LANDSCAPE IRRIGATION EFFICIENCY

BACKGROUND

- Landscape irrigation is the single largest use of potable water in the U.S.
- Up to 70% of your water use is outdoors.
- As much as 50% of water used for irrigation is wasted due to evaporation, wind, and overwatering caused by inefficient irrigation methods and systems.
- Through education and planning, it is estimated that landscapes can be well maintained using 30 to 50% less water.

IRRIGATION AND LANDSCAPE DESIGN STANDARDS

- Landscape irrigation industry lacks national or international standards for construction and installation.
- Most jurisdictions do not have strong provisions for water efficiency within their landscape codes.

8/2011

Athol Elementary

8/2011

Betty Kiefer Elementary

8/2011

Dalton Elementary

8/2011

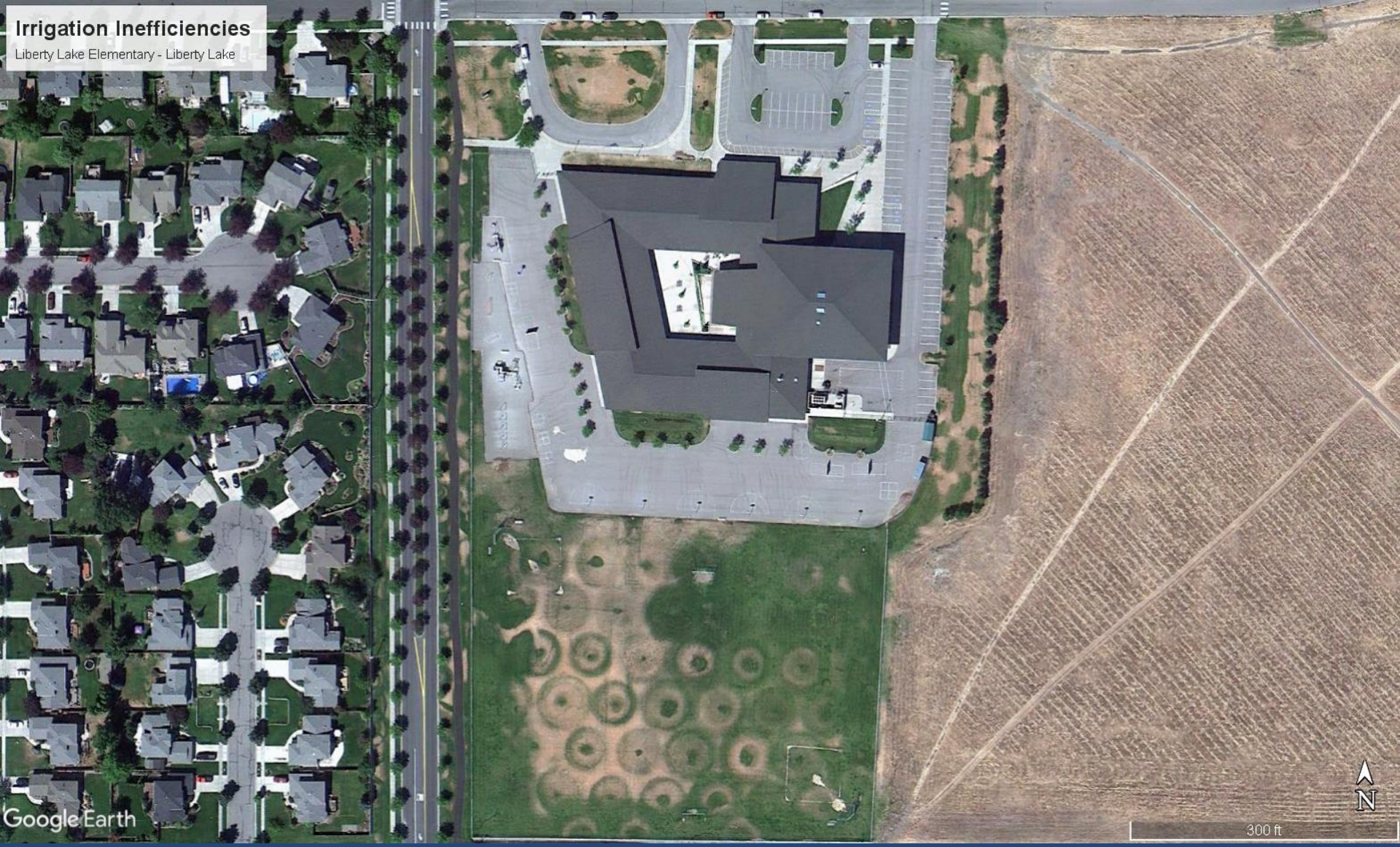
Woodland Middle School

8/2011

Highlands Golf Course

8/2011

Spokane County Sheriff's Training Center



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Liberty Lake Elementary

8/2011

Valley Christian School

8/2011

Whitman Elementary

DESIGN INEFFICIENCIES

