Data Management for Efficient Facilities

Facility Manager‘s Forum

June 5, 2013

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Agenda

- Controls
- BIM and COBIE
- AiM and MMS
- Utility Information project

Controls

- >25,000 points monitored at IUB 24/7/365
- Siemens Building Technologies & Johnson Controls
- Start, Stop, Temp, Humidity, Valve Position, etc.
- Trend analysis (huge data storage requirements)

BIM and COBIE

- Building Information Modeling
  - Design technique using objects
  - Used by Contractors (saves time and $)
  - Complete building model during design
  - Clash detection
- Construction Operations Building Information Exchange
  - Critical operating data, i.e. equipment lists, product data sheets, warranty, parts lists, PM schedules, etc.
  - Delivered in spreadsheet format
  - Example

IU Physical Plant
AiM and MMS
Preventive Maintenance Management Initiative

This physical plant program has an initial goal of improving the efficiency of procedures for collecting data on and managing all IU assets (equipment) that require periodic preventive maintenance.

AiM-MMS has a lot of potential as a database and to help manage all maintenance, billing, inventory, renovations, troubleshooting, etc.

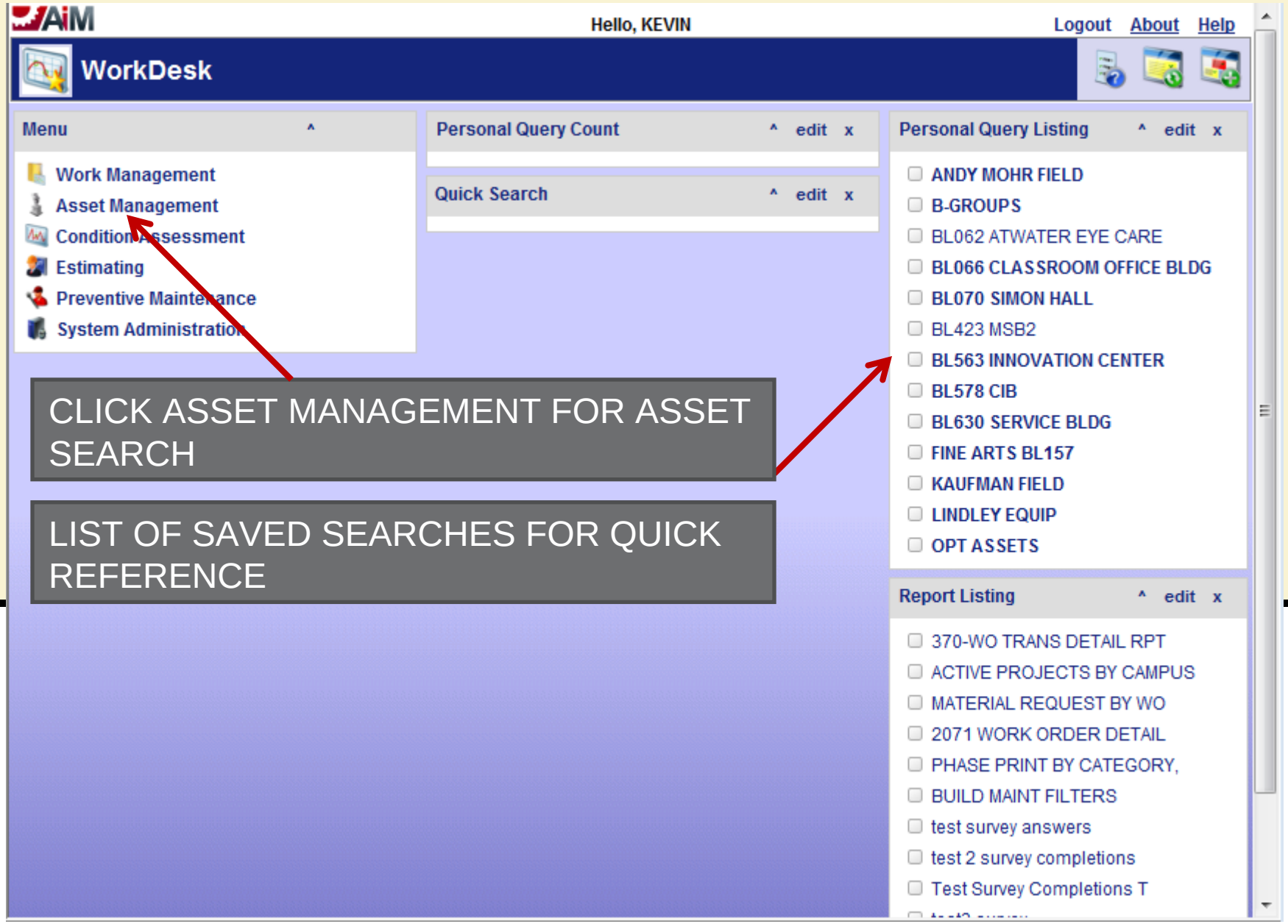
IU Physical Plant
AiM and MMS
Preventive Maintenance Management Initiative

