

## **URBP 298 Research Proposal**

**By**  
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### **Title**

Recommended Bicycle Parking Policies for Oakland, California

### **Audience**

The intended audience is the City Council of Oakland.

### **Background**

Oakland is in the geographical heart of the San Francisco Bay Area. It is home to over 377,000 people<sup>1</sup> and has experienced a significant population growth in the city's downtown as a result of the 10K Housing Initiative, a program to bring 10,000 residents downtown.<sup>2</sup> Its economy is varied, it is culturally diverse, and its place as the Bay Area's geographical heart makes it an important node for travel within the metropolitan region. The city is well served by both local and regional transit. All Bay Area Rapid Transit (BART) lines that serve the region run through the city. Amtrak also serves the city's regional transit needs. AC Transit, an award winning transit agency, provides local transit.<sup>3</sup>

Recent and forecasted growth will add users to the city's transportation system. Oakland recently surpassed its *10K Housing Initiative* that put 10,000 new residents downtown,<sup>4</sup> and the city is expected to continue to grow. The Association of Bay Area Governments (ABAG) forecasts Oakland to grow from 410,000 to 542,500 residents by the year 2035.<sup>5</sup> The impacts from growth could have detrimental effects on the city's and region's already congested roadways. Encouraging cycling as a means of transportation locally and as a feeder mode to transit stations could help alleviate the burden on roadways and transit.

Oakland's neighborhoods have the key elements to support bicycling as a transportation mode. A study of 50 Bay Area neighborhoods found an associative relationship between dense mixed-

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<sup>1</sup> U.S. Census, *2006 American Community Survey Data Profile Highlights: Oakland, CA*.  
<<http://factfinder.census.gov/>> [1 December 2007].

<sup>2</sup> Oakland Community and Economic Development Agency, *10K Housing Initiative* (No date).  
<<http://www.business2oakland.com/main/10kdowntownhousinginitiative.htm>> [1 December 2007].

<sup>3</sup> Clarence Johnson, "AC Transit Celebrates its 'Best of Best' Winners," *AC Transit: News* (9 June 2006)  
<<http://www.actransit.org/news/articledetail.wu?articleid=20437367>> [3 September 2007].

<sup>4</sup> City of Oakland Community and Economic Development Agency, *10K Housing Initiative* (No date).  
<<http://www.business2oakland.com/main/10kdowntownhousinginitiative.htm>> [2 September 2007].

<sup>5</sup> Russell, Kiley, "Growth forecast worries planners," *Oakland Tribune*, November 25, 2006.

use neighborhoods and vehicle trip reduction.<sup>6</sup> Oakland has many dense mixed-use neighborhoods including Old Oakland, Chinatown, Rockridge, Piedmont Avenue, Grand Lake, and Montclair. There is an associative relationship between urban design tailored for bicycle friendliness and diverse land uses with the decision to cycle.<sup>7</sup>

Oakland is poised to be a cycling city. It has a relatively mild climate and a varied topography. The city is relatively flat from the San Francisco Bay to the Oakland Hills. These flat lands ensure relatively easy bicycle rides. Conversely, the Oakland Hills provide excellent riding conditions for recreational cyclists. As Oakland grows, it should take advantage of its setting and pursue policies that encourage cycling as a means of transportation. Many destination points in Oakland are easily traveled by bicycle, but Oakland has only a 1.2% bicycle mode share.<sup>8</sup> When compared with neighboring cities like Berkeley and San Francisco, with mode shares of 5.62% and 1.98%, respectively,<sup>9</sup> Oakland's bike mode share is distressingly low but has room to grow.

One way Oakland can promote bicycling is by increasing the quantity of bicycle parking facilities. The decision to bicycle can be influenced by the type and availability of bicycle parking at destination points. There are three bicycle parking types or classes. Class I parking is high security parking, usually with weather protection.<sup>10</sup> Examples of Class I parking are storage lockers or restricted access covered areas that provide facilities for individually locked bicycles. Class II parking is intended for shorter term parking. This parking type includes racks that provide two points of contact to allow both wheels and frame to be secured with a user-supplied lock.<sup>11</sup> Class III bicycle parking is the least secure. It provides only for securing one wheel and frame.<sup>12</sup> This parking class can include street poles or bicycle racks. Long-term bicycle parking includes Class I parking. For this study, Class II facilities will be considered short-term parking. Class III parking will not be considered appropriate for this study because it does not provide two points of contact for secure parking.

