

The background features a large, faint, light green circular seal of the Irvington Union Free School District. The seal contains the text "IRVINGTON" at the top, "UNION FREE SCHOOL DISTRICT" at the bottom, and the motto "PER ASPERA AD ASTRA" in the center. A large, stylized letter "I" is also visible in the center of the seal.

# **Best Practices for Grounds Maintenance in a Sustainability Oriented Mindset**

**Richard Pittore, Director of Facilities**  
**November 22, 2022**



# Agenda

- Best Practices for Mowing Fields
- Other Required Field Maintenance (Non Turf Fields)
- District's Current Equipment
- Gas versus Electric Equipment
- Other Sustainability Considerations for Grounds Maintenance
- Landscaping Committee Update



# Best Practices for Mowing Fields

Different schools of thought for best practices

- Recommended height varies depending the type of grass and usage of grass
- Many experts recommend a 4” turf height
  - It makes scalping (turf damage from mowing too short) much less likely to happen
  - It allows you to clip about 30 percent of the leaf blade each time you mow
  - It promotes establishment of a larger root system, which is more drought tolerant
  - It provides broadleaf weed and crabgrass control by shading the soil surface
  - It establishes a grub-tolerant lawn because of the larger root mass
- Experts recommend cutting fields frequently to maintain the “One Third Rule”
- Important to establish consistency of grass height throughout the cutting season



# Best Practices for Mowing Fields

Irvington's School grounds encompass Athletic Fields, Recess/Play areas and Open Space

- Sports require a grass height of 1 to 3 inches. Higher grass heights create unsafe “clumpy” conditions for athletes. Clumping is an area of grass that grows more quickly than others, causing an uneven playing surface
- While experts recommend cutting fields frequently, IUFSD only has manpower for once per week
  - Occasionally apply resources for key competitions
- Recommended height also varies depending the type of grass
  - Ryegrass is the predominant grass type used on the District's fields.
- District mowers are set to a height of 2 ½” for Athletics and Recess areas





# Best Practices for Mowing Fields - cont.

## Open Space Areas

Potential opportunity to allow grass to grow above 3" for spaces not actively used by students

- Advantages
  - Allows roots to deepen and become more drought tolerant
  - Potentially less manpower needed and noise generated with some reduced mowing
  - Provides broadleaf weed and crabgrass control by shading the soil surface
- Disadvantages
  - Higher grass creates tick-friendly environment
  - Aesthetically not pleasing to many, especially with variable individual grass heights that occur
  - Need to perform maintenance on lawn equipment each time to set a different mow height
  - Still need to mow frequently to maintain 4" height
- Consideration
  - Is the community okay with the aesthetics of higher grass areas? Has an unkempt appearance.
  - Do we replace grassy areas with other landscape materials?
  - Currently under discussion with Landscaping Committee



# Other Required Field Maintenance (Natural Turf Fields)

- Aeration
  - Core aeration releases built-up toxic gases, such as CO<sub>2</sub>, and allows the influx of O<sub>2</sub> into the root zone
  - Core aeration increases soil infiltration rates as a result of increased surface area, thereby reducing water runoff and puddling, and allowing wet soils to dry faster
  - Core aeration increases plant uptake of nutrients, and promotes incorporation of immobile materials such as lime and phosphorus into the root zone
- Fertilization
  - Typically done twice per year
  - Currently using 22-0-3 (nitrogen, phosphate, potassium)
- Seeding/Overseeding
  - Typically performed twice per year
  - Fills in bare spots and inhibits weed growth
    - School districts mostly prohibited from using pesticides found in most weed control products
  - Reduce water runoff



# Other Required Field Maintenance (Non Turf Fields) - cont.

## Irrigation

- Athletic playing fields are equipped with Irrigation systems.
  - East Field
  - Upper Dows
  - Lower Dows
- Other fields/recess areas rely on Mother Nature
- Rain sensors for sprinkler system exist only on East Field so manual controls are used for other fields with irrigation systems
- Occasionally valves are damaged with storm debris or vandalism, which can prevent the sprinklers from turning off
  - Looking to improve controls and timers to prevent this from occurring



# Other Required Field Maintenance (Non Turf Fields) - cont.

## Leaf Blowing

- Needed for student and pedestrian safety
  - Leaves are slippery creating tripping hazards, both dry and wet
  - Decomposition of leaves triggers mold allergies
- Utilize Love and Leave concept in many areas via mulching with mower
  - Community perceives we are mowing lawns in late fall, but are actually mulching leaves and leaving mulched leaves in place where appropriate - eg. low traffic areas
- Blowers are also used to clear debris for safety reasons