Initial database is in MMS-test and will eventually be migrated into MMS-production.

MMS-production currently has a small amount of data on approximately 3,300 assets of the estimated 75,000+ IU Bloomington assets that could be collected.

The following slides show examples of how the AiM-MMS database can be used to gather information.

Kevin's Test Workdesk



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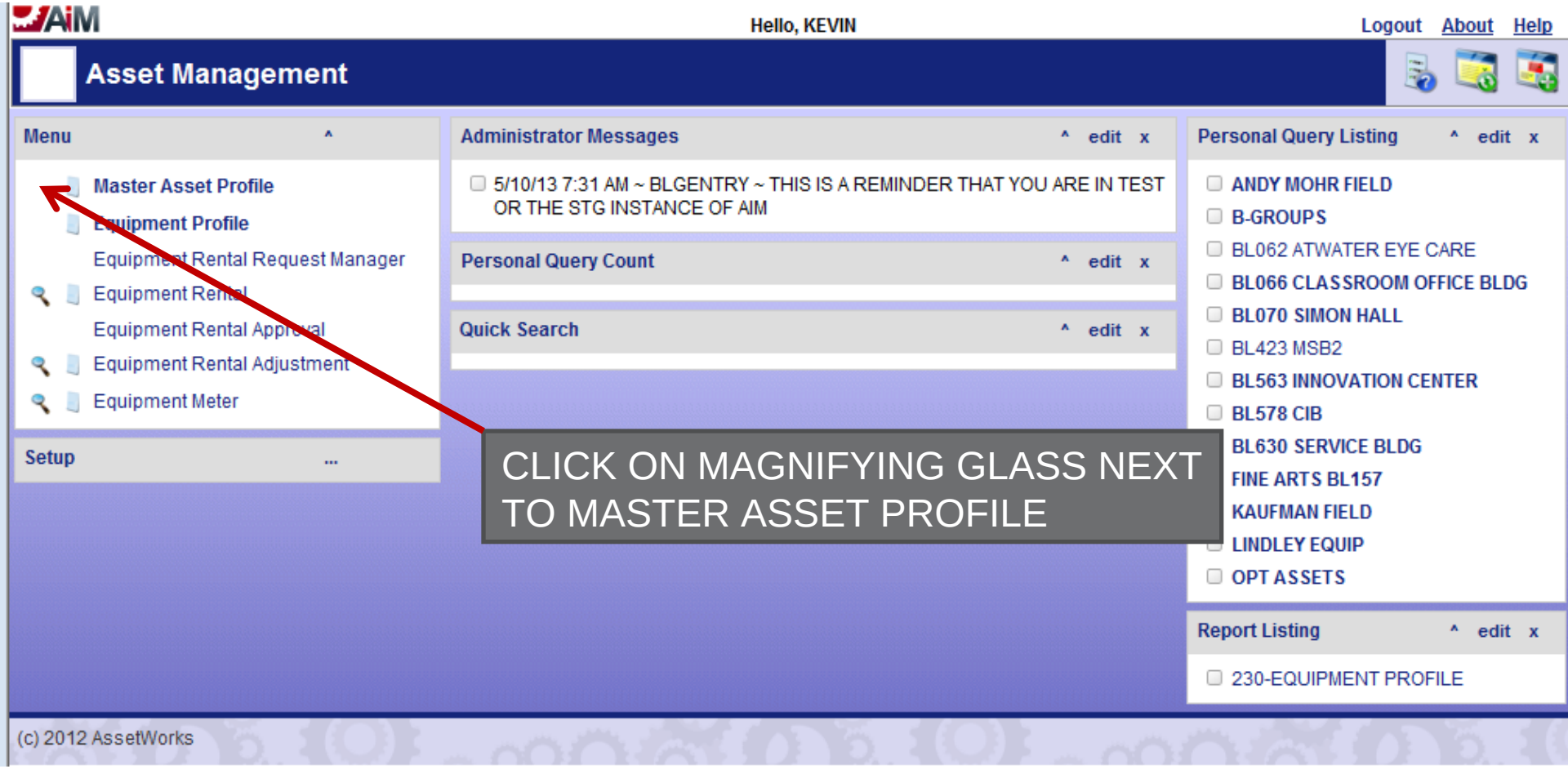

