

Water-wise Landscape Design



Do you know...



Where we get our water?

Where we store our water?

How much water our city uses per year?

What programs we offer?

How much water we have saved over the years?

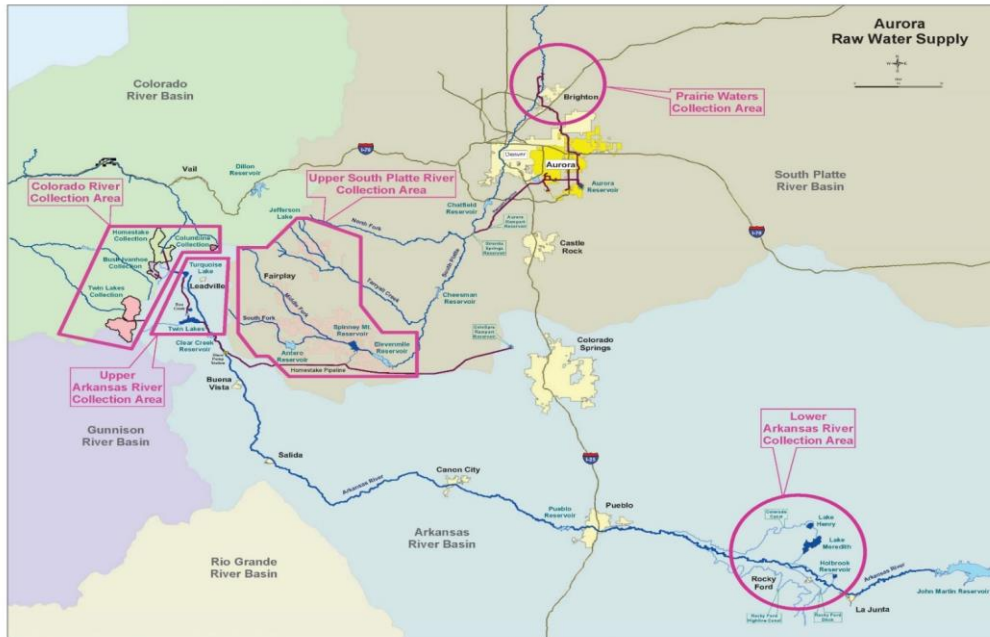
...where we get our water?



Colorado is a headwaters state, with the majority of the state's rivers beginning high in the Rocky Mountains as snowmelt. One of the benefits of living in a state that relies primarily on surface water is that unlike groundwater, surface water is a renewable water source.

One of the drawbacks is that precipitation levels vary greatly from year-to-year making the majority of the state's water supply relatively unpredictable – and highly prone to drought.

... where we store our water?



Aurora's water system starts nearly 180 miles away and includes the use of reservoirs, the natural river system, pipes, tunnels and pumps, all of which help us pull the water we own from our three river basins and deliver it to Aurora.

Aurora receives 25% of its water supply from the Colorado, 25% from the Arkansas and 50% from the South Platte river basins.

Homestake
Turquoise
Twin
Spinney Mountain
Jefferson
Strontia Springs

Rampart
Quincy
Pueblo
Aurora
Meredith
Henry

...how much water we use as a city?



16.6 billion gallons



The average annual distribution for the past three years is 16.6 billion gallons annually. About half of that water is used outdoors. Aurora has a semi-arid climate, and our snow and rain levels are about half of the average annual precipitation for the United States, so it's important that we all do our part to help conserve water.

...we offer programs to help you save water and money?

INDOOR PROGRAMS

- Free indoor water assessment
- Ultra-high-efficiency toilet rebate
- Low-income water efficiency program

OUTDOOR PROGRAMS

- Free landscape designs and rebates
- Free automatic sprinkler system assessments and rebates
- Customize your watering schedule
- Water conservation classes
- Gardening and volunteering



...how much water the conservation
division has saved?



**448 million
gallons or 7.2
billion cups
of water**



Combined water savings for 2016, 2017, 2018

Class Goals



- Prepare for your design consultation
 - Draw your site map
 - Analyze opportunities and constraints
 - Design ideas



Our goals are that you
Understand how to create your own site map
Analyze the conditions of your site.
Understand the city code that applies to your front yard
Explore some basic design features

What are YOUR goals for this class?

Project Area

- Where turf is not needed
- Which is defined by a fence, property line, or sidewalk
- Is on a separate irrigation zone
- That meets the Water-wise Landscape Rebate size requirements (500 sq. ft.)



Step 2 is to make sure that you're choosing an appropriate location for your water-wise landscape.

Collect Your Supplies

- Site Map Packet
- Measuring Tape
- Pencil
- Note Paper
- Camera

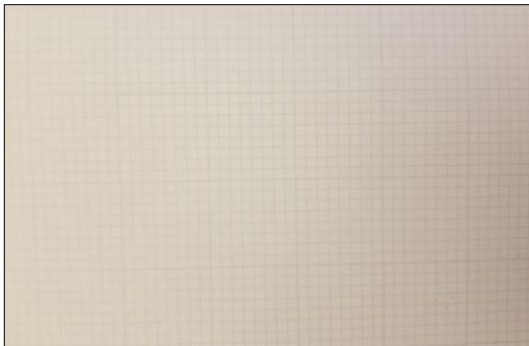


The first step in drawing your site map is to collect your supplies. Whether you opt to create a design yourself or utilize Aurora Water Conservation's design service, request a site map packet by calling 303-739-7195. It typically takes ten days to receive it. Contact us if you have not received it within two weeks.

