VPP Parking Regional Analysis

Research, findings, and policy recommendations

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Project Manager: Valerie Knepper, MTC

This report addresses the issues raised in the MTC Value Pricing Pilot (VPP) parking project by itemizing the eleven policy questions identified in the study, and developing an approach to address each question. Academic research and best-practices relating to pricing, modeling, and innovations within parking policy are reviewed in detail.

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Executive Summary

Parking policies have a powerful effect on land use development patterns and travel choice. The Metropolitan Transportation Commission (MTC) has been providing research, best practices, workshops and technical support for cities interested in parking reform for several years, in order to support the goals of the Regional Transportation Plan / Sustainable Communities Strategy, including reduced greenhouse gases (GHG), increased affordable housing, a vibrant economy and improved equity.

MTC received funding through the FHWA Value Pricing Pilot (VPP) program to delve into potential regional parking policies, particularly in the realm of pricing and management. The effort developed a regional parking database to inform this policy work and for use by local jurisdictions. The Value Pricing Pilot Parking Regional Analysis Project (the "Project") uses case studies, academic research, policy analysis and data analysis to address the relationship between parking pricing, policies, parking supply, and parking demand in cities around the Bay Area.

This Parking Policy Paper is organized around key questions in the areas of

1. Parking Supply and Demand in the Bay Area
2. Parking Requirements, Pricing and Unbundling
3. Parking Structure Analysis
4. Employee Programs
5. Potential Regional Parking Policies
6. Local Best Practice Parking Policies
7. Enacting Pricing Policies

This report addresses each of the Project's 11 policy questions in these areas by explaining its purpose, and discussing analytical, modeling, policy, and expert research on the topics.

Key Findings

1) **Most of the study locations have significant amounts of unused parking, even during the peak use time.** While there is excess parking demand and usage on particular streets during the peak in some locations, there are significant amounts of unused parking spaces in lots and structures within a few blocks in almost all the locations at almost all times.

2) **Many locations do not have pricing policies that effectively balance parking demand across their area. There is a lack of coordination of prices between on-street and off-street parking.** Prices for on-street parking are typically lower, or free, while lots and structures tend to have higher prices. This commonly results in drivers double parking and searching for on-street parking spaces, clogging up local business districts and resulting in excess vehicle miles of travel, while structures go underutilized.

3) **Many parking requirements are not closely aligned with demand of the relevant population in the local context.** Households that are younger or lower income and who have good walk/bike and transit access have lower automobile ownership rates. High parking requirements make housing less affordable. There is some movement toward reformed parking requirements based more on local populations, local land uses, transit access, and prices; regional support is valued.

4) **When parking structures are included in transit projects, there is often a lack of analysis of relative cost and effectiveness of alternative modes of access and pricing on the need for or appropriate size of a structure.** While parking structures can be a component of the transit system, their relative cost effectiveness and usefulness depends on local land use and transportation conditions. In some cases high density housing would provide higher transit ridership and more revenue to the transit agency.

5) **Employee programs that charge for parking are the most effective in reducing driving to work.** However, many employers are reluctant to charge employees for parking. Parking cash-out is an attempt to put charging for parking into a more favorable perspective, but is not being implemented in the Bay Area. Programs that provide subsidies for alternative modes are more expensive and less effective than charging for parking, but appear to be more acceptable; combinations of charging for parking and subsidies for other modes may be most effective and acceptable.

6) **Regional parking policies are a logical policy approach as part of the Sustainable Community Strategy (SCS), as per SB 375.** Regional policies can be effective by providing expertise, supporting local analyses and implementation, conditioning funds on local adoption of appropriate parking policies, new innovative programs and increased scrutiny on the use of regional funds.

Potential Regional Parking Policies

A stronger supportive regional role is likely necessary to make significant progress in reforming parking policies in the Bay Area in the near future. This report recommends MTC work closely with cities, transit agencies, the Association of Bay Area Governments (ABAG), Congestion Management Agencies (CMAs), the Bay Area Air Quality Management District (BAAQMD), development and business interests, advocacy groups, and other stakeholders in considering the following policies and activities (arrayed below from bold innovation to incremental changes):

1. Work with BAAQMD to explore the development of an **Indirect Source Rule (ISR)**, and/or develop a **regional parking cap and trade approach**.

2. Explore the development of a new **regional parking fee or tax** program, (using a VMT / GHG estimate), potentially with proceeds being **returned to CMAs and/or local jurisdictions** for use on TDM or projects to improve local quality of life.

3. **Condition receipt of certain federal, state and regional transportation and development funds** on local adoption of appropriate local parking pricing and management policies, including for potential future programs such as OBAG 3, Regional Measure 3, New Starts/Small Starts. Establish standards based on place types or other considerations.

4. Revise MTC's Resolution 3434 TOD Policy to include **appropriate parking policies for transit oriented developments around transit stations**, and include provisions for appropriate **local parking pricing and management policies for other transit extensions** and programs with regional participation.

5. **Require a robust analysis of proposed parking structures** with parking demand and multi-modal access and financial proforma prior to MTC contribution of regional funds. Consider establishing policy and threshold requirements.

6. **Enforce the State parking cash-out law** at a regional level and refine the next Bay Area Commuter Benefit Ordinance to emphasize parking cash out and pricing parking.

7. **Increase regional funding support** for local planning and capital improvement parking projects**,** focusing on **reduced requirements and pricing** to manage demand effectively**.**

8. Publicize new **State legislative reforms to parking policies that promote or allow development of more housing and infill mixed use with less parking**, and support further State reform efforts that support the goals of the Regional Transportation Plan / Sustainable Communities Strategy.

9. Collect and publicize code and policy language of **effective local strategies;** collect **additional parking data** and incorporate it into the **Regional Parking Database,** provide **training** for use of the database and analytical tools for local jurisdictions. **Develop a parking demand calculator**, including local conditions and pricing, for use by local jurisdictions; consider use of the calculator in conditioning of funds and other policies.