### **Research Question**

What bicycle parking requirements should the city of Oakland apply to development projects to ensure they have adequate bicycle parking?

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<sup>6</sup> Robert Cervero and Kara Kockelman, "Travel Demand and the 3Ds: Density, Diversity, and Design," *Transportation Research D* 2, no. 3 (1997): 216.

<sup>7</sup> Robert Cervero and Michael Duncan, "Walking, Bicycling, and Urban Landscapes: Evidence from the San Francisco Bay Area," *American Journal of Public Health* 93, no. 9 (September 2003): 1482.

<sup>8</sup> City of Oakland Bicycle and Pedestrian Program, *City of Oakland Draft Bicycle Master Plan* (14 March 2007), 19.

<sup>9</sup> U.S. Census, 2000 *Census SF3: P30 Means of Transportation to Work for Workers 16 Years and Over* (2000). <<http://factfinder.census.gov/servlet/>> [3 January 2008].

<sup>10</sup> Victoria Transportation Policy Institute, "Online TDM Encyclopedia: Bicycle Parking," 7 March 2007, <<http://www.vtpi.org/tdm/tdm85.htm>> [10 September 2007].

<sup>11</sup> U.S. Department of Transportation Federal Highway Administration. *Lesson 22: Bicycle Parking and Storage*. No date. <[http://safety.fhwa.dot.gov/ped\\_bike/univcourse/swless22.htm](http://safety.fhwa.dot.gov/ped_bike/univcourse/swless22.htm)> [10 September 2007].

<sup>12</sup> U.S. Department of Transportation Federal Highway Administration. *Lesson 22: Bicycle Parking and Storage*. No date. <[http://safety.fhwa.dot.gov/ped\\_bike/univcourse/swless22.htm](http://safety.fhwa.dot.gov/ped_bike/univcourse/swless22.htm)> [10 September 2007].

## **Relevance**

Oakland has invested in bicycle parking but does not have a comprehensive bike parking program. It has installed over 900 bicycle racks since 1999,<sup>13</sup> but those racks address just a portion of the need and are almost exclusively short-term parking. The city can only install parking facilities in public right-of-way with neighboring business permission. These restrictions on installing public bicycle parking facilities limit the city's ability to provide adequate parking. As the city grows in population and as it expands its bikeways, Oakland needs a comprehensive program to address short-term and long-term bicycle parking needs.

In order for a bicycle network to sufficiently serve Oakland it needs to have three components: secure parking at the start-trip facility, bike and road ways to connect cyclists to their destinations, and secure bike parking at the end-trip destination. Oakland has installed over 90 miles of bicycle lanes and routes<sup>14</sup> and is continuing to expand its bikeway network.<sup>15</sup> In "Bicycle Commuting and Facilities in Major U.S. Cities," Dill and Carr found an association between bike lanes per square mile and the bicycle commuting levels.<sup>16</sup> This research suggests that as Oakland expands its bikeway network, its bicyclist mode share will increase. As the bicycle mode share increase, bicycle parking will continue to be an important issue. Secure parking is important in three ways. First, it is a primary concern for current cyclists. Secondly, it could encourage new cyclists and lastly, it could lead to increased transit use.