Site Map Packet



Aerial



Vellum



Ruler

Aurora Water
SITE MAP AND LANDSCAPE DESIGN
CONSULTATION PACKET

Name: _____

Address: _____

Date: _____

THIS PACKET CONTAINS:

1. Preparing for Your Design Consultation Handout
2. Site Survey worksheet
3. One piece of vellum tracing paper
4. Ruler at scale: 1" = 8' or 10' or 16' or 20'
5. Aerial of your property
6. Current class schedule

If you are interested in participating in a free, one-on-one landscape design consultation, please complete the following steps:

- ☐ Complete the Preparing for Your Design Consultation class. This class may be taken in-person or online. Check our current class schedule for class times or visit www.aurora.org for all of our online classes.
- ☐ Complete the site map
- ☐ Complete the Site Survey
- ☐ Email photos and the plot list to: members@aurora.org

Once you've taken the class and completed the paperwork, you can schedule your design consultation by calling 303-739-7195.

The consultation will take place at:
Water Conservation
Aurora Municipal Center
15151 E. Alameda Parkway, Ste. 3228

It should take about 1.5 hours. **Remember to bring all of your completed materials with you to the consultation.**

If you have any questions, please contact Water Conservation at 303-739-7195.
Thank you for using water efficiently in Aurora.
We look forward to working with you.

7/17

☐ Deciduous Trees ☐ Terracing ☐ Stairs ☐ Benches
☐ Ornamental Trees ☐ Walkways ☐ Dry-Creek Bed

Please ☐ Walkways

Notes:

1 2 3 4 5 Natural

1 2 3 4 5 Spine

1 2 3 4 5 High End

IT LIST

and a traffic meter.

Site Survey / Ideal Landscape



While you may obtain an aerial via an online mapping tool, it is often difficult to print the map to a workable scale (1 inch = 8 feet, 10 feet, 16 feet, or 20 feet).

Aerial



An example of an aerial provided in the site map packet.

Aerial shows square footages based on plant type and approximates the quantity of water used for each

Site Map

To-scale image: 1"= 8', 10' or 20'



1 inch = 10 feet

0 5 10

Ft



Your aerial will be printed at a scale of 1"=8 feet, 10 feet, or 20 feet.

The scale is indicated in the lower right hand corner of the sheet. It consists of numeric and graphical portion. Both are required on any design.



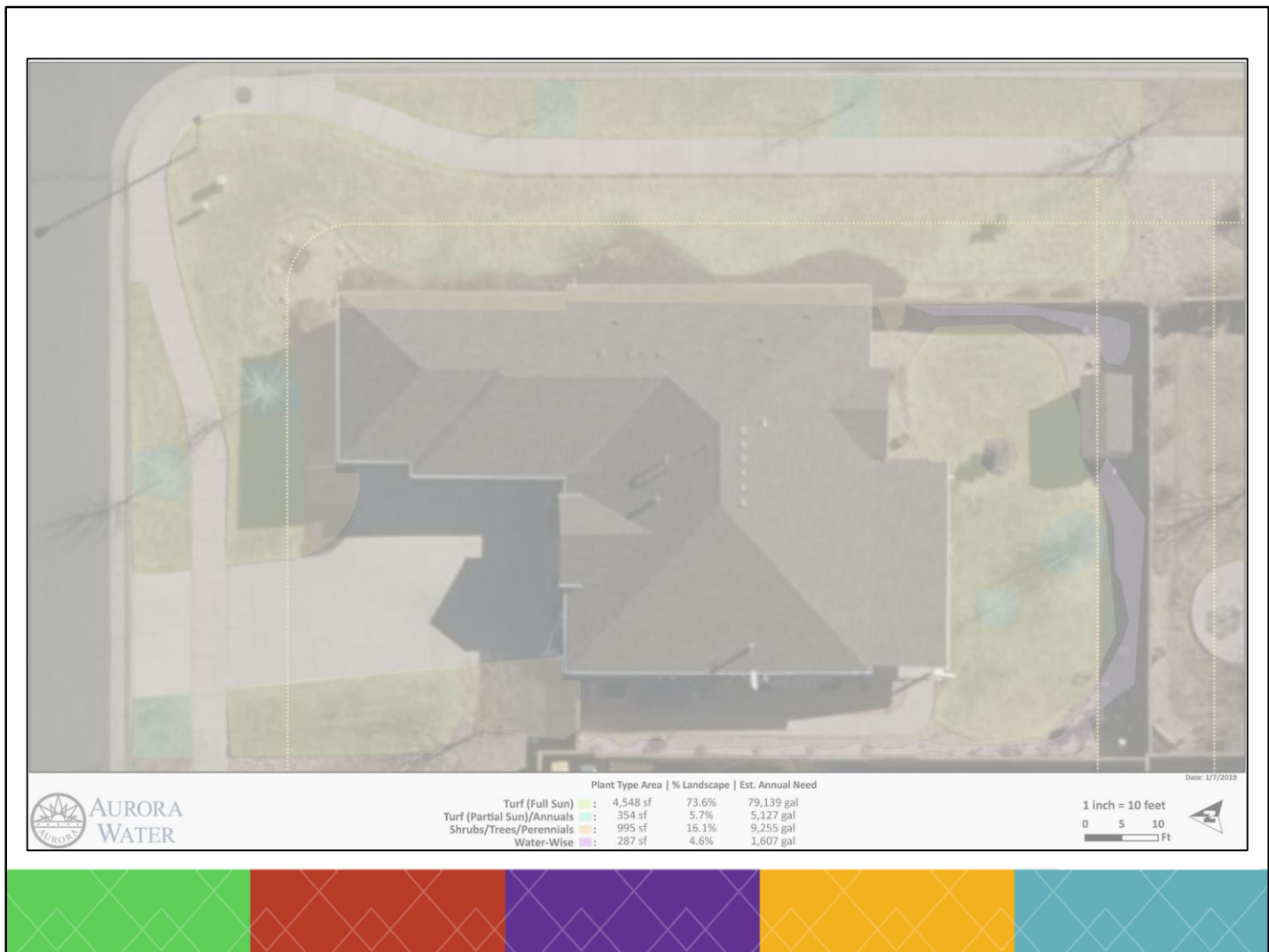
It may be easier to draw lines on the aerial before overlaying the vellum

Note the dotted yellow line. This is an easement.