10. Incorporate the impact of parking policies, especially pricing, into MTC/ABAG land use and transportation **modeling for future Regional Transportation Plans / Sustainable Community Strategies**.

These recommended strategies range from bold innovative steps to small incremental activities, and most can be implemented in tandem with each other. They build on extensive review of existing policies and conditions in Bay Area cities and beyond, innovative concepts, and robust analysis, and reflect work with a wide variety of stakeholders. These ideas offer the potential to significantly improve local parking conditions, support local businesses, support affordable housing, shape regional land use, impact travel choices, and reduce vehicle miles of travel and greenhouse gasses. Reformed parking policies can play a vital and substantial role in the Bay Area in achieving the goals of the Regional Transportation Plan / Sustainable Communities Strategy.

VPP Parking Regional Analysis

The Metropolitan Transportation Commission (MTC), is the regional transportation planning and programming agency for the San Francisco Bay Area. MTC has been providing research, best practices, workshops and technical support for cities interested in parking reform for several years (see Appendix E). MTC sought and received funding through the FHWA Value Pricing Pilot (VPP) program to delve more into complex issues about potential regional parking policies, particularly in the realm of pricing and management, and to develop a regional parking database to inform this policy work, and for use by local jurisdictions and the regional agencies, among others.

The VPP Parking Regional Analysis Project (the "Project") includes data analysis that demonstrates the impact of poor pricing and information systems, resulting in a perception of little parking – typically people cruising and double parking on key streets, while spaces in structures go underused. This creates a poor business climate and inconveniences the public, along with increasing VMT and GHG.[1]

This report – the Project Policy paper - is focused around eleven key questions about parking policies. This report addresses each of these questions by explaining its purpose, and discussing analytical, modeling, policy, and/or expert research on the topics as described below:

1. Information gleaned from literature review, including:
    - Current best practices, particularly relating to pricing, and
    - Existing academic research.
2. Focused research, including:
    - Applications of best practice policies relating to pricing,
    - Analysis of applications and how they relate to the Bay Area, and
    - Analysis of surveys that have been conducted for studies within the Bay Area.
3. Original work of this effort, including:
    - Modeling and analysis through UrbanSim and Travel Model One,
    - Analysis of new and existing parking data,
    - Visual and quantitative analysis of new and existing data using GIS, and
    - Expert panel review and analysis.

The discussion on each policy question includes the purpose of each question, the audience most likely to benefit from the information provided, and the significance of its policy application. The best practice policy application also includes short descriptions of examples of best practice policies that have been applied in the United States. While this review is not exhaustive, it covers many of the most effective parking policies that exist today. Select policy questions include original work as well as

[1] Richard W. Wilson, *Parking Management for Smart Growth* (Island Press, Washington D.C, 2015)

information on the challenges concerning our ability to answer the policy question(s). **Table 1** on the following page summarizes the primary methods that are used to answer each policy question.

Important resources can be found in the Appendices (separate document). Key definitions can be found in **Appendix A.** Analysis of the 25 cities can be found in **Appendix B**. A detailed description of the modeling tools used in this study can be found in **Appendix C**. UrbanSim methodology and assumptions can be found in **Appendix D**. Previously done regional parking analysis by MTC can be located in **Appendix E**. Finally, expert testimony information can be found in **Appendix F**.

Table 1: Primary Method of Analysis for Key Policy Questions

Policy Question	Data Analysis	Literature	Modeling	Current Applications	Expert Review
	Data collection & GIS analysis	Best practices & academic literature	UrbanSim & Travel Model One	Policy application & survey analysis	Expert panel review & staff interviews
#1 Where is local parking supply greater than demand, and where is local demand greater than supply, and at what prices for parking does this hold? Does this vary systematically by type of place or other criteria?	✓	✓		✓	
#2 What would be the impact of reduced parking requirements on distribution and types of new development in different areas of the region?		✓	✓	✓	
#3 How much demand exists for housing with lower amounts of parking? At what prices and in which areas?	✓	✓		✓	✓
#4 What would be the impact of unbundling parking from rents on residential demand in urban areas, and how would it alter demand vis-à-vis less urban areas? What would be the transportation, environmental and financial impacts of a charge placed on parking spaces?		✓		✓	✓
#5 Could some planned or proposed parking structures be downsized through pricing and provision of other modes without negative impacts on transit ridership/revenues and downtown retail?		✓	✓	✓	
#6 What would be the impact on employment location and types, and on employees' income of a regional parking cash-out program?		✓		✓	✓
#7 What are the most effective actions the regional agencies can take to support pricing parking policies?		✓		✓	✓

#8 Under what conditions might cities and transit agencies want to enact or enforce various priced parking policies?		✓		✓	
#9 Under what conditions do individuals perceive parking pricing policies to be appropriate?		✓		✓	
#10 How common are the conditions that would lead to a successful local parking pricing policies in the San Francisco Bay Area?	✓	✓		✓	
#11 What are the specific approaches to parking pricing programs and the components that are most important for a successful program?		✓		✓	✓

Policy Question 1: Supply and Demand

Where is local parking supply greater than demand, and where is local demand greater than supply, and at what prices for parking does this hold? Does this vary systematically by type of place or other criteria?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

This is a fundamental question that addresses the relationship between parking supply, demand, and pricing. This question is of prime interest to MTC and ABAG. Local jurisdictions are primarily interested in the answers to these questions within their own jurisdictions. This question is especially dependent on parking economics. Each specific location will have its own balance of supply, demand, and price elasticity that will determine how a set price (or lack of pricing) affects the relationship between supply and demand. Factors affect supply and demand are location-dependent—including attractions, origins, demographics, transportation options in the area, local and regional policies, as well as culture. **Figure 1** illustrates the relationships between parking demand, supply and price.

