Current Issues in Cell Tower Regulation

Basics of Wireless Technology for Attorneys

Presenter:

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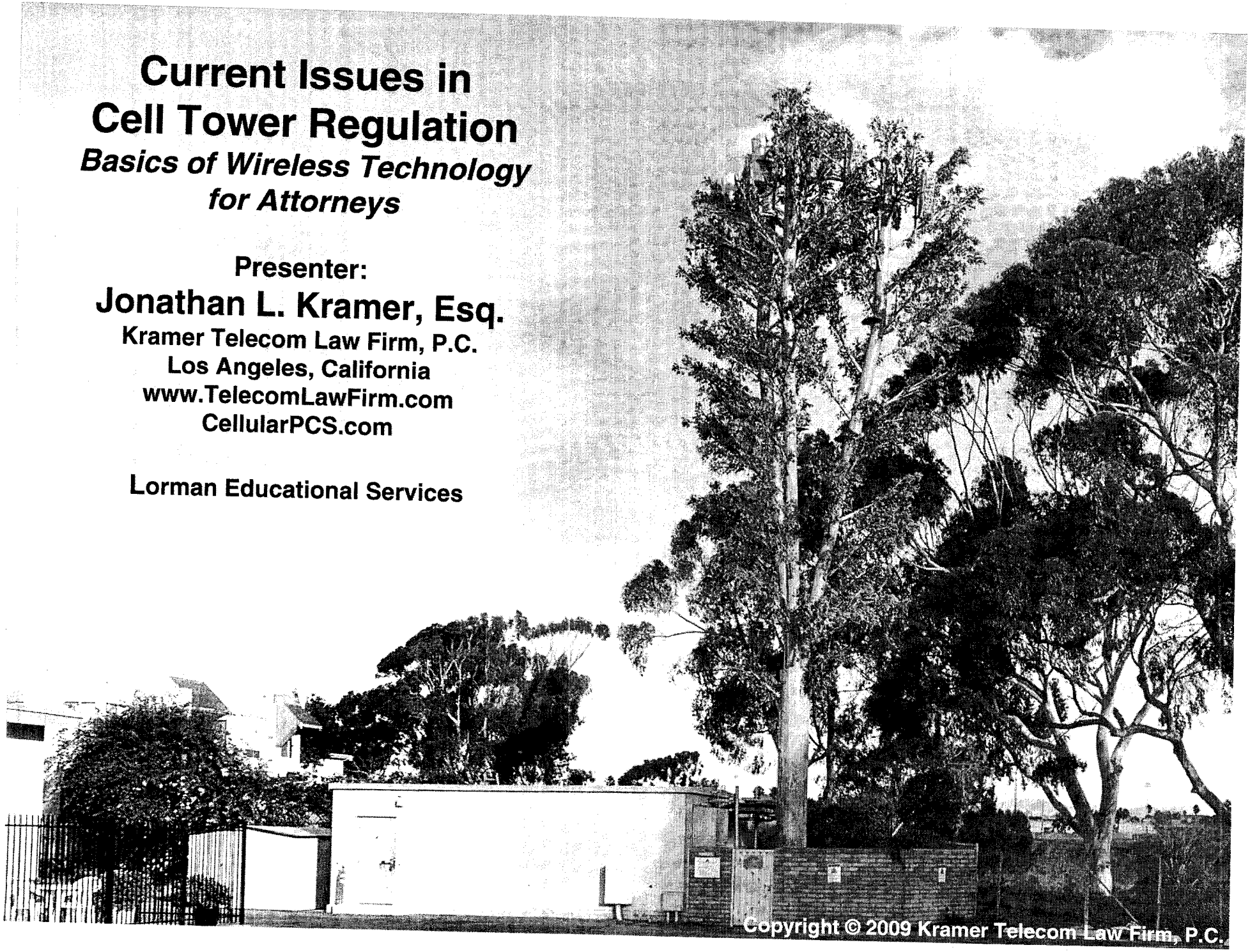
CellularPCS.com

Lorman Educational Services



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- **Wireless Siting Planning Expert for Local Governments over the past 18+ years**
- **Siting Planning and RF Emissions Safety Reviews**
- **FCC Licensee (top commercial radio-telephone, digital, radar, amateur licenses)**
- **Member, State Bar of California Public Law Section Executive Committee**
- **Member, IMLA, FCBA, NATOA, SBE**

36.19

Basic Wireless Terms and Concepts You Need to Know

Links to selected photos at http://CellularPCS.com/gallery/ * great for planning + zoning

- *Antenna (Panel): A directional antenna.*
- *Antenna (Omni-directional): A non-directional antenna.*
- *Back-haul: The communications circuit used to connect a cell site to the switching center (MTSO).*
- *Back-up Generator: A back-up power source to keep a site powering during a commercial power outage. May be gas, diesel, batter, fuel cell, solar.*
- *BTS Cabinet: "Base Telecommunications Station."*
- *Camouflage: Using various techniques to reduce or eliminate the visual impact of a cell site.*
- *Capacity: Whether a cell/PCS system has sufficient technical resources at existing cell sites to handle the expected number of calls.*
- *Coverage: Whether a cell/PCS Cell covers a particular area.*
- *GPS: "Global Positioning System." Used for digital network timing synchronization with adjacent cell sites.*
- *DAS: "Distributed antenna system." A means of transporting RF over fiber to remote, smaller radio sites.*
- *Generator Socket: Used to connect an external emergency generator power to a cell site during a commercial power outage.*

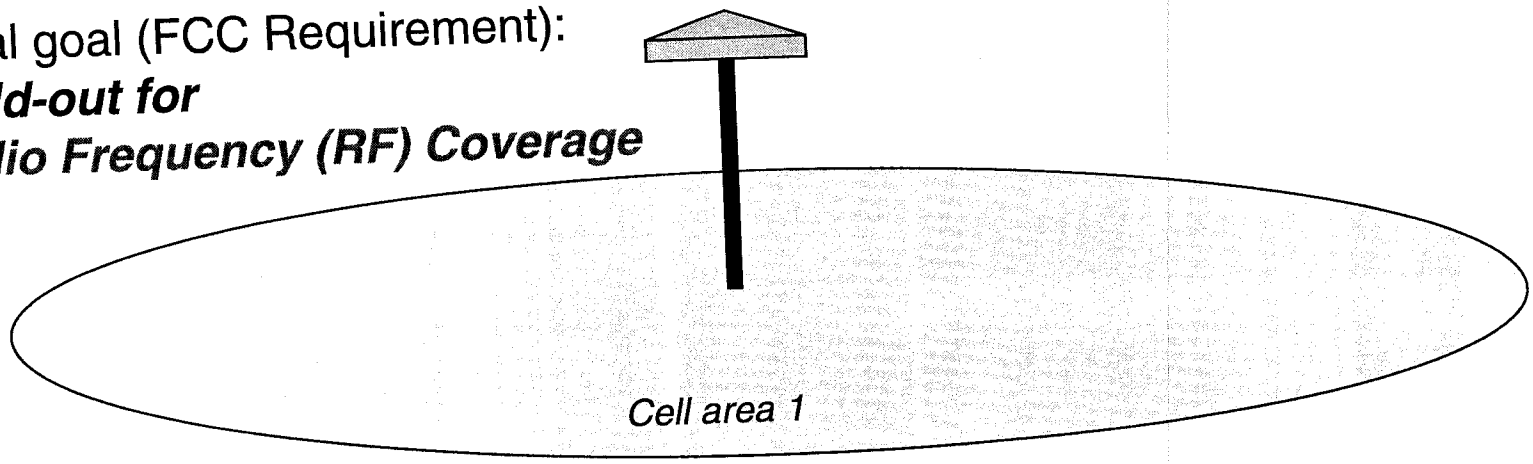
A. Basic Wireless Terms and Concepts You Need to Know

- *Hand-off Zone: An intentional overlap of RF coverage from two cell sites. Call transfers between sites occurs in this zone.*
- *Ice Bridge: A metal shield used to protect coax cables from falling ice.*
- *LMU Antenna: Used by some carriers to help locate users for E-911 purposes.*
- *MTSO: Mobile Telephone Switching Office.*
- *RF: Radio Frequency.*
- *RFR: Radio Frequency radiation (sometimes called RFE for Radio Frequency Emissions…a less scary term).*
- *T1: A type of data communications line typically provided by the local wired phone company to connect the cell site back to the MTSO (see back-haul).*
- *TMA: Tower mounted amplifier.*
- *Whip: See Antenna (Omni-directional).*
- *WiFi: "Wireless Fidelity."*
- *WiMAX: "Worldwide Interoperability for Microwave Access."*

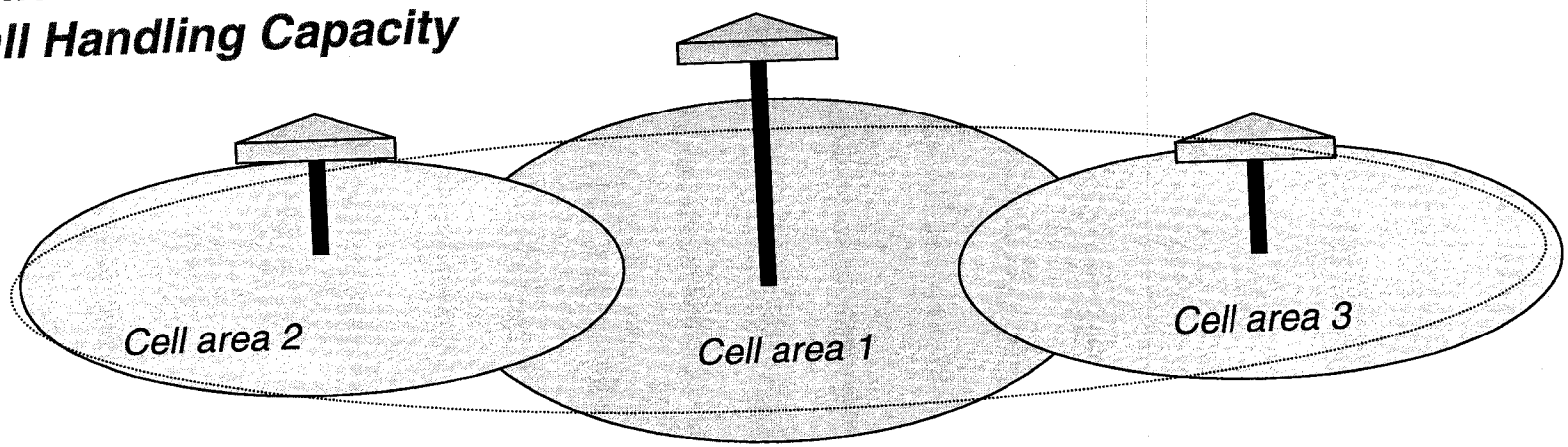
For more terms visit: http://TelecomLawFirm.com/cell/wireless_technobabble.php

Radio Frequency Coverage versus Call Handling Capacity Issues

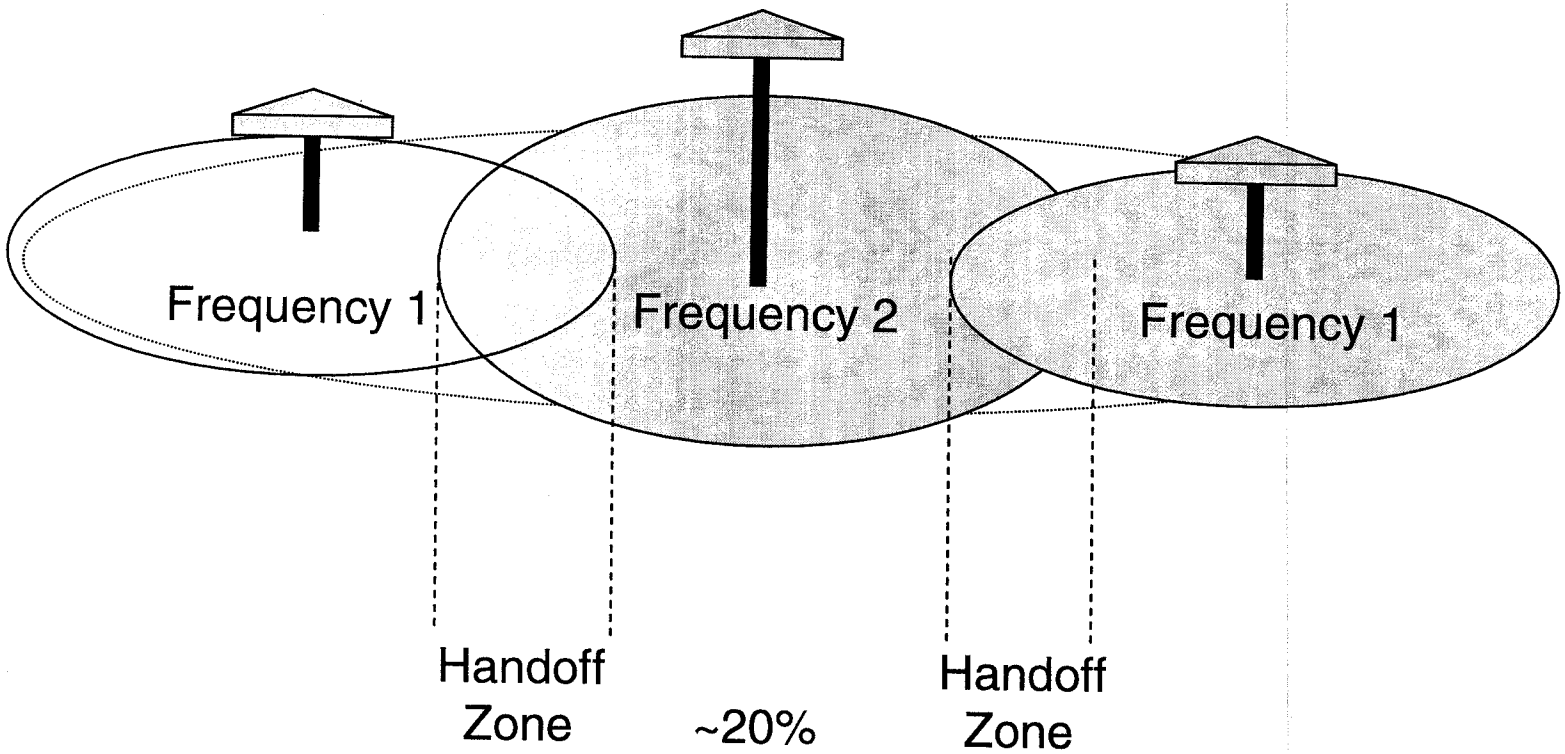
Initial goal (FCC Requirement):
Build-out for
Radio Frequency (RF) Coverage



End goal (never reached):
Build-out for
Call Handling Capacity



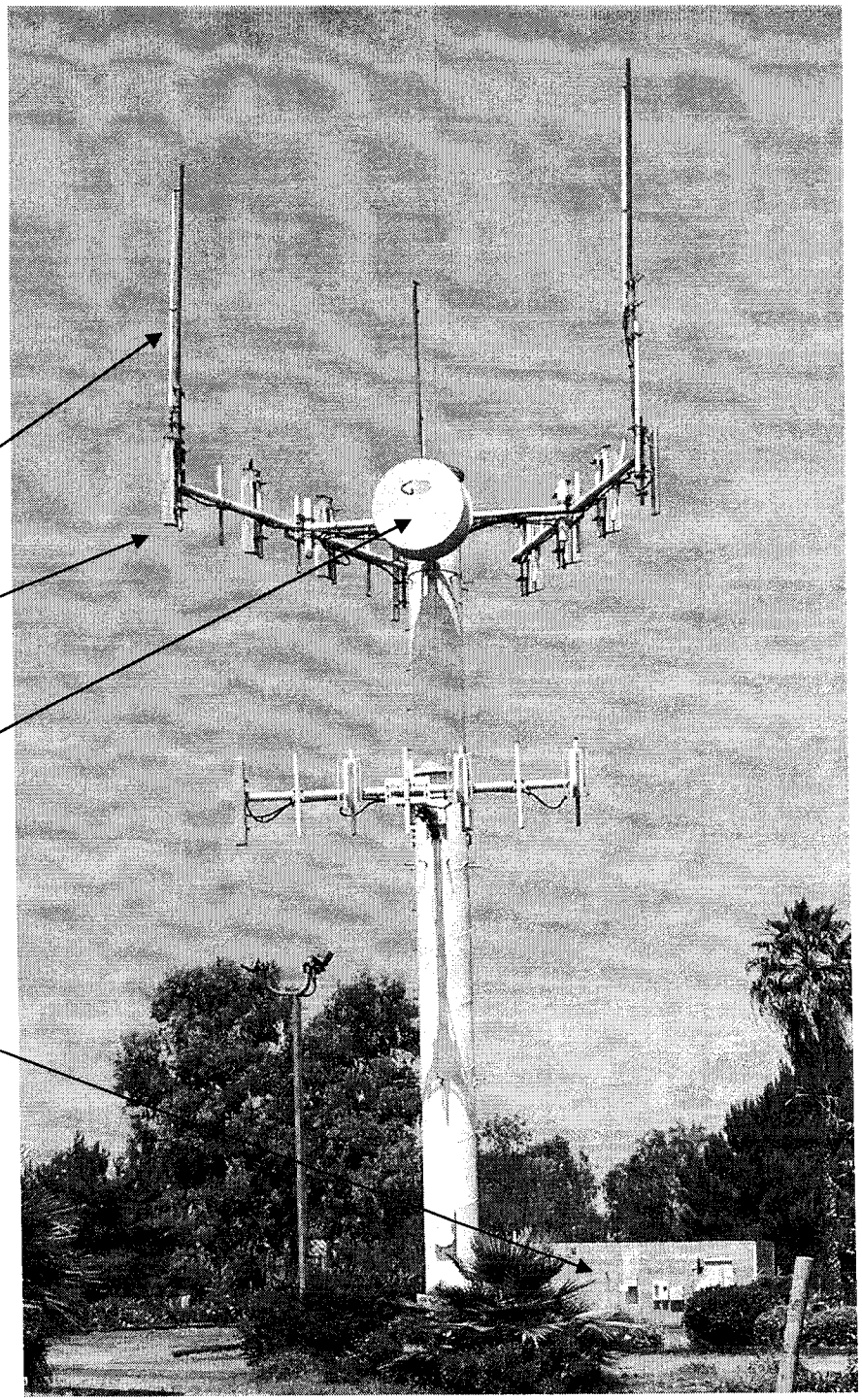
Coverage versus Capacity Issues



Frequency 1 sites do not interfere with Frequency 2 sites (frequency separation);
Frequency 1 sites do not interfere with other Frequency 1 sites (physical separation)

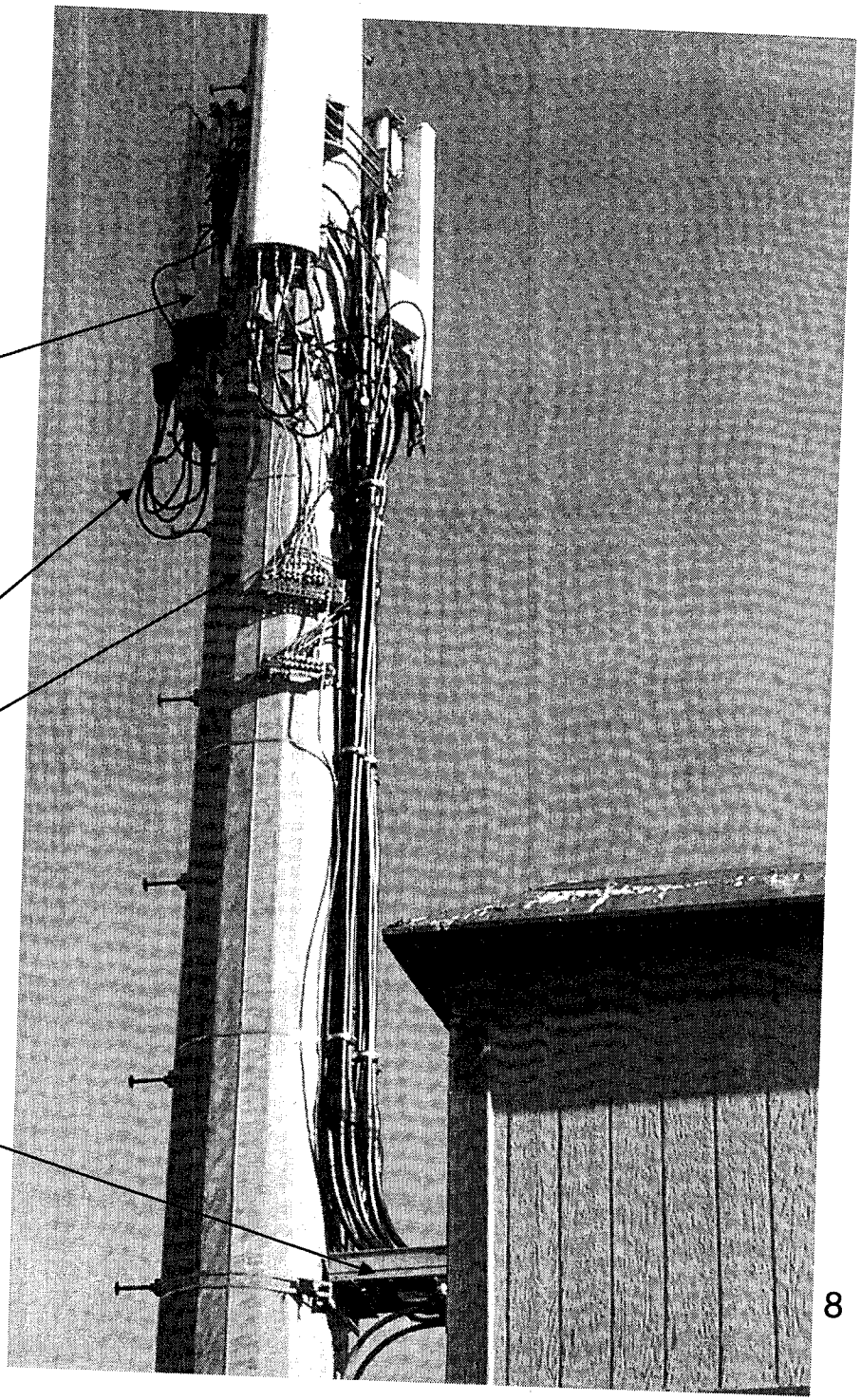
Parts of a cell site:

- Omnidirection (whip)
- Direction (panel)
- Microwave (dish)
- Equipment Shelter



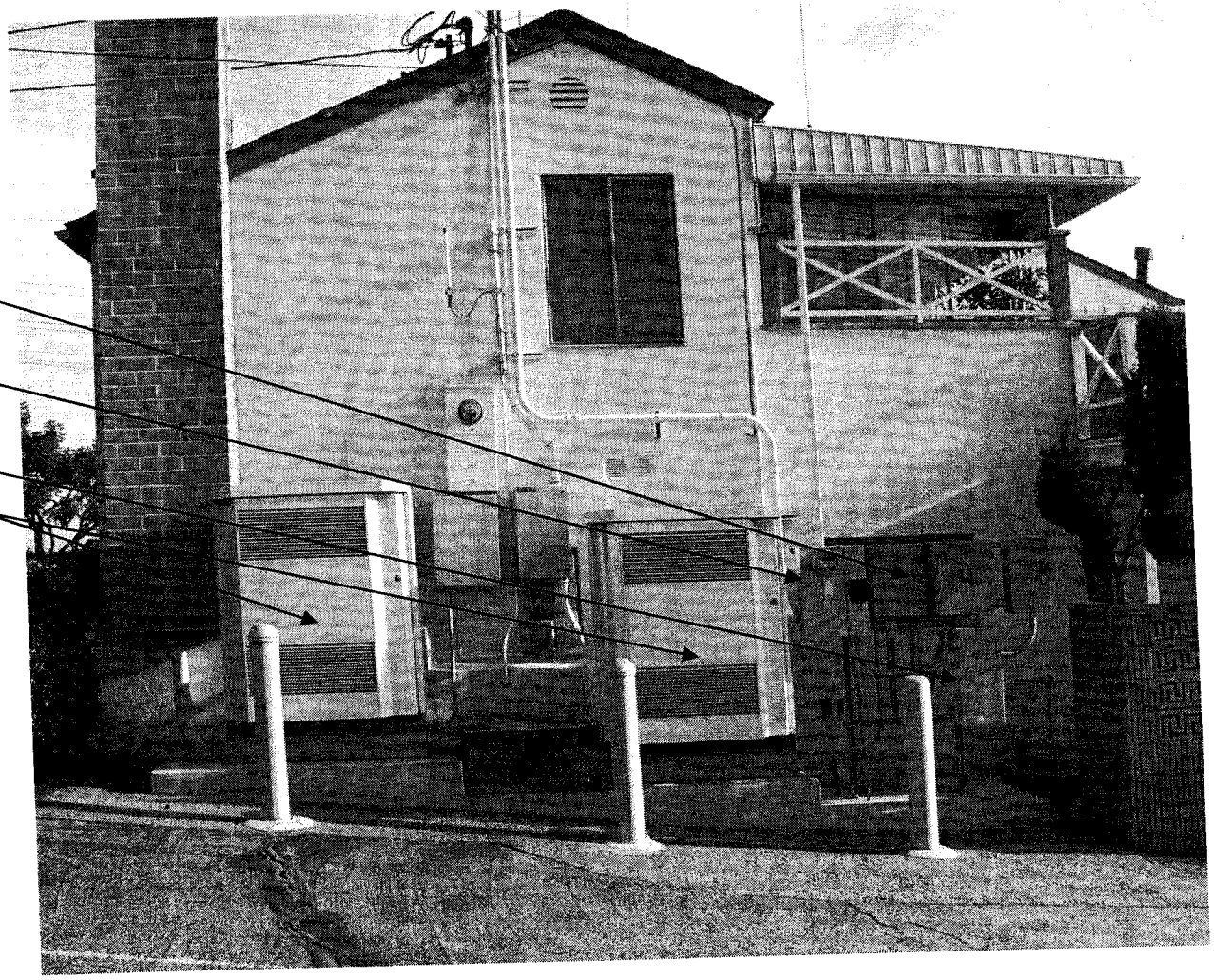
Parts of a cell site:

- Tower Mounted Amplifiers
- Antenna cables (coax)
- Ground cables (green wires)
- Ice Bridge



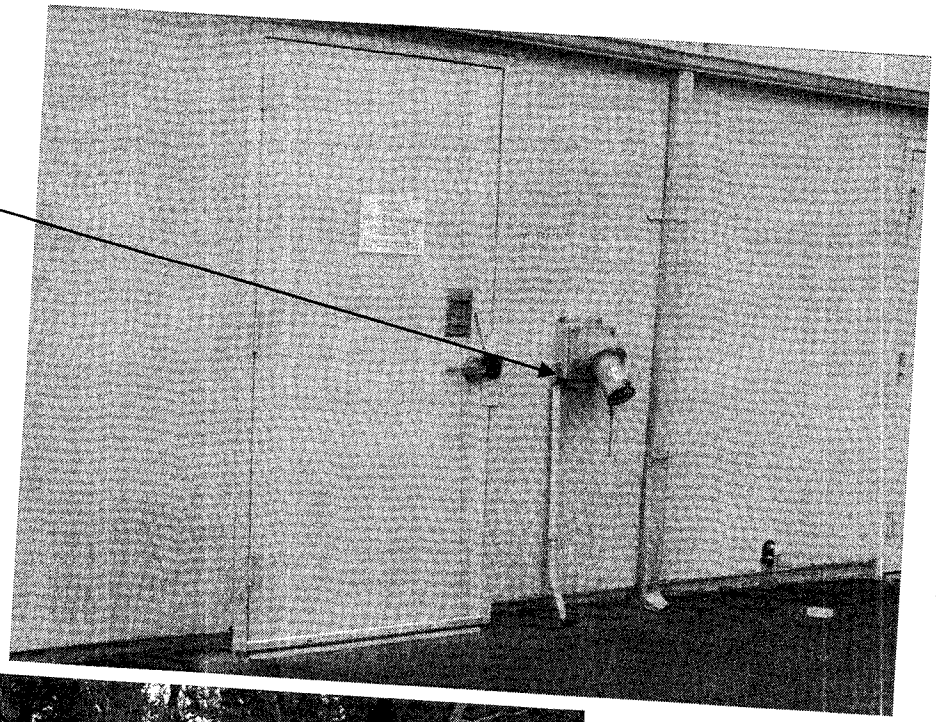
Parts of a cell site:

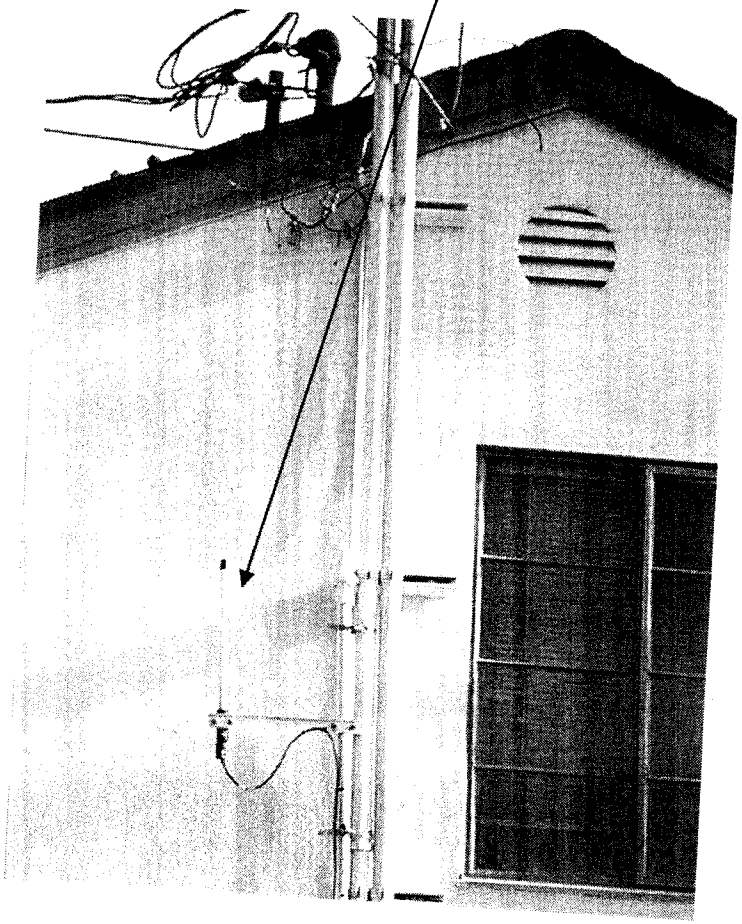
- Cabinets
  - Power
  - Meter
  - Telco
  - Base Station



Parts of a cell site:

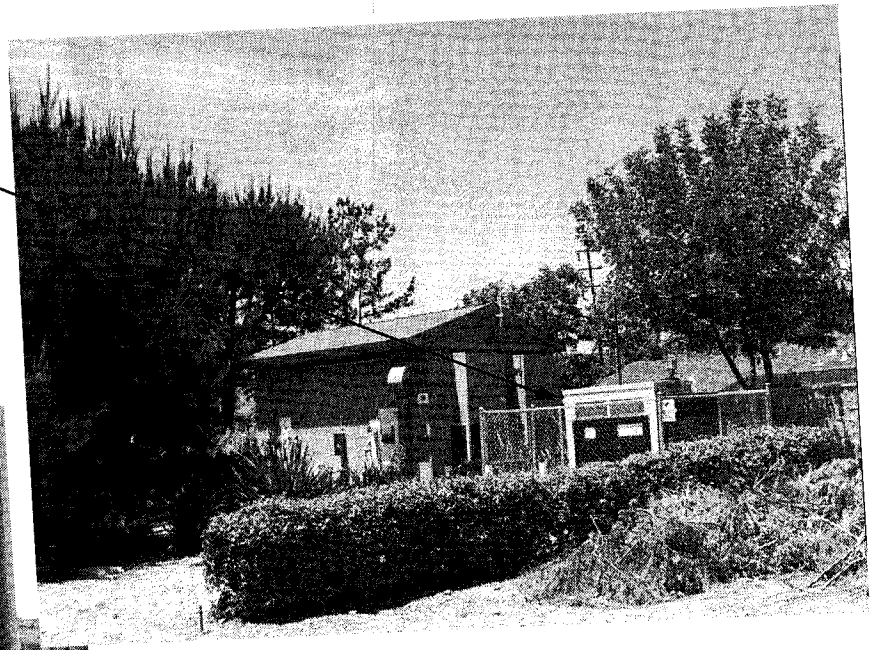
- Generator Socket
- GPS Antenna
- LMU Antenna





Parts of a cell site:

- Standby Power Generator



No FCC rule for backup power (at least right now)

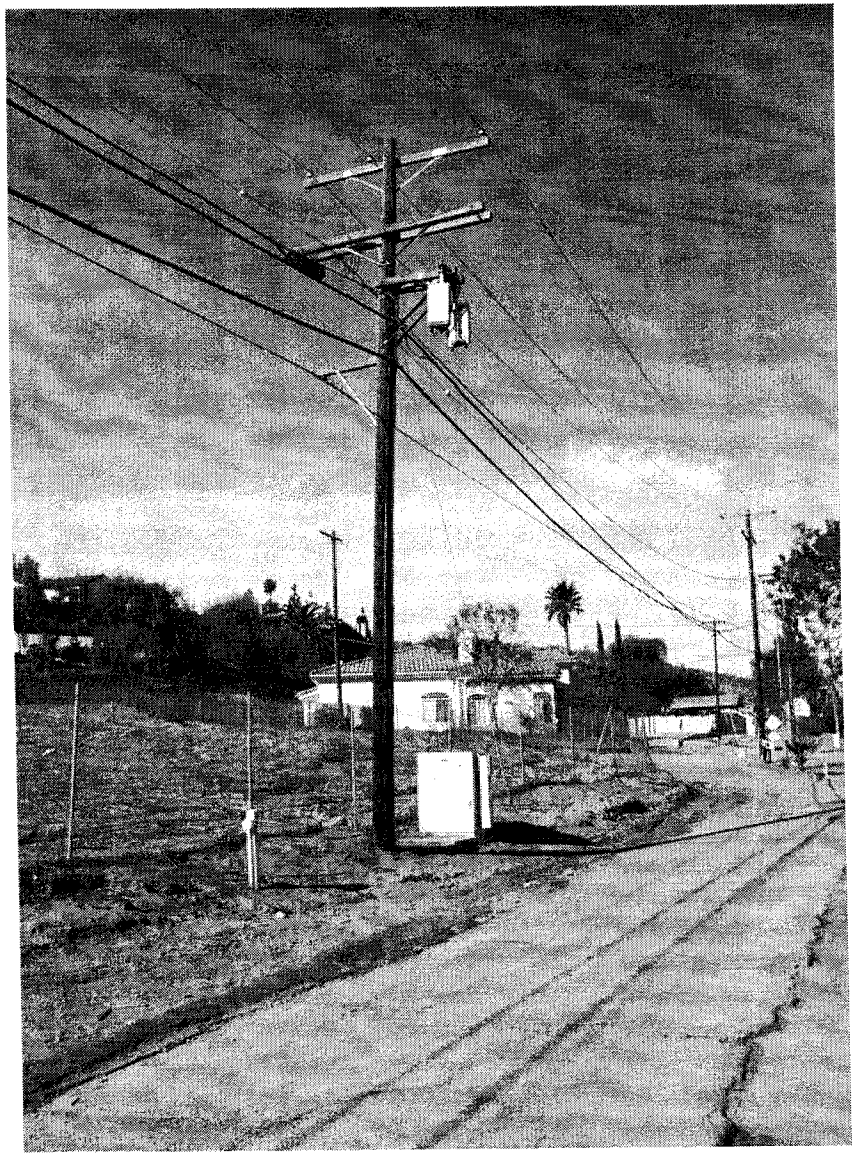
Traditional Wireless Sites v. Distributed Antenna Systems

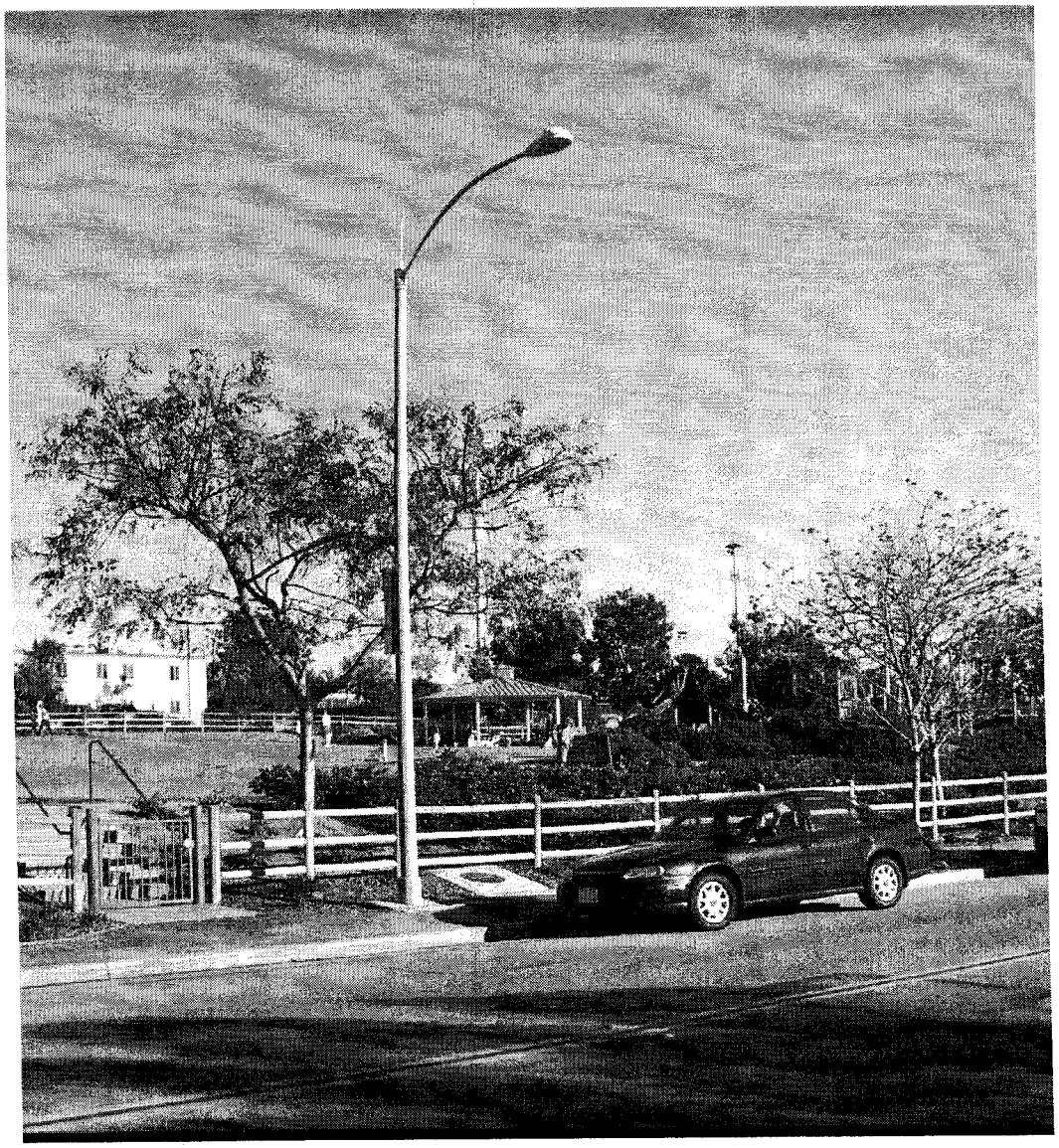
- Traditional Cellular/PCS
  - Really is a wireless carrier
  - Typically one carrier or frequency per antenna
  - Protocol specific
  - Big base station equipment at the antenna site
  - Microwave, T1 data line, fiber for backhaul
  - Higher power output level
  - Larger coverage area
  - Fewer, but larger sites

- Distributed Antenna Systems
  - Really is a telco in some jurisdictions
  - One to 4 to 6 carriers per antenna
  - Protocol Agnostic
  - Small equipment footprint at the antenna site
  - Fiber optic cable for backhaul Owned by DAS or leased
  - Lower power output level
  - Smaller coverage area per site
  - More, but smaller sites

Neither approach is always better
Location, location, location...

DAS Comes in Various Flavors





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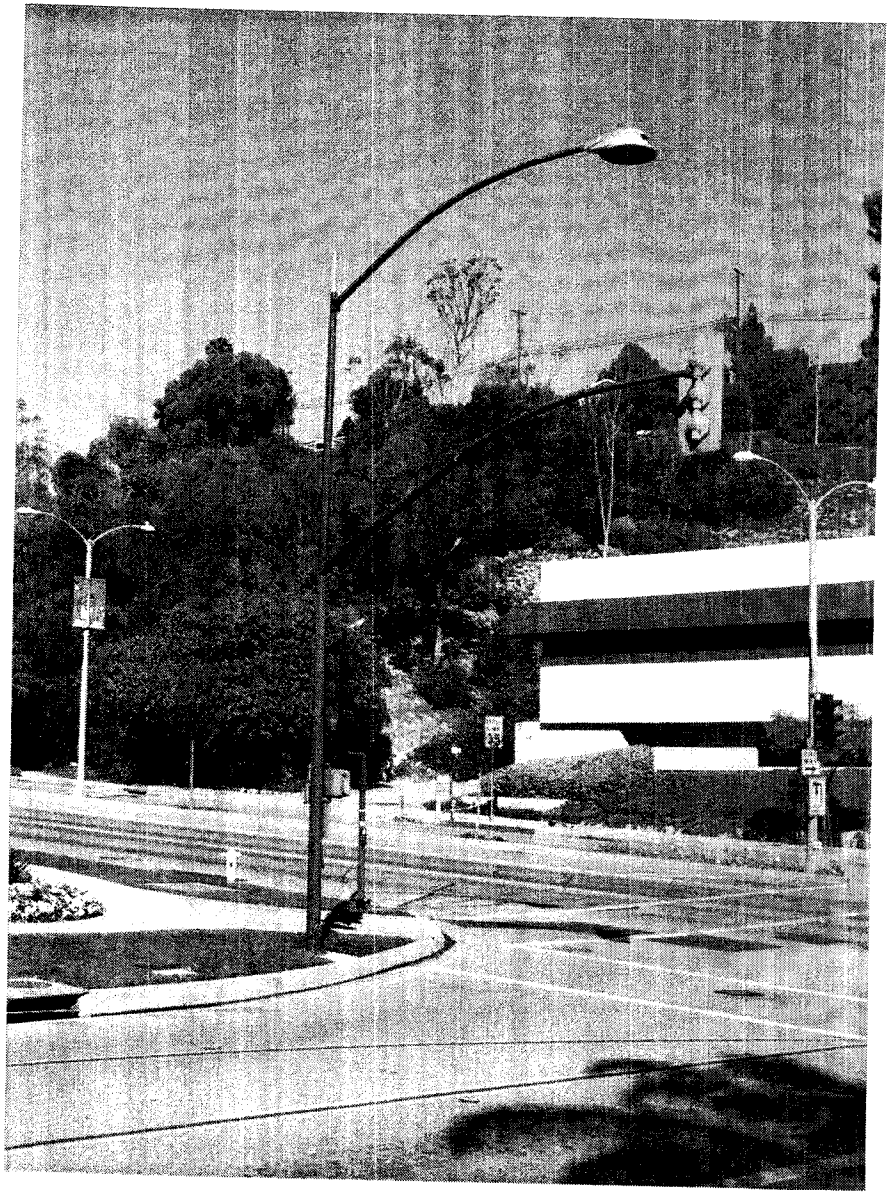
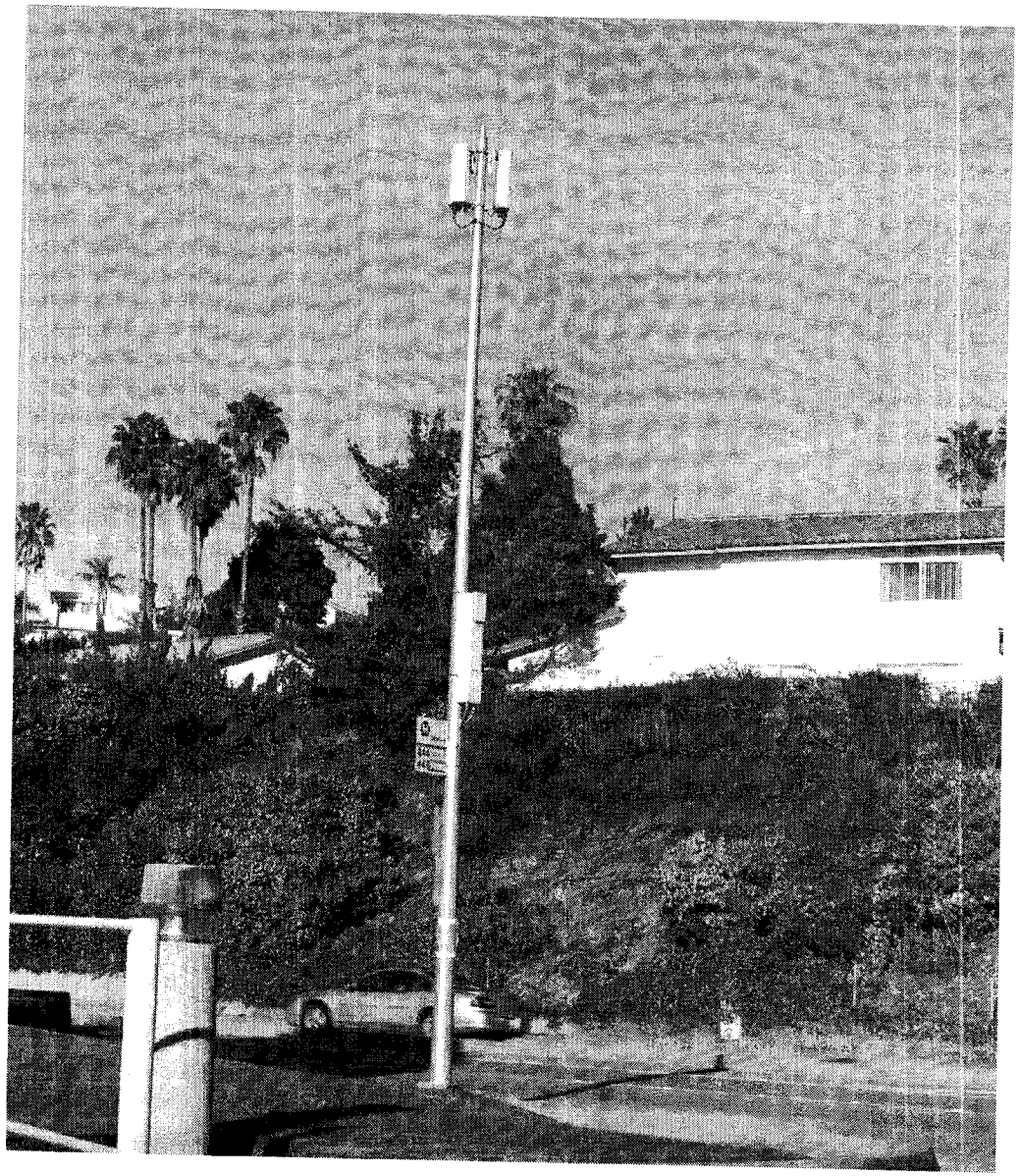
DAS Comes in Various Flavors





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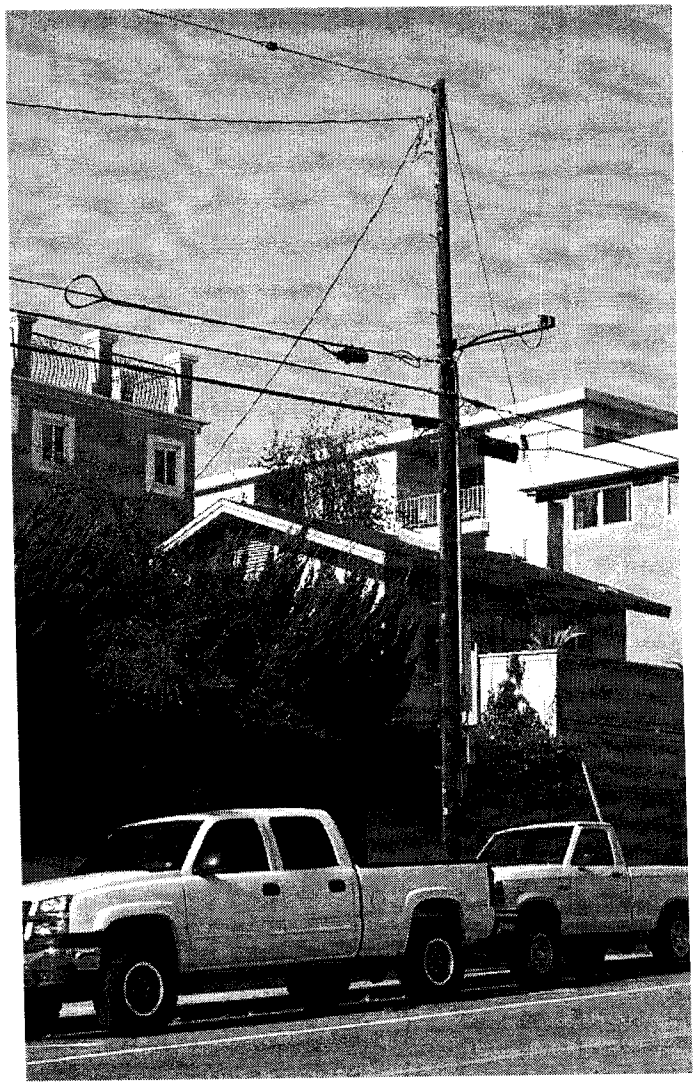
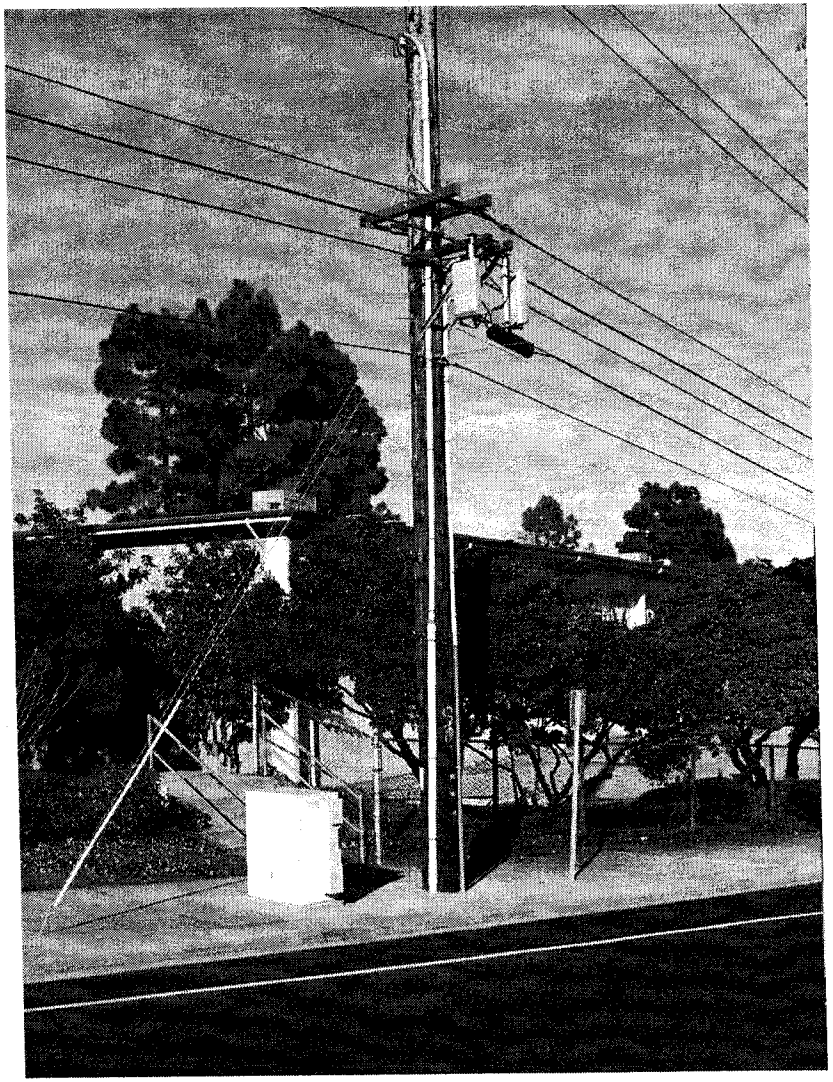
DAS Comes in Various Flavors





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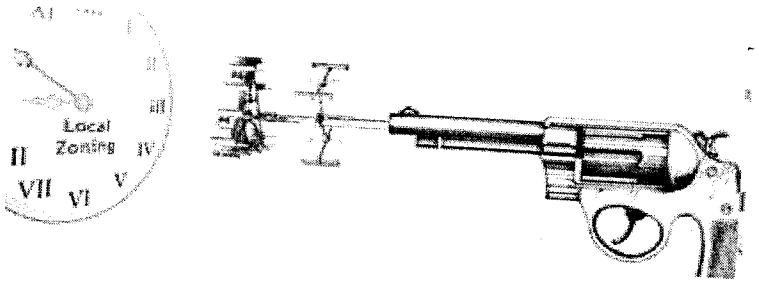


Shot through the clock, but always in good form.

http://TelecomLawFirm.com/siting/

GOVERNMENT OF GENERIC
SUPPLEMENTAL APPLICATION FORM FOR WIRELESS PROJECTS AND DISTRIBUTED ANTENNA SYSTEM ("DAS") PROJECTS

The Government of Generic recognizes that the provision of wireless and DAS services are highly technical enterprises subject to various federal, state, and local regulations. This supplemental application form is designed to elicit necessary and required technical information in support of a planned Conditional Use Permit ("CUP") or Special Use Permit ("SUP") or Variance/Waver application for a new or modified wireless telecommunications site project or a Distributed Antenna System ("DAS") project within the Government of Generic.

Completion of this supplemental application is a mandatory document for a wireless Project. This form assists the Government of Generic to comply with its duties under its Municipal Code ***[[INSERT GOVERNMENT OF GENERIC'S WIRELESS ORDINANCE LEGAL REFERENCE HERE, OR OMIT]]***; Sections 253, 332, and 704 of the Communications Act of 1934 as amended; the FCC Shot Clock Order (FCC 09-99); California Public Utilities Code Sections 7901 and 7901.1; the California Environmental Quality Act (CEQA); the provisions of Government Code Sections 65850.6 and 65964; and other local, state, and federal laws, regulations, and court rulings. The Government of Generic requires that the applicant provide this information to assist it in creating a written administrative record containing substantial evidence sufficient to permit the Government of Generic's informed consideration of your request, and to determine the rights and obligations of the Government of Generic and the applicant/owner of the proposed project.

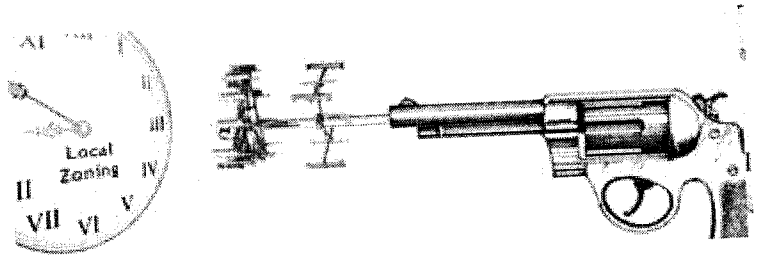
No application for a new wireless site or for a modification of an existing wireless site shall be considered for determination of completeness until all required responses to this supplemental application form and required attachments are completed and tendered to the Government of Generic.

If you do not believe that a specific item of information is necessary or applies to your application, mark the item on this form with the words, "Not Applicable" and attach a detailed written explanation as to the basis for your belief (e.g., "Question 94.7 does not apply to this application because the proposed Project has no microwave transmission element.") An unsupported statement such as "Question 94.7 does not apply" is insufficient, and the determination of completeness of your application will be delayed while you provide a meaningful and detailed explanation.

Every page of this form <u>including this page and the last page</u> must be tendered to the Government of Generic. Each page <u>including this page and the last page</u> must be initialed where indicated. The last page must also be completed, signed, and dated.

Questions about this form or the required information to be provided should be directed to the Government of Generic Community Development Department planner assigned to your project.

Applicant <u>Must</u> Initial Here: _____



Ordinance Revised?

Facially complete?

Checklist review?

Team already assembled?

Fees for all reviews?

Fees for extra meetings?

Did you buy an alarm clock?

Concrete Rule Structure.

Don't Start the Clock.

Geared to the counter Planner.

Too late after receipt.

Why fund the industry?

Ditto.

Or at least a good calendar.

Alternative Site Analysis

- Basics:
  - There is very rarely "*one-and-only-one*" location for a particular cellular/PCS site.
  - The more mature the system, the harder it is to locate a new site (cutting up an assembled jigsaw puzzle).
  - A change in location of several hundred feet may (not) have any (material) impact on the service provided to a particular area.
  - Computer models (predictions) < > drive test results (factual, scientific basis)
  - ***Consult your Admin Record; Make a finding based on Substantial Evidence in that Record; Write it Down!***

RF Safety Compliance Analysis to Determine Compliance with FCC Rules

- Some Carriers: You can **NEVER** evaluate RF safety…it's a federal issue. You can **NEVER** even mention it at a hearing.

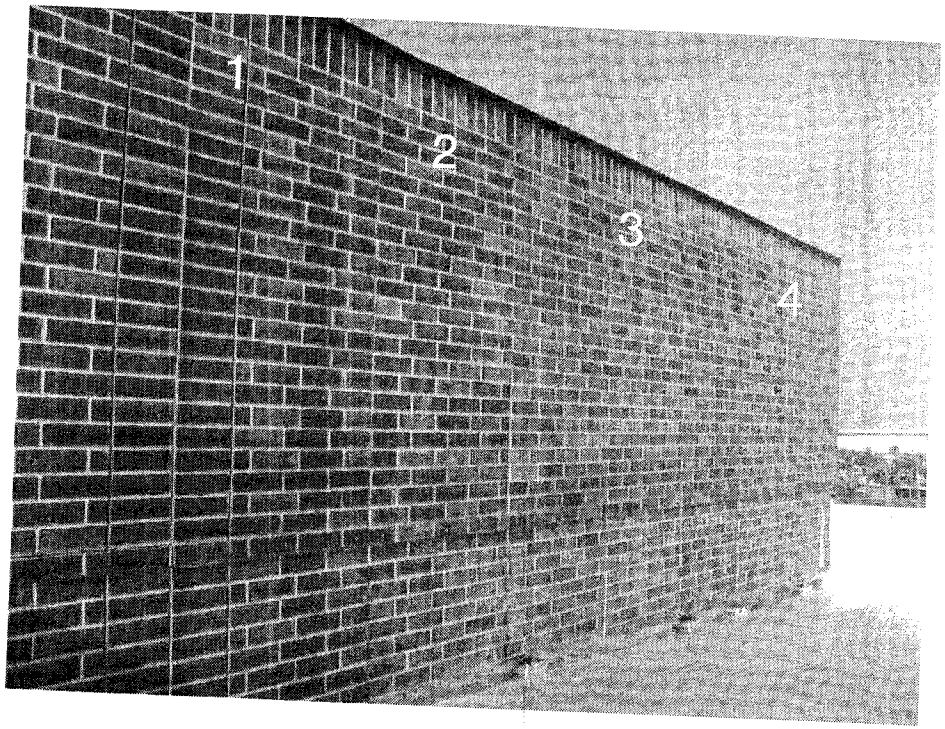
- Congress/FCC: Local governments **CAN** evaluate RF safety ***to determine compliance with the federal standards*** in FCC OET Bulletin 65.

RF Safety Evaluation

- There are two federal standards in the FCC OET Bulletin 65 rules (sometimes misapplied by carriers): The Controlled/Occupational standards and Uncontrolled/General Population standard.

Which one to use?

Most roof-top installations require detailed RF evaluations and likely will require special permit approval conditioning to ensure compliance with FCC rules.



RF Safety Evaluation

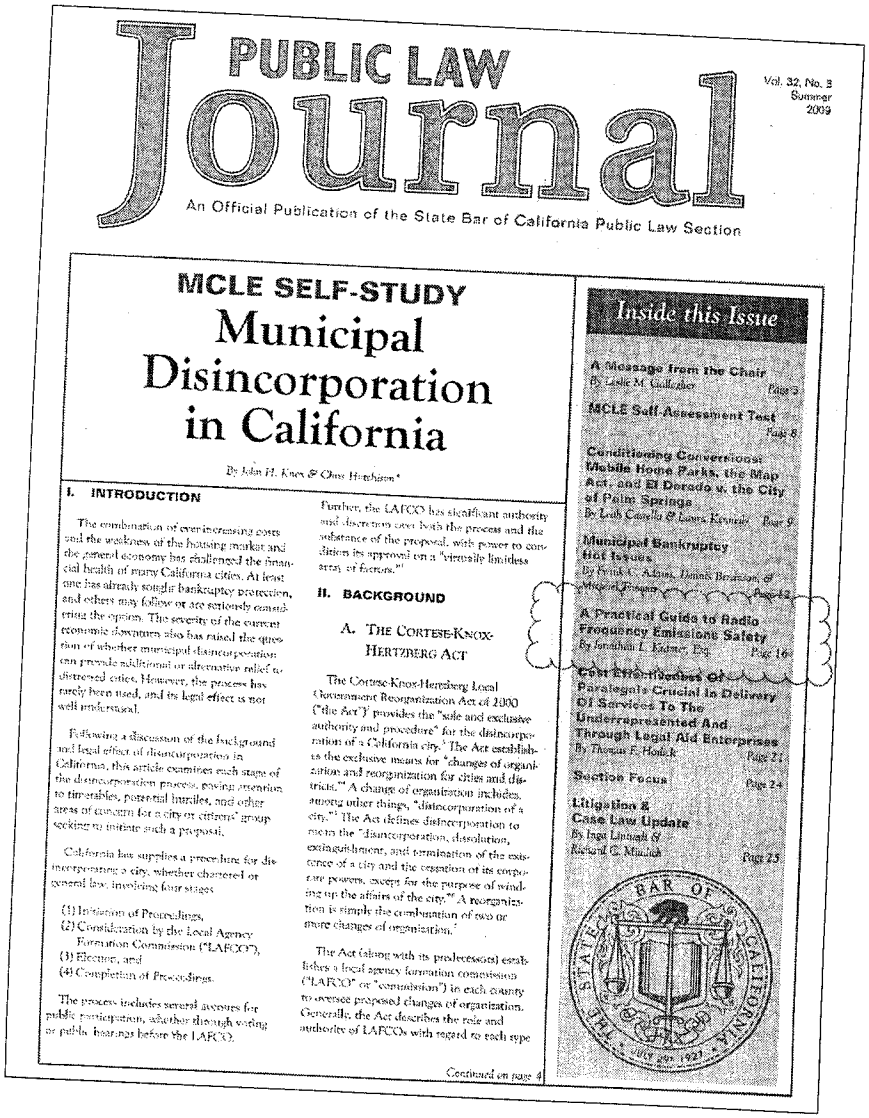
- The FCC has a simple 2-page RF safety evaluation form within:

  "A Local Government Official's Guide to Transmitting Antenna RF Emission Safety: Rules, Procedures, and Practical Guidance"

  Download from: http://www.fcc.gov/oet/rfsafety/

  (*Remember that the form is a good* STARTING POINT, but may not be the END POINT for your inquiry!)

RF Safety Evaluation



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MCLE SELF-STUDY

Municipal Disincorporation in California

By John H. Knox & Chris Hutchison*

I. INTRODUCTION

The combination of ever-increasing costs and the weakness of the housing market and the general economy has challenged the financial health of many California cities. At least one has already sought bankruptcy protection, and others may follow or are seriously considering the option. The severity of the current economic downturn also has raised the question of whether municipal disincorporation can provide additional or alternative relief to distressed cities. However, the process has rarely been used, and its legal effect is not well understood.

Following a discussion of the background and legal effect of disincorporation in California, this article examines each stage of the disincorporation process, paying attention to timetables, potential hurdles, and other areas of concern for a city or citizens' group seeking to initiate such a proposal.

California law supplies a procedure for disincorporating a city, whether chartered or general law, involving four stages:

(1) Initiation of Proceedings,
(2) Consideration by the Local Agency Formation Commission ("LAFCO"),
(3) Election, and
(4) Completion of Proceedings.

The process includes several avenues for public participation, whether through voting or public hearings before the LAFCO.

Further, the LAFCO has significant authority and discretion over both the process and the substance of the proposal, with power to condition its approval on a "virtually limitless array of factors."[1]

II. BACKGROUND

A. THE CORTESE-KNOX-HERTZBERG ACT

The Cortese-Knox-Hertzberg Local Government Reorganization Act of 2000 ("the Act")[2] provides the "sole and exclusive authority and procedure" for the disincorporation of a California city.[3] The Act establishes the exclusive means for "changes of organization and reorganization for cities and districts."[4] A change of organization includes, among other things, "disincorporation of a city."[5] The Act defines disincorporation to mean the "disincorporation, dissolution, extinguishment, and termination of the existence of a city and the cessation of its corporate powers, except for the purpose of winding up the affairs of the city."[6] A reorganization is simply the combination of two or more changes of organization.[7]

The Act (along with its predecessors) establishes a local agency formation commission ("LAFCO" or "commission") in each county to oversee proposed changes of organization. Generally, the Act describes the role and authority of LAFCOs with regard to each type

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The Public Law Journal of the State Bar of California has published Jonathan's article, "A Practical Guide to Radio Frequency Emissions Safety." The article appears in the Summer 2009 edition (Vol. 32, No. 3).

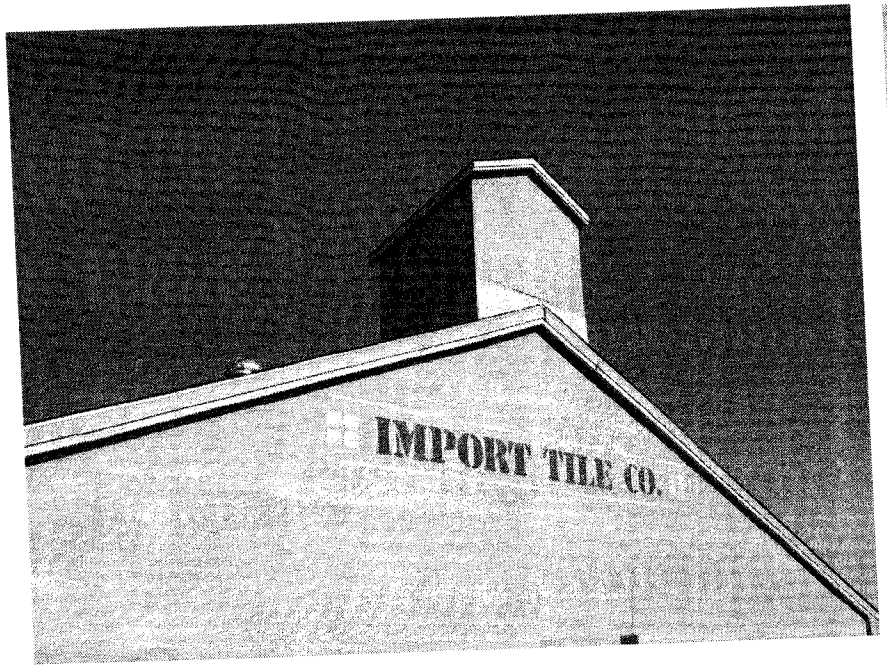
This guide discusses how local government agencies can properly and effectively deal with RF safety issues that come up in connection with wireless siting cases (primarily cell sites, but also broadcast, ham radio, and commercial two-way users, as well).

While written primarily for California public law attorneys, attorneys around the country will find many important and useful gems in the article. Download from: http://TelecomLawFirm.com/rfsafety/

Site Camouflage Techniques and Considerations

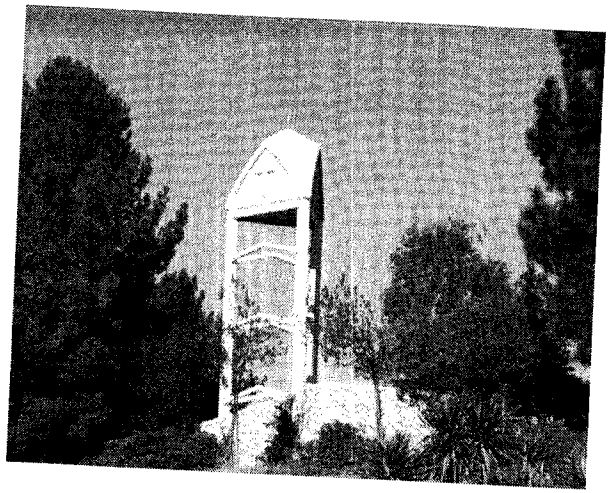
Basics:

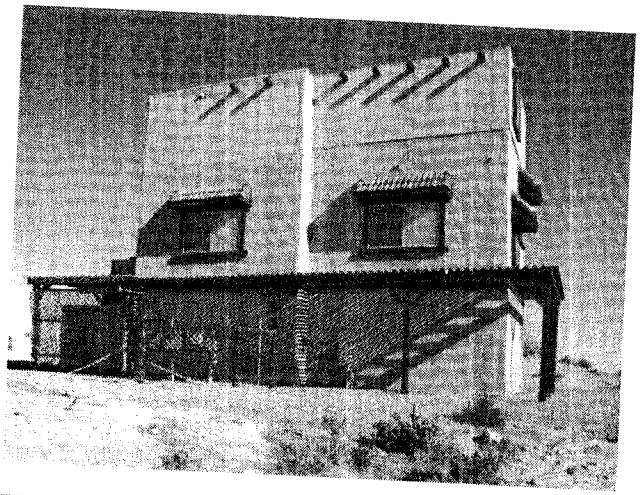
- **Not every site need be camouflaged (and we don't call it 'stealth').**
- **It's far easier to camouflage a 40' mono-Frankenstein or a building top or building side-mount site compared to a 199 foot mono-Frankenstein above a 40 foot tree line.**
- **It's ALWAYS a time-to-market consideration: Smart ordinances recognize this.**

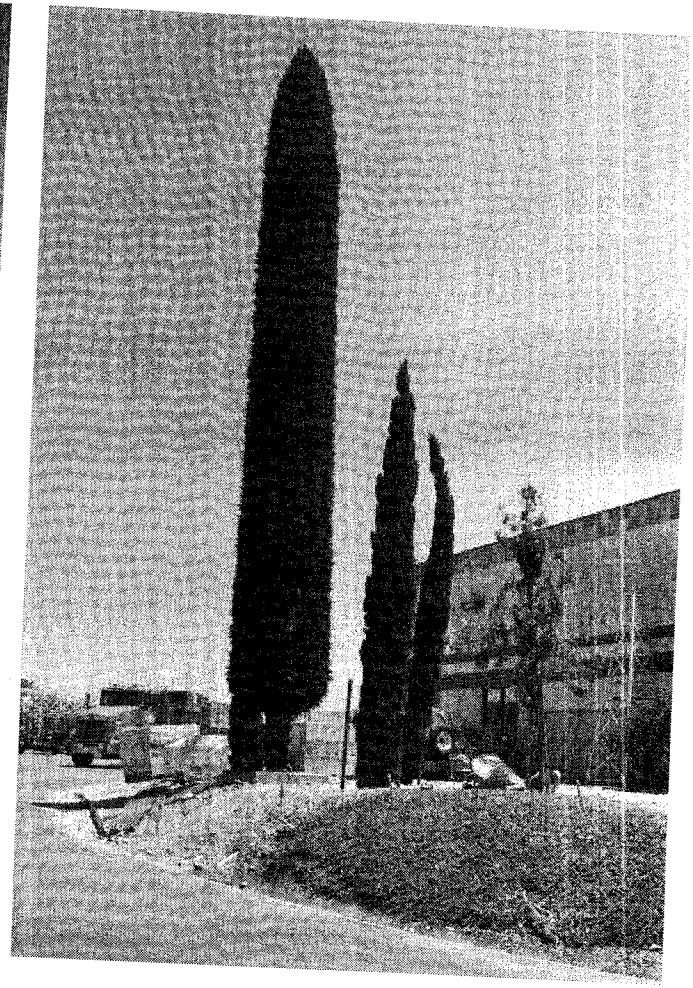


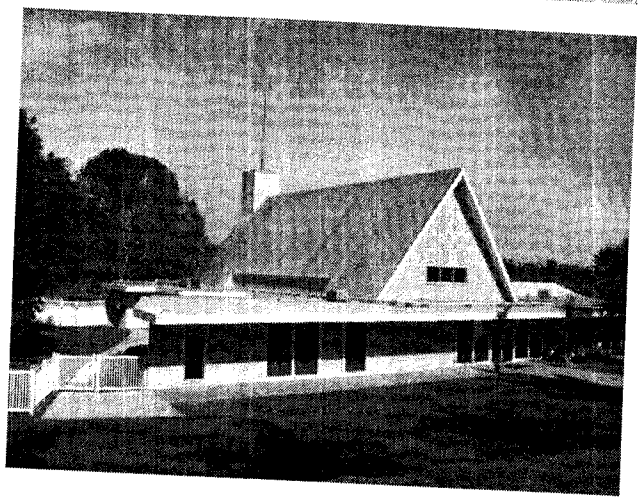
Photos from www.CellularPCS.com/gallery/
(over 1000 photos for planners to use in government presentations)

Camo*licious*









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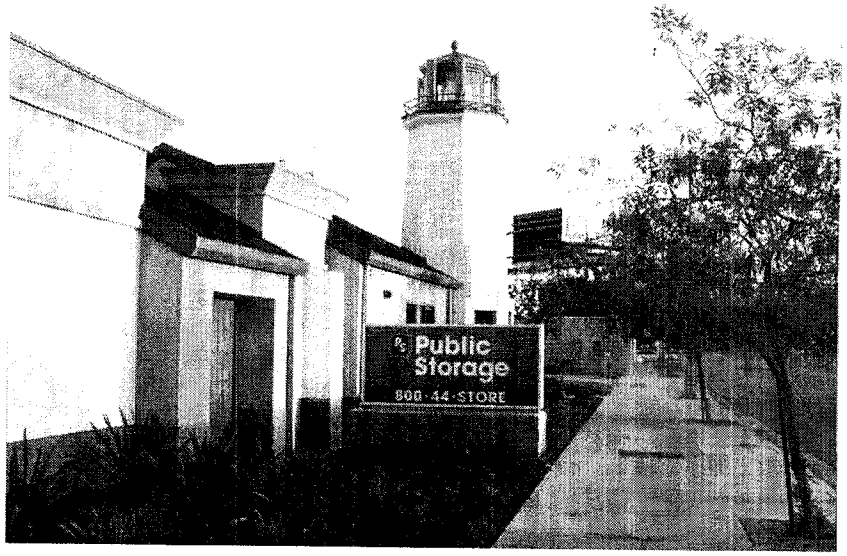

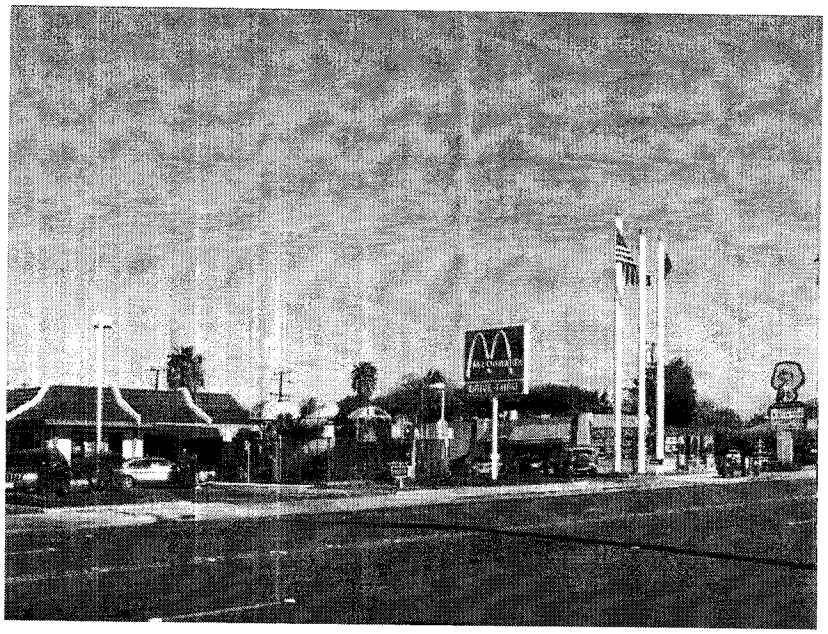

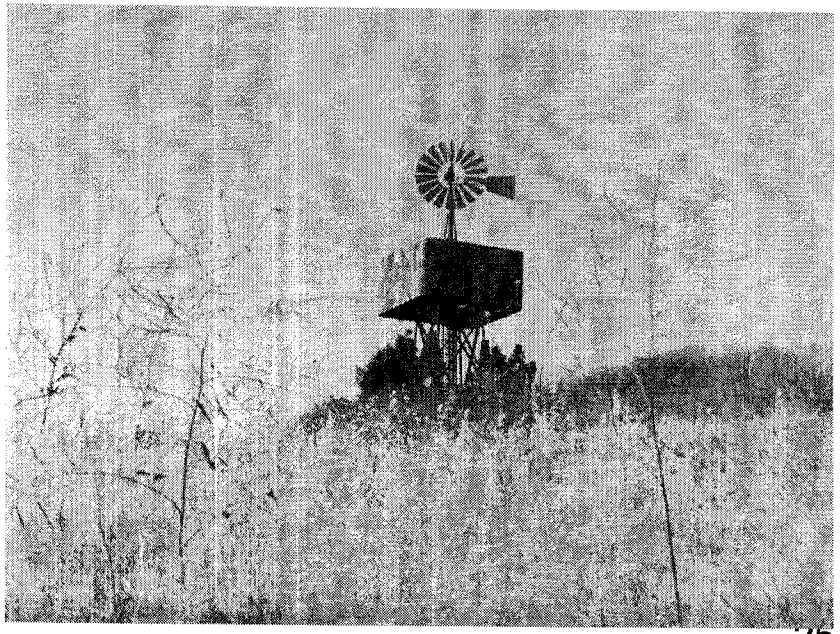

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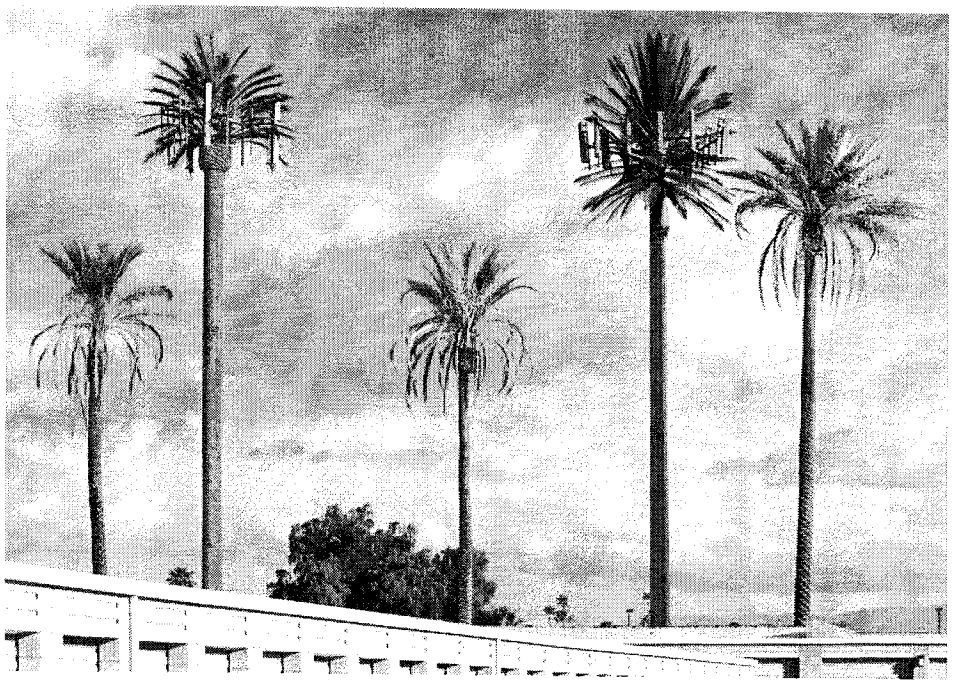

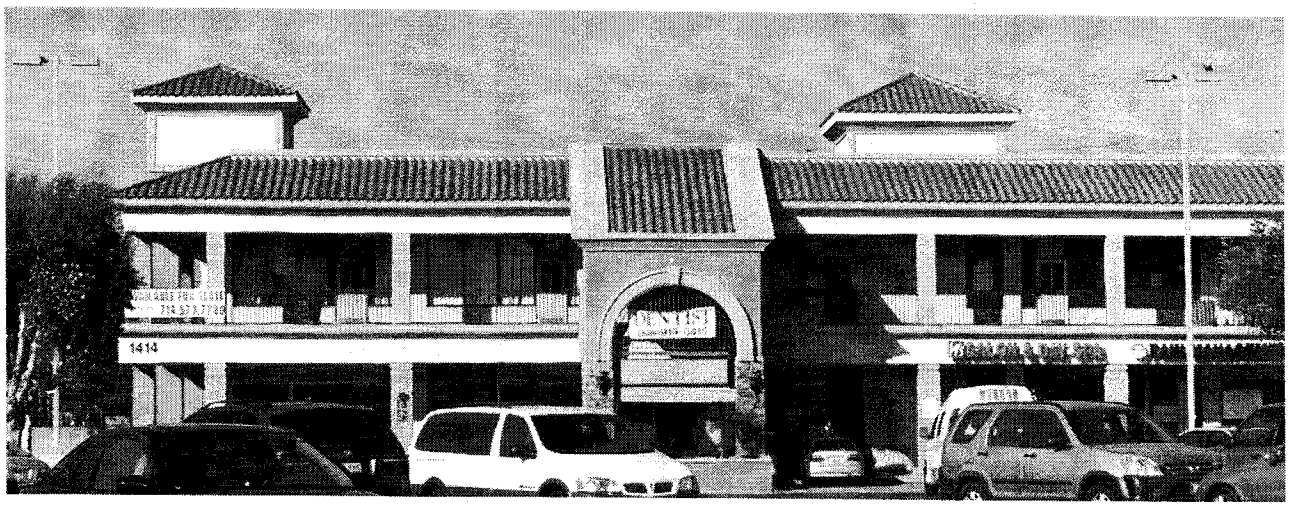

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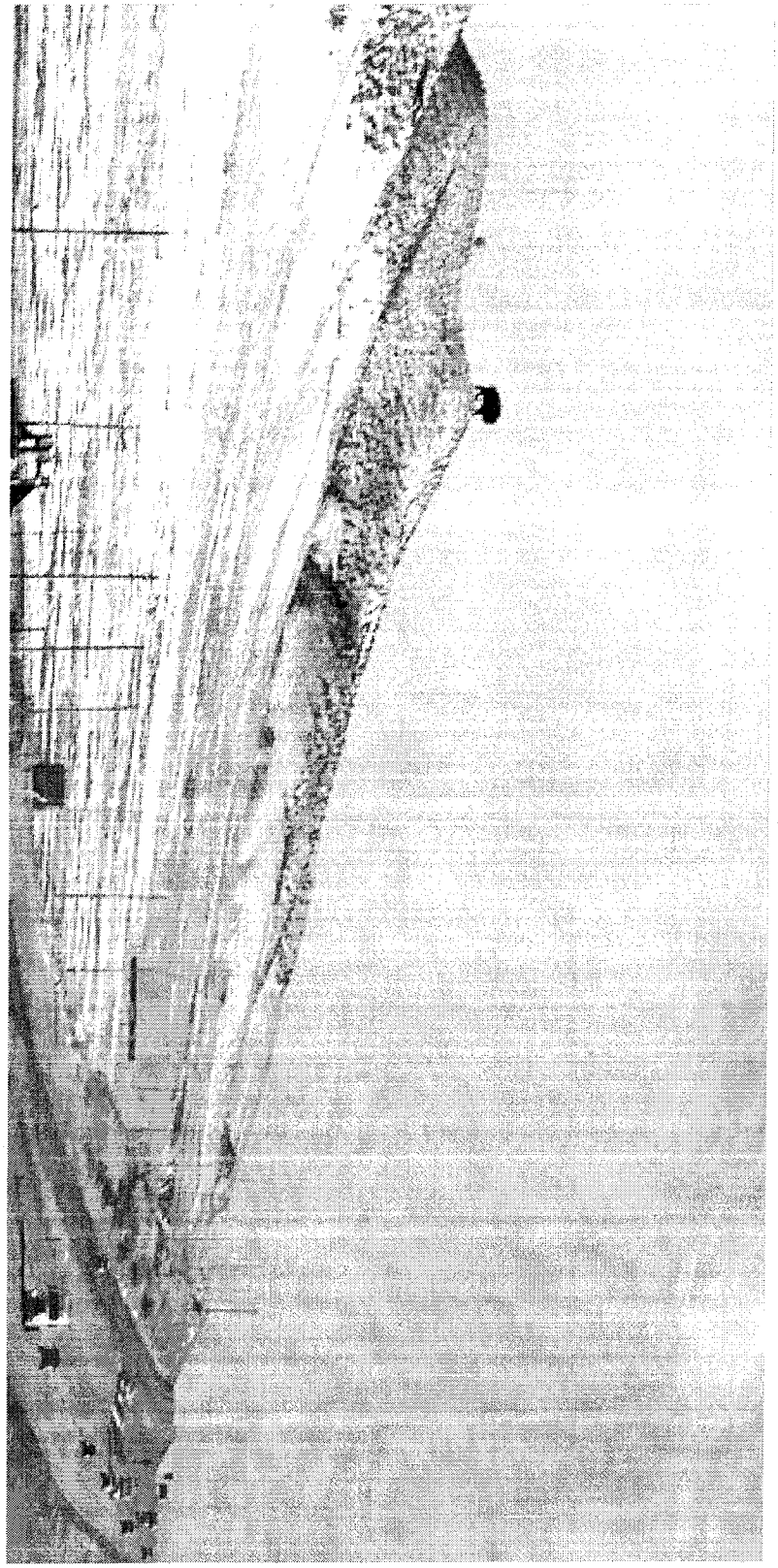
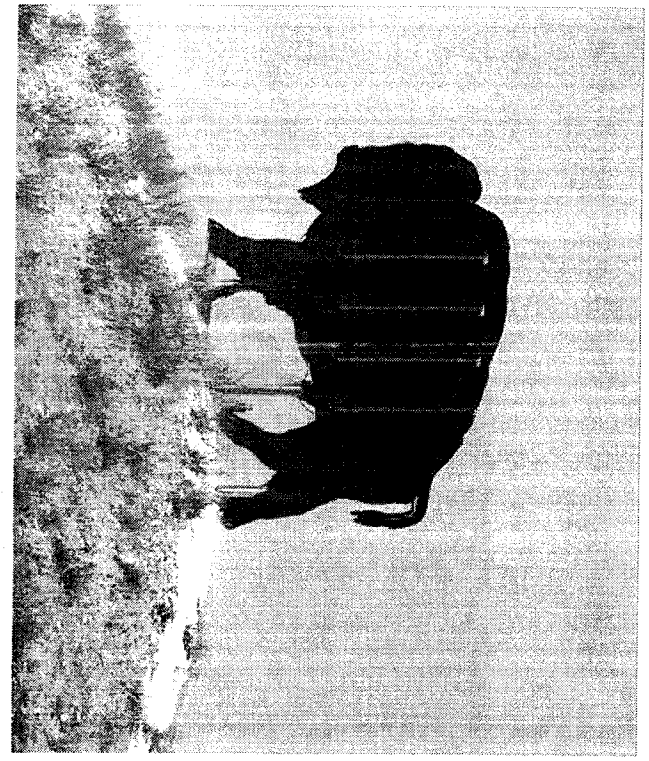
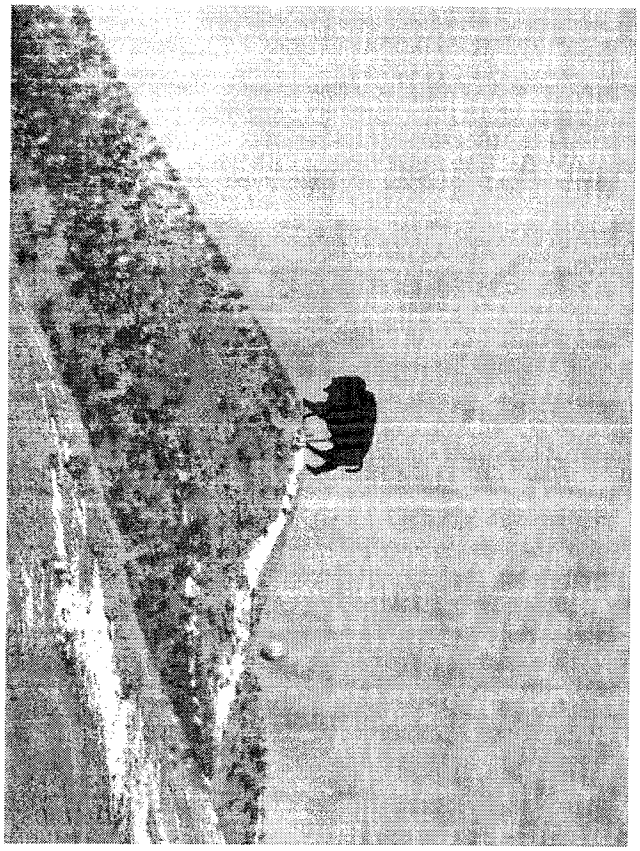


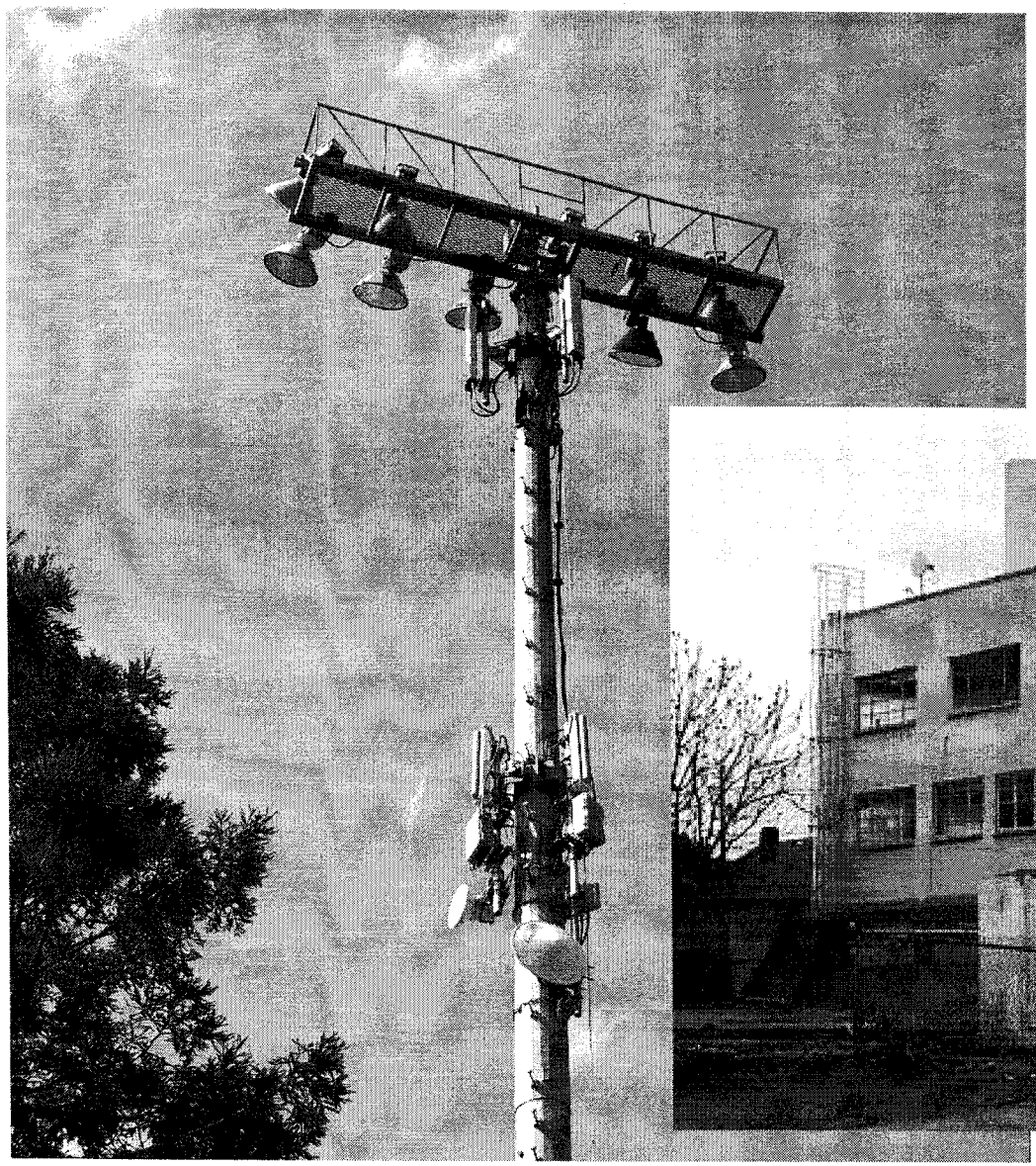


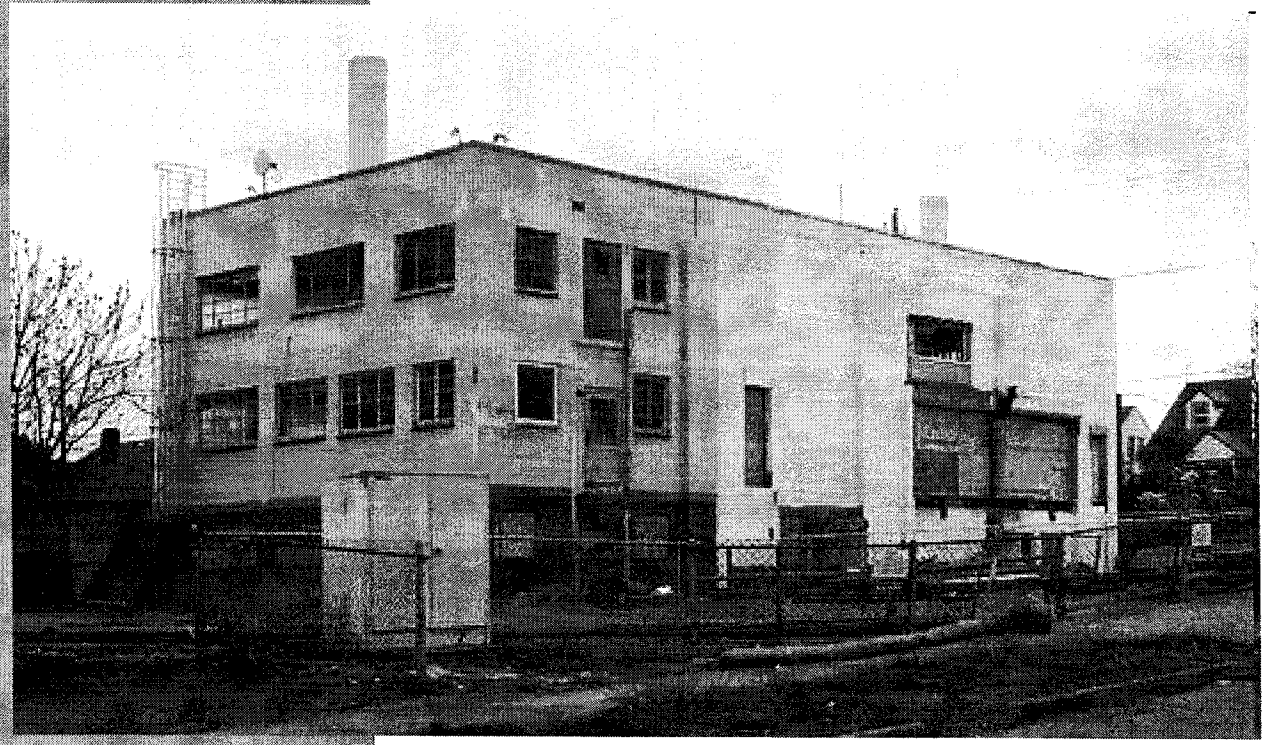


Don’t Mess With This Site!

WiMAX Deployment at Cellular/PCS Wireless Sites

Sprint's (Clearwire's) WiMAX Over-the-Air Internet Service, for example:





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