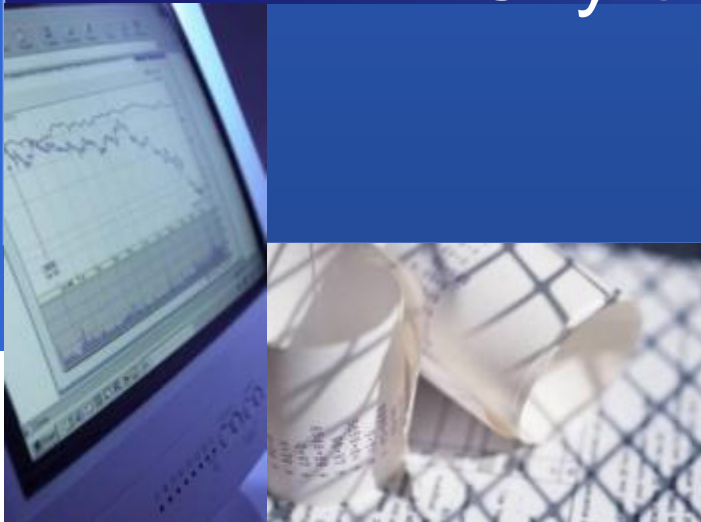




Municipal Wireless Deployment City of Santa Rosa, CA



Eric McHenry
Chief Technology Officer
City of Santa Rosa
October 22, 2007



SNAPSHOT: The City of Santa Rosa

- **153,000 Residents**
- **62,000 Households**
- **Median Age: 37.2**
- **65% have (at least) some completed years of college**
- **\$68,000 median household income (2005)**
- **4.3% unemployment**
- **\$440,000 median home price**

- **7 person City Council**
- **Full service city (including Fire, Police, Utilities...)**
- **13 city Departments**
- **Roughly 1300 employees**
- **In-house full service IT Staff of 29pp (\$4.2M budget)**

Santa Rosa





Santa Rosa City Council Objectives

“Ensure Santa Rosa is on the leading edge for technology”

- 1. Access to franchise-based video entertainment service throughout our community**
- 2. Access to high-speed Internet throughout our community**
- 3. City Organization uses leading edge technology**
 - **Continue to deploy resident and business focused online services**
 - **Easier to do business with the City**
- 4. Wireless Internet service in key City zones**



ITD Three Year Strategic Plan Framework

1. **Technology and Business Solution Improvements**
2. **Citizen and Business Relations**
3. **Legislation and Policy**
4. **Application Development and Support**
5. **Core Network**
 - Performance
 - Security
 - Robustness
6. **Wireless Network**
 - General
 - Deployment Roadmap
 - Public Safety (Fire and Police)
 - Public Service (City Workers)
 - Public Access (Citizens, Visitors and Businesses)
7. **Disaster Preparedness**
 - Internal ITD operations
 - City Systems, Networks and Communications
8. **Helpdesk and Desktop Support**
9. **GIS Services**
 - General
 - Improve GIS website
 - New Fee-based services for residents, businesses and non-profits
 - GIS Hosting Services
 - Enhanced access to public GIS Website
10. **People**





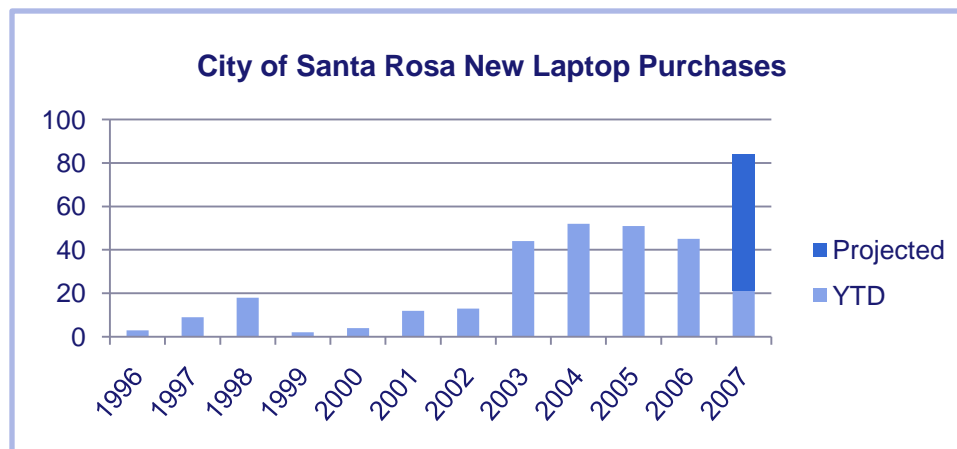
Strategic Objective 6.0: Deploying and Managing a Unified Indoor and Outdoor WiFi Network:

