Parking Management for Silicon Valley

A Guide for Planners, Decision Makers, and the General Public

A Thesis

Presented to the Faculty of

California Polytechnic State University

San Luis Obispo

In Partial Fulfillment of the Requirements for the Degree

Master of City and Regional Planning

By

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COMMITTEE MEMBERSHIP


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ABSTRACT


Tracy Wang

The crisis of climate change has jumpstarted a renewed interest in environmental sustainability. The growing awareness of the problem and the ensuing intense search for solutions called for a scrutinizing reexamination of the relationships between transportation, land use, and greenhouse gas emissions. Major publications such as *The High Cost of Free Parking* by Donald Shoup in 2005, and *Parking Management, Strategies, Evaluation and Planning* by Todd Litman in 2008, have identified parking as a crucial link. Parking issues are intrinsic to planning because parking facilities are a major land use type that affects how we design and build our commercial and residential areas, as well as influences our travel behavior which directly affects the form of urban infrastructure demanded by society.

The management of parking demand and supply is highly complex because of its political and controversial nature. This thesis studies parking comprehensively in order to provide a guide for Silicon Valley cities. The contents of this comprehensive toolbox include background information, overview of major strategies with local examples, suggestions for securing financial and human resources necessary for planning and implementation of parking policies, and an inventory and analysis of current policies of 22 Silicon Valley cities. Also included in the appendix is a presentation with illustrations summarizing the thesis, titled "The Story of Parking".

This study recommends strengthening the language of existing, adopted parking policies and following up with appropriate implementation measures to decrease general parking demand in Silicon Valley cities. Cities can further manage their parking supply and demand by adopting new policies such as parking maximums, allowance of off-site parking with shuttle services, allowance of parking lifts, and improving accessibility of parking user information. More aggressive policies to adopt and implement include parking taxes, parking pricing, encouraging car share, and unbundling parking.
ACKNOWLEDGEMENTS

The author thanks Associate Professor Cornelius Nuworsoo for his insightful comments and overall guidance, and the planning staff from Santa Clara Valley Transportation Authority for initial introduction to the issues of parking and for offering their general support.
# TABLE OF CONTENTS

LIST OF TABLES ................................................................................................................. ix
LIST OF FIGURES ................................................................................................................ x
EXECUTIVE SUMMARY ........................................................................................................ xi

CHAPTER

1. INTRODUCTION ............................................................................................................. 1
   1.1 Organization ............................................................................................................. 2
   1.2 Methodology ............................................................................................................ 3

2. BACKGROUND ISSUES ................................................................................................. 4
   2.1 Reducing Congestion and Greenhouse Gas Emissions Through Parking Policy ....................................................................................................................... 4
   2.2 Minimum Parking Requirements ............................................................................. 13
      2.2.1 The Principles of Minimum Parking Requirements ...................................... 13
      2.2.2 The Relationship Between Minimum Parking Requirements and free parking .................................................................................................................. 14
      2.2.3 The Costs of Minimum Parking Requirements ............................................. 15
      2.2.4 Factors Reinforcing the Usage of Minimum Parking Requirements ............. 18
   2.3 The Politics of Minimum Parking Requirements ..................................................... 23
      2.3.1 Transportation Politics and the Political Process ............................................ 23
      2.3.2 Addressing Stakeholder Concerns .................................................................... 24
      2.3.3 Gaining Stakeholder Support ......................................................................... 27

3. OVERVIEW OF PARKING POLICIES AND STRATEGIES ............................................. 28
   3.1 Effectiveness of Parking Policies/Programs ............................................................... 28
   3.2 Parking Supply .......................................................................................................... 30
      3.2.1 Parking Maximums ........................................................................................ 30
      3.2.2 Reduced Parking Requirements ..................................................................... 31
      3.2.3 In-lieu Fees ..................................................................................................... 32
      3.2.4 Landscape Reserves ....................................................................................... 33
3.2.5 Remote Parking…………………………………………………………… 34
3.2.6 Shared Parking…………………………………………………………… 35
3.2.7 Increase Capacity of Existing Parking Facilities………………… 38
   Reduced Parking Stall Size……………………………………………… 38
   Tandem Parking ………………………………………………………… 39
   Angled Parking………………………………………………………… 39
   Mechanical Parking …………………………………………………… 41
   Automated Parking………………………………………………… 42

3.3 Parking Demand……………………………………………………………… 44
3.3.1 On Street Pricing………………………………………………………… 46
3.3.2 Unbundled Parking…………………………………………………… 50
3.3.3 Commuter Financial Incentives……………………………………… 53
3.3.4 Parking Districts……………………………………………………… 55
3.3.5 Car Share……………………………………………………………… 57
3.3.6 Parking User Information and Technology……………………… 59
   Pre-Trip Parking Information Systems………………………………… 60
   Lot Specific Parking Information Systems…………………………….. 60
   Floor, Aisle and Space Specific Parking Information Systems 60
   Real Time Reservation Systems………………………………………… 61
   Other Systems…………………………………………………………… 62

3.4 Parking Program Financing………………………………………………… 65
3.4.2 Parking Taxes……………………………………………………………… 65
3.4.3 Grants……………………………………………………………………… 66
   U.S Environmental Protection Agency…………………………………… 67
   Department of Energy……………………………………………………… 67
   California Energy Commission………………………………………. 67
   Bay Area Air Quality Management District……………………… 68
   Metropolitan Transportation Commission…………………………… 69
   James Irvine Foundation………………………………………………… 70
   Silicon Valley Community Foundation……………………………… 71

3.5 Developing a Parking/Implementation Plan…………………………… 72
3.6 Conclusion…………………………………………………………………… 73

4.  SNAPSHOT OF SILICON VALLEY PARKING POLICIES……………… 74
4.1 Methodology.............................................................................. 75
4.2 Results...................................................................................... 76
4.2 Recommendations................................................................. 77

5.  CHAPTER REFERENCES.......................................................... 79

6.  APPENDICES............................................................................. 88
5.1 Grant Proposal........................................................................... 89
5.2 Request for Proposal............................................................... 115
5.3 Inventory and Analysis of Silicon Valley Parking Policies........... 126
5.4 Outreach Material: The Story of Parking................................. 136
LIST OF TABLES

Table E-1-Parking Supply Management in Silicon Valley……………………………… xiii
Table E-2-Parking Demand Management in Silicon Valley………………………… xiv
Table E-3-Funding Sources for Non-Profits/Other Organizations…………………… xv
Table E-4-Funding Sources for Local Governments…………………………………… xvi
Table 2.1-Comparison of Old and New Parking Paradigms................................. 11
Table 3.2- Factors Affecting Parking Supply....................................................... 30
Table 3.2.1- Redwood City Downtown Parking Zone........................................ 31
Table 3.2.3- Parking In-Lieu/Impact Fees for Office Buildings in 2002................. 33
Table 3.2.6- Comparison of Parallel and Angled Parking.................................... 41
Table 3.3- Factors Affecting Parking Demand and Requirements........................ 44
Table 3.3.1- Parking Pricing Obstacles and Potential Solutions........................ 49
Table 3.3.2- Parking Requirement and Actual Parking Demand........................ 52
Table 3.3.6- Potential Stakeholders and Roles.................................................... 63
Table 3.4.3- Sample of Funded Projects from California Democracy Program ..... 70
Table 3.4.3a- Sample of Proposals for Regional Planning Strategy Program........ 71
Table 4.1- Current and Potential Parking Demand Reductions for Silicon Valley…. 76
LIST OF FIGURES

Figure 2.1- California Climate Policy ................................................................. 7
Figure 2.2- Effect of Parking Costs on Developer Profits per Acre ................... 17
Figure 2.3- Six-Step Process of Planning for Free Parking ............................ 22
Figure 3.1- Effectiveness of Parking Policies and Programs .......................... 29
Figure 3.2.5- Parking Demand Cycles ............................................................... 36
Figure 3.3.2- Vehicle Ownership Reduction from Residential Parking Pricing ... 52
Figure 4.1- Map of Silicon Valley Cities ......................................................... 74
EXECUTIVE SUMMARY

BACKGROUND AND PURPOSE
The crisis of climate change has jumpstarted a renewed interest in environmental sustainability. The growing awareness of the problem and the ensuing intense search for solutions called for a scrutinizing reexamination of the relationships between transportation, land use, and greenhouse gas emissions.

Parking management is an effective solution for many different planning objectives: affordable housing and infill development, encouragement of trips by walking, cycling, and public transportation, reduction of traffic and parking congestion, and reduction of greenhouse gas emissions and sprawl.

This thesis advocates parking reform as part of the solution to reducing vehicle miles traveled (VMT) and greenhouse gas emissions in climate action planning. It is written for the suburban context—specifically for Silicon Valley cities—as a guide on best practices in parking management. The goal for the parking guide is to be an education and advocacy tool for municipalities to overcome the hurdles in adopting and implementing policies for parking reform.

To aid Silicon Valley communities in reforming their parking policies to achieve these objectives, this study has drawn liberally from many resources to identify major parking management strategies, provide supportive examples and case studies that demonstrate the success of parking management in comparable communities, and suggest methods to overcome common barriers to implementation of the strategies. The study also provides suggestions for securing financial and human resources necessary for planning and implementation of parking policies, and an inventory and analysis of current policies of 22 Silicon Valley cities.
PARKING SUPPLY

Parking supply is the total amount of parking spaces in a city. A city’s planning department typically manages parking supply. The planning department prescribes a minimum number of spaces that must be built along with any significant expansion or new development. The numbers of spaces vary by land use and can be specific to the number of units in a housing development, or number of seats in a theatre and so on. The study reviews various methods of managing parking supply to make sure valuable land and funds are not wasted on providing too much parking. These methods include prescribing parking maximums, reducing parking requirements, allowing different uses to share the same parking facility, and increasing the capacity of existing facilities with more efficient layouts and technologies.

Table E-1 presents an overview of parking supply management policies in Silicon Valley. A review shows that most cities allow flexible parking requirements, reducing the minimum parking requirement for senior housing, developments near transit hubs and such. The majority of cities studied also allowed some type of shared parking, and allowed tandem and angled parking. Few cities had parking maximums, and only one city, San Carlos, allows the use of mechanical parking systems in their code.

PARKING DEMAND

Parking demand refers to the amount of parking that would be used at a particular time, place and price. Parking demand can fluctuate depending on other transportation alternatives available, user information and technology, and of course, pricing. Parking supply and demand must be balanced to provide easy and efficient use of existing parking spaces. Improvements in technology are making this easier to achieve in real-time. The study reviews various methods of managing parking demand such as on-street pricing, unbundled parking, parking districts, and user information and technology.

Table E-2 presents an overview of parking demand management policies in Silicon Valley. A review shows that the majority of cities have some type of financial incentive for
commuters. Less than half of the cities studied provided clear user information on parking (location of lots, restrictions, etc.) on their websites. Few cities had on-street pricing, and only one city, Santa Cruz, implements a parking tax.

Table E-1-Parking Supply Management in Silicon Valley

<table>
<thead>
<tr>
<th>County/ City</th>
<th>Parking Maximums</th>
<th>Flexible Standards</th>
<th>Remote Parking/ Shuttle Services</th>
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<th>Increase Capacity of Existing Parking Facilities</th>
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PARKING PROGRAM FINANCING

Creating and managing parking programs require funds to cover capital and operating costs. The study introduces how parking taxes can help provide incentives to reduce vehicle ownership and raise revenue to run programs. However, the main focus of this section is to explore current grants available. A list of funders and grants are provided based on their potential interest in funding parking studies and programs as part of transportation demand management programs or smart growth/transit-oriented developments. Many of these funders are listed because they previously funded similar projects and/or their stated mission is to support emission reductions and smart growth.

Tables E-3 and E-4 provide an overview of federal and local funding sources that do or may support planning and implementation of parking policies. These tables are by no means exhaustive, but rather do offer an idea of the kinds of programs available, who receives them, and for what type of projects. Parking planning and implementation programs are often tied in as actions under a greater sustainability strategy to combat climate change. There are many funding programs that support emissions reduction, transit-oriented developments and encourage community input in planning processes.

Table E-3-Funding Sources for Non-Profits/Other Organizations

<table>
<thead>
<tr>
<th>Program Name</th>
<th>Foundation</th>
<th>Supports</th>
<th>Who May Apply</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Democracy Program</td>
<td>James Irvine Foundation</td>
<td>Include community members in policymaking on transit issues, land use decisions, etc.</td>
<td>Local communities in policymaking (Community Development Institute, Working Partnerships, USA, Urban Habitat Program, TransForm)</td>
</tr>
<tr>
<td>Regional Planning Strategy Program</td>
<td>Silicon Valley Community Foundation</td>
<td>Community participation in Building sustainable land use and transportation plans (adopt parking policies to support transit-oriented development, increase public awareness/support)</td>
<td>Local communities (TransForm, Working Partnerships, USA, The Sierra Club, Redwood City)</td>
</tr>
<tr>
<td>Program Name</td>
<td>Source</td>
<td>Administered By</td>
<td>Supports</td>
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<tr>
<td>Mobile Source Outreach Assistance Program</td>
<td>The Clean Air Act</td>
<td>U.S. Environmental Protection Agency (EPA)</td>
<td>Reduce emissions from cars (parking benefit district)</td>
</tr>
<tr>
<td>Energy Efficiency and Conservation Block Grant (EECBG)</td>
<td>American Recovery and Reinvestment Act</td>
<td>Department of Energy</td>
<td>Reduce fossil fuel emissions, reduce total energy use, improve energy efficiency in transportation, building, other sectors</td>
</tr>
<tr>
<td>EECBG’s Climate Action Planning Grant</td>
<td>American Recovery and Reinvestment Act</td>
<td>California Energy Commission</td>
<td>Climate Action Planning (Parking management programs as part of Transportation Demand Management for emissions reduction)</td>
</tr>
<tr>
<td>Mobile Source Incentive Fund (MSIF)</td>
<td>$2 surcharge fee on vehicles registered with the Department of Motor Vehicles (DMV)</td>
<td>Bay Area Air Quality Management District (BAAQMD)</td>
<td>Finance vehicle scrap programs, agricultural assistance programs, purchasing new lower-emission school buses (Note: Funds available for both public and private sector)</td>
</tr>
<tr>
<td>Transportation Fund for Clean Air (TFCA)</td>
<td>$4 surcharge on motor vehicles registered in the Bay Area.</td>
<td>Air District, Congestion Management Agencies</td>
<td>Decrease motor vehicle emissions to improve air quality (purchase or lease clean air vehicles, shuttle/feeder bus service, ridesharing programs, bicycle facility improvements)</td>
</tr>
<tr>
<td>Station Area Planning Grant Program</td>
<td>MTC’s funding sources include AARA, TIP, RM2, STIP, FTA, Prop 1B, FMS, etc.)</td>
<td>Metropolitan Transportation Commission (MTC)</td>
<td>Station-area planning efforts. (plans are required to include parking demand and parking requirements)</td>
</tr>
<tr>
<td>Transportation for Livable Communities Program</td>
<td>MTC’s funding sources include AARA, TIP, RM2, STIP, FTA, Prop 1B, FMS, etc.)</td>
<td>Metropolitan Transportation Commission (MTC)</td>
<td>Community-based transportation projects (implementing parking management best practices)</td>
</tr>
<tr>
<td>Climate Initiatives Program (Innovative Grant Program, Safe Routes to School)</td>
<td>MTC’s funding sources include AARA, TIP, RM2, STIP, FTA, Prop 1B, FMS, etc.)</td>
<td>Metropolitan Transportation Commission (MTC), Bay Area Air Quality Management District (BAAQMD), Association of Bay Area Governments (ABAG), Bay Conservation and Development Commission (BCDC)</td>
<td>Demonstration projects to test strategies in reducing transportation-related emission and vehicle miles traveled (VMT), encourage the use of cleaner fuels (Note: Funds also available for community organizations and businesses)</td>
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IMPLEMENTATION PLAN

The study provides a brief summary of tips from The Parking Handbook for Small Communities, by John D. Edwards. Edwards describes what should be included in a parking plan, how to secure endorsement for the plan, and how to implement and maintain the plan.

A well-conceived parking plan needs to consider current and future parking demand. The plan should specify how the plan actions and programs will be implemented, managed, reviewed/revised and financed. A flexible and responsive regulation strategy is desired because parking conditions are ever changing. It is also more resource effective to establish recommendations to increase effectiveness of current parking supply before constructing new parking facilities.

Edward suggests involving stakeholders when identifying problem, before beginning data gathering and analysis, and throughout the planning process. For successful implementation, it is crucial to secure support from stakeholders on the costs of completing the plan, and to secure endorsement from the city to review existing regulations that may be in conflict with the incorporated parking plan. For monitoring progress, it is important to first create a set definition of how effectiveness of parking strategies will be measured.

The next step is to establish the management (staff and funding) within a specific timeframe after plan adoption. The city should complete necessary revisions to existing city plans (comprehensive plan, downtown specific plan, land-use/zoning ordinances, and building code) to reflect the conditions established by the adopted parking plan no later than a year after plan adoption.

Once the plan is implemented, Edward recommends conducting an informal assessment every 12 to 18 months, and a thorough update every three to five years. Elements that may require fine-tuning include time limits, fees, fines, restrictions, financing options, management system, etc.
COMPARATIVE ANALYSIS OF SILICON VALLEY PARKING POLICIES

This study provides a brief inventory of the major parking policies adopted by 22 cities in Silicon Valley—as evidenced by zoning ordinances, municipal codes, and City websites—and analyzes the estimated current and potential reduction in general parking demand as a result of those strategies. The analysis provides a minimum and maximum percentage for typical reductions achievable for the particular set of strategies each city currently has adopted. These reductions account for the fact that implementing multiple parking strategies in an area results in a compounded reduction in demand. Results show that parking policies adopted have little correlation with population, population density per square mile, or even county affiliation.

From the inventory, the most common parking policies adopted in Silicon Valley included shared/joint parking, tandem and angled parking, and reduced requirements for certain areas or uses. Also common were methods to address spillover parking such as time limits and parking permits. Parking user information (sharing information on parking location, availability, or promoting certain parking-related programs) accessible by city websites was only provided by nine of the 22 cities.

The least common parking policies were generally the policies that are more politically difficult to implement, such as parking pricing or parking taxes. Only five cities have parking pricing: Foster City, Redwood City, San Mateo, San Jose, and Santa Cruz. Santa Cruz was the only city inventoried that has a parking tax. None of the cities studied unbundles parking as a strategy; and although car share is often listed, there is no car share company serving Silicon Valley.

The comparative analysis suggests that by simply strengthening the language of existing, adopted parking policies and following up with appropriate implementation measures, cities can decrease general parking demand by approximately 8 percent.
RECOMMENDATIONS

This study therefore recommends strengthening the language of existing, adopted parking policies and following up with appropriate implementation measures to decrease general parking demand in each city. Cities of Los Altos, Morgan Hill, and Saratoga especially have the most to gain with this method, and would be able to reduce general demand by an additional 20 to 35 percent in each city. If cities with no difference between current and potential scenarios need to further manage their parking supply and demand, they can adopt new policies such as parking maximums, allowance of off-site parking with shuttle services, allowance of parking lifts, improving accessibility of parking user information, and incorporating parking management strategies in their Transportation Demand Management programs. More aggressive policies to adopt and implement include parking taxes, parking pricing, encouraging car share, and unbundling parking.
INTRODUCTION

Parking is an unquestioned land use whose proliferation and existence have been largely unchallenged as part of the urban landscape. Now, in a time where cities are pressured to develop mitigation and adaptation measures in response to climate change, the potential for parking policies to change travel behavior and reduce greenhouse gas emissions must not be overlooked.

This thesis advocates parking reform as part of the solution to reducing vehicle miles traveled (VMT) and greenhouse gas emissions in climate action planning. It is written for the suburban context—specifically for Silicon Valley cities—as a guide on parking management best practices. The goal for the parking guide is to be an education and advocacy tool for municipalities to overcome the hurdles in adopting and implementing policies for parking reform.

The guide is unique in that it aims to provide a complete toolbox for cities including background information, overview of major strategies with local examples, suggestions for securing financial and human resources necessary for planning and implementation of parking policies, and an inventory and analysis of current policies of 22 Silicon Valley cities. A major portion of this guide is dedicated to the consolidation and summarization of crucial information necessary for educated and defensible policy-making. Information is drawn from several key resources. As Donald Shoup and Todd Litman have been the main advocates for parking reform, the literature review for the guide rests largely in their work; however, a range of research on parking policies has also been utilized. These sources are referenced throughout the document.

ORGANIZATION

The focus of this guide is on the reduction or elimination of parking requirements; however these should be done in conjunction with other parking policies to effectively manage parking supply and demand. As such, the guide appropriately organizes policies by parking supply and demand and attempts to give all major policies equal coverage.
Chapter 1: Introduction

The guide first reviews the legislative, environmental, social, political and economic issues associated with parking policy. The second chapter reviews major parking policies and specifically the drawbacks, benefits, and strategies for overcoming barriers for each policy. As an education and advocacy tool for Silicon Valley municipalities, examples and case studies of parking strategies are drawn from the Bay Area and within California whenever possible. Also included at the end of this chapter are an exploration of funding sources and a brief outline of common steps in plan development and implementation. As cities are under particular fiscal constraints in the current recession, it is worthwhile to explore possible revenue sources for parking management that will not take any existing revenue from the general fund. The sources of funding in this section are identified merely for their potential interest in funding parking studies and programs as part of transportation demand management programs or smart growth/transit-oriented developments. The appendices include a hypothetical grant proposal and Request for Proposal (RFP) authored by me as an aid for municipalities to develop their own.

The final chapter provides a brief inventory of the major parking policies adopted by 22 cities in Silicon Valley—as evidenced by zoning ordinances, municipal codes, and City websites—and analyzes the estimated current and potential reduction in general parking demand as a result of those strategies. This comparative analysis identifies the most and least utilized policies amongst the cities and offers recommendations for improvement based on difficulty of implementation. For example the analysis shows that by simply strengthening the language of existing, adopted parking policies and following up with appropriate implementation measures, cities in Silicon Valley can decrease general parking demand by approximately 8 percent.

1.2 STUDY METHODOLOGY

The research methodology included extensive literature review and data acquisition. Information for the background chapter and the overview of major policies chapter was obtained mainly through research publications and from Internet sources. Policy data for the inventory was
gathered from zoning ordinances, municipal codes, city websites, and the occasional confirmation phone call or e-mail correspondence with planning staff.

The percentages of parking demand reductions attributable to various strategies are reported in the literature. These percentages are applied in the conduct of an assessment of the minimum and maximum typical reductions achievable for the particular set of strategies adopted by each of twenty-two Silicon Valley cities. The implementation of multiple parking strategies in an area is assessed as compounded reduction in demand.
This chapter reviews the legislative, environmental, social, political and economic issues associated with parking policy. The chapter includes a review of existing literature related to the research question and is organized into four sections that provide the background information for this study, namely: reducing congestion and greenhouse gas emissions through parking policy; minimum parking requirements; and the politics of parking.

2.1 REDUCING CONGESTION AND GREENHOUSE GAS EMISSIONS THROUGH PARKING POLICY

“Reducing transportation-related emissions of carbon dioxide—the primary greenhouse gas that contribute to climate change and adapting to the consequences of climate change will be among the biggest public policy challenges facing the transportation profession over the coming decades.” Transportation Research Board of the National Academies

Growing evidence has verified the once-debatable theory that the alarming rate of climate change is primarily due to greenhouse gases (GHG) emitted from human activity. The Intergovernmental Panel on Climate Change (IPCC) report, produced in 2007, announced the confirmation by over 2,500 expert scientific professionals that climate change is indeed a veritable fact and poses many urgent threats to the natural, managed, and human systems on a global scale. Consequences of climate change include droughts, flooding and hurricanes of increasing frequency and severity, rising ocean levels, decreased availability of fresh water, increased incidence of malaria and other diseases, and mass extinctions of species (Darakjian, 2009). The IPCC 2007 report estimates that 20 to 30 percent of plant and animal species will be at risk from a temperature rise of 1.5 to 2.5 °C (2.7-4.5 °F). The report also estimates that the global average temperature is likely to rise anywhere from 1.1°C to 6.4°C (2.0°F to 11.5°F) by 2080-2099 relative to 1980-1999 (Henson, 2008). Regarding major sea-level rise, scientists consider it likely that the Greenland ice sheet will begin melting uncontrollably if global temperatures reach much more than 2°C (3.6°F). If the
Greenland and/or West Antarctica ice sheets are thrown into an unstoppable melting cycle, sea level could rise by more than 7m (23 feet) over the course of a few centuries (Henson, 2008).

The crisis of climate change has jumpstarted a renewed interest in environmental sustainability. The growing awareness of the problem and the ensuing intense search for solutions called for a scrutinizing reexamination of the relationships between transportation, land use, and greenhouse gas emissions. Carbon dioxide is the major greenhouse gas of concern in the issue of global warming. The IPCC 2001 report identifies four sectors that account for virtually all global carbon dioxide emissions: Industry (over 40%), Buildings (around 31%), Transportation (22%), and Agriculture (4%) (Henson, 2008). Between 1990 and 2006, total CO$_2$ emissions rose 28 percent. Cars and trucks are responsible for a little over 50 percent of the 28 percent increase in emissions (Jia et al., 2008). Evaluation of human activity contributions to emissions revealed the movement of goods and people to be California’s single largest producer of GHGs, responsible for 38 percent of overall emissions (ARB, 2008). In attempt to reduce emissions from cars and light trucks in California, new laws based on greater fuel efficiency from new vehicles, reducing the carbon content of fuels, and changing the growth patterns to reduce overall driving, have been adopted in rapid succession in just the past five years.

In 2002, Assembly Bill 1493 was the first of its kind worldwide to address global warming emissions by directing the California Air Resources Board (CARB) to set emission standards for greenhouse gases (GHG) for new passenger cars and light trucks beginning in 2009. However AB 1493 currently faces federal and state court challenges by automakers and car dealers. In 2006, the Legislature passed AB 32—the Global Warming Solutions Act of 2006—the first-in-the-world comprehensive program using regulatory and market mechanisms to achieve cost-effective reductions of greenhouse gases. The law requires the Air Resources Board (ARB) to be responsible for monitoring and reducing GHG emissions and establishes a 1990 baseline emissions inventory defining the target greenhouse gas emissions level to be reached by 2020 (ARB, 2007). The statewide goals of AB 32 directly impacted the legal and regulatory landscape
surrounding land use planning. To assist AB 32, the Senate Bill 375 was adopted in 2008 and became the nation’s first law to control GHG emissions by curbing sprawl. SB 375 requires metropolitan planning organizations to include sustainable communities strategies in their regional transportation plans for the purpose of reducing GHG emissions, aligns planning for transportation and housing, and creates specified incentives, such as CEQA streamlining, for residential, mixed-use, and transit priority projects that meet specified standards. (See Figure 2.1)

“Today, planners have the opportunity and obligation to address the historic challenge of global climate change. The planning profession and the process of planning are uniquely suited to help communities make the changes needed to rise to this challenge and achieve the outcomes needed to create communities of lasting value.” (APA, Policy Guide on Planning & Climate Change, 2008)

Planners are faced with the challenge of serving increased growth while promoting energy efficiency in the existing built environment and changing development patterns, transportation systems, and regulations in ways that reduce GHG emissions. The popular long-range strategy in urban centers is based on the concept of concentrating development around transit corridors to decrease development pressure on open space and agricultural lands. Such development is typically mixed use development, high density development near transit and infill and redevelopment to utilize existing utilities and services. This strategy addresses several other planning concerns such as maintaining a jobs-housing balance and meeting air quality standards. A jobs-housing balance is the term used when people live and work in the same region and do not need to commute long distances in order to find employment. Conceptually, if a jobs-housing balance is maintained, there will be reduced vehicle miles traveled (VMT) and reduced tailpipe emissions from traffic congestion.
Figure 2.1 - California Climate Policy

California Climate Policy

Executive Order S-03-05 (2005)
Established GHG reduction targets for California:
- 2000 levels by 2010
- 1990 levels by 2020
- 80% below 1990 levels by 2050

- “Scoping Plan”
- Cap-and-Trade Program
- Reduction of 30% in vehicle GHG emission by 2016
- 33% renewables by 2020
- Industrial standards
- Reduction of High Global Warming Potential Gases
- Forest sequestration
- Efficient agricultural operations
- Methane emissions reductions from landfills
- High recycling and zero waste

SB 375 (2008)
- Regional target setting for GHG reduction
- Sustainable Communities Strategy
- Transportation funding consistency
- CEQA incentives for projects consistent with SCS or APS
- Regional housing and transportation planning synchronization
- Local input for MPO planning

Attorney General Litigative Action

SB 97 (2007)
- Additional questions to CEQA checklist:
  - Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
  - Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?

