorado Water," Allen Best, Water Education Colorado's Headwaters Magazine, Fall 2017, available at: <https://www.watereducationcolorado.org/news-and-publications/headwaters-magazine/fall-2017-can-colorado-save-its-farms/flex-time-for-colorado-water/>.
- 55 Alternative Water Transfers, p. 17, available at: <https://www.edf.org/sites/default/files/alternative-water-transfers-colorado.pdf>.
- 56 Agricultural Water Conservation, p. 22, available at: <http://www.cwi.colostate.edu/media/publications/cr/232.pdf>.
- 57 Agricultural Water Conservation, p. 22, available at: <http://www.cwi.colostate.edu/media/publications/cr/232.pdf>.
- 58 Agricultural Water Conservation, p. 22, available at: <http://www.cwi.colostate.edu/media/publications/cr/232.pdf>.
- 59 Agricultural Water Conservation, p. 22, available at: <http://www.cwi.colostate.edu/media/publications/cr/232.pdf>.
- 60 Alternative Water Transfers, p. 17, available at: <https://www.edf.org/sites/default/files/alternative-water-transfers-colorado.pdf>.
- 61 Larimer County, Little Thompson Farm ATM Grant Completion Report, pp.1-2, March 2018 (Larimer), available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 62 Larimer County had sufficient water to continue farming except in the driest years (based on historical averages, each C-BT share provides approximately 0.7 AF). Larimer, pp.1-3, 13, 17, Appendix A available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 63 Larimer, p. 1-3, available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 64 Larimer, p. vii, available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 65 Larimer, pp. 3.2 - 3-4, available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 66 Larimer, p. 3-2, available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.

- 67 Larimer, p. 3-3, available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 68 Larimer, p. 3-4, available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 69 Larimer, p. 3-3, available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 70 Larimer, Appendix C p. 2, available at: http://www.larimer.org/sites/default/files/uploads/2018/larimer_county_atm_final_report.pdf.
- 71 Water Market Insider, Colorado's South Platte Basin Water Rights Market, WestWater Research LLC, Q1 2016, available at: <http://www.waterexchange.com/wp-content/uploads/2016/02/16-0217-Q1-2016-WWInsider-LO-singles.pdf>.
- 72 "Colorado Springs Utilities reaches novel water-sharing agreement", Marianne Goodland, Aug 2018, available at: https://gazette.com/news/colorado-springs-utilities-reaches-novel-water-sharing-agreement/article_ff43ac62-a19f-11e8-bb7e-6be70cdbfec1.html
- 73 Fort Collins Water Supply and Demand Management Policy Revision Report, City of Fort Collins, pp. 7-9, April 2014 (Fort Collins), available at: https://www.fcgov.com/utilities/img/site_specific/uploads/Final_Fort_Collins_Policy_Report_April_2014_w_Appendices.pdf.
- 74 Fort Collins, pp. 9, 12, 36, 48-51, 61, 85-86 available at: https://www.fcgov.com/utilities/img/site_specific/uploads/Final_Fort_Collins_Policy_Report_April_2014_w_Appendices.pdf.
- 75 Fort Collins, pp. 89-90, available at: https://www.fcgov.com/utilities/img/site_specific/uploads/Final_Fort_Collins_Policy_Report_April_2014_w_Appendices.pdf.
- 76 Fort Collins, pp. 85-86, available at: https://www.fcgov.com/utilities/img/site_specific/uploads/Final_Fort_Collins_Policy_Report_April_2014_w_Appendices.pdf.
- 77 Fort Collins, p. 90, available at: https://www.fcgov.com/utilities/img/site_specific/uploads/Final_Fort_Collins_Policy_Report_April_2014_w_Appendices.pdf.
- 78 Fort Collins, p. 64, available at: https://www.fcgov.com/utilities/img/site_specific/uploads/Final_Fort_Collins_Policy_Report_April_2014_w_Appendices.pdf.
- 79 Alternative Agricultural Water Transfer Methods Grants, Colorado Water Conservation Board, available at: <http://cwcb.state.co.us/LoansGrants/alternative-agricultural-water-transfer-methods-grants/Pages/main.aspx>