Problem Areas and Key Drivers

- **Improve our indoor WiFi network**
 - Staff access
 - Guest public access
 - Improved security
 - Reduce operational effort / improved management
 - 50 APs deployed, growing to 100 APs
- **Path for outdoor WiFi network growth**
 - Partial city model
 - Partnership with local WISP
 - Network ownership and management by internal IT
- **Deploy a WiFi network suitable for IP camera backhaul**
- **Emerging Public Safety interests**
 - 4.9GHz / in-vehicle deployment needs
 - More surveillance cameras (fixed and portable)



- **Business Drivers For Indoor WiFi**
 - Significant growth in internal laptop usage
 - Outside vendors and guests with laptops



- **Business Drivers for Outdoor WiFi**
 - Economic Development
 - Parking, Public Safety operational use



Evaluation and Selection Process

1. Technology Trial (Sept06 through Jan07)

- a) Evaluate technologies for unified indoor and outdoor wireless network
 - a) Public access, public service and public safety
 - b) Test performance, reliability and system management
- b) Evaluate wired & wireless IP camera technologies
 - a) Network issues + wireless subscriber access
- c) Evaluate internetworking technologies (disaster response, cost sharing)
- d) Learn enough to shape future best-value purchases



2. Broad Deployment and RFPs

- 100+ Cisco 1130 /1300 LWAPP APs + WLAN controller + WCS software
- Approximately 10 Cisco 1500 mesh APs + controllers
- Roughly 50 IP cameras + server(s) + ONSSI software
 - Transit, Parking, Police
- RFP for public access traffic + support





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Municipal Wireless Deployment – Santa Rosa, CA

Simplified System Architecture



Central
Management
Software



Controller



Controller



Indoor
Network



Firewall

DMZ
Controller

802.11a

Opt-E-MAN

DSL

VPN

Railroad
Square

Public
Internet



Downtown
Mesh



Golf Course
Mesh

Outdoor
Network



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Network Summary

Controllers: 2

Coverage Area

Name	Total APs	Active	Radius	802.11n	802.11g	802.11a
CSRS01	4	4	0	0	0	0
CSRS02	2	2	0	0	0	0
CSRS03	2	2	0	0	0	0
CSRS04	4	4	0	0	0	0
CSRS05	4	4	0	0	0	4

Total APs not yet assigned to Maps: 2

Most Recent Rogue APs

MAC address	SSID	Type	State	Date/Time
00:0C:29:32:50:26	404-0-001_4	AP	Warn	3/3/07 01:17:46
00:0C:29:32:50:26	8040AC	AP	Warn	3/3/07 01:17:46
00:0C:29:32:50:26	404-0-001_4	AP	Warn	3/3/07 01:17:46
00:0C:29:32:50:26	404-0-001_4	AP	Warn	3/3/07 01:17:46
00:0C:29:32:50:26	404-0-001_4	AP	Warn	3/3/07 01:17:46
00:0C:29:32:50:26	404-0-001_4	AP	Warn	3/3/07 01:17:46