CLICK ON MAGNIFYING GLASS NEXT TO MASTER ASSET PROFILE

Asset Search Example
For All Bloomington Campus ATS's

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Master Asset Profile

Queries BL070 SIMON HALL

Asset

Hide All/Show All

Asset	-	=	
Description	-	contains	
Asset Type	-	=	
Asset Group	-	=	B-ATS
Status	-	=	ACTIVE
Region	-	=	BL
Facility	-	=	
Property	-	=	
Location	-	=	
Warehouse	-	=	
Bin	-	=	
Useful Life (Months)	-	=	
Purchase Cost	-	=	
Replacement Cost	-	=	
Purchase Date	-	=	
Book Value	-	=	
Remaining Life (Months)	-	=	
Replacement Cost Entry Date	-	=	
Planned Replacement Year	-	=	
Quantity	-	=	
UOM	-	=	
Shop	-	=	
Shop Person	-	=	
Rentable	-	=	
Assembly	-	=	
Custodian	-	=	
Contractor	-	=	

FILL IN QUERIES, HIT EXECUTE SEARCH

ASSET GROUP, AUTOMATIC TRANSF
SWITCHES
ASSET STATUS, ACTIVE (IN USE)
REGION CAMPUS, BLOOMINGTON

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Search Results For All Bloomington Campus ATS's (Currently Entered)

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Master Asset Profile

Asset	Description	Asset Type	Asset Group	Status	Region	Facility	Property	Location
065-ATS1-A	AUTOMATIC TRANSFER SWITCH	SERIALIZED	B-ATS	ACTIVE	BL	OPTOMETRY SCHOO	BL065	005A
423-ATS1-A	AUTOMATIC TRANSFER SWITCH	SERIALIZED	B-ATS	ACTIVE	BL	MULTI SCIENCE 2	BL423	098
423-ATS2-A	AUTOMATIC TRANSFER SWITCH	SERIALIZED	B-ATS	ACTIVE	BL	MULTI SCIENCE 2	BL423	098
423-ATS3-A	AUTOMATIC TRANSFER SWITCH	SERIALIZED	B-ATS	ACTIVE	BL	MULTI SCIENCE 2	BL423	098
578-ATS1-A	AUTOMATIC TRANSFER SWITCH, LEFT UNIT	SERIALIZED	B-ATS	ACTIVE	BL	CYBERINFRASTRUC	BL578	097
578-ATS2-A	AUTOMATIC TRANSFER SWITCH, RIGHT UNIT	SERIALIZED	B-ATS	ACTIVE	BL	CYBERINFRASTRUC	BL578	097
594-ATS1-A	AUTOMATIC TRANSFER SWITCH	SERIALIZED	B-ATS	ACTIVE	BL	ANDY MOHR FIELD	BL594	100
594-ATS2-A	AUTOMATIC TRANSFER SWITCH	SERIALIZED	B-ATS	ACTIVE	BL	ANDY MOHR FIELD	BL594	100
630-ATS1-A	AUTOMATIC TRANSFER SWITCH	SERIALIZED	B-ATS	ACTIVE	BL	SERVICE BLDG	BL630	172

LINKS TO ASSET

Asset Profile For Selected Automatic Transfer Switch

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Master Asset Profile View: Select

"SMART NUMBER"

Asset	065-ATS1-A	Editor	KBUCY
		Edit Date	Jun 04, 2013 08:42 AM
Description	AUTOMATIC TRANSFER SWITCH		

065-ATS1-A

Location

Region	BL
	BLOOMINGTON
Facility	OPTOMETRY SCHOO
	800 E ATWATER AVE
Property	BL065
	OPTOMETRY SCHOOL
Location	005A
Warehouse	
Bin	