Figure 1: Relationships between parking demand, supply and price

Source: Concept and information from Richard Willson; adapted and edited by CDM Smith, February 2014.

Data analysis methods for this question can be used by local jurisdictions for development of strategies, to begin larger discussions on parking management, or as a starting point for a larger study. Supply and occupancy data can establish a baseline for comparative analysis, allowing local jurisdictions to evaluate how the relationship between parking supply, demand, and price in their jurisdiction compares to the larger region.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, we would address this question by analyzing a complete data set of parking inventory, occupancy, turnover, and pricing throughout the region and for all times of day, days of week, and seasons. Information for all parking—both private and public supplies—would allow a full supply and demand analysis. Additionally, before and after data showing user responses to introduction of pricing/parking price changes would make it possible to calculate the price elasticity of demand, which would allow the project to determine what price could be charged for parking in order to achieve desired occupancy levels.

In this study, this question is addressed primarily through new analysis of new data collected on supply, occupancy, and price of public parking facilities for 25 locations throughout the Bay Area.[2] This information is location-specific so that demand by area is correlated with a high-level summary of the policy, demographic, transit service and/or land use characteristics that makes each area unique. In addition to analyzing occupancies by region, GIS is used to map findings spatially and look at which parking conditions are common throughout the Bay Area. Inventory (including supply, price and restrictions) and occupancy of public parking (on- and off-street) for one weekday (Monday-Thursday) and one Saturday during five times of the day (5AM, 9AM, 12PM, 4PM, and 8PM) was recorded. The results are also discussed in relationship to the parking policies within each study area.

Literature Review

Parking Supply, Demand and Pricing

Professor Donald Shoup, an expert on parking economics, suggests using a performance basis for pricing, specifically keeping prices consistent with an occupancy level of approximately 85% in order to realize the "right price" for parking.[3] "Underpriced and overcrowded curb parking creates problems for everyone except a few lucky drivers who find a cheap space," Shoup explains in the introduction to his research on demand based pricing in San Francisco (2013). Additionally, while underpricing and overcrowding creates problems, overpricing and under-crowded spaces also have negative effects.

For areas with more supply than demand, unused parking spaces could be converted to more efficient land uses (such as developments, public space, or parklets); excess (underutilized) parking in these areas could also be used by adjacent high-demand areas by implementing shared parking policies or valet parking policies (see Policy Question #7-11 for application descriptions). Additional literature relating to this balancing of supply, demand through pricing policies include:

- SFPark, goBerkeley, and New York City's Variable Pricing Pilot projects: each of these projects, explained in detail below, include cutting-edge research on managing on-street parking with variable pricing.
- Transpo Group (2013). Seattle Annual Paid Parking Occupancy Report 2013. Prepared for the Seattle Department of Transportation: This study looks at parking conditions where parking

[2] Analysis will also utilize data from study areas with current (since 2010) data where available.

[3] Some of the most relevant and recent publications include by Donald Shoup include: Donald Shoup, "Cruising for Parking," Transport Policy, Vol. 13, No. 6, November 2006, pp.479–486; Gregory Pierce and Donald Shoup, "Getting the Prices Right: An Evaluation of Pricing Parking by Demand in San Francisco," Journal of the American Planning Association, Vol. 79, No. 1, Winter 2013, pp. 67–81; Donald Shoup, The High Cost of Free Parking, Chicago: Planners Press, 2005 and revised 2011.

pricing is in effect. Occupancy varies by time of day for different locations with different prices and enforcement policies in place.

- Auchincloss et al. (2014). Public Parking Fees and Fines: A Survey of U.S. Cities. Published in Public Works Management & Policy: This study looks at parking prices within 107 U.S. cities and finds that higher parking costs are associated with an increase in public transit use and less personal automobile demand.
- Some studies have also looked at the relationship between supply and demand, including Robert Cervero's (2009) study in California that found an 11% decrease in parking demand for every 50% reduction in supply.

Price Elasticity of Demand

Several studies have researched how parking prices change demand, calculating price elasticity of demand for different regions. The change in demand due to changes in price is also dependent on supply. Because of this, effects of changes in price on demand are very location-specific. Price elasticity of demand found in cities around the world range from -0.15 to -0.58 from a variety of research. Note that the initial introduction of pricing on parking may have an even stronger impact on travel behavior than price changes, but cannot be calculated as elasticity because of the lack of an initial price.

Key studies include:

- Kelly and Clinch (2009): A study in Dublin, Ireland found an average of 2.9% decrease in demand with the introduction of a 10% increase in pricing.
- Dueker, et al (1998): A study in Portland found a 5.8% decrease in demand per 10% increase in price using an $80/month base charge.
- Shoup (1994): Study found a 1.5% decrease in demand per 10% increase in price.
- Pierce and Shoup (2013): An SFPark study found a 4% decrease in demand per 10% increase in pricing. Additionally, Millard-Ball, Weinberger, and Hampshire (2014)[4] look at the impacts of SFPark's pricing research, detailed further within the discussion for Policy Question #7.

Best Practice Applications

Variable Pricing

Policy Application: New York City's Variable Pricing Pilot

New York City received an FHWA grant to implement demand-based variable pricing. The conditions that led to the program's initiation were a high rate of cruising for parking, low availability of parking during peak demand periods, and a high rate of double parking. Within Greenwich Village, pricing was raised from $1 to $2 during the peak demand period from noon to 4pm. Occupancy on weekdays decreased about 8% on weekdays and vehicle turnover increased, allowing a higher number of total vehicles to park. Results of the 6-month pilot were well documented and success of the program

[4] Is the Curb 80% full or 20% empty? Assessing the Impacts of San Francisco's Parking Pricing Experiment. Transportation Research Part A: Policy and Practice.

resulted in continuing the variable pricing policy, raising the fees to $2/hour off-peak and $3/hour during peak periods.