- Proper head spacing (distance) and placement (blockage)
- Proper head height
- Proper head applications (i.e. 15' head for 6' space)
- Proper nozzle applications (fine mist, large droplets, breakup)
- Matched precipitation rates
- Mismatched heads
- Zone separation
- System pressure
- Pipe size
- Plant water requirements
- Slope, drainage and landscape contours
- Soil type, compacted soils, root zone depth
- Installation practices (sprinkler/screen plugging)
- Backflow (devices installed on the wrong side of blowout)

MAINTENANCE INEFFICIENCIES

- Misdirected spray
- Broken risers and heads
- Leaking seals
- Plugged nozzles and screens
- Blocked spray
- Tilted heads
- Head height
- Nighttime watering (not checking system regularly)

SYSTEM OPERATION INEFFICIENCIES

- Scheduling
  - Start up/shut down
  - Start times
  - Run times
  - Cycle soak programs
- Root zone depth
- Mow height
- Grass clippings
- New turf settings
- Rain delay
- Sensor technologies


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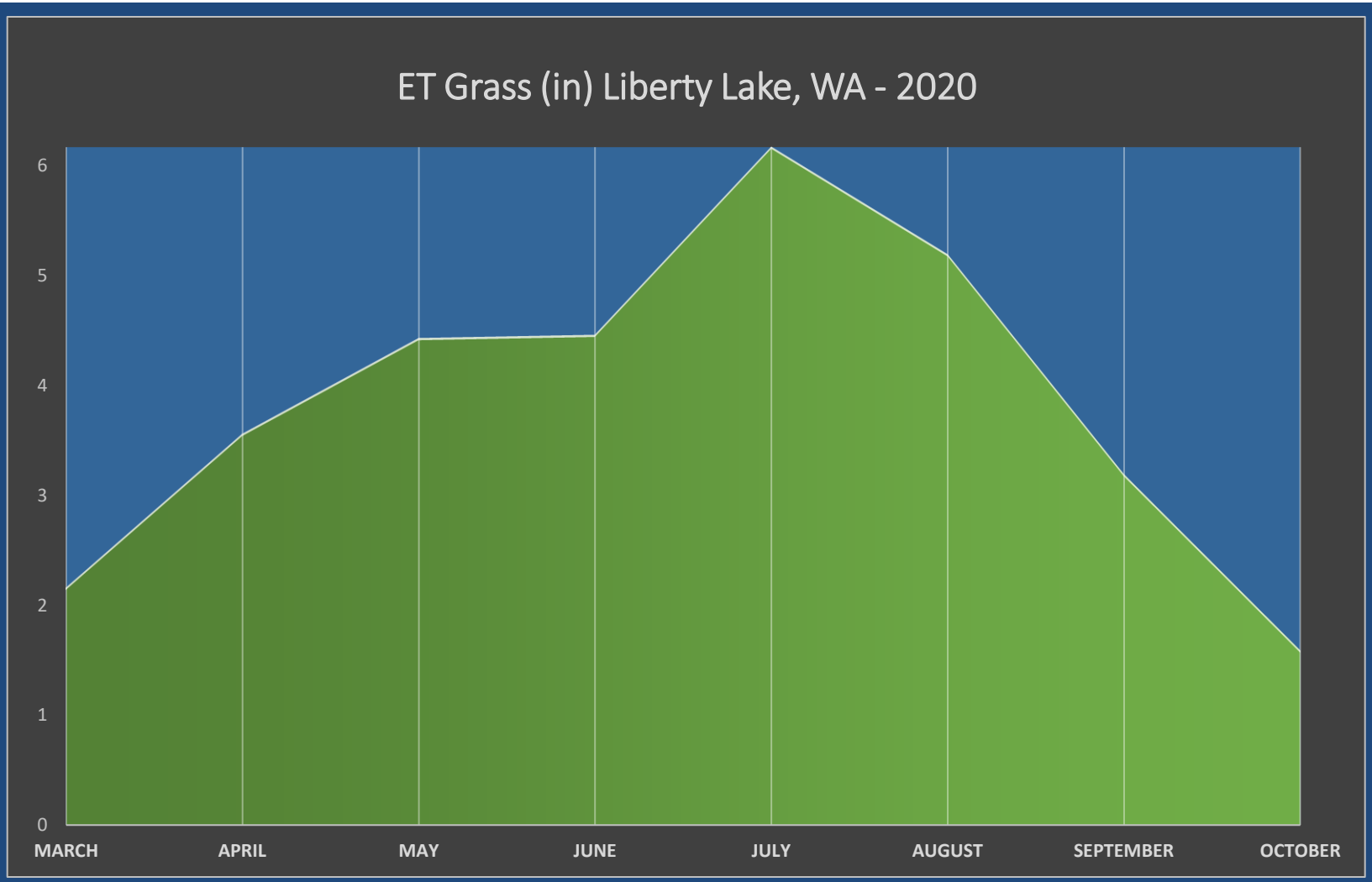
PLANT WATER REQUIREMENTS AND IRRIGATION SCHEDULING



