

Grounds Maintenance Programs

APPA Institute for Facilities Management

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AIA
Continuing
Education
Provider

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.

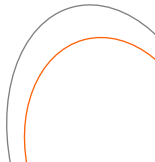
Learning Objectives

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

Learning Objectives

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

Purpose of Grounds Management



- 62% of high school seniors were most influenced 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



- Students visit an average of 10 college campuses.

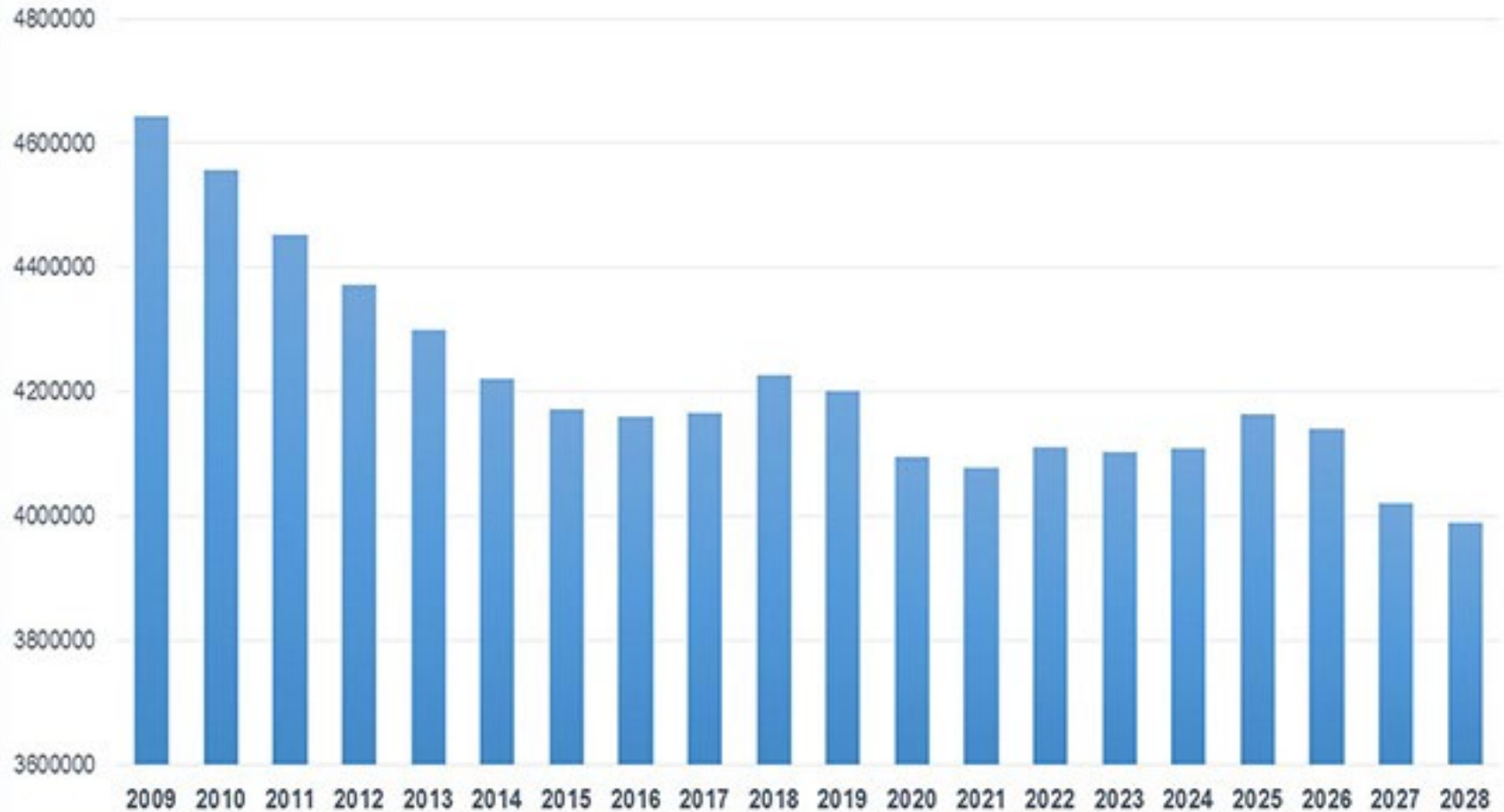
National Association of College Admissions Counselors