Policy Application: Berkeley's goBerkeley Pilot

In 2013, with funding from the Federal Highway Administration (FHWA), the City of Berkeley initiated a pilot program that implemented several on-street dynamic pricing strategies. Hourly rates for on-street parking range from $1.00 to $2.25; prices were set based on the demand for parking in the area. In Berkeley's Elmwood District, a popular commercial corridor with limited on-street parking, a tiered-parking strategy was implemented to encourage short-term parking and discourage longer-term parking. Prices start at $1.00 per hour and increase by $0.50 per hour for every additional hour of stay, up to three hours. Pilots were also initiated in the Downtown Berkeley and Southside/Telegraph neighborhoods. In these areas premium and value areas were established. The higher demand premium areas had shorter time limits and higher hourly rates to encourage turnover, and lower demand value areas had longer time limits and lower hourly rates.

Off-street lots are commonly priced higher than on-street parking, resulting in underutilized off-street parking and excess demand (including double parking) within on-street parking in high demand areas. Off-street parking typically needs to be less expensive to encourage longer term parking, increasing availability of on-street parking for short-term parking. In 2013, Berkeley found that the $0.50/hour higher cost for on-street parking (at $1.50/hour) compared to off-street costs (at $1.00/hour) was not sufficient to encourage parkers to use off-street facilities over on-street facilities. Even with this price differential, on-street parking was still consistently above 85% occupied while off-street facilities were 75% occupied. This study resulted in recommendations that the pilot implement additional pricing measures to make off-street parking more competitive with on-street parking.[5] Furthermore, the pilot program improved parking availability, increased parking rates at previously underutilized facilities, and enhanced customer satisfaction by adjusting parking rates and time limits.[6]

Policy Application: SFpark's Demand-Based Pricing

With funding from the FHWA in 2011, San Francisco began an ambitious program to set on-street parking prices at variable levels dependent on the demand for that area. Seven pilot zones were selected to have demand-based pricing, with prices adjusted every few weeks based on occupancy rates. For example, if occupancy rates are below 30%, the price was decreased by 50 cents per hour; if occupancy is above 80%, the price was increased 25 cents per hour (**Figure 2**).

[5] Memo to the Honorable Mayor and Members of the City Council from Christine Daniel, City Manager. October 29, 2013. City of Berkeley. Re: Enable Off-Street Parking Rate Changes in goBerkeley Pilot Program.

[6] Berkeley City Council Information Report, December 16, 2014. Available at: http://www.goberkeley.info/results.php

Figure 2: Weekday Morning Prices at Fisherman's Wharf[7]

There were several benefits of the SFpark program. First, vehicles spent less time circling for parking. This reduced traffic congestion and decreased emissions from excess driving. Second, drivers parked in the areas of higher demand parked for a shorter time, increasing turnover rate and therefore, making these spaces available to accommodate more people. Last, more people used alternative modes and carpool to highly demanded destinations with the highest prices, such as baseball games at AT&T Park.

Pierce and Shoup (2013) calculated the price elasticity of demand based on SFPark data of 5,294 changes in price and occupancy within San Francisco. Overall, meter prices did not increase—meters were adjusted both up and down with the average meter price falling 1%. The average elasticity value calculated was -0.4. Therefore, as the cost for parking increased by $1, occupancy fell by 40%. In other words, on a street block-face with 10 spaces, raising the price by 25 cents per hour opened up one parking space.

After the program had been in effect for six months, Pierce and Shoup (2013) looked at two of the seven pilot areas to calculate the price elasticity of demand based on SFPark's data showing price and occupancy changes in 2012. The study found that the price elasticity of demand in an area at Fisherman's wharf was -1.3. Demand for parking was low at this location (average occupancy at 27%) and prices were decreased to reach higher occupancies. For every $1 decrease in price per hour, occupancy increased 130% (**Table 2**). Even though per-hour prices decreased, the parking revenue for the Beach Street area increased, because occupancy increased substantially.

Table 2: Price and Demand Changes for Two SFPark Study Areas

Area	Change in Price	Change in Occupancy	Price Elasticity of Demand
600 block area near Beach Street at Fisherman's Wharf	**-53%** **$3/hr to $1.75/hr**	**+70%** **27% to 56% occupied**	**-1.3**
200 block area at and near Drumm Street	**+25%** **$3.50/hr to $4.50/hr**	**-13%** **98% to 86% occupied**	**-0.5**

VPP Regional Parking Database Analysis

Data was collected for 25 sites in the Bay Area to look at parking supply, policies (including pricing) and occupancy. This information was mapped and analyzed for each location, with recommendations relating to the type of parking concerns in each city. The restrictions for each study area were

[7] Access Magazine. SFpark: Pricing Parking by Demand. Available at: http://www.uctc.net/access/43/access43_sf_park.shtml

compared to the parking occupancy, by time of day and day of week. **Appendix B** shows the full analysis for each of these locations.

Where is local parking supply greater than demand and where is local demand greater than supply?

In most study areas, there is more supply than demand. Hot spots exist within some of these locations, where high demand in a relatively small area could be distributed with proper demand management policies. In several sites, supply was much greater than demand. **Table 3** lists each site, the peak off-street occupancy, the peak on-street occupancy, and the total peak occupancy. **Table 3** also highlights study areas with particularly low (below 50%) or high (above 75%) peak occupancy. Some study areas have both high very demand and very low demand for their peak periods, depending on the type of parking. Several of these study areas have commuter lots (BART or Caltrain) that have high demand during the midday. Study areas with large discrepancies between on- and off-street parking are in strong need of demand distribution policies.