An extensive literature review has revealed that bicycle parking facilities are important to cyclists. In "Influences on Bicycle Use," Abraham and Hunt conducted a study of cyclists in Edmonton, Canada. They found that though many factors influencing bicycle use, secure bicycle parking has a significantly positive effect.<sup>17</sup> In this study secure bicycle parking was found to be equally attractive as a 26.5 minute reduction in cycling in mixed traffic. Other studies have found similar results. A survey of cyclists in Calgary, Canada by the same authors found that end-trip bicycle parking facilities were important enough to cyclists that they were willing to travel further for these facilities.<sup>18</sup>

Secure bicycle parking availability may also encourage non-cyclists to ride. In 1995 England's Department of Transportation funded projects to encourage bicycle use. The Nottingham Cycle-Friendly Employers project instituted many provisions, policies and facilities to encourage employees to cycle to work. The more popular and successful programs included secure bicycle parking.<sup>19</sup> This is a reasonable conclusion when considering where commuters could store their

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<sup>13</sup> The City of Oakland, Public Works Agency, *Bicycle/Pedestrian – Bicycle Parking* (29 June 2007). <<http://www.oaklandpw.com/Page127.aspx>> [23 July 2007].

<sup>14</sup> Bicycle lanes are striped on-street bicycle facilities. Bicycle routes are un-striped on-street bicycle routes recommended for cycling.

<sup>15</sup> The City of Oakland, Public Works Agency, *Bicycle/Pedestrian – Bike Lanes and Routes* (29 June 2007) <<http://www.oaklandpw.com/Page122.aspx>> [23 July 2007].

<sup>16</sup> Jennifer Dill and Theresa Carr, "Bicycle Commuting and Facilities in Major U.S. Cities," *Transportation Research Record* 1828 (2003): 121.

<sup>17</sup> John E. Abraham and John Douglas Hunt, "Influences on Bicycle Use," *Transport* 34 (2007): 466.

<sup>18</sup> John E. Abraham, Susan McMillan, Alan T. Brownlee, and John Douglas Hunt, "Investigation of Cycling Sensitivities" (presented at the Transportation Research Board Annual Conference, Washington D.C. January 2002): 10.

<sup>19</sup> Johanna Cleary and Hugh McClintock, "The Nottingham Cycle-Friendly Employer's Project: Lessons for Encouraging Cycle Commuting," *Local Environment* 5, no. 2 (2000): 220.

bicycles during the day. Cubicles are too small for storage and locking a bicycle outside for a full work day is not secure.

Bicycle parking at transit stations are also important and may increase transit ridership. Over 85% of Oakland residents live within 2 miles of transit.<sup>20</sup> Many studies cite bicycle parking as part of a successful transportation network. In “Green Connectors: Off-Shore Examples,” Robert Cervero discusses how green connectors to transit and bicycle parking help encourage bike-and-ride trips.<sup>21</sup> In “Why Canadians cycle more than Americans: A comparative analysis of bicycling trends and policies,” Pucher and Buehler found that in many large Canadian cities, where bike mode share is higher than most American cities, local governments provide and require more bicycle infrastructure. Governments provide ample bicycle parking in public spaces such as sidewalks and at transit stations and additionally have policies that require private development to provide bicycle parking facilities.<sup>22</sup>

A study of bicycle parking policies is needed because existing policies differ greatly and my literature review find? studies investigating appropriate frameworks for bicycle parking requirements or bicycle parking policy assessments. There have been two bicycle parking requirement comparisons for some North American cities.<sup>23</sup> Provided by the Massachusetts Bicycle Coalition, these comparisons are a list of general requirements by land use categories but are not an analysis of requirements or a determination of appropriate frameworks for developing requirements. Although a bicycle parking policy comparison is helpful as a starting point, determining Oakland’s bicycle parking policies will require policy analysis as well as an investigation into the appropriate framework for requirements by land use. This study, while specifically addressing Oakland’s needs, will be valuable to other cities as they consider enacting bicycle parking policies.

### **Hypothesis**

Oakland should establish a bicycle parking policy that requires private development as well as public agencies to provide short and long-term secure bicycle parking. The city should establish bicycle parking policies that are determined by land use activity. Policies that are determined by land use will reflect anticipated demand and need. Means of determination will be unit count, square footage, or number of occupants.

Many major international and U.S. cities have implemented bicycle parking requirements for private development<sup>24</sup> and Oakland should follow their example. Developments appropriate for bicycle parking includes residential uses, commercial, as well as transit facilities. Commercial and transit facilities are key components to increasing bicycle mode share. Robert Cervero

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<sup>20</sup> City of Oakland Bicycle and Pedestrian Program, *City of Oakland Draft Bicycle Master Plan* (14 March 2007), 19.

<sup>21</sup> Robert Cervero, “Green Connectors: Off-Shore Examples,” *Planning* 69, no. 5 (May 2003): 27.

<sup>22</sup> John Pucher and Ralph Buehler, “Why Canadians Cycle more than Americans: A Comparative Analysis of Bicycling Trends and Policies,” *Transport Policy* 13 (2006): 273.

<sup>23</sup> Massachusetts Bicycle Coalition, *Bicycle Parking* (12 August 2005).  
<<http://www.massbike.org/bikelaw/parking.htm>> [2 September 2007].

<sup>24</sup> Massachusetts Bicycle Coalition, *Bicycle Parking* (12 August 2005).  
<<http://www.massbike.org/bikelaw/parking.htm>> [2 September 2007].

discusses how transit use in Latin American and European cities is higher than American cities and how these transit stations are better served by bicycle facilities.<sup>25</sup> Cycling is predominantly a recreational activity but encouraging cycling as a commuting option could alleviate congestion if adequate facilities are available. Bicycle parking requirements should be based on a various indicators such as unit count, square footage and number of employees. Requirements should not be based on automobile parking because auto demand is not an indicator of bicycle demand and because automobile parking requirements are often based on what other cities have done or on peak demand for suburban uses.<sup>26</sup>

Additionally, Oakland should provide options for off-site parking or in-lieu fees. Successful bike parking stations that serve an area rather than a specific building may provide a solution for developments that are not able design bike parking into their facilities. The Long Beach bike station<sup>27</sup> and the Chicago bike station at Millennium Park<sup>28</sup> are examples of parking that could be an alternative to on-site facilities. In-lieu fees that are directed to providing parking in the vicinity of the development project will serve the same purpose.

## **Methods**

- 1) Identify and evaluate bicycle parking policies in Oakland and other cities.
  - a) Identify Oakland's bicycle parking policies and objectives
    - i) Data sources: Oakland 1999 Bicycle Master Plan, Draft 2007 Bicycle Master Plan, Oakland Planning Code
    - ii) Reason for collecting data: The data will be used to give an understanding of Oakland's current policies regarding bicycle parking. It will also be used to understand the city's policies, goals, and objectives in regards to cycling in general.
    - iii) Data collection procedures: Find draft and adopted policy documents and municipal codes on the web, or call appropriate agencies to request copies if the documents are not on the web.
    - iv) Method of analysis: I will create a matrix of current and proposed policies, goals, and objectives.
  - b) Identify bicycle parking policies used by other cities.
    - i) Data sources: Municipal codes, *Municipal Bike Parking Requirements* (Arthur Ross), *Bike Parking Requirements in North American Cities* (Paul Schimek), and other sources that identify cities with bicycle parking policies and in-lieu fees.
    - ii) Reason for collecting data: The data will be used to create a matrix of bicycle parking requirements organized by land use activity. Secondary sources that cite cities with bicycle parking policies will provide a starting point for identifying which cities have

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<sup>25</sup> Robert Cervero, "Green Connectors: Off-Shore Examples." *Planning* 69, no. 5 (May 2003): 26.

<sup>26</sup> Donald C. Shoup, *The High Cost of Free Parking* (Chicago: Planners Press, 2004), 32.

<sup>27</sup> Earl S. Cryer, "How Valet Parking Could Save the Planet," *Time* (24 May 2007).  
<<http://www.time.com/time/world/article/0,8599,1625309,00.html>> [19 August 2007].

<sup>28</sup> Zach Patton, "Pedal Push," *Governing* 20, no. 2 (November 2006): 58-60.

- policies. Existing bicycle parking policies will be used as a basis for what policies can be used as well as guide what is appropriate and reasonable for Oakland.
- iii) Data collection procedures: Data will be collected through web and library searches or published material, as well as interviews with bicycle planners.
  - iv) Method of analysis: There are many cities with bicycle parking policies. I will create a matrix of policies that include three categories of cities: cities that are comparable to Oakland in population, density, and bicycle mode share; cities that have innovative policies; and cities in the Bay Area that may share cultural and environmental similarities to Oakland.
- c) Of cities that have bicycle parking policies, identify which are comparable to Oakland in population, density and bicycle mode share.
- i) Data sources: Census 2000, Statistics Canada 2001
  - ii) Reason for collecting data: In order to compare bicycle parking policies that may be appropriate for Oakland, cities that are similar in population, density and bicycle mode share will help determine politically acceptable levels of required bicycle parking.
  - iii) Data collection procedures: Determine Oakland's statistics and compare to cities that have bicycle parking policies.
  - iv) Method of analysis: Cities that are similar to Oakland will be used for comparison.
- d) Evaluate bicycle parking policies
- i) Data Sources: Municipal codes
  - ii) Reasons for collecting data: Evaluate existing bicycle parking policies for possible frameworks, procedures, and scope.
  - iii) Data collection procedures: Find draft and adopted policy documents and municipal codes on the web, or call appropriate agencies to request copies if the documents are not on the web.
  - iv) Method of analysis: Bicycle parking policies will be organized into a matrix to facilitate comparison. A policy-analysis approach will be used. Evaluation criteria will include economic impacts to development, ability to create adequate bicycle parking, and political acceptability.
- 2) Interview city planners, officials and bicycle program staff
- a) Data Sources: City planners, officials and bicycle program staff at selected cities with bicycle parking policies.
  - b) Reason for collecting data: To gather knowledge of the success, concerns, effectiveness, and background information regarding their cities' bicycle parking programs.
  - c) Data collection procedures: Telephone interviews.
  - d) Method of analysis: Qualitative summaries of staff's perceptions may be included in the analysis of potential policies and recommendations for Oakland

- 3) Research published literature and studies about bicycling facilities.
  - a) Data Source: Data will include peer reviewed and other journal articles, reports, as well as magazine and newspaper articles.
  - b) Reason for collecting data: The data from this research will provide insight into what bicycle parking facilities exist, what are the needs of cyclists, and whether bicycle parking encourages cycling.
  - c) Data collection procedures: Literature will be gathered from databases available through San Jose State University Library, as well as other databases including Google Scholar, Melvyl, and TRIS Online.
  - d) Method of analysis: Categorize studies by reasons why cycling is important to cities, successful bicycle programs, and cyclist preferences.
- 4) Research parking policies for cars
  - a) Data Source: Data will include municipal codes and literature.
  - b) Reason for collecting data: The data from this research will provide insight as to how anticipated demand is determined for particular land use activities. Anticipated auto demand may indicate expected volume of users which may be helpful in determining levels of bicycle parking needed.
  - c) Data collection procedures: Find draft and adopted policy documents and municipal codes on the web, or call appropriate agencies to request copies if the documents are not on the web.
  - d) Method of analysis: Municipal code requirements will be categorized. Literature will provide the framework for understanding how auto parking policies are determined.