Top 5 APs

AP Name	Map Location	802.11n	802.11g	802.11a	Total
CSRS01	CSRS_01	2	2	0	4
CSRS02	CSRS_02	2	0	0	2
CSRS03	CSRS_03	2	0	0	2
CSRS04	CSRS_04	2	0	0	2
CSRS05	CSRS_05	2	0	0	2

Heatmap

View Filters: RSSI Color Lookup

Zoom: 100%

Refresh

Heatmap

View Filters: RSSI Color Lookup

Zoom: 100%

Refresh

Contributing APs:

- MSCS_NE
- MSCS_SE
- MSCS_NW
- MSCS_SW

Refresh Heatmap

City of Santa Rosa
Cisco WCS
Management
Software Screen
Shots

Outdoor Network

Indoor Network



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Municipal Wireless Deployment – Santa Rosa, CA



Backbone for IP video surveillance system





WiFi Network Deployment and Usage

Deployment

- Downtown streets and gathering areas: ~10sq blocks
- Railroad Square area: ~2sq blocks
- Finley Park and Aquatic Center: ~4sq blocks
- Bennett Valley Golf Course Clubhouse

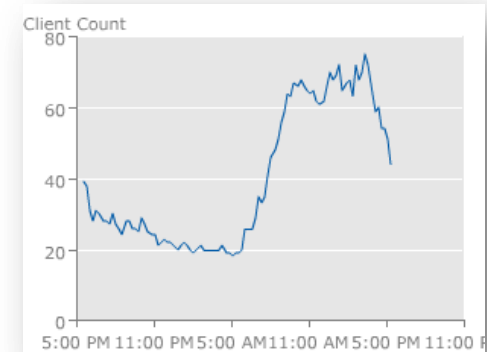
Usage

- City employees: 60-70 users per day
- City guests: 5-10 users per day
- Outdoor (free WiFi): roughly 10 simultaneous per day

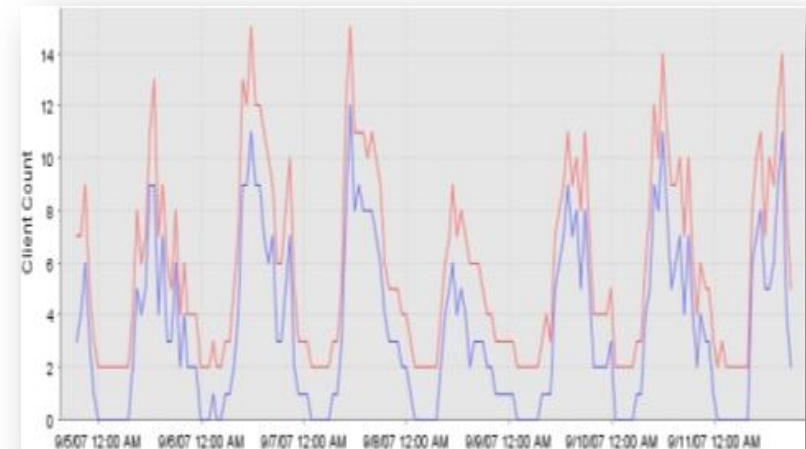
Installation and Management

- Installed by Public Works & IT
- Managed by IT
- ~\$5K per WAP

Overall Clients

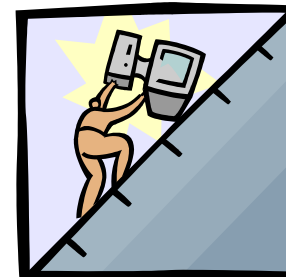


Outdoor Network





City of Santa Rosa WiFi: Is it Successful...?



- **Have met the business objectives**
- **Model allows incremental, tailored growth**
- **Proven to be extremely manageable (and reliable)**
- **Has enabled new solutions...**
 - **Backbone for new Parking solutions**
 - **Backbone for new Transit mobility solutions**
 - **Internetworking with County / Sherriff**
 - **The ideas keep coming...**

Thank You !!!



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Background Slides



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ONSSI Camera Management Software



SAN



Web View City Users



Main Camera Server



Police Comms Center Server



Covert Cameras

