

# Delivering Free Wi-Fi

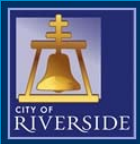
## City of Riverside's WiFi Approach

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May 12, 2008

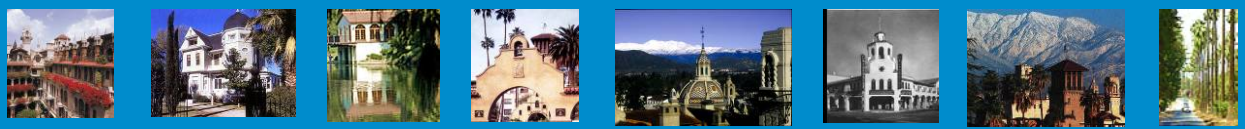
Steve Reneker, City of Riverside

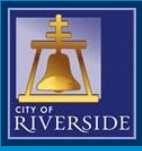




## About Riverside

- 290,000+ residents
- 86+ Square Miles
- 40,000+ students



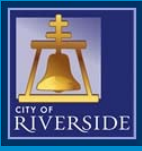


# City of Riverside Wi-Fi and Public Safety Network

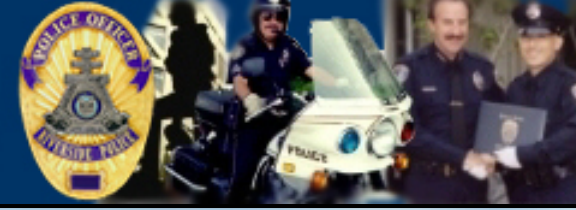
## Why Broadband Wireless in Riverside?

- SmartRiverside – attract and retain high technology companies
- Keep students in Riverside to fill jobs locally
- Offer a Digital Inclusion program to offer computers and internet access to every home
- Enhance Public Safety Communications to keep Riverside safe

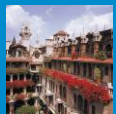


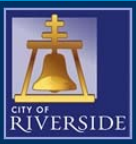


# Police Drivers



- March 5, 2001 – Stipulation for Entry of Judgement
- Officers need fast and reliable tools to effectively police
- Information and communications are key

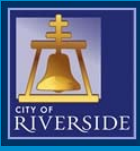




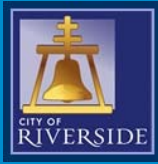
# Timing

- City Council Approved – October 17<sup>th</sup>, 2006  
Agreement provision with SmartRiverside 501 C(3)
- Phase I
  - Pilot Period – October 2006 - February 2007
  - Testing/Acceptance – February 2007 – May 2007
- Phase II
  - City Build out – June 2007 – June 2008
- Phase III
  - Correct coverage areas – July 2008 – November 2008





# The Model : Anchor Tenancy Requirement



- Commitment to procure Products and Services through AT&T over 5 years
- Commitment to pay for monthly use of WiFi over 5 years:

Public Safety at 4.9 GHz – 1 Mb service

City use at 2.4 Ghz - 1Mb and 90 Kbps service

- Ball Field Light Controls
- Traffic Controls
- Parking Meters
- Streaming in car video
- Video Security Cameras
- SCADA
- Building Inspection
- Code Enforcement
- Police/Fire MDCs
- Free Internet across the City





# Anchor Tenancy – 2.4Ghz – 802.11 b/g WiFi

## City-Wide Wireless Anchor Tenant Commitments from City Departments on 2.4Ghz/802.11 WiFi

Department	Monthly ATT	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Comm Dev Dept</b>						
Code Enforcement - 18 Toughbooks	\$28		\$6,037	\$6,037	\$6,037	\$6,037
Solander Center	\$180		\$2,160	\$2,160	\$2,160	\$2,160
<b>General Services</b>						
Ball Field Lighting (12)	\$3		\$432	\$432	\$432	\$432
<b>Library</b>						
La Sierra - Premium Services, Inside Libraries	\$28		\$335	\$335	\$335	\$335
Central - Premium Services, Inside Libraries	\$28		\$335	\$335	\$335	\$335
Casa Blanca - Premium Services, Inside Libraries	\$28		\$335	\$335	\$335	\$335
Nichols Cybrary - Premium Services, Inside Libraries	\$28		\$335	\$335	\$335	\$335
Arlington - Premium Services, Inside Libraries	\$28		\$335	\$335	\$335	\$335
Marcy - Premium Services, Inside Libraries	\$28		\$335	\$335	\$335	\$335
Orange Terrace - Premium Services, Inside Libraries	\$28		\$335	\$335	\$335	\$335
<b>Museum</b>						
Heritage House	\$180		\$2,160	\$2,160	\$2,160	\$2,160
<b>Parks &amp; Recreation</b>						
Villegas Park	\$180		\$2,160	\$2,160	\$2,160	\$2,160
La Sierra Park	\$180		\$2,160	\$2,160	\$2,160	\$2,160
Bobby Bonds Park	\$180		\$0	\$2,160	\$2,160	\$2,160
Bordwell Park	\$180		\$2,160	\$2,160	\$2,160	\$2,160
Hunt Park	\$180		\$2,160	\$2,160	\$2,160	\$2,160
Reid Park	\$180		\$0	\$2,160	\$2,160	\$2,160
Ball Park Lights - Musco	\$3		\$6	\$9	\$12	\$15
Tyler Mall PD Store Front	\$180		\$2,160	\$2,160	\$2,160	\$2,160
PD Family Law	\$180		\$2,160	\$2,160	\$2,160	\$2,160
Crime Free Multi Housing	\$180		\$2,160	\$2,160	\$2,160	\$2,160
UNET	\$180		\$2,160	\$2,160	\$2,160	\$2,160
<b>Public Utilities</b>						
Meter Reading	\$28		\$84	\$140	\$196	\$252
40 Mobile Data Computers	\$50		\$23,976	\$23,976	\$23,976	\$23,976
<b>Public Works</b>						
Lift Station #1, 14th Street Storm	\$28		\$335	\$335	\$335	\$335
Lift Station #2, Edgemont	\$28		\$335	\$335	\$335	\$335
Lift Station #3, River Crest	\$28		\$335	\$335	\$335	\$335
Lift Station #4, Warren & Wells	\$28		\$335	\$335	\$335	\$335
Lift Station #5, Van Buren Storm Water	\$28		\$335	\$335	\$335	\$335
Lift Station #6, Crest & Ontario	\$28		\$335	\$335	\$335	\$335
Lift Station #8, University Knolls	\$28		\$335	\$335	\$335	\$335
Lift Station #10, Western	\$28		\$335	\$335	\$335	\$335
Lift Station #11, Fairgrounds	\$28		\$335	\$335	\$335	\$335
Lift Station #12, University Underpass Storm	\$28		\$335	\$335	\$335	\$335
Lift Station #13, Dexter	\$28		\$335	\$335	\$335	\$335
Lift Station #14, 13th/14th Street Storm	\$28		\$335	\$335	\$335	\$335
Lift Station #16, M.L.K.	\$28		\$335	\$335	\$335	\$335
Lift Station #17, Arlington & Fairhaven	\$28		\$335	\$335	\$335	\$335
Lift Station #18, Lakewood	\$28		\$335	\$335	\$335	\$335
Lift Station #19, M.L.K. 2	\$28		\$335	\$335	\$335	\$335
Lift Station #20, Arlington Storm Water	\$28		\$335	\$335	\$335	\$335
Lift Station #21, Apostel	\$28		\$335	\$335	\$335	\$335
Lift Station #22, JFK	\$28		\$335	\$335	\$335	\$335
30 Mobile Data Computers	\$28		\$10,062	\$10,062	\$10,062	\$10,062
350 Intersections	\$28		\$16,770	\$33,540	\$50,310	\$67,080
AVL/GPS - 2 Street Sweeper, 6 Trash Trucks	\$28		\$2,683	\$2,683	\$2,683	\$2,683
Totals			\$90,371	\$111,520	\$128,348	\$145,177

5 yr. 2.4 Ghz Total: \$475,416





# Anchor Tenancy – 4.9Ghz – Public Safety

## City-Wide Wireless Anchor Tenant Tentative Commitments from City Departments on 4.9Ghz

Department	Monthly ATT	Year 1	Year 2	Year 3	Year 4	Year 5
<b>Fire Dept</b>						
24 - Mobile Data Computers	\$50		\$14,386	\$14,386	\$14,386	\$14,386
<b>Parks &amp; Recreation</b>						
Video Surveillance (30 Cameras) - 5-6/site	\$50		\$1,499	\$1,499	\$1,499	\$1,499
<b>Police Department</b>						
300 Mobile Data Computers (120- Vehicles)	\$50		\$71,928	\$71,928	\$71,928	\$71,928
<b>Public Utilities</b>						
Video Surveillance (100)	\$50		\$59,940	\$59,940	\$59,940	\$59,940
<b>Public Works</b>						
Video Surveillance - 3 Graffiti & 2 Illegal Dumping	\$50		\$2,997	\$2,997	\$2,997	\$2,997
Totals			\$150,749	\$150,749	\$150,749	\$150,749
<b>Total 2.4Ghz/802.11 Wifi plus 4.9Ghz Public Safety</b>			\$241,120	\$262,269	\$279,098	\$295,926

5 year 4.9 Ghz Total: \$602,996

5 year combined 2.4 & 4.9 Total: \$1,078,412







# Total Revenue Commitment

## Anticipated Net New Revenue from AT&T

	Year 1	Year 2	Year 3	Year 4	Year 5	Total	TRC Credit	30%
Internet Services	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$250,000	\$75,000	
311 Services	\$32,000	\$32,000	\$32,000	\$32,000	\$32,000	\$160,000	\$48,000	
UMTS Cards	\$27,000	\$27,000	\$27,000	\$27,000	\$27,000	\$135,000	\$40,500	
Cingular Services	\$175,000	\$175,000	\$175,000	\$175,000	\$175,000	\$875,000	\$262,500	
911 Services	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$250,000	\$75,000	
VoIP	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000	\$1,750,000	\$525,000	
					<b>Total</b>			<b>\$1,026,000</b>



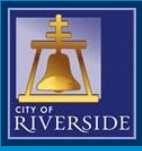


# City-Wide WiFi Project

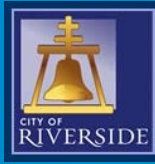
## What the City Gives:

- **Light poles, traffic signals and City Facilities – estimated at \$60/year/pole**
- **Power – estimated at \$3/pole/month (combined \$124,800/year – GF)**
- **Total Revenue commitment of net new services over 5 years**
  - **Anchor Tenant on Wireless (T1s, MDCs, TMC, other)**
  - **EVDO cards to AT&T UMTS**
  - **Cell service from various carriers to AT&T/Cingular**
  - **VoIP to replace the Ericsson System**
- **Anchor Tenant on 2.4 and 4.9 Networks over 5 years**
- **Waive permit fees**



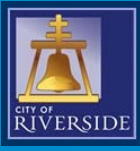


# City Provides for Free



- Access to 60 City Facilities and power
- Access to 354 Traffic Signals and power
- Access to 27,561 Street Lights and power
  - Post Top: 2,696
  - Mast arm: 4,801
  - Cobra: 20,064
  - Historical or Ornamental – No Allowed
- For in turn Free Internet to City of Riverside Businesses and Residents





# City-Wide WiFi Project



## What the City Gets (technical):

- **40 VLANs/ 2 SSIDs**
- **95% Outdoor coverage in Developed areas (86 versus 55 square miles)**
- **90% Indoor coverage of first and second floors with CPE**
- **6 - Civic Links on the Free and Fee Portal**
- **4.9Ghz Network to support 128 bit encryption for CLETS**
- **8 hours of battery backup on backhaul**
- **No more than 25% of the browser window for advertisement (no pop-ups)**
- **No blocked ports – open network**
- **Two check boxes for acceptance of the terms and conditions and age**
- **Support for Fee services – 8am-8pm seven days**



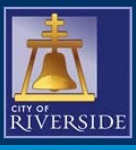


# City-Wide WiFi Project

## Service Levels

- **4.9 Ghz – 99.9%**
- **Respond to network trouble calls within 4 hours**





# City-Wide WiFi Project

## Wholesale

- **\$50K setup charge**
- **Minimum of 500 user accounts**
- **City of Riverside Small Business Credit**
  - **\$25K set up charge (for up to two retailers)**
  - **Must have a City address and City Employees**
- **Wholesale rate set at \$12/month per user account**





# Public Safety

## In Car Video

**In Car Digital Solutions**

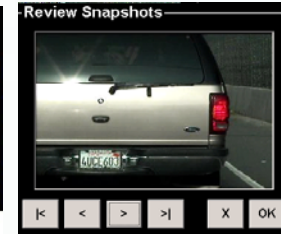
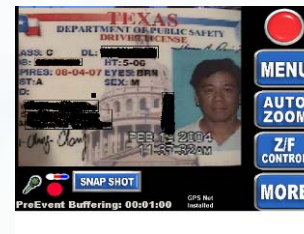
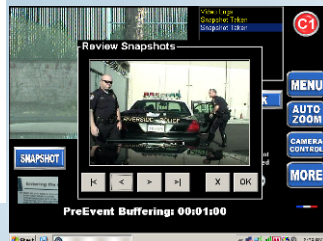
- Capture
- Transfer
- Store
- Manage

**COBAN**



Capture Video and Audio in the field

Transfer Video back to enterprise storage over wireless



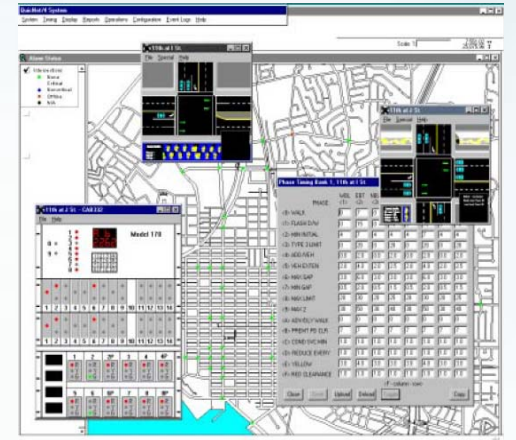
## Traffic Management System



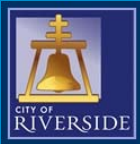
Upgrade existing controllers to 802.11 b/g

Control/monitor traffic signals from central facility

Installing cameras at 354 Intersections to monitor traffic







# City Applications

## Parking Management



Replacing cellular credit card approvals  
with 802.11 b/g – 53 meters

Develop web site to track available parking  
spaces





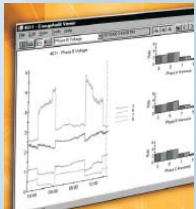
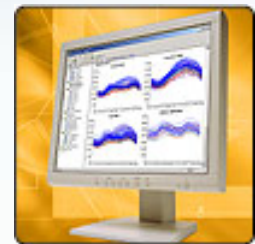
# City Applications

## Electric Meter Reading – Automated Meter Reading (AMR)



Capture reads electronically

Enable customers to view  
usage over the Internet





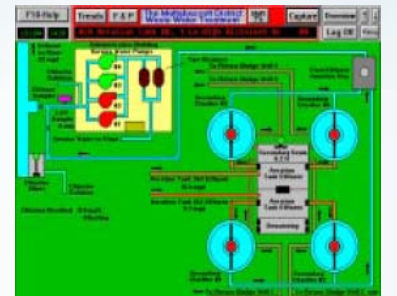
# City Applications

## Sanitation Pumping Stations – Supervisory Control and Data Acquisition (SCADA)

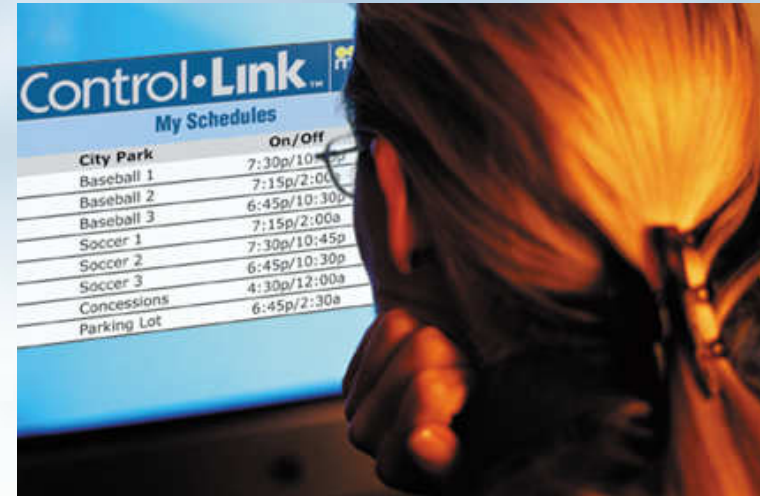


Remove RF network and install 802.11 b/g real time wireless

Fiber to each site was cost prohibitive



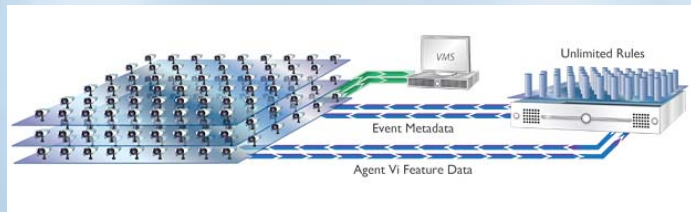
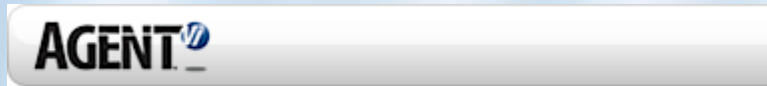
## Ball Field Lighting



- Control ball field lighting over the Internet via 802.11 b/g
- Reduces power savings and visits from staff
- Decreases complaints from nearby home owners



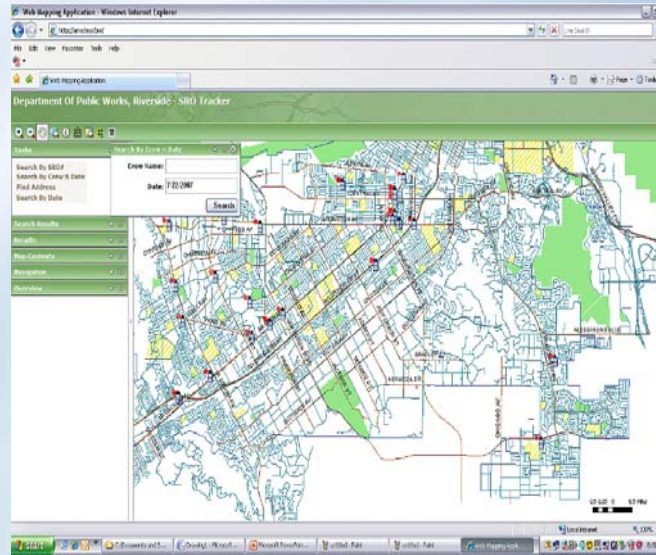
## Video Security



Traffic Management  
 Graffiti and gang intervention  
 Parks and Facility Security  
 Analytics



## Graffiti

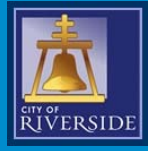


Abatement crews take photos

Download over wireless to populate GIS

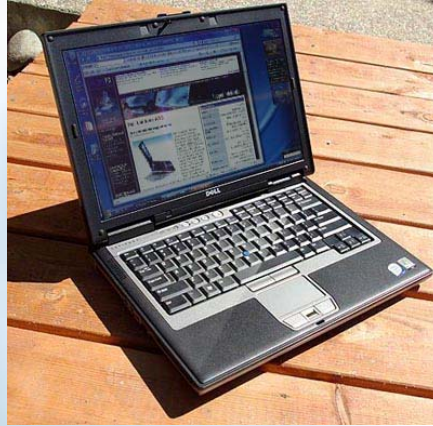
Capture GPS coordinates via Ricoh Camera





# City & Public Safety Mobile Applications

## Mobile



Private SSID Networks

Mobile Data Computer w/Ubiquity Card

Field Notebooks (Panasonic CF-30s & Dell ATG)

Ricoh WiFi Camera

Blackberry PDA Phones





# Digital Inclusion Program

## Goal- A PC in every Riverside home within 5 years

- FREE for households with combined incomes less than \$45,000
- Focus on households with children in 6<sup>th</sup> grade or higher
- Focus on seniors over 65 years of age
- Requires 8-10 hours of training and certificate
- Applications processed on a first come, first served basis
- City will produce up to 250 systems per month
- Wireless Access Devices will be included when network is up and running (modems in the interim)
- <http://www.smartriverside.org>







# Digital Inclusion Qualification

- Apply at a Community Center, RUSD or RCOE or Online at [www.SmartRiverside.org](http://www.SmartRiverside.org)
- Application validated by SmartRiverside
- Applicant must complete a 8-10 hour Training program
- Refurbished PC, Wireless Access Card, and Microsoft OS and Office provided for free from donations through SmartRiverside

## DIGITAL INCLUSION COMPUTER GIVE-AWAY!

*Don't let technology pass you by!  
Earn your very own computer!*

- MS Windows and basic computer operation
- MS Office (Word, Excel, Power Point, etc.)
- Hardware troubleshooting, internet browsing, and more

**Courses available at all Community Centers  
Youth ages 10 – 17 and seniors 55+  
Only one (1) computer give away per household**

The Digital Inclusion Program provides deserving families with access to open computer labs and introductory technology courses. Upon satisfactory completion of the beginning computer course, qualifying students are given a free refurbished computer system for home use. Space is limited so register today. Contact a facility below for class times, dates, and applications; or visit us at: [http://www.riversideca.gov/park\\_rec](http://www.riversideca.gov/park_rec)

Park	Address	Phone
Bobby Bonch Park	2060 University Ave.	952-5747
Banfield Park	2018 Hill St.	926-5255
Bryant Park	7950 Hillman Ave.	351-4135
Hunt Park	4015 Jackson St.	351-6132
La Sierra Park	3215 La Sierra Ave.	351-6131
Nichols Park	5555 Downey Ave.	351-6130
Road Park	701 H. Chicago St.	926-5654
Village Park	7240 Marguerite Ave.	351-6142
Lincoln Park	4261 Park Ave.	866-3119
Dallas St. Center	3936 Chestnut St.	926-5303

In partnership with the Riverside Parks & Recreation Department, the City of Riverside is offering a limited number of refurbished computers to eligible residents. The program is subject to availability and is not a guarantee of a computer. The program is for residents of the City of Riverside who are 10 years of age or older and are currently unemployed. The program is for residents who are currently unemployed and are currently receiving unemployment benefits. The program is for residents who are currently unemployed and are currently receiving unemployment benefits. The program is for residents who are currently unemployed and are currently receiving unemployment benefits.

**DIGITAL INCLUSION PROGRAM APPLICATION FORM AND WAIVER**  
PLEASE PRINT ALL INFORMATION & FILL OUT COMPLETELY - CLASSES ARE SUBJECT TO CHANGE

PARTICIPANT INFORMATION			
Name: _____			
Address: _____			
City: _____ State: _____ Zip: _____			
Phone Number: _____			
Emergency Contact (Name, Relationship, Address, Phone Number): _____			
CLASS AND PARTICIPANT INFORMATION			
Class Size	Participant's Name	Gender	Age
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
PLACEMENT QUESTIONNAIRE			
Please circle your total household income: _____			
None less than \$15,000	\$15,000 to \$14,999	\$15,000 to \$15,999	
\$20,000 to \$24,999	\$25,000 to \$29,999	\$30,000 to \$34,999	
\$35,000 to \$39,999	\$40,000 to \$44,999	\$45,000 to \$49,999	
\$50,000 to \$54,999	\$55,000 to \$59,999	\$60,000 to \$64,999	
Age of person receiving the computer upon completion of the program course: _____			

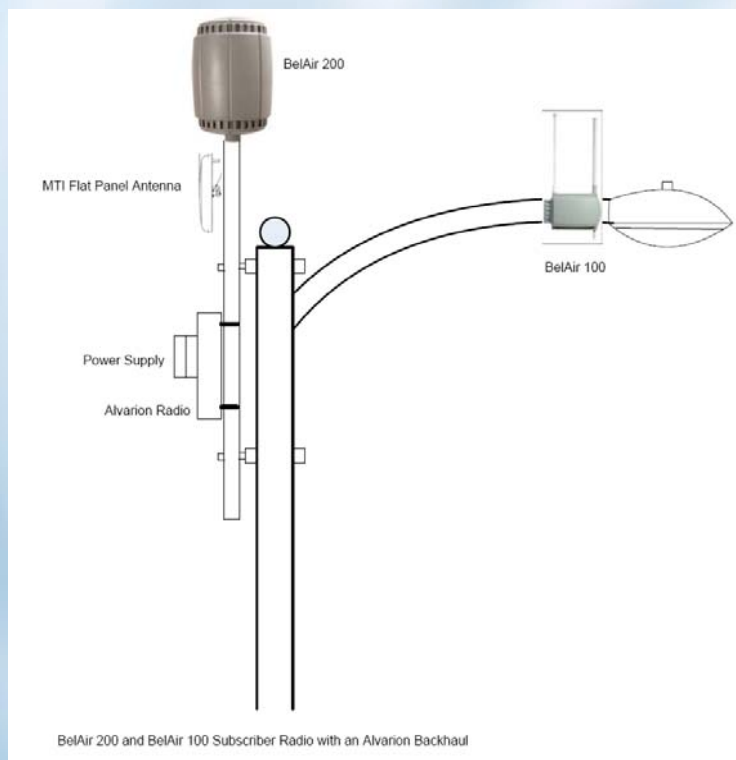
**PLEASE READ AND SIGN BELOW**  
 The recipient of participants must complete and submit this agreement. It is understood that the program is a limited program and the City of Riverside is not responsible for the success or failure of the program. The program is for residents who are currently unemployed and are currently receiving unemployment benefits. The program is for residents who are currently unemployed and are currently receiving unemployment benefits. The program is for residents who are currently unemployed and are currently receiving unemployment benefits.

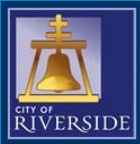
I have read and fully agree to the City of Riverside Digital Inclusion Program. I understand that the City of Riverside is providing a limited number of refurbished computers to eligible residents. The program is subject to availability and is not a guarantee of a computer. The program is for residents of the City of Riverside who are 10 years of age or older and are currently unemployed. The program is for residents who are currently unemployed and are currently receiving unemployment benefits. The program is for residents who are currently unemployed and are currently receiving unemployment benefits.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 I have read and fully agree to the City of Riverside Digital Inclusion Program. I understand that the City of Riverside is providing a limited number of refurbished computers to eligible residents. The program is subject to availability and is not a guarantee of a computer. The program is for residents of the City of Riverside who are 10 years of age or older and are currently unemployed. The program is for residents who are currently unemployed and are currently receiving unemployment benefits. The program is for residents who are currently unemployed and are currently receiving unemployment benefits.



- Number of Access Points/square mile varies on terrain and product (1515 minimum = avg. 28/sq. mi.)





# Broadband Access Points



Fire Station 7



Lincoln Police Station

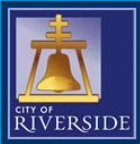


Fire Station 12



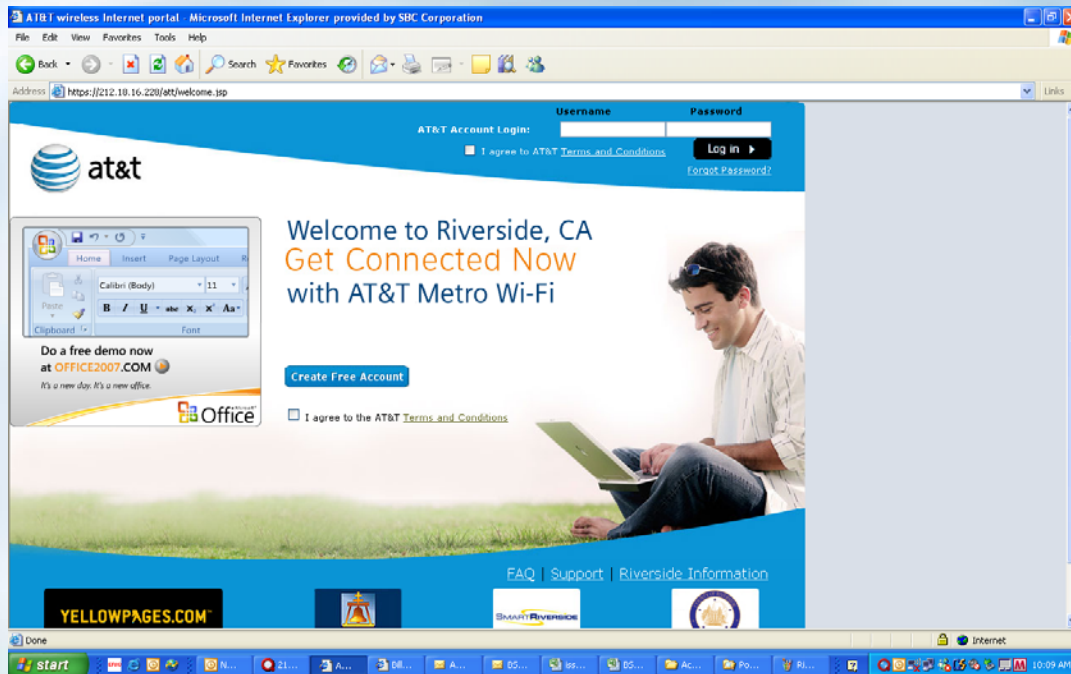
80 feet high – Alvarion WiMax Backhaul

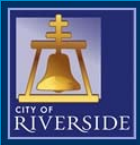




## How Does it Work?

- Accessible through a PC browser
- Required wireless access device on a PC
- Most notebooks already equipped





# Creating a Free Account

AT&T wireless Internet portal - Microsoft Internet Explorer provided by SBC Corporation

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail News RSS Feeds

Address <https://212.18.16.228/att/createAccount.jsp> Links

at&t

Home - New Account

AT&T Metro Wi-Fi

Login  
T&C

Create new FREE account:

Username*	<input type="text"/>
Password*	<input type="password"/>
Confirm Password*	<input type="password"/>
First Name*	<input type="text"/>
Last Name*	<input type="text"/>
Address*	<input type="text"/>
ZIP*	<input type="text"/>
City*	<input type="text"/>
Country	United States
State	Select State
Email*	<input type="text"/>
Telephone number	<input type="text"/>
Mobile number	<input type="text"/>

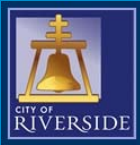
Create Free Account Cancel

Done

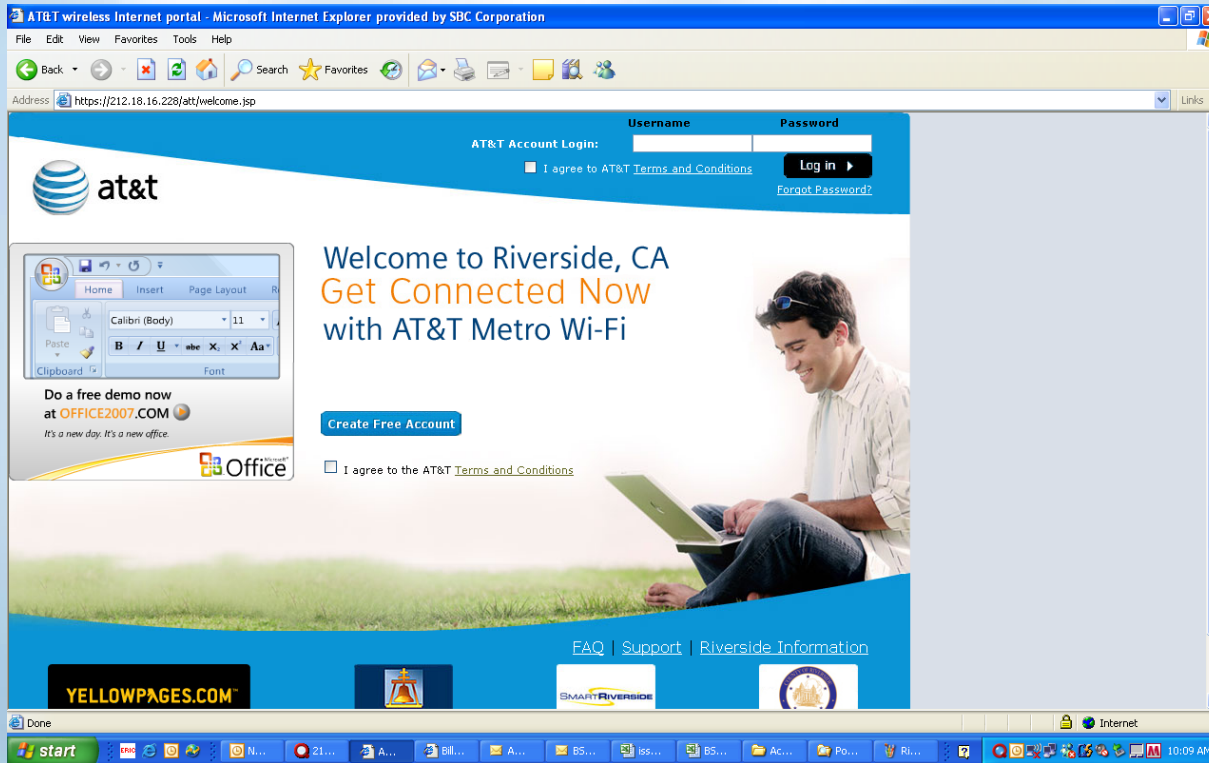
start

10:10 AM





# Free City-wide Internet



- AT&T's First Customer
- Riverside will have 55 square miles deployed in 2008
- One of the Largest 4.9Ghz Public Safety network in the US
- Free up to 512 Kbps/256Kbps
- Free up to 1 Mb for AT&T DSL Subscribers

City of Riverside  
[www.riversideca.gov](http://www.riversideca.gov)

SmartRiverside  
[www.smartriverside.gov](http://www.smartriverside.gov)

Greater Riverside Chamber of Commerce  
<http://www.riverside-chamber.com/>

Riverside Art's Council  
<http://www.inlandarts.com/>

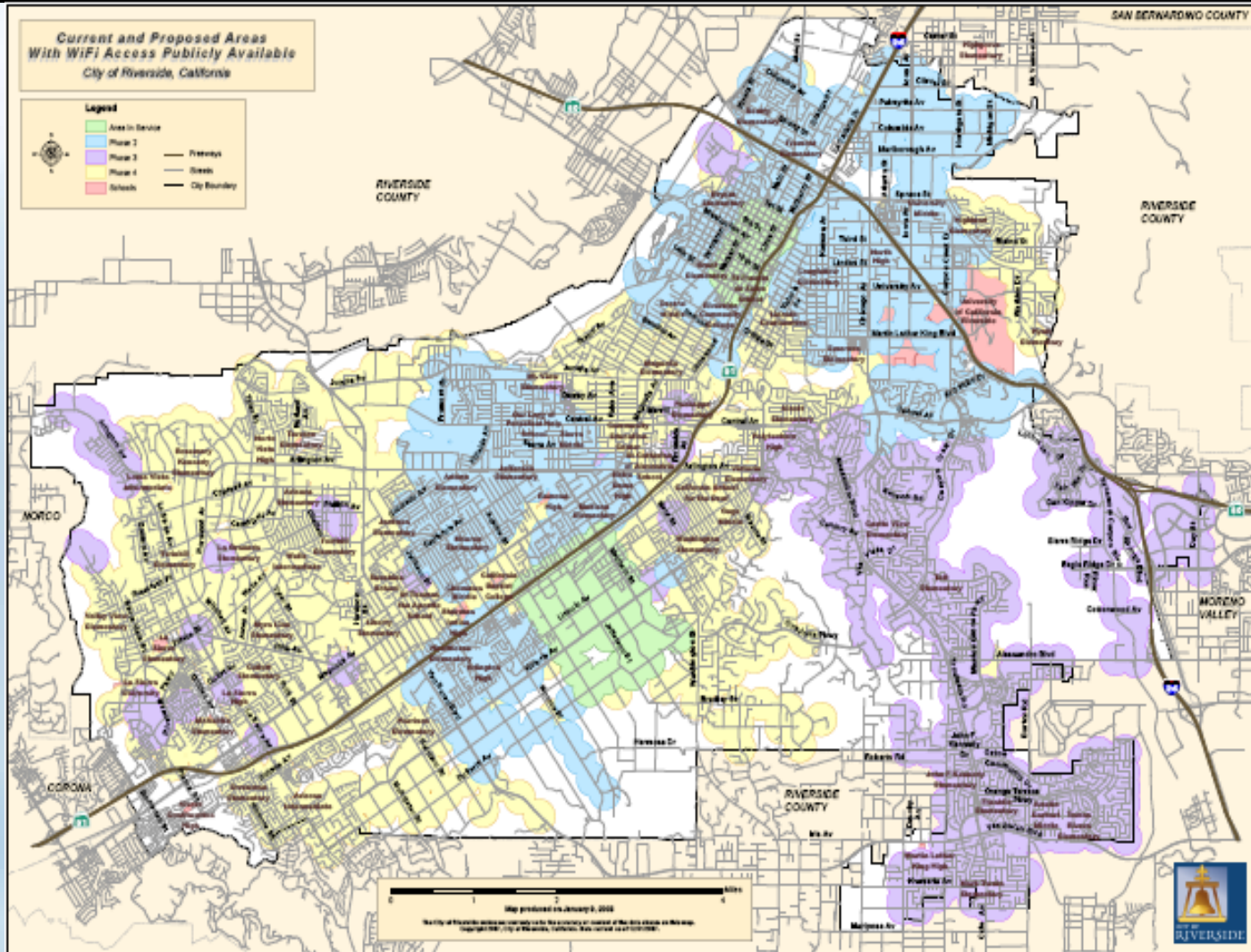
County of Riverside  
<http://www.countyofriverside.gov>

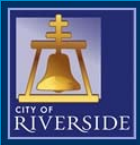


City of Riverside

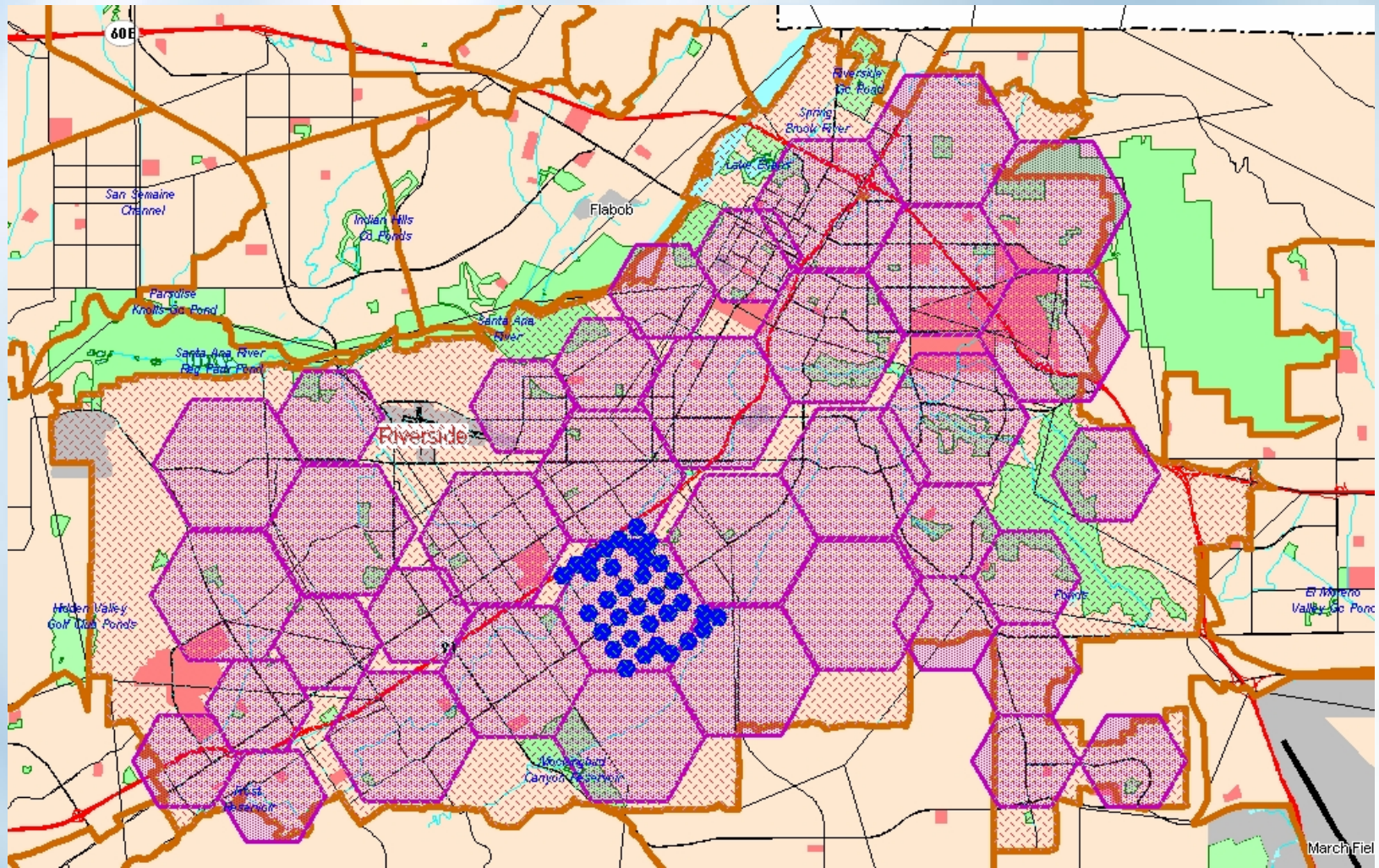


# Roll-out Strategy





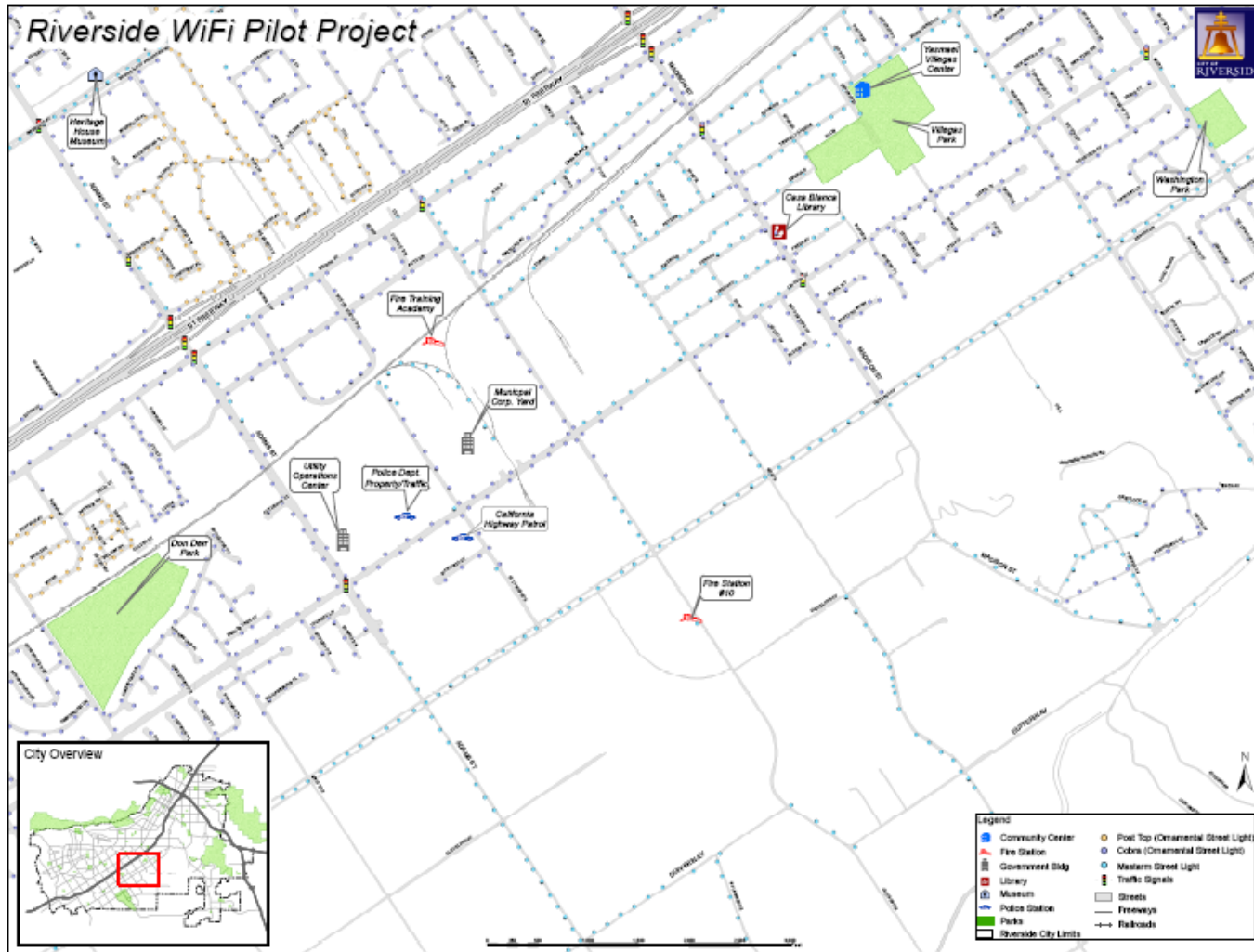
# Coverage – 95% of Developed Areas (55 Sq. Miles)







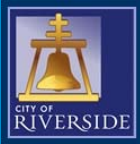
# Pilot – 3 month



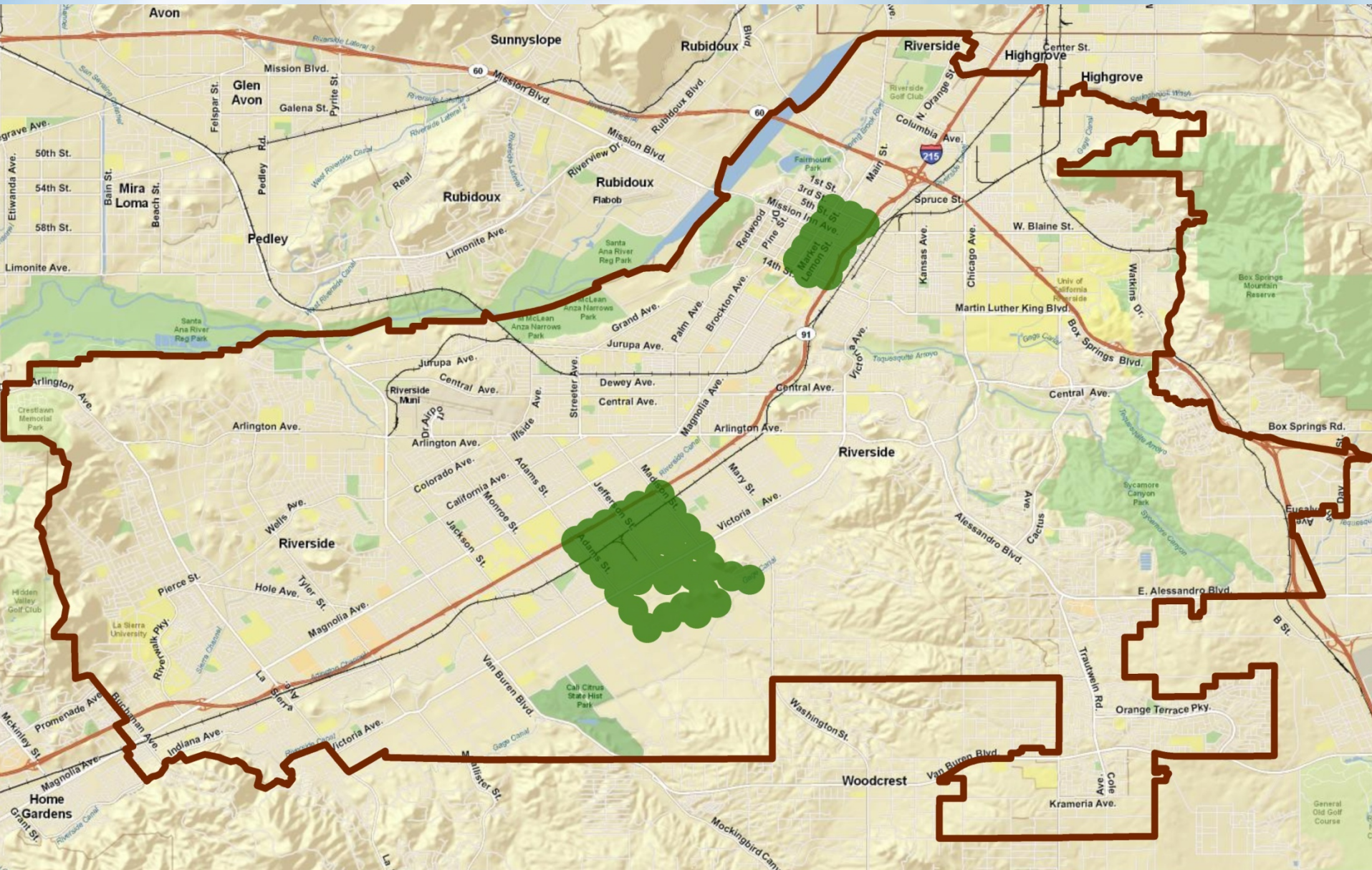
North: 91 Fwy  
 South: Victoria  
 East: Madison  
 West: Adams

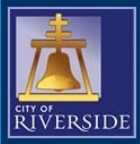
Covers:  
 Lincoln Station  
 RPU UOC  
 Residential  
 AutoCenter



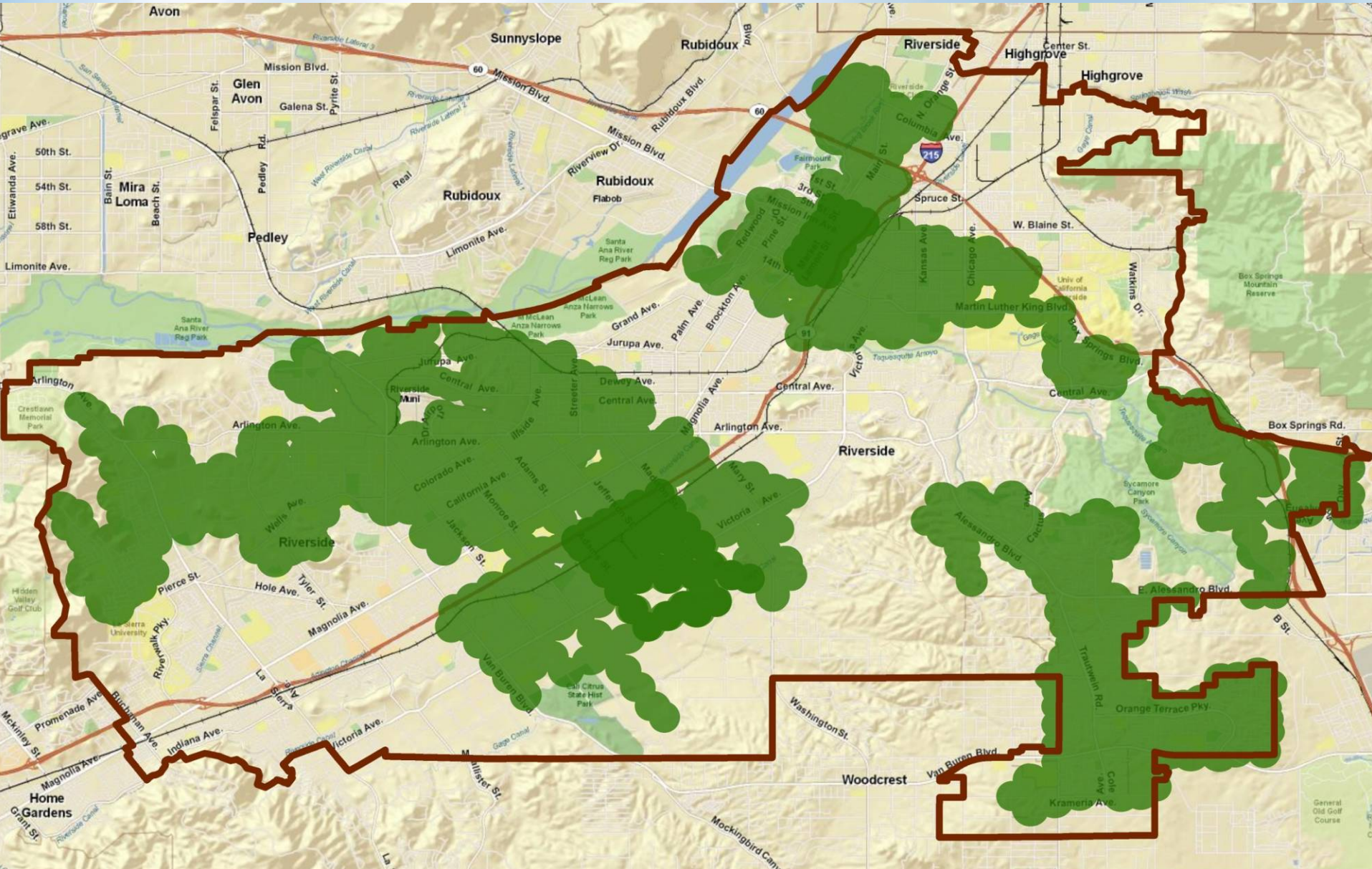


# Live as of May 7, 2007



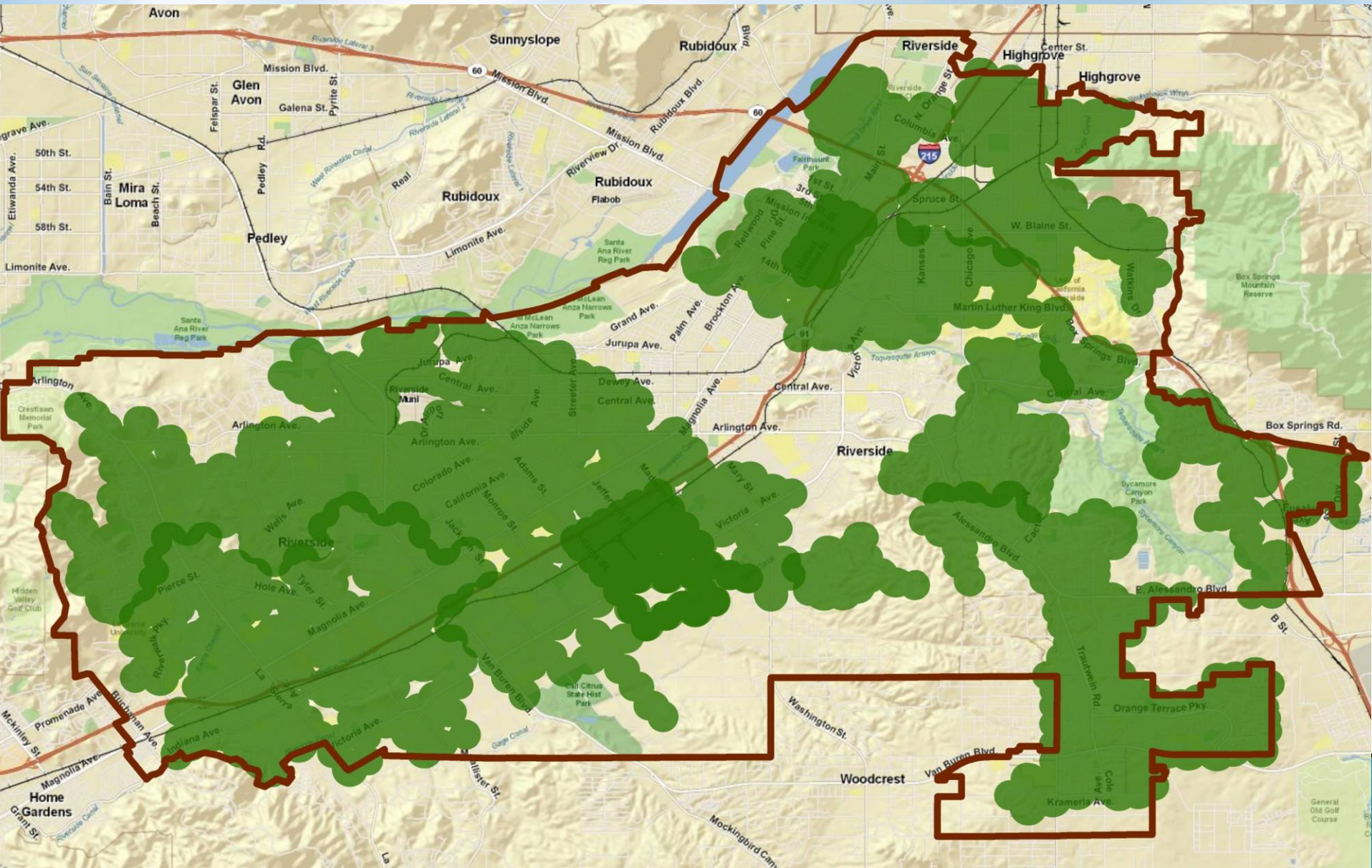


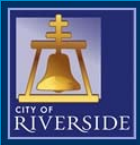
# WiFi Coverage – May 2008



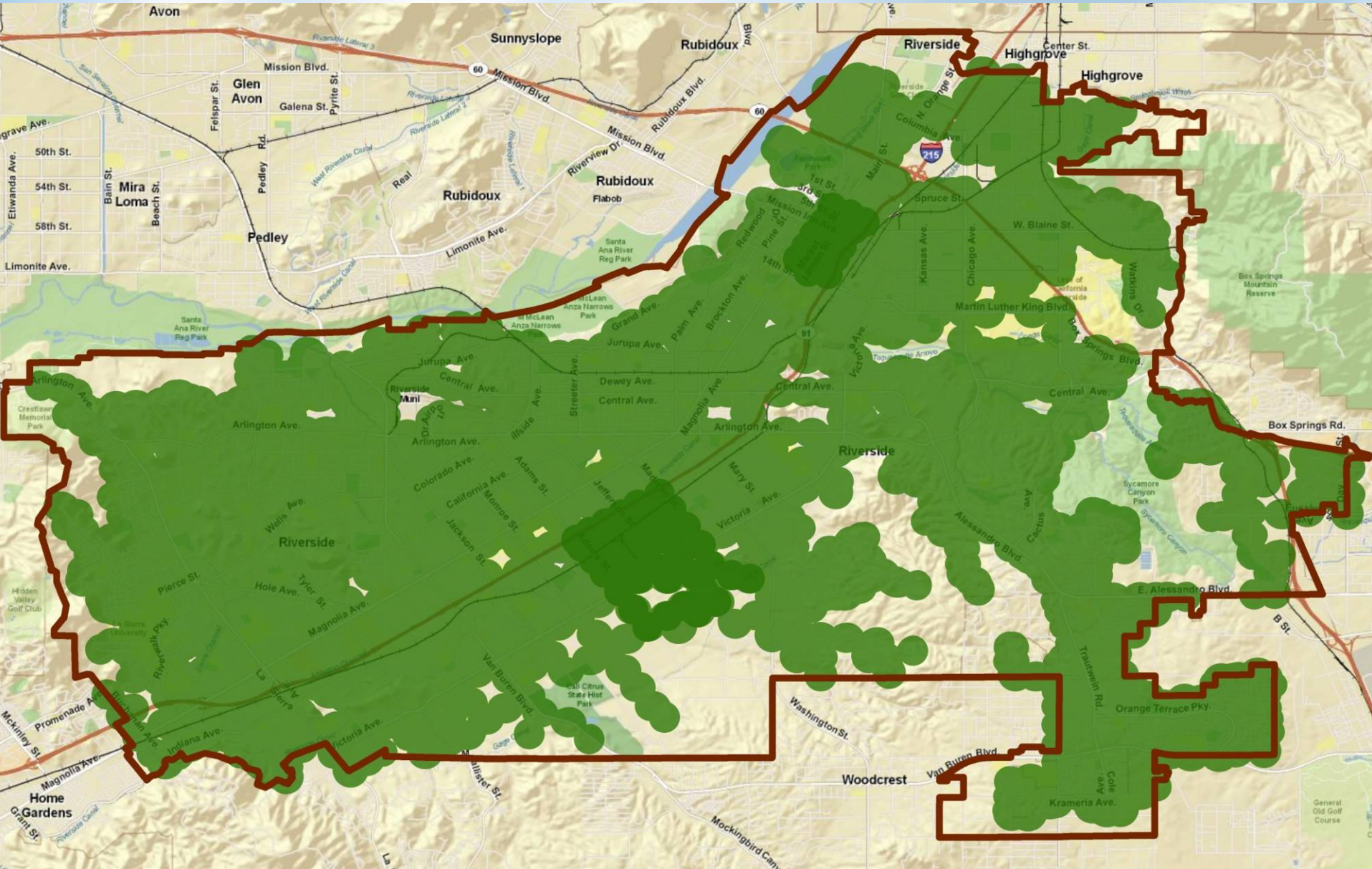


# WiFi Coverage – June 2008



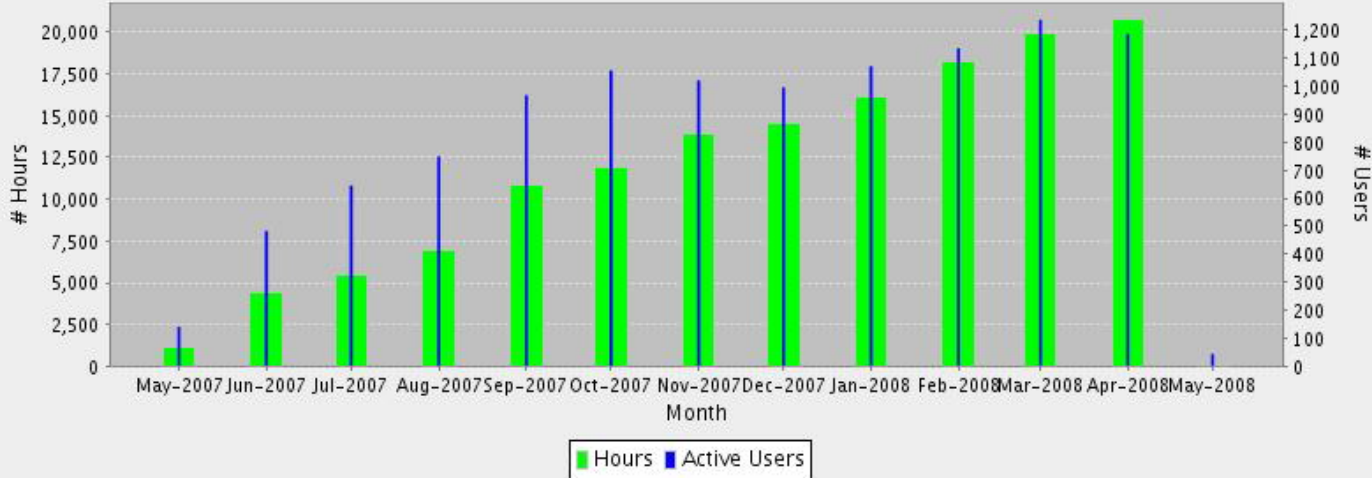


# End of Summer - WiFi Coverage

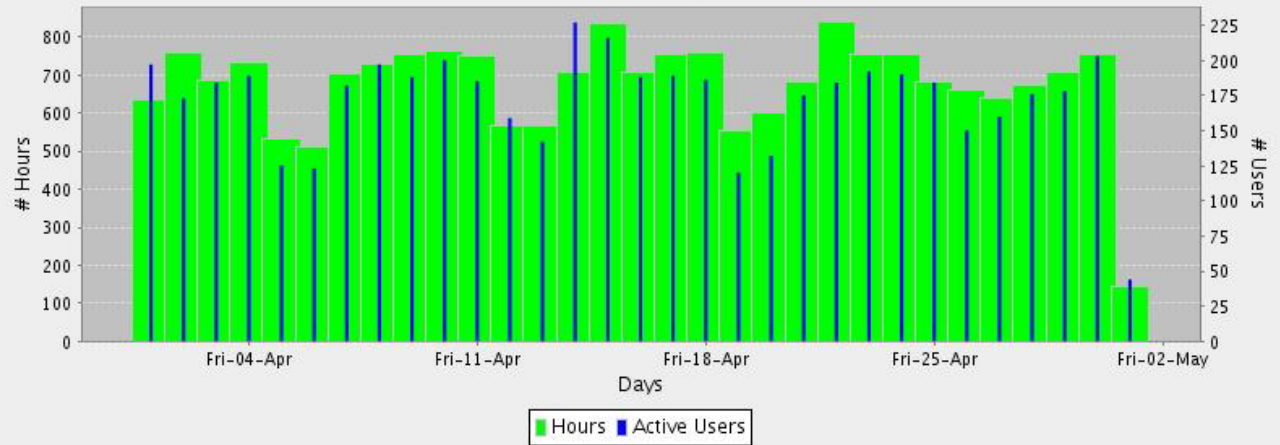




### Monthly Usage



### Daily Usage





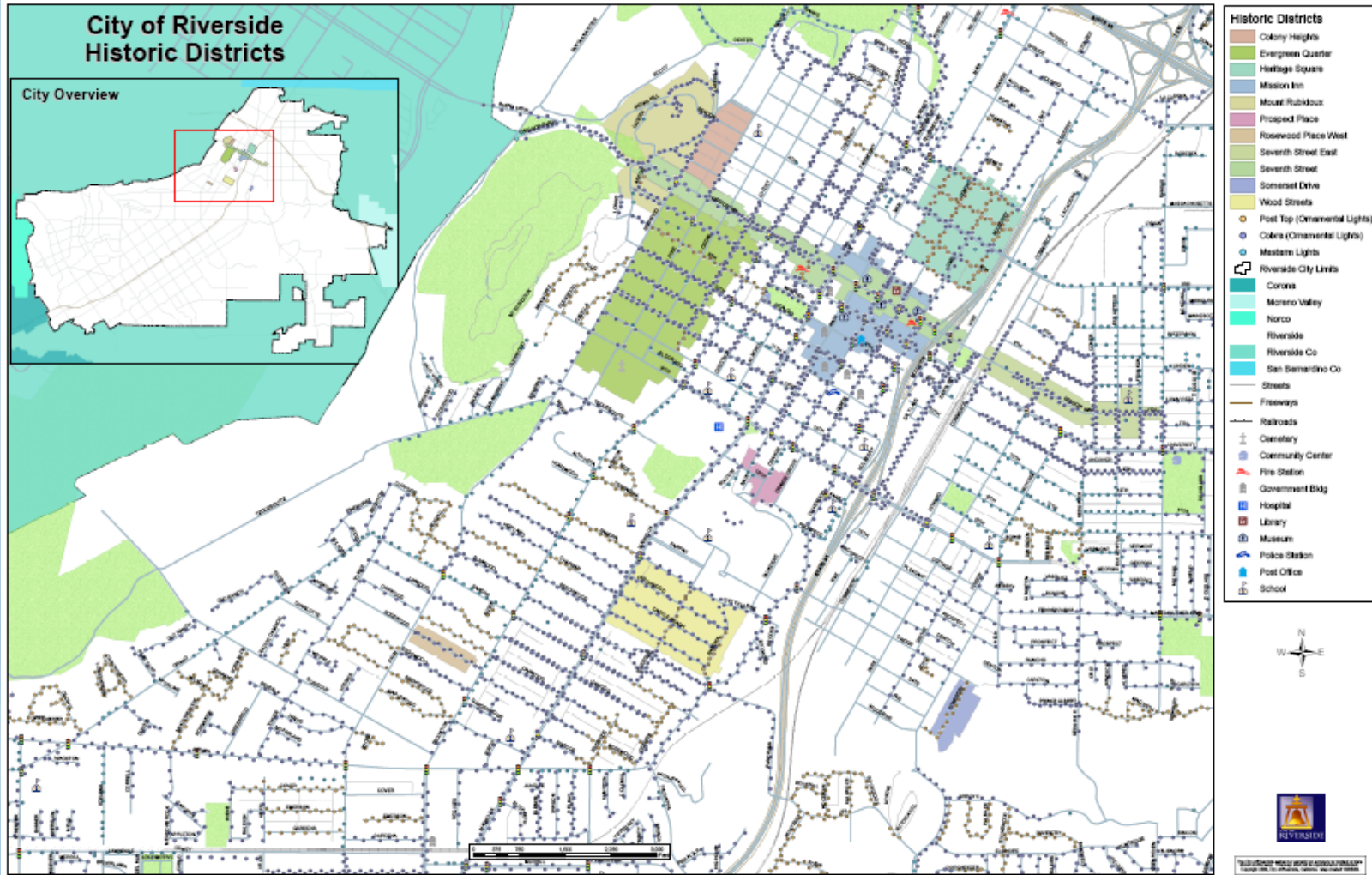
# Challenges

- Mounting Assets – Availability
- Available 4.9Ghz devices
- Privacy issues – check box required to opt in and validate age
- RUSD and Alvord K-12 Coverage
- Historical areas and ornamental poles
- Digital Inclusion PCs with Modems till wireless available
- Departmental commitment for wireless anchor tenancy
- Minimum Annual Revenue Commitment to AT&T