- 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



US Population of 18 year-olds by Year



Fewer Students with the Ability to Pay

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

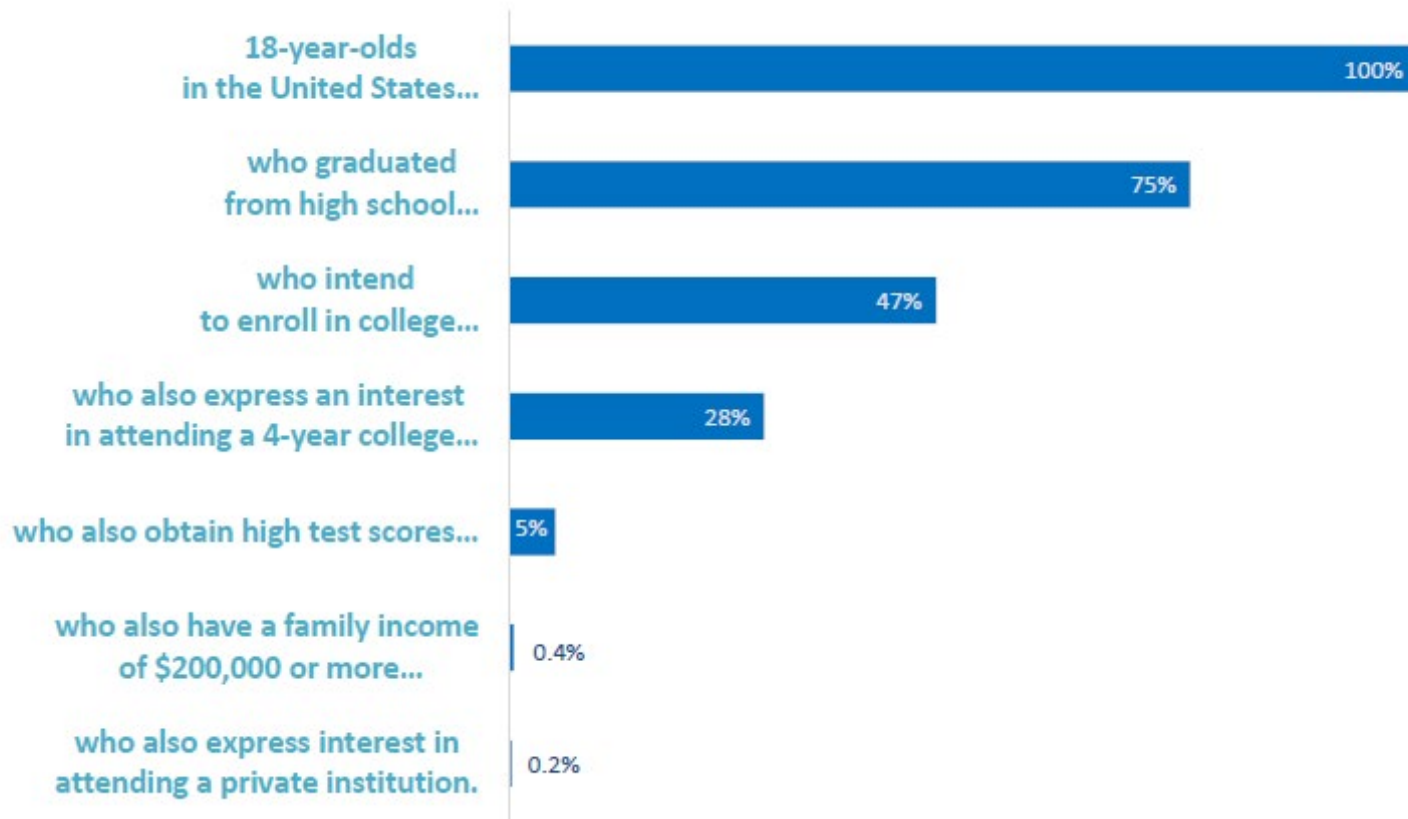
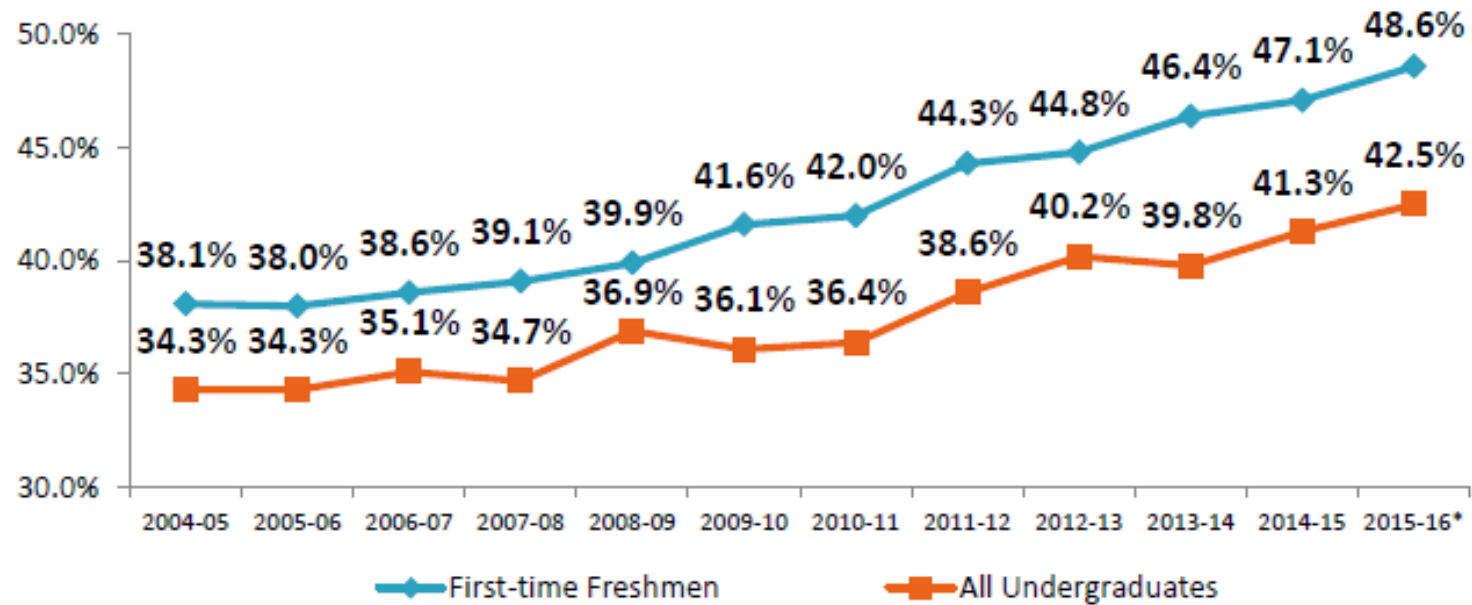


Figure 1. Average Institutional Tuition Discount Rate, by Student Category³



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%

- Organizational Goals/Mission
 - Marketing
 - Low Cost
 - Safe
 - Functional
 - Attractive
 - Educational Resource

What is your VISION?



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?

Parts & Priorities

- **APPA Level 3 - *Clean & Green***
 - Litter Collection
 - 2-3 /wk



Parts & Priorities

- **Level 3 - Clean & Green**
 - Snow Removal



Parts & Priorities

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

- Mow, Blow & Go

- Mow 1 / 10 days
- 1 fertilization / yr
- Litter 2-3 / wk



Parts & Priorities

- **APPA Level 2 – *The Academic Village***
 - Turf Management
 - Mow 1/wk
 - Fertilize 1+ /yr
 - Irrigation
 - Weed Control
 - Seed, Seed, Seed!



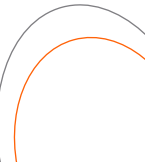
Parts & Priorities

- **Level 2 – *The Academic Village***
 - Tree management
 - Shrub plantings
 - Litter, 5 days/wk



Parts & Priorities

- **APPA Level 1 – *The Campus Garden***
Annual & Perennial Flowers



Parts & Priorities

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



Parts & Priorities

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



- **Miscellaneous Services**
 - Landscape Construction
 - Landscape Architecture
 - Site Furnishings



- **Miscellaneous Services**
 - Pavement Management
 - Waste & Recycling
 - Composting



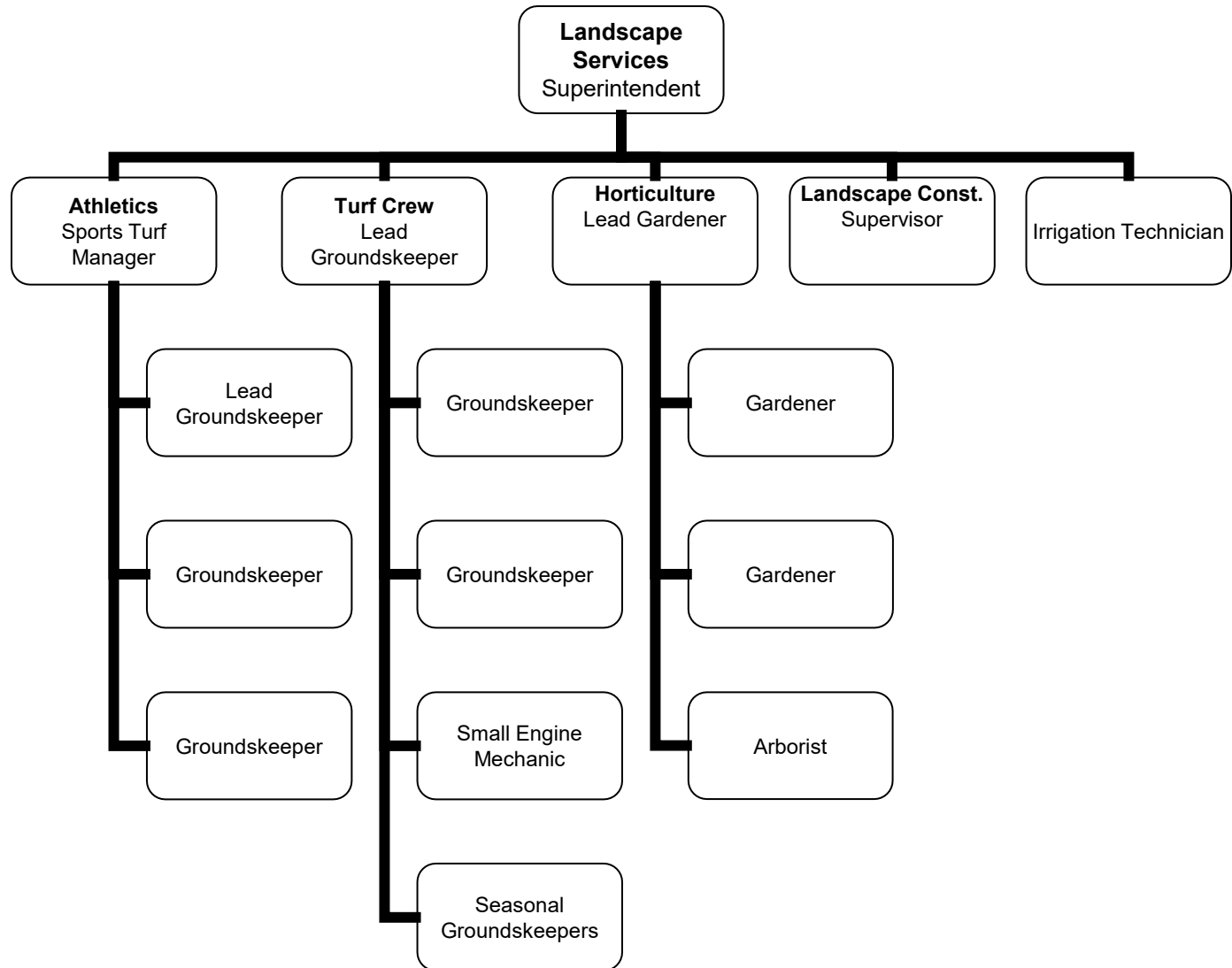
- Conflicting Services

- Moving & Setups
- Labor Shop

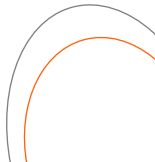
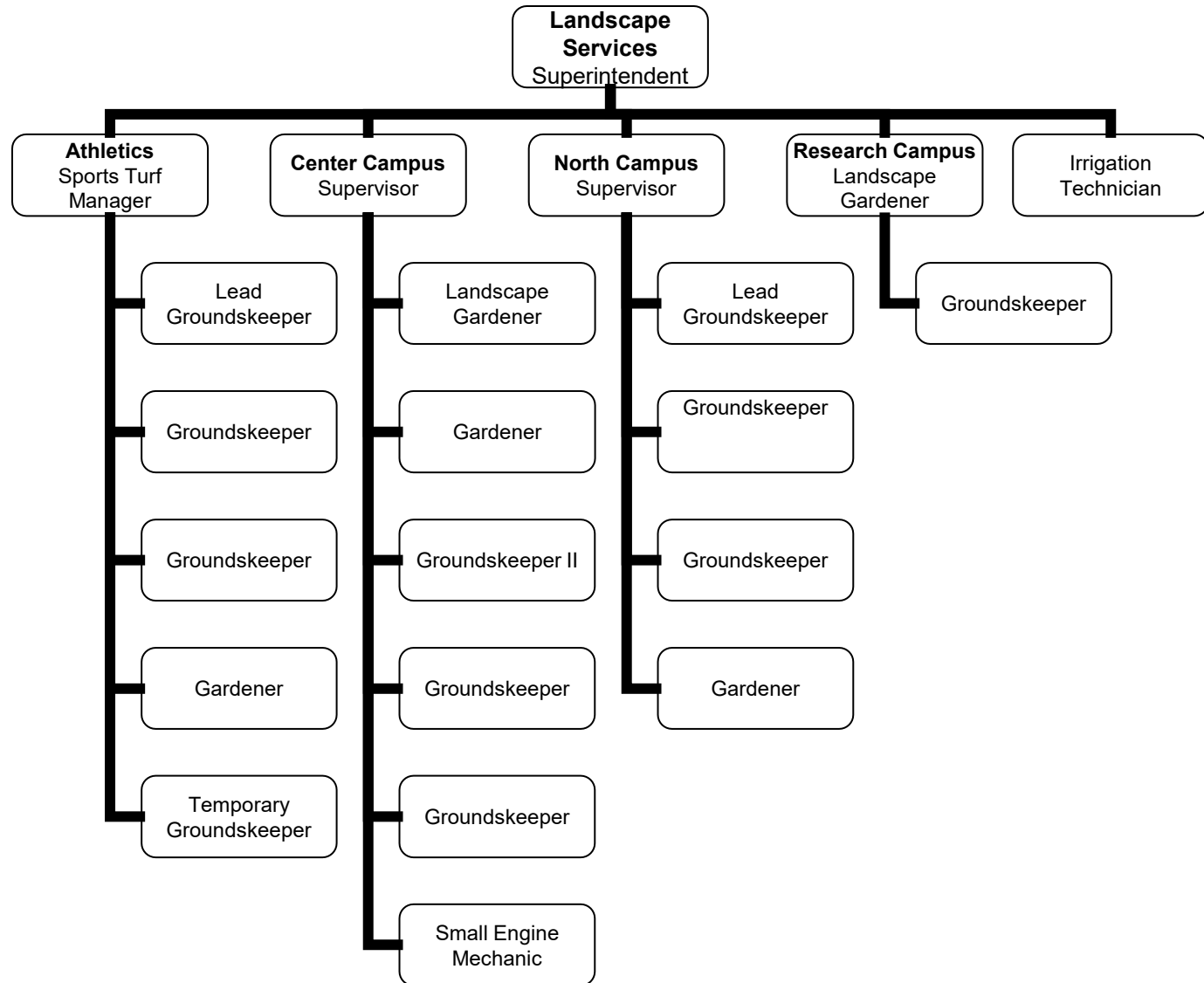


