

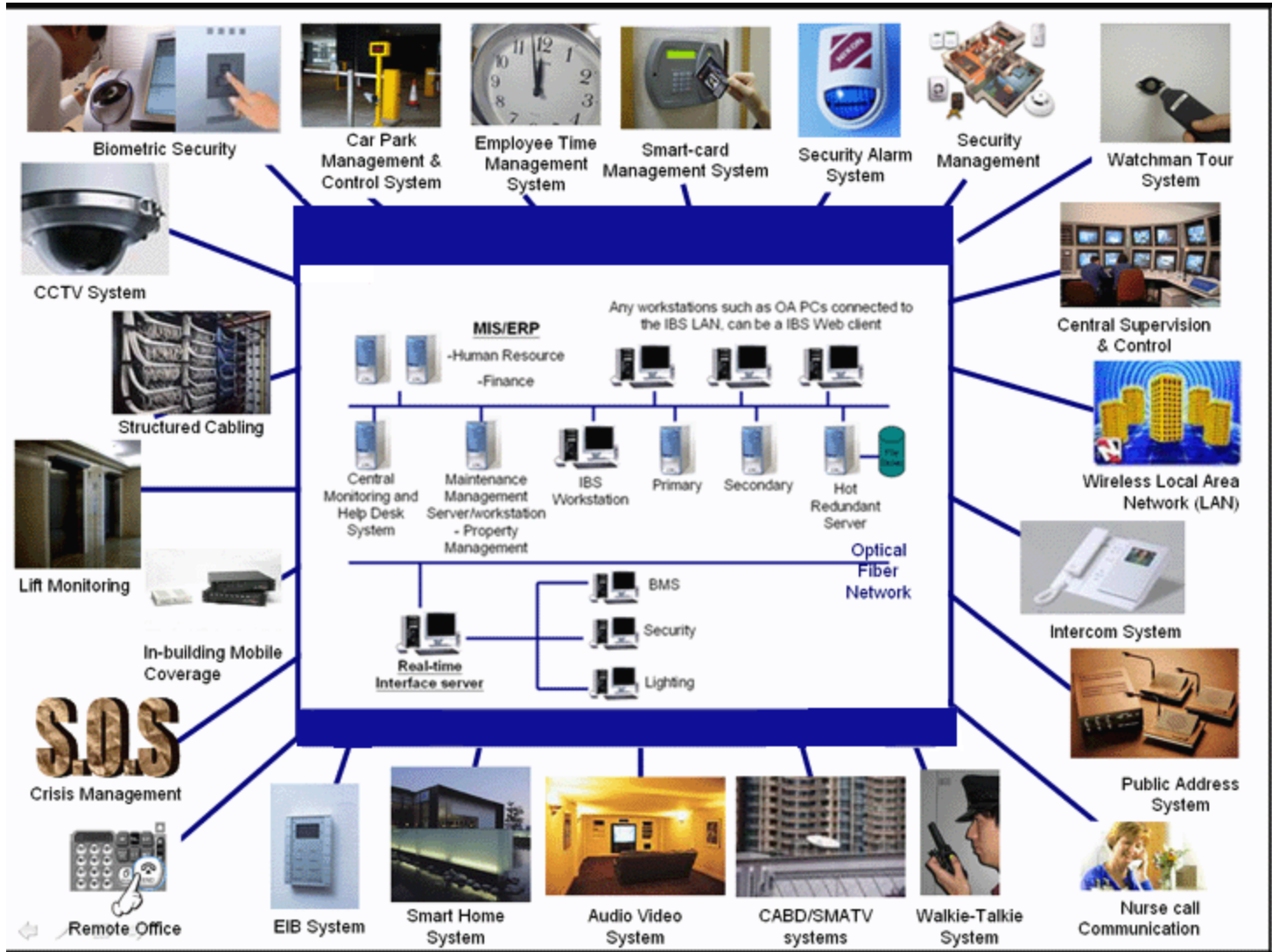


# Impact of New Technology in Buildings

Total Facilities Live 2012

Rick van Driel, Solution Executive – Smarter Buildings  
IBM Asia Pacific





# IBM Real-Time Asset Locator enables enterprise asset management with real-time data

*Sensor-tagged assets send location information*



*Real-Time Asset Locator processes sensor data & integrates events with Maximo Asset Management*