Table 3: Occupancy Summary for each Study Area

Study Area	Peak On-Street, %	Peak Off-Street, %	Total Peak, %	Demand/Supply relationship	On-Street Pricing/ Off-street Pricing (see Table 4 for details)
Alameda Park Street Downtown	89%	98%	90%	Demand is high relative to supply.	Yes/No
Albany San Pablo Avenue	59%		59%		No/No
Albany Solano Avenue	58%		58%		No/No
Burlingame Caltrain Station Area	72%	83%	79%		Yes/Yes
Dublin BART Station Area	40%	45%	45%	Demand is low relatively to supply.	No/No
El Cerrito del Norte	50%	98%	71%		No/Yes
El Cerrito Plaza	50%	98%	61%		No/Yes
Emeryville Shopping District	83%	90%	86%	Demand is high relative to supply.	No/No
Fairfield Downtown and Amtrak	36%	76%	48%	Demand is low relatively to supply.	No/No
Gilroy Downtown and Amtrak	44%	50%	47%	Demand is low relatively to supply.	No/No
Hayward Downtown and BART Station Area	47%	72%	70%		No/No (subsequently Yes)
Lafayette Mt Diablo Boulevard	35%	88%	63%		Yes
Martinez Downtown	54%	52%	53%		Yes
Millbrae El Camino Real	59%	79%	63%		No/No
Pinole Downtown	33%	65%	39%	Demand is low relatively to supply.	No/No
San Jose North Downtown	77%	73%	65%		See Table 4
San Jose South Downtown	52%	52%	52%		See Table 4
San Jose Diridon Station Area	50%		50%		See Table 4
San Jose Northeast Downtown	57%	29%	39%	Demand is low relatively to supply.	See Table 4
Santa Rosa Downtown*	43%	47%	46%	*While Downtown demand is high, residential demand is low relatively to supply.	Yes/Yes
Sausalito Waterfront	74%	96%	83%	Demand is high relative to supply.	Yes/Yes
South San Francisco Downtown	82%	54%	78%		Yes/Yes
Sunnyvale Downtown and Caltrain Station Area	52%	52%	52%		No/No
Union City Downtown and BART Station Area	40%	81%	58%		Yes/Yes
Vallejo Downtown and Waterfront	39%	70%	54%		No/Yes

Note: Green represents occupancy below 50%; orange represents occupancy between 75% and 85%; red represents occupancy above 85%

What prices for parking does this hold?

Pricing was analyzed for each of the 25 parking analysis sites. 11 of the 25 sites have no pricing, except for BART facilities. On-street prices range typically range from $0.50-$2.00/hour. Off-street prices often are higher, despite lower off-street demand in these areas (e.g. San Jose, South San Francisco, and Vallejo). Cities with on-street pricing have an average peak on-street occupancy of 60%, while cities without on-street pricing have an average peak on-street occupancy of 50%. Finally, areas with on-street pricing typically have higher occupancy. **Table 4** below provides pricing summaries for the 25 study areas examined in this study.

Table 4: Pricing Summary by Study Area

Study Area	Pricing Summary
Alameda Park Street Downtown	On-street pricing varies from $1.00 - $1.50/hour throughout Alameda; Prices are $1.50 in the Park Street business district and $1.00 around Webster Street; no off-street pricing.
Albany San Pablo Avenue	No on-street or off-street pricing.
Albany Solano Avenue	No on-street or off-street pricing.
Burlingame Caltrain Station Area	On-street pricing includes $1.00/hour on Howard Ave from Primrose Rd to Highland Ave, $1.00 first hour/$2.00 second hour on Burlingame Avenue, and $2.00 for 2 hours. Off-street pricing includes $1.00 first hour/$2.00 second hour or $3.00 for 10 hours for other facilities.
Dublin BART Station Area	No on-street or off-street pricing.
El Cerrito del Norte	Off-street pricing at $1.00-$3.00/day.
El Cerrito Plaza	No on-street pricing; $3.00 daily fee at El Cerrito BART parking.
Emeryville Shopping District	No on-street or off-street pricing.
Fairfield Downtown and Amtrak	No on-street or off-street pricing.
Gilroy Downtown and Amtrak	No on-street or off-street pricing.
Hayward Downtown and BART Station Area	No on-street or off-street pricing at public facilities. Recent implementation of BART pricing after time of data collection (2015).
Lafayette Mt Diablo Boulevard	On-street pricing at $1.00/hr.
Martinez Downtown	On-street pricing at $0.50/hr.
Millbrae El Camino Real	No on-street or off-street pricing.
Pinole Downtown	No on-street or off-street pricing.
San Jose North Downtown	San Jose parking meters charge $2 per hour in the downtown core (except multi-space meters) and $1 per hour outside the downtown core. Multi-space meters charge $2 on weekdays near Diridon Station and special pricing during events or near the Convention Center. Off-street pricing at $1.00 for 20 min/$20 max weekends $5.00 flat fee.
San Jose South Downtown	
San Jose Diridon Station Area	
San Jose Northeast Downtown	
Santa Rosa Downtown	$1.00/hr pricing both on-street and off-street.
Sausalito Waterfront	On-street pricing $1.00/hr; $1-3/hour off-street pricing with $5-25 daily max prices.
South San Francisco Downtown	On-street pricing ranges from $0.75-$1.00/hr. Off-street pricing ranges from $0.75-$3.00/hour and includes daily permit.
Sunnyvale Downtown and Caltrain Station Area	No on-street or off-street pricing.
Union City Downtown and BART Station Area	On-street pricing at $0.50/hr. Off-street pricing ranges from $2.50-$3.00/hr.

Vallejo Downtown and Waterfront	No on-street pricing; some off-street pricing at $5.00 daily fees and/or $20 monthly passes.

In order to better understand the dynamics of the relationship between pricing and occupancy it is necessary to look at individual areas and the basis for demand for parking, i.e., businesses, recreation, residence, etc., along with the land use/built form and the availability of other modes of access.

