



Grounds Maintenance Programs

APPA Institute for Facilities Management

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Course Description



- 203 Grounds Maintenance Programs, September 2023
- Examine the basic issues related to an effective grounds maintenance program: turf and plant materials, necessary equipment, organization and staffing requirements, and grounds design guidelines. The presentation will include discussion of staff training and technical requirements, planning and scheduling landscape activities, inspections and quality control, and customer relations. Explore various contracting alternatives.



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Learning Objectives



- Part I – The Basics
 1. Purpose & Organizational Goals
 2. Maintenance Levels, Parts & Priorities
 3. Organizational Structures
 4. Resources
 - Facilities, Equipment, Financial



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Learning Objectives



- Part II – The Complex
 5. Staffing
 6. Snow Removal
 7. Athletics & Synthetic Turf
 8. Discussion



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Purpose of Grounds Management



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- 62% of high school seniors were most influence by the appearance of the building and grounds during their visit to college campus.

- *How Do Students Choose a College, 1986*, Carnegie Foundation for the Advancement of Teaching



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- Students visit an average of 10 college campuses.



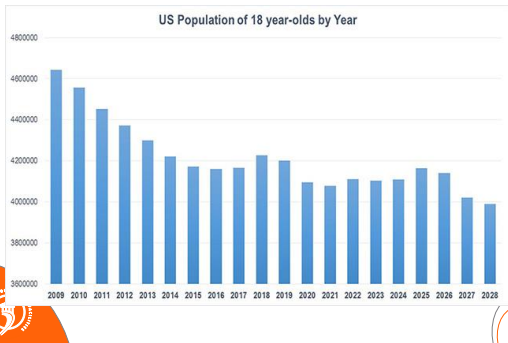
National Association of College Admissions Counselors

- 47 % of students said the campus visit was the most influential factor in their college selection.

2009, *How Students Really Decide*; *College Selection From the Inside*. Zinch.com



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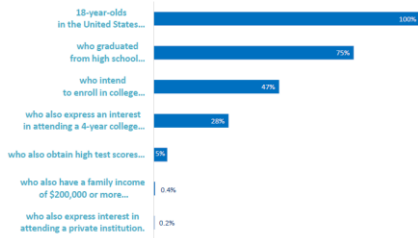


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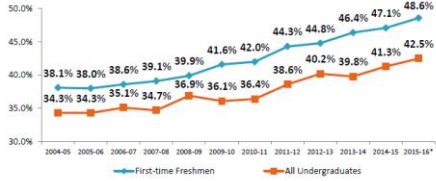
Fewer Students with the Ability to Pay

There are 4.34 Million 18-Year-Olds in the United States



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Figure 1. Average Institutional Tuition Discount Rate, by Student Category³



Source: 2015 NACUBO Tuition Discounting Study, various years. Data as of the fall of each academic year.
*Preliminary estimate.



6 out of 10 institutions had tuition discount rates that put them at risk for losing net revenue per full-time equivalent for every new student they enroll
FY21-22 increased to 54.5% and 49%



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• Organizational Goals/Mission

- Marketing
- Low Cost
- Safe
- Functional
- Attractive
- Educational Resource



What is your VISION?



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APPA Grounds Maintenance Levels

- Level 6 – Natural areas
- Level 5 – Minimum-level
- Level 4 – Moderately low-level
- Level 3 – Moderate-level
- Level 2 – High-level
- Level 1 – State-of-the-art

What level is your school?



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Parts & Priorities



- **APPA Level 3 - Clean & Green**

- Litter Collection
- 2-3 /wk



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Parts & Priorities



- **Level 3 - Clean & Green**

- Snow Removal



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Parts & Priorities



- **Level 3 - Clean & Green**

- Mow, Blow & Go
- Mow1 /10 days
- 1 fertilization/yr
- Litter 2-3 / wk



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Parts & Priorities



- **APPA Level 2 – *The Academic Village***

- Turf Management
 - Mow 1/wk
 - Fertilize 1+/yr
 - Irrigation
 - Weed Control
 - Seed, Seed, Seed!