- Terrain and High Foilage Areas





# Historical Districts





# Remaining Challenges

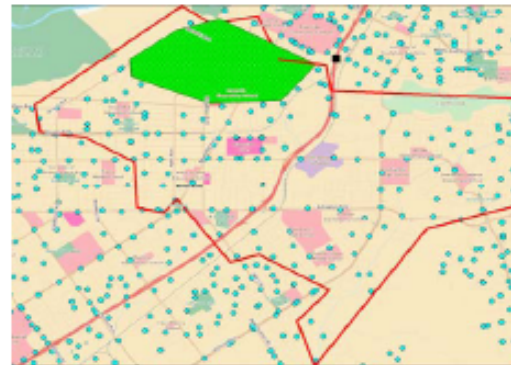
## High Vegetation Area - Issues

We have identified a 6 square-mile area with densely wooded streets, undeployable poles and lack of line of sight to provide sufficient backhaul capacity.



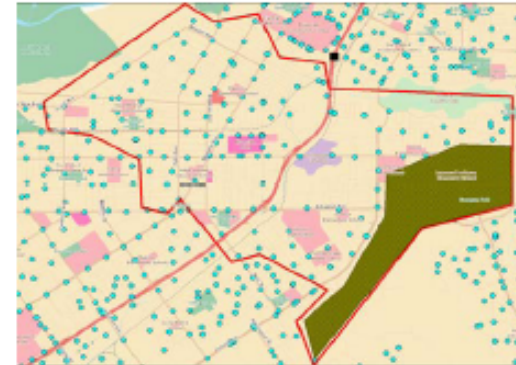
### Non-Deployable Assets Area

- Poles were identified during Phase 2 Planning
- Post tops and unknown poles unsuitable for deployment



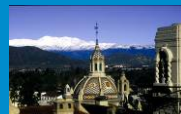
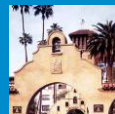
### Dense Vegetation Area

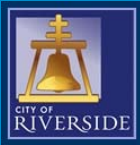
- 0.75 Sq Mile Area
- Inter-nodal Coverage Issues



### Extreme Terrain Area

- 1.35 Square Mile Area
- Hilly Terrain
- Lower than Average Number of Poles





# Now Live in Riverside and Growing