# Other Required Field Maintenance (Non Turf Fields) - cont.

## Leaf Blowing

- District has been increasingly using electric leaf blowers and minimizing use of blowers when possible
- District does not have manpower to sweep as it takes a significantly longer time
- Given the total yardage of our grounds, it would be extremely costly in labor to not use blowers at all
  - Tested labor time to clear area from District Office entrance to the stage doors, a distance of 57 yards
    - Time sweeping: 40 minutes
    - Time with a leaf blower: 5 minutes



# District's Current Equipment

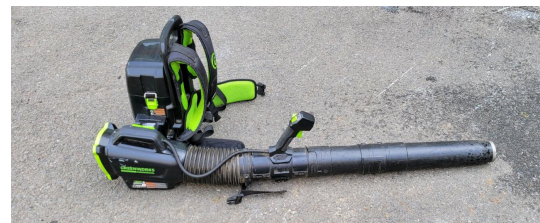
- Blowers (Handheld and backpack)
  - # gas - three (being phased out)
  - # electric - twelve
- Push Mowers
  - # gas - two
  - # electric - three
- Riding Mowers
  - Two Riding Gas Mower
  - One Riding Electric Mower



# Gas versus Electric Equipment - cont.

## Leaf Blowers

- Noise level of Blowers not vastly different so still noisy
  - Gas backpack - 70 - 90dB+
  - Electric backpack - 65dB on average
  - Electric hand held - 65 - 70dB on average
- Perception is District is still using gas blowers
  - Difficult to tell equipment is electric
- Advantage of electric equipment is that there are no exhaust fumes, thus, improving air environment and ozone layer preservation. Additionally, electric as a fuel source is less dependent on natural resources.
- Disadvantage is cost and reduced run time





# Gas versus Electric Equipment

## Cost Considerations

- Battery blowers are not as powerful as their gas counterparts thus requiring more labor time
- Additional labor is required when using electrical equipment due to need for multiple batteries to complete a job
  - Battery operated blower: Run time on a battery 23 minutes
  - Gas powered blower: Run time about 2 hours/tank of gas
  - Recharge time for batteries: 1 hour 40 minutes
  - Additional Cost
    - Cost of a battery: \$160
    - Battery life degrades with age of battery. Gas powered equipment tends to have a more consistent and longer life

Despite these concerns, the District is committed to going green for leaf blowing and push mowers and has been phasing out gas equipment in these areas for environmental reasons. Each fiscal year, the District is purchasing electric blowers and electric push mowers to replace gas ones.



# Gas versus Electric Equipment - cont.

## Push Mowers

- Gas push mowers have been phased out
- Electric push mowers are used exclusively now
- Battery runtime has improved, but batteries still need to be swapped or recharged frequently during mowing time
- The areas where a push mower can be used are small and limited as these are walk behind mowers
  - Parking lot islands
  - Hard to reach areas for riding mowers





# Gas versus Electric Equipment - cont.

## Riding Mowers

- Three gas-powered riding mowers
  - Cut grass
  - Mulch leaves
  - Large blower attachment
  - Plow snow
  - Salt walkways
- One electric riding mower (Residential)
  - Cut grass
  - Mulch leaves
  - Can't cut grass on hills or embankments due to weight of batteries
- District avoids using gas equipment on bad air quality days (high ground level ozone)
- Commercial electric riding mower is in ARP grant budget and once District believes the equipment will meet our needs, we plan to purchase one, potentially Spring 2023



# Gas versus Electric Equipment - cont.

Electric Commercial Riding Mowers are becoming more affordable

- Pros
  - Easier to maintain (No need to refuel)
  - They are easy to operate
  - The speed of the rotor blades (high/low) can be controlled.
- Cons
  - The actual runtime is not as advertised due to terrain (i.e. - wet grass, hills, etc.).
  - The industry is evolving and the battery operated equipment still lacks the run time for large areas.
  - On Board charging. Eliminates the advantages of swapping batteries
  - Lacks ability to climb hills - can climb only a 15% grade hill under ideal conditions
  - No in house repairs - must return to vendor which creates significant downtime waiting for repairs
  - Limited in attachments that can be added



# Gas versus Electric Equipment - cont.

Electric Commercial Riding Mowers are becoming more affordable

- Demo of Greenworks Zero Turn on November 10th
  - Advertises a runtime of up to 6 hours and 14 acres
  - Cost of approximately \$19,000
- Exploring Greenworks CZ60R Next Generation
  - Cost of \$25,900 with greater power and better run time. Available Late Spring 2023

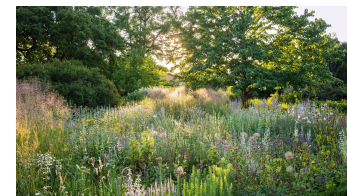






# Other Sustainability Considerations for Grounds Maintenance

- To reduce areas to mow, consider creating hardscapes such as benches, artificial turf and walkways and alternative landscaping such as plant beds, pollinator gardens and meadow areas
  - Reduces labor costs for maintenance
  - Where gas equipment is still in use, reduces exhaust emissions
  - Less mowing is less noise
  - Can be visually appealing or not, depending on viewer perspective
- Currently under consideration with landscaping committee for open field areas
- One suggestion for new turf area is the Campus Quad area (between HS, LGA, CMS and MS) as mowing there is disruptive to learning and grass is difficult to maintain due to high pedestrian traffic





# Landscaping Committee Update

Newly formed committee is comprised of landscape architect, representatives from the O'Hara Nature Center, District staff and community members. Looking to add students from Environmental Club

At our first meeting, committee discussed our overall vision for District plantings:

- Plant only native plants
- Include pollinator pathways where possible and where bees will not be in key student traffic areas
- Create gardens to promote ecology and which will require minimal maintenance.
- Landscaping designs should draw people to the building walkways, not obstruct areas needed for supervision or key views, and locate plants where they will best thrive (salting, deer, maintenance).
- Noted immediate need is to plant the NYPA trees on the campus as a result of the capital project
- Take time to plan the rest of the design and discuss in depth
- Start small and then add to our design over time
- Utilize resources from the Greater Irvington Land Trust
- Work to incorporate students into the project

Future meetings to discuss

- Review overall health of existing trees - need for arborist review
- Areas to create non mowable grounds



# Campus



East Field -  
used for Athletics



# Campus



Used for Athletics



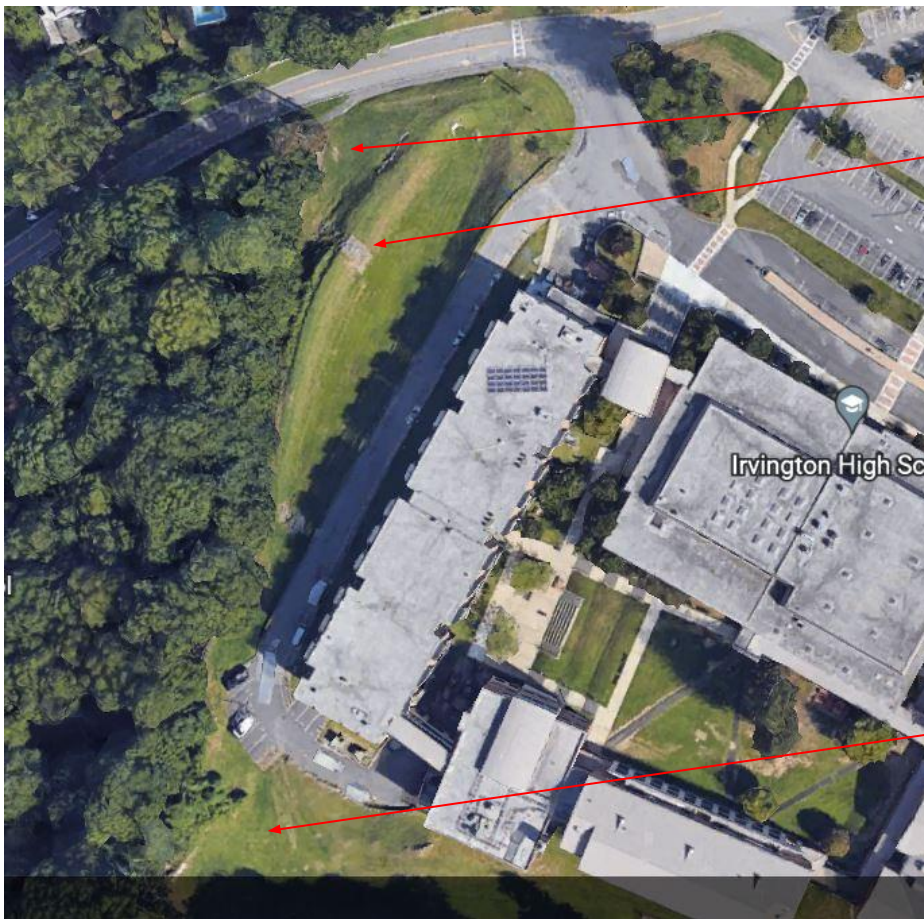
# Campus



New trees  
recently planted



# Campus



Potential area for hardscape or plantings

Need to keep back area open for fire access but some opportunities exist for plantings