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Parts & Priorities



- **Level 2 – *The Academic Village***

- Tree management
- Shrub plantings
- Litter, 5 days/wk



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Parts & Priorities



- **APPA Level 1 – *The Campus Garden***

Annual & Perennial Flowers



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Parts & Priorities



- **APPA Level 1 – The Campus Garden**
 - Botanical Gardens & Arboreta



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Parts & Priorities



- **APPA Level 1 – The Campus Garden**
 - Arboriculture
 - Tree inventory & appraisal



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- **Miscellaneous Services**

- Landscape Construction
- Landscape Architecture
- Site Furnishings



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• Miscellaneous Services

- Pavement Management
- Waste & Recycling
- Composting





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• Conflicting Services

- Moving & Setups
- Labor Shop

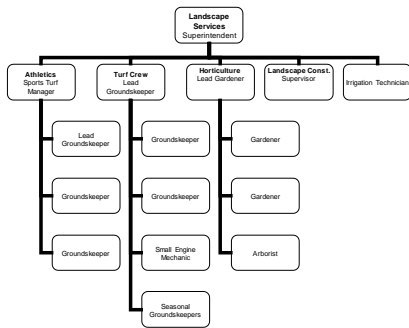


The tyranny of the urgent trumps the completion of the important.



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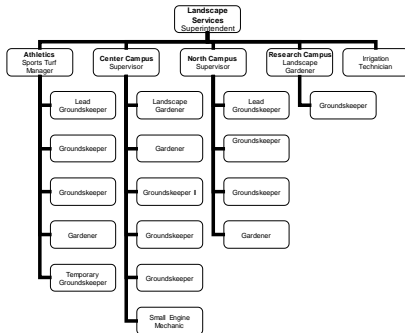
Task Oriented Structure





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Zone Oriented Structure





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Organizational Structures



Task

- More efficient use of labor
- More efficient use of equipment
- Less ownership
- May be less pride
- Easier to train employees
- More monotony

Zone

- Less efficient use of labor
- More equipment required
- More ownership = pride
- More accountability
- May create silos
- More training required
- Greater job satisfaction



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Resource Requirements



Facilities

- Equipment shop
- Covered storage
- Bulk materials storage
- Holding nursery





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Resource Requirements



- **Equipment**

- Reel & Rotary Mowers



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- **Electric Equipment**



MEAN GREEN

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Resource Requirements



- **Equipment**

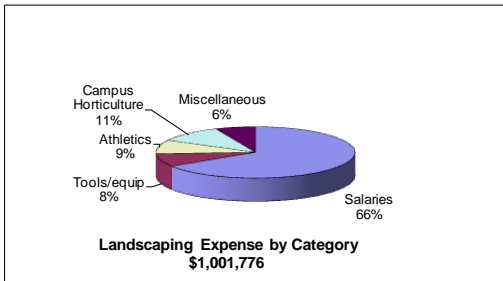
- Spreaders / sprayers
- Miscellaneous

~ 5%-10% of op. budget
in capital equipment
annually



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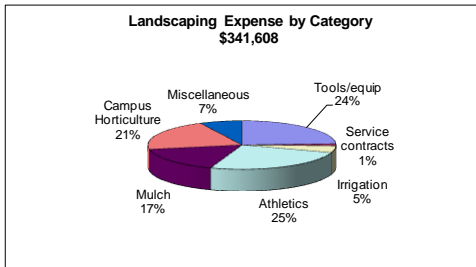
Resource Requirements - Financial 





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Resource Requirements - Financial 





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Resource Requirements - Financial 

- The 95/5 rule
 - 95 % of the grounds budget is taken by tasks that only 5% of the customers notice.
 - But 95% of the customers notice what we spend only 5% of the grounds budget on.

BREAK



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Resource Requirements



- **Staffing** - Comparative issues
 - Climate
 - Quality & expectations
 - Landscape style
 - Volume of use
 - Campus setting
 - Area measurements



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Staffing



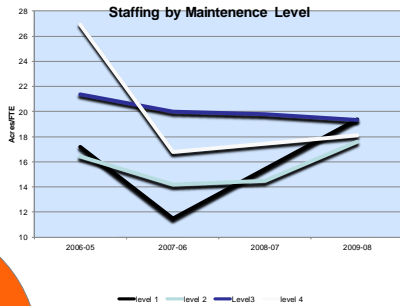
- Data Sources
 - APPA Facilities Performance Indicators (FPI)
 - Operational Guidelines for Grounds Management - APPA
 - Institutional History