Parking Supply and Demand in the Bay Area - Findings

Supply, policy and occupancy data was collected for 25 sites in the Bay. This information was mapped and analyzed for each city, with recommendations relating to the parking concerns of each city. **Appendix B** shows detailed maps and analysis for each of the individual study area.

The analysis found key conditions and issues that are common in the Bay Area, as described below. Examples of the key conditions and issues stated below, as well as specific strategies to target them, can be found in **Appendix G**.

1. Very high demand exists within a hot-spot area, but there is available supply elsewhere
2. Demand is high throughout much of an area's on-street parking facilities
3. Pricing regulations exist, but prices are too low to manage demand
4. Regulations exist, but not during periods of highest occupancy
5. On-street parking is high, but there is available off-street supply
6. Low overall occupancy and a high amount of unused supply

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

There are several impediments to data collection and analysis that inhibit our ability to answer this question entirely.

1. Due to limited resources, data collection is limited to 25 new sites, rather than being able to collect data throughout the Bay Area. Locations with relatively high parking demand, quality transit, and local interest in the study were favored. Findings are most generalizable to similar locations, especially growing medium and small city downtowns with quality transit.
2. Data collection was completed between August 2014 and February 2015. While generally regarded as representative times, data collection did not cover the holiday season, which some cities consider to capture the peak demand for some downtown business districts.
3. It is challenging to collect supply and use data for private off street parking; in some places this type of parking is a major component of the total parking supply and this gap should be recognized in the development of findings. While some collections do include some private off-street facilities, most collections include only on-street and public off-street facilities.

Recommendations

- MTC should continue to work with local jurisdictions to increase the amount and quality of data collected in existing study areas and other areas of interest.
- MTC should conduct and support additional analysis to assist in implementing better pricing and management to achieve local and regional goals.
- Metering within areas of very high demand should be further implemented to reduce hot spots and provide more balanced parking dynamics.
- Wayfinding to direct users to off-street parking (where available) should be implemented to help provide information when needed to shift demand to available off-street supply and mitigate on-street congestion.
- Cities that already have metering and parking restrictions in place should reexamine existing conditions and analyze the potential costs/benefits of increasing fees in areas of highest demand, reducing fees in areas of lowest demand, and make sure that existing parking restrictions are in line with desired parking behavior.
- Cities should consider evaluating new technologies that can allow for variable pricing or efficient enforcement in heavily congested areas to support the regular use and turnover of the available parking supply.

Policy Question 2: Reduced Parking Requirements

What would be the impact of reduced parking requirements on distribution and types of new development in different areas of the region?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

Typical parking requirements subsidize driving, increasing drive-alone mode shares and act as a barrier to Smart Growth.[8] Rigid parking requirements—especially those that are high—can prevent development or incentivize development in low-density areas where land costs are cheaper. Standard uniform parking requirements disproportionately dampen urban development because of higher land values in urban areas compared with suburban locations. For residential developments, the cost of building parking is passed on to the resident, increasing housing costs for all users, regardless of car ownership. Altogether, this research can help inform how parking requirements affect the cost and location of development in the Bay Area.

This information can help local governments and regional governments in developing appropriate land use and transportation policies. Local governments can benefit from this information to better understand the local land use implications of their parking policies. The regional agencies are interested in this information to help develop effective policies that provide residents with more choices in how they live and access their needs, and that support implementation of the development patterns envisioned in the regional plan, Plan Bay Area. Plan Bay Area emphasizes additional development in the larger cities and along transit corridors, particularly in priority development areas (PDAs) in part to address housing and greenhouse goals. In the long run this information and subsequent policy changes are expected to benefit residents who desire housing with less parking, through reduced costs for housing.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, we would like to analyze the economics of developments and their parking requirements throughout the region, and the size of the market for various types of housing and transportation choices. In addition, before and after data of all commercial and residential development that have implemented reduced or eliminated parking requirements, would be useful in order to focus on the real-life impact of parking requirement policies. However, timing for such types of applications is very specific; therefore, research for this question will include an analysis of research and applications as well as modeling reduced and eliminated parking requirement scenarios through UrbanSim.

UrbanSim was used to estimate the impact of parking policies on future patterns of development based on demographic trends, emerging behavior patterns, real estate finances, transportation costs, etc. Cost of building parking as well as the current parking requirements was be incorporated into UrbanSim's real-estate model; the model then simulated the cost savings to developments when

[8] https://www.itdp.org/wp-content/uploads/2014/07/ITDP_US_Parking_Report.pdf

parking requirements are reduced using a "pro-forma" approach. Simulations show the effect that reductions to this cost would have on a developer's choice to build.

Best Practice Research

What information are we aware of that we can use to address this question?

A number of studies have looked at the effect of changes in reduced parking requirements, often in relationship to development potential and costs. In addition to academic studies, application examples of reduced parking requirements directly include the Los Angeles Adaptive Reuse Ordinance (ARO), Berkeley, CA and Oakland, CA.

Reduced Parking Requirements

In "High Cost of Free Parking", Donald Shoup (2005) proposes that in order to avoid subsidizing the cost of driving with free parking; parking should be viewed as a commodity like any space rental. While research is scarce, this research accumulates data from two separate studies to look at how providing free parking by way of parking requirements can (1) increase the construction costs per dwelling by 18%, (2) decrease housing density by 30%, and (3) decrease land value 32-33%. Altogether, this work discusses how parking requirements make development more expensive and discourage high density development while encouraging sprawl. Additional studies looking at the effect of reduced parking requirements include:

- "Turning Housing into Driving: Parking Requirements and Density in Los Angeles and New York," (Manville, Beata, and Shoup, 2013) looks at how parking requirements decrease density and increase automobile ownership. In New York City, the researchers found that for every 10% increase in minimum parking requirements, there was a 6% reduction in both population and housing density, and a 5% increase in the number of vehicles per square mile.[9]
- Vinit Mukhija and Donald Shoup, "Quantity versus Quality in Off-Street Parking Requirements," Journal of the American Planning Association, Vol. 72, No. 3, Summer 2006, pp. 296–308. This research discusses how minimum parking requirements increase demand for automobiles, by providing a parking supply beyond what the market would naturally provide and spreading out land uses making it more difficult to get places with alternative modes. This article looks at several successful examples of cities that have policies that eliminate or add flexibility to minimum parking requirements, including:
    - Portland, Oregon: does not have minimum parking requirements for sites within 500 feet of a transit service with at least 20-minute peak hour service.
    - Carmel, California: limits parking in an effort to maintain and enhance its pedestrian-focus by barring any off-street parking within the central commercial district.
    - Tacoma, Washington: eliminates parking requirements for new buildings in the downtown and relaxes them by 50% in outside places if the location is near Link light rail stations and certain bus corridors.[10]

[9] Michael Manville, Alex Beata, and Donald Shoup, "Turning Housing into Driving: Parking Requirements and Density in Los Angeles and New York," Housing Policy Debate,Vol. 23, No. 2, 2013, pp. 350–375.

[10] http://www.psrc.org/growth/housing/hip/case-studies/tacoma-pkg

Table 5 provides some examples of additional cities that have reduced or eliminated parking requirements.

Table 5: Examples of cities with reduced or eliminated minimum parking requirements

City	Policy
San Francisco, CA	Eliminated minimum parking requirements; established maximum requirements.
Los Angeles, CA	Project-specific reduced minimum parking requirements.
Palo Alto, CA	Reduced minimum parking requirements for land banking (described below).
Sacramento, CA	Eliminated and reduced minimum parking requirements (described below).
Berkeley, CA	Eliminated and reduced minimum parking requirements (described below).
Portland, OR	Eliminated minimum parking requirements within 500 feet of a transit line with at least 20 minute peaks.
Seattle, WA	Reduced minimum parking requirements for certain types of development such as senior and multi-family housing, and developments with carsharing. Eliminated requirements in downtown.
San Diego, CA	Reduced minimum parking requirements for some developments.
Hartford, CT	Reduced minimum requirements in exchange for taking efforts to reduce demand.
Centennial, CO	Reduced minimum parking requirements for shared parking.
Arlington County, VA	Context-specific reduced minimum parking requirements.
Portland, OR	Established parking maximums based on availability of transit service; eliminated minimum requirements.
Cincinnati, OH	Reduced and eliminated parking minimum requirements in the CBD.
New York, NY	Eliminated minimum parking requirements for affordable units in downtown Manhattan and Brooklyn.
Washington, DC	Eliminated minimum parking requirements in high-density downtown areas and reduced parking requirements in transit-rich areas outside of downtown.
Tacoma, WA	Eliminated minimum parking requirements throughout the downtown core.
Nashville, TN	Eliminated minimum parking requirements within the 600-acre downtown core.

Santa Clara County Parking Utilization Study

This recent study of 12 TOD residential properties in Santa Clara County (2010) found that there was substantial unused parking at all of the sites, which had been built to the local parking requirements.[11] It concludes that as such, many Santa Clara County municipalities could reduce their residential parking requirements significantly without the risk of "underparking" a TOD residential site. The estimated cost of the 2,496 unused parking spaces counted in the study for these sites represent about $37.4 million in opportunity cost. Such studies can help inform decision-makers as well as the public that areas near transit stations are often over-parked. This parking can be reduced and converted to other kinds of development projects, such as affordable housing, further supporting transit ridership. These findings should guide local municipalities into adopting lower parking requirements that allow for sufficient parking and optimize land use.

Policy Application: Zoning Code Reform in Sacramento, CA

In an effort to improve the ease of doing business in the City and promote sustainable communities, the City of Sacramento revised their Zoning Code in 2012 to bring more flexibility for parking requirements in urban areas.[12] The City has removed all requirements in the Central Business District,

[11] http://www.sjsu.edu/urbanplanning/docs/VTA-TODParkingSurveyReport-VolI.pdf

[12] http://portal.cityofsacramento.org/Community-Development/Planning/Current%20Planning/Zoning/Zoning%20Code%20Parking%20Regulations

has removed all requirements for projects smaller than 6,400 square feet in the Central City, and for all other areas requirements are based on the neighborhood context, access to alternative transportation modes, and existing parking supplies in the area.[13] The purpose of the changes was to encourage more business development in the city, especially downtown.

Policy Application: Reducing Parking Requirements in Berkeley, CA

Berkeley, California has written into their Zoning Ordinances that parking requirements can be reduced if a new development falls under certain criteria. While the exact wording of the code can be found in Berkeley's Zoning Ordinance Section 23B.28.050, the code stipulates that the land use falls under one of the following summarized criteria:

1. The development is within 1/3 mile from a BART station, Berkeley's Amtrak stations, or a bus rapid transit stop;
2. The development is within ½ mile from an underutilized public parking lot;
3. A parking survey shows that there is ample parking in the neighborhood during the new development's peak parking demand;
4. The new development is a Retail Product Store, Food Service Establishment, and/or Personal/Household Service; or
5. The reduced requirements are deemed to improve the area or there are other factors where demand will be reduced.

Policy Application: Elimination of Minimums and Creation of Maximum Requirements in San Francisco

In 2006, San Francisco eliminated parking requirements for housing in downtown commercial (C-3) zoning districts and replaced these with maximum parking requirements of 1 parking space for every 4 housing units. These policies have been implemented along with car-sharing, secure bicycle parking and unbundling policies (further detailed in Policy Question #4). Successful application of these policies resulted in extending these policies—including maximum requirements and unbundled parking—to several new neighborhoods.[14]

Parking and Affordable Housing

Inclusion of parking in housing costs raises the cost of housing. There have been a number of analyses of the impact of the inclusion of parking on housing prices.

In a report by Jia and Wachs (1998), an economic analysis investigated the impact on housing affordability of code required parking in six neighborhoods in San Francisco. Using hedonic pricing it estimated that parking requirements increased prices by about 10%. Based on the findings it recommends a rethinking of these parking code requirements so that housing is more affordable, particularly for lower income households.

[13] http://downtownsac.org/new-parking-standards-approved-by-council/
[14] San Francisco municipal code, off-street parking requirements in City and County of San Francisco. http://www.amlegal.com/nxt/gateway.dll?f=templates&fn=default.htm&vid=amlegal:sanfrancisco_ca

The Bay Area Council Poll in 2014 found that 79% of those polled (in all nine San Francisco Bay Area counties) said that the Bay Area faces "crisis in housing costs."[15] Inclusion of parking increases the cost of building housing, limiting the amount of housing that can be produced under a set budget. Demand for more affordable housing in the Bay Area is sky-high, resulting in long waiting lists. The following studies specifically look at how minimum requirements affect affordable housing:

- The study, *Parking Utilization in Affordable Housing* in San Diego, CA (Willson, O'Connor, and Hajjiri, 2012) looks at housing affordability and parking demand and finds that demand for parking is lower than the built supply and assessing the policies that will cause individuals to determine whether vehicle ownership is worth the cost. The study found that demand for parking in affordable housing rental units was approximately half that of market rate rental units in San Diego. Furthermore, there was a direct relationship between parking demand and income level. In several affordable and senior housing developments in San Diego, data collection showed that utilization rates were only a small proportion of the minimum requirements under code.

- Due to lower car ownership rates within low-income groups, parking in affordable housing developments often go unused, yet the requirements still increase the rental costs. "Parking Requirement Impacts on Housing Affordability," (Litman, 2013) estimates that a single parking space increases the cost of a housing unit by 12.5%. Demand can be influenced by household income, tenure, household size, population density and alternative transportation, as well as pricing policies. Despite lower demand in many areas with more transit options and lower-income populations, parking requirements are typically set at the same rate for all housing.

Policy Application: Reduced Parking Requirements in Los Angeles

The Adaptive Reuse Ordinance (ARO), passed in the City of Los Angeles in 1999, was created to encourage the conversion and reuse of vacant commercial buildings as residential apartments in downtown Los Angeles. In order to encourage residential reuse of older, often abandoned, office buildings, the City both reduced the parking requirements and allowed off-site facilities to satisfy these lower requirements. A study of the ARO buildings by Shoup and Manville (2007) found that these developers made more efficient use of fewer spots by unbundling the parking, and reducing the overall demand for spaces by tenants. [16]

"Parking Requirements and Housing Affordability" (Jia and Wachs, 1999) looks at reduced parking requirements in downtown L.A. This study finds that with reduced requirements, developers provide more housing overall as well as a greater variety of housing for different types of household sizes and incomes. It also finds that developers will provide some housing specifically marketed towards people who do not have a car to park at the site.

[15] Housing, driving hit crisis points in Bay Area, poll shows. http://www.sfgate.com/bayarea/article/Housing-driving-hit-crisis-points-in-Bay-Area-5508178.php

[16] Los Angeles parking requirements also studied in "Parking requirements as a barrier to house development: regulation and reform in Los Angeles" (Manville, 2006)

Flexible Parking Requirements & Carsharing

"Car-sharing: Where and How it Succeeds," (Millard-Ball, 2005)[17] explores how carsharing can be used as a policy tool to reduce minimum parking requirements. It gives several examples in North America of where and how this tool has been used, including:

- Rather than an in-lieu fee, Aspen Colorado allowed the developers of residential units in the new Visitor's Center to contribute funds to carsharing.
- The City of Seattle has modified its Land Use Code to allow required residential spaces to be dedicated for car-sharing use.
- Austin, Texas has modified its code to allow parking reductions for multi-family developments that participate in car-sharing within the University Neighborhood Overlay district.
- The City of Vancouver in Canada allows a single car-sharing space to substitute for up to three required parking spaces within multi-family buildings of 30 units or more.

Additionally, some developments have started offering a portion of their units without parking and at a lower cost. "Moda," a condo development in downtown Seattle, offered lower-priced units for 83 of the 251 units that do not provide parking. The demand was so high for units without parking that they sold out in less than a week.[18] Similarly, The Civic in Portland, OR offered 25 lower-cost units without parking.

Reduced and Flexible Parking Requirements

Parking requirements are sometimes reduced on a case-by-case basis, but few cities have policies written into their code. Requiring flexible parking requirements, reduced parking requirements for development near transit, or setting regional parking requirement maximums would allow regional agencies to manage parking supply by having an indirect effect on the price of development due to parking.

[17] Adam Millard-Ball (2005). Volume 108 of Report (Transit Cooperative Research Program). Transportation Research Board, 2005. Pages 5-24 to 5-27.

[18] "Direct Reports: No Parking", Multifamily Executive Magazine, February 1, 2007; http://www.multifamilyexecutive.com/industry-news.asp?sectionID=539&arti...

Regional Policy Application: King County's Right Size Parking Calculator

The Right Size Parking Calculator is a tool to help determine how much residential parking is required for new developments, with demand factors that are specific to the King County region. The motivation behind the Right Size Parking Project was the understanding that parking is often oversupplied due to minimum parking requirements and the methods of estimating parking needs that are based on suburban vehicle ownership rates do not apply well to the area. The project found that residences in the area built an average of 1.4 spaces per dwelling unit, despite only needing approximately 1 space per dwelling unit. This is a large and wasteful cost to developers, passed along to homebuyers and renters; it also represents a barrier towards Smart Growth and TOD principles. Therefore, the calculator is a tool