*Enabling new business use cases and workflows*

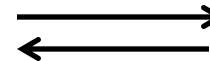
Sensor Infrastructure

Raw sensor data

IBM Real-Time Asset Locator

Events

Maximo Asset Management

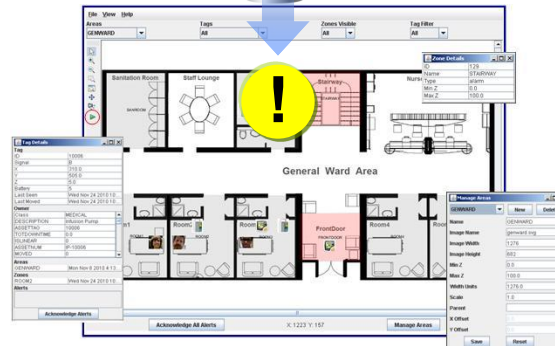


Asset, personnel, and patient tags

Filtering and correlation of raw data

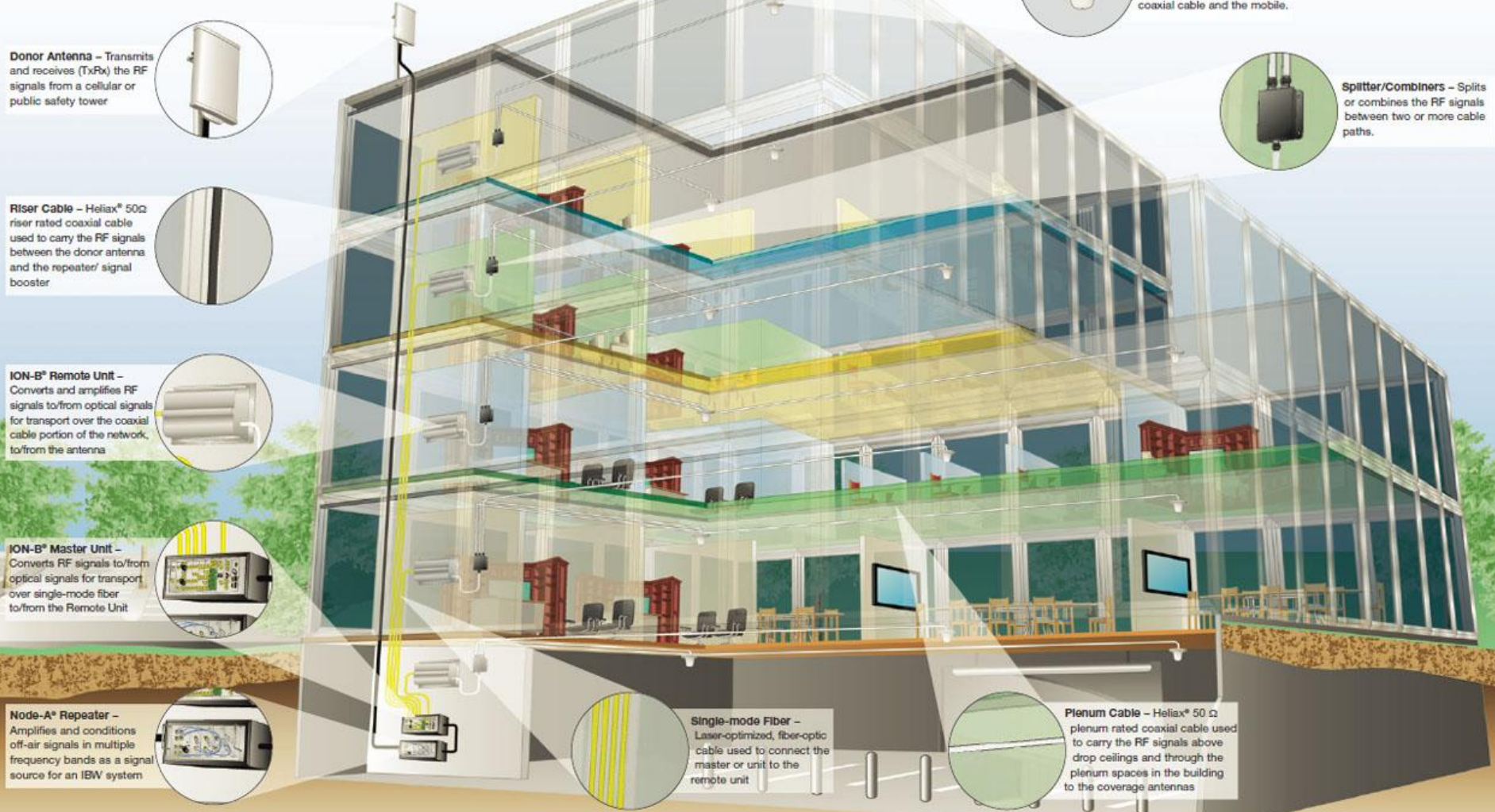


Recognition of actionable events and conditions

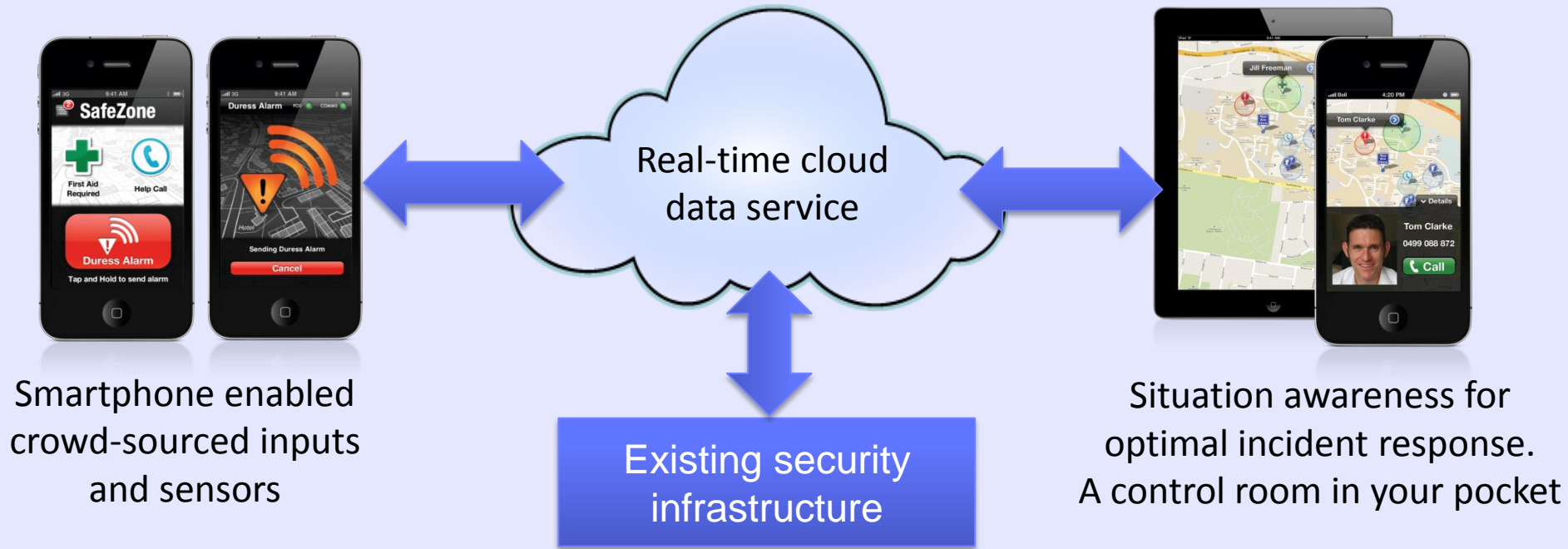


- Automatic location and condition updates
- Event-driven workflows and escalations
- Real-time visualization of asset location and status
- New reports and metrics providing insight into inventory, utilization, and exceptions

## CommScope's In-Building Wireless Solution Infrastructure



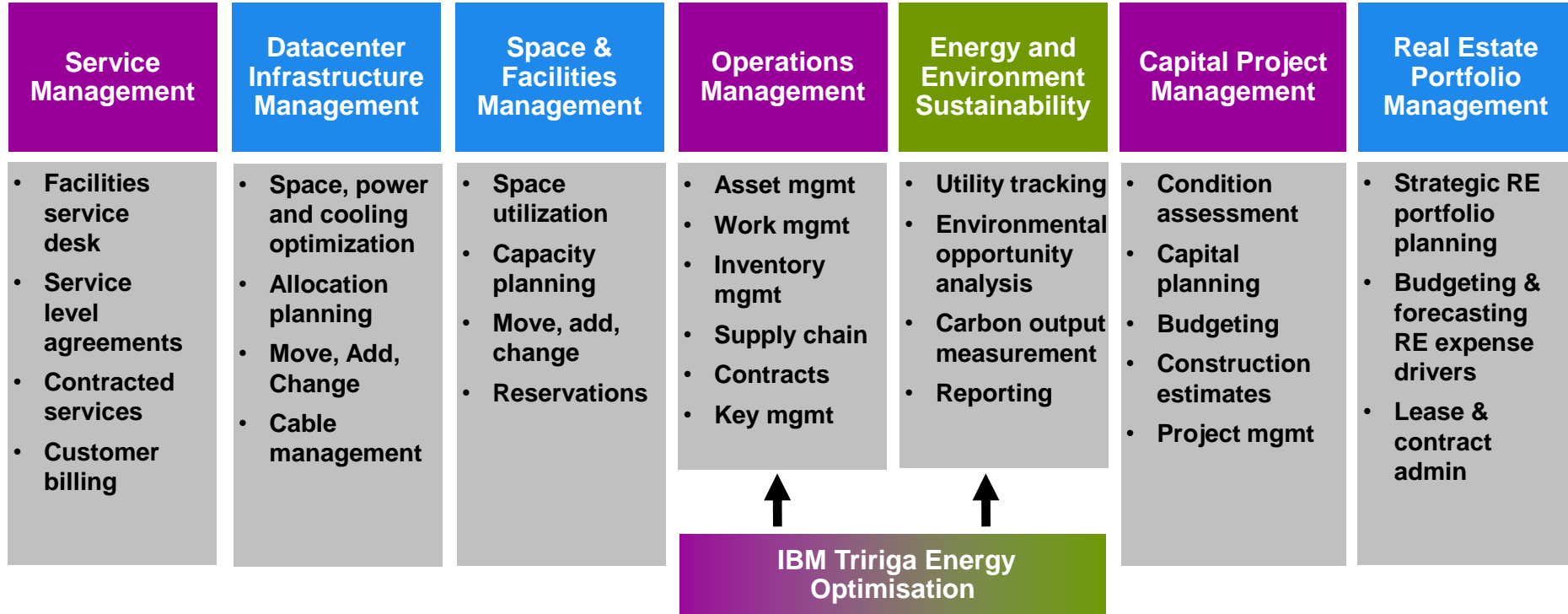
## Security System Innovation - SafeZone



- No fixed infrastructure
- Security everywhere
- Positive reputational impact
- Improved OH&S



# ← IBM Solutions for Smarter Buildings →



Real-Time Monitoring  
 Energy Analytics  
 Improved Operational Efficiency  
 Integrated Energy and Operations  
 Pre-package Building Management system interfaces

- ENERGY
- OPERATIONS
- SPACE

## Diverse Real Estate Portfolio:

### **200 Data Centers**

- Support of Global Customer Needs for Strategic Outsourcing



### **400,000 Seated Employees Worldwide**

- Migration to Software and Services



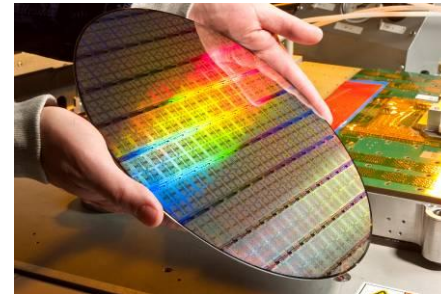
### **Research Labs in 12 Countries**

- #1 Patent Portfolio in the World



### **High End Technology Manufacturing**

- Servers and Advanced Semiconductors



## Rochester Facility Overview:

- **Established 1956**
- **3.1M Sq Ft / 36 Bldgs**
- **Variety of Space Type**
  - **Office**
  - **HW & SW Labs**
  - **Data Center**
  - **Manufacturing**
  - **Warehouse**
- **Wide Variety of Equip.**
- **Central Utility Plant**
- **Metasys Controls Sys.**  
(~ 30,000 Points)





## With IBM Software We Optimize Across Two Dimensions:

### ▪ Strategic Optimization - Global Portfolio Analysis

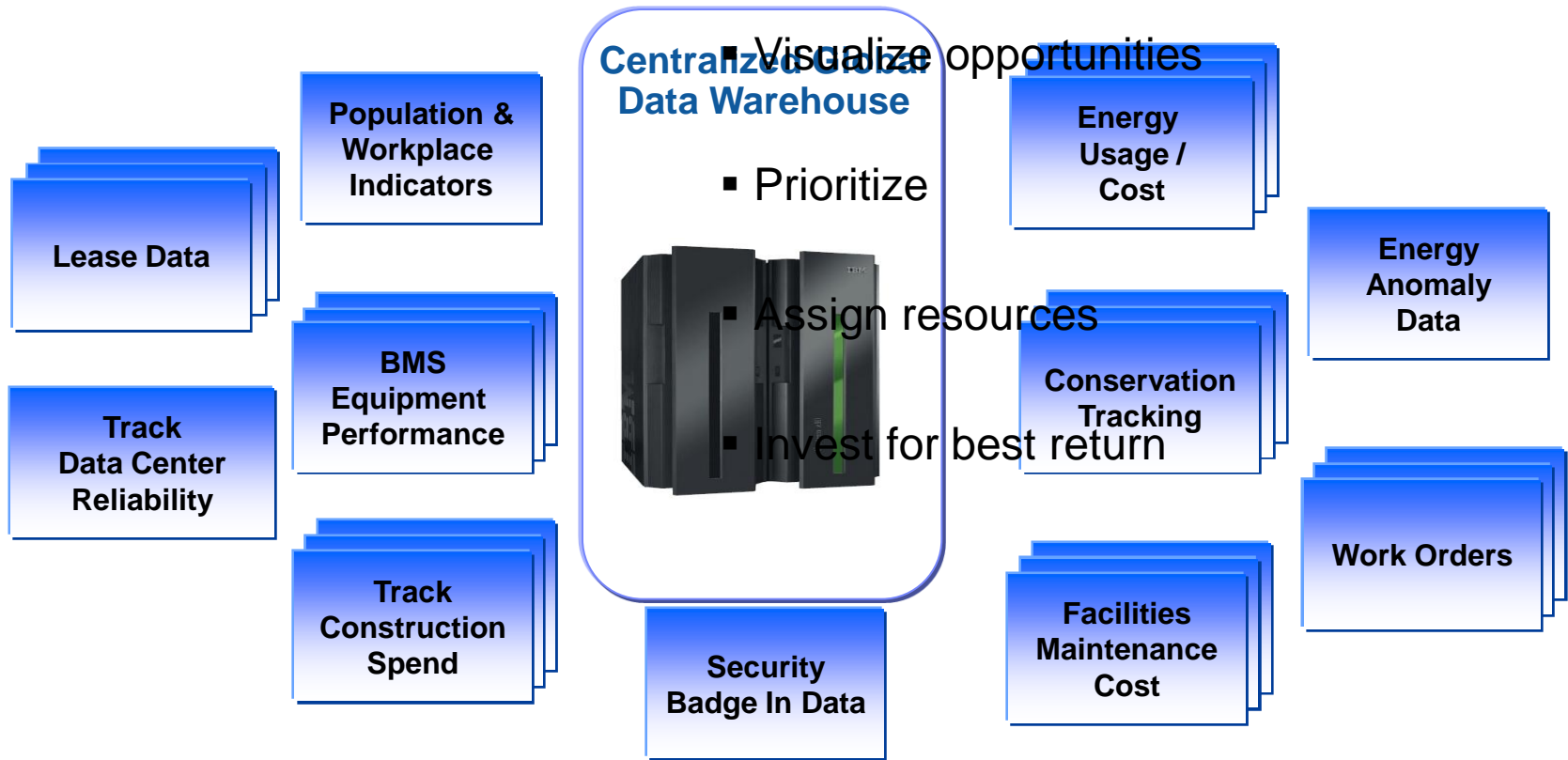
- Aggregation of Key Global Indicators:
  - Lease Information
  - Space Utilization
  - Energy Usage & Conservation
  - Work Order History
  - Supplier Performance
- Drives resource and investment prioritization: higher efficiency & effectiveness

### ▪ Building Optimization – Individual Building Performance

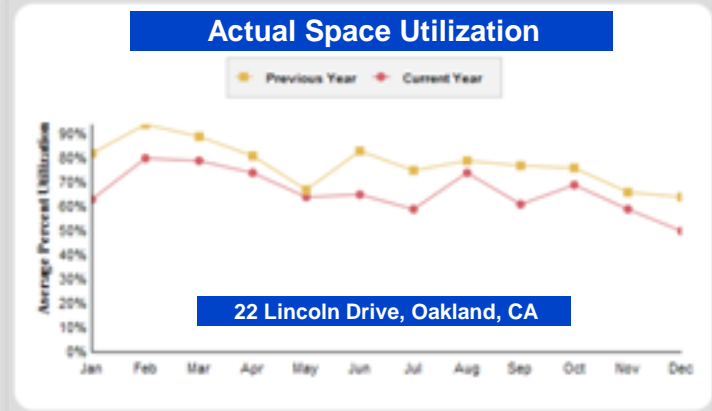
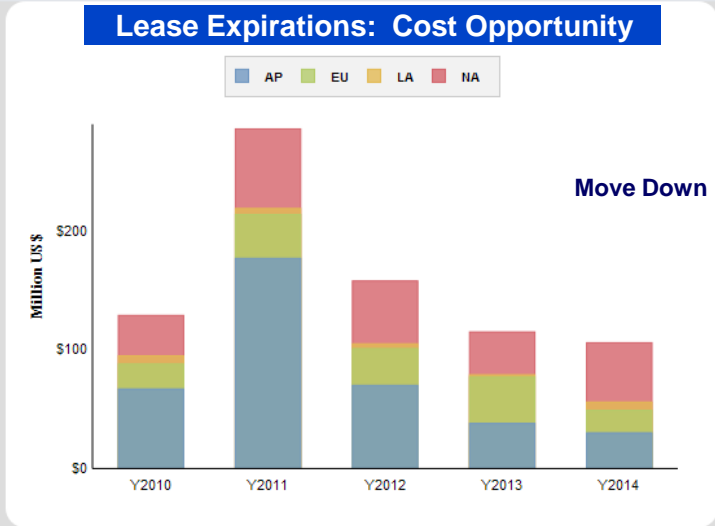
- Focus on building efficiency through visibility to operating anomalies
- Software integrated with building systems to report
  - Ambient conditions
  - Equipment malfunctions
  - Set point deviations
  - Real time demand for water, HVAC and lighting
- Automated response to improve building efficiency, reduce co2 emissions & improve reliability



## We Modified The “Single System Strategy” & Developed Global Data Repository:



# Strategic Optimization: Lease Analytics



### Lease Expirations: Cost Opportunity

Geo	Y2010	Y2011	Y2012	Y2013	Y2014
AP	\$67,009,503	\$177,455,001	\$70,378,884	\$38,501,637	\$30,027,514
EU	\$21,350,213	\$37,160,100	\$31,144,329	\$39,429,562	\$19,949,039
LA	\$7,889,684	\$5,052,020	\$4,973,533	\$2,787,103	\$7,124,124
NA	\$34,171,472	\$67,797,468	\$53,869,256	\$36,235,981	\$50,875,812
TOTAL	\$130,420,872	\$287,464,589	\$160,366,002	\$116,954,283	\$107,976,489

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### Top 10 Leases

Country	City	Address	Expiration	Rent	OpsExp
US	AUBURN	11501 BARNES RD	03/31/2011	\$15,000,000	\$88,000
US	BURLINGTON	6710 RODGERS DR	02/28/2011	\$6,500,000	\$3,000,000
US	VENICE	8020 TOWERS DR	07/31/2011	\$3,500,000	\$310,000
US	OAKLAND	22 LINCOLN DRIVE	11/30/2011	\$3,300,000	\$1,900,000
US	LANDOVER	20 WAGEE RD	12/31/2011	\$3,200,000	\$1,100,000
US	BETHESDA	8051 WASHINGTON AVE	09/30/2011	\$3,000,000	\$2,000,000
US	BINGHAMTON	15 WAYBURN RD	09/30/2011	\$2,200,000	\$0
US	AUSTIN	5871 KINGS PKWY	04/30/2011	\$1,800,000	\$700,000
US	EXTON	1475 PHILADELPHIA PKE	05/31/2011	\$1,700,000	\$600,000
US	WAUWATOSA	334 71ST STREET	04/30/2011	\$1,500,000	\$500,000

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# Strategic Optimization: Energy Analytics

▼ Geo
▼ Region
▼ Site
▼ Location
▼ Shortcuts

SB Pilot Feedback and Support

Exec Analytics ▼

[Settings](#) | [Help](#) | [Logout](#)

Lease Analytics
Energy Analytics
Maintenance Analytics
New Page

Share ▼
Customize
More Actions ▼

### Energy Scoreboard

Status	Metric	Date
Green	YTY Energy Consumption	08/23/2010
Green	YTY Energy Cost	08/23/2010

[Page 1](#)
[Previous](#) | [Next](#)

### YTD Electric Usage

Previous YTD Usage	1,868,522 MWh
Current YTD Usage	1,774,802 MWh
Percent Change	-5%
YTD Dollar Impact	-\$7,489,237

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### Top 100 Energy Users

Rank	Locations	MWh	Change	Rate	Impact
1	Auburn	444,220	0.3%	\$78.22	\$101
2	Venice	396,737	-4.5%	\$81.56	-\$1,394
3	Kingston	220,868	3.5%	\$80.04	\$600
4	Oakland	145,960	-5.7%	\$65.58	-\$514
5	Landover	163,355	-0.8%	\$52.19	-\$71
6	Bethesda	114,982	-5.7%	\$45.93	-\$35
7	Binghamton	92,664	-6.5%	\$82.01	-\$462
8	Exton	48,867	-7.3%	\$72.72	-\$280
9	Axtel	70,288	-1.4%	\$89.97	-\$92
10	Wauwasoa	96,298	0.2%	\$71.90	\$16
11	New Orleans	65,220	-12.7%	\$162.61	-\$1,198
12	Petersburg	48,804	5.2%	\$113.88	\$274
13	Englewood	55,585	2.5%	\$65.06	\$87
14	Osawa	50,373	-5.8%	\$106.93	-\$298
15	Jackson	48,919	-6.5%	\$135.24	-\$462
16	Worwick	46,687	-2.1%	\$100.54	-\$99
17	Farmington	45,329	-9.1%	\$96.30	-\$365
18	San Diego	35,712	-0.4%	\$107.13	-\$17
19	St. Louis	10,923	-4.9%	\$68.16	-\$38
20	Middleburg	20,183	5.8%	\$118.57	\$131

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**Top 20 Sites**  
45% of WW spend  
51% of WW usage

**Next 80 Sites**  
27% of WW spend  
25% of WW usage

Weather

Current Conditions:  
Fair, 23 F

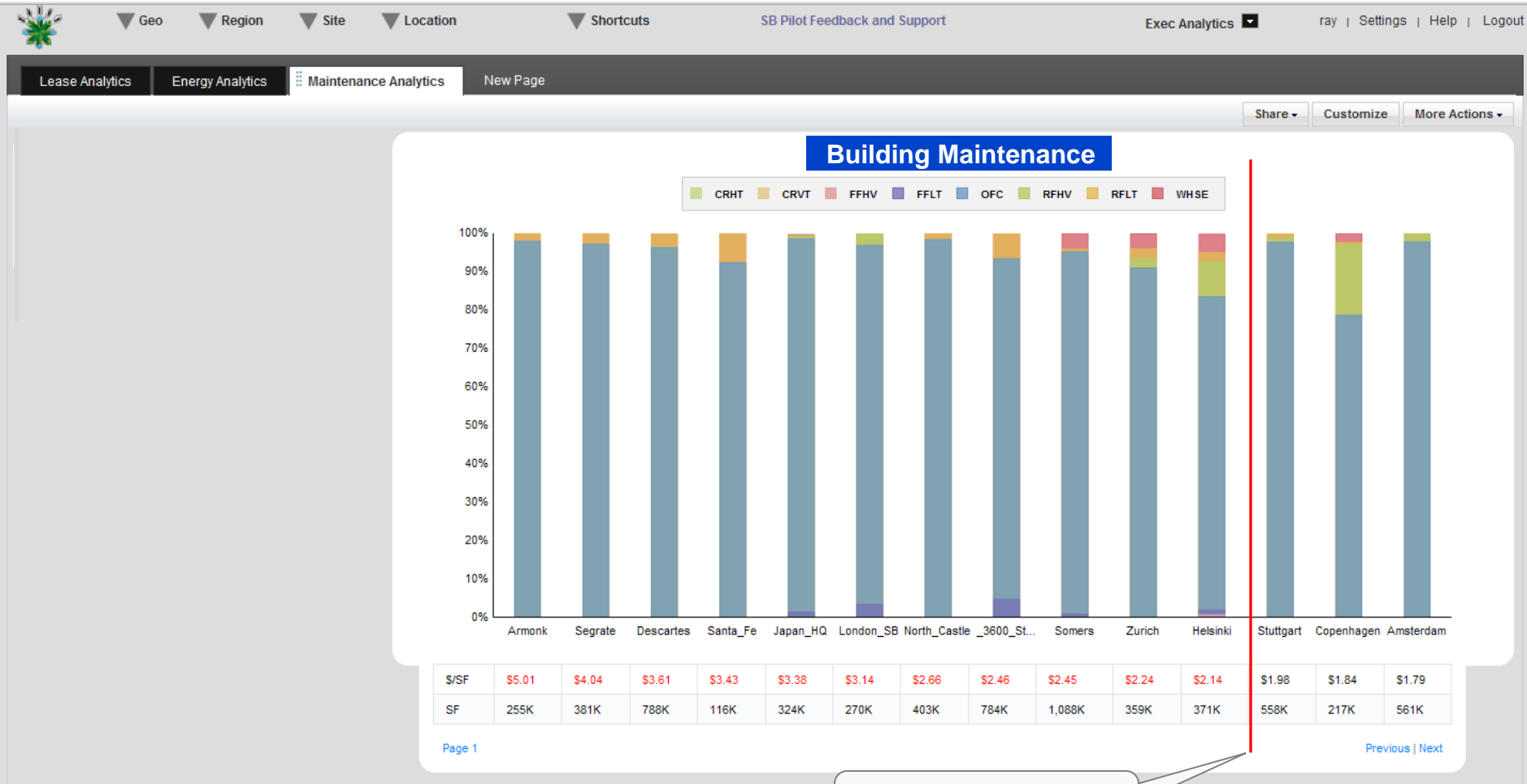
Forecast:  
Fri - Mostly Clear. High: 24 Low: 10  
Sat - PM Snow Showers. High: 32 Low: 24

[Full Forecast at Yahoo! Weather](#)  
(provided by [The Weather Channel](#))

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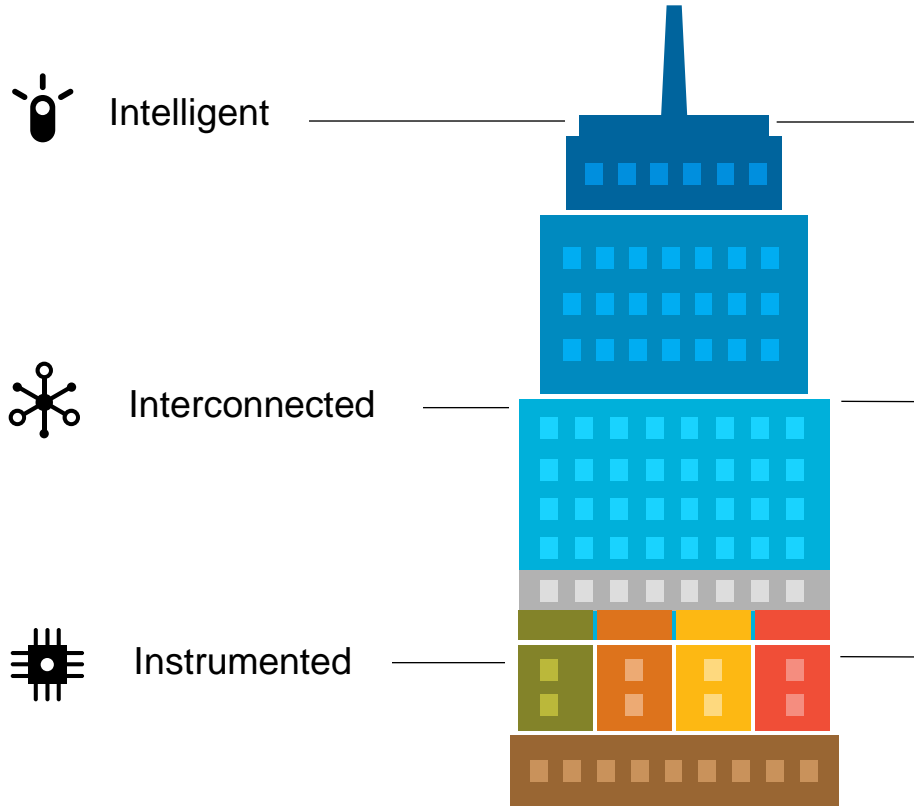
SAMPLE DATA

# Strategic Optimization: Maintenance Analytics



SAMPLE DATA

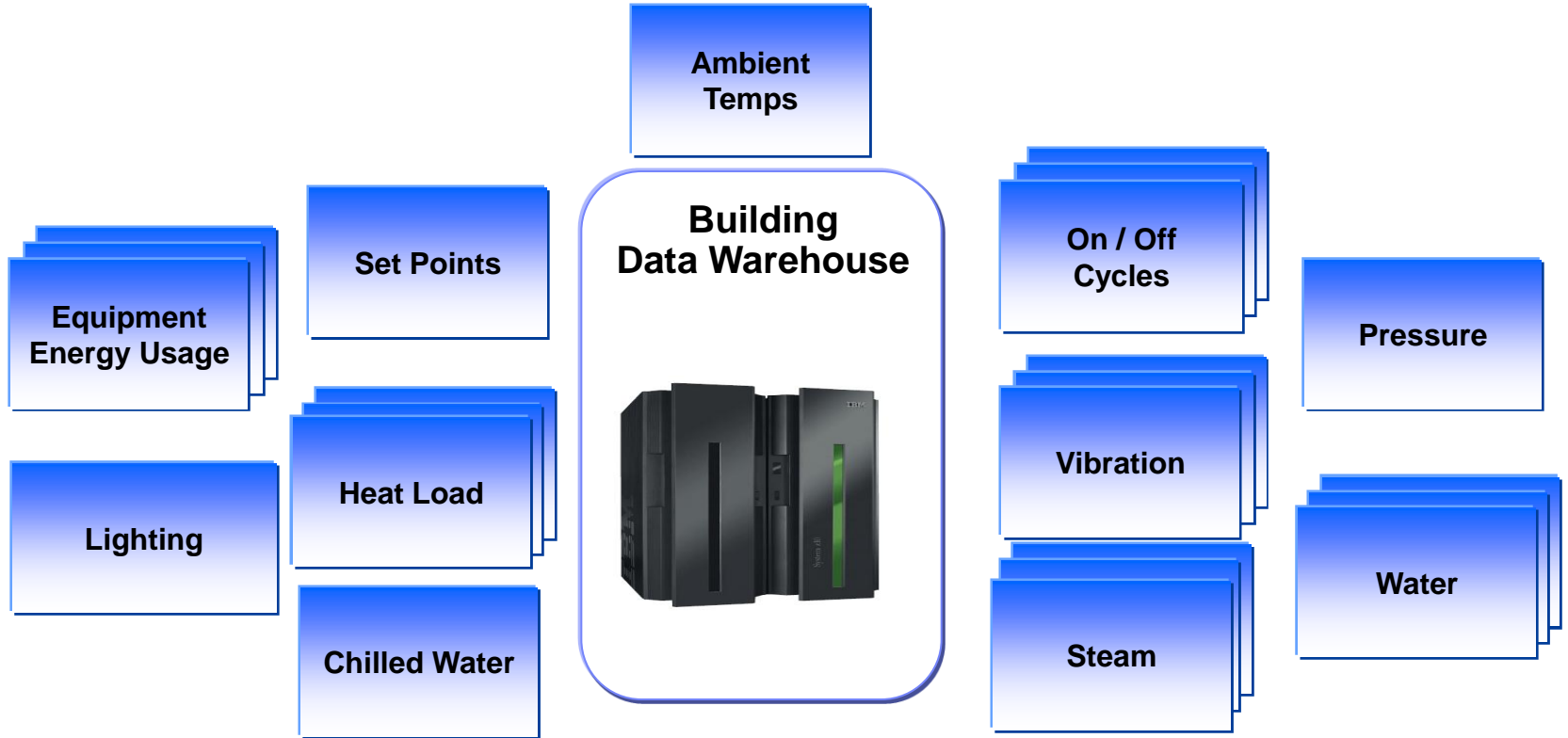
# Making Our Buildings Smarter by Increasing Visibility to Sub Optimal Operating Conditions:



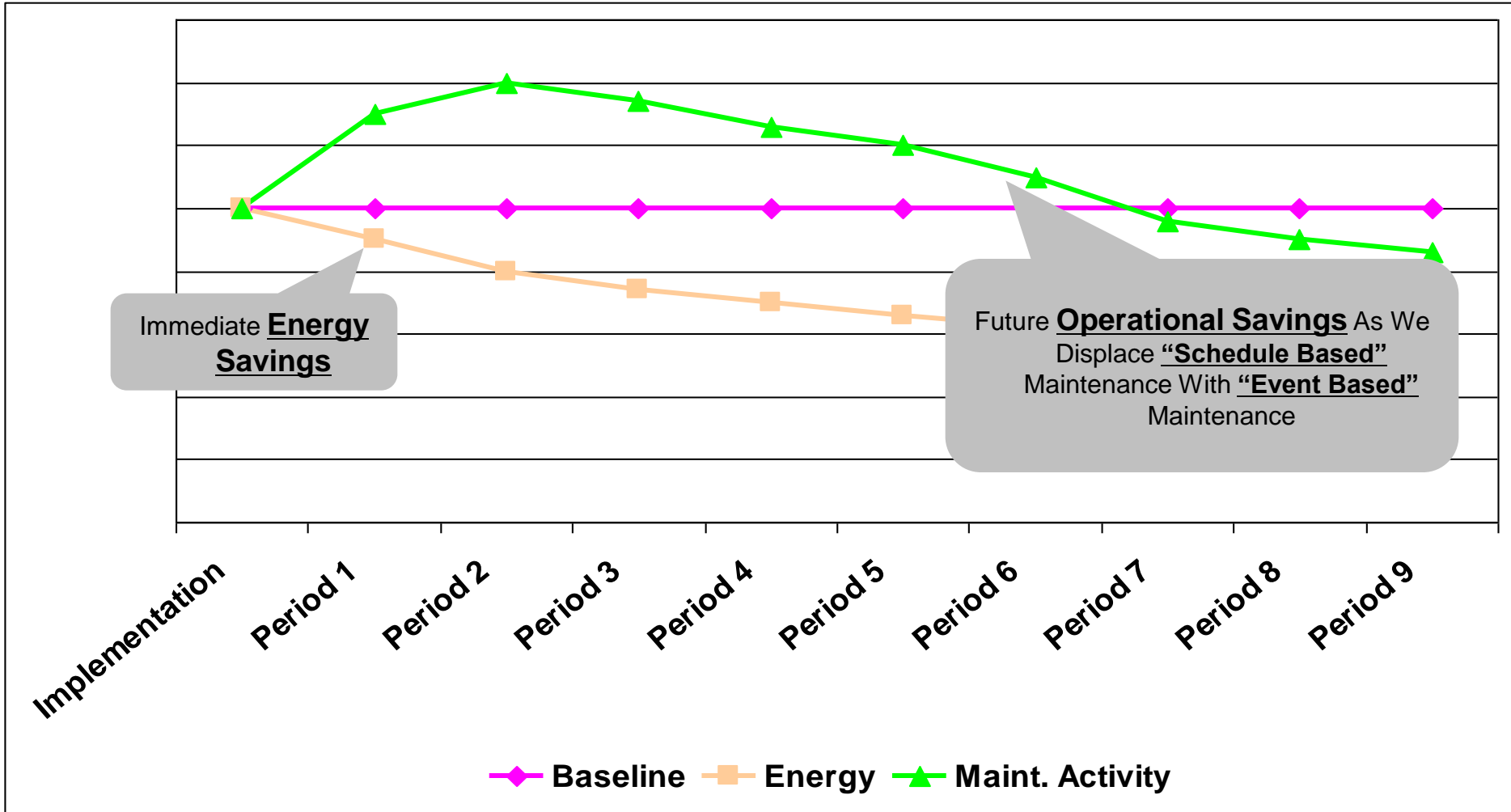
- **Use IBM Analytics Software to:**
  - Filter and Prioritize Building Alerts
  - Isolate Poor Performing Assets
  - Benchmark Building Equipment Across Portfolio
  - Improve Visualization with Advanced Dashboards
- **Deployed IBM Data Mgmt Software to:**
  - Aggregate Energy Usage & Equipment Performance Data
  - **Establish Rules Representing Performance Standard**
  - Alert Sub-Optimal Operational Conditions
  - Automatically Create Work Orders
- **Meters and Sensors Installed at Selected Points in the Infrastructure**
  - High Energy Use Points
  - Reliability Exposure Points



## Same Data Aggregation Principles Applied Now at the Building Level:

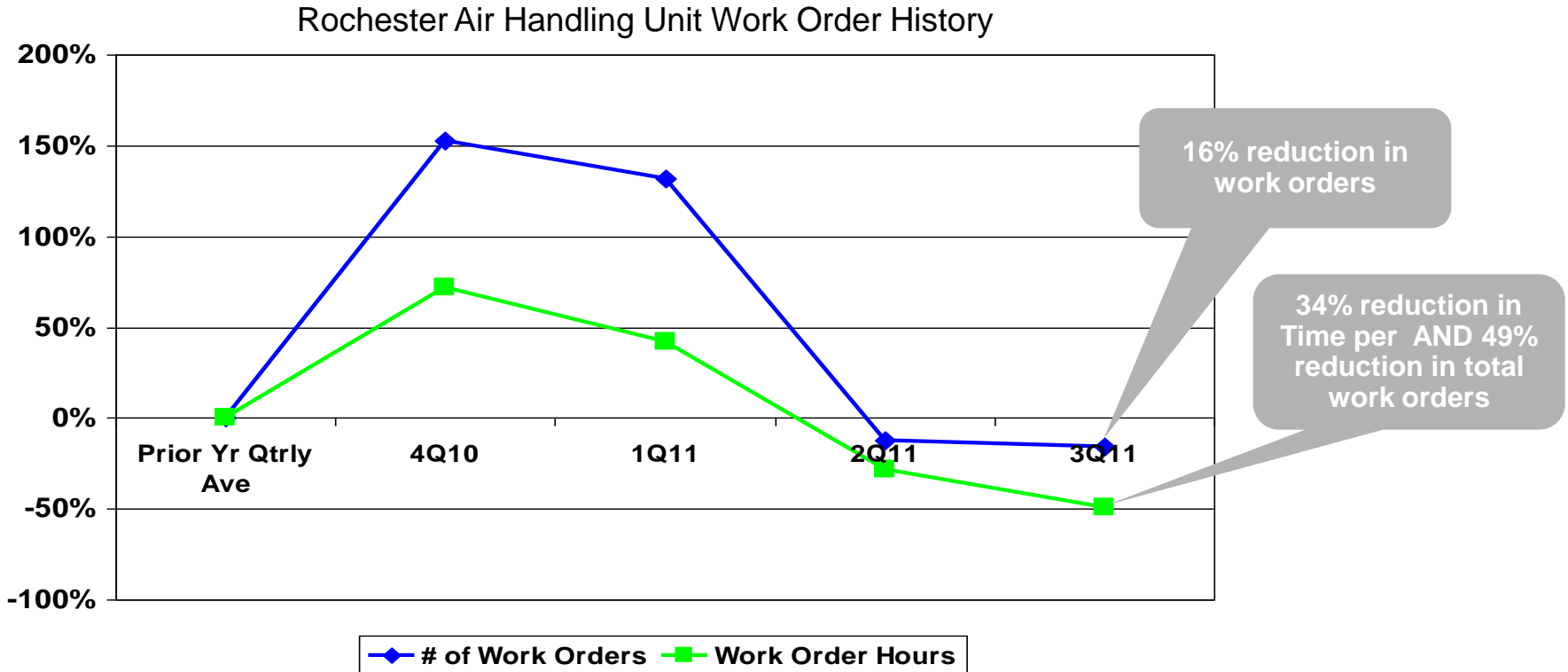


## Smarter Building Savings Model:





## Smart Building Results: Maintenance



- Quick Savings: Over 1,300 alerts and 600 work orders generated in first month for Phase 1

## Rochester Return on Investment:

### One Year Payback

- Factors that will Influence Site Specific Results:
- Implementation Cost:
  - Level of Existing Instrumentation
  - Building Management System Sophistication
  - Work Order Logistics System
  - Skilled Staff Availability
- Benefits:
  - Maintenance Productivity
  - Equipment Efficiency Levels
  - Depth of Implementation
  - Type of Space (Office, Data Center, etc.)

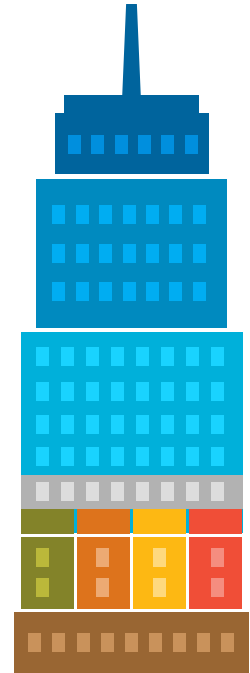
### First Step:

- Select a Building
- Assess Starting Point

INTELLIGENT

INTERCONNECTED

INSTRUMENTED



## Summary

**By The Way, Last year, this equated to savings of \$43m for IBM**

- 400,000 Employees
- Portfolio Extending Across more than 120 Countries
- Diversified Operations, Office, Data Centres, Manufacturing, Research & Dev, etc
- One Year Payback possible, depending on scope
- 10% to 15% Energy Savings

## Links

- IBM Smarter Buildings
  - <http://www-142.ibm.com/software/products/us/en/tririga-energy-optimization/>
- YouTube Videos
  - <http://www.youtube.com/watch?v=NU19fWq6MRY> **Smarter Building Solution Overview**
  - <http://www.youtube.com/watch?v=Yd2fM1exP7I> **Smarter Building Case Study Overview Rochester USA**
  - <http://www.youtube.com/watch?v=QBGyAM9KpQ0> **Smarter Buildings at Tulane University after Hurricane Katrina**



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