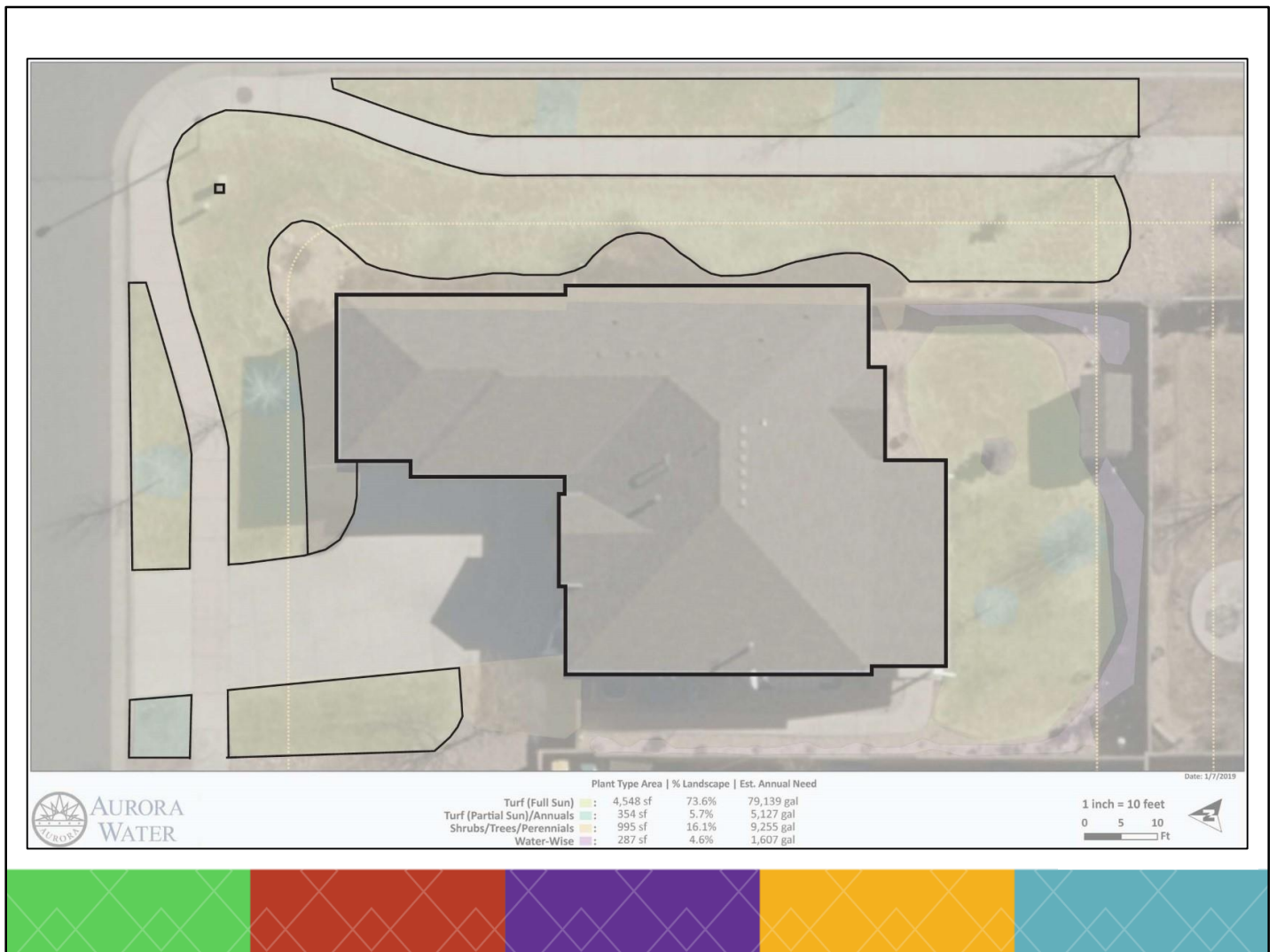
Mark the following:

- house
- driveway
- sidewalks
- patio
- other impermeable areas
- landscape beds

TIP: Tape the aerial to a window with a lot of light, then tape the vellum over the aerial. This may help the landscape features pop out.



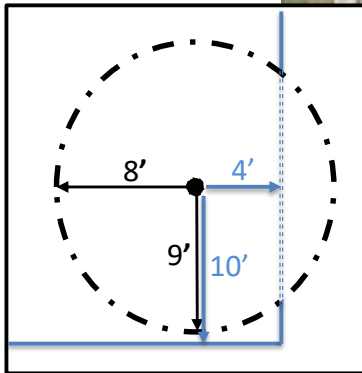
Once you've drawn the lines, place the vellum over the aerial and trace the lines you've drawn. Again, it may be easier to trace the lines when the aerial is backlit.



Trace major lines onto the vellum.



Draw trees and shrubs on the vellum.



To draw existing trees:

Determine the location of the tree. Measure from the trunk to a fixed object in two different directions (use a property line, sidewalk, driveway, fence, etc.) and record these numbers.

Find the tree diameter by measuring along the ground from the trunk to the approximate tips of the longest branches (the edge of the canopy). Multiply by 2. This is your diameter.

Put your tree location and diameter into your site map's scale. For example, using a 1 inch = 8 feet scale: if your tree canopy diameter is eight feet, the circle you draw to represent your tree will be one inch in diameter.

Draw on site map with a circle template, compass, or household item like a lid or can of food.

Site Analysis

Opportunities and Constraints

- What is existing?
- What outside influences are present?
 - Sun/Shade
 - Wind
 - Viewsheds
 - Slope
 - Soils
 - Utility easements
 - Access
 - Noise
 - Right-of-ways
- Add features to your sitemap where appropriate



Walk your proposed project area. Inventory the area for each of the above characteristics. In addition, ask yourself the following questions:

What are current issues on the site?

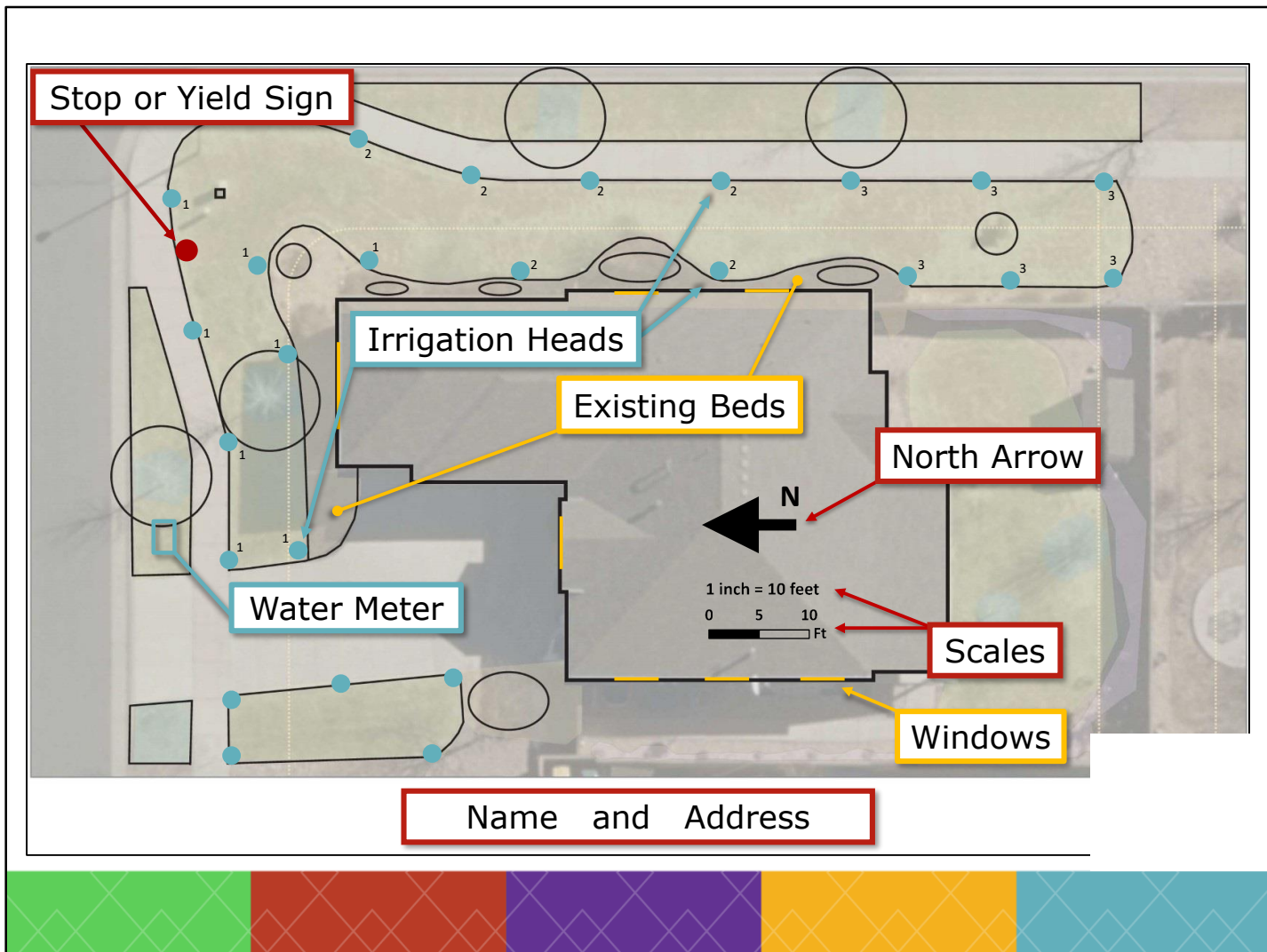
What are the existing site features?

How do you want it to look?

Is grass needed?

How do you want to use the space?

Choose your specific goals and desires before attending the design consultation.



Label the site map with:

Name

Address

North arrow

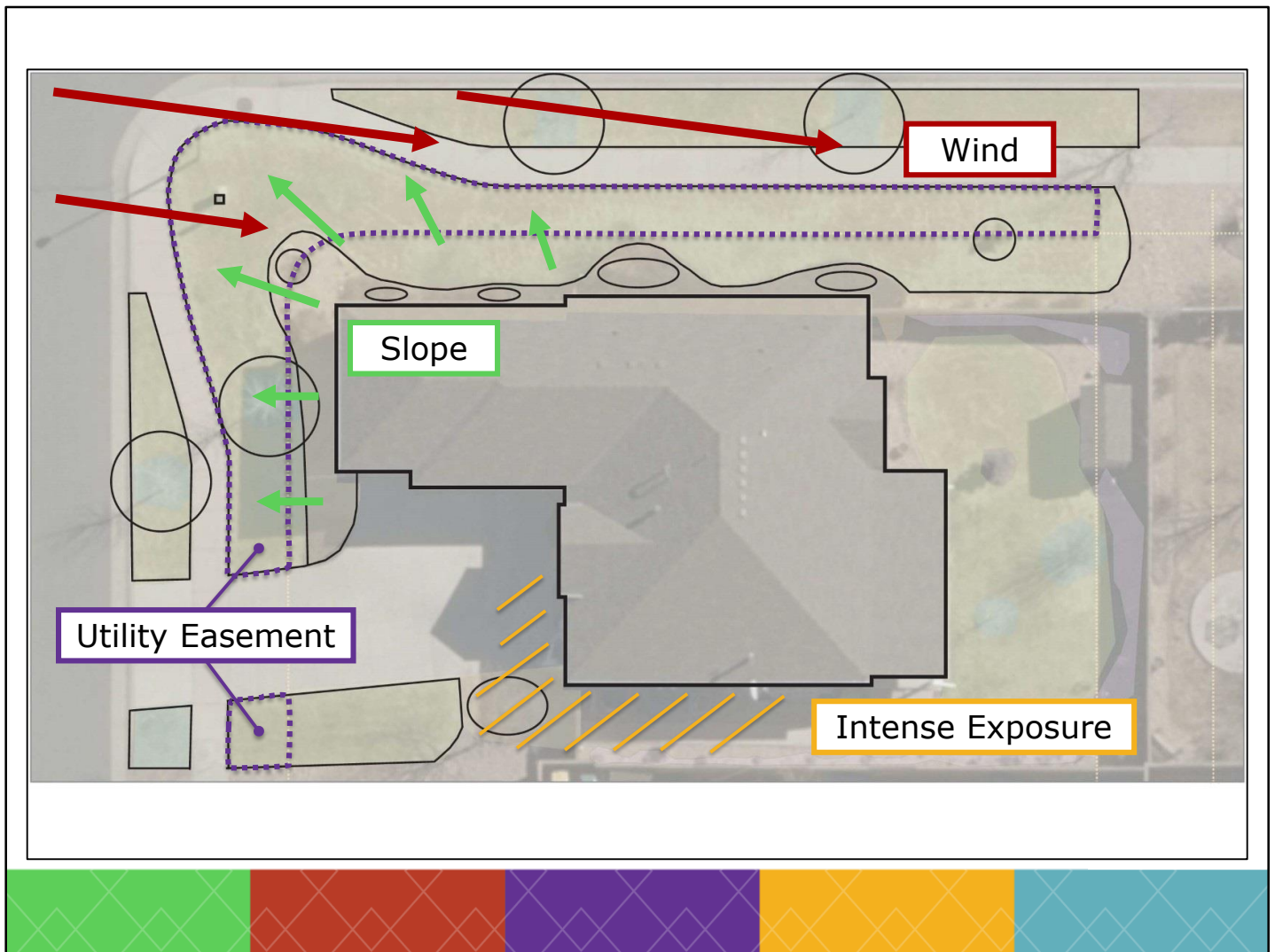
Scales

Stop or yield signs

Water meter

Irrigation heads and zones

Window locations



Understand the following conditions on your property and be ready to discuss them with the designer if necessary. You do not need to include them on the vellum.

Easements – research if you suspect you may have an easement. Call Public Works at 303-739-7300. Be aware that the type of easement influences the type of work that can take place in that area. Structures are typically not permitted. Also to note, there may be limitations on the type of plant material that may be utilized. For example, trees are typically not allowed in a utility easement. Utility companies have the right to tear up the landscaping in such easements.

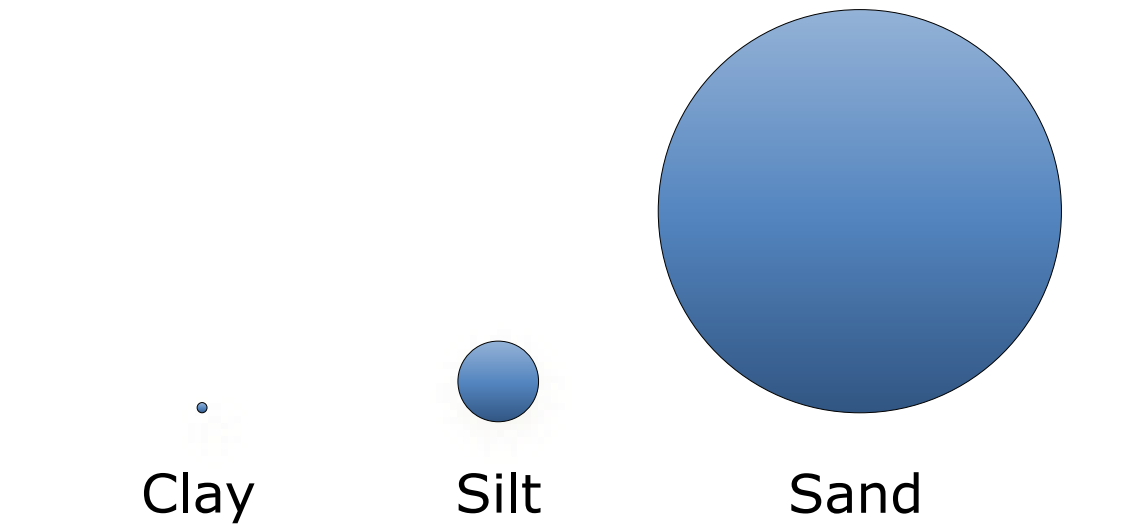
Estimate a slope and note your drainage patterns.

Extreme exposures and microclimates – Wind, reflected light or heat, continually moist soils or sheltered areas.

Patterns of use – Note the circulation / use patterns. These may be places to ideal for pathways.

Sunny and shady Areas – Mentally note if your yard's sun exposure is blocked by any features such as neighbor's home or tree. Understand sun angles.

Soils



There are three particles that make up our soils: clay, silt and sand.

Soil is never comprised of just one of these particles, it's always a mixture. Clayey soils contain mostly clay particles. For example, a clayey soil could be 56% clay, 33% silt, and 11% sand. A sandy soil is comprised mostly of sand particles. For example, 14% clay, 25% silt, 61% sand.

The physical characteristics of soil are best evaluated while the soil is damp. When rubbed between a finger and a thumb, a moist CLAY soil will feel sticky or silky smooth. It holds its shape moderately to very well. When rubbed between a finger, a moist SANDY soil will feel very gritty. It does not hold a shape well.

Aurora soils are comprised predominately either clayey or sandy.

Plants are very adaptable, most will perform well regardless of the soil they are planted in. Soil type directs us on how we should water.

Water-wise Landscapes and Your HOA

Aurora Zoning Code

- Sec. 146-1452
“...any private covenant(s) that purports to invalidate or disallow the xeriscaping provisions contained in [the zoning code] are invalid..”

Colorado Revised Statutes

- Section 37-60-126 (11)



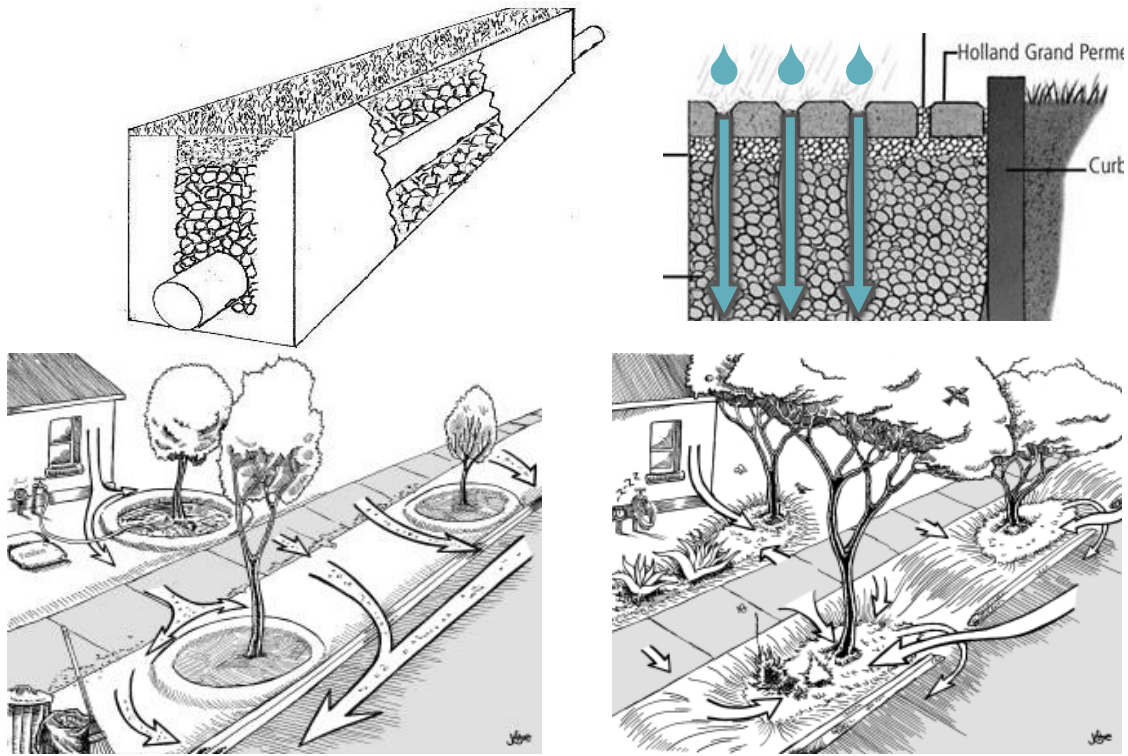
Aurora City Council passed ordinance 146-1452, making it illegal for Homeowner's Associations (HOA) or Metro Districts to (1) have covenants or restrictions preventing the installation of water-wise landscapes or (2) requiring part or all of a landscape to be comprised of high water-use grass. The State of Colorado has a similar law. Zeroscape and landscapes of inorganic or organic mulch do not fall into the category of a water-wise landscape. The landscape must contain at least 50% long-lived plant material to meet city code or at least 60% long-lived plant material for any project area to be eligible for the water-wise landscape rebate.

Aurora Water Conservation has worked with several HOA's to develop water-wise landscape standards for the community that meet or exceed City code requirements and are in harmony with the aforementioned City and State regulations. Prior to your consult, please obtain and email us a copy of the landscape standards for your HOA or Metro District so that we may review them and understand what guidelines we have to work with. For HOA's and Metro Districts that do not have water-wise landscape guidelines or have guidelines that are restrictive, we are willing to discuss the City and State regulations with them and assist in development of water-wise landscape guidelines specific to the community. When water-wise landscape guidelines do not exist for a community, we will default to City code or rebate program guidelines.

Aurora Water Conservation cannot provide legal advice regarding either of these regulations.

Design Elements

Rainwater 'collection' and diversion



Rainwater diversion is meant to slow down the movement of water across your property in order to (1) help your plants get more water and (2) slow or stop erosion.

Permeable Paving is a range of materials – typically porous concrete, porous asphalt or pavers. Permeable surfaces allow water to percolate into the ground instead of being channeled into streets where it picks up contaminants that are then dumped into sewers and waterways. Allowing rainwater, storm water, and, yes, polluted runoff, to disperse more naturally into the ground instead improves water quality, and replenishes subsurface water. Permeable paving is typically very costly.

French Drains are a means of directing water directly into the ground. Commonly made from perforated pipe or a length of landscape fabric filled with rock.

Berms and swales direct the flow of water across your property. You cannot create swales near existing trees because digging will damage the roots.

Drawings courtesy of Brad Lancaster and Joe Marshall 2005

Design Elements

Landscape Features



A dry creek bed, a bench and a flagstone patio, are aesthetically pleasing elements that you can consider to add beauty and function to your landscape.

These elements are not considered hardscapes features

Code Requirements

Front Yards – Plant Coverage



Plant Material: At least 50% of landscape
Mulch: No more than 50% inorganic



50% of any landscapeable area of your front yard (or any area facing a public right-of-way) must be covered in long-lived plant material, not annuals. This is an example of how we determine how many plants are required:

Area of front yard: 1,000 square feet (s.f.)

Plant coverage requirement = area of the front yard times 50%:

$$1,000 \text{ s.f.} \times 0.50 = 500 \text{ s.f.}$$

Now that we know the plant material requirement, we need to determine how many plants need to be installed.

City Code gives plant types specific square foot values:

Shrubs = 32 s.f.

Perennials = 10 s.f.

Ornamental grasses = 10 s.f.

Number of plants = plant material requirement divided by a plant square foot value:

$$500 \text{ s.f.} / 32 \text{ s.f.} = 15.6 \text{ shrubs}$$

Rounding up, we need to install 16 shrubs. Ornamental grasses and perennials may be used instead of shrubs. For each shrub, use 3 ornamental grasses or perennials or combination of. If you know you want all ornamental grasses and perennials, divide 500 s.f. by 10 s.f.

In terms of mulch, you may cover your front yard in any organic mulch, such as bark or wood chips. If you prefer inorganic mulch, such as gravel, cobble or pea gravel, you can only use up to 50% on the landscapeable area.

Code Requirements

Front Yards - Hardscape



Current code requires implementation of one hardscape feature in your front yard. You have the following hardscape options to choose from:

Boulders – 2' x 3' x 18", minimum 3

Wall – 1-2.5' high, natural stone, stucco, or masonry

Berm – max 2.5' tall, grade may not exceed 1:4 slope

Fence – See City of Aurora Zoning Code, Article 17. Sec. 146-1741 (B) (Available at municode.com)

All fences must be in compliance with building regulations. Fencing does not meet the hardscape requirement for the Water-wise Landscape Rebate.



Send up to 10 photos to
zverslui@auroragov.org



Practical photos are required for your design consultation. The photos should accurately represent the proposed project area. As in the example above, for a front yard project, take a photo that will capture the overall project area. Several other photos from the sidewalk or other areas of the project will help provide an up-close perspective.

Make sure images have a high enough resolution. Modern-day cell phones and digital cameras will accomplish this just fine. Images sizes between 250K and 3MB are sufficient. Email the photos to zverslui@auroragov.org before your consultation. Please add a subject such as "Design Consultation Photos – (your property address)."

Water-wise Plants

Over 500 plants on our Water-wise Landscape Plant List
Grasses, Shrubs, Perennials, Trees, Vines, Edibles



Before we will schedule you to meet with a designer, you must create a list of at list of 5 plants. This list will help the designer understand the type of plant material you would like to see in your landscape and serve as a starting point for making other plant recommendations.

Please email the list prior to the consult.

The photos from left to right are of: species tulip, banana yucca, dwarf fountain grass, coneflower and serviceberry.

Water-wise Plants

- Water-wise Demonstration Gardens
- Denver Botanic Garden
- Local garden centers and nurseries
- Websites
 - *plantselect.org*
 - *aurorawater.org*
 - *highcountrygardens.com*
- Aurora Public Libraries
- Water Conservation office



These are wonderful resources for gleaning ideas and starting to see what you'd like on your plant list.

Time to Schedule

- Verify completion of site map packet
- Email photos and plant list to Zach at zverslui@auroragov.org
- Designer will contact you to schedule



As mentioned before, we would prefer that you email any HOA guidelines prior to your design consult so that we have an opportunity to review them.

Design Consultation

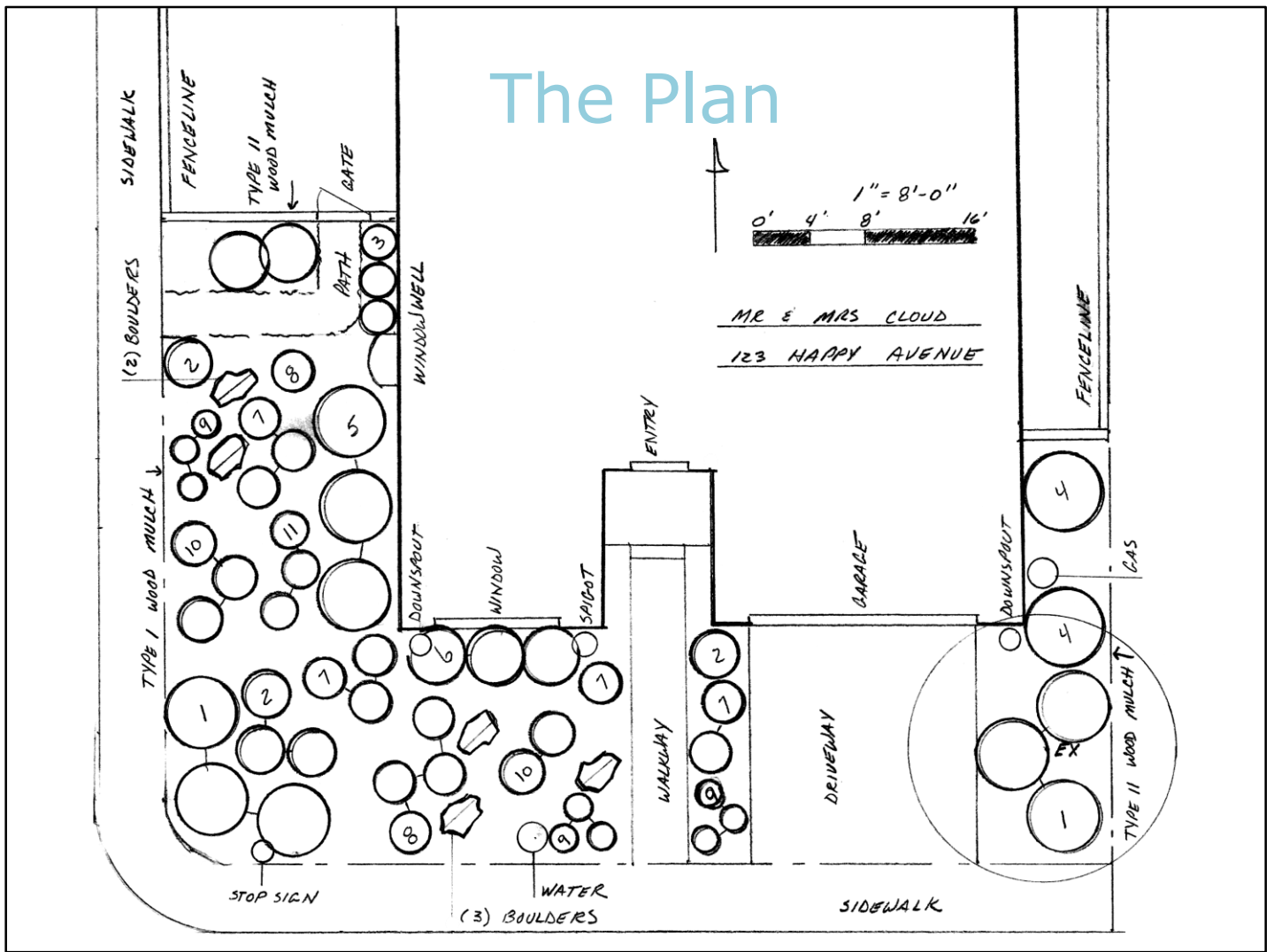
Materials needed

- Completed site map
- Site Survey Worksheet & Plant list
- Photographs
- HOA guidelines (if applicable)

Reschedule at least 48 hours prior to consult



The Plan



An example of a final design.

Plant List

Customer Plant List

Customer Name: Mr. & Mrs. Cloud Potential Errors
 Customer Address: 123 Happy Ave
 Converted Sqft. : 1427 Highly irrigated turf removed & converted to plant beds
 Coverage (Sqft): 1066 Square Footage Value for Existing and Proposed Plant Material

% Coverage: 75% % Coverage must be > 50% for Code and 60% for Rebate
 %Plants-Moderate H20: 12% % of Moderate H20 plants must be less than 20%
 Cubic yards compost: 0.60

NOTES: (5) Boulders: 3' x 2' x 18" min.

Type I Wood Mulch: Coffee Brown
 Type II Wood Mulch: Shredded cedar

Symbol	Quantity	Botanical Name	Common Name	Water Usage	SF Value	Minimum Size	Compost Qty
1	6	Arctostaphylos x coloradoensis 'Mock Bearberry'	Mock Bearberry	low	32	#1	1
11	3	Berberis thunbergii 'Crimson Pygmy'	Crimson Pygmy Japanese Barberry	moderate	8	#5	1
3	3	Berberis thunbergii 'Orange Rocket'	Orange Rocket Barberry	low	18	#5	1
4	2	Euonymus alatus 'Fire Ball'	Fire Ball Burning Bush	moderate	50	#5	1.5
5	3	Juniperus scopulorum 'Wichita Blue'	Wichita Blue Juniper	low	64	#5	1
5	6	Rosa x 'Nearly Wild'	Nearly Wild Rose	low	32	#5	1
2	5	Agastache cana 'Sinning'	Sonoran Sunset® Hyssop	low	10	#1	1
8	5	Iris pallida 'Variegata'	Variegated Sweet Iris	low	10	#1	1
9	9	Sedum 'Autumn Joy'	Autumn Joy Stonecrop	low	8	#1	1
7	9	Bouteloua gracilis 'Blonde Ambition'	Blonde Ambition Blue Grama Grass	low	10	#1	0.5
10	5	Helictotrichon sempervirens	Blue Avena Grass	low	10	#1	1

This is an example of the plant list you will receive after your design is complete. It shows:
 The landscape coverage, shown as a percentage based on the total converted square footage.

City code requires this to be at least 50%

The water-wise landscape rebate requires this to be at least 60%

The percentage of plants listed which are moderate water users, as opposed to strictly xeric.

The symbol, quantity, botanic name, common name and minimum acceptable container size of each plant in your design.

Let us know how we're doing

Please take just a few minutes to evaluate this class. We hope you enjoyed it.

<https://www.surveymonkey.com/r/AuroraWater>



Thank You

Water Conservation Office
Hotline 303.739.7195
conservation@auroragov.org



Please visit our website for additional information at www.auroragov.org