City of San Bernadino (2007)
- Requires County to inventory and mitigate GHG emissions associated with its land use planning decisions

City of Stockton (2009)
- Requires City to prepare a Climate Action Plan
“When viewed in total, the evidence on land use and driving shows that compact development will reduce the need to drive between 20 and 40 percent, as compared with development on the outer suburban edge with isolated homes, workplaces, and other destinations. It is realistic to assume a 30 percent cut in VMT with compact development. Making reasonable assumptions about growth rates, the market share of compact development and the relationship between CO\textsubscript{2} reduction and VMT reduction, smart growth could, by itself, reduce total transportation related CO\textsubscript{2} emissions from current trends by 7 to 10 percent as of 2050.” (Ewing et al., Growing Cooler)

Compact development strategies are only successful in reducing GHG emissions if there are robust and efficient transportation network and services, which accommodate multiple modes of travel such as walking, bicycling, and transit. Hence, multi-modal transportation has gained renewed popularity as a method of decreasing auto emissions by reducing driving demand and vehicle miles traveled. In March 2009, the Complete Streets Act of 2009 (S. 584/H.R. 1443) was introduced to ensure that all users of the transportation system, including pedestrians, bicyclists, transit users, children, older individuals and disabled individuals are able to travel safely and conveniently on and across federally funded streets and highways.

According to the December edition of APA Advocate, APA’s e-newsletter on federal legislative and public policy issues, Rep. Earl Blumenauer (D-Ore.) has drafted language for legislation establishing an Active Transportation Investment Program. The program would award two billion in competitive, discretionary grants to communities to “encourage a mode shift” to active transportation within selected communities by providing safe and convenient options to bicycle and walk for routine travel. The bill is expected to be formally introduced to Congress in early 2010.

Also in December, Transportation Secretary Ray LaHood announced the availability of funding through the new Interagency Partnership on Sustainable Communities of the Department of Transportation, Department of Housing and Urban Development, and Environmental Protection Agency. The funding will be used to create a Federal Transit Administration bus livability grant program and an urban circulator livability program. According to the agency,
eligible projects must promote walkable, mixed-use development (APA Advocate, December 2009 edition).

At the March 2010 National Bike Summit, Transportation Secretary Ray LaHood had announced a “major policy revision” that aims to give bicycling and walking the same policy and economic consideration as driving. In his official U.S Secretary of Transportation blog he wrote, “Today, I want to announce a sea change. People across America who value bicycling should have a voice when it comes to transportation planning. This is the end of favoring motorized transportation at the expense of non-motorized.”

Outside of legislature, organizations have been taking actions with immense success. Following the creation of Leadership in Energy and Environmental Design (LEED) for green building certification by the U.S. Green Building Council (USGBC) in 1998, USGBC, in collaboration with Congress for New Urbanism and the Natural Resources Defense Council, introduced in 2007 the first national rating system for neighborhood development—LEED ND—integrating the principles of smart growth, urbanism, and green building. After a pilot period of two and a half years, registration for new projects is anticipated to open in 2010.

Such smart growth strategies cannot be implemented successfully without extensive research and consideration on how parking policies need to be reformed in order to support the use of transit facilities and services. For many years, parking has been identified as a crucial link between transportation and land use because parking facilities are a major land use type and affects how we design and build our commercial and residential areas. Parking influences our travel behavior, which directly affects the form of urban infrastructure demanded by society, and the amount of greenhouse gas emissions generated by cars and trucks.

Major publications such as The High Cost of Free Parking by Donald Shoup in 2005, and Parking Management Best Practices by Todd Litman in 2006 advocate for studying parking comprehensively in order to provide the right amount of parking in the right locations at the right prices—a relatively new concept to the nation. Publications such as these have inspired action
from cities nationwide and organizations like Maryland Governor’s Office of Smart Growth, Metropolitan Transportation Commission, Association of Bay Area Governments, Bay Area Air Quality Management District, and the U.S. Environmental Protection Agency.

A complete paradigm shift on parking policies is already underway (See Table 2.1). In fact, in February 2009, Senate Bill 518 was introduced by Senator Lowenthal to limit funding for subsidized parking and provide incentives for adopting certain measures that account for the full cost of parking. As of January 2010, the bill is still being amended in the Senate.

In the Policy Guide on Planning & Climate Change, adopted by the American Planning Association in April 2008, transportation and parking policy is identified as a climate change policy finding where “Programs such as congestion pricing, parking cash out, transit benefit equity, elimination of minimum parking requirement, and demand responsive parking pricing can be effective tools to reduce transportation-related GHG emissions and save energy costs” (APA, 2008).

Parking policies will be a key component of any sustainable communities strategy in the SB 375 for reducing GHG emissions in regional transportation plans. The Complete Streets Act of 2009 will no doubt impact the design of streets; landscaping, lane widths, and the supply of on-street parking, which also affects off-street parking supply. LEED ND awards credits for Transportation Demand Management (TDM) programs with strategies such as unbundling parking and transit passes, and also awards credits for environmentally sustainable and pedestrian friendly design features such as locating parking facility behind buildings, incorporating vegetative swales and bioretention areas, providing on street parking, breaking up large parking lots, and limiting curb cuts.
Table 2.1 - Comparison of Old and New Parking Paradigms

<table>
<thead>
<tr>
<th>Old Parking Paradigm</th>
<th>New Parking Paradigm</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Parking problem means inadequate parking supply.”</td>
<td>“Parking problem” can mean inadequate supply, inefficient management, inadequate user information, and other types of problems associated with parking facilities and activities.</td>
</tr>
<tr>
<td>More parking is better.</td>
<td>Too much parking is as harmful as too little.</td>
</tr>
<tr>
<td>Parking should generally be free. Whenever possible, parking facilities should be funded indirectly through building rents or taxes.</td>
<td>As much as possible, users should pay directly for parking facilities.</td>
</tr>
<tr>
<td>Parking should be available on a first-come basis.</td>
<td>Parking should be managed to favor higher-priority uses and encourage efficiency.</td>
</tr>
<tr>
<td>Parking requirements should be applied consistently, without exception or variation.</td>
<td>Parking requirements should reflect each situation and should be applied flexibly.</td>
</tr>
<tr>
<td>Traditional solutions should be favored. New approaches should be discouraged since they are unproven and not widely accepted.</td>
<td>Innovations should be encouraged, since even unsuccessful experiments often provide useful information.</td>
</tr>
<tr>
<td>Parking management should only be applied as a last resort where it would be too costly to increase supply.</td>
<td>Parking management programs should be widely applied to increase efficiency and prevent problems.</td>
</tr>
<tr>
<td>Transportation consists of driving. Dispersion of destinations (urban sprawl) is acceptable or even desirable.</td>
<td>Driving is just one of many transport modes. Dispersed, automobile-dependent land-use patterns may be undesirable.</td>
</tr>
</tbody>
</table>

Source: Parking Management Best Practices by Todd Litman, p. 7

“Communities also are beginning to understand that addressing the sources of greenhouse gas emissions also can improve air quality, cut traffic, save money, improve the efficiency of municipal operations and improve community quality of life. Why? Because the sources of GHG emissions are the same as those that make local air smoggy, streets congested, and energy bills high, as well as contribute to global warming pollution and climate change.” (ICLEI, Cities for Climate Protection Milestone Guide, 2009)

Parking policies will also be a key component in local climate action planning. Cities consume 73 percent of the world’s energy and emit 80 percent of the greenhouse gases (Newman, Beatley, Boyen, 2009). Over a thousand mayors over the nation has joined the U.S. Conference of Mayors’ Climate Protection Agreement since its inception in 2005, vowing to reduce carbon emissions in their cities below 1990 levels, in line with the Kyoto Protocol (The United States Conference of Mayors Climate Protection Center, 2010). Moving beyond the feel-good posturing of sustainability rhetoric, actual emissions reductions requires complex greenhouse gas emission inventories, and preparing a climate action plan at the community level with mitigation and adaptation policies and programs. As of October 2009, there were only 62 city-level stand-alone climate action plans that have been adopted in the nation—24 of which are in California (Boswell
et al. 2010). However, climate action plans are gaining popularity, particularly in communities sensitive to the effects of climate change, such as coastal, mountainous, or drought-prone communities. Many planners feel an ethical obligation to address the climate change issue for their communities and many other planners want to act now in anticipation of future mandates. Developers, which look to save hundreds of thousands of dollars on CEQA streamlining for their projects under SB 375, are also pressuring cities to adopt climate action policies.

A hearing in the State Capitol in February of 2009 started a state-level discussion of how parking policies can impact social goals such as economic development, traffic congestion reduction, clean air, and arresting climate change. Several speakers testified on the significant benefits of numerous parking reforms. Speakers included Dr. Donald Shoup from UCLA, Dr. Allison Yoh from the RAND Corporation, Justin Horner from the Natural Resources Defense Council, Dan Zack from the City of Redwood City, Mark Yamarone from the City of Pasadena, Nathaniel C. Ford Sr. from the San Francisco Municipal Transportation Agency, Patrick Siegman from Nelson/Nygaard Consulting Associates, and Josh Shaw from the California Transit Association.

Based on the testimony at the hearing, a few of the findings proposed by the committee staff are categorized as follows:

General
- Reducing driving demand is critical to achieving AB 32 goals for greenhouse gas emission reductions. The transportation sector is the single biggest contributor to greenhouse gas emissions and with the absence of the reduction in driver demand, emissions from VMT growth could easily outweigh reductions from cleaner fuels and more efficient vehicles.
- Parking reforms are one of the most cost-effective ways to achieve congestion reduction and greenhouse gas emission reduction benefits. Reforms can be implemented at little to no cost to the public sector and can even generate revenues to support transit services, neighborhood improvement and beautification, and other services.

Parking Pricing
- Parking is never free. In fact, the cost of land and construction to provide parking spaces is extremely high, and these costs are passed on to consumers in the form of higher prices for housing and other goods for everyone, including those who do not drive.
- Free or cheap parking at the large majority of destinations masks the true cost of driving and artificially skews transportation choices towards automobile trips, increasing parking demand, vehicle miles traveled, and air emissions.
- Free or cheap parking meter rates create a lack of vacancies, which results in additional congestion as drivers cruise for available parking spaces.
- Employing pricing, including parking pricing, is key to reducing traffic congestion on roads and highways because it is the one strategy that permanently reduces demand by changing behavior.

Minimum Parking Requirements

- As a general rule, minimum parking requirements stipulate more parking spaces than the private market would provide on its own, significantly adding to the cost of housing and commercial development.
- Minimum parking requirements often make it infeasible to bring new uses to older buildings and to develop infill parcels, hindering the ability to achieve denser development.
- Excessive parking requirements spread out development, increase travel distances, and make the environment less friendly to pedestrians and less viable for transit.

2.2 MINIMUM PARKING REQUIREMENTS

This section identifies and explains the issues associated with minimum parking requirements. It introduces the principles of parking requirements, relationship between parking requirements and free parking, the costs associated with parking requirements, and factors reinforcing the usage of minimum parking requirements.

2.2.1 The Principles of Minimum Parking Requirements

Minimum parking requirements are one of the three basic sets of regulations, in addition to permitted uses and permitted bulk, in any zoning ordinance. In response to congestion created by drivers circling for vacant free curb parking in the 1930’s, cities began to require off-street parking in their zoning ordinances. Fresno, California became the first U.S. city to establish a parking requirement for land uses other than housing in 1939 (Shoup, 2005, p. 607). The typical purpose of minimum parking requirements is to ensure that developers provide sufficient on-site parking spaces to meet the demand created by all activities associated with the use of the site (Davidson and Dolnick, 2002).
Shoup asserts that parking requirements are “a professional practice that evolved into conventional wisdom without good theory or careful research” (2005, p. 11). And yet few other planning practices, other than the invention of zoning, have spread more rapidly than off-street parking requirements. A 1946 survey of 76 cities found that only 17 percent had parking requirements in their zoning ordinances. Five years later, 71 percent of these cities had parking requirements or were adopting them (Mogren and Smith, 1952).

2.2.2 The Relationship Between Minimum Parking Requirements and Free Parking

Minimum parking requirements are an ill-conceived solution to parking shortage because they are trying to respond to a parking shortage caused by the insatiable demand for free parking. According to Shoup, responding to shortages with physical rather than economic solutions is a common pattern in transportation policy and parking requirements are no exception. Instead of regulating demand through pricing, planners often think of free parking as an entitlement, and the resulting demand for free parking as a “need” that must be met. This becomes a grievous misconception that parking becomes a problem only when there aren’t enough spaces to meet the demand (Shoup, 2005).

The planner’s common misconception also serves to reinforce the expectations for free parking by the public. The 1990 Nationwide Personal Transportation Survey data indicated parking to be free for 99 percent of all automobile trips made in the U.S. (Shoup, 2005). Although the classic “tragedy of the commons” problem is typically applied by Shoup and Litman to free on-street parking, it can be applied to unregulated or free off-street parking as well. Drivers have no incentive to economize on how long they park which results in a scarcity of spaces that drivers must waste time and fuel competing for, exacerbating the problems of air pollution and traffic congestion while cruising (Shoup, 2005).
2.2.3 Costs of Minimum Parking Requirements

As stated in the findings of the Transportation & Housing Committee state hearing in February 2009, minimum parking requirements generally require more parking spaces than the private market would provide on its own. Many authors and organizations have extensively described the negative impacts that excessive parking has on economic vitality, urban design and development, housing affordability, stormwater management, travel behavior, and climate change. (MTC, 2007; Litman, 2006, 2009; Alameda County CMA, 2007; EPA, 2006; Shoup, 2005) While a full examination of direct and indirect costs would be too lengthy to include here, this section will provide an overview of major criticisms associated with direct and indirect costs of minimum parking requirements.

**Indirect Costs**

Excessive parking requirements spread out development and increase travel distances, thereby increasing emissions and reinforcing unsustainable travel behavior in a time where communities are concerned about climate change. The behavior of cruising for parking also adds to traffic congestion and increased emissions. Research at six sites showed that an average of 30 percent of the cars in congested traffic were cruising for parking (Shoup, 2005). In 2001, an Environmental Impact Report (EIR) for University of California, Los Angeles, calculated total external costs for a 1,500-space parking structure to be $117 a month per space: $73 for added congestion and $44 for added pollution (Shoup, 2005).

Opportunity costs, the costs of using a space for parking instead of another use with higher value, are complicated to calculate due to the variety of other purposes to which parking spaces could be dedicated. A study, *Paved Over: Surface Parking Lots or Opportunities for Tax-Generating, Sustainable Development*, evaluates the potential economic and social benefits if surface parking lots around rail transit stations were developed into mixed-use, pedestrian
friendly, transit oriented developments. The parking lots in nine case studies are estimated to be able to generate 1,188 new residential units and at least 167,000 square feet of new commercial space, providing additional tax revenues, plus significant reductions in trip generation and transportation costs compared with more conventional development (CNT, 2006).

**Direct Costs**

Direct environmental costs are a negative externality inherent in the physical properties of parking. In their publication Parking Spaces/Community Places, EPA describes the externalities to include the exacerbation of the heat island effect (where dark pavement artificially raises air temperature in urban areas), the reduction of a region’s “green infrastructure” for recreation and ecosystem services, and the effects of impervious paving such as degraded water quality and increased stormwater runoff and flooding issues (EPA, 2006).

Minimum parking requirements significantly add to the cost of development. One of the ways in which parking requirements spread out development and increase travel distances is by shifting lower-priced housing to urban fringe locations where land prices are lower but transport costs are higher (Litman, 2006). For higher-priced housing in suburban areas with lower land costs, supplying two parking spaces per unit adds 10 percent to development costs; for lower-priced residential buildings in urban areas with higher land costs, providing two parking spaces increases costs more than 20 percent.

According to a study by Shoup, generous minimum parking requirements are the largest of all regulatory burdens placed on developers, about four times greater than all other development fees combined, such as levies for schools, parks and roads (Shoup, 1999). Developer profits decline with increased parking due to increased development costs and reduced maximum potential density of units per acre (See Figure 2.2). The cost per parking space typically includes land, construction, operation and maintenance. A study, *Parking Evaluation*, estimates construction costs per space to range from $2,000 to $25,000 and operation and
maintenance costs per space to range from $200 to $500 annually. The total annual cost per space is estimated to range from $389 to $2,645 (VTPI, 2005).

Figure 2.2- Effect of Parking Costs on Developer Profits Per Acre

Minimum parking requirements impact the design of urban projects in terms of what can be built (e.g. number of units), what it looks like (e.g. square footage), and how much it costs. “Parking requirements now drive many site designs, and are often the make or break issue for financing new developments…too many quality smart growth projects remain on the drawing board because they simply cannot solve the parking dilemma” (Governor’s Office of Smart Growth, 2005).

Infill projects, adaptive reuse projects, and affordable housing projects are often constrained by conventional parking standards resulting in reduced urban redevelopment, increased sprawl, and unaffordable housing. In infill locations, each on-site parking space can reduce the number of new housing units or other uses by 25 percent or more (Transportation and Land Use Coalition, 2002). In his January 2009 article Parking Requirement Impacts on Housing Affordability, Litman explains how, based on typical affordable housing development costs, one parking space per unit increases costs by about 12.5 percent, and two parking spaces increase
costs by about 25 percent. This cost is translated to the buyer or renter in the form of higher cost of housing which poses a significant financial burden on low-income families.

2.2.4 Factors Reinforcing the Usage of Minimum Parking Requirements

The perpetration of minimum parking requirements resulting in the oversupply of parking is caused by a variety of factors. Shoup and others have identified these factors to include the uncertainty of future parking demand, absence of academic or professional guidance on how to properly set parking requirements, and the lack of alternatives, aside from copying requirements of other cities and consulting misleading ITE data, due to temporal and financial restrictions. (Shoup, 2005; Davidson, M., and Dolnick, F., 2002; Litman, 2006)

Cities require parking spaces during the permit application process when knowledge about the future demand for parking is most uncertain. The uncertainty of future parking demand causes planners to rely on precise but inaccurate numbers and err on the side of providing too much parking. The legal system of land use regulation discourages acknowledgement of the uncertainty in planning decisions and pressures transportation engineers, urban planners, developers, and elected officials to adopt a false façade of credibility by “relying on precise estimates to report highly uncertain parking and trip generation rates” (Shoup, 2005, p.63).

Planners typically take the maximum parking demand estimate and then adjust upward to set the minimum parking requirements. Another incentive for erring on the side of providing too much parking is to avoid the possible criticism of approving development that later creates parking spillover issues (Shoup, 2005).

According to Shoup, urban planners receive almost no academic or professional guidance on how to set parking requirements, and have little time or financial resources to conduct a comprehensive review of local parking standards on a regular basis. Yet planners are responsible for coming up with the proper number of parking spaces to be provided. Left with few alternatives, planners employ two strategies in setting minimum parking requirements: copy other
cities, and consult ITE data (Shoup, 2005, p.30). These trends are evident in the findings from five surveys of parking requirements conducted by Planning Advisory Service (PAS) since 1964. The findings suggest two main patterns of planning for parking: parking requirements are often copied from other cities, and parking requirements are often based on scant evidence (PAS 2002).

Richard Willson from California Polytechnic University Pomona interviewed planning officials in 138 cities on what sources of information they normally use to set minimum parking requirements for workplaces. Forty-five percent of the respondents ranked “Survey nearby cities” as most important, and “Institute of Transportation Engineers handbooks” came in second place at 15 percent. More planners responded, “Don’t know” (5 percent) than responded that they commissioned parking studies (3 percent) (Willson, 2000, p.118).

Cities often neglect to investigate their minimum parking requirements or change them over time. Even in the popularity of form-based codes since the start of the 21st century and LEED certification—an ideal opportunity for determining appropriate parking requirements by urban context and use—parking requirements have not veered significantly enough from conventional standards to make a difference. In an article on Planetizen, Todd Litman argues that “LEED building certification is practically irrelevant if we fail to implement parking policies and encourage more location-efficient development” (Litman, 2010). He uses an example of a 98-unit market rental apartment tower in the City of Vancouver, designed to achieve LEED Gold certification, to explain how vehicle ownership is still being subsidized by $215 a month in this project from inefficient pricing strategies—even though the project is served by abundant local transit services and has parking stalls rented separately from housing units.

A study in 2009 by Hananouchi and Nuworsoo from California Polytechnic University San Luis Obispo examines parking policies in form-based codes and evaluates whether development codes adjust parking requirements based on form and context of the built environment. The City of Miami’s new form-based code adopted in July 2009, Miami 21, is compared with the City of Miami’s previous Euclidean zoning ordinance, Duany Plater-Zyberk...
and Company’s *SmartCode*, and Parolek & Crawford’s *Form-Based Codes*. The findings reveal that the parking policies in Miami 21 form-based code include only marginal improvements to existing parking policies and do not differ greatly from conventional zoning ordinances. Downtown parking maximums are set roughly equal to the parking requirements found in suburban areas, and relatively high minimums were found even in more urban transects (Hananouchi & Nuworsoo, 2009).

Urban planners rely on a series of accepted, but questionable, reports authored by transportation engineers. The Parking Generation report published by the Institute of Transportation Engineers (ITE) is a common resource for planners, and relates the peak parking occupancy to a characteristic of the land use, such as the floor area or number of employees at a site. ITE reports are attractive to planners because they offer precise, off-the-shelf numbers without addressing difficult public policy questions. Ironically, it is ITE’s intention that these resources be updated over time and be used as “an informational report—not a manual, recommended practice, or standard” (ITE Parking Generation, 2004, p.6). Shoup has written in extensive detail how ITE parking generation and trip generation handbooks are misleading guides to transportation and land use planning. The key points supporting his argument describe ITE data to be inflated, inaccurate, and statistically insignificant.

Parking generation rates are inflated because they measure the peak parking demand observed at a few suburban sites with ample free parking and no public transit. Parking rates generated under this scenario cannot be accurately applied to denser urban areas or areas with viable multi-modal options such as transit, walking or bicycling (e.g. downtowns). Parking generation rates are statistically insignificant because of inadequate sample sizes. Half of the 101 parking generation rates in ITE’s 1987 edition are based on four or fewer studies and 22 percent are based on a single study (Shoup, 2005, p.32).

Trip generation influences parking demand because demand at a site depends on vehicle trips to the site. ITE publishes a report called Trip Generation, which predicts the number of
vehicle trips to and from a land use during a given period and produces a trip generation rate by dividing the number of vehicle trips per day by the floor area of the land use. Regardless of the fact that floor area alone cannot accurately predict the number of vehicle trips, urban planners and transportation engineers continue to report trip generation as a function of building size because they have always done so (Shoup, 2005, p.49).

Similar to parking generation rates, trip generation data were primarily collected at suburban areas with scant transit service, nearby pedestrian amenities, or travel demand management (TDM) programs. The data is also based on small sample sizes. Half of the 1,515 published trip generation rates are based on surveys at five or fewer sites, and 23 percent are based on surveys at only one site (ITE Trip Generation, 1997).

Shoup illustrates a six-step process that results in a vicious cycle of over-emphasis on parking requirements, over-supply of free parking, and development sprawl (See Figure 2.3).
Figure 2.3- Six-Step Process of Planning for Free Parking

Step 1
Parking Generation Rates
Transportation engineers survey the peak parking demand at suburban sites with ample free parking but no public transit. The ITE summarizes the data in Parking Generation, which reports a precise parking generation rate for each land use.

Step 2
Minimum Parking Requirements
Urban planners consult Parking Generation to set minimum parking requirements for each land use. The maximum observed parking demand becomes the minimum required parking supply.

Step 3
Ample Free Parking
Developers provide all the parking spaces that planners require. Because the required parking supply is so large, the market price of most parking is zero, and people drive more often because they can park free for most trips.

Step 4
Trip Generation Rates
Transportation engineers survey vehicle trips to and from suburban sites with ample free parking but no public transit. The ITE summarizes the data in Trip Generation, which reports a precise trip generation rate for each land use.

Step 5
Transportation System Design
Transportation planners consult Trip Generation to design the transportation system, which therefore provides enough capacity to satisfy the demand for vehicle trips to and from suburban sites with ample free parking but no public transit.

Step 6
Urban Sprawl
Urban planners limit density so that new development will not generate more vehicle trips than nearby roads can carry. The lower density spreads activities farther apart, further increasing vehicle travel and parking demand.

Source: Shoup, 2005, p. 58
2.3 THE POLITICS OF MINIMUM PARKING REQUIREMENTS

While the evidence outlined in the previous sections suggest the harmful consequences of minimum parking requirements and the vital role a paradigm shift in parking policy can play in addressing climate change, the decision to reform remains a political battle. Shoup claims that “parking requirements are especially difficult to reform because they are entrenched in zoning ordinances and embedded in an elaborate structure of permits, variances, covenants, court decisions, and entitlements” (2005, p.581). The purpose of this section is to acknowledge the powerful role of politics in the creation of parking policies and to identify and address the common public perceptions and concerns which stand as barriers to improvement.

2.3.1 Transportation Politics and Political Process

“Politics” often refers to the distribution of benefits and costs, and politicians often strive to produce the greatest possible ratio of satisfied to dissatisfied constituents. Historically, the political system seeks inclusiveness and broad support by accommodating new demands incrementally—by means, in so far as possible, that

“leave previous programs and administrative arrangements undisturbed, that involve the least possible disruption for private enterprises, and that involve the least possible inconvenience and annoyance for individuals who have built their life-styles around the expectation of system stability.” (Altshuler, 1979)

These conditions can apply equally to transportation politics today. Urban transportation is inherently a highly political subject because transportation expenditures are so large and the consequences of access are so vital to economic and social life of communities. Factors adding to the political complexity include competition in a web of interrelated public and private resources, and the conflicting views of many government bodies and interest groups that seek influence over the outcomes of policy debates (Wachs, 1995). Even alliances between various interest groups are constantly forming and dissolving.

“In this kind of fragmented political arena, where leadership is frequently weak, there is a constant struggle to reach consensus that will allow action. And although analysis performed by social scientists and professional experts in transportation can inform the debates, there are
simply too many perspectives and interests at work to allow decisions to be dictated by technical expertise alone.” (Wachs, 1995)

Under the political circumstances of transportation policy, it is more difficult to introduce new methods than to marginally change current practices. Wachs explains that:

“in the American political system, most changes are small, and most innovations are incremental. Proposals for change must pass many political tests. Only relatively safe, marginal changes are usually supported by so many interests that they pass muster in every test, whereas entirely new ways of doing business are rarely adopted because those who oppose them can win by defeating them only a few times” (Wachs, 1995, p.278).

This suggests that reforming minimum parking requirements will most likely be an incremental process instead of the sweeping scheme of cities emancipating themselves from off-street parking requirements advocated by Shoup (Shoup, 2005, p.583). Cities may begin by implementing parking policies as specific and tailored measures to areas with transit alternatives or high demand for parking, such as transit/mixed-use corridors, transit oriented developments, the downtown core, commercial/retail areas, and established parking districts. The public will be less intimidated by the prospect of new parking policies when made aware of their breadth and scope.

2.3.2 Addressing Stakeholder Concerns

Parking has been traditionally viewed by many as a public commodity to which all are entitled, and stakeholders perceive smart growth as a set of policies which threaten to take away their valuable parking. Stakeholders can include City officials, Downtown Development board members, Chamber of Commerce executives, merchants, property owners, residents, developers, employees and customers.

A technical paper by the Metropolitan Transportation Commission (MTC) on Bay Area policies summarizes common stakeholder concerns, stating that business owners in the downtowns and commercial districts have traditionally viewed parking as crucial to the success of their businesses, residents want to be assured that their residential parking is not subject to spill over by commercial district patrons, developers seek the easiest and most cost effective method of meeting parking requirements in order to expedite project approval, and politicians tend to
distance themselves from controversial issues, such as parking policies, that may threaten their chances of re-election (Hurrell, 2007).

Parking policies are becoming less controversial as more evidence grows on the benefits they bring to the environment and community. A key political figure is needed to act as a main source of support and provide the political will necessary to implement a policy or program. The current Mayor of Chicago, Richard M. Daley, was originally elected in 1989 and was re-elected for the sixth time in 2007. Widely viewed as the nation’s top urban executive, Daley has earned a national reputation for his innovative community-based programs. Through his leadership, Chicago was transformed into the national leader in the construction of green roofs. (Drum Major Institute for Public Policy, 2009). If a political figure of such stature were to step forward to advocate for parking reform in California, the figure could surely be the catalyst for unprecedented transformation of parking policy and design.

In actuality, smart growth policies promote the increased efficiency in the use of parking. Smart growth parking policies can aid businesses because high turnovers translate to increased patron visits. Two active businessmen from Los Altos had a revelatory take that free parking is a problem that thwarts economic growth, and set about conducting a parking inventory, researching parking management strategies, and making recommendations for Los Altos. They produced a report in 2009 titled, “The New Science of Parking”, which they presented to the downtown development committee.

Redwood City realized that the parking requirements it had was restricting desired infill growth in their downtown because the cost to developers of private parking made projects infeasible, and the city could not afford public parking lots or structures. The city implemented five key parking reforms in 2007. Dan Zack, parking manager and downtown development coordinator, testified during the State Transportation & Housing Committee hearing in 2009 that the result of their good pricing strategies created the turnover and vacancies needed to reduce
congestion and provide easy access to area merchants—and the desired growth came to the downtown core.

Parking policies can protect the residential characteristics of neighborhoods by limiting the amount of parkers from outside the neighborhood. The College Terrace neighborhood in Palo Alto had historically been suffering from large volumes of non-neighborhood traffic and parking from students and employees from Stanford University and other nearby employers who constantly park on neighborhood streets to avoid the cost of parking permits or because of convenience. A residential parking permit program institutes a two-hour limit for street parking on weekdays and a new pilot program allows residents to purchase a license and park on the street for longer than the limit allows. According to Shahla Yazdy, the city transportation engineer overseeing the program, of the 704 addresses in College Terrace opting into the program, 447 addresses applied for permits. Enforcement began in December 2009 and neighborhood leaders said they were mostly pleased. "It's like night and day," said Susan Rosenberg, secretary of the College Terrace Residents' Association, who lives on Stanford Avenue at Dartmouth Street. "Once the grace period was over, nobody was parking there. It's very successful," she said (Dremann, 2010).

Parking typically represents about 10 percent of building development costs, and more where land values are high. Since developers typically earn 10 percent return on investments, each unit of reduced parking requirements can provide a comparable increase in profits (Litman, pp.61, 2006). In general, a commercial developer like Lowes generates its own internal parking requirements by trial and error. Several years ago when land was considered relatively inexpensive, it was not a financial problem to max out the paved area for parking if a parcel was purchased that was much larger than needed. Now that land prices have increased substantially, companies like Lowes do not have the luxury of unchecked paving and must count the number of unused paces on days like Memorial Day or Labor Day to see if a particular facility has enough parking spaces (Bob Midkiff, Lowes Director of Engineering and Construction, 2009).
In 2006, Genentech located in South San Francisco, began offering its employees $4 per day for each day they did not drive to work. Patrick Siegman from Nelson/Nygaard Consulting Associates testified that after two and a half years, the drive alone rate of its employees dropped from 78 percent to 65 percent, and Genentech saved $25-50 million on the construction of parking spaces.

2.3.3 Gaining Stakeholder Support

A strong community outreach component engaging all stakeholders is vital in the process of policy development to convince the public and decision makers that action is indeed necessary. It is recommended that implementation of a promotional program should begin prior to data gathering and analysis phases (Edwards, 1994). Stakeholders must be identified and encouraged to participate actively in the framing of the problem, the process of analysis, planning, implementation, and on-going management of the parking system. By creating dialogue with the community through public meetings, community workshops, focus groups, and the like, cities can address concerns and misunderstandings to allay public qualms. Skepticism can also be addressed with implementation of new policies on selected test sites (Hurrell, 2007).

The customer base can be educated through a promotional campaign for parking—addressing how much parking is available, where it can be found, the value of on-street parking, the need for consistent enforcement procedures, plans for additional parking, and the way the parking system operates. Promotional material may include distribution of a monthly newsletter on the status of the parking plan and system, current problems and possible solutions, and description of plans for operational and capital improvements. Programs may also include a monthly prize drawing for employees who participate in parking in a designated employee area, employee I.D. cards, parking maps and brochures, parking validation programs, and identification of parking signage types and locations (Edwards, 1994).
Chapter 3: Overview of Parking Policies and Strategies

3 OVERVIEW OF PARKING POLICIES AND STRATEGIES

This chapter reviews the major parking policies and strategies available for implementation. The chapter is organized into three sections that provide an overview of proven tactics based on parking supply, demand, and financing. Parking policy refers to parking facility regulation, pricing, management, and design decisions (VTPI, 2010). Although the focus of this study is on the reduction or elimination of minimum parking requirements, these actions should be taken in conjunction with parking policies that would effectively manage parking supply and demand.

3.1 EFFECTIVENESS OF PARKING POLICIES/PROGRAMS

The effectiveness of policies and programs to reduce parking demand are highly dependent on context. Factors such as development density, mix of land use, demographics, transit services and infrastructure, bicycle and pedestrian network connectivity, and the cost of parking in neighboring areas all influence travel and parking behavior. Thus, policies and programs need to be combined and customized for maximum effectiveness. Figure 3.1 from Metropolitan Transportation Commission’s 2007 handbook, Reforming Parking Policies to Support Smart Growth, summarizes the potential effectiveness of major parking policies.
Most parking management strategies have modest individual impacts, typically reducing parking requirements by 5 to 15 percent, but their impacts are cumulative and synergistic. For example, sharing parking and walkability improvements may each reduce parking requirements just 10 percent if implemented alone, but 25 percent if implemented together because they are complementary. A comprehensive parking management program that includes an appropriate combination of cost-effective strategies can usually reduce the amount of parking required at a destination by 20 to 40 percent, while providing additional social and economic benefits. It is also important to note that results generally increase over time as programs mature. Parking strategies can provide a reduction in conventional parking requirements from 15 to 30 percent when programs have matured after five or ten years (Litman, 2010).
3.2 PARKING SUPPLY

There are many factors that can affect the amount of parking needed at a particular location and should be considered when establishing minimum parking requirements (Litman, 2006). Table 3.2 summarizes these factors:

Table 3.2-Factors Affecting Parking Supply

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>*Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic location</td>
<td>Variation in vehicle ownership and use in different areas</td>
<td>Higher vehicle ownership and use leads to higher parking need</td>
</tr>
<tr>
<td>Land-use density</td>
<td>Number of residents, housing units, or employees per acre/hectare</td>
<td>High density could lead to lower per capita parking need</td>
</tr>
<tr>
<td>Land-use mix</td>
<td>Different land uses located close together</td>
<td>Higher mix of uses may preclude the need for vehicle trips and parking for certain purposes</td>
</tr>
<tr>
<td>Transit accessibility</td>
<td>Availability of transit service nearby</td>
<td>Increased transit availability enables its use thereby precluding the need for parking</td>
</tr>
<tr>
<td>Carsharing</td>
<td>Whether a carsharing service is located nearby</td>
<td>This may reduce the need to use one’s own vehicle</td>
</tr>
<tr>
<td>Walkability</td>
<td>Quality of walking environment</td>
<td>Higher quality promotes more walking with reduced need for parking</td>
</tr>
<tr>
<td>Demographics</td>
<td>Age and physical ability of residents or commuters</td>
<td>The most physically able can walk and use other travel modes reducing the need for parking</td>
</tr>
<tr>
<td>Income</td>
<td>Average income of residents or commuters</td>
<td>Higher income residents can afford private vehicles and use requiring parking</td>
</tr>
<tr>
<td>Pricing</td>
<td>Degree to which parking is priced, unbundled, or cashed out</td>
<td>High pricing reduces consumer demand for parking</td>
</tr>
<tr>
<td>Parking and mobility management</td>
<td>Whether parking and mobility management programs are implemented at a site or within an area</td>
<td>Areas with parking and mobility management results in parking need reductions</td>
</tr>
<tr>
<td>Design hour</td>
<td>Number of allowable annual hours that a parking lot may be filled</td>
<td>The more hours lots are allowed to be filled, the less regular users are inclined to look for parking</td>
</tr>
<tr>
<td>Contingency-based planning</td>
<td>Identification of potential solutions to implement if needed</td>
<td>The more solutions are implemented, the lower the parking need</td>
</tr>
</tbody>
</table>

Source: Litman, 2006 p. 86  *Comments by author

3.2.1 Parking Maximums

Parking maximums are established limits or “caps” on the quantity of parking that can be provided for a given development. Lower maximums can be established for developments in
areas with transit accessibility and availability. Maximums often apply only to certain types of parking, such as long-term, single-use, free, or surface parking, depending on planning objectives. These strategies are usually implemented in large commercial centers as part of integrated programs to reduce excessive parking supply, encourage use of alternative modes, create more compact development patterns, create more attractive streetscapes, and preserve historic buildings (Booz Allen Hamilton, 2006). Leaving the market to slowly figure out the most optimum and efficient amount of parking will take a long time because businesses who consider abundant, free, on-site parking to be a crucial factor to their success will be reluctant to reduce parking supply. Parking maximums may be necessary to achieve quicker benefits (Litman, 2010). Redwood City has adopted parking maximums for the Downtown Parking Zone. As illustrated in Table 3.2.1, an interim strategy is to simply convert existing parking minimums to maximums.

Table 3.2.1 - Redwood City Downtown Parking Zone

<table>
<thead>
<tr>
<th>Land Use</th>
<th>Required Minimum</th>
<th>Maximum Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Dwelling (2 bedrooms or more)</td>
<td>1.5 space/unit</td>
<td>3 spaces/unit</td>
</tr>
<tr>
<td>Residential Dwelling (1 bedroom)</td>
<td>1 space/unit</td>
<td>2 spaces/unit</td>
</tr>
<tr>
<td>Residential Dwelling (studio)</td>
<td>0.75 space/unit</td>
<td>1.5 spaces/unit</td>
</tr>
<tr>
<td>Hotel/Motel</td>
<td>1 space/unit</td>
<td>1 space/unit</td>
</tr>
<tr>
<td>Commercial Uses</td>
<td>6 spaces/1,000 square feet</td>
<td>6 spaces/1,000 square feet</td>
</tr>
</tbody>
</table>

Source: Redwood City Zoning Code: Article 30 Off Street Parking and Loading

Overcoming barriers to implementation

Large-scale commercial developers may argue that maximums are an economic disincentive that will cause businesses to locate elsewhere. In response to their concerns, parking maximums should not be a one-size-fits-all ordinance. Maximums should be sensitive to the differing volume of goods and services and thus varying degrees of parking demand that depend on the type of commercial use.

3.2.2 Reduced Parking Requirements
Parking requirements can be reduced from conventional standards and even eliminated especially in transit rich neighborhoods, downtown centers, congested corridors, mixed-use projects, and affordable housing projects (see Table 3.3). A couple of examples include the City of Mountain View, which has implemented reduced parking requirements downtown and along transit corridors, and the City of San Jose, which offers a 10 percent reduction for off-street parking spaces for uses within 2,000 feet of rail and up to a 50 percent reduction for mixed-use projects.

Reduced parking requirements increase housing affordability because as the number of surface parking spaces increases, the number of housing units declines and costs rise. Based on typical affordable housing development costs, one parking space per unit increases costs by about 12.5 percent, and two parking spaces increase costs by about 25 percent (Litman, 2009).

**Overcoming barriers to implementation**

A common concern is that reduced parking will result in spillover issues. To prevent spillover parking from happening, reduced requirements are often implemented in conjunction with other transportation demand management (TDM) strategies such as car share, and then monitored after implementation. If spillover issues are found, they can be addressed with strategies such as residential parking districts and landscape reserves.

### 3.2.3 In-lieu Fees

An in-lieu fee is usually an option given to developers to pay the local jurisdiction a fee as a way to opt-out of providing parking with a new development. The fees can range from the full cost of parking construction to significantly less. In-lieu fees are attractive to developers because these fees are typically lower than developers’ cost of building parking. However, a common concern is that the lack of on-site parking can reduce the ability of a business to attract tenants and customers.

Cities also have the option of mandating in-lieu fees—which are referred to as impact fees. Although fees can be calculated on a case-by-case basis for each project, most cities set
uniform fees per space for all projects for the simplicity and the certainty it provides developers for early financial analyses (Litman, 2006). Cities like Palo Alto, adjust their fees annually based on the ENR Construction Cost Index, which measures cost inflation in the construction industry (Shoup, 2005).

Cities use the accumulated pool of fees to fund public parking facilities—however there are no guarantees on when and where spaces will be provided by the city. In-lieu fees are typically given as an option where land values are high, such as in urban neighborhoods and downtowns. This is often implemented through a business improvement district. In-lieu fees tend to be more cost effective and efficient compared to each business supplying its own facilities because it leads to shared parking. With shared parking, customers can park once and visit multiple sites in an area (Litman, 2006).

Additional benefits of in-lieu fees is that it is easier to restore and rehabilitate historic buildings when there is no requirement to fit a minimum number of parking spaces for the new use, on constrained sites. It also leads to better urban design because without each business having to supply its own parking, there can be continuous storefronts and infill projects (Shoup, 2005). Table 3.2.3 below shares a few examples of in-lieu and impact fees calculated by parking requirements for office buildings in 2002.

Table 3.2.3: Parking In-Lieu/Impact Fees for Office Buildings in 2002

<table>
<thead>
<tr>
<th>City</th>
<th>In-Lieu Parking Fee ($/space)</th>
<th>Parking Requirement (spaces per 1,000 square feet)</th>
<th>Parking Impact Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Palo Alto</td>
<td>$50,994</td>
<td>4.0</td>
<td>$204</td>
</tr>
<tr>
<td>Mountain View</td>
<td>$26,000</td>
<td>3.0</td>
<td>$78</td>
</tr>
<tr>
<td>Berkeley</td>
<td>$12,000</td>
<td>1.5</td>
<td>$18</td>
</tr>
</tbody>
</table>

Source: Donald Shoup, 2005, p. 244

3.2.4 Landscape Reserves

Landscape reserves are lands earmarked to accommodate future overflow parking on-site in exchange for reduced parking requirements. Landscaping can be used to turn this land into an
attractive community amenity. In most cases the developers never need to use that land and it can be kept as a park or landscape reserve for public enjoyment.

The Palo Alto Medical Foundation on El Camino Real in Palo Alto set aside land for a landscape reserve in 1997 and was able to reduce the number of required parking spaces from 1,400 to 1,200 because of close proximity to train station (0.6 miles) and the dedicated landscape reserve. After almost 10 years the landscape reserve was converted into a three-level parking structure in 2006 to accommodate growth (Jury, 2009). Below is a sample of the language used in the Palo Alto Municipal Code (Sec 18.52.050b) for deferral of meeting full parking requirement by landscape reserve.

"Deferral of Meeting Full Requirement by Landscape Reserve

Where the expected need for off-street parking or bicycle facilities for a particular use is uncertain, due to unknown or unusual operating characteristics of the use and unavailability of comparable data to establish need, the director, upon recommendation of the architectural review board, may authorize that construction and provision of not more than fifty percent of the required off-street parking stalls and not more than twenty-five percent of the bicycle parking spaces be deferred. The number of bicycle parking spaces deferred shall be apportioned by construction type (long term or short term) in the same percentages as indicated in Table 1 of Section 18.52.040. The director may set such conditions as necessary to guarantee provision of such deferred spaces whenever the director determines the need to exist. Land area required for provision of deferred parking or bicycle spaces shall be maintained in reserve and shall be landscaped pursuant to a plan approved by the architectural review board demonstrating that ultimate provision of the deferred spaces will meet all requirements of this chapter. Upon use of the parking area at near build-out (at least 90% occupancy) over a period of at least ten years, the director may allow the reserve area to be used for other uses that do not generate parking demand, subject to restrictions and conditions to prevent conversion to a more intense use unless sufficient additional on-site parking is provided."

3.2.5 Remote Parking

Similar to landscape reserves, remote parking is parking designed to accommodate overflow, however located at off-site parking facilities instead of on-site. Such a parking facility can be located at the periphery of a business district or activity center for a special event that attracts large crowds. If the walking distance from parking lot to final destination is considered...
unacceptable, special shuttles or free transit service may be provided. Another example is Park & Ride, where commuters leave their vehicles at a facility located at the urban fringe and then carpool or use public transit to arrive at their final destination. Remote parking is most suitable for application in major commercial areas, campuses, airports, recreation and sports centers, and large urban areas where transit and ridesharing are promoted (Litman, 2006).

**Overcoming barriers to implementation**

Users can be reluctant to use remote parking spaces due to inconvenience or a perceived sense of insecurity. This can be addressed by providing information (signs and maps), and incentives for motorists (cheaper parking or free transit service). If implemented appropriately, remote parking can reduce on-site parking requirements by 10 to 30 percent (Litman, 2006).

### 3.2.6 Shared Parking

Shared parking means parking spaces are shared by more than one user. Shared parking can mean using public parking facilities instead of private lots. It can also mean parking shared by a group of residents or employees, such as 100 employees share 70 parking spaces. Parking can also be shared among different buildings and facilities in an area to take advantage of different seasonal or daily peak periods (See exhibit 3.2.5). For example, an office complex can efficiently share parking facilities with a church or meeting hall, since offices require maximum parking during weekdays, while churches and meeting halls require maximum parking during weekends and evenings (VTPI, 2010). Thus, shared parking can reduce parking facility costs and environmental impacts, allows greater flexibility in facility location and site design, and encourage more efficient land use. The total amount of parking can be reduced 40-60% compared with standard off-street parking requirements for each destination (VTPI, 2010).

Shared parking is based on a “park once” concept where all attractions are accessible to one another by foot. Although shared parking is limited by the proximity of destinations that share a parking facility, shared parking can be applied in many situations—especially in
situations where, land values and parking facility costs are high, traffic congestion or vehicle pollution are significant problems, and where clustered development is desired. A few guidelines and tools for implementing shared parking include The Shared Parking Methodology by the Urban Land Institute, which involves nine steps from research to parking plan, and the Shared Parking Model, which was developed for use in conjunction with the Shared Parking Methodology to calculate the estimated peak accumulation of vehicles for a mixed-use development or district (Davis, 2009).

The City of Mountain View approves shared parking on a case-by-case basis. For a 211-unit apartment project on El Camino Real (Skyview or Avalon Bay), there is one space for each residential unit plus 200 parking spaces that are shared with an adjacent office project. For another mixed-use (residential/commercial) project on El Camino Real, the guest parking (0.3 space per unit) is shared with the commercial development. At the Crossings, which is next to a Caltrain station, there is one space for each of the 128 condominium units plus 200 spaces that are shared with Caltrain commuters according to a time-of-day agreement (City of Mountain View, 2002).

*Figure 3.2.5: Parking Demand Cycles*
Overcoming barriers to implementation

Some public officials consider shared parking difficult to administrate because it requires flexible parking standards, verification and enforcement. They are also concerned that shared parking could create spillover problems, especially during unusual peak demand periods. Developers may consider shared parking to be unfair since some developers benefit more than others. Also, users accustomed to assigned spaces may object to this practice due to perceived inconvenience (VTPI, 2010). In some circumstances, shared parking will not be a viable option for industrial uses (due to liability concerns, timing, logistics, or facility security concerns) and increased parking demand will create conflicts between neighboring facilities and occupancies (SVLG 2006).

To address these concerns, planners should establish standard procedures for implementing shared parking which specify how to calculate minimum parking requirements for different combinations of land uses, acceptable walking distances, requirements for sharing agreements, verification and enforcement. It is important to educate planning officials and developers about the potential for shared parking and procedures for implementing it. Planners should anticipate potential spillover problems, and respond with appropriate regulations and
enforcement programs. They can identify problems with shared parking by performing regular parking studies and getting feedback from users. Other best practices include provision of good pedestrian access and appropriate signage for users concerning shared parking, and the use of Transportation Management Associations or local planning agencies to provide shared parking matching and brokerage services (VTPI, 2010).

3.2.7 Increase Capacity of Existing Parking Facilities

*Reduced parking stall size*

Instead of building more parking, increasing the capacity of existing parking facilities should be a primary strategy in managing supply. Compact vehicles require about 20 percent less space than full-sized stalls (Litman, 2006). However, due to frequent abuse of non-compact cars parking in compact spaces, universal stall sizes have become popular in California. Full sized stalls are typically 9 feet wide by 18 feet long, whereas compact parking stalls measure 8 feet wide by 16 feet long. Universal stall sizes are in-between at typically 8.5 feet wide by 18 feet long. However, universal stall sizes can still accomplish the smart growth goals of compact stall sizes, and many cities including Redwood City, Mountain View, and San Jose have adopted them (Hanna, 2008). They are also more efficient in terms of layout, providing more parking spaces in the same amount of square footage than full stall and compact stall combinations. The following example shows parking estimations from The Opus Group for a proposed parking garage in the City of Brisbane. Assuming the size of the parking garage were to remain the same, three different parking scenarios are explored.

Full Stalls Only = 1,080 stalls

50% Full Stalls and 50% Compact Stalls = 1,160 stalls

Universal Stalls Only = 1,180 stalls

As the above example shows, the most efficient use of the parking garage is to stripe with universal parking stall sizes (The Opus Group, 2008). It is important to note that parking stall
design is dependent on parking turnover rates, which is influenced by land use. For example, residential parking is considered low turnover and retail parking is considered high turnover. Typically high turnover stalls are designed to be larger for ease of mobility (Davis, 2009).

Parking stall reductions can be proposed by developers based on anticipated reduction in automobile traffic demand associated with a particular project’s transportation demand management (TDM) measures. Benefits include economic savings, reducing a parking structure’s carbon footprint, more green/landscaping space, reduced site paving, and reduced stormwater run-off (Hanna, 2008).

**Tandem parking**

Tandem parking is when one vehicle is parked behind another, whether on a driveway as in a residential situation, or in a parking lot with attendant parking, to maximize the number of vehicles that can park in a limited space. Some cities such as San Diego, allow tandem parking to count towards minimum residential parking requirements (Litman, 2006). In the San Diego Municipal Code, a Residential Parking Overlay Zone was created to identify the conditions under which tandem parking may be counted as two parking spaces in the calculation of required parking for single or multiple dwelling unit developments.

**Overcoming barriers to implementation**

Although tandem parking may not be the most convenient option, especially for roommates who share a residence, with proper planning, good communication and cooperation, roommates won’t inconvenience each other. When parking is at a premium, tandem parking is appreciated as a better alternative than having to look for on-street parking.

**Angled parking**

Angled parking is when cars are arranged at an angle of 45 to 60 degrees to the aisle or street. There is even reverse angle parking where motorists back into the spaces for increased visibility when exiting. Angled parking allows motorists increased mobility from a gentler turn that results
in less time required for parking maneuver. The narrower aisles accommodate a greater number of stalls than perpendicular parking or parallel parking. Angled parking can approximately double the number of parking spaces of parallel parking (Litman, 2006).

Angled parking is best applied on streets with low traffic volume, wide lane widths, and safe sight distance. Other considerations include the type of land uses, pedestrian activity, the availability of parking, impact on adjacent street segments, transit operations and potential accidents (Edwards, 2002).

As a strategy for reducing minimum parking requirements and encouraging smart growth principles, angled parking offers a wider buffer (18 feet to 20 feet instead of 8 feet to 9 feet) between the sidewalk and the driving lane than parallel parking. This increased buffer reduces noise and fumes, providing an improved perception of safety for pedestrians. Angled parking also slows traffic because of drivers looking out for potential conflicts, which works to the benefit of the pedestrian (Edwards, 2002). Other benefits include increased safety from the fact that drivers and passengers exit vehicles outside of the traveled way unlike parallel parking. (See table 3.2.6).

Overcoming barriers to implementation

However, angled parking can impact transit operations in several ways: (1) It may increase route time due to additional congestion; (2) it may make the conversion of parallel to angle parking on narrow street widths unfeasible; and (3) the presence of transit stops may reduce the number of potential additional spaces that might be gained with angle parking (ODOT, 2001).

Another major concern is safety. Studies prior to the 1980’s and in the 1990’s comparing angled and parallel parking concluded that angled parking had higher crash rates (ODOT, 2001). Although a study by the Oregon Department of Transportation in 2001 found that the higher crash rate and frequency of angled parking is more likely due to the increased activity of parking rather than the characteristics of either parking. However, they still recommend that parallel parking be used if ample parking supply exists. AASHTO A Policy on Geometric Design of
Wang

Chapter 3: Overview of Parking Policies and Strategies

Highways and Streets (1994) and the ODOT Highway Design Guide (1996) also suggest that parallel parking is preferable to angle parking whenever possible.

Table 3.2.6-Comparison of Parallel and Angled Parking—Drawbacks and Benefits

<table>
<thead>
<tr>
<th></th>
<th>Benefits</th>
<th>Drawbacks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parallel Parking</td>
<td>• Lower accident risk than angled parking</td>
<td>• Driver and passengers may have to exit vehicle into the traveled way</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Parking maneuver takes more time than angled parking</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Some drivers must execute maneuver multiple times</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Interruption of through movement depending on width of cross section</td>
</tr>
<tr>
<td>Angled Parking</td>
<td>• Less time required for parking maneuver</td>
<td>• Driver leaving space has limited visibility to the rear</td>
</tr>
<tr>
<td></td>
<td>• Greater number of stalls</td>
<td>• Empty spaces are hard to detect by approaching drivers resulting in stop and go movements</td>
</tr>
<tr>
<td></td>
<td>• Driver and passengers exit vehicle outside of the traveled way</td>
<td>• Through drivers decrease speed in anticipation of conflict movements</td>
</tr>
<tr>
<td></td>
<td>• Wider buffer between sidewalks and driving lanes</td>
<td>• Higher accident risk</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Can be incompatible with transit operations</td>
</tr>
</tbody>
</table>

Source: ODOT, 2001

Mechanical parking

Mechanical parking is an apparatus, such as car stackers, operated by a valet parker that can stack two or more motor vehicles on two or more levels. Shoup describes mechanical parking as substituting labor for land and capital in parking cars (Shoup, 2005). Stackers are typically installed in existing facilities that are deficient in parking and can store two to 30 cars per unit.

One drawback is that stackers may be unable to accommodate larger vehicles, such as sport utility vehicles, vans and trucks. However, mechanical parking can provide more parking spaces for lower construction costs than compared to self-park spaces. In 2008, Watry Design, Inc. studied various options to increase parking by 46 stalls for the Olympia Place development in Walnut Creek, California. Valet operated stack car lifts provided 66 new stalls at a construction cost of $19,790 per stall while a self-park expansion provided 62 new stalls at a construction cost of $55,473 per stall (Davis, 2008).

Automated parking
In automated garages, cars are parked mechanically instead of by a valet service. The driver pulls into the entryway of what looks like a single-car garage, steps out and pulls a ticket before departing. After sensors have determined that the occupants have left, the car is lifted on a pallet and transferred to a storage slot. When drivers return and reinsert their tickets, their vehicles are delivered to them, facing the exit, each within a couple of minutes. “From the driver’s point of view, the system works like valet parking, although the driver keeps the keys and no tip is expected” (Shoup, 2005, p. 616).

Automatic parking systems are operated by software and make maximum use of available space while providing effective protection against theft and damage (Litman, 2006). Dents and scratches are no longer a concern since throughout the time that the vehicle is in the facility, it will not come into contact with other cars or with the parts of the system itself (McDonald, 2008).

Automated garages require only half the volume of conventional garages since they don’t require ramps, aisles, elevators, and stairs (Shoup, 2005). Reducing the amount of space required for parking adds more leasable space to a development, creating additional real estate opportunities. Typical automated parking systems can store anywhere from 50 to several thousands of cars and new software allows garage designers to accurately assess how a facility will manage peak traffic volumes. Other benefits include opportunities to blend the facades of automated parking facilities with the surrounding buildings, create park-like pavilions for entryways to underground facilities, and to integrate the lobbies of automated facilities as a community gathering space with coffee shop, newsstand, and other similar amenities.

Computerization also simplifies the building engineering, allowing a simple frame structure that is perfect for adaptive re-use as movement patterns change. It also permits accelerated depreciation and may qualify a facility for municipal financing (McDonald, 2008).

In April 2010, the West Hollywood City Council approved the issuance of a Request for Proposals (RFP) to explore the feasibility of building the first-in-California, fully-automated Municipal Parking Structure for City Hall visitors, staff and commercial patrons as part of the
City Hall renovations. The City found the automated structure to provide a smaller footprint and lower cost than building a conventional structure. They also see this as a strategy for reducing CO\textsubscript{2} emissions. “For the proposed 200-space parking structure, the reduction in CO\textsubscript{2} emissions for the automated garage system is equal to taking 92 cars off the road each year or planting 67,000 trees” (WeHo News, 2010).

**Overcoming barriers to implementation**

“...because the generous supply of required parking spaces has reduced the price of most parking to zero in the U.S., off-street parking requirements have reduced the potential profitability of automated garages and delayed their development.” (Shoup, 2005, p 617.)

Automated garages are popular in European and Asian countries, and in a few locations in the U.S., such as New Jersey, Washington D.C., Maryland, Massachusetts, Chicago, and New York, where land is at a premium. Shannon McDonald in her article How Mechanization Can Help Cities Rethink Parking on Planetizen.com, states that mechanized parking is “poised to be among the important solutions for the 21\textsuperscript{st}-century United States” (McDonald, 2008). For automated parking to become popular in the U.S., there are several barriers to overcome. Supply of parking must be managed to reflect the true cost of parking, and zoning and building codes must be updated. Zoning codes that typically require a certain number of physical parking spaces of a specific size need to be updated to include a mechanical capacity to store the same number of vehicles. Building codes also need to be updated to include standards for safe construction and operation of automated garages. Planners can turn to cities that have developed codes pertaining to mechanized parking structures as a guide in developing their own standards. (For example, New York City’s Building Code 2008, chapters 4, 6, and 7 pertain to mechanized parking structures.)

3.3 **PARKING DEMAND**

Transportation Demand Management (TDM) is a general term for strategies that increase transportation system efficiency by changing travel behavior. It can affect travel frequency,
mode, destination, or timing (Litman, 2006). Managing parking demand is a crucial element in a TDM program. Table 3.3 is from Todd Litman’s *Parking Management Best Practices*, 2006 which lists factors affecting parking demand and how they can be applied to adjust parking supply requirements.

Table 3.3 - Factors Affecting Parking Demand and Requirements

<table>
<thead>
<tr>
<th>Factor</th>
<th>Description</th>
<th>Analysis Method</th>
<th>Typical Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geographic location</td>
<td>Vehicle ownership and trip generation rates in an area.</td>
<td>Population and travel data to identify variations.</td>
<td>Adjust parking requirements to reflect variations in vehicle ownership and trip rates in an area.</td>
</tr>
<tr>
<td>Residential density</td>
<td>Number of residents or housing units per acre/hectare.</td>
<td>Models, such as Holtzclaw (1994), can be used to determine how density affects vehicle ownership and use.</td>
<td>Reduce parking requirements 1% for each resident per acre: reduce requirements 15% where there are 15 residents per acre, and 30% where there are 30 residents per acre.</td>
</tr>
<tr>
<td>Employment density</td>
<td>Number of employees per acre.</td>
<td>Adjust employee parking requirements to reflect automobile commute mode split.</td>
<td>Reduce requirements 10% to 15% in areas with 50 or more employees per gross acre.</td>
</tr>
<tr>
<td>Land-use mix</td>
<td>Range of land uses located within convenient walking distance.</td>
<td>Apply trip and parking demand reduction factors, such as Portland (City of Portland, 1995). Apply shared parking factors.</td>
<td>Reduce requirements 5% to 10% in mixed-use developments; additional reductions if parking facilities are shared.</td>
</tr>
<tr>
<td>Transit accessibility</td>
<td>Nearby transit service frequency and quality.</td>
<td>Adjust worksite parking to reflect transit commute mode split. Models, such as Holtzclaw (1994), can predict how transit service quality affects vehicle ownership and use.</td>
<td>Reduce requirements 10% for housing and employment within one-quarter mile of frequent bus service, and 20% for housing and employment within one-quarter mile of rail transit station.</td>
</tr>
<tr>
<td>Carsharing</td>
<td>Whether a carsharing service is located within or near a residential development.</td>
<td>Based on experience and comparable programs.</td>
<td>Reduce residential requirements 5% to 10% if a carsharing service is located within one-quarter mile, or reduce 5 to 10 parking spaces for each carshare vehicle located in a building.</td>
</tr>
<tr>
<td>Walkability</td>
<td>Quality of walking environment.</td>
<td>Pedestrian Environmental Factor and pedestrian level of</td>
<td>Reduce requirements 5% to 15% in walkable communities, with</td>
</tr>
</tbody>
</table>
### Service and Demographics

<table>
<thead>
<tr>
<th>Source</th>
<th>Description</th>
<th>Additional Reductions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litman, 2006, p. 44</td>
<td>Additional reductions if walking improvements allow more shared and off-site parking.</td>
<td>Reduce requirements 20% to 40% for housing for young (under 30), elderly (over 65), or disabled people.</td>
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### On-Street Pricing

On-street parking pricing charges motorists directly for using parking facilities and is typically applied where land is valuable, such as downtowns. It is known as the most effective strategy for managing parking demand when implemented as part of an integrated parking management program.

### Table: Additional Reductions for Various Parking Policies

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program (MTC, 2007). The price elasticity of vehicle trips with respect to parking price is typically –0.1 to –0.3 (a 10% increase in parking fees reduces vehicle trips by 1% to 3%), depending on conditions (Litman 2008). Parking demand is reduced when drivers adapt to pricing by economizing on parking. Typical strategies include reducing parking durations, splitting the cost of parking, parking off-street, diverting trips to off-peak hours when parking is cheaper, and/or making trips by carpool, public transit, cycling or walking.

On-street parking pricing best practices strive to set the lowest price that will avoid parking shortages, which is recommended as a target occupancy of 85%—equating to 1 space in every 8 that remains vacant (Shoup, 2005). Since parking demand fluctuates by time of day, ideally on-street parking prices would reflect the change in demand to consistently achieve the target occupancy rate—charging more for peak hours and little to none for off-peak hours (Shoup, 2005).

One of the major goals of parking pricing is to reduce cruising—the search for an unoccupied space. Cruising and double-parking shrinks the capacity of downtown streets, congests traffic, wastes fuel, causes accidents, and pollutes the air. Cruising for parking can inflate vehicle travel tremendously. A study of underpriced curb parking by Donald Shoup in Westwood Village, L.A., a 15-block commercial district near UCLA, found that the average time to find a curb space among the 500 spaces available to be 3.3 minutes. The estimated vehicle miles traveled per year for cruising, after accounting for variables such as cruising time, turnover rate, average cruising speed, and the number of curb spaces, amounted to 912,500 VMT per year—enough vehicle travel to make 38 trips around the earth (Shoup, 2005, p. 348).

In addition to improving user convenience, traffic congestion, energy consumption and pollution emissions, property implemented parking can generate new revenue. It is recommended that revenues be made to finance additional parking supply, alternative modes and management programs. Parking Pricing Implementation Guidelines (2010) by Todd Litman, lists various ways in which parking revenues can be used:
• Recover parking pricing costs (equipment, enforcement, user information, etc.).

• Recover parking facility construction and operating expenses.

• Help support the development of parking benefit districts.

• Parking and transportation management program expenses, including commute trip reduction programs and improvements to alternative modes that reduce parking and traffic problems.

• Municipal transportation expenses (street and sidewalk capital and operating expenses).

• Special district and neighborhood improvements, such as streetscaping, improved street and sidewalk cleaning and security, and commercial district marketing.

• Reduce general taxes or offset tax increases that would otherwise be required.

• Help finance special projects or programs, such as a municipal arena or recreation center.

Overcoming barriers to implementation

Parking pricing must be executed carefully, in a transparent and predictable manner that the public will understand and support, with benefits clearly communicated and potential problems addressed. Implementation requires overcoming various political, institutional and technical obstacles. One of the greatest concerns regarding on-street pricing is reduced economic activity. Even though over the short term there may be a drop in the number of visitors to an area with priced parking, parking fees are largely associated with positive effects on the local economy over the long term. Many economically successful retail areas have priced parking while other shopping centers with free parking are less successful (Litman, 2010a). Downtown Los Altos, CA struggled with a declining sales-tax revenues over a 13-year period despite offering plenty of free parking, while just about 22 miles away, Downtown Burlingame—which offers metered parking—registered upswings in revenue over the same period (Barton, 2009). Parking pricing provides businesses benefits such as reducing delivery costs, insuring that motorists can always find a
convenient parking space, and revenues that can finance additional downtown services (cleanliness, safety, lighting, street furniture) (Litman, 2010a).

If cash-strapped cities are hesitant to assign existing meter revenue from the general fund to the neighborhoods that generate it, cities can keep the revenue they already collect and return to neighborhoods only the increment in meter revenue – resulting from increased business activity in their districts—that occurs after a parking benefit district is formed. This method of parking increment finance allows business improvement districts to receive added public services without added costs to the city or themselves (Shoup, 2005).

Another concern is spillover impacts. Motorists may park illegally at nearby parking lots, or cause parking congestion problems on nearby streets where parking is not priced. This can be addressed by improving parking regulations, user information and enforcement (Litman, 2010a). Parking pricing is often tiered to regulate parking duration and cost based on distance and convenience to major destinations, particularly the downtown core. Downtown Redwood City generally stratifies parking pricing into two tiers: 50 cents/hour for the main street and side streets, and 25 cents an hour for periphery streets. After implementation of performance based pricing for curb meters and eliminated time limits, occupancy on Broadway decreased from 100% to 82%, ensuring that spaces are available and motorists do not have to cruise the block. The average length of occupancy neared the desired one-hour mark, and monthly permit sales for city garages increased 50% as downtown employees moved off the street (Zack, 2009).

Table 3.3.1 is an excerpt from Todd Litman’s paper identifying ways to address common objections and obstacles to parking pricing implementation:
### Table 3.3.1: Parking Pricing Obstacles and Potential Solutions

<table>
<thead>
<tr>
<th>Objections and Obstacles</th>
<th>Potential Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>User inconvenience, delay and frustration with pricing systems and enforcement practices.</td>
<td>Use more convenient pricing systems. Use meters that offer multiple payment options (coins, bills, credit and debit cards, and pay-by-phone) and only charges for the exact amount of time a vehicle is parked. Improve user information on their transport and parking options. Insure that enforcement is fair, friendly and courteous.</td>
</tr>
<tr>
<td>High transaction costs, including expenditures on equipment (parking meters) and operations, which consume a significant portion of revenues (often hundreds of dollars annually per space).</td>
<td>Use more cost effective pricing systems, including multi-space meters (each of which serves about ten spaces), and integrated systems that achieve scale economies.</td>
</tr>
<tr>
<td>Spillover impacts (motorists parking illegally in nearby parking lots or on residential streets).</td>
<td>Implement parking pricing as part of an integrated parking management program that includes improved parking regulation, user information and enforcement which anticipate and address spillover impacts.</td>
</tr>
<tr>
<td>Reduced business and economic activity if competitors offer unpriced parking.</td>
<td>Design parking pricing to improve business access, by favoring delivery and customer vehicles, providing convenient information to customers on their transport and parking options, and supporting other modes. Use portion of revenues to support local development. Offer targeted discounts and exemptions, such as customer parking validation.</td>
</tr>
<tr>
<td>Financial burden on motorists, particularly those with lower-incomes.</td>
<td>Implement parking pricing in ways that maintain affordable parking options (such as free or low-priced parking a few blocks away) and improvements to alternative modes. Use revenues in ways that benefit lower-income people.</td>
</tr>
<tr>
<td>Where parking supply is abundant it seems inefficient to price parking if this results in spaces left unoccupied.</td>
<td>Allow parking supply to be reduced to optimal level. Rent or lease excess parking spaces, or convert land to other uses.</td>
</tr>
<tr>
<td>General unhappiness and distrust of government (perception that taxes are excessive, services are poor, and mayors are overpaid).</td>
<td>Implement parking pricing in a transparent and predictable way. Clearly define how revenues will be used and how this benefits citizens.</td>
</tr>
</tbody>
</table>


The parking ordinance of Redwood City, CA provides a good example of an ordinance that is written to achieve efficient parking fees and return revenues to local business districts. It was adopted unanimously by the city council in 2005, and is supported by local business leaders.

Here are some excerpts from the ordinance (Chapter 20, Article VII, Division 4):

To accomplish the goal of managing the supply of parking and to make it reasonably available when and where needed, a target occupancy rate of eighty-five percent (85%) is hereby established.

At least annually and not more frequently than quarterly, the Parking Manager shall survey the average occupancy for each parking area in the Downtown Meter Zone that has parking meters.
Based on the survey results, the Parking Manager shall adjust the rates up or down in twenty-five cent ($0.25) intervals to seek to achieve the target occupancy rate.

Revenues generated from on-street and off-street parking within the Downtown Meter Zone boundaries shall be accounted for separately from other City funds and may be used only for the following purposes:

A. All expenses of administration of the parking program
B. All expenses of installation, operation and control of parking equipment and facilities within or designed to serve the Downtown Core Meter Zone
C. All expenses for the control of traffic (including pedestrian and vehicle safety, comfort and convenience) which may affect or be affected by the parking of vehicles in the Downtown Core Meter Zone, including the enforcement of traffic regulations as to such traffic.
D. Such other expenditures within or for the benefit of the Downtown Core Meter Zones the City Council may, by resolution, determine to be legal and appropriate.

3.3.2 Unbundled Parking

Unbundled parking is where parking spaces are rented and sold separately from building space, enabling households and employers to freely choose how many spaces to lease. Parking is typically unbundled by developers and facility managers in college towns like San Luis Obispo, for affordable housing developments and buildings with parking shortages. Unbundled residential parking typically reduces vehicle ownership by 5 to 15 percent, and more where parking facility costs are higher than average. The cost for each new structured parking space in the Bay Area is $30,000 per space and upwards (Nelson\Nygaard, 2008). Depending on geographic and demographic factors, renting out a parking space for $100 a month is likely to reduce automobile ownership by 15 to 30 percent (Litman, 2006). See Figure 3.3.2. Thus, minimum parking requirements can be reduced for developments with unbundled parking in recognition that it tends to reduce parking demand.

In San Francisco, where the market has put a value of $75,000 on an off-street parking space, an affordable housing project at 8th and Howard had to rent parking separately from housing units to significantly reduce apartment rents. The 66 spaces for 74 family apartments and 88 studios
provided a ratio of only 0.38 spaces per unit. Unbundled parking also freed up space for a childcare center and neighborhood retail (Baker, 2003).

Unbundling parking in conjunction with other TDM strategies can yield significant reductions in parking needed. A residential project proposed in 2008 just outside downtown San Mateo, California has 33 housing units and an underground parking garage. The project has 17 standard spaces, 15 compact spaces, 2 accessible spaces, 8 tandem spaces and 24 spaces in parking lifts. Nelson\Nygaard Consulting Associates prepared a TDM program for this development that included the unbundling of parking. “Unbundling of parking, free Caltrain passes, abundant bicycle storage, a transportation coordinator, will reduce the need for residents to travel by car as much as 15%” (Nelson\Nygaard Consulting, 2008, p.7). The trip reduction calculated by Nelson\Nygaard due to the location, affordable units, accessibility to transit, and the TDM measures resulted in a roughly 30% reduction in parking generation at the site compared to the City parking requirements for multifamily projects. Instead of the 66 spaces required by the City, only 45 spaces were actually needed based on demand. See Table 3.3.2 (Nelson\Nygaard, 2008).

“The applicant will unbundle parking and sell the parking spaces separate from the sale of the housing unit. The exception to this policy will be the three below market rate units, which will each be sold with two tandem parking spaces included in the purchase price. The parking spaces that are not sold initially will be turned over to the HOA for management and may be purchased later on by future tenants” (Nelson\Nygaard, 2008, p.5).

*Table 3.3.2-Parking Requirement and Actual Parking Demand—Residential Development, San Mateo*

<table>
<thead>
<tr>
<th>Unit Type</th>
<th># Units</th>
<th>Spaces Required per Unit (per City Code)</th>
<th>Actual Demand Incl. Guest Parking Per Unit</th>
<th>Total Number of Spaces Required (per City Code)</th>
<th>Total Number of Spaces Needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-Bedroom</td>
<td>3</td>
<td>1.8</td>
<td>1.22</td>
<td>5.4</td>
<td>3.6</td>
</tr>
<tr>
<td>2-Bedroom</td>
<td>27</td>
<td>2</td>
<td>1.35</td>
<td>54.0</td>
<td>36.5</td>
</tr>
<tr>
<td>3-Bedroom</td>
<td>3</td>
<td>2.2</td>
<td>1.49</td>
<td>6.6</td>
<td>4.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>66</td>
<td>45</td>
</tr>
</tbody>
</table>

*Source: Nelson/Nygaard memorandum, 2008*
Another example of unbundled parking is Parker Place. It is a 155-unit mixed-use project planned for Downtown Berkeley, which is committed to unbundling all 123 residential parking spaces, as well as offering discounted transit passes.

**Overcoming barriers to implementation**

Parking costs are generally included in the sale or rental price of housing and commercial space for the sake of simplicity, and because it is the traditional practice in real estate (Nelson\Nygaard, 2008). Property managers may be concerned about increased administrative and enforcement costs. The community may be concerned about the possibility of spillover problems from people parking off-site to avoid the parking fee. These concerns can be addressed by creating transportation management associations to facilitate unbundling and enforcement strategies to prevent spillover issues.

*Figure 3.3.2-Vehicle Ownership Reductions from Residential Parking Pricing*

<table>
<thead>
<tr>
<th>Annual (Monthly) Fee</th>
<th>-0.4 Elasticity</th>
<th>-0.7 Elasticity</th>
<th>-1.0 Elasticity</th>
</tr>
</thead>
<tbody>
<tr>
<td>$300 ($25)</td>
<td>4%</td>
<td>6%</td>
<td>8%</td>
</tr>
<tr>
<td>$600 ($50)</td>
<td>8%</td>
<td>11%</td>
<td>15%</td>
</tr>
<tr>
<td>$900 ($75)</td>
<td>11%</td>
<td>17%</td>
<td>23%</td>
</tr>
<tr>
<td>$1,200 ($100)</td>
<td>15%</td>
<td>23%</td>
<td>30%</td>
</tr>
<tr>
<td>$1,500 ($125)</td>
<td>19%</td>
<td>28%</td>
<td>38%</td>
</tr>
</tbody>
</table>

*This table indicates reductions in vehicle ownership resulting from various residential parking fees, assuming that total vehicle ownership costs average $4,000 per year.*

*Figure 3.3.2.1 Reduction in Vehicle Ownership From Residential Parking Prices*

*This figure illustrates typical vehicle ownership reductions due to residential parking pricing, assuming that the fee is unavoidable (free parking is unavailable nearby).*

*Source: Litman, 2006, pp. 40, 152*
3.3.3 Commuter Financial Incentives

The use of financial incentives to encourage more efficient commute modes and reduced parking demand include strategies such as parking cash out, travel allowance, transit benefits and rideshare benefits. These strategies are most effective in areas with significant traffic, parking or pollution problems and sufficient alternative commute options (Litman, 2010).

- **Parking Cash Out** means that commuters who are offered subsidized parking are also offered the cash equivalent if they use alternative travel modes (Shoup, 2005).

- **Travel allowances** are a financial payment provided to employees instead of parking subsidies. Commuters can use this money to pay for parking or for another travel mode.

- **Transit and rideshare benefits** are free or discounted transit fares provided to employees. Santa Clara Valley Transportation Authority offers an EcoPass program where employers purchase annual Eco Pass stickers for their employees at a fraction of the cost of standard monthly passes. Employees then affix the stickers to the back of their VTA-produced photo ID cards and the entire VTA fleet is at their service. There is also a residential Eco Pass offered at a deep discount to housing developments. The EcoPass program resulted in a 19 percent reduction in parking demand (MTC, 2007).

“Over the medium and long term most firms have opportunities to benefit financially from reduced parking demand: to provide additional parking to accommodate growth, to lease or sell excess parking, or to use the land for a new building, equipment storage, or greenspace.” (Litman, 2010).

Parking cash out programs are one of the most effective means to encourage employees not to drive alone to work. Cash out programs are an effective means of allocating scarce parking or managing a growing demand for more parking. Parking cash-out provides equity by improving access to employment, and giving non-drivers benefits comparable to drivers. Other benefits
include increased affordability, reduced peak-period traffic congestion, and increased demand for alternative modes—which all result in reduced emissions. Each gallon of gasoline not combusted prevents 19.4 pounds of CO$_2$ emissions from being added to the atmosphere (EPA, 2005).

**Overcoming barriers to implementation**

Possible barriers to implementation may be resistance from business, labor organizations, or employees who are unfamiliar with the program. Employers may also be concerned about employees abusing the program by claim to commute by alternative modes but actually drive and use an off-site parking space. To overcome these barriers it is important to include employees in program development and planning to help identify and address practical and equity concerns. Careful parking management will prevent the program from being abused. If programs are made flexible, employees can participate full or part-time and have the choice to walk, bicycle, carpool, or take transit. Businesses may perceive no short-term financial savings from reduced auto use if they have sufficient parking capacity and may incur financial costs if incentives are paid but are unable to lease or sell excess parking capacity or use the land in other profitable ways. However, they may be willing to implement the program for the benefits of attracting and retaining the best employees. Commuter financial incentives can be integrated with other TDM efforts to become robust enough for significant improvements in reducing congestion and emissions. Models are available to predict the travel impacts of a specific Commute Trip Reduction program. These include the CUTR_AVR Model (www.cutr.usf.edu/tdm/download.htm), the Business Benefits Calculator (BBC) (www.commuterchoice.gov) and the Commuter Choice Decision Support Tool (www.ops.fhwa.dot.gov/PrimerDSS/index.htm) (Litman, 2010).

The suburban City of Pleasanton, initiated a daily form of parking cash out in January 1994. The City offers $2 per day to employees who use a commute alternative instead of driving to work alone. All city employees are eligible to participate with no minimum days required. The program has resulted in annual savings of 20,625 trips, which translates into 12,375 gallons of
fuel and 123 tons of CO2. In 1993, the year before the program was implemented, only 28 employees were commuting to work using alternative modes. Average participation in 2004 was 57 employees per month representing a steady rise in ten years (EPA, 2005, p. 14).

3.3.4 Parking Districts

Residential parking permit is a program where neighborhood residents are given priority use of on-street parking by allocating a limited number of permits to be given or sold at a minimal fee to residents and their guests to park in a particular block or area. Non-residents or those without permits who park on-street will risk citations, fines, and possible towing. Residential parking permits are usually implemented in areas that frequently suffer from spillover parking problems from nearby business or schools. Other problems from spillover that residents may contend with include: 1) lack of guest parking, 2) late night noise, 3) difficulty accessing driveways, 4) intersection safety, 5) additional auto theft, 6) interference with weekly refuse collection, 7) difficulty with curbside mail delivery, 8) additional trash and deterioration of landscaping, and 9) a perceived loss in personal safety and privacy. The College Terrace neighborhood in Palo Alto responded to spillover parking from the nearby Stanford University with a residential parking permit program that institutes a two-hour limit for street parking on weekdays and a new pilot program that allows residents to purchase a license and park on the street for longer than the limit allows (Dremann, 2010).

A method for neighborhoods willing to proactively manage on-street parking through price-based regulation and restructured residential permit parking is through a parking benefit district. A parking benefit district program can be made available to neighborhoods facing parking challenges, regardless of whether the neighborhood is covered by a residential parking permit program. The key difference is that non-residents are allowed to park on the streets, instead of not at all, by paying the fair market price—typically in the form of a parking permit. Neighborhoods can opt in on a block-by-block basis. With the consent of the residents, a few
permits can be sold to employees of nearby businesses to park in the benefit district during the day while most residents have taken their own cars to work. This policy fosters neighborhood self-government because each neighborhood can decide its own policy about charging for curb parking and choose its own priorities for spending the revenue. Even without neighborhood management, cities can dedicate parking proceeds from the benefit district to improve the neighborhood (clean streets, repair sidewalks, plant trees, provide security) (Shoup, 2005).

Best practices include limiting the number of non-resident permits issued to the spaces available, setting the price of the permit to achieve an 85 percent target occupancy rate, and testing with pilot programs before full implementation. The hours during which parking is priced would be evaluated and modified as necessary. Typically, an area must experience at least 75 percent on-street occupancy, have at least 25 percent of parked vehicles owned by nonresidents, and have a majority of residents who support the permit system to qualify (ITE, 2000).

Santa Cruz, CA has residential parking benefit districts in six areas where Downtown employees pay $240 a year for commuter permits to park during the day in nearby residential permit districts, while residents pay only $25 a year to park on the street overnight. However, nonresidents may only purchase passes if the particular residential street is less than 75 percent occupied (City of Santa Cruz, 2005). The City of Mountain View also offers daily ($40 per book of 25), monthly ($40), and annual ($240) parking permits for businesses, employees, and residents located within the Downtown Parking District (City of Mountain View, 2010).

**Overcoming barriers to implementation**

Shoup asserts that parking benefit districts should gain political support because the policies easiest to implement tend to produce concentrated benefits (residents receive additional public services) and widely distributed costs (paid for by the parking revenue) (Shoup, 2005). However, there can be conflicts to how permits are allocated, since not everyone can obtain one. There may
also be spillover issues if nearby blocks do not require parking permits. Hence, a neighborhood perspective should be kept in mind when designing the program block by block.

It is also important to recognize the limits of fully addressing overnight demand in residential areas. In many neighborhoods, demand for overnight on-street parking is especially high. Enforcement is more of a challenge during very late hours even with a parking benefit district. However, traffic volumes and business activities are light during late-night periods, so on-street occupancies in excess of 85 percent may be more tolerable (Litman, 2010).

3.3.5 Car Share

A car share is an automobile rental service typically available in or near a residential development, or in densely populated areas such as city centers and university campuses. Car share services encourage the occasional and efficient use of the automobile, reducing auto ownership rates and the need for parking. According to Litman, car sharing can reduce parking requirements by 5 to 10 percent (Litman, 2006). These services are typically used on occasion for errands such as shopping and recreation, since it is generally not cost-effective for regular commuting to a full-time job.

Cost savings, convenient locations, and guaranteed parking are identified as the most common motivations for carsharing use worldwide (Shaheen, 2007). In Japan there are over 20 car sharing companies in 2010 — and about half of them started up just the previous year, according to the Japanese website, car-share.net. As the number of services grows, companies are competing to differentiate themselves by going online and mobile — a few have launched free iPhone apps that let members find locations and rates for available shared cars near particular areas or train stations and make or change reservations (The Japan Times, 2010)

City Car Share is a Bay Area non-profit serving individuals, households, and businesses in San Francisco and the East Bay since 2001. The customer visits their website to find a car available at the location they want, reserve the vehicle online or by phone 24/7, pick it up and go.
The average driving rate is $6.75/hour with gas, insurance, parking, cleaning, and maintenance included.

A long-term study completed in 2004 of City CarShare members by Professor Robert Cervero at the University of California, Berkeley, found that 30 percent of households that joined sold one or more of their privately owned cars. Overall automobile travel among the hundreds of City CarShare members dropped 47% in the 18-month study period. “Each day City CarShare is saving 13,000 miles of vehicle travel, 720 gallons of gasoline, and 20,000 pounds of carbon dioxide emissions” (CityCarShare, 2004).

**Overcoming barriers to implementation**

Workshops with shareholders should be held to discuss the technical, behavioral, and organizational issues related to car sharing to inform the design of the application. Research around policies and guidelines to ensure that carshare is right for your community—-and running a trial period—-are crucial steps for successful deployment. A study using a Geographic Information Systems tool to assess the market potential for new carsharing operations in urban communities found that neighborhood and transportation characteristics are more important indicators for carsharing success than the individual demographics of carsharing members. Results show that low vehicle ownership rates and high percentages of one-person households are two characteristics needed to support carsharing (Celsor, 2007).

**3.3.6 Parking User Information and Technology**

This program covers parking user information about parking availability, regulations, price, and alternative travel options. Improved user information can increase the effective parking supply serving a destination by 5 to 15 percent (Litman, 2006). The primary strategy for provision of parking information is Advanced Parking Management Systems (APMS). The following paragraphs summarize a few key concepts in the 2007 study by the Federal Highway Administration entitled, *Advanced Parking Management Systems: A Cross-Cutting Study.*
Advanced parking management systems include elements from traditional traveler information systems and from specialized parking management applications. Parking user information covers a wide range of applications. There are pre-trip parking information systems, lot specific parking information systems, floor aisle and space specific parking information systems, and real-time reservation systems (FHA, 2007).

Advanced parking management systems (APMS) provide convenient and accurate information on parking availability and price, allowing people to find parking spots quickly—reducing frustration and enhancing the visitor’s experience. Parking operators experience increased space occupancy in their facilities and associated increases in revenue. Another benefit is the reduction in the number of patrons circulating through the street network looking for a parking space and fewer vehicles parked illegally on local streets (FHA, 2007).

**Pre-Trip Parking Information Systems**

Pre-trip parking information systems can be as low-tech as publishing a map of available parking facilities. For more high-tech systems, several cities across the U.S. provide pre-trip parking information over the Internet. These Web pages provide a map of where the parking facilities are relative to major access routes and attractions. These Web pages also provide other information to help the traveler make a parking plan, i.e., the facility’s address, capacity, hours of operation, costs, and forms of payment accepted. Often, Web pages are the first step in moving towards a more sophisticated APMS solution (FHA, 2007).

One such website is from the City of Santa Monica, CA. The website offers real-time parking space availability in the city that is updated every five seconds. There is also a parking overview map providing information on lot locations, hours and rates. Santa Monica even has a parking and traffic information radio station providing up to the minute parking announcements (See http://parking.smgov.net/). There is also www.bestparking.com. The website is a free search
engine that helps people find the cheapest and most convenient parking facilities at major airports and seven major cities, including San Francisco and Los Angeles.

**Lot Specific Parking Information Systems**

Lot-specific systems provide parking information using signs that typically have both passive and active components. The passive component provides simple directions to parking facilities, such as with an arrow. The active component supplements the passive component to advise the traveler of the availability of spaces at the facility (FHA, 2007).

**Floor, Aisle, and Space Specific Parking Information Systems**

In addition to providing information about which lots are full and how many spaces are available at remaining lots, more complex advanced parking information systems have signs on every floor of a garage, at the start of every aisle, and sometimes in front of every individual parking space (FHA, 2007).

Park Assist is a company specializing in parking guidance, bay sensing and enforcement parking management systems. In 2008, they installed their system at Westfield Century City Mall in Los Angeles. Park Assist conducted a before-and-after study with Cambridge Systematics and ARUP at Century City to measure search time, reliability, fuel and environmental impacts. Study findings show that installation of the Park Assist system decreased average time spent searching for parking in the facility by 44% and saved up to 459,000 kg CO₂ annually (Tao, 2009).

**Real-Time Reservation Systems**

Some advanced parking management systems allow the traveler to reserve and pay for a parking space using the telephone, Internet or wireless handheld devices. The system used by Bay Area Rapid Transit at a park-and-ride facility in Millbrae, California, are services offered by private company ParkingCarma™. BART riders may reserve any of these 50 spaces over the Internet, personal digital assistant (PDA) or telephone. Daily or monthly reservations are available up to two weeks in advance. It costs a commuter $4.50 to reserve a spot in advance through
ParkingCarma™, compared to the daily rate of $1.00 for those who drive into the lot and find a space. Utilization of the reserved parking spaces has increased from 10 percent before the test to 75 percent after the test. Over 1,000 users have registered to participate in the reservation program. Stakeholders believe that the system also has improved difficult-to-quantify measures such as customer satisfaction. One commuter said that without the ParkingCarma™ service, “I would probably not take BART” (FHA, 2007).

The latest trend in parking management is online reservation services. Two companies—including MobileParking LLC and SpotScout™—allow drivers to check parking availability for select cities using their radio, cellular telephone or computer. MobileParking LLC currently covers 400 parking facilities in 50 cities across the U.S. MobileParking’s service allows drivers to call a toll-free number from their cellular telephones to check parking availability in their cities. After the driver provides the operator with his or her final destination, the operator directs the driver to the closest available space. The first reservation is free. Additional reservations cost $1.75 each. At some of MobileParking’s partner garages, in addition to paying MobileParking for the reservation, customers can also pay the parking fee itself through MobileParking, eliminating the need to make a separate payment to the garage operator (FHA, 2007).

SpotScout™ launched in 2004 and began taking parking reservations in New York and Boston beginning in 2006. The SpotScout™ service allows drivers to reserve and pay for parking spots either online or through Web-enabled cellular telephones. Once a driver has reserved a spot and paid for it, a text message is sent to the driver’s cell phone with a confirmation code and directions to the facility. In addition, SpotScout™ allows users to sell their personal parking spaces to other motorists for short-term use. These users are called “SpotCasters.” SpotScout™ allows users to set the price and time parameters within which they wish to make their space(s) available. In the future, SpotScout™ hopes to include on-street spaces in its network of parking spaces. Since the SpotScout™ service allows the parking facilities to update the number of available spots online, no sensor infrastructure is required (FHA, 2007).
Other Systems

An original, futuristic, permission-based-access, automated, gated parking system design for Palo Alto’s Stanford Research Park was studied in 2005. The benefits of the system include the ability to provide an instantaneous count of the number of parked vehicles—information valuable in the justification of land use. The proposed system uses WiFi cellular phones as the primary access technology, license plate recognition via image processing as the secondary technology, keypad entry as the third technology, and verbal interchange as the last resort. The office park encompasses 20,000 employees and has 132 access points to parking lots. The strict access policy creates a high security office park. Implementation cost is estimated at $5.9M. A $0.50 per day parking charge per car is proposed, generating $1.9M per year in offsetting revenue (Raney, 2005).

Overcoming barriers to implementation

A primary barrier to implementation of advanced parking management systems may be the cost required for system design, equipment, installation, communications, operations, and maintenance. APMS applications can range widely in cost depending on type and level of accuracy of the information provided, degree of complexity in installation of the sensors, availability of communications channels, availability of power supplies for remote components, and signage required to convey the information at appropriate decision points. A study by the Federal Highway Administration in 2007 examined advanced parking management systems at three sites—Baltimore-Washington International Airport near Baltimore, Maryland; Seattle Center in Seattle, Washington; and the Chicago Metra park-and-ride facilities near Chicago, Illinois—and found that advanced parking management systems cost between $250 and $880 per space (FHA, 2007).

Required effort to identify and work with stakeholder groups may be another barrier to implementation. In most advanced parking management systems, there will be many stakeholder
groups, such as parking operators (public and private), parking patrons, departments of transportation (city, county, state, and Federal), Councils of Government, utility providers, historical preservation groups, and neighborhood boards. Table 3.3.6 lists the agencies and groups that may be included in an APMS project and identifies the roles each may have in the planning, installation, operations, and maintenance of advanced parking management systems.

Table 3.3.6-Potential Stakeholders and Roles

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Department of Transportation</td>
<td>• Integrate APMS project into regional initiatives and larger statewide ITS architectures</td>
</tr>
<tr>
<td>City or County Planning Departments</td>
<td>• Seek Federal and state Congestion Management and Air Quality (CMAQ) funds</td>
</tr>
<tr>
<td></td>
<td>• Coordinate growth and development plans</td>
</tr>
<tr>
<td>City or County Transportation or Public Works Department</td>
<td>• Champion the project</td>
</tr>
<tr>
<td></td>
<td>• Coordinate with local transportation planning efforts including transit development</td>
</tr>
<tr>
<td></td>
<td>• Seek Federal and state transportation and transit improvement funds</td>
</tr>
<tr>
<td>City or County Police Departments</td>
<td>• Support the APMS project, seeking reduction in uniformed police services to enforce illegal parking and/or control intersections in close proximity to major attractions</td>
</tr>
<tr>
<td>Councils of Government</td>
<td>• Coordinate with other jurisdictions within the participating region identifying interoperability issues and resource sharing opportunities</td>
</tr>
<tr>
<td>Citizen Action Committees</td>
<td>• Support the APMS project, seeking improved neighborhood environments</td>
</tr>
<tr>
<td></td>
<td>• Help promote public awareness</td>
</tr>
<tr>
<td>City or County Architectural Control Boards</td>
<td>• Review signage plans to ensure consistency and fit within the architectural and visual environment</td>
</tr>
<tr>
<td>Utility Companies</td>
<td>• Provide information on the availability of power sources and advise on restrictions to power access</td>
</tr>
<tr>
<td>Communications Companies</td>
<td>• Provide information on the availability of fiber optic, T-1, and twisted copper wire communications media</td>
</tr>
<tr>
<td></td>
<td>• Advise on restrictions to communications access</td>
</tr>
<tr>
<td>Privately Owned Parking Vendors</td>
<td>• Provide the information and linkages required to develop large-scale public and private facility networks</td>
</tr>
</tbody>
</table>

Source: Federal Highway Administration, 2007, p. 7-3

The following list highlights four recommendations critical to successful APMS deployment (FHA, 2007, p.1-2,1-3):
• It is important to involve all stakeholders in a formal and collaborative manner to ensure that the needs of all stakeholders are met.

• There must be a champion and a formalized stakeholder group.

• APMS sign structure and locations require continuity of effort. Coordinating sign appearance and locations with historical preservation organizations, commercial property owners, and local jurisdictions requires continuity of effort over several years.

• Coordination with the regional ITS architecture helps ensure interoperability and helps leverage resources. Stakeholders should consider APMS as part of a developing local ITS architecture. In doing so, it may be possible to leverage funding for the system by sharing costs with other ITS-based traveler information systems, congestion management efforts, and clean air attainment programs. Broader stakeholder support and a wider range of funding options increase the potential for successful deployment.

• System accuracy is a critical factor. System error characteristics can cause the inventory count to be in error in a positive or a negative direction. Under-counting available spaces means a lost opportunity for a patron and lost revenue for the operator. Over-counting available spaces results in extremely frustrated patrons and potential loss of future credibility and revenue for the operator.

• It is important to identify the roles and responsibilities of each agency for system operations and maintenance. It is critical to identify these responsibilities early in the planning process. Failure to maintain the systems will reduce credibility and public acceptance will be negatively impacted.

3.4 PARKING PROGRAM FINANCING
The planning and implementation of parking programs, monitoring, and enforcement require capital costs and operating costs. The development costs of a program include “hard” costs of equipment purchase, installation, construction; and the “soft” costs of program development, planning, design; costs of obtaining clearances and approvals, cost of soliciting and reviewing bids, and costs of administering the installation of the equipment (MTC, 2007). As cities are under particular fiscal constraints in the current recession, it is worthwhile to explore possible revenue sources for parking management that will not take any existing revenue from the general fund.
3.4.2 Parking Taxes

Parking taxes can help provide incentives to reduce vehicle ownership and use in addition to raising revenue. They can encourage property owners to reduce parking supply and implement more parking management strategies. Taxes that specifically target unpriced parking or parking subsidies can encourage parking pricing, thereby correcting existing distortions that undertax parking—increasing economic efficiency and equity. Municipalities can implement a small annual parking tax on free or bundled spaces, or privately operated parking structures (Litman, 2006).

*Free Parking Levies*

Free parking levies are a tax on all parking spaces, either per-space or based on area. These taxes typically distribute costs broadly among property owners and motorists, which tends to increase equity, particularly if considered a user fee. Special taxes imposed on unpriced parking, such as a $50 annual tax per space provided free to employees, gives businesses incentive to reduce parking supply and increase the portion of parking that is priced. It is encouraged that parking suppliers pass the taxes on to motorists, rather than absorb it.

This tends to encourage better parking management, reduce vehicle use, and encourage more compact development. Todd Litman states in his article, *Parking Taxes: Evaluating options and impacts*, that a parking levy may cause a 5-10% reduction in total parking supply and a similar size increase in the portion of parking that is priced (Litman, 2010b). Litman also shares three successful examples of parking levies in Australian cities.

*Overcoming barriers to implementation*

Parking taxes are most successful when they are structured and implemented to increase public acceptability. Governments should maximize income from other parking-related revenue sources before imposing special parking taxes, to communicate to the public that taxing is part of an overall parking and mobility management program. Stakeholders should be consulted to insure
that regulations, administrative procedures, and enforcement policies are efficient and fair. Best practices include the establishment of an evaluation program, with before-and-after analysis, to determine the programs impacts on parking supply and pricing, economic activity, traffic, and spillover problems (Litman, 2010b).

3.4.3 Grants

The sources of funding listed below are listed merely for their potential interest in funding parking studies and programs as part of transportation demand management programs or smart growth/transit-oriented developments, because of previous similar funded projects and/or for their stated mission towards emission reductions and smart growth.

Funding for local governments

One of the primary funding source search engines for local governments is Grants.gov. Grants.gov was established in 2002 as a central storehouse for information on over 1,000 grant programs and provides access to approximately $500 billion in annual awards (Grants.gov, 2010).

U.S Environmental Protection Agency (EPA)

Mobile Source Outreach Assistance Program

The Mobile Source Outreach Assistance Program seeks to reduce emissions from cars. In 2005, the City of Austin, TX received $20,000 for the implementation of a parking benefit district (Leak, 2005). However EPA did not issue any new Mobile Source Outreach Grants for the fiscal years of 2007 or 2008.

Energy Efficiency and Conservation Block Grant (EECBG)

The Energy Efficiency and Conservation Block Grant (EECBG) Program, funded for the first time by the American Recovery and Reinvestment Act (Recovery Act) of 2009, offers formula and competitive grants to empower local communities to make strategic investments to meet the nation's long-term goals for energy independence and leadership on climate change. It is intended
to assist U.S. cities, counties, states, territories, and Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects and programs designed to:

- Reduce fossil fuel emissions;
- Reduce the total energy use of the eligible entities;
- Improve energy efficiency in the transportation, building, and other appropriate sectors; and
- Create and retain jobs.

Activities eligible for use of funds include transportation programs to conserve energy or any other appropriate activity that meets the purposes of the program and is approved by the Department Of Energy (U.S. DOE, 2010).

**California Energy Commission (CEC)**

The California Energy Commission offers a competitive grant program of $30 million for climate action planning that is available to smaller cities and counties. In the event that parking management programs will be part of Transportation Demand Management programs included as a strategy for emission reduction in climate action planning, this potential funding source is worth noting.

**Bay Area Air Quality Management District (BAAQMD)**

*Mobile Source Incentive Fund (MSIF)*

The Mobile Source Incentive Fund (MSIF) was authorized by the Bay Area Air Quality Management District in December 2004, and is used as a funding source for both public and private sector projects. MSIF revenues are collected from a $2 registration surcharge fee on vehicles registered with the Department of Motor Vehicles in the District’s jurisdiction. This surcharge generates about $11 million for the fund every year. MSIF revenues are used to finance vehicle scrap programs, agricultural assistance programs, and the purchasing of new lower-emission school buses.

**Transportation Fund for Clean Air (TFCA)**

The Transportation Fund for Clean Air (TFCA) is a grant program funded by a $4 surcharge on motor vehicles registered in the Bay Area. This generates approximately $22 million per year in
revenues. The purpose of the TFCA program is to provide grants to implement the most cost-effective projects in the Bay Area that will decrease motor vehicle emissions, and thereby improve air quality. Projects must be consistent with the 1988 California Clean Air Act and the Bay Area Ozone Strategy. The Air District administers TFCA funds through the Regional Fund, and the Bay Area’s nine county congestion management agencies (CMAs) administer the funds through the County Program Manager Fund.

The TFCA program can fund a wide range of project types, including the purchase or lease of clean air vehicles; shuttle and feeder bus service to train stations; ridesharing programs to encourage carpool and transit use; bicycle facility improvements such as bike lanes, bicycle racks, and lockers; arterial management improvements to speed traffic flow on major arterials; smart growth projects; and transit information projects to enhance the availability of transit information.

**Metropolitan Transportation Commission (MTC)**

MTC develops funding programs to foster livability in the Bay Area communities, improve the quality of development patterns and enhance alternatives to auto travel. These efforts include:

**Station Area Planning Grant Program**

The Station Area Planning Grant Program funds city-sponsored planning efforts for the areas around future stations. These station-area plans are intended to address the range of transit-supportive features that are necessary to support high levels of transit ridership. The plans are required to include various elements including parking demand and parking requirements.

**Transportation for Livable Communities Program**

The Transportation for Livable Communities (TLC) Program supports community-based transportation projects that bring new vibrancy to downtown areas, commercial cores, neighborhoods, and transit corridors. TLC provides funding for projects that offer a range of transportation choices, support connectivity between transportation investments and land uses, and are developed through an inclusive community planning effort. After implementing the
program for over ten years, MTC has sixty success stories of projects implementing parking management best practices.

**Climate Grants Program (Innovative Grant Program, Safe Routes to School)**

The MTC Climate Grants Program funds major demonstration projects to test the most innovative strategies in promoting changes in driving and travel behaviors. The Climate Initiatives Program, created in 2009, aims to test new strategies to reduce transportation-related emissions and vehicle miles traveled, encourage the use of cleaner fuels, and build a knowledge base through evaluation that informs the Sustainable Communities Strategy of SB 375 (MTC, 2010).

Currently, the Metropolitan Transportation Commission, in partnership with the Bay Area Air Quality Management District (BAAQMD), Association of Bay Area Governments (ABAG), and Bay Conservation and Development Commission (BCDC), is offering two competitive grant programs focusing on school-related emission reductions and innovative strategies for reducing GHG emissions. A total of up to $33 million in grant funding is available on a competitive basis to assist public agencies, businesses and community organizations that implement high-impact, innovative transportation-related GHG emission reduction strategies. The deadline for proposal submission is July 30, 2010, with approval of grant awards on September 22, 2010.

One of the competitive grants, the Innovative Grant Program, requires projects to fall into one of the following categories to be considered eligible for grant funding:

*Provide a clear connection between transportation and air quality improvement, focusing on innovative ways to reduce GHG and yield co-benefits for reducing criteria pollutants emissions from transportation sources;*

*Fall into one of the following project categories:*

a. Project tests the effectiveness of one or more of the following three strategies that have potential for reducing emissions but have not yet been sufficiently tested for replication on a larger scale in the region:
   1. Parking management and pricing policies
   2. Accelerate effort to shift to cleaner, low-GHG vehicles
   3. Transportation demand management

b. Project is an innovative transportation project derived from a locally-adopted Climate Action Plan or plan-equivalent; or
c. Project is a "showcase" transportation project that innovatively combines a number of strategies that together reduce GHG emissions

**Funding for non-profits and other organizations**

**James Irvine Foundation**

The California Democracy Program has awarded several grants to organizations for including local communities in policymaking in the Bay Area over the years. The goal of the program is to advance effective public policy decision-making that is reflective of and responsive to all Californians. Table 3.4.3 below briefly highlights four examples of previously funded projects.

*Table 3.4.3: Sample of Funded Projects from California Democracy Program*

<table>
<thead>
<tr>
<th>Organization</th>
<th>Community Development Institute</th>
<th>Working Partnerships, USA</th>
<th>Urban Habitat Program</th>
<th>TransForm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>Palo Alto</td>
<td>San Jose</td>
<td>Oakland</td>
<td>Oakland</td>
</tr>
<tr>
<td>Year Awarded</td>
<td>February 2005</td>
<td>March 2007</td>
<td>May 2008</td>
<td>June 2009</td>
</tr>
<tr>
<td>Grant Amount</td>
<td>$30,000</td>
<td>$400,000</td>
<td>$35,000</td>
<td>$300,000</td>
</tr>
<tr>
<td>Grant Term</td>
<td>12 months</td>
<td>24 months</td>
<td>6 months</td>
<td>24 months</td>
</tr>
<tr>
<td>Project Mission</td>
<td>To include community members in local policymaking related to economic development and land use in San Francisco's South of Market neighborhood.</td>
<td>To include low-income communities in Santa Clara County in policymaking on transit, housing, and other issues.</td>
<td>For the development of financial management systems and related policies and processes.</td>
<td>To create opportunities for underrepresented communities to engage in regional decision making and to promote models for involving low-income residents in land use decision making.</td>
</tr>
</tbody>
</table>

*Source: The James Irvine Foundation (www.irvine.org), Grants Database, 2010*

**Silicon Valley Neighborhood Grants**

Silicon Valley Community Foundation is focused on innovative solutions that solve problems and improve the quality of life throughout San Mateo and Santa Clara counties. Under the Regional Planning Strategy Program there is a grant currently offered called Building Sustainable Land
Use and Transportation Plans to Secure the Future of Silicon Valley and its Residents. Proposals are due August 19, 2010 and grantees will be notified in November 2010. Table 3.4.3a below briefly summarizes four submitted proposals among many awaiting notification.

Table 3.4.3a: Sample of Received Proposals for Regional Planning Strategy Program

<table>
<thead>
<tr>
<th>Organization</th>
<th>TransForm</th>
<th>Working Partnerships USA</th>
<th>The Sierra Club Foundation</th>
<th>Redwood City 2020</th>
</tr>
</thead>
<tbody>
<tr>
<td>Area Served</td>
<td>Santa Clara County</td>
<td>Santa Clara County</td>
<td>San Mateo and Santa Clara</td>
<td>San Mateo County</td>
</tr>
<tr>
<td>Year Submitted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amount Requested</td>
<td>$112,500</td>
<td>$75,000</td>
<td>$75,000</td>
<td>$50,000</td>
</tr>
<tr>
<td>Project Mission</td>
<td>To support engaging residents in advocating for and shaping bus rapid transit in Santa Clara County (Alum Rock/Santa Clara) and spurring cities to adopt parking and traffic policies that support transit-oriented development.</td>
<td>To support WPUSA’s effort to ensure that San Jose develops a general plan built on goals and policies that effectively promote equitable development, health and move the city away from sprawling growth planned around the automobile. WPUSA will engage in research, policy development, leadership training, coalition building and advocacy.</td>
<td>To support the Building Climate Friendly Communities project, which will increase local capacity and collaboration to create significant public support for smart growth policies in planning documents.</td>
<td>To support the County of San Mateo and the City of Redwood City in developing sustainable land use plans for the North Fair Oaks/Redwood City region by engaging community participation and building capacity for inclusive collaboration</td>
</tr>
</tbody>
</table>

Source: The Silicon Valley Community Foundation (www.siliconvalleycf.org), Regional Planning Grantees, 2010 at http://www.siliconvalleycf.org/grantmaking-strategies/index.html#RP.

3.5 DEVELOPING A PARKING/IMPLEMENTATION PLAN

The following suggestions are summarized from The Parking Handbook for Small Communities, by John D. Edwards, and describe the contents of a parking plan, securing endorsement for the plan, implementing the plan, and maintaining/revising the plan (Edwards, 1994).
A well-conceived parking plan includes:

- An assessment of current conditions
- An analysis of current demand
- Projection of future demand
- Recommended changes and systems required to increase the effectiveness of the current parking supply
- A parking development strategy
- Recommended revisions to parking regulations that reinforce flexibility
- A recommended management plan (staffing arrangements, marketing plan, promotional programming, measuring effectiveness, ongoing maintenance)
- A financing system for parking development (bonds, grants, revenues)
- Procedures for formal review and revision

**Securing endorsement for the Parking Plan**

- Garner support and participation of stakeholders when identifying the problem, before beginning data gathering and analysis.
- Get support for the costs of completing the plan, agreement for stakeholders to participate in reviews throughout the planning process, agreement from city to review and/or revise regulations, codes, and standards to meet objectives of parking plan, agreement not to change major existing policy during the life of the planning process
- Develop a communications strategy with stakeholder meetings, periodic updates, and a public relations campaign. Secure formal endorsement from the city and to agree to review any existing regulations that might be in conflict with the incorporated parking plan

**Basic steps to successful plan implementation**

- Get the management operation going first. (hiring/re-assigning staff, oversight, funding all need to be in place within a specified period of time of plan adoption)
- Specify how the effectiveness of the parking strategies is to be gauged.
- Begin the communications strategy with an announcement of the formal adoption of the plan
- Complete the necessary revisions to the comprehensive plan, the downtown specific plan, selected land-use and zoning ordinances and the building code to reflect the conditions established by the adopted parking plan (make sure all necessary revisions are in place no later than 12 months after plan adoption)
- Establish production schedules for new parking development

**Analysis of and revision to the parking system**

- Conduct an informal assessment every 12 to 18 months (analyze revenue stream, interviews parking patrons and business owners, conduct spot parking turnover and duration surveys)
- Every three or five years conduct a thorough update (redo duration, turnover, parking projection analyses, attitude surveys)]
- Change your communications strategy completely
Submit parking plan revisions for adoption by the city only if the review warrants it (Elements that require fine tuning: time limits, fees, fines, restrictions, financing options, management system, etc.)

3.6 CONCLUSION

Inefficient parking management practices are well entrenched—however parking management is an effective solution for many different planning objectives: affordable housing and infill development, multimodal travel with a growing portion of trips by walking, cycling, and public transportation, reduction of traffic and parking congestion, and reduction of greenhouse gas emissions and sprawl. To aid Silicon Valley communities in reforming their parking policies to achieve these objectives, this guide has drawn liberally from many resources to identify major parking management strategies, provide supportive examples and case studies demonstrating the success of parking management in comparable communities, and suggest methods to overcome common barriers to implementation of the strategies.
4 SNAPSHOT OF SILICON VALLEY PARKING POLICIES

This chapter provides a brief inventory of the major parking policies adopted by 22 cities in Silicon Valley—as evidenced by zoning ordinances, municipal codes, and City websites—and analyzes the estimated current and potential reduction in general parking demand as a result of those strategies. This comparative analysis is done only for the policies that were listed in city ordinances or codes at the time of this study and may not account for recent updates or changes. The cities were chosen based on the listing by Silicon Valley Economic Development Alliance as part of Silicon Valley (See Figure 4.1 below).

Figure 4.1- Map of Silicon Valley cities

Source: The Silicon Valley Economic Development Alliance.


4.1 ASSESSMENT METHODOLOGY

The assessment of “current” and “potential” scenarios are based on qualitative judgment of the strength of the policy language, the degree to which the policy is detailed and planned for implementation, and the effort made on the city website to provide information, explain, and encourage participation of the parking policies to the general public. For example, a city that adopts reductions in parking requirement for shared parking would be considered a “current” reduction, whereas a city that allows shared parking but requires the number of the parking spaces to be no less than the sum of the individual requirements would be considered a “potential” reduction. If the City chooses to simply restructure the language to support parking reductions with shared parking, the full potential of the policy is achieved. Other strategies of “current” and “potential” scenarios include whether or not the City includes parking strategies as part of its Transportation Demand Management programs, and if off-site parking is allowed more than 300 to 500 feet from the use entrance with shuttle services.

The parking demand reductions are taken from a range of percentages given by Todd Litman for each strategy in his article, Parking Management: strategies, evaluation, and planning (Litman, 2008, p.23). The assessment of current and potential scenarios is done twice, once with the lowest percentage in the range given and once again with the highest percentage given. This shows the minimum and maximum typical reductions achievable for the particular set of strategies each city currently has adopted. The implementation of multiple parking strategies in an area results in a compounded reduction in demand. Although most strategies are specific to a particular context or use (e.g. downtown, senior housing), the reductions are generalized for the entire city. For this exercise, a general number of 3,000 parking spaces was used as a starting point for which to calculate reductions and as a common baseline from which to conduct comparative analysis (See Appendix C).
### Table 4.1 - Current and Potential Parking Demand Reductions for Silicon Valley

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>% reduction (current)</td>
<td>% reduction (potential)</td>
</tr>
<tr>
<td><strong>Alameda County</strong></td>
<td></td>
<td></td>
<td>% reduction (current)</td>
<td>% reduction (potential)</td>
</tr>
<tr>
<td>Fremont</td>
<td>203,413</td>
<td>1,024</td>
<td>28%</td>
<td>41%</td>
</tr>
<tr>
<td>Newark</td>
<td>42,471</td>
<td>3,871</td>
<td>15%</td>
<td>23%</td>
</tr>
<tr>
<td><strong>San Mateo County</strong></td>
<td></td>
<td></td>
<td>% reduction (current)</td>
<td>% reduction (potential)</td>
</tr>
<tr>
<td>Belmont</td>
<td>25,123</td>
<td>5,546</td>
<td>24%</td>
<td>31%</td>
</tr>
<tr>
<td>Foster City</td>
<td>28,803</td>
<td>7,664</td>
<td>47%</td>
<td>47%</td>
</tr>
<tr>
<td>Menlo Park</td>
<td>30,786</td>
<td>3,034</td>
<td>34%</td>
<td>34%</td>
</tr>
<tr>
<td>Redwood City</td>
<td>75,447</td>
<td>4,356</td>
<td>42%</td>
<td>52%</td>
</tr>
<tr>
<td>San Carlos</td>
<td>27,718</td>
<td>4,682</td>
<td>35%</td>
<td>47%</td>
</tr>
<tr>
<td>San Mateo</td>
<td>92,372</td>
<td>7,570</td>
<td>29%</td>
<td>47%</td>
</tr>
<tr>
<td><strong>Santa Clara County</strong></td>
<td></td>
<td></td>
<td>% reduction (current)</td>
<td>% reduction (potential)</td>
</tr>
<tr>
<td>Campbell</td>
<td>38,187</td>
<td>6,803</td>
<td>37%</td>
<td>37%</td>
</tr>
<tr>
<td>Cupertino</td>
<td>50,657</td>
<td>4,621</td>
<td>41%</td>
<td>41%</td>
</tr>
<tr>
<td>Gilroy</td>
<td>41,587</td>
<td>3,040</td>
<td>41%</td>
<td>41%</td>
</tr>
<tr>
<td>Los Altos</td>
<td>27,585</td>
<td>4,361</td>
<td>8%</td>
<td>31%</td>
</tr>
<tr>
<td>Milpitas</td>
<td>62,714</td>
<td>4,623</td>
<td>34%</td>
<td>34%</td>
</tr>
<tr>
<td>Mountain View</td>
<td>70,467</td>
<td>5,863</td>
<td>28%</td>
<td>34%</td>
</tr>
<tr>
<td>Morgan Hill</td>
<td>33,556</td>
<td>2,875</td>
<td>21%</td>
<td>41%</td>
</tr>
<tr>
<td>Palo Alto</td>
<td>58,783</td>
<td>2,475</td>
<td>38%</td>
<td>44%</td>
</tr>
<tr>
<td>San Jose</td>
<td>893,889</td>
<td>2,223</td>
<td>44%</td>
<td>44%</td>
</tr>
<tr>
<td>Santa Clara</td>
<td>102,104</td>
<td>2,149</td>
<td>28%</td>
<td>34%</td>
</tr>
<tr>
<td>Saratoga</td>
<td>29,855</td>
<td>2,465</td>
<td>12%</td>
<td>34%</td>
</tr>
<tr>
<td>Sunnyvale</td>
<td>131,905</td>
<td>2,319</td>
<td>37%</td>
<td>37%</td>
</tr>
<tr>
<td><strong>Santa Cruz County</strong></td>
<td></td>
<td></td>
<td>% reduction (current)</td>
<td>% reduction (potential)</td>
</tr>
<tr>
<td>Santa Cruz</td>
<td>54,593</td>
<td>4357</td>
<td>47%</td>
<td>52%</td>
</tr>
<tr>
<td>Watsonville</td>
<td>44,265</td>
<td>6,971</td>
<td>11%</td>
<td>19%</td>
</tr>
</tbody>
</table>

**Average Demand Reduction Available** | 7.45% | 8.18%

### 4.2 RESULTS

Table 4.1 shows that the parking policies adopted have little correlation with population, population density per square mile, or even county affiliation. From the inventory, the most common parking policies adopted in Silicon Valley included shared/joint parking, tandem and angled parking, and reduced requirements for certain areas or uses. Saratoga, Los Altos, and Newark were the only three cities that had little or no mention of parking reductions. Also common were methods to address spillover parking such as time limits and parking permits.

However, because the literature does not give a range of percentages for these methods, they were
not included in the inventory or calculations. Transportation Demand Management strategies were often mentioned, however, only half of the cities detail specific strategies and include parking management. Parking user information (sharing information on parking location, availability, or promoting certain parking-related programs) accessible by city websites was only provided by nine of the 22 cities.

Of the 22 cities inventoried, only four cities set or mention parking maximums in their codes; these cities are Redwood City, Cupertino, Gilroy, and Milpitas. Tandem and angled parking are the most common methods of increasing capacity. There is no mention of automated parking and only one city, San Carlos, allows parking lifts. Although many cities allow off-site parking, only one city, Foster City, allows off-site parking to be as far as ¼ mile with shuttle services. Most cities restrict off-site parking to be located within 300 to 500, or 900 feet of the use entrance.

The least common parking policies were generally the policies that are more politically difficult to implement, such as parking pricing or parking taxes. Only five cities have parking pricing; Foster City, Redwood City, San Mateo, San Jose, and Santa Cruz. Santa Cruz was the only city inventoried that has a parking tax. None of the cities studied unbundled parking as a strategy; and although car share is often listed, there is no car share company serving Silicon Valley.

### 4.3 RECOMMENDATIONS

By analogy to low-hanging fruit, simply strengthening the language of existing, adopted parking policies and following up with appropriate implementation measures can decrease general parking demand in each city by approximately 8 percent. Cities of Los Altos, Morgan Hill, and Saratoga especially have the most to gain with this method, and would be able to reduce general demand by an additional 20 to 35 percent in each city. If cities with no difference between current and potential scenarios need to further manage their parking supply and demand, they can adopt new policies such as parking maximums, allowance of off-site parking with shuttle services,
allowance of parking lifts, improve accessibility of parking user information, and incorporate parking management strategies in their Transportation Demand Management programs. More aggressive policies to adopt and implement include parking taxes, parking pricing, encouraging car share, and unbundling parking.
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Transportation Research Board of the National Academies


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6 APPENDICES
APPENDIX A
GRANT PROPOSAL
Parking Reform Research and Advocacy Project (PRRAP)

A Proposal to The Bullitt Foundation

1000 Friends of Oregon
543 SW Third, Suite 300
Portland, OR 97204
503 497 1000

Amount Requested: $76,595
February 26, 2010
February 26, 2010

Denis Hayes
President
The Bullitt Foundation
1212 Minor Avenue
Seattle, WA 98101-2825
info@bullitt.org
(206) 343-0807

Dear Mr. Hayes:

Please find attached grant application for the Parking Reform Research and Advocacy Project (PRRAP). As described in the application, 1000 Friends of Oregon proposes to reduce Greenhouse Gas (GHG) Emissions in Oregon by directing state agencies to actively manage parking demand and supply with efficient parking regulations. The principal deliverable will be a comprehensive report which will serve as a resource for municipalities and assist in the reform of parking regulations.

To accomplish this goal, we will survey public opinion on pricing parking, parking requirements, and the supply of parking, evaluate the supply and demand of parking at transit-oriented developments, and project the effect of population and employment growth trends on GHG emissions in preliminary alternative future scenarios.

Our board of directors is enthusiastic about the project and eager to launch it to begin generating substantive evidence of our own in support of smart growth policies. Our research efforts will directly inform our recommendations as a task force member serving on the MPO Task Force on Greenhouse Gas Emissions.

Our proposed PRRAP work with span a period of two years, at a total cost of $229,895. 1000 Friends of Oregon requests a grant of $76,595 to support the efforts described in this application.

We are happy to respond to any questions you may have. Please contact Lori Meadows, Development Director, (503) 497-1000, x 131, or lori@friends.org.

Thank you for your consideration.

Respectfully,

Bob Stacey
Executive director
1000 Friends of Oregon

Signatory: Tracy Wang
# Table of Contents

1. **Narrative** .............................................................................................................. 1
   - A. Introduction ........................................................................................................ 1
   - B. Problem Statement .......................................................................................... 2
   - C. Work Plan: Goals and Objectives .................................................................... 3

2. **Project Management** .......................................................................................... 6
   - A. Management Plan ............................................................................................. 6
   - B. Key Personnel ................................................................................................ 6
     1. Organization Chart ......................................................................................... 7
     2. Project Organization Chart ............................................................................ 8
   - C. Commitment and Capacity ............................................................................ 9

3. **Evaluation** .......................................................................................................... 9
   - A. Process Evaluation ......................................................................................... 9
   - B. Results Evaluation .......................................................................................... 11
   - C. Dissemination ................................................................................................ 12

4. **Sustainability** ................................................................................................... 12

5. **Budget** ............................................................................................................... 12

6. **Appendices** ....................................................................................................... 15
   - A. 1000 Friends of Oregon Board of Directors .............................................. 16
   - B. Portland Metro MPO Maps .......................................................................... 20
   - C. 1000 Friends of Oregon 2008-2009 Annual Report .................................... 21
Abstract

Established in 1975, 1000 Friends of Oregon is a statewide non-profit advocacy, education, and research organization tasked with protecting Oregon’s quality of life from the effects of uncontrolled growth.

Since 1975, 1000 Friends have worked in legislature, the courtroom, the press, and the city council chamber to ensure cities develop efficiently and effectively, saving taxpayers money and protecting Oregon’s resources. Now the organization has been called upon as one of the task force members to plan for the threats of climate change and for tomorrow’s needs. As one of the 16 members serving on the MPO Task Force on Greenhouse Gas Emissions, the task force is charged with evaluating and producing recommendations on how the integration of land use and transportation planning can reduce greenhouse gas emissions in Oregon’s large urban areas. We will apply the expertise, staff resources, and community support that has given us the legacy in land use protection towards ensuring that transportation and development projects reduce greenhouse gas emissions to create a healthy place where Oregonians are proud to call home.

1000 Friends proposes the Parking Reform Research and Advocacy Project (PRRAP) to reduce Greenhouse Gas (GHG) Emissions in Oregon by directing state agencies to actively manage parking demand and supply with efficient parking regulations.

The proposed project is a two-part project. The first part is a research project which evaluates the supply and demand of parking at transit-oriented developments. The second part is the development of a comprehensive report to serve as a resource which gives municipalities the data needed to begin evaluating if their own parking regulations are actually supporting or hindering greenhouse gas reductions. The report will assist municipalities with how to reform their parking regulations based on successful case studies, and what improvements they can expect to see and when, once parking reform is complete. The program is considered a success if the report gains widespread recognition and credibility, sets an example for future studies and reports, and influences the adoption of more efficient parking regulations.

The total cost of implementation of our PRRAP program is $229,895. Of this amount, $153,300 has been secured by in-kind contributions. Your investment of $76,595 will complete the funding we need to fully implement this project, and we are excited about the prospect of partnering with you. Thank you for your consideration of our request.
Narrative

Introduction

Established in 1975 by Governor Tom McCall and Henry Richmond, 1000 Friends of Oregon is a statewide non-profit advocacy, education, and research organization tasked with protecting Oregon’s quality of life from the effects of uncontrolled growth. Celebrating its 35th anniversary this year, the organization continues the enormous legacy of McCall in the environmental sphere.

The organization serves community goals such as economic security and improved health for families, and the protection of places that make Oregon a place people are proud to call home. Specific strategies include investing in farming and forestry, providing more parks, trails and natural areas, and planning for transportation given today’s climate threats and tomorrow’s needs. To ensure that transportation and development projects reduce greenhouse gas emissions and to create a climate-friendly transportation system, 1000 Friends proposes several actions—one of them being to direct state agencies to better implement land use laws that require efficient development. With funding from The Bullitt Foundation, 1000 Friends of Oregon will be able to develop a resource that will be assist municipalities in reforming parking policies to support efficient development and travel behavior.

1000 Friends of Oregon is currently one of the 16 members serving on the MPO Task Force on Greenhouse Gas Emissions established under last session’s House Bill 2186 in 2009. The MPO Task Force on Greenhouse Gas Emissions was established to define the processes, impediments, resources needed to address GHG emissions and to make recommendations on how to meet the GHG reduction goals. The task force is charged with evaluating how integration of land use and transportation planning can reduce greenhouse gas emissions in Oregon’s large urban areas, and with making legislative recommendations for February 2010 session. Under this charge, 1000 Friends of Oregon proposes the Parking Reform Research and Advocacy Project (PRRAP), which will directly inform our recommendations to the Metro MPO.

The Portland Metro MPO is one of six MPOs in Oregon. Areas under Metro jurisdiction consist of three counties and 25 cities comprising 463 square miles and approximately 1.5 million residents. The Portland Metro MPO is the only MPO with land use authority. The Metro is responsible for managing the Portland region’s Urban Growth Boundary (UGB) and is required by state law to have a 20-year supply of land for future residential development within the boundary. The Metro is also responsible for reviewing local comprehensive land use plans to ensure consistency with statewide planning goals.

Since 2007, Metro staff has been preparing to incorporate planning for climate change into the organization’s plans and programs in response to Oregon HB 3543, which established GHG reduction goals for the State. These goals include stabilization of emissions by 2010, a 10% reduction below 1990 levels by 2020, and a 75% reduction below 1990 levels by 2050.
Problem Statement

“Reducing transportation-related emissions of carbon dioxide—the primary greenhouse gas—that contribute to climate change and adapting to the consequences of climate change will be among the biggest public policy challenges facing the transportation profession over the coming decades.” Transportation Research Board of the National Academies

In the United States, between 20 and 40 percent of manmade hydrocarbon and nitrogen oxide emissions, two of the chief precursors to the formation of ground-level photochemical smog, and about two-thirds of carbon monoxide emissions come from the tailpipes of cars and trucks (Cervero, 1999). As of 2006, passenger cars accounted for 34 percent and light trucks accounted for 28 percent of transportation Greenhouse Gas Emissions (GHG) in the U.S. In 2007, Oregon HB 3543 established GHG reduction goals for Oregon. These goals include stabilization of emissions by 2010, a 10% reduction below 1990 levels by 2020, and a 75% reduction below 1990 levels by 2050. To achieve these reduction goals, there are three major avenues to reducing emissions from cars and light trucks specifically: greater fuel efficiency from new vehicles, reducing the carbon content of fuels, and changing the growth patterns to reduce overall driving.

Like many urban centers, we are faced with the challenge of serving increased growth with an efficient transportation system while balancing land uses to conserve open spaces and agricultural lands. The long-range strategy in urban centers is based on the concept of concentrating development around transit corridors to decrease development pressure on open space and agricultural lands. This strategy addresses several other planning concerns such as maintaining a jobs-housing balance and meeting air quality standards. A jobs-housing balance is the term used when people live and work in the same region and do not need to commute long distances in order to find employment. Conceptually, if a jobs-housing balance is maintained, there will be reduced vehicle miles traveled (VMT) and reduced tailpipe emissions from traffic congestion. These transit-oriented development strategies are only successful in reducing GHG emissions if there are robust and efficient transportation network and services, which accommodate multiple modes of travel such as walking, bicycling, and transit.

Such transit-oriented development strategies cannot be implemented successfully without extensive research and consideration on how parking policies need to be reformed in order to support the use of transit facilities and services. For many years, parking has been identified as a crucial link between transportation and land use because parking facilities are a major land use type and affects how we design and build our commercial and residential areas. Parking influences our travel behavior, which directly affects the form of urban infrastructure demanded by society, and the amount of greenhouse gas emissions generated by cars and trucks.

There are legislative, environmental, social, political, economical, and aesthetical issues associated with parking policy. Minimum parking requirements often make it infeasible to develop infill parcels or reuse existing buildings and often require more parking spaces than the
private market would provide on its own. These excessive parking requirements spread out development, increase the cost of development, increase travel distances, and make the environment less friendly to pedestrians. The fact that most parking is free, despite the high cost of land and construction of parking spaces, means that the costs are passed onto consumers in the form of higher housing prices and other goods. Free or cheap parking creates an increased demand for parking spaces and results in a lack of vacancies. This creates congestion and emissions from drivers cruising around to find available parking spaces. Finally, the availability of free or cheap parking at the large majority of destinations hides the true cost of driving and artificially influences transportation choices towards automobile trips.

Parking reforms are one of the most cost-effective ways to achieve congestion reduction and greenhouse gas emission reductions. Reforms can be implemented at little to no cost to the public sector and will increase housing affordability, increase feasibility of infill parcel development and adaptive reuse projects, decrease travel distances, support the pedestrian friendly urban environment, manage demand and increase the number of parking vacancies, and direct transportation choices towards carpooling, transit, walking, and bicycling. It is clearly evident that reformed parking regulations will be one of crucial long-term strategies needed in the toolbox of every municipality in order to achieve GHG reduction goals, and the Parking Reform Research and Advocacy Project (PRRAP) is a vital resource to assist them in this challenging task.

**Work Plan: Goals and Objectives**

The overarching goal of the PRRAP is to reduce GHG emissions in Oregon by directing state agencies to better implement land use laws that require efficient development. In order to make recommendations on how to reform parking policies, we need to first assess the travel behavior of residents and workers in transit-oriented communities and their perception of parking policies so that we can gauge how much education and outreach efforts will be needed to gain their support. We also need to forecast future conditions to see how much growth we will need to accommodate and where we can best accommodate them in order to make recommendations to cities on what land use regulations may need to be changed in order to foster sustainable growth patterns. We also need to study transit-oriented sites to see how the implementation of reduced parking requirements and other parking policies have influenced parking supply and demand so that we may exhibit them as successful case studies that cities may look to for guidance. Lastly, we need to share the results of our studies and our recommendations by distributing copies of the report and making it available on our website.

The goal of PRRAP will be accomplished by the following four program objectives:

**Objective 1:** Survey public attitude and opinion on pricing parking, parking requirements, and the supply of parking of Oregonians under Portland Metro jurisdiction who live in Transit Oriented Developments with an 80% response rate by December 2010.
1000 Friends of Oregon will arrange necessary support staff for survey organization, creation, administration, and analysis. The Organizer will be responsible for organizing tasks for volunteers. It is projected that five volunteers may be needed. The Administrative Assistant will be needed to collect a pool of applicants, writing job descriptions, and mailing survey materials. The entire survey process from hiring volunteers to analyzing survey results should be completed within the first six months of the program.

Objective 1

<table>
<thead>
<tr>
<th>Activities/Methods</th>
<th>Measurable Outcomes</th>
<th>Timeline (Month/Year)</th>
<th>Responsible Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hire necessary support staff for survey organization, creation, administration, and analysis</td>
<td>• Surveys distributed.</td>
<td>First six months of program (06/2010 to 12/2010)</td>
<td>• Organizer</td>
</tr>
<tr>
<td></td>
<td>• 5 volunteers hired.</td>
<td></td>
<td>• Administrative Assistant</td>
</tr>
<tr>
<td></td>
<td>• 80% response rate for surveys.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


1000 Friends will hire a full-time senior planner to model population and employment projections, draft alternative future scenarios identifying where transit-oriented development may take place, and compare scenarios based on volume of estimated GHG emissions. The planner will also research existing parking policies in areas identified as suitable for transit-oriented development. Resources needed include funds for salary and benefits, assistance with the application and selection process, and a new workspace with computer equipment in the Portland office. This task should be completed within the first year of the program.

Objective 2

<table>
<thead>
<tr>
<th>Activities/Methods</th>
<th>Measurable Outcomes</th>
<th>Timeline (Month/Year)</th>
<th>Responsible Persons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hire full-time senior planner</td>
<td>• Senior planner hired.</td>
<td>First year of program (06/2010 to 06/2011)</td>
<td>• Executive Director</td>
</tr>
<tr>
<td></td>
<td>• Population and employment projections.</td>
<td></td>
<td>• Senior Policy Analyst</td>
</tr>
<tr>
<td></td>
<td>• 3 alternative future scenarios.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Report on existing parking policies in TOD areas.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Objective 3: Research and collect studies on parking demand and supply in at least 20 transit oriented developments in the area under Portland Metro jurisdiction, and/or other areas of Oregon
by March 2011.

1000 Friends will contract with a transportation planning and engineer firm to research and collect data on parking demand and supply. It is estimated that a senior transportation planner, a half-time transportation engineer, and perhaps two full-time transportation-planning interns will be needed. The interns will collect raw data, the engineer will input the data into appropriate models, and the senior planner will oversee the process and serve as the point of communication between the firm and 1000 Friends. The amount of time needed for the senior transportation planner to oversee the process and attend meetings with 1000 Friends should only be a few hours a week. Resources needed include funds for contractual pay, assistance with the application and selection process, and funds for two staff members to travel occasionally for meetings with the contracting firm. The contract should only last for nine months.

<table>
<thead>
<tr>
<th>Objective 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activities/Methods</strong></td>
</tr>
</tbody>
</table>
| Hire parking consultants/transportation planning firm | • Parking supply and demand data collected for 20 sites. | Contract term of nine months (06/2010 to 03/2011) | • Executive Director  
• Senior Planner |
| *senior transportation planner | *transportation engineer | *transportation interns | |

Objective 4: Produce and publish a comprehensive report with analysis and implications of the projections of alternative future development scenarios, parking research results, findings, and recommendations, and the survey results by 2012.

The report will be a joint effort with the senior planner, senior policy analyst, and the contracted transportation firm with oversight from the senior staff attorney and executive director. Resources need for website management, printing, and employee pay. The report should be completed within the last year of the program.

<table>
<thead>
<tr>
<th>Objective 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Activities/Methods</strong></td>
</tr>
</tbody>
</table>
| Produce comprehensive report | • Report completed.  
• Report published and distributed. | Last year of program (06/2011 to 06/2012) | • Senior Planner  
• Senior Policy Analyst  
• Transportation consultants |
Project Management

Management Plan

Since its inception in 1975, no other organization like 1000 Friends of Oregon has brought the expertise, staff resources, and community support to land use protection. 1000 Friends has had a history of success beginning with the Oregon Supreme Court decision on 1000 Friends of Oregon vs. Land Conservation and Development Commission and Curry County (301 Or at 447), where 1000 Friends of Oregon expanded the application of urban growth boundaries to ensure that counties and the Land Conservation and Development Commission must address urban growth boundaries in rural areas as well. Another major success was the passage of Measure 49, which overturned and modified many of the provisions of Measure 37—a controversial measure allowing property owners whose property is reduced by environmental or other land use regulations to claim compensation from state or local government. Acting true to the organization’s values of protecting farmland, forestland, natural and scenic resources, as well as the built environment, 1000 Friends of Oregon now brings its experience to addressing GHG emissions reductions through efficient development and the integration of transportation and land use planning.

Key Personnel

The executive director of 1000 Friends of Oregon and primary overseer for the Parking Reform Research and Advocacy Project will be Bob Stacey (assigned 5%), who has dedicated his career as community leader, activist and manager of agencies that have successfully worked to improve neighborhoods and transportation in Oregon. He served as Chief of Staff to City of Portland Commissioner Earl Blumenauer for two years in the late 1980’s and went on to become Planning Director for the City of Portland from 1989 to 1993. Stacey later served as Senior Policy Advisor to Oregon Governor Barbara Roberts for two years. In 1997, Stacey became the Executive Director for Policy and Planning for Tri-County Metropolitan Transportation District of Oregon until the year 2000. Under his tenure, the agency completed three new light rail lines serving the Metro area, and expanded both rail and bus ridership. Bob Stacey became the executive director of 1000 Friends of Oregon in 2002. His key accomplishments in this position include leading statewide opposition to the harmful development authorized by Measure 37; conceiving and directing “Envision Oregon,” a civic engagement process that involved more than 2000 Oregonians in dialogue about the future of Oregon’s land use planning system; and organizing the successful campaign to pass Measure 49, limiting Measure 37 by protecting farm and forestland from overdevelopment.

Mary Kyle McCurdy (assigned 12.5%) is the senior staff attorney. She earned her BS in Human Biology from Stanford University and her JD from the University of California at Davis. She served as a clerk to Ninth Circuit Court of Appeals Judge Edward Leavy. After two years in
private practice, she became a Staff Attorney at 1000 Friends of Oregon in October 1990. She has many years of experience representing clients in appeals to the Oregon Land Use Board of Appeals and the Oregon Court of Appeals. Her current focus is participating in Metro’s regional planning process, with emphasis on urban containment and housing affordability. She is also active in urban growth management issues in communities around Oregon and in urban growth boundary issues at the state level with the Land Conservation and Development Commission.

Other staff includes the senior policy analyst, Kate Kimball (assigned 20%) to provide support for the to-be-hired senior planner. An organizer, Tara Sulzen (assigned 12.5% FTE) who transferred from the Oregon Bus Project, will be responsible for overseeing volunteers. At any given point, 100 Friends has approximately 25 non-board volunteers. Volunteers will assist with research projects, update the website, and general office support. In addition, an administrative assistant, Robin Jennings (assigned 30%) will be responsible for clerical support to staff and contracted consultants.

Job descriptions of yet-to-hire and contracted positions as follows:

Senior Planner
The senior planner (100%) will serve as project manager for PRRAP, manage planning projects to quality, schedule and budget requirements, coordinate efforts with in-house planning team members and sub-consultants, be responsible to develop alternative future scenarios and GIS services, complete project tasks to include data collection, data analysis, concept development, report writing, meeting facilitation, etc.

Senior Transportation Planner
The senior transportation planner (12.5%) will collaborate with 1000 Friends staff, oversee the work of the transportation engineer and transportation planning interns and assist in the preparation of the PRRAP report. The contract position will last for 9 months.

Transportation Engineer
The transportation engineer (50%) will perform air quality analysis of GHG emissions and various analyses for parking supply and demand at transit-oriented development sites. The contract position will last for 9 months.
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Commitment & Capacity
The Parking Reform Research and Advocacy Project has internal support from 1000 Friends of Oregon staff and board, and external support from strong community partnerships, such as the Governor, Metro Councilors, and transportation advocates. (See Appendix for list of Board of Directors). Bob Stacey will be contributing time to oversee the project and will effectively lead the project to success with his competence, intelligence, and experience in the public and private sector, and with insights from his policy and administrative background of the federal, state, regional, and local level.
1000 Friends of Oregon is also fortunate to have an annual total budget of approximately $1.5 million. We also have an incredible volunteer base, strong board of directors, and extremely loyal and generous donor base of financial and political strength.

In 2008, the Bullitt Foundation awarded 1000 Friends of Oregon $80,000 under their Growth Management & Transportation Program for continuing support of 1000 Friends’ “Blueprint for Oregon’s Future”, a research, policy development and outreach project to inform a new generation of Oregonians and their leaders of the importance of planning and growth management. In the same year, 1000 Friends received other grants such as $20,000 from the Lazar Foundation to promote a vision for transportation in Oregon that is responsive to the threat of global warming, and $15,000 from the Penney Family Fund to engage the public in sustainable land use planning. In 2009, 1000 Friends of Oregon received $75,000 from the Bullitt Foundation for a similar project in the implementation of newly enacted state polices that require Portland Metro to adopt and execute integrated land use and transportation plans to meet lowered greenhouse gas emissions targets through reduction of vehicle miles traveled.

Evaluation

Process Evaluation

The desired outcome of the PRRAP report is to reduce GHG emissions in Oregon by directing state agencies to better implement land use laws that require efficient development. Below is a list of key questions to evaluate how well the methods and activities contributed to the success of the objectives.

Objective 1: Survey public attitude and opinion on pricing parking, parking requirements, and the supply of parking of Oregonians under Portland Metro jurisdiction who live in Transit Oriented Developments with an 80% response rate by December 2010.

Evaluation of this objective will occur after the survey has been drafted, after survey distribution, and after survey results analysis. A surveys expert may conduct the evaluation.

Are the survey questions crafted in a way that is easy to understand, concise, and will elicit responses that can be used for analysis/assessment?

Is the survey administered to the target population in a way that ensures that the opinions sampled are representative of the population as a whole? (sample size determination and sampling technique)

Is the survey method successful in attaining an 80% response rate? (personal interviews, phone interviews, web-based questionnaire, mail-in questionnaire)

Evaluation of this objective will occur after the population and employment projections have been made, and again after the three alternative scenarios have been crafted. A long-range senior planner from the public or private sector with considerable experience may conduct the evaluation.

Are the principles and assumptions clearly stated in each scenario? (constraints and opportunities to development, source of population and employment projections, methodology used in linking/predicting emissions to land uses)

Are the scenarios developed in consistent ways that allow for more accurate comparison and analysis? Are findings and recommendations included?

What type of modeling technology was employed in the development of the scenarios? Is it credible?

Do the alternative future scenarios include a baseline scenario, with existing conditions and business as usual, to compare other alternatives against?

Objective 3: Research and collect studies on parking demand and supply in at least 20 transit oriented developments in the area under Portland Metro jurisdiction, and/or other areas of Oregon by June 2011.

Evaluation of this objective will first occur during the hiring process, during regular intervals once the contractors have been hired, and after the contractors have completed the studies, findings and recommendations. An expert transportation planner and engineer who can check the data and calculations of the contracting firm can conduct the evaluation.

Do the consultants have experience in conducting studies like this before? Is the firm reputable in producing quality work?

Are the consultants capable of effectively communicating study methodology and technical results/findings to decision-makers both verbally and graphically?

Are the consultants conducting their research and studies in a timely manner with appropriate correspondence, such as progress reports and meetings, as agreed in the contract?

Objective 4: Produce and publish a comprehensive report with analysis and implications of the projections of alternative future development scenarios, parking research results, findings, and recommendations, and the survey results by 2012.

Evaluation of this objective will occur after the first draft of the report has been completed, after the final draft, and after the report has been made accessible to the public. The evaluation can be conducted by a knowledgeable transportation planning professor with extensive past experience
working with parking issues, such as Donald Shoup from UCLA or Todd Litman from Victoria Transport Policy Institute (VTPI). The evaluation results will be compiled in a report for the Bullitt Foundation, Board of Directors, and other stakeholders.

Is the report written in a language that can be understood by the public, planning professionals, and decision-makers? Does the report use clear and impactful graphics to communicate the results of technical findings?

Is the report accessible to all jurisdictions in Oregon and nationwide?

Has the report been evaluated by experts and peer professionals before public circulation?

Does the report possess the credibility to influence the adoption of new parking regulations and standards and to stand up against criticism?

**Results Evaluation**

To achieve the goal of GHG reductions with parking reform, it is necessary to evaluate how the public and government organizations are responding to the report. Is the report gaining traction and widespread circulation in the media or the planning field? This can be evaluated by comparing the number of articles or newspapers featuring parking, and monitoring the number of changes in parking regulations since the year 2009. It is also necessary to determine the long-term impacts of the report on urban form and GHG emissions reductions.

The following performance measures have been selected to determine what impacts the program will have on the region’s housing, transportation system and air quality.

**Housing/Land Use Measures**

Housing and land use measures will be comparative of transit-oriented development versus an existing or “base-case” scenario.

- Projected regional jobs/housing ratios
- Projected out-commuting and in-commuting
- Density of development
- Percent housing units in infill locations
- Open space acreage
- Farmlands acreage

**Transportation Measures**

Transportation impact measures will be employed to determine how future changes to parking requirements in transit-oriented areas will affect the transportation system. These measures include:

- Trips by mode of transportation (auto, transit, bicycle, walk)
- Daily transit boardings
- Daily vehicle trips and vehicle miles traveled
- Daily hours of delay
Average delay per vehicle
Average time travel per trip
Accessibility to jobs
Average weekday daily vehicle trips by County-of-Origin

Air Quality Measures
Emission data from travel activity; including vehicles in use, daily vehicle miles traveled and engine starts will be utilized to determine air quality impacts:
  Emission estimates for criteria pollutants using EMFAC2002 Factors (ROG, NOx, CO, PM10, PM25)

Dissemination

Local and State Level
Addressing GHG reductions is a statewide priority and there is much interest at every planning municipality in obtaining knowledge and data on how they can reduce GHG emissions in the most cost-effective manner. Project staff will pursue opportunities to network with others in the state who are part of the GHG emissions reductions task force, and will request opportunities to present workshops at appropriate municipalities in the local area. The PRRAP report and supporting information will be posted on Internet websites dealing with climate change and GHG emissions reductions in Oregon, as well as on the 1000 Friends of Oregon website.

Sustainability

Although we do not intend to continue the project, it may be possible to form a small committee comprised of a couple individuals to whom questions will be forwarded. They may perform consultation services for municipalities that are interested in reforming their parking regulations. The committee will stay intact as long as there is a sufficient demand for their time and expertise. Donations or consultation fees will fund the committee since there will be continued work in land use/transportation/greenhouse gas emissions as a task force member and a need for future funding for similar research efforts.

Budget

The total cost of the project is $229,895 over the span of two years. The requested grant amount is $76,595 and covers mainly contractor salaries, supplies, printing, postage and travel. The remaining cost is supplied by in-kind contributions. See next page for detailed budget worksheet.
### REVENUE

<table>
<thead>
<tr>
<th></th>
<th>GRANT</th>
<th>IN-KIND</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundation</td>
<td>$76,595</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volunteer Services</td>
<td></td>
<td>$20,160</td>
<td></td>
</tr>
<tr>
<td>(5 volunteers at $8.40/hr for 480 hours)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Revenue</strong></td>
<td><strong>$76,595</strong></td>
<td><strong>$20,160</strong></td>
<td><strong>$96,755</strong></td>
</tr>
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</table>

### EXPENSES

<table>
<thead>
<tr>
<th>Expenses Description</th>
<th>GRANT</th>
<th>IN-KIND</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Salaries</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Senior Planner</td>
<td>$10,000</td>
<td>$75,000</td>
<td>$137,750</td>
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<tr>
<td><em>Full Time</em></td>
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</tr>
<tr>
<td>Administrative Assistant</td>
<td></td>
<td>$10,500</td>
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</tr>
<tr>
<td><em>30% of $35,000 salary</em></td>
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</tr>
<tr>
<td>Executive Director</td>
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<td>$5,000</td>
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<tr>
<td><em>5% of $100,000 salary</em></td>
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</tr>
<tr>
<td>Organizer</td>
<td></td>
<td>$5,625</td>
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<tr>
<td><em>12.5% of $45,000 salary</em></td>
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<tr>
<td>Senior Policy Analyst</td>
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<td>$16,000</td>
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</tr>
<tr>
<td><em>20% of $80,000 salary</em></td>
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</tr>
<tr>
<td>Senior Staff Attorney</td>
<td></td>
<td>$15,625</td>
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</tr>
<tr>
<td><em>12.5% of $125,000 salary</em></td>
<td></td>
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</tr>
<tr>
<td><strong>Benefits (20% of salaries)</strong></td>
<td></td>
<td>$25,550.0</td>
<td><strong>$27,550.0</strong></td>
</tr>
<tr>
<td><strong>Contract Personnel</strong></td>
<td>$59,625</td>
<td>$59,625</td>
<td></td>
</tr>
<tr>
<td>Senior Transportation Planner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>$100,000 salary, 12.5% for 9 months</em></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transportation Engineer Half Time</td>
<td></td>
<td>$26,250</td>
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</tr>
<tr>
<td><em>$70,000 salary, 50% for 9 months</em></td>
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<td></td>
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<tr>
<td>Transportation Planning Interns</td>
<td></td>
<td>$24,000</td>
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<tr>
<td><em>2 interns: 1600 hours at $15/hr</em></td>
<td></td>
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<tr>
<td><strong>Supplies</strong></td>
<td>$3,000</td>
<td>$3,000</td>
<td></td>
</tr>
<tr>
<td>Computer and programs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Printing paper, ink, envelopes</td>
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<td></td>
<td></td>
</tr>
<tr>
<td><strong>Printing</strong></td>
<td>$650</td>
<td>$650</td>
<td></td>
</tr>
<tr>
<td>Surveys</td>
<td></td>
<td>$250</td>
<td></td>
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<tr>
<td>Report</td>
<td></td>
<td>$400</td>
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<tr>
<td><strong>Postage</strong></td>
<td>$880</td>
<td>$880</td>
<td></td>
</tr>
<tr>
<td>2,000 surveys at 44 cents each</td>
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<td></td>
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</tr>
<tr>
<td><strong>Travel</strong></td>
<td></td>
<td>$440</td>
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<tr>
<td>2 people traveling for meetings: 880 miles x .55</td>
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<tr>
<td><strong>Total Expenses</strong></td>
<td><strong>$76,595</strong></td>
<td>$153,300.0</td>
<td><strong>$229,895.0</strong></td>
</tr>
</tbody>
</table>
Appendix i | 1000 Friends of Oregon Board of Directors

President
Elisabeth L. Lyon
Community Activist, Portland
After earning her BA in Art History from Mt. Holyoke College and a Masters Degree in City Planning from the University of Pennsylvania, Elisabeth did post-graduate work in growth management. She has experience as a professional planner in Kentucky, Maryland, North Carolina and Oregon. Elisabeth has served on many non-profit boards; she is currently chair of The Library Foundation (Multnomah County, Oregon) and a board member of Pathfinders International.

Vice President
Charlie Swindells
Attorney, Portland
Charlie Swindells is a third generation Oregonian and long-time Portland resident. He earned his Bachelor of Arts degree from the University of the Pacific and his J.D. from Northwestern School of Law. Charlie was a staff attorney for 1000 Friends from 1993 to 2002. Now in private practice, he specializes in land conservation and development law, and is an active member of our Cooperating Attorney Program. He is also a small woodlands manager. Charlie serves on several social service, conservation and arts boards.

Secretary/Treasurer
Sang Ahn
CPA, Portland
A native of Korea, Sang Ahn spent a few years in Hawaii before deciding to call Oregon “home.” He earned his BS degree from Hawaii Pacific University and his MS from Portland State University. Sang is a CPA with McDonald Jacobs, PC, providing accounting services and tax advice to small to mid-size privately held companies and non-profits. He also volunteers with Artists for the Arts, an organization that helps fund arts education in Oregon. His over-arching concern is securing a bright future for the next generation, including his own two children.

John V. Allcott III, MD
Physician, Eugene
John Allcott and his wife, Beth Hunt, arrived in Oregon “for 8 months” in 1978, and never left. He has practiced internal medicine in several Lane County communities, now with offices in Eugene and Veneta. Opposed to the West Eugene Parkway, John created a non-profit to study threatened plant and butterfly species in the path of the proposed road. Failure of that road project gave birth to the West Eugene Collaborative, a group which seeks to address transportation issues; he is a member. John also serves on the boards of Lane Independent Private Practitioners and Cease Fire Oregon.
Nancie Peacock Fadeley  
Community Leader, Eugene  
As State Representative from 1971-1981, Nancie Peacocke Fadeley chaired the House environment committees. Legislation reported from those committees included SB 100, the bill that created the raison d'être for 1000 Friends. A free-lance journalist, with an MA in Journalism from the University of Oregon, Nancie specializes in articles about Oregon history and environmental issues. Other activities include long-time service on boards at all levels: local, national, and international. She is now retired from the University of Oregon where she was public affairs director for KWAX (formerly an NPR radio station) before becoming Assistant Vice Provost.

Steve Gutmann  
Portland  
Steve Gutmann spent his early years in Switzerland and Quebec, and was 8 years old when his family moved to Oregon. One of four children, he spent many summer vacations camping and hiking throughout the Pacific Northwest. Since earning his BA from Dartmouth College, he has helped grow several businesses that are both profitable and environmentally beneficial. He has held business development roles for ShoreBank Pacific, Flexcar, Green Leasing, LLC and EcoSecurities. He is currently with EcoSecurities, a leading developer of greenhouse gas reduction (i.e. “carbon offset”) projects for the international and domestic carbon markets. Steve is married with two young daughters, lives in Portland, and also serves on the board of Focus the Nation.

Tom Keffer  
Community Activist, Hood River  
Tom Keffer represents the fourth generation of Keffers to live in the Northwest. He received a BA in Biology and Physics from Cornell University, and a Ph.D. in Physical Oceanography from Oregon State University. From 1980 to 1985, he worked at Woods Hole Oceanographic Institution, first as a postdoctoral Fellow, later joining the faculty. In 1985, he taught at the University of Washington. In 1989 he co-founded Rogue Wave Software, Inc., becoming its Chairman, President, and CEO. By the time he retired as CEO in 1998, the public company had grown to nearly 300 employees with revenues of over $44M. He was selected Oregon Technology Entrepreneur of the Year in 1997.

Kurt Koehler  
Business Owner, Hillsboro  
Kurt Koehler is CFO and co-founder of Kryptiq Corporation, the leading provider of next generation connectivity solutions for healthcare. Prior to Kryptiq, Kurt spent 20 years at Intel in a variety of roles including finance, product marketing, general manager, plant manager and director of internal application development. Kurt received a BA from Stanford in 1977 and an MBA from Wharton in 1981. Kurt and his wife Mary live in downtown Hillsboro where they
Wang

Appendices

-raised seven children. Kurt is a founding board member and past president of the Hillsboro Schools Foundation and a board member of the Hillsboro Chamber of Commerce.

Eric Lemelson
Vintner, Dayton
Eric Lemelson moved to Oregon in 1979 from the East Coast to attend Reed College. It took two years to realize that Oregon was his permanent home. After a series of political jobs, he attended Northwestern School of Law of Lewis and Clark College studying environmental and natural resources law, obtaining his J.D. in 1992. In 1995, he planted several acres of Pinot noir and Pinot gris on his small farm, becoming a full-time winegrower and winemaker several years later. Lemelson Vineyards owns and manages 115 acres of wine grapes at six sites in Yamhill County; the winery is located three miles east of Carlton.

Nolan Lienhart
Urban Designer, Portland
Nolan Lienhart is an Urban Designer with Zimmer Gunsul Frasca Architects, where he specializes in mixed-use and transit-oriented development. He left Portland to attend Colgate University, where he developed a passion for urban planning, and a desire to return to help protect Oregon’s world-renowned reputation for livable communities and environmental stewardship. On the way home, he stopped to work as a policy assistant to Congressman Earl Blumenauer in Washington, DC, and earned a Master of City Planning and a Certificate of Real Estate Design and Development at the University of Pennsylvania’s School of Design. Nolan also serves on the boards of the Bus Project and the Center for Innovative School Facilities.

Jim McDonald
CPA, Portland
Jim McDonald, CPA is a partner with McDonald Franceshi, LLC in Portland. With over 40 years of experience in accounting, tax and financial consulting, he is a member of the Oregon Society of Certified Public Accountants and the Financial Planning Association. He joined the board of 1000 Friends in 1995 as Secretary/Treasurer and served as President from 2004-06. Jim has also served on the boards of Oregon Ballet Theatre, National Spinal Cord Injury Foundation, Young Musicians and Artists, The American Advertising Museum, and Sisters of the Road Café.

Denyse C. McGriff
Planner, Oregon City
Informed by her experience as Principal Planner for the City of Oregon City, Denyse McGriff is currently a project manager for the Portland Development Commission. She previously worked with the Deschutes County Planning Department. From 1982 to 1989, Denyse chaired the State Citizen Involvement Advisory Committee of the Land Conservation and Development Commission. On the 1000 Friends Board since 1988, Denyse served as President from 2000-04.

Patricia R. Serrurier
Community Activist, Bend
Community activist and longtime McCall Society member Pat Serrurier is a revered educator. As a member of Trinity Episcopal Church in Bend, Pat is actively involved in the programs that feed the homeless and sell fair trade coffee. She also travels annually to teach in Condega, Nicaragua with the church’s international outreach program.

David L. Vernier
Business Owner, Portland
David Vernier is a former high school physics teacher who came to Oregon in 1973 and stayed because he appreciated the state’s progressive positions on land use, the bottle bill, and beach access. Dave and his wife, Christine, started a business producing software and sensors for science teachers. This company is now a nationwide leader in the field of data acquisition in science teaching and has been on the “Best Place To Work in Oregon” list for the last six years. He is Immediate Past Chair of the OMSI Board of Directors and current board member of YES (Youth Exploring Science).
Appendix ii | Portland Metro MPO Map
Appendix iii | 1000 Friends of Oregon 2008-2009 Annual Report
APPENDIX B
REQUEST FOR PROPOSAL
Parking Plan

City of Los Altos

One North San Antonio Road

Los Altos, CA 94022

Prepared by Tracy Wang

REQUEST FOR PROPOSAL
# TABLE OF CONTENTS

**Introduction and Background** ................................................................. 3

**Scope of Work** ......................................................................................... 4
  - Requirements
  - Deliverables

**Guidelines for Proposal Preparation** ....................................................... 6
  - Proposal Submission
  - Detailed Response Requirements
  - Executive Summary
  - Scope
  - Deliverables
  - Project Management Approach
  - Detailed and Itemized Pricing
  - Appendix: References
  - Appendix: Project Team Staffing
  - Appendix: Company Overview

**Evaluation Factors for Award** ................................................................. 8
  - Firm Qualifications & References
  - Technical Proposal
  - Price/Cost Proposal
  - Emissions Impact Analysis

**Administrative** ....................................................................................... 10
  - Schedule of Events
  - Technical Contact
  - Contractual Contact
  - Due Dates
  - Proposal Submittal
INTRODUCTION AND BACKGROUND

Introduction

The City of Los Altos, California is soliciting a qualified consulting firm to submit a proposal for the creation of a parking plan for downtown Los Altos. The City desires to have a plan detailing recommended parking management strategies to stimulate the economic vitality of downtown.

There is widespread awareness that Downtown lacks a strong customer base and remains uncompetitive while other downtown retail areas, such as Mountain View, Burlingame, and Los Gatos, are gaining market share. The 2009-2010 Provisional City Budget shows that downtown business sales-tax revenues have remained nearly flat in real dollars for the last 13 years, and declined when adjusted for inflation.

Over the past 18 months, the Los Altos Downtown Development Committee reviewed options to consider constructing additional parking in the form of a parking garage in order to draw more people into downtown—but concluded that this option was prohibitively expensive. Discussions of a possible public/private partnership to develop office space and parking resulted in a “Downtown Los Altos Public Parking Plazas Opportunity Study” that is still currently being studied by the committee and the Los Altos City Council. The Committee recommends building a minimum of 200 net new public parking spaces as part of any proposed project on the 10 City-owned Downtown parking plazas.

The following Request for Proposal (RFP) provides a brief background description, scope of work, submittal requirements, and criteria to be used to evaluate submittals.

Background

The City of Los Altos, with a population of approximately 27,728, is located 40 miles south of San Francisco and 15 miles north of San Jose. The City covers about 6.35 square miles and has a population density of less than 4,367 per square mile. The Downtown core is a major destination for the community with shops, restaurants, and small offices. The core also serves as the location for long-standing community festivals and events. The character of Downtown is defined by attractive shop frontages and streets lined with Chinese Pistache trees and potted blooming flowers.

Downtown’s parking needs are currently served by on-street parking as well as the 10 City-owned surface plazas mentioned earlier that are distributed throughout the Downtown core. These parking plazas are located behind buildings and accessed from the two major retail streets, Main and State streets, by the numbered side streets.

There is ongoing debate on whether the solution to stimulate the Downtown economy is to provide more parking or to revise current parking policies, or both. The Greentown Sustainable Land Use Group state that there is no shortage of available commercial parking spaces in Downtown and that even after a vacancy rate of 15%, the downtown triangle still has hundreds of spaces available—891 spaces to be exact. They recommend creating a reverse auction system of converting underutilized existing parking into shared parking as an inexpensive way to increase available parking.
The purpose of this RFP is to: 1) conclude if the City of Los Altos needs to construct additional parking based on extensive parking inventory, modeling, and surveys, 2) identify alternatives to increase the efficiency and flexibility of the existing parking supply, 3) engage stakeholders throughout the process of this study, 4) explore the potential of each alternative to aid emissions reduction.

**SCOPE OF WORK**

**Requirements**

- Outline a strategy and draft programs for promoting the parking plan to merchants/employees, property owners, and customers. Implementation of promotional program should begin prior to data gathering and analysis phase. Strategies include, but not limited to, the following:
  - Identify stakeholders: City officials, Downtown Development board members, Chamber of Commerce executives, merchants, property owners and other downtown leaders
  - Encourage stakeholders to participate actively in the process of analysis, planning, implementation, and on-going management of the parking system
  - Distribute periodic reports on the status of the parking plan and system, current problems and possible solutions, description of plans for operational and capital improvements
  - Educating the customer base through a promotional campaign for downtown parking addressing the how much parking is available, where it can be found, the value of on-street parking, the need for consistent enforcement procedures, plans for additional parking, and the way the parking system operates
  - Programs may include, but not limited to, the following:
    - A monthly newsletter
    - A monthly prize drawing for employees who participate in parking in a designated employee area and employee I.D. cards
    - Parking maps and brochures
    - Parking validation programs
    - Identification of parking signage types and locations
- Assessment of current conditions by gathering data using, but not limited to, the following:
  - Extensive parking inventory, off-street and curbside
  - Parking occupancy survey
  - Parking turnover survey
  - Comprehensive parking interview
- Shopper attitude survey
- Creation of a parking model and analysis of current demand, 5-year projections based on planned projects, and 10-year or long range projections based on trend analysis
- Recommendation of changes and systems required to increase the effectiveness and flexibility of the current parking supply. Recommendations may be related, but not limited to:
  - Revising minimum parking standards
  - Shared parking
  - Unbundling parking
  - Tiered parking
  - Parking cash out
  - On-street parking restrictions (time limits, parking meter rates and technologies, stopping and loading zones)
  - On-street angled parking
  - Re-striping parking spaces to reflect smaller automobile dimensions
  - Assessment districts
  - Re-evaluating current fine structure and recommendations for improvement
  - Re-evaluating parking ticket design, system of logging violations, ticket tracking procedure, notification system, and enforcement procedures (Method of identifying violators: chalking tires, hand-held computers. Identifying an enforcement route that can be covered by a parking violations officer within the prescribed time limit for each block or off-street facility. Identifying the number, type, and cost of personnel needed to enforce parking regulations.)
- Recommendation of management plan and identification of suitable management oversight structure such as the following:
  - Downtown Parking Advisory Committee
  - Downtown Parking Corporation
  - Parking Authority
  - Parking Unit
  - Public Ownership/Private Operation
- Identification of possible annual parking revenues, financing system for parking development, and possible disposition of parking fees and fines such as general fund or special parking fund
- Procedures for formal review and revision (recommended revisions to zoning ordinances, building codes, land use regulations, compliance standards, development incentives to meet the objectives of the completed parking plan)

Deliverables
At the conclusion of the assessment, the City of Los Altos requires written documentation of the approach, findings, and recommendations associated with this assignment. A formal presentation of the findings and recommendations to senior management may also be required. The documentation should consist of the following:

**Detailed technical report**
A document developed for the use of the City’s staff that discusses: methodology, strategy and programs for promotion of the parking plan effort, detailed findings from the parking inventories, models and surveys, and recommendations to increase the effectiveness and flexibility of the existing parking supply. Each recommendation should include an estimation of the potential increase in parking supply, projected implementation and/or maintenance costs, projected revenues (if any), approximate time frame needed for planning and implementation, and estimated emissions reductions or increases resulting from implementation of the recommendation. Each recommendation should also include supporting case studies from similar or nearby cities.

**Executive summary report**
A document developed to summarize the scope, approach, findings and recommendations, in a manner suitable for senior management.

---

**GUIDELINES FOR PROPOSAL PREPARATION**

**Proposal Submission**

Rights Reserved By City - The City reserves the right, as its sole discretion, to pursue any or all of the following actions with regard to this RFP:

- Issue addenda to the RFP;
- Request additional information and/or clarification from the Proposers;
- Reject any or all proposals, permit the timely correction of errors, waive minor deviations;
- Issue subsequent request for proposals based on refinements of concepts proposed in response to this RFP;
- Withdraw this RFP;
- Take whatever other action it deems in its interest.

Consultant's proposal shall be submitted in several parts as set forth below. The Consultant will confine its submission to those matters sufficient to define its proposal and to provide an adequate basis for the City’s evaluation of the Consultant’s proposal.

Consultant’s proposal in response to this RFP will be incorporated into the final agreement between the City of Los Altos and the selected Consultant(s). The submitted proposals are suggested to include each of the following sections:

1. Executive Summary
2. Scope
3. Project Deliverables
4. Project Management Approach
5. Detailed and Itemized Pricing
6. Appendix: References
7. Appendix: Project Team Staffing
8. Appendix: Company Overview

The detailed requirements for each of the above-mentioned sections are outlined below.

Executive Summary

This section will present a high-level synopsis of the Consultant’s responses to the RFP. The Executive Summary should be a brief overview of the parking plan, and should identify the main alternatives and recommendations of the proposed plan.

Scope

The scope covers an assessment of current conditions, analysis of current demand, projection of future demand, recommended changes and systems required to increase the effectiveness of the current parking supply, recommended revisions to parking regulations that reinforce flexibility, recommended management plan, financing system for parking development, procedures for formal review and revision and recommended revisions to zoning ordinances, building codes, land use regulations, compliance standards, development incentives to meet the objectives of the completed parking plan.

Deliverables

Include detailed descriptions of the recommendations. Include sample reports as attachments to the proposal to provide an example of the types of reports that will be provided for this project.

Project Management Approach

Include the method and approach used to manage the overall project and client correspondence. Briefly describe how the engagement proceeds from beginning to end.

Detailed and Itemized Pricing

Include a fee breakdown by project phase and estimates of travel expenses.

Appendix: References

Provide three current corporate references for which you have performed similar work.

Appendix: Project Team Staffing

Include biographies and relevant experience of key staff and management personnel. Describe the qualifications and relevant experience of the types of staff that would be assigned to this project by providing biographies for those staff members. Describe bonding process and coverage levels
of employees. Affirm that no employees working on the engagement have ever been convicted of a felony.

Appendix: Company Overview

Provide the following for your company:

- Official registered name (Corporate, D.B.A., Partnership, etc)
- Key contact name, title, address (if different from above address), direct telephone and fax numbers.
- Person authorized to contractually bind the organization for any proposal against this RFP.
- Brief history, including year established and number of years your company has been offering parking consultant services

EVALUATION FACTORS FOR AWARD

Any award to be made pursuant to this RFP will be based upon the proposal with appropriate consideration given to operational, technical, cost, and management requirements. Evaluation of offers will be based upon the Consultant’s responsiveness to the RFP and the total price quoted for all items covered by the RFP.

The following elements will be the primary considerations in evaluating all submitted proposals and in the selection of a Consultant(s):

Proposal Evaluation Criteria

| Firm Qualifications & References | 10% |
| Technical Proposal               | 30% |
| Price/Cost Proposal              | 50% |
| Emissions Impact Analysis        | 10% |

Firm Qualifications & References
Availability of sufficient high quality Consultant personnel with the required skills and experience for the specific approach proposed, management ability of Consultant; recommendations from references; responsiveness of the references to questions about the quality of services provided by the Consultant to similar communities; and insurability of Consultant.

Technical Proposal
Completeness of supporting facts and case studies for recommendations, ability to meet schedule; overall plan compatibility.

Price/Cost Proposal
Overall cost of Consultant’s proposal. The price/cost proposal will be evaluated based on the difference in cost of each proposal. The low cost proposal will receive the maximum score (50 points), and other proposals will receive points relative to the difference in price relative to the low price. So, for example, if a proposal is 20% higher price than the low cost proposal, it will receive a score 20% less than the high score (40 points).

Emissions Impact Analysis
Projections of possible emissions reductions or increases for all alternatives and components of the parking plan.

The City of Los Altos may, at their discretion and without explanation to the prospective Consultants, at any time choose to discontinue this RFP without obligation to such prospective Consultants.

ADMINISTRATIVE

Schedule of Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
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<tbody>
<tr>
<td>1. RFP Distribution to Consultants</td>
<td>September 23, 2009</td>
</tr>
<tr>
<td>2. Mandatory Pre-Proposal Conference at 10:00 AM</td>
<td>October 13, 2009</td>
</tr>
<tr>
<td>3. RFP Questions Deadline at 2:00 PM</td>
<td>October 19, 2009</td>
</tr>
<tr>
<td>4. <strong>Proposal Due by 2:00 PM</strong></td>
<td><strong>November 17, 2009</strong></td>
</tr>
<tr>
<td>5. Complete Initial Review and Shortlist</td>
<td>December 1, 2009</td>
</tr>
<tr>
<td>6. Interview Proposers (if necessary)</td>
<td>December 9-18, 2009</td>
</tr>
<tr>
<td>8. Council Authorization of Contract (if 2nd meeting needed)</td>
<td>February 9, 2010</td>
</tr>
<tr>
<td>9. Conform agreement (2 weeks after authorization)</td>
<td>February 23, 2010</td>
</tr>
<tr>
<td>10. Start of Project</td>
<td>September 15, 2010</td>
</tr>
</tbody>
</table>

Contact

Any questions concerning technical specifications or Statement of Work (SOW) requirements and questions regarding contractual terms and conditions or proposal format must be directed to:

<table>
<thead>
<tr>
<th>Name</th>
<th>Tracy Wang</th>
</tr>
</thead>
</table>

-124-
**Due Dates**
A mandatory pre-proposal conference will be held at 10:00 AM on 10/13/09. All proposals are due by 2:00 pm on 11/17/09. Any proposal received at the designated location after the required time and date specified for receipt shall be considered late and non-responsive. Any late proposals will not be evaluated for award.

**Proposal Submittal**
Proposers must submit two bound copies printed two-sided, one unbound original printed one-sided, and an electronic copy (on a flash drive or CD) in Word or Adobe PDF format of the Proposal by 2:00 PM on Tuesday, November 17, 2009, to:

City Clerk  
City of Los Altos  
One North San Antonio Road  
Los Altos, CA 94022

The Proposal shall be in an envelope or package marked on the outside:  
“Parking Plan Proposal for the City of Los Altos”
APPENDIX C
INVENTORY AND ANALYSIS OF SILICON VALLEY PARKING POLICIES
## SILICON VALLEY CITIES

<table>
<thead>
<tr>
<th>Management Strategy</th>
<th>Typical Range of Reductions in the Amount of Parking Supply Required at a Destination</th>
<th>Minimum Reduction</th>
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<td>Fremont</td>
<td>Newark</td>
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<tr>
<td>Parking Supply</td>
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<tr>
<td>Parking Minimum</td>
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<tr>
<td>More Accurate and Flexible Standards (Reduced requirements)</td>
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<td>Remote Parking/ Shuttle Services</td>
<td>15%–30%</td>
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</tr>
<tr>
<td>Shared Parking</td>
<td>10%–30%</td>
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<tr>
<td>Parking Capacity of Existing Parking Facilities</td>
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<td>Reduced Lot Size</td>
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<td>Angled Parking</td>
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<td>Automated Parking</td>
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<td>Parking Demand</td>
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<td>On-Street Parking</td>
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<td>Off-Street Parking</td>
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<td>Parking User Information</td>
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<td>Parking Rates</td>
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**EFFECTIVENESS SCORING**

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<tr>
<td>Overall</td>
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<td>Remaining Demand</td>
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<td>2000</td>
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<td>Potential Reduction</td>
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<td>2000</td>
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<td>Current Reduction</td>
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<td>2000</td>
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</table>

1 Sample number of downtown parking spaces based on San Mateo Ordinance
++ no reductions given for shared parking
* Ordinance states total number of spaces allocated shall be not less than the sum of the individual requirements.
** Prohibited, unless allowed by City
+/+ TDM mentioned briefly or no parking related policies mentioned in TDM
**+/+ reductions found for elderly/disability employees/transit users
+/+ off-site parking allowed if within 300-500 feet from entrance of use, no mention of shuttle services
**+/+ off-site parking and site need to be under same ownership.
<table>
<thead>
<tr>
<th>Management Strategy</th>
<th>Redwood City</th>
<th>San Carlos</th>
<th>San Mateo</th>
<th>Campbell</th>
<th>Cupertino</th>
<th>Gilroy</th>
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<tr>
<td><strong>SILICON VALLEY CITIES</strong></td>
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<td>San Mateo County</td>
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<td><strong>PARKING SUPPLY</strong></td>
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<td><strong>Overuse Capacity of Existing Parking Facilities</strong></td>
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1 Sample number of downtown parking spaces based on San Mateo
2 no reductions given for shared parking. Ordinance states total number of spaces allocated shall be not less than the sum of the individual requirements.
3 prohibited unless allowed by City
4 TDM mentioned briefly or no parking related policies mentioned in TDM
5 reductions found for elderly/disabled, retirement, transit, or park and ride only
6 off-site parking allowed if within 300-500 feet from entrance of use, as mention of shuttle services
7 off-site parking site need to be under same ownership.
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Sample number of downtown parking spaces based on San Mateo
* no reductions for shared parking. Ordinance states total number of spaces allocated shall not be less than the sum of the individual requirements.
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<tr>
<td>Remaining Demand After Potential Reduction</td>
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<td>2019</td>
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</tr>
</tbody>
</table>

1 Sample number of downtown parking spaces based on San Mateo
* no reductions given for shared parking. Ordinance states total number of spaces allocated shall be not less than the sum of the individual requirements.
**Prohibited unless allowed by City
\* TMD mentioned briefly or no parking related policies mentioned in TMD
\* reductions found for elderly/disabled/rural/retirement/transit/ low-income only
\* off-site parking allowed if within 300-500 feet from entrance of use, as mentioned of shuttle services
\* off-site parking and sites need to be under same ownership.
<table>
<thead>
<tr>
<th>Management Strategy</th>
<th>Typical Range of Reductions in the Amount of Parking Supply Required at a Destination</th>
<th><em>minimum_reduction</em></th>
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<td>Parking Cash Out</td>
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<td>Parking User Information</td>
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<td>Downtown Parking*</td>
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<td>Menlo Park</td>
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<tr>
<td><strong>REMAINING DEMAND</strong></td>
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<tr>
<td>Remaining Demand After Potential Reduction</td>
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<tr>
<td>Remaining Demand After Current Reduction</td>
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<td>3000</td>
</tr>
<tr>
<td>Estimate of Current Reduction (%)</td>
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</tr>
</tbody>
</table>

1 Sample number of downtown parking spaces based on San Mateo
2 No reductions given for shared parking. Ordinance states total number of spaces allocated shall be not less than the sum of the individual requirements.
3 **Prohibited unless allowed by City**
4 *Prohibited unless allowed by City*
5 *Prohibits transit and/or housing only.*
6 *Prohibits transit and/or housing only.*
7 Off-site parking allowed if within 300-500 feet from entrance of use, no mention of shuttle services.
8 *Off-site parking and also need to be under same ownership.*
<table>
<thead>
<tr>
<th>Management Strategy</th>
<th>Redwood City</th>
<th>San Carlos</th>
<th>San Mateo</th>
<th>Campbell</th>
<th>Cupertino</th>
<th>Gilroy</th>
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<tr>
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<td>0.30</td>
<td>0.30</td>
<td>0.30</td>
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<td>Increase Capacity of Existing Parking Facilities</td>
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<td>0.15</td>
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<td>0.15</td>
<td></td>
</tr>
</tbody>
</table>

| PARKING DEMAND       |              |            |           |          |           |        |
| On-Street Pricing    | 0.30         | 0.30       | 0.30      | 0.30     | 0.30      | 0.30   |
| Unbundled Parking    |              |            |           |          |           |        |
| Commuter Financial Incentives | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 | 0.30 |
| Parking Signage      |              |            |           |          |           |        |
| Transit Alternatives |              |            |           |          |           |        |
| Car Share            |              |            |           |          |           |        |
| Parking User Information | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 |        |
| Parking Fees         |              |            |           |          |           |        |

**EFFECTIVENESS SCORING**

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<thead>
<tr>
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**Remaining Demand After Potential Reduction**

<table>
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<th>376</th>
<th>364</th>
<th>432</th>
<th>520</th>
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<tbody>
<tr>
<td>250</td>
<td>376</td>
<td>364</td>
<td>432</td>
<td>520</td>
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**Estimate of Potential Reduction (%)**

<table>
<thead>
<tr>
<th>Remaining Demand After Current Reduction</th>
<th>10%</th>
<th>18%</th>
<th>18%</th>
<th>18%</th>
<th>18%</th>
<th>18%</th>
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</thead>
<tbody>
<tr>
<td>10%</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
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**Estimate of Current Reduction (%)**

<table>
<thead>
<tr>
<th>Remaining Demand After Current Reduction</th>
<th>10%</th>
<th>18%</th>
<th>18%</th>
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<th>18%</th>
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</thead>
<tbody>
<tr>
<td>10%</td>
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<td>18%</td>
<td>18%</td>
<td>18%</td>
<td>18%</td>
</tr>
</tbody>
</table>

1 Sample number of downtown parking spaces based on San Mateo
2 no reductions given for shared parking. Ordinance states total number of spaces allocated shall be not less than the sum of the individual requirements.
3 prohibited unless allowed by City
4 treatment briefly or no parking related policies mentioned in OPM
5 reductions found for elderly/disabled/transit
6 parking housing only
7 off site parking allowed if within 300-500 feet from entrance of use, any mention of shuttles services
8 off site parking and site need to be under same ownership.
### Management Strategy

<table>
<thead>
<tr>
<th>SILICON VALLEY CITIES</th>
<th>Santa Clara County</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Los Altos</strong></td>
<td><strong>Milpitas</strong></td>
</tr>
<tr>
<td><strong>PARKING SUPPLY</strong></td>
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<tr>
<td>Parking Policies</td>
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</tr>
<tr>
<td>More Accurate and Flexible Standards (Reduced requirements)</td>
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</tr>
<tr>
<td>Remote Parking/Shuttle Services</td>
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<tr>
<td>Shared Parking</td>
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</tr>
<tr>
<td>Increase Capacity of Existing Parking Facilities</td>
<td>✓</td>
</tr>
</tbody>
</table>

#### EFFECTIVENESS SCORING

| Downtown Parking | ✓ | ✓ | ✓ | ✓ | ✓ |
| Commuter Financial Incentives | ✓ | ✓ | ✓ | ✓ | ✓ |
| On/Offsite Parking | ✓ | ✓ | ✓ | ✓ | ✓ |
| Transit Allowances | ✓ | ✓ | ✓ | ✓ | ✓ |
| Car Share | ✓ | ✓ | ✓ | ✓ | ✓ |
| Parking User Information | ✓ | ✓ | ✓ | ✓ | ✓ |
| Parking Taxis | ✓ | ✓ | ✓ | ✓ | ✓ |

#### REMAINING DEMAND AFTER POTENTIAL REDUCTION

| Remaining Demand | 87% | 75% | 65% | 82% | 89% |

#### REMAINING DEMAND AFTER CURRENT REDUCTION

| Remaining Demand | 59% | 46% | 32% | 73% | 42% |

---

* Sample number of downtown parking spaces based on San Mateo.

* ✓ no reductions given for shared parking. Ordinance states: the number of spaces allocated shall be not less than the sum of the independent requirements.

* ✓ prohibited unless allowed by City

* ✓ TDM mentioned briefly or no parking related policies mentioned at all.

* ✓ reductions found for elderly/disabled/retirement/transit user housing only.

* ✓ off site parking allowed if within 300-500 feet from entrance of use, no mention of shuttle services.

* ✓ off site parking and also need to be under same ownership.
### SILICON VALLEY CITIES

<table>
<thead>
<tr>
<th>Management Strategy</th>
<th>Santa Clara</th>
<th>Saratoga</th>
<th>Sunnyvale</th>
<th>Santa Cruz</th>
<th>Watsonville</th>
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<td>48.7%</td>
<td>39.9%</td>
<td>20.0%</td>
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</table>

* Sample number of downtown parking spaces based on San Mateo
** no reductions given for shared parking. Ordinance states total number of spaces allocated shall be not less than the sum of the individual requirements.
*** prohibited unless allowed by CLIP
/ TDM mentioned briefly or no parking related policies mentioned in TDM
/ reductions found for elderly/disabled/retirement/transit
/ off-site parking allowed if within 300-500 feet from entrance of use, no mention of shuttle services
/ off-site parking and site need to be under same ownership.
<table>
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<tr>
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<td>8.18%</td>
<td>7.45%</td>
<td>8%</td>
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APPENDIX D
OUTREACH MATERIAL: THE STORY OF PARKING
“Good morning! My name is Tracy Wang and welcome to my thesis defense. I’m here today to share the story of my journey to creating a parking management guide for Silicon Valley.”
“When I think of parking, I see two lines and some pavement—not really much to look at. So why should anyone be interested in parking?”
"But would you believe—and this is a 2010 estimate—that there are roughly 105 million to 2 billion parking spaces in the U.S.? AND each spot costs anywhere from $2,000-$25,000 to construct. And THEN tack on another $200-$500 for maintenance, per spot, per year. That is a lot of money and a lot of land."
“Initially, what drew me to parking was that no matter what cap I donned throughout my educational career: architect, developer, planner, transportation consultant, or just plain me driving around—parking was always this intimidating beast. As an architect, it influenced the design of the building and layout of the site, as a developer it dictated the number of units that could be built which influenced the bottom line, as a planner there was the problem of figuring out how many spaces to require and what it would mean for sprawl or smart growth, and as a consultant, parking was linked to effects on the transportation system, emissions, Vehicle Miles Traveled (VMT), and finally me as a member of the community, my own experience of driving around looking for parking...”
“...and paying for parking, and worst of all—getting tickets for parking.”
“...and I thought, ‘wow!' if there was some way to improve the design and management of parking, it would have a positive impact on multiple scales—on site level, city level, regional level, and even nationwide.”
And so my thesis became a record of my journey to learning: what do we know about parking, where are we now, where do we want to be, and how do we get there? My thesis is not the type of research focused on a specific question, such as do Transit Oriented Developments really use less parking, but more of a high-level overview that is easily understood by the public, planners, and decision-makers—A parking management guide for Silicon Valley. This includes an overview of parking management strategies, potential funding sources and implementation tips.”
“So what DO we know about parking? Most of my time was initially spent reading about the problem of free parking as explained by Donald Shoup—because I mean, who wants to pay for parking? It sucks! Especially when if you try a little harder, you can usually find it for free. But that is the problem...”
The problem with free parking... 

It’s NOT free

“...It’s NOT free!”
“The costs of land and construction of parking are actually passed onto consumers in the form of higher prices for rent, housing, and other goods. It costs peoples’ time that they waste in traffic congestion, driving around in circles looking for parking. It costs the environment from increased emissions from people choosing to drive because parking is free, heat island effect from paved lots, and increased stormwater runoff. There is also the opportunity cost of the land itself, which could have been made into more affordable housing, or a park. Overall, it is a tragic waste of resources, especially if parking is only used a few times a year.”
“Another reason why parking is not truly free is that it must obey the rules of supply and demand. I don’t remember where I picked up this analogy, but if ice cream were free, there would be no more ice cream because we would eat it all, not to mention the long lines—but on the other hand, if you charged $20 bucks per cone, no one would buy it. So it’s all about stiking a healthy balance. Well, it’s the same with parking.”
“Parking experts say that the general rule of thumb for a healthy balance is to have 85% of available spaces be occupied—that translates to one spot in every eight that will remain vacant—so you don’t have this backup of people cruising around looking for a spot.”
“The tricky question that planners face is how much parking to provide? On the supply side of the equation, this is where minimum parking requirements come in—and a whole can of worms.”
"First of all, few cities ask the question ‘where are we now’? In order to save time and money they don’t conduct a comprehensive review to assess how much parking is there, and how it is being used. There is also the uncertainty of estimating future parking demand. Planners aren’t educated in school or on the job about how to properly set parking requirements—and so planners copy neighboring cities assuming they did their homework, or they consult the ITE manual. But the problem is, the neighbors probably didn’t do their homework, and the ITE collects data from these cities that may not know what they are doing, for others to use as examples! So it is a cycle of planning for an oversupply of parking.”

**Minimum Parking Requirements**

- Few cities ask “where are we now”
- Uncertainty of estimating future demand
- Planners aren’t educated on how to properly set parking requirements
- And so, planners turn to copying neighboring cities and consulting the ITE manual
- ITE measures the demand for FREE parking with no public transit, and producing manuals for others to copy rates
“This cycle thus entrenches sprawl into the planning process. First transportation engineers survey peak parking demand at suburban sites with ample free parking and no public transit. They produce a manual reporting parking generation rates for each land use. Second, planners use the manual (which recorded MAXIMUM demand) to set MINIMUM parking requirements for each land use. Third, the developers build an oversupply of parking because they have to and want their project to get approved as quickly as possible. And now, people now drive more because they can park for free!”
“It doesn’t end there. Then transportation engineers survey vehicle trips to and from suburban sites with ample free parking and no public transit. They produce a manual called Trip Generation, which reports a trip generation rate for each land use. Then transportation planners consult the Trip Generation manual to design transportation systems to be able to hold that capacity to and from suburban sites with ample free parking and no public transit. Then urban planners limit density so that new development will not generate more vehicle trips (than the ample free parking and no public transit scenario), and so it becomes a vicious cycle for sprawling development.”
“Another fact that makes estimating a ‘proper’ number of parking spaces a difficult task is that demand fluctuates—it changes by season, by hour, and by land use! As you can see here, the demand for office parking is high during weekdays when people go to work, and the demand for restaurant parking is high during noontime and evenings when people eat, which makes a lot of sense, but is more complicated to plan for.”
“Planners try to deal with this by using parking management strategies. My thesis covers each of these strategies in more detail with local examples and tips for overcoming barriers to implementation. But here are a few examples...”
Parking Supply

• Parking maximums
• Reduced requirements/Flexible standards
• Remote parking/Shuttle services
• Shared parking
• Increase capacity of existing lots (tandem, angled, mechanical, automated)

“Parking maximums set a cap on the number of spaces instead of a minimum. Reduced requirements are more flexible depending on the situation (e.g. usually cities reduce parking around Transit Oriented Developments and senior housing.) Remote parking allows parking lots to be further away from the site and people can take shuttles in. It can help preserve the character and density of an area. Shared parking allows different uses to share the same lot. And increasing capacity has to do with the physical arrangement of vehicles. I’m not going to go into detail on all of them, but I do want to touch upon a couple...”
Shared Parking

- More efficient—different land uses (office and church)
- Important strategy for mixed-use developments
- Example: Mountain View (residential parking shared with office)
- Parking requirements can be reduced 40-60% compared to standard off-street parking requirements
- Common concerns: spillover problems, difficult to administer

“Shared parking is a great solution to the issue of fluctuating demand—when one use is not using the parking, another can! For example, offices and churches can share lots because one peaks on weekdays, and the other on weekends. Or residential can share parking with office, like in Mountain View. So you can see that this is an important strategy for mixed-use development. Shared parking can reduce requirements 40-60% compared to standard off-street parking requirements. However, common concerns are spillover issues and also that flexible regulations may be difficult to administer.”
Increase Existing Capacity

- Universal stall size (8.5x 18 ft long) are in between full-sized and compact parking spaces. Redwood City, Mountain View, San Jose have adopted them.
  - Full-sized only (1,080 stalls)
  - Universal only (1,180 stalls)
- Tandem parking (San Diego counts tandem as two spaces in required parking calculations)
- Angled parking (can approximately double the number of parking spaces of parallel parking)

“There are a few ways to increasing existing capacity—this includes changing the stall size, allowing tandem parking, angled parking, mechanical parking and automated parking. The universal stall size is in between a full sized and a compact sized parking space. For example if we have a generic lot with full-sized spaces only, we could fit 1,080 parking spots. However if we changed those to the universal stall size, we could fit 1,180 spots. So it is more efficient use of space. Tandem parking is when two cars use the same driveway, one parked in front of another, so it saves space. San Diego allows tandem parking to be counted as two spaces in their required parking calculations. And angled parking which we’ve probably all seen, can approximately double the number of parking spaces of parallel parking.”
"Mechanical parking is the use of car lifts to stack cars on top of each other. There is a successful development in Walnut Creek that wanted to expand their parking structure. Watry, a firm based in Redwood City, did an analysis that they were kind enough to share. As you can see, if they used car lifts, they could add another 66 parking spots at the cost of $19,790 per stall. However if they expanded the structure for self-parking, it would add 62 spots and cost $55,473 per stall. So car lifts can add more spaces for much less money."
"Here you have automated parking where a machine parks your car for you. It requires only half the volume of conventional garages because it doesn’t need the ramps and stairs for cars to drive and for people to get out. Automated parking is highly popular in other European and Asian countries with dense urban cores. There is an automated structure planned for the West Hollywood City Hall, and if approved, could be the first automated structure in California."

Increase Existing Capacity

Automated parking (require only half the volume of conventional garages)

- West Hollywood City Hall may have first automated structure in California
“Strategies for managing parking demand include pricing, unbundling, commuter incentives, car share, user information, and taxes. Pricing is charging to park, whether using on-street meters or off-street garages. Unbundling is separating the cost of parking from rent, so those that need a parking spot can pay for it, and those that don’t have a car don’t have to. Commuter financial incentives are when employees use monetary incentives to get employees not to drive alone to work. User information is clear accessible information on where parking is located in the city, how many spots are available, at what times, at what price, and what the enforcement procedures are. Taxes are an annual tax on free or bundled spaces in privately operated structures (paid for by property owners) and this encourages owners to reduce the parking supply.”
“Again, I’m not going to go into detail on all of the strategies but I will talk more about pricing and unbundling. Pricing reduced demand by making people think twice about parking and even driving because now they are being charged. This opens up parking spots because fewer people are now parking and for shorter time spans—so it increases turnover and reduces cruising. Common concerns are that pricing will scare customers away and businesses will suffer, or that people will just find parking nearby where it’s free (spillover issues). However, when Redwood City installed parking meters with their revitalization plan, parking occupancy dropped from 100% occupied to 82%. Monthly permit sales increased 50% as employees moved off the streets and into garages. The length of occupancy neared the desired one-hour mark, and overall it brought more business downtown.”
Unbundling parking

- Renting out a parking space for $100/month is likely to reduce auto ownership by 15-30%
- Common concerns: administrative and enforcement costs, spillover problems
- Planned mixed-use development—Parker Place in Downtown Berkeley plans to unbundle all residential parking spaces
- Many cities are looking into unbundling

“Unbundling parking doesn’t punish those who don’t drive or have a car, and instead incentivizes it. Renting out a parking space for $100/month is likely to reduce auto ownership by 15-30%. Common concerns are the administrative and enforcement costs, and spillover problems. There is a planned mixed use development in Downtown Berkeley called Parker Place that plans to unbundle all residential parking spaces. Silicon Valley cities do not have the policy of unbundling yet, but many cities are currently looking into it.”
“MTC’s 2007 handbook on reforming parking policies ranks the effectiveness of some of the “best practices”—Here you can see that, true to the ice cream analogy, pricing is the most effective strategy to reduce demand. But it’s only effective in situations where demand is high.”
The use of parking management strategies is highly dependent on context. Development density, mix of land uses, demographics, transit services, bike and pedestrian network, cost of parking in neighboring areas—all influence travel and parking behavior. Policies and programs need to be combined and customized for maximum effectiveness, because implementing complimentary strategies actually compounds the results! For example, if you have two strategies, say shared parking, which reduced demand by 10%, and walkability, which reduces demand by 10 percent. If you implement the two strategies together, the resulting reduction in demand is 25%, not 20%, because of the compounded effect. Also, results increase with time. Programs are considered mature after 5 to 10 years. Effectiveness increases from 5-15% decreased demand to 15-30% decreased demand when programs are mature.”
“Now that we’ve covered the basics of what do we know, the next question is where are we now? I asked this question from a regional perspective to choose Silicon Valley as my study area—I’ve got family and friends there, I worked there, and it’s suburban. And since everyone was picking on suburbia, I said...why not?”
In my study area there are four counties and 22 cities. I took a brief inventory of the major parking policies of the 22 cities. True enough they had very similar set of policies, which could indicate that neighboring cities were copying each other. One observation is that after sorting the data by population, population density/square mile, or county affiliation, there was no correlation to the parking policies adopted. So it’s not like the denser more populated cities had more progressive parking policies—which I thought was interesting.
“So here is a breakdown by supply and demand, of major parking management strategies in the 22 cities. As you can see, the most common policies are angled parking, shared parking, and flexible standards. Watsonville was the one city that did not mention shared parking. Saratoga, Los Altos, and Newark had no mention of parking reductions. For remote parking, although half the cities allowed it, only Foster City allowed the lots to be as far as ¼ mile away, whereas the other cities required the lot to be within 300 or 500 feet of the building. There were four cities with parking maximums: Milpitas, Redwood City, Cupertino, and Gilroy, and only San Carlos mentioned Parking Lifts.”
Parking Demand Management Strategies Overview

<table>
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<th>Commuter financial incentives</th>
<th>Parking user information</th>
<th>On-street pricing</th>
<th>Parking taxes</th>
<th>Unbundled parking</th>
<th>Car share</th>
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• The most common policy-Commuter financial incentives
  • (parking cash-out, travel allowances, rideshare)
  • TDM (Often mentioned but only half detail specific strategies and include parking management)
• Parking pricing (Foster City, Redwood City, San Mateo, San Jose, Santa Cruz)
• Parking taxes (only Santa Cruz)
• Unbundling and Car Share (Often mentioned, nothing implemented)

“For demand management strategies...” ➔ read slide.
Potential Reductions in Demand

Bare minimum (average of 8% reduction in demand)

- Strengthen policy language
  - Incorporate parking strategies in TDM programs
  - Allow remote parking more than 300-500 feet from site
  - Shared parking without requiring the number of parking spaces to be no less than the sum of the individual requirements

Keep up with the Joneses

- Los Altos, Morgan Hill, Saratoga have potential to reduce general demand by 20 to 35% in each city

“The most common reasons for not having parking management policies may be that they think there is no need, complex politics, or lack of funds. But what if cities were to do the bare minimum and simply strengthened their policy language? They could achieve an average reduction of 8% in demand! By strengthen policy language I mean incorporate parking strategies in their Transportation Demand Management programs, allow remote parking to be more than 300-500 feet from the site, allow shared parking without requiring the number of parking spaces to be no less than the sum of individual requirements.” For a few cities, namely Los Altos, Morgan Hill, and Saratoga, they have the potential to reduce general demand by 20 to 35% in each city if they were just to keep up with the Joneses in what neighboring cities have already adopted. And this is just to say that they could if they had the need to, perhaps they do not have a huge demand for parking.”
Funding Programs

- For non-profits (TransForm, The Sierra Club, Working Partnerships, Urban Habitat Program, Community Development Institute)
  - California Democracy Program from James Irvine Foundation (supports policymaking on transit issues, land use decisions, etc.)
  - Regional Planning Strategy Program from Silicon Valley Community Foundation (supports community participation in land use and transportation plans)

“I also looked into funding sources and even tried my hand at writing a grant proposal and Request for Proposal. I found funding sources linked to sustainability for both non-profits and local governments. For non-profits like TransForm and The Sierra Club, there were two foundations—the James Irvine Foundation, and the Silicon Valley Community Foundation—both supporting community participation in transportation and land use policymaking.”
Funding Programs

• For local governments
  – Energy Efficiency and Conservation Block Grant
  – Station Area Planning Grant Program
  – Transportation for Livable Communities Program
  – Mobile Source Outreach Assistance Program
  – EECBG’s Climate Action Planning Grant
  – Mobile Source Incentive Fund
  – Transportation Fund for Clean Air
  – Climate Initiatives Program (Innovative Grant Program, Safe Routes to School Program)

“For local governments, there are programs such as the Energy Efficiency and Conservation Block Grant, Station Area Planning Grant, and the Transportation of Livable Communities Program.”
Funding Administration

- Administered by
  - U.S. Environmental Protection Agency (EPA)
  - Department of Energy (DOE)
  - Association of Bay Area Governments (ABAG)
  - Metropolitan Transportation Commission (MTC)
  - California Energy Commission (CEC)
  - Bay Area Air Quality Management District (BAAQMD)
  - Air District
  - Congestion Management Agencies (CMA)
  - Bay Area Conservation and Development Commission (BCDC)

“Funding is administered by many agencies such as the EPA, DOE, ABAG, and MTC. Cities apply for grants from these agencies to fund their projects.”
“Funding sources come from the Clean Air Act, the American Recovery and Reinvestment Act, a $2 or $4 surcharge fee on vehicles registered with the Department of Motor Vehicles, and a whole slew of federal funds which you can see is like the alphabet soup here and I won’t be getting into those.”
Implementation

– The Parking Handbook for Small Communities by John D. Edwards
  
  • Contents of a parking plan
  • Securing endorsement for the plan
  • Implementing the plan
  • Maintaining/revising the plan

“I also looked at implementation tips from the Parking Handbook for Small Communities by John D. Edwards. He covers the contents of a parking plan, securing endorsement for the plan, implementing the plan, and maintaining the plan. For contents he suggests having an analysis of current and future conditions, increase the effectiveness of existing supply first before building new supply, having a parking development strategy, management plan, financing plan, and procedures for formal review and revision. His main tip for securing endorsement is to get stakeholders to participate in identifying the problem, even before data collection begins, and to get their agreement on costs and to participate in reviews. For implementing the plan it is important to get the management team going first, establish how to measure program effectiveness, and ensure consistency with other plans (General plan, specific plans). For maintaining the plan he advises an informal assessment every 12-18 months and a thorough update every 3-5 years.”
“These days the big buzz word is climate change. You can’t open a General Plan without seeing some language on encouraging multi-modal travel and reducing greenhouse gases. Many cities now have a climate action plan. If cities are to be consistent with their goals, they must re-evaluate their parking situation. There are many solutions out there for a sustainable community—but parking management is definitely one solution that cannot be ignored.”
“How do we get there? We need to re-evaluate by doing parking studies (you can hire Wilbur Smith!), educate with public outreach, have fearless leadership, a political constituency to back up the policies, and helping hands. Again everyone is involved, the architect, developer, planner, engineer, and the public. And there is a movement. We, at Wilbur Smith Associates, are doing comprehensive parking studies for Mountain View, Santa Cruz, and Menlo Park. We are also working with MTC and congestion management agencies to conduct a parking interest survey and training program for 9 counties in the Bay Area. Training would teach parking management fundamentals to jurisdictions and also conduct on-site parking management labs.”
There is a great opportunity for innovation in parking—on both policy and design levels. A couple examples are the Senate Bill 518 by Lowenthal in 2009 to limit funding for subsidized parking and provide incentives for adopting parking management strategies. Although that didn’t go anywhere, it is an example that people are trying innovative policies on a higher level. On the design side, Boomerang company invented what they call a roaming shuttle concrete system, which is basically a system of little robots that slide under cars, following wires buried under the floor to move them around—a robotic valet service!
Lesson

- Don’t be intimidated by parking, but see it as a marvelous opportunity to improve the way we plan, build, and travel in our community.

“So the takeaway lesson is, don’t be intimidated by parking, but see it as a marvelous opportunity to improve the way we plan, build, and travel in our community.”
“The End. Thank you!”