## **Report Outline**

### List of Tables and Figures

- 1) Introduction to Research
  - a) Research question (<1 page)
  - b) Relevance of research (2 pages)
  - c) Overview of report (< 1 page)
- 2) Oakland: urban context, conditions, cycling environment
  - a) Oakland: urban context (2 pages)
    - i) Location with the Bay Area region
    - ii) Bicycling potential of natural and built environment
      - (1) Topography and weather
      - (2) Land uses and neighborhoods
  - b) Existing bicycle facilities (2 pages)
    - i) Bikeways
    - ii) Bicycle parking
      - (1) Short-term
      - (2) Long-term
  - c) Existing bicycle policies (1 page)
- 3) Why more bicycle parking will benefit Oakland.
  - a) Bicycling as a part of Oakland's transportation network (1 page)
  - b) Bicycle parking as a part of a complete bicycle network (1 page)
  - c) Preferences of cyclists (include success of bike stations) (2 pages)
- 4) Bicycle parking policies in other cities
  - a) Criteria for choosing comparative cities (>1 page)
  - b) Frameworks for Bicycle Parking Requirements (1 page)
  - c) Examples of determining needs from other cities (3 pages)
    - i) Proportion of automobile parking requirements
      - (1) Analysis
    - ii) Proportion of building square footage and building occupancy
      - (1) Analysis
  - d) Analysis of bicycle parking requirements
    - i) Residential land use activities (3 pages)
    - ii) Civic land use activities (2.5 pages)
    - iii) Commercial land use activities (3 pages)
    - iv) Manufacturing and other land use activities (2 pages)
- 5) Recommendations for Oakland
  - a) Framework for requirements (1 page)
    - i) Bicycle parking requirements by district option
    - ii) In-lieu fees options
  - b) Residential land use activities (1 page)
  - c) Commercial land use activities (2 pages)
  - d) Manufacturing and other land use activities (1 page)
  - e) Impacts to development (2 pages)
- 6) Conclusion (1 page)
- 7) Bibliography



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***Relevant items not yet read***

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### Schedule of Tasks

<b>Date</b>	<b>Task</b>
09.04.07	* Draft #1 of Research Proposal
09.09.07	Begin Draft #2 of Research Proposal
09.16.07	Begin literature review, IRB Application
09.17.07	* Draft #2 of Research Proposal; Peer Review for colleague's proposals
09.20.07	* Peer Review due
09.20.07	Research cities that have bicycle parking policies
09.24.07	* Draft #1 of IRB Application; continue working on draft literature review
09.27.07	* Final Research Proposal
09.27.07	Identify which cities with bicycle parking policies will be used for comparison and reference
10.04.07	* Draft of Literature Review
10.04.07	Revise IRB Application; Create comparison table of bicycle parking policies
10.11.07	Revise Literature Review
10.17.07	* Final IRB Application
10.18.07	Finalize Literature review; Research and review auto parking requirements
10.25.07	Identify possible frameworks for bicycle parking policies
10.29.07	* Final Literature Review
11.01.07	Identify possible interview candidates and make appointments
11.08.07	Interviews; Begin writing draft report section "Oakland: Urban context, Conditions, Cycling environment"
11.15.07	Interviews; Begin writing draft report section "The Case for Bicycle Parking"
11.22.07	Begin writing draft report section "Case Studies: Bicycle Parking Policies in Other Cities"
11.29.07	Begin writing draft report section "Frameworks for Bicycle Parking Requirements"
12.02.07	Begin writing draft report section "Specific Recommendations for Oakland"
12.09.07	Finalize Draft Report Sections
12.10.07	* Draft Report Sections
12.16.07	Review feedback from Draft Report Sections
12.23.07	Holiday
12.30.07	Revise "Oakland: Urban context, Conditions, Cycling Environment"
01.06.08	Revise "The Case for Bicycle Parking"
01.13.08	Finalize "The Case for Bicycle Parking"
01.20.08	Revise "Case Studies: Bicycle Parking Policies in Other Cities"
01.27.08	Finalize "Case Studies: Bicycle Parking Policies in Other Cities"
02.03.08	Revise "Frameworks for Bicycle Parking Requirements"
02.10.08	Finalize "Frameworks for Bicycle Parking Requirements"
02.17.08	Revise "Specific Recommendations for Oakland"

02.24.08	Finalize “Specific Recommendations for Oakland”
03.02.08	Begin writing “Conclusion”
03.09.08	Begin writing “Introduction”; Revise and complete “Conclusion”
03.16.08	Revise and complete “Conclusion”
03.17.08	* Turn in first full draft of report
03.23.08	Revise first full draft of report
03.30.08	Revise first full draft of report
04.06.08	Revise first full draft of report
04.13.08	Revise first full draft of report
04.17.08	* Turn in second full draft of report
04.20.08	Revise second full draft of report
04.27.08	Revise second full draft of report
04.28.08	* Turn in final draft of report
05.01.08	* Turn in finished final draft