# Campus



Potential area for  
hardscape or  
plantings



# Dows Lane



Lower Dows -  
Used for  
Athletics

Used for  
Recess





# Dows Lane



Upper Dows -  
Used for  
Athletics

Potential area for  
plantings



# Dows Lane

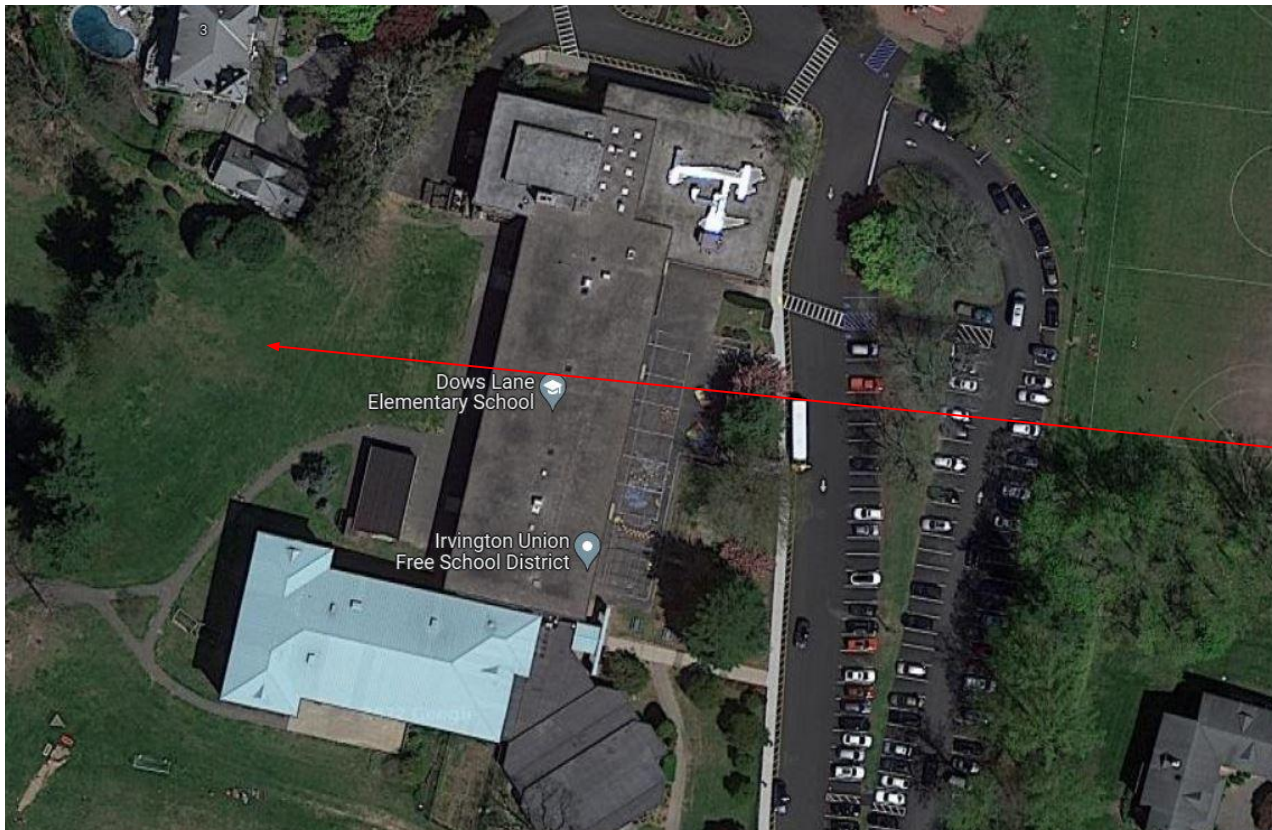


Used for  
recess

Potential area for  
plantings  
(between Willow  
St circle area and  
Maple St)



# Dows Lane



Potential area for plantings - area slopes downhill considerably



# Main Street School



Used for Recess

Potential area for plantings



# References

- <http://hort.cornell.edu/turf/variety-guidelines.pdf>
- [https://ag.umass.edu/sites/ag.umass.edu/files/pdf-doc-ppt/lawn\\_bmp\\_establishment\\_2016\\_final.pdf](https://ag.umass.edu/sites/ag.umass.edu/files/pdf-doc-ppt/lawn_bmp_establishment_2016_final.pdf)
- <https://kenneymachinery.com/how-to-maintain-a-natural-grass-athletic-field/>
- <https://turf.unl.edu/NebGuides/AthleticFieldMaintenance2012d.pdf>
- <http://ipm.ucanr.edu>