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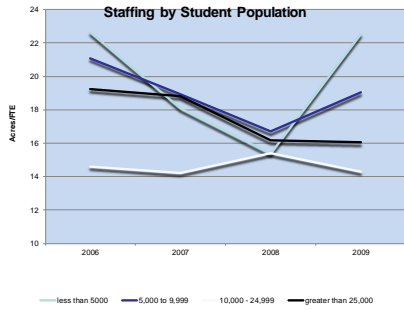
APPA FPI



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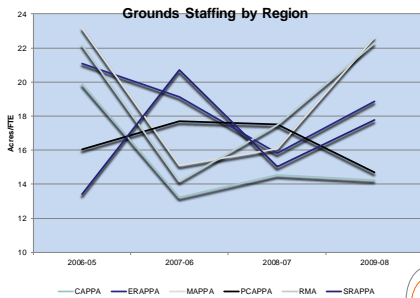


APPA FPI



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APPA FPI



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Turf Maintenance - Open Area							1 year = 48 weeks	84.9 Ac
LABOR	Levels of Maintenance			Total min/wk	Total hrs/yr	Labor \$/yr	FTE	
	High	Medium	Low					
	LABOR min/Ac	\$/Ac	\$/Ac	\$/Ac				
Blow	36.00	36.00	8.5	18.00	9.00			
72" rider	308.00		0.00	0.00	308.00	204.00	\$3,060.00	
16' baler	13.00	13.00	76.9	4.50	3.25	988.00	\$9,880.00	
Fertilize PTD	15.00	0.75	84.5	0.38	0.00	63.38	42.25	
Weed Control	130.00	3.25		0.00	0.00	0.00	0.00	
Overseed	48.00	1.20		0.00	0.00	0.00	0.00	
Mitigate	69.00	4.50		0.00	0.0	0.00	0.00	
Seal	69.00	3.00		1.50	0.00	0.00	0.00	
TOTAL					904.92		\$13,673.75	



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Resource Requirements



- APPA Staffing Level 1
 - High use/
high visibility areas,
3 – 7 Acres / FTE



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Resource Requirements



- APPA Staffing Level 2
 - Medium use & visibility areas,
7 - 14 Acres / FTE



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Resource Requirements



- APPA Staffing Level 3-4
 - Low use areas,
14- 100 Acres / FTE



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Resource Requirements



- Staffing
 - Athletic fields – NCAA
 - 1 – 3 Fields/ FTE



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Resource Requirements



- Staffing
 - Athletic fields – Recreational
 - 3 - 6 Fields/ FTE



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Resource Requirements



- Staff Training
 - Professional degree
 - Hands on
 - Both management & technical
 - See peer institutions
 - Mentoring



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Snow Removal



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Snow Removal - Response Plans

By Priority

By Zone

By Equipment Assignment



Reasonable and Defendable

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Snow Removal

- Equipment



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Snow Removal - Equipment



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Snow Removal - Materials

- Calcium Chloride (-25° F)
- Magnesium Chloride (5° F)
- Sodium Acetate (5° F)
- Calcium Magnesium Acetate (5°F)
- Potassium Chloride (12° F)
- Urea (15° F)
- Sodium Chloride (20-22° F)
- Various Blends (usually 20-22° F)
- Sand

- Source www.Peterschemicals.com



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Athletics & Synthetic Turf Professional Sports Field Management

- Manage for Student Athlete Safety
 - Coach Communications
 - Team Member 16/7



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Professional Sports Field Management



- Considerations
- Capital cost
- Life cycle cost
- Maintenance needs
- Multiple lines
- Painting and scrubbing
- Surface temperature
- All weather use
- Number of uses
- Injury & playability
- Coach preferences 

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Operations Costs Natural Field

McKinnon Field-Game Field (6 FB Games, 2 Soccer Games, 6 Fall Practices, 3 Spring Practices)