~The tyranny of the urgent trumps the completion of the important.

Task Oriented Structure



Zone Oriented Structure



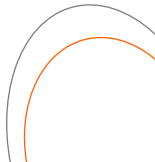
Organizational Structures

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



Resource Requirements

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

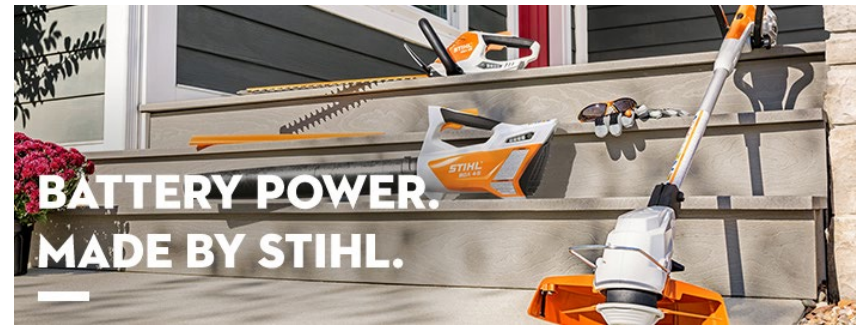


Resource Requirements

- **Equipment**
 - Reel & Rotary Mowers



- Electric Equipment



Resource Requirements

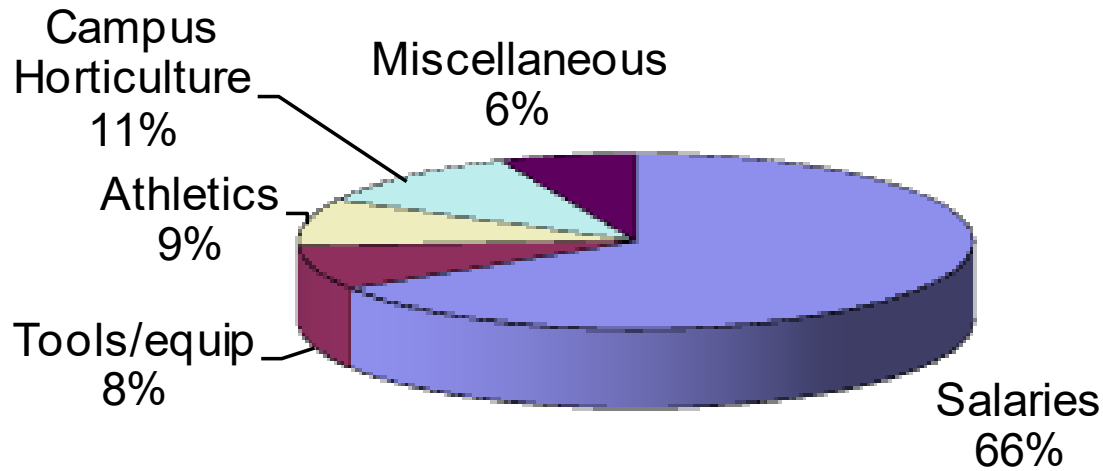
- **Equipment**

- Spreaders / sprayers
- Miscellaneous

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



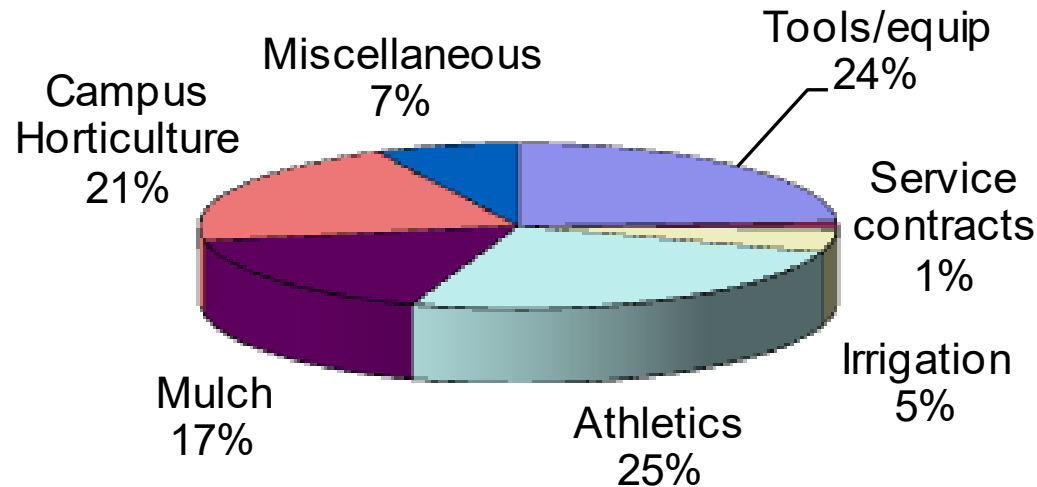
Resource Requirements - Financial



Landscaping Expense by Category
\$1,001,776

Resource Requirements - Financial

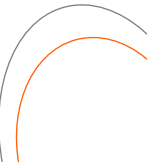
Landscaping Expense by Category
\$341,608



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



Resource Requirements

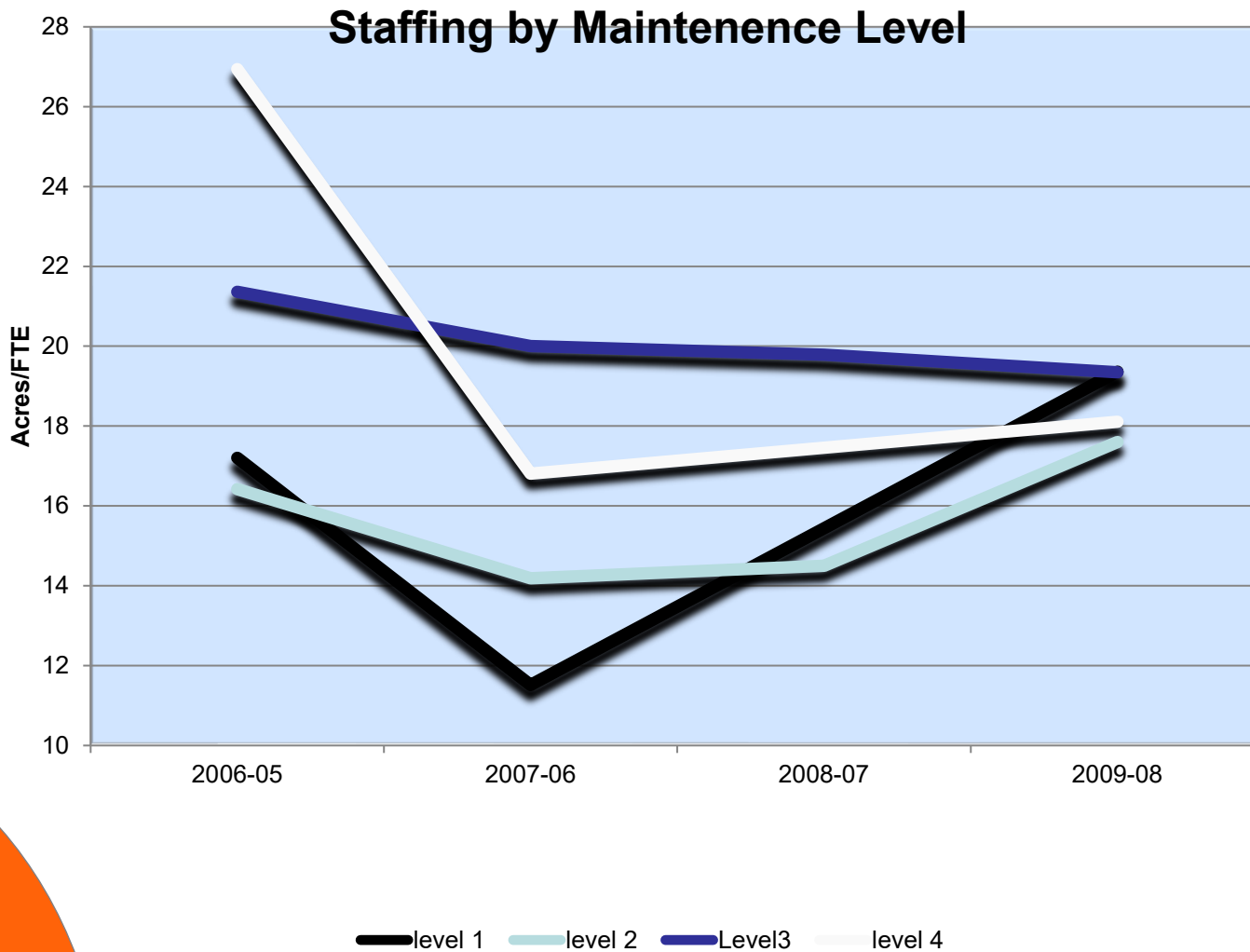
- **Staffing** - Comparative issues
 - Climate
 - Quality & expectations
 - Landscape style
 - Volume of use
 - Campus setting
 - Area measurements



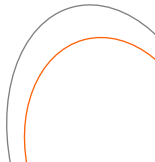
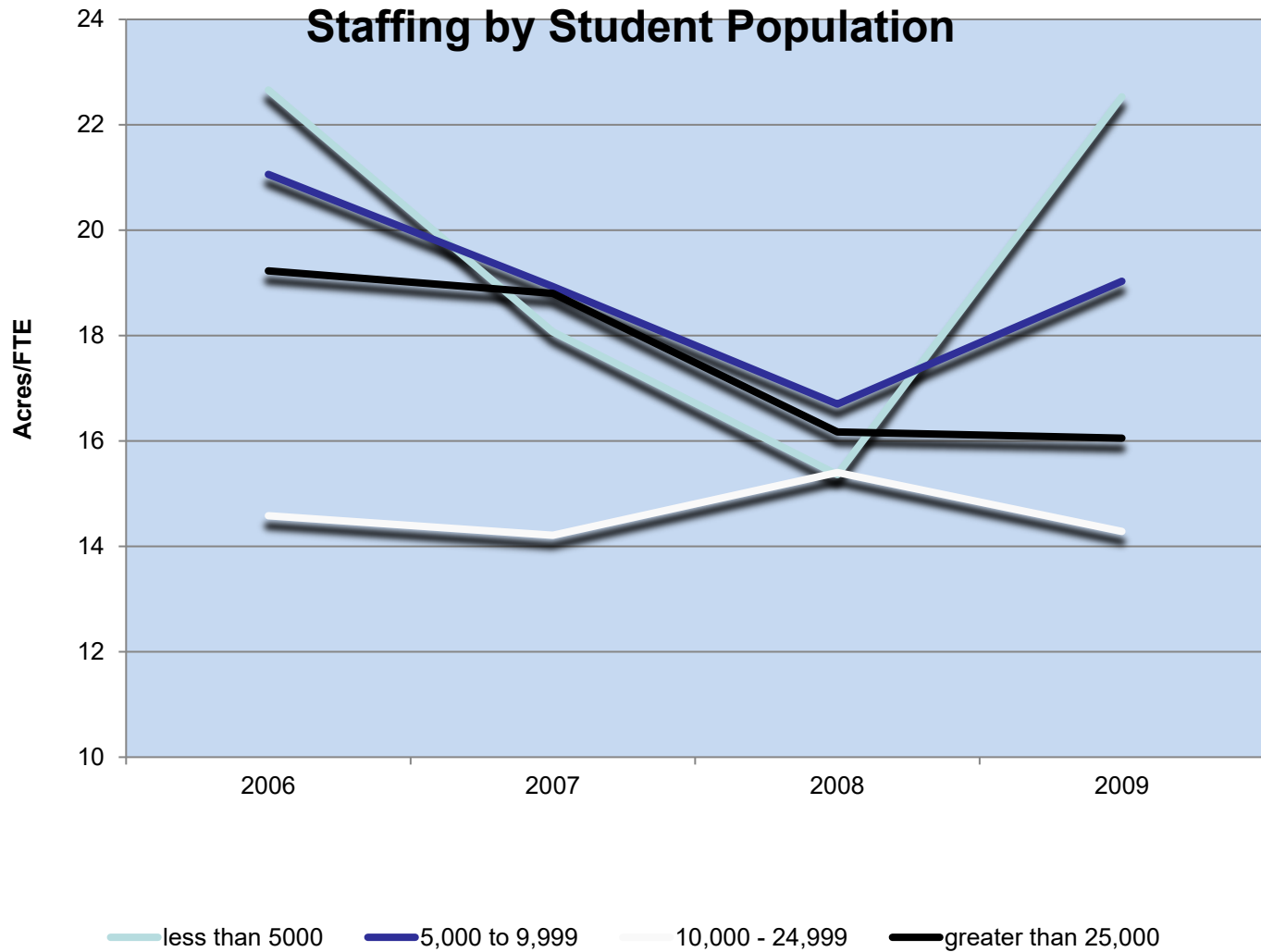
Staffing

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

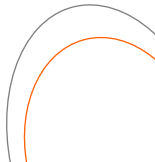
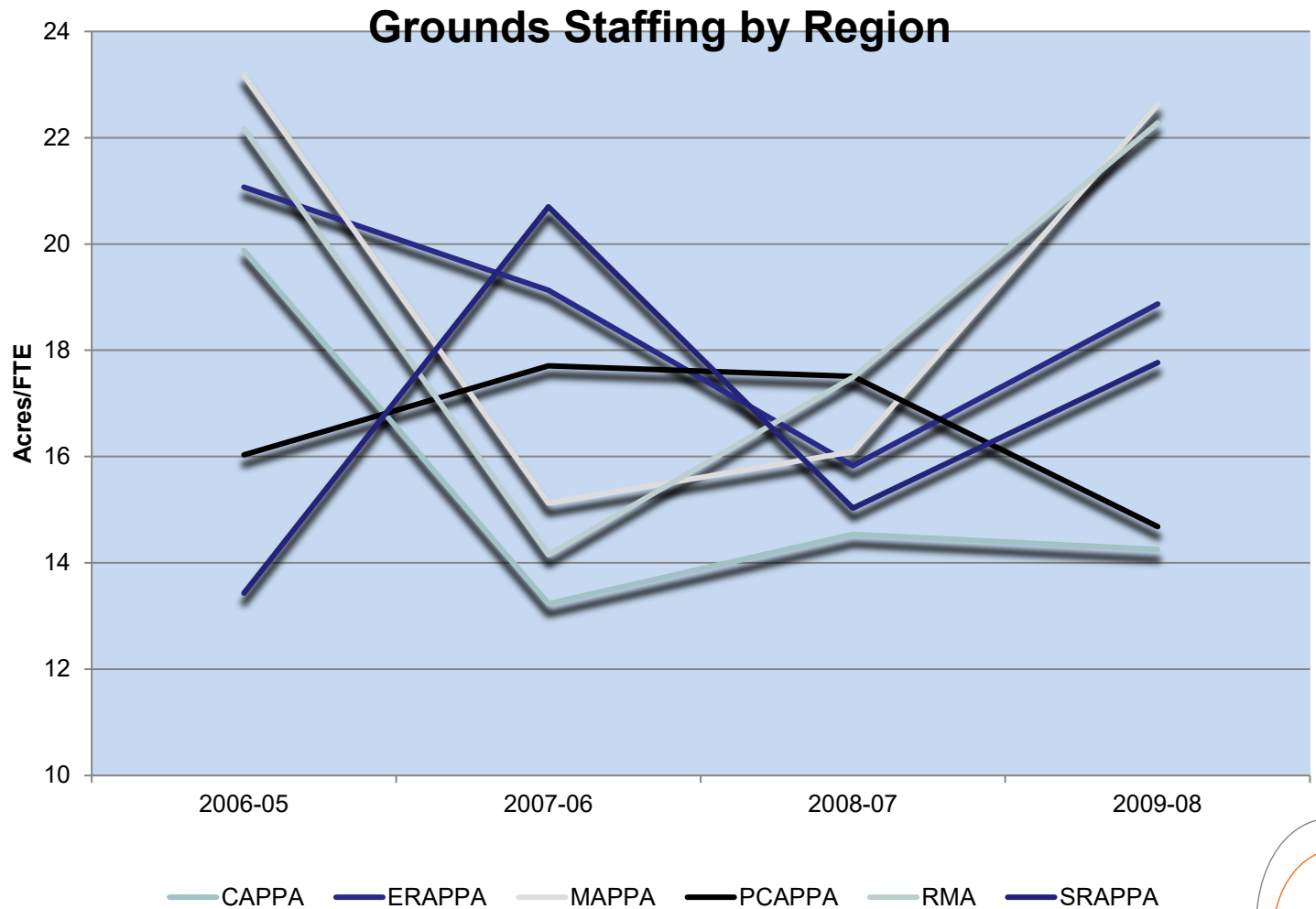
APPA FPI



APPA FPI



APPA FPI

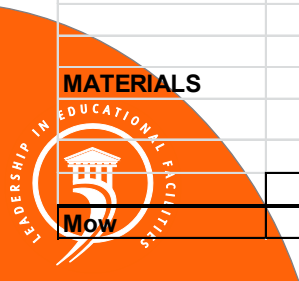


Turf Maintenance - Open Area							1 year =	40	weeks	84.9 Ac
LABOR										
Levels of Maintenance										
	High	Medium	Low	Total min/wk		Total hrs/yr		Labor \$/yr		
	LABOR min/Ac	#Ac.	#Ac.	#Ac.						\$15
Mow										
72" rider	36.00	36.00	8.5	18.00		9.00				
		306.00		0.00		0.00		306.00	204.00	\$3,060.00
16' batwing	13.00	13.00	76.0	6.50		3.25				
		988.00		0.00		0.00		988.00	658.67	\$9,880.00
Fertilize PTO	15.00	0.75	84.5	0.38		0.00				
		63.38		0.00		0.00		63.38	42.25	\$633.75
Weed Control	130.00	3.25		0.00		0.00				
		0.00						0.00	0.00	\$0.00
Overseed	48.00	1.20		0.00		0.00				
		0.00						0.00	0.00	\$0.00
Irrigate	60.00	4.50		0.00	0.0	0.00				
		0.00		0.00				0.00	0.00	\$0.00
Aerate	60.00	3.00		1.50		0.00				
		0.00		0.00				0.00	0.00	\$0.00
TOTAL									904.92	\$13,573.75

MATERIALS

Levels of Maintenance

	High	Medium	Low	Total min/wk		Total hrs/yr	fuel	gal fuel/yr	# Nitroger Gal Water # s
	#Ac.	#Ac.	#Ac.				G/hr		
Mow									



Resource Requirements

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



Resource Requirements

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



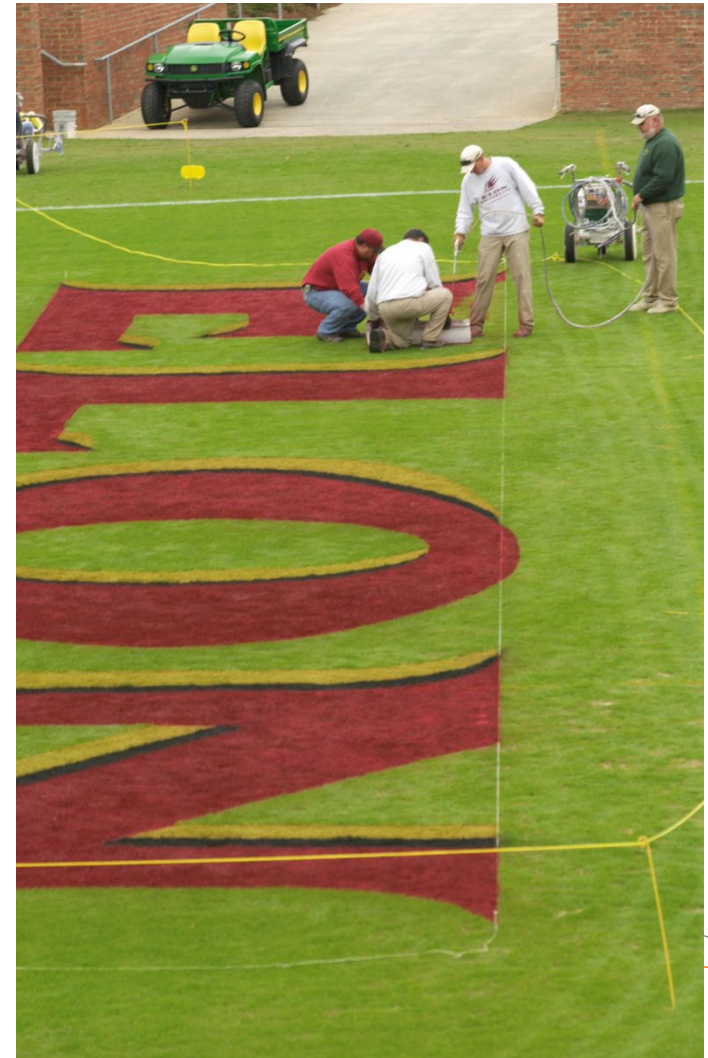
Resource Requirements

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



Resource Requirements

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



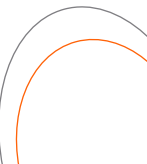
Resource Requirements

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

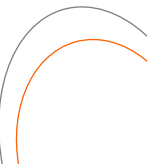


Resource Requirements

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



Snow Removal

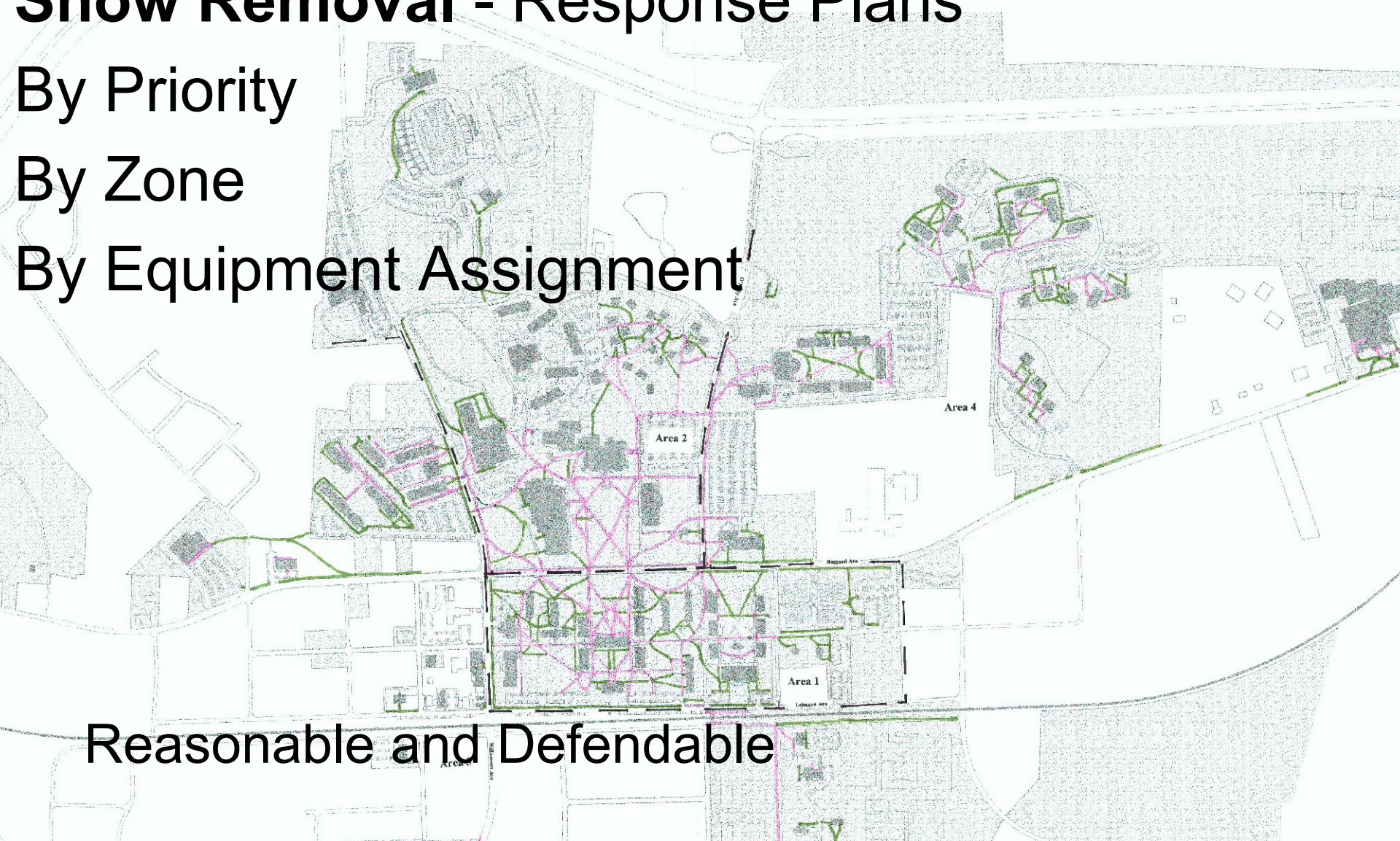


Snow Removal - Response Plans

By Priority

By Zone

By Equipment Assignment



Reasonable and Defendable

Snow Removal - Equipment



Snow Removal - Equipment



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



Athletics & Synthetic Turf Professional Sports Field Management

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



Professional Sports Field Management

- Considerations
- Capital cost
- Life cycle cost

Maintenance needs

Multiple lines

Painting and scrubbing

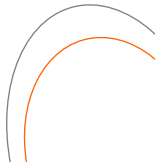
Surface temperature

All weather use

Number of uses

Injury & playability

- Coach preferences



Operations Costs Natural Field



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

	<u>Material Qty</u>	<u>Material Cost</u>	<u>Hours</u>	<u>Costs</u>	<u>Personnel</u>	<u>Total Per Event Costs</u>	<u>Frequency During Year</u>	<u>Total Labor Costs</u>	<u>Total Costs</u>
Events:									
Paint Football Field Lines	5	\$313	3	\$75	6	\$763	15	\$6,750	\$11,438
Paint Football Colors-Logos,etc.	5	\$313	4	\$100	4	\$713	6	\$2,400	\$4,275
Paint Middle Logo	2	\$125	1	\$25	1	\$150	8	\$200	\$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
Divot Repairs	4	\$64	2	\$50	2	\$164	17	\$1,700	\$2,788
Event Setup/Breakdown			<u>3</u>	<u>\$75</u>	<u>2</u>	<u>\$150</u>	<u>19</u>	<u>\$2,850</u>	<u>\$2,850</u>
	TOTAL EVENT	\$9,219						\$15,475	\$24,694
Maintenance:									
Mowing	5	\$18.75	3	\$75	1	\$93.75	180	\$13,500	\$16,875
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	\$1,068.75
Rolling Field	10	\$38	4	\$100	1	\$137.50	1	\$100	\$137.50
*Sodding	5000	\$4,500			Contracted Out		1		\$4,500
Overseed Rye costs 8lbs per 1000	17	\$671.50	2	\$50	1	\$721.50	1	\$50	\$721.50
Chemical Removal of Rye	1	\$215	<u>2</u>	<u>\$50</u>	1	<u>\$265</u>	1	<u>\$50</u>	<u>\$265</u>
	TOTAL MAINTENANCE	\$19,105.25						\$18,150	\$37,255
	TOTAL OPERATIONAL COSTS	\$28,324.50						\$33,625	\$61,950

Operational Costs Synthetic

Synthetic Use-Football 15 uses, Women's Lacrosse 11 uses, Soccer 2 uses									
	<u>Material Qty</u>	<u>Material Cost</u>	<u>Hours</u>	<u>Costs</u>	<u>Personnel</u>	<u>Total Costs Per Event</u>	<u>Frequency During Year</u>	<u>Total Labor Costs</u>	<u>Total Costs</u>
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	<u>510</u>	<u>\$13,260</u>			<u>Contracted Out</u>		1		<u>\$13,260</u>
	Total Operational Costs	\$19,815						\$5,430	\$25,245.00



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	\$61950	\$61950	\$61950	\$61950	\$61950	\$61950	\$61950	\$61950	\$61950	\$61950	\$619,500	
Capital Costs	\$42,500	\$69,500	\$42,500	\$42,500	\$42,500	\$69,500	\$42,500	\$42,500	\$142,500	\$42,500	\$579,000	\$1,198,500
\$850k 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	
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
\$950k split depreciation \$450k/20y, \$500k/9y												

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

Discussion & Questions



MOSELEY CENTER

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