IMPORTANCE OF DISTRIBUTION UNIFORMITY

DU %	Water the plant needs	÷	DU Decimal	=	Amount of water you need to keep the dry areas green
30%	1 inch	÷	0.3	=	3.33 inches
50%	1 inch	÷	0.5	=	2.00 inches
70%	1 inch	÷	0.7	=	1.42 inches

DU measures how uniformly an irrigation system applies water to the landscape

Excellent (Achievable)	Good (Expected)	Poor (Common)
75%	60%	50%

EFFICIENCY

- Efficiency of various irrigation methods:
  - Subsurface drip – 90%
  - Surface drip (micro) irrigation – 85%
  - Large rotors – 70%
  - Small rotors – 65%
  - Spray heads – 50%
- Matched Precipitation Rate (MPR)
  - Example: MP Rotator 70%
  - Hunter, Rainbird, Toro all offer mini rotators

Traditional Spray Head

Flow (GPM) = 0.1 to 5.52

VS.

Example:
Traditional 1.85 X 20 min = 37 Gal

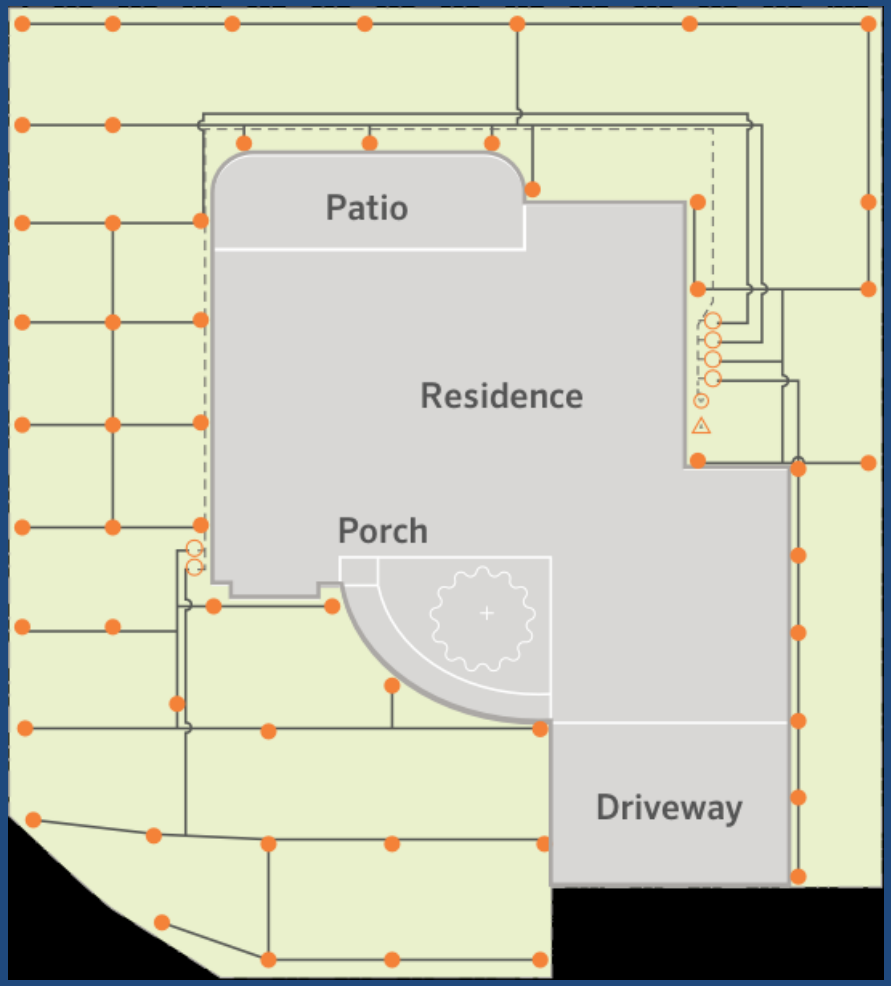
MP Rotator 0.50 X 20 min = 10 Gal

= 73% reduction

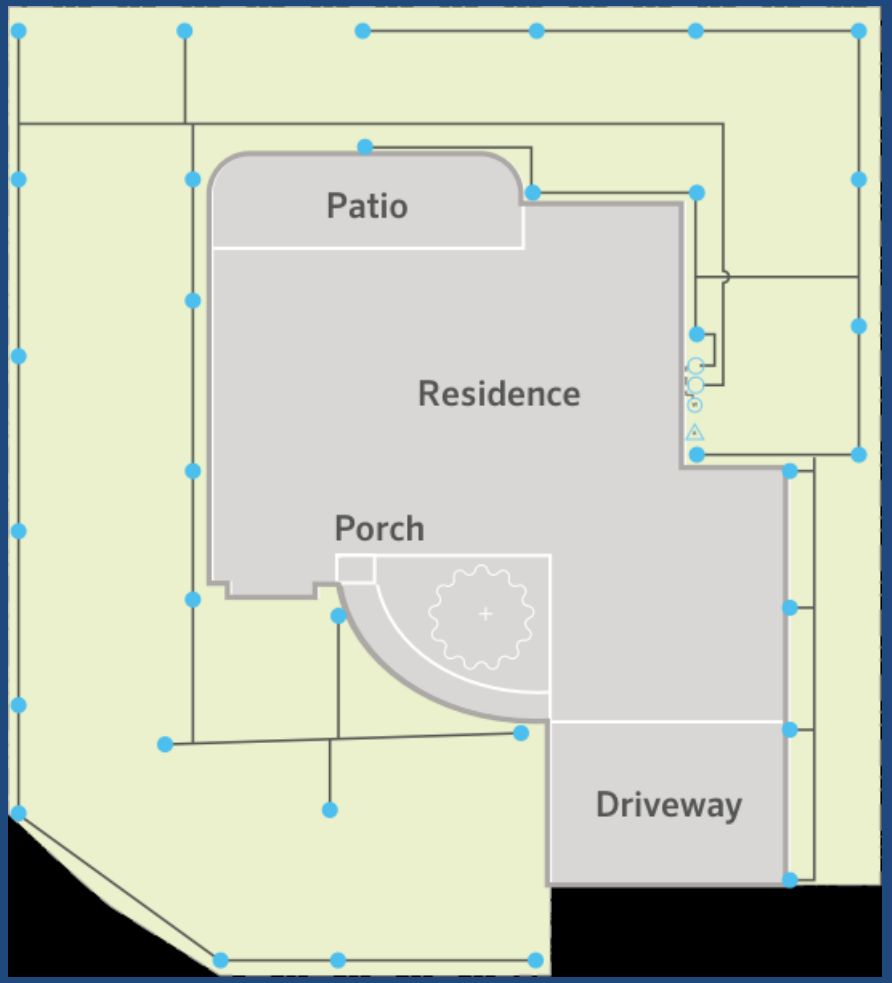
MP Rotator

Flow (GPM) = 0.17 to 1.01

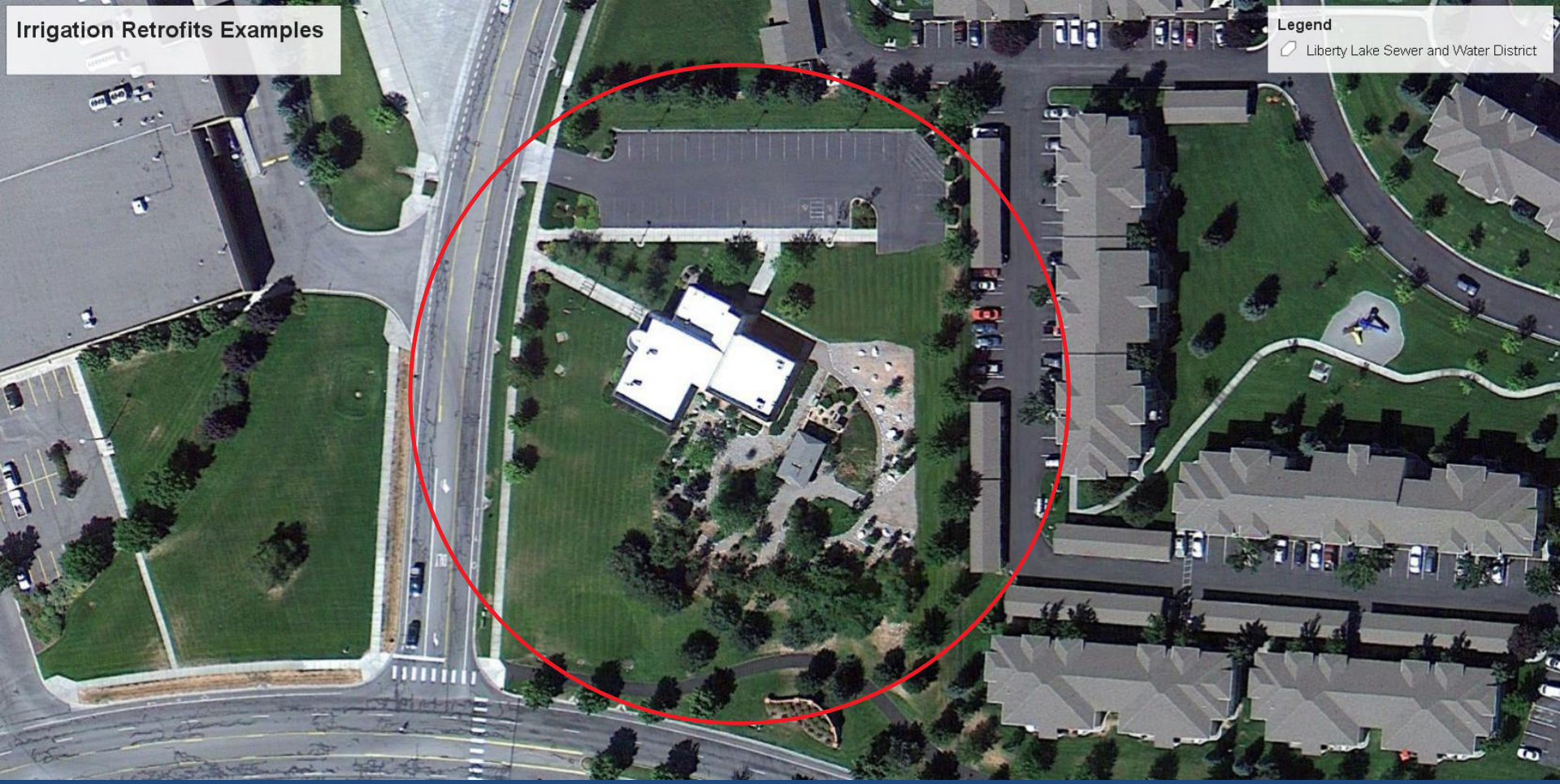
Design Using Traditional Sprays



Design Using MP Rotators



Having a slow precipitation rate across such a large radius range means less pressure loss throughout the zone. This allows more heads to run on one valve and simplifies the design layout (https://www.hunterindustries.com/mp-smarter-faster-better)

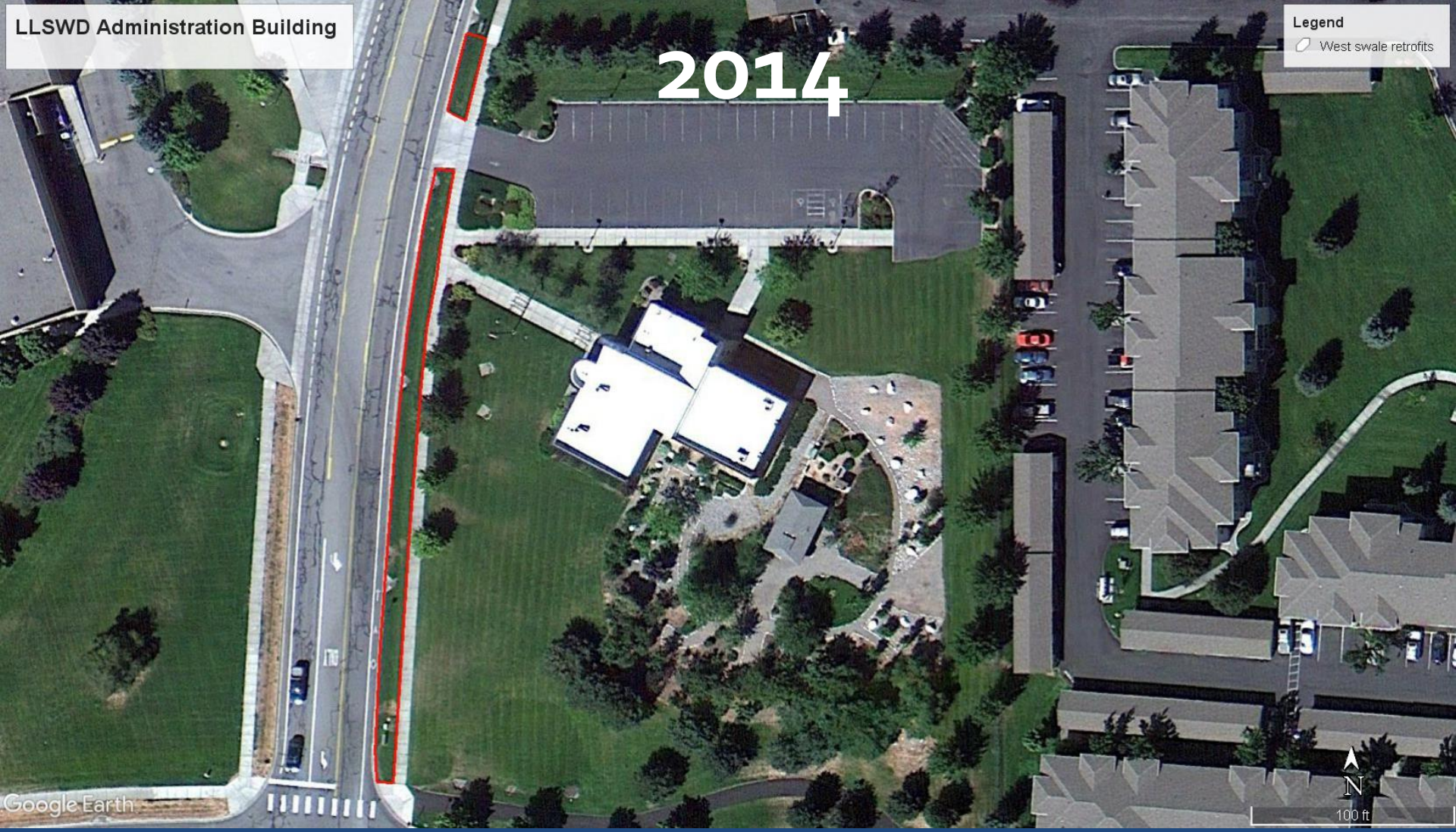


Liberty Lake Sewer and Water District Example

8/2011

- 2.4 acres. Audited in June 2005. System efficiency (DU) was 44%
- Implemented landscape measures (pressure regulation, matched and aligned rotor heads, and installed sensor-based technology)
- Cost under $500 (including soil sensor)
- **Reduced water by 36% the following year and improved DU to 61%**

- Retrofitted 22 spray heads to MP2000 Rotators
- Observed water savings was 2.66 GPM to 0.71 GPM per head
- **Recognized savings = 42.9 gallons per minute the system runs**



- 61 spray heads – 34 were retrofitted to MP1000 Rotators and 27 were eliminated.
- Observed water savings was 1.85 GPM to 0.50 GPM per head
- **Recognized savings = 95.85 gallons per minute the system runs**

IWAC – EFFICIENT IRRIGATION AND LANDSCAPE DESIGN GUIDELINES

- Provide industry, local jurisdictions, agencies, and water purveyors with an understanding of the importance of designing, installing, and maintaining efficient landscapes.
- Enact water efficient irrigation and landscape requirements for new and rehabilitated landscape projects to address irrigation efficiency and design standards.
- This guide provides the recommended elements that an ordinance or design standard should include, to ensure landscapes are designed with water efficiency in mind.

https://www.iwac.us/irrigation-and-landscape-guidelines/

CONTACT INFORMATION

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