Cell Sites and Cities:

Evaluating the Advantages and Disadvantages of Adopting a Wireless Telecommunications Ordinance for Suburban Communities

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Urban & Regional Planning 298A: Planning Report Development

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1. Proposed Title

Cell Sites and Cities: Evaluating the Advantages and Disadvantages of Adopting a Wireless Telecommunications Ordinance for Suburban Communities

2. Audience

The proposed report intends to be written for any city planning departments that are looking to either adopt their first wireless telecommunications ordinance, or amend their existing ordinance.

3. Background

Nowadays, almost every single person in developed countries owns a cell phone. Many just use it to make phone calls, but a significant number of people use cell phones and wireless devices to text message, surf the internet, and watch videos. What many people do not realize is that in order for them to be able to use these devices to their full potential, the wireless carrier must place wireless telecommunication facilities throughout the city that they live in. A wireless telecommunication facility ("cell site") is any sort of structure with antennas and associated equipment on it that is used for wireless transmission. "Structures" could be buildings, towers, utility poles, streetlights, church steeples, etc.

With cell phones continuing to evolve into all-encompassing wireless personal computers, carriers must install additional wireless telecommunication facilities or add additional equipment to their existing facilities so the network can handle the tremendous amount of data being transferred wirelessly. Recognizing the effect that the number and size of these cell sites has on the aesthetics of their city, many municipalities have chosen to adopt wireless telecommunication ordinances. These ordinances attempt to regulate the type, design, and location of wireless facilities within a particular city.

4. Research Question

What are the advantages and disadvantages for a suburban community to adopt a wireless telecommunications ordinance? How would an ideal wireless telecommunications ordinance look?

5. Hypothesis

I think that some of the advantages that I will find will be:

- Added revenue for the city through both application fees and leases with the wireless carriers for cell sites on municipal land.¹
- Less visual clutter from cell sites

• Getting the residents of the cities more involved in the process, since most
ordinances require some sort of public noticing period or community meeting. Many
scholars have noted the importance of getting the public involved, since they are
often directly affected by the construction of the wireless sites.\(^2\)

I expect one of the disadvantages of having a wireless ordinance is that it will elongate the
application process, which would lead to the city trailing behind others in terms of their
wireless infrastructure (4G, 5G, etc.).\(^3\) In general, I believe that the advantages will outweigh
the disadvantages. I think that the information I find will show that those few cities that do
not currently have a wireless ordinance in place should, in fact, adopt one.

Similar to what Callahan notes, I believe many of the responses from my interviews with city
planners will show that ordinances should contain restrictions on where cell towers should
be placed, the amount of equipment they can have on the site, and how they are actually
designed in certain zoning districts.\(^4\) All of these items will likely be key aspects of my draft
wireless ordinance that I intend to write as part of this project. I also believe that my draft
wireless ordinance will be similar to Foster City’ in its aggressive, yet fair regulations on where
cell sites can be placed and how they can be designed.\(^5\)

6. Relevance to the Planning World

The exponential boom of the cell phone industry in the past two decades has put cities and
counties in quite the conundrum. Cities and counties want their respective residents to have
access to the “4G” networks with the great cell phone service and coverage. At the same
time, they do not want the visual clutter that comes with the sometimes hundreds of cell
sites that they see in their city. So what do they do?

Many cities have opted to develop some sort of wireless facilities ordinance in order to
regulate the cell sites in their city. More drastically, local jurisdictions like the Town of
Hillsborough and the City of Burlingame, have recently placed a moratorium on all cell site
applications until an ordinance is actual drafted or revised.\(^6\) These ordinances typically limit
where the facilities can be located and how they can be designed in hopes of limiting the
visual clutter of the cell sites.

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\(^2\) Jeffrey Berger, “Efficient Wireless Tower Siting: An Alternative to Section 332(c)(7) of the Telecommunications Act
Attack: The Heights to Which Communities Will Climb to Prevent the Siting of Wireless Towers,” The Journal of

\(^3\) Graelyn Brashear, “County Considers Scaling Back Cell Tower Regulations to Improve Coverage,” C-Ville Weekly,
coverage/#.UvnCT0JdWQR (accessed February 5, 2014).

\(^4\) Dale Callahan and Lea Callahan, “Municipal Ordinances and Reviews for Wireless Communication Towers,”


go.com/kg/story?section=news/local/peninsula&id=9029667 (accessed December 5, 2013); Miriam Finder, “Council
5, 2014).
For cities that do not have wireless ordinances in place, cell phone carriers can submit applications to cities to build wireless telecommunication facilities in any type of zone (residential, commercial, industrial, public, etc). These applications may or may not go to public hearings, but in most cases the public is not even notified of the application and has no say in the process. The problem with this is that a cell phone site could be approved to be installed across the street from someone’s home, or in a scenic area without the public having a say in the placement or the design of the site. As one resident put it when the City of Juneau was contemplating a moratorium on cell sites, “what we should have is an opportunity, real opportunities, for the public to participate both in the structuring of the final ordinance, and during the siting of different towers.”

In my experiences in the cell phone industry, some city planners are favorable of their ordinance in its way to limit design, while other planners, including Yen Han Chen, an Associate Planner at the City of Santa Clara, are satisfied with their city not having an ordinance, because it streamlines the process of upgrading the city’s wireless infrastructure. My hope is that through interviewing various planning departments that have ordinances and those that do not, I can pin down some of the major advantages and disadvantages.

In conducting a brief review of the existing literature on cell sites and wireless telecommunication ordinances, I have not found any peer or non-peer reviewed articles that specifically look at the advantages or disadvantages of adopting a wireless telecommunication ordinance. Much of the existing literature simply looks into the NIMBYism approach that residents and some cities have in relation to the placement of new cell sites. A good amount of the other literature out there on cell sites discusses the tools that local jurisdictions have in regulating the design and placement of the cell sites. Although related, what has yet to be researched is a comprehensive study on the advantages and disadvantages of adopting a wireless ordinance. This research report attempts to determine these advantages and disadvantages.

7. Literature Review Strategy

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In what ways can cities/counties benefit from regulating cell sites in their city? (This will help write both the “Responses to the Boom in the Cell Phone Industry” and will likely be compared to the responses I receive from my interviews.)

- Do wireless telecommunication facilities increase or decrease nearby property values? (This will help me with my “Responses to the Boom in the Cell Phone Industry” section, specifically the “NIMBYism” subsection in which residents usually claim sites near their property will decrease their property value)

- What tools do municipalities have to regulate cell sites? (This will help me with my “Responses to the Boom in the Cell Phone Industry” section, specifically the “Municipality Responses” subsection

- How has NIMBYism effected the location and design of cell sites? (This will help me with my “Responses to the Boom in the Cell Phone Industry” section, specifically the “NIMBYism” subsection.)

- Do the emissions from the cell sites have negative effects on the health of those nearby, or are the claims that the cell sites cause cancer false?

Databases to Search:
- Academic Search Premier
- Science Direct
- HeinOnline
- Web of Science
- ABI/INFORM Complete
- Google Scholar

Keywords To Search:
- Wireless Telecommunication Facility
- Wireless Facilities
- Wireless Antennas
- Wireless
- Local Government
- NIMBY
- Land Use
- Zoning
- Cell Site
- Telecom
- Regulation
- Regulate
- Site Planning
- EMF emissions
- Radiation

8. Methodology  

Overview
I will interview city planners/directors of various Peninsula and East Bay Area cities that both do and do not have wireless ordinances in place, as well as representatives from the four major wireless carriers in hopes of determining (a) the advantages and disadvantages for a city to adopt a wireless telecommunication ordinance, and (b) the ideal content for a wireless telecommunications ordinance.

**Reason for Collecting Data**

The data collected from the interviews should help me determine the advantages and disadvantages of adopting a wireless telecommunication ordinance for a city. From there, I should be able to make a determination, definitive or otherwise, about whether or not it is advantageous for cities to develop a wireless telecommunication ordinance. Responses from the interviews will also help me see what types of provisions and content should be included in ordinances and what aspects should be left out.

**Data Collections Procedures**

*Step 1: Research Santa Clara, Contra Costa, Alameda, and San Mateo County Suburban Communities and Their Wireless Ordinances (if any)*

I will generate a chart that shows which suburban communities in the four major Bay Area Counties actually have wireless ordinances in place, and for how long they have had them in place. I will not analyze the actual county jurisdictions because they tend to have a larger amount of open space, vacant land, and are more rural in character than cities. The cities of Antioch, Brentwood, Clayton, Livermore, Oakley, and Pittsburg will also be excluded from the analysis, because they contain a lot of land that is more rural in character. The cities of Oakland and San Francisco will also excluded because they are larger, more urban-centric.

If the ordinance has recently been updated, I will include that year as well. Although there are a great number of cities in this geographic area, I do have experiences with most of them, so I either have access to this information already, or have a good contact to obtain this information. For those cities that I have not worked with, I can get this information either from the city website, or I can call the community development department to get the information. The chart will look similar to below:

<table>
<thead>
<tr>
<th>City Name</th>
<th>Wireless Ordinance?</th>
<th>Year Wireless Ordinance Adopted (and Updated)?</th>
<th>Planning Contact Name or Department</th>
<th>Planning Contact or Department Phone Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Carlos</td>
<td>Yes</td>
<td>1999 (updated 2006)</td>
<td>Jill Lewis</td>
<td>(650) 595-6763</td>
</tr>
</tbody>
</table>

In addition, I will obtain a copy of the most recent wireless ordinance for any city that has one. I already have copies of the most recent wireless ordinances for most of the cities in
the area, but for those cities that I do not have copies of their ordinances, I will pull from the city’s website or call the city to obtain it. The purpose of this is to help me get a better sense of what jurisdictions I will reach out to in Step 2.

The reason I chose to focus on the cities within Santa Clara, Contra Costa, Alameda, and San Mateo Counties is because many of the cities are relatively similar in size and/or have a similar urban landscape. These municipalities have lots of residential areas, but still have a strong commercial, industrial, and office areas as well. I chose not to collect data on counties because they tend to have a larger amount of open space, vacant land, and are more rural in character than cities. The City of Livermore was excluded from the analysis, because it too contains a lot of land that is more rural. The cities of Oakland and San Francisco are also excluded because they are larger, more urban-centric. Figure 1, below, shows a map that shows the geographic area that my data collection will come from.

![Figure 1. Map of East Bay Area and Peninsula Cities Analyzed](http://www.google.com/maps)

**Step 2: Analyze the City Chart and Identify Interviewees**

Other than using this chart as a quick reference, I want to use the information in Step 1 to see which cities I need to reach out to in order to conduct interviews. I will want to reach out to at least 5 planning departments that have a wireless ordinance in place, and 5 planning departments that do not have a wireless ordinance in place. I intend to review the ordinances for all of the East Bay Area and Peninsula cities that have wireless ordinances. I will select 5 municipalities that I believe have the strongest wireless ordinances in place and will reach out to them to interview. I hope to interview 5 planning departments that have, what I perceive from experience, strong ordinances. I plan to randomly select 5 cities to interview for those cities that do not have ordinances in place. Obviously, the more interviews I have conducted, the better information I will likely obtain.
Not only do I want to speak with various planning departments, I also want to interview representatives from the cell phone companies. I know many people from AT&T, Sprint, and T-Mobile who work in the jurisdictional entitlements branch, that would be happy to sit down with me to answer some questions. I also know many people in the industry who are “Wireless Planners”, like myself, who deal with cities on a daily basis to get entitlements for cell sites on behalf of the carriers. I hope to interview at least 5 of these individuals.

Step 3: Develop Interview Questions

I will need to develop three sets of interview questionnaires. One will need to be for the planning department contacts for the cities that have a wireless ordinance in place, and one will need to be for the cities that do not have one in place. Although these interview questionnaires will be very similar, there will likely be a few different questions I will ask. The last set of interview questions will be used to interview representatives of the cell phone carriers.

What I hope to get out of the interviews with the various planning departments is a sense of what they perceive are the advantages and disadvantages of having an ordinance, so questions will be focused around this. For those cities that do have an ordinance in place, I would like to find out what the interviewees view as a strength of their ordinance, and what things they would improve. For those cities that do not have an ordinance, I will likely ask a hypothetical question, along the lines of “Why do you think your city has not adopted a wireless ordinance at this point?” or “If your jurisdiction decided to implement an ordinance, what sort of items would you like to see in it?”.

The purpose of the interviews with the carriers would be to see how the carriers perceive the wireless ordinances and if having a wireless ordinance in place affects the amount of development the carriers do in that city. I would also like to see what sort of things they like and dislike in wireless ordinances in general. Below is a preliminary draft of the questions:

Interview questions for City Planners that work in a city with a Wireless Telecommunications Ordinance:

1. How long have you worked with this city?
2. When was your wireless ordinance adopted? Has it been updated?
3. What is the application process for a brand new wireless facility? How about a modification to an existing wireless facility?
4. In your experience, what is the average length of time an application takes to completely process for a brand new wireless facility?
5. In your experience, what is the average length of time an application takes to completely process for a modification to an existing wireless facility?
6. What are some aspects of your wireless ordinance that you feel are strong components?
7. What are some aspects of your wireless ordinance that you feel are weak components that need to be improved upon?
8. Have you ever worked for a city that did not have a wireless ordinance in place? If so, what are some of the differences between the wireless process (i.e. application
9. What is the application fee for a brand new wireless facility?
10. What is the application fee for a modification to an existing wireless facility?
11. Does the city currently enter lease agreements with the carriers when they want to go on city owned land? What about in the right of way? What is the typical month to month fee the city charges?
12. Do you feel your wireless ordinance needs to be updated again?

*Ask these questions only if the interviewee worked with the city prior to the adoption/updating of a wireless ordinance*:

1. What brought about the adoption/updating of the wireless ordinance?
2. Did you notice any of the following changes once the ordinance was adopted/updated?:
   - Changes in the number of applications submitted?
   - Changes in the design of the sites when applications were submitted?
   - Changes in the length of process time for the applications
   - Changes in the number of sites approved?
   - Other changes?

Interview questions for City Planners that work in a city without a Wireless Telecommunications Ordinance:

1. How long have you worked in this city?
2. Do you know why your city does not have a wireless ordinance?
3. Do you believe your city should adopt a wireless ordinance? Why or why not?
4. Since the city does not have an ordinance, what is the application process for a brand new wireless facility? How about a modification to an existing wireless facility?
5. Is there any sort of public outreach to notify residents about the application?
6. In your experience, what is the average length of time an application takes to completely process for a brand new wireless facility?
7. In your experience, what is the average length of time an application takes to completely process for a modification to an existing wireless facility?
8. What is the application fee for a brand new wireless facility?
9. What is the application fee for a modification to an existing wireless facility?
10. Does the city currently enter lease agreements with the carriers when they want to go on city owned land? What about in the right of way? What is the typical month to month fee the city charges?

Interview questions for Wireless Planners:

1. In your experience with the cities within the four counties, what is the average length of time an application takes to completely process for a brand new wireless facility?
2. In your experience with the cities within the four counties, what is the average length of time an application takes to completely process for a modification to an existing wireless facility?
3. In your experience, has the wireless carrier ever avoided working with certain jurisdictions because the application fees were too high?
4. What are some of the more difficult jurisdictions to work with, in that they have a very strict ordinance or design guidelines?
5. What are some of the easier jurisdictions to work with in terms of wireless facilities?
6. Do the carriers ever avoid certain jurisdictions because they
7. Have you ever noticed the carriers desire to place more cell sites in jurisdictions that tend to have a less strict ordinance? How about no ordinance at all?
8. When you enter leasing agreements with jurisdictions, what would you say is the average month to month lease amount? Is there a threshold where the carrier will not pay more than a certain amount?
9. In terms of designing these cell sites, what sort of design does the carrier prefer? What design do they shy away from?
10. In your experience, has the carrier ever pulled an application or walked away from a proposed cell site because the requirements the city were placing on the design of the site were too strict?

**Step 4: Conduct Interviews**

Interviews can either be over the phone or in person- whichever the interviewee prefers. I plan to take notes while interviewing the person. I likely will ask the interviewees for their consent to record the interview. The purpose of recording the interview would be to go back and listen to it to make sure I did not miss anything that the interviewee said. If I am able to record the interview or not, I still plan to take as detailed notes as possible. Hopefully I can interview at least 5 representatives from cities with wireless ordinances, and 5 representatives without wireless ordinances. Interviews. I hope to interview at least one representative from each of the main carriers (AT&T, Sprint, T-Mobile, and Verizon). I expect each interview to take anywhere from twenty minutes to a full hour, depending on how engaging the interviewees are and how much time they themselves have.

**Method of Data Analysis**

**Step 5: Analyze Interview Data Collected**

For those interviews that were recorded, I will listen to them again and take more detailed notes to make sure I accurately noted their responses. After doing this, I will review all of the notes that were taken during the interviews and note any patterns in responses. From this information, I expect to generate some sort of chart indicating the advantages and disadvantages that I discovered from the interviews. This chart should help me determine common themes in responses, which will help determine whether or not it is advantageous to adopt an ordinance and what elements to include or avoid in an ordinance.

**Step 6: Review Wireless Ordinances and Develop a Draft Wireless Ordinance**

Based off of the responses from the planning departments and the wireless carriers in regards to what aspects they like and dislike about their ordinances, I will develop a draft wireless ordinance. I will review the wireless ordinances for those cities I interviewed and will review any ordinances that the planners recommend from other cities and pull aspects that are advantageous to the city and the carriers. My hope is for the draft ordinance to be a document that is supported by both sides: the planning departments and the wireless carriers.
9. Report Outline

I. Introduction (~2-4 pages)
   a. Research Questions
   b. Background on Cell Sites and Issues with Municipalities and the Public
   c. Hypothesis
   d. Methodology
   e. Report Structure

II. Cell Sites and the Boom In the Cell Phone Industry (~10-15 pages)
   a. What is a Cell Site?
   b. An Overview of the Boom in the Cell Phone Industry
   c. Responses to the Boom in the Cell Phone Industry
      i. Nimbyism and Public Opposition
      ii. Municipality Responses
      iii. Important Federal Laws Applicable to Regulating Cell Sites
         1. Telecommunications Act of 1996
         2. Middle Class Tax Relief and Job Creations Act of 2012

III. Wireless Telecommunication Ordinances: Advantageous or Disadvantageous? (~10-15 pages)
   a. Methodology
      i. Geographic Area Analyzed
      ii. The Interview Selection Process
      iii. Methods of Data Analysis
   b. Major Themes From Interviews With City Planners, Wireless Carriers and Literature Review
      i. Literature Review Findings
      ii. Advantages
      iii. Disadvantages

IV. Drafting an Ideal Wireless Telecommunication Ordinance (~5 Pages)
   a. Major Themes from Interviews with City Planners
   b. Major Themes from Interviews with Wireless Carriers
   c. Major Themes from Review of Existing Ordinances

V. Conclusion (~3-5 pages)
   a. Findings
   b. Limitations
   c. Policy Implications
   d. Opportunities for Future Research

Bibliography
Appendix: Complete Draft of Ideal Wireless Telecommunications Ordinance

10. Bibliography

Bibliography for Research Proposal

*Berger, Jeffrey A. “Efficient Wireless Tower Siting: An Alternative to Section 332(c)(7) of


**Other Relevant Items That I Have Read**


**Items I Have Identified As Useful And Plan To Read**


Richards, Ronald. “FCC: Ordinances That Prefer Cellular Facilities Be Located on Municipal


11. Schedule of Tasks

Spring 2014 Semester
February 18 to February 23- Incorporate advisor’s comments into Draft #2 research proposal
February 25- Submit Draft #2 of research proposal
March 2- Finish the IRB application (all forms and narrative)
March 4- Submit IRB application
March 9- Finish compiling and reading all sources. Also finish draft outline of lit review
March 11- Submit final research proposal
March 18- Submit draft #1 of literature review
March 25- Have preliminary draft of interview questions drafted. Set up appointment with Asha to review interview questions and revise as necessary.
April 7- Finish the "Introduction" Section of the report
April 13- Finish the “What is a Cell Site?” and “An Overview of the Boom in the Cell Phone Industry” section of the report
April 15- Submit Final Draft of Literature Review
April 22- Submit Draft of Report Sections (at least 4,000 words)

Summer 2014
May 1- Have final list of questions for interviews developed. Have Asha review the interview questions one last time to make sure everything looks good. Put together list of desired interviewees.
May 8- Start reaching out to planners to get them to agree to conduct interviews
June 30- Have all interviews (at least 13) completed
July 8- Finish “Responses to the Boom in the Cell Phone Industry” section
July 20- Finish compiling analysis (table showing major themes in responses) from all the interviews

Fall 2014
August 20- Finish “Wireless Telecommunication Ordinances: Advantageous or Disadvantageous” section
September 15- Finish “An Overview of the Boom in the Cell Phone Industry” section of the report
October 1- Finish the “Conclusion” section of the report
October 14- Submit Draft #1 of Final Report
October 21 to November 12- Incorporate Advisor’s Comments from Draft 1 into Draft 2
November 15- Finish the formatting of the report
November 18- Submit Draft # 2 of Final Report
November 25 to December 6- Incorporate Advisor’s Comment from Draft 2 into Final Report
December 8- Turn in Final Report