	Material Qty	Material Cost	Hours	Costs	Personnel	Total Per Event Costs	Frequency During Year	Total Labor Costs	Total Costs
Events:									
Paint Football Field Lines	5	\$313	3	\$75	6	\$763	15	\$6,750	\$11,438
Paint Football Coats-Logos, etc.	5	\$313	4	\$100	4	\$713	6	\$2,400	\$4,275
Paint Middle Logo	2	\$125	1	\$25	1	\$150	8	\$300	\$1,200
Paint Soccer Lines	2	\$125	3	\$75	2	\$275	2	\$300	\$550
Mowing After for Cleanup	5	\$18.75	3	\$75	1	\$93.75	17	\$1,275	\$1,593.75
Chair Repairs	4	\$64	2	\$50	2	\$164	17	\$1,700	\$2,768
Event Setup/Breakdown	2	\$75	2	\$75	2	\$150	12	\$2,850	\$2,850
TOTAL EVENT		\$9,219						\$15,475	\$24,694
Maintenance:									
Mowing	5	\$18.75	3	\$75	1	\$93.75	180	\$13,500	\$14,875
Fertilizing	6	\$120	1	\$25	1	\$145	40	\$1,000	\$5,800
Aerating	15	\$56.25	6	\$150	2	\$356.25	6	\$1,800	\$2,137.50
Sand Topdressing	1	\$500	3	\$75	1	\$575	10	\$750	\$5,750
Verticutting	15	\$56	6	\$150	2	\$356.25	3	\$900	\$1,066.25
Rolling Field	10	\$38	4	\$100	1	\$137.50	1	\$100	\$127.50
*Sodding	5000	\$4,500				Contracted Out	1		\$4,500
Overseed Rye costs \$/sq per 1000	17	\$671.50	2	\$50	1	\$721.50	1	\$50	\$721.50
Chemical Removal of Rye	1	\$425	2	\$50	1	\$425	1	\$50	\$425
TOTAL MAINTENANCE		\$19,105.25						\$16,150	\$37,255
TOTAL OPERATIONAL COSTS		\$28,324.50						\$33,625	\$61,950

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Operational Costs Synthetic

Synthetic Use-Football 15 uses, Women's Lacrosse 11 uses, Soccer 2 uses

	Material Qty	Material Cost	Hours	Costs	Personnel	Total Costs Per Event	Frequency During Year	Total Labor Costs	Total Costs
Annual Maintenance:									
Painting Soccer Lines	2	\$260	4	\$60	3	\$440	1	\$180	\$440
Painting Lacrosse Lines	2	\$260	4	\$60	3	\$440	3	\$540	\$1,320
Scrubbing Paint From Field	11	\$715	8	\$120	4	\$1,195	4	\$1,920	\$4,780
Sanitizing Field	2	\$125	4	\$60	1	\$185	18	\$1,080	\$3,330
Dragging Field	3	\$11.25	3	\$45	1	\$56.25	30	\$1,350	\$1,687.50
Grooming Field	3	\$11.25	4	\$60	1	\$71.25	6	\$360	\$427.50
Goal Area Replacement	510	\$13,260				Contracted Out	1		\$13,260
Total Operational Costs		\$19,815						\$5,430	\$25,245.00

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Synthetic vs. Natural Life cycle costs



COST COMPARISON OVER A 10 YEAR PERIOD FOR THE McKinnon Field

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	Total Costs	Total Together
McKinnon-Natural Grass												
Operational Costs	\$61,950	\$61,950	\$61,950	\$61,950	\$61,950	\$61,950	\$61,950	\$61,950	\$61,950	\$61,950	\$619,500	\$619,500
Capital Costs	\$42,500	\$69,500	\$42,500		\$42,500	\$69,500	\$42,500	\$42,500	\$142,500	\$42,500	\$579,000	\$1,198,500
*\$500k depreciated @ 20 years												
McKinnon-Synthetic												
Operational Costs	\$25,500	\$25,500	\$25,500	\$25,500	\$25,500	\$25,500	\$25,500	\$25,500	\$25,500	\$25,500	\$255,000	\$255,000
Capital Costs	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$78,000	\$500,000	\$1,202,000	\$1,457,000
*\$500k split depreciation \$250k @ 20 yrs @ \$125k/yr												

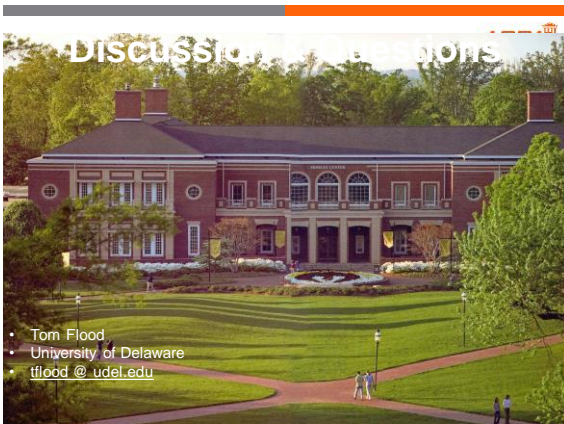
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- This concludes The American Institute of Architects Continuing Education Systems Course



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