Preventive Maintenance

PM Route	
Route Sequence	
Lockout/Tagout	Yes

Manufacturer

Manufacturer	AUTOMATIC SWITCH CO.
Model	906
Serial Number	58814X
Part	

Status	ACTIVE
Asset Type	SERIALIZED
Asset Group	B-ATS
	D509002
Rentable	No
Replacement Tag	

Record 1 of 9

Attributes (Data) For Selected Automatic Transfer Switch

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Attributes

Asset	065-ATS1-A	Editor	KBUCY
		Edit Date	Jun 04, 2013 08:42 AM
Description	AUTOMATIC TRANSFER SWITCH		

Sequence	ID	Attribute	Value
20	2	SYSTEMS / AREAS SERVED	EMERGENCY LIGHTING
40	4	VOLTAGE	208 V
50	5	PHASE	3 PHASE , 4 WIRE
60	6	AMPERAGE	100A
70	7	TRANSITION TYPE	OPEN
80	8	EXERCISER	YES
90	9	REMOTE DISPLAY	NO
100	10	INSTALLATION DATE	1967
110	11	WARRANTY DATE	
120	12	UTILITY SOURCE BREAKER	RM 005B

SMART NUMBER
ORIGINAL EQUIPMENT (A)
ASSET NUMBER
ASSET GROUP

ASSET GROUP DETERMINES WHAT ATTRIBUTES ARE REQUESTED/ENTERED

THIS LIST SHOWS ATTRIBUTES FOR: GROUP-ATS

(c) 2012 AssetWorks

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Typical AHU Asset Profile

CLICK ON DROP-DOWN FOR ATTRIBUTES OR RELATED DOCUMENTS

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Master Asset Profile View: Select

Asset	065-AHU1-A	Editor	KBUCY
		Edit Date	Apr 24, 2013 02:54 PM
Description	AIR HANDLING UNIT 1 MMS-105758-065-AHUS-001		

065-AHU1-A

CLICK ON PICTURE FOR LINK TO LARGER PICTURE IN MMS DATABASE

Location

Region	BL
	BLOOMINGTON
Facility	OPTOMETRY SCHOO
	800 E ATWATER AVE
Property	BL065
	OOL
Bin	

Manufacturer	AMERICAN STANDARD
Model	CUSTOM BUILT
Serial Number	
Part	

Status	ACTIVE
Asset Type	SYSTEM
Asset Group	B-AIR HANDLING UNIT
	D304008
Rentable	No
Replacement Tag	

COMPONENT ASSETS FOR THIS AIR HANDLER

Component Asset

Sequence	Asset	Description	Asset Type	Asset Group	Replacement Tag	Status
1	065-VFD1-A	VFD, AHU1 SUPPLY FAN, WEST WALL	SERIALIZED	B-MOTOR CONTROL		ACTIVE
2	065-VFD2-A	VFD, AHU1 RETURN FAN, NEXT TO AIR COMPRESSOR	SERIALIZED	B-MOTOR CONTROL		ACTIVE
3	065-HWP11-A	AHU1 HOT WATER COIL SUPPLY PUMP	SERIALIZED	B-PUMP		ACTIVE

Record 2 of 84

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Typical Air Handler Attributes

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Attributes

Asset	065-AHU1-A	Editor	KBUCY
		Edit Date	Apr 24, 2013 02:54 PM
Description	AIR HANDLING UNIT 1 MMS-105758-065-AHUS-001		

Sequence	ID	Attribute	Value	Description
10	1	SERVES	ENTIRE BUILDING	
20	2	SF FRAME	1770RPM, 67.4FLA, FRAME 364T	
30	3	SF SHAFT SIZE		
40	4	SF HP	60HP	
50	5	SF BELTS	4 X C210	
60	6	SF LUBE		
70	7	SF SOURCE PANEL	MCC1 ROOM 005MR	
80	8	SF SOURCE BREAKER		
90	9	RF FRAME	FRAME 284T	
100	10	RF SHAFT SIZE		
110	11	RF HP	25HP, 1770 RPM, 29.1 FLA,	
120	12	RF BELTS	4 X B210	
130	13	RF LUBE		
140	14	RF SOURCE PANEL	MCC1 ROOM 005MR	
150	15	RF SOURCE BREAKER	SF-LOWER RIGHT BREAKER (175A) RF-BREAKER LEFT SIDE 2ND DOWN	
160	16	FILTER 1, #, SIZE, MERV?	42- 24X24X2 MERV8	
170	17	FILTER 2, #, SIZE, MERV?	7- 18X24X2 MERV8	
180	18	FILTER 3, #, SIZE, MERV?		
190	19	PUMP #	065-HWP11-A, HOT DECK PUMP	
200	20	INSTALLATION DATE	1967	
210	21	AHU / UNIT CFM		

DRIVE BELTS AND FILTER SIZES FOR PM CREW REFERENCE

Related Documents Can Be Stored For Quick Reference Data Sheets, Submittals , Shop Drawings, O&M Manuals, Etc.

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Related Documents

Asset	065-AHU1-A	Editor	KBUCY
		Edit Date	Apr 24, 2013 02:54 PM
Description	AIR HANDLING UNIT 1 MMS-105758-065-AHUS-001		

Document Listing

Thumbnail	GUID	Title	Extra Description	Document Type
	03516F66-C626-4E69-9ABB-94AAD6F70F29	065-VFD1-A.AHU1SF		IMAGE
	5AA09D0F-E18C-40D7-9B08-7AC0F333ADDF	065-VFD2-A.AHU1RF		IMAGE
	BD49B4B8-D7C4-4953-AE69-7E52A39736D8	065-AHU1-A.RF		IMAGE
	D9615278-6F0A-4911-96C9-F34154B3D3DE	065-AHU1-A.SF		IMAGE

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Results Of A Search Of All Bloomington Assets Currently Entered In AiM-MMS Test Program

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Master Asset Profile

Asset	Description	Asset Type	Asset Group	Status	Region	Facility	Property	Location
059-AD1-A	AIR DRYER, HVAC CONTROLS	SERIALIZED	B-AIR DRYER	ACTIVE	BL	LINDLEY HALL	BL059	500
059-AD2-A	AIR DRYER, MACHINE AIR, SHOP	SERIALIZED	B-AIR DRYER	ACTIVE	BL	LINDLEY HALL	BL059	500
059-AHU1-A	AHU1, SERVES LEVEL 1, BASEMENT	SYSTEM	B-AIR HANDLING UNIT	ACTIVE	BL	LINDLEY HALL	BL059	500
059-AHU4-A	AHU4,SERVES LEVEL 4, 3RD FLOOR	SYSTEM	B-AIR HANDLING UNIT	ACTIVE	BL	LINDLEY HALL	BL059	500
059-AHU5-A	AHU5,SERVES LEVEL 5, 4TH FLOOR	SYSTEM	B-AIR HANDLING UNIT	ACTIVE	BL	LINDLEY HALL	BL059	500B
059-AHU6-A	AHU6,SERVES ROOM 416	SYSTEM	B-AIR HANDLING UNIT	ACTIVE	BL	LINDLEY HALL	BL059	416
059-AHU7-A	AHU7,SERVES ROOM 416	SYSTEM	B-AIR HANDLING UNIT	ACTIVE	BL	LINDLEY HALL	BL059	416
059-BFD1-A	BACKFLOW DEVICE,FIRE SYSTEM, OUTSIDE PIT MMS-100385-059-BFD-159882	SERIALIZED	B-BACKFLOW DEVICE	ACTIVE	BL	LINDLEY HALL	BL059	
059-BFD2-A	BACKFLOW DEVICE, FIRE SYSTEM, OUTSIDE PIT MMS-100387-059-BFD-9057532	SERIALIZED	B-BACKFLOW DEVICE	ACTIVE	BL	LINDLEY HALL	BL059	
059-BFD3-A	BACKFLOW DEVICE, CHILLED WATER M/U, MMS-	SERIALIZED	B-BACKFLOW	ACTIVE	BL	LINDLEY	BL059	500

LIST OF ASSETS FOR 13 BUILDINGS CURRENTLY ENTERED

1ST OF 63 PAGES 1,560 ACTIVE ASSETS TOTAL TO DATE

Page 1 of 63 Display: 25 50 100 Records Found = 1560

All assets will be tagged with an asset sticker.

Sticker has a QR code which is a link to the smart number and AiM-MMS.

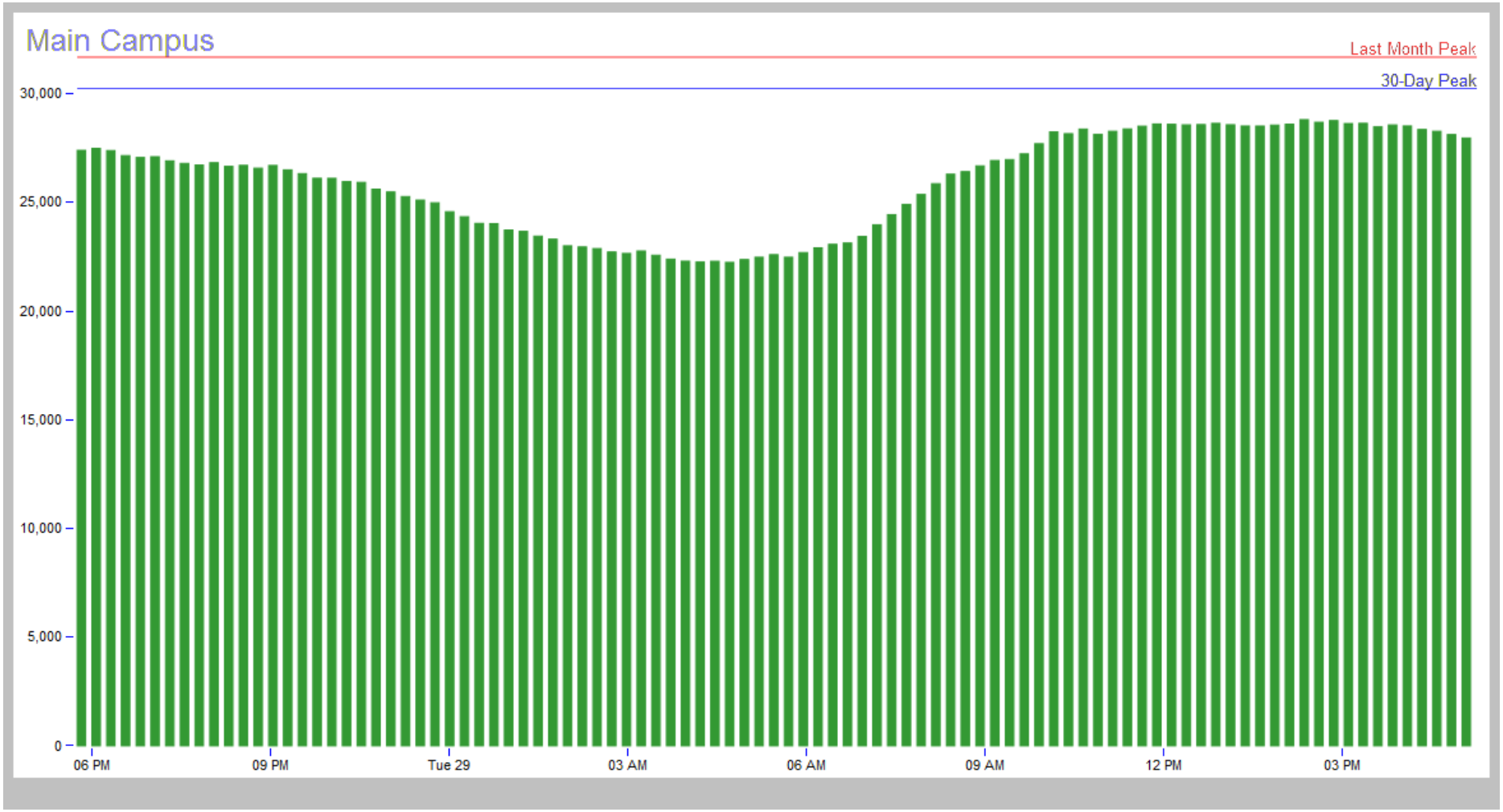
BUILDING NAME
ROOM NUMBER
SMART NUMBER
BRIEF DESCRIPTION

2-7/8” X 3-7/8”

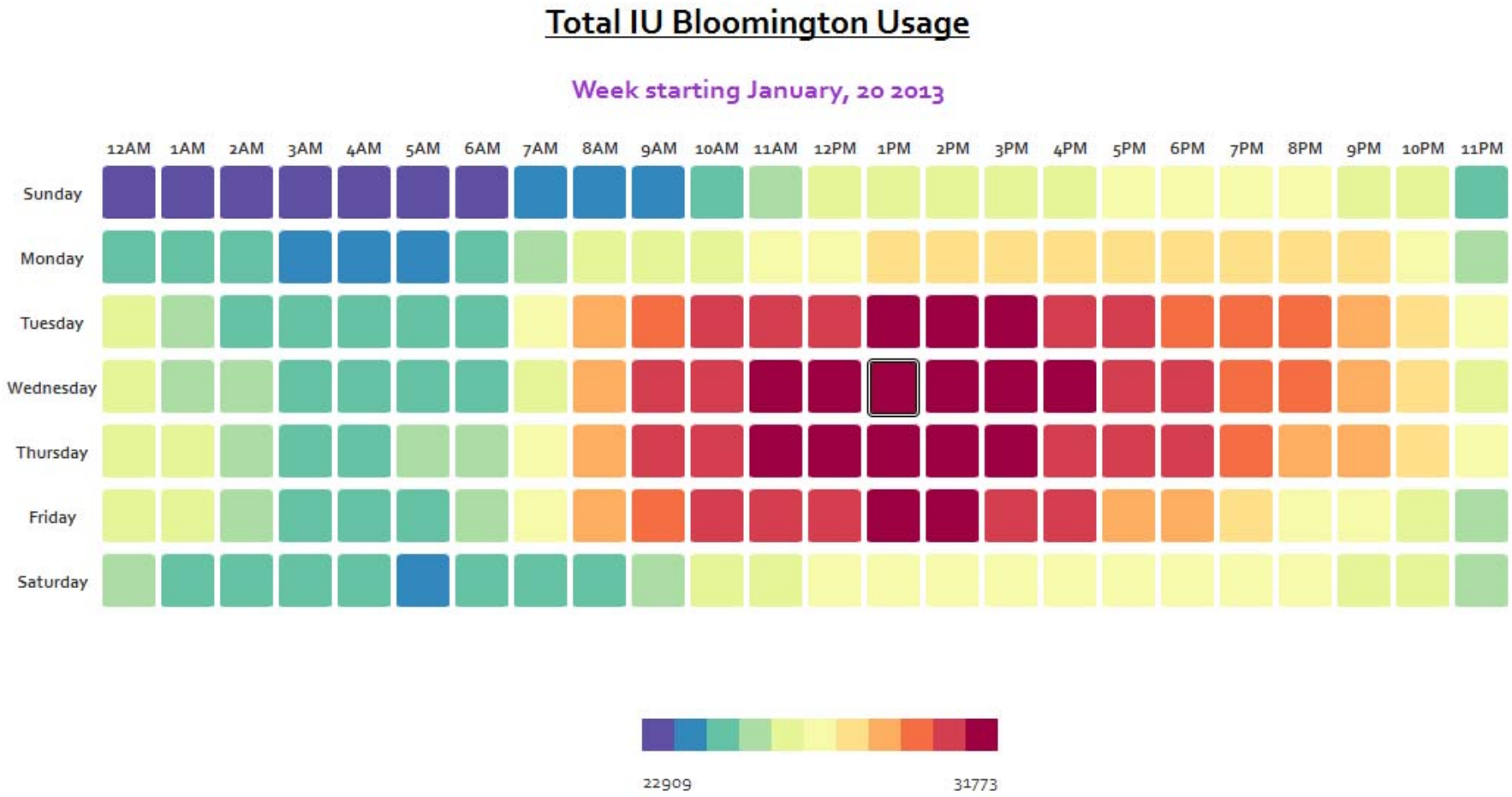
Utility Information Project - Electricity

1. Electricity – in the final phase
   - Pulling in the meter data by building on 15 minute intervals,
   - Aggregating building data up to the master bill and matching on demand and usage
   - Storing monthly total usage and contribution to peak in AiM
   - Storing all meter readings in SQL database for continued analysis
2. Data will be used by Facilities to:
   - Identify which buildings are energy hogs
   - Identify which buildings are most sensitive to weather conditions, i.e. sun intensity, heat, humidity, etc.
3. Data will be used by building occupants to:
   - Modify behavior in the interest of conservation especially during periods when the campus is at risk of exceeding peak targets

Sample Chart of Peak Management Dashboard

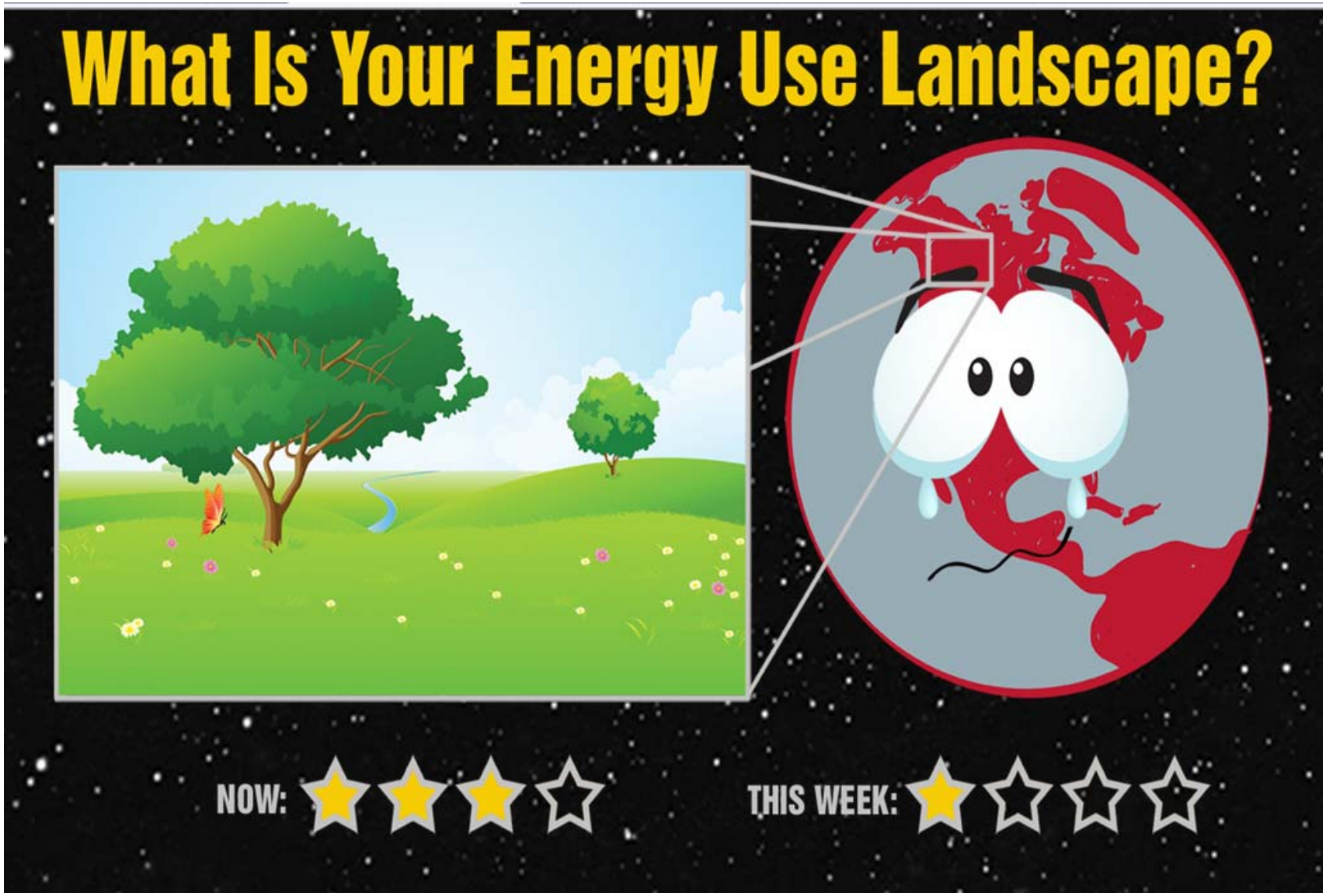


Sample Chart of Electrical Usage by Hour for a Week



Utility Information Project – Other Utilities

1. Water
   - Work completed includes – metering complete, receiving billing files electronically, meter trees are nearly complete
   - Still need to do the programming work to connect meter data at a building level to the master bill
2. Natural Gas
   - Working with Vectren on meter heads that can be read hourly
   - Working with Vectren on electronic billing
   - Will need to then complete the meter tree and connect meter data with billing data
3. Work on Chilled Water and Steam will follow natural gas and water


What Is Your Energy Use Landscape?
NOW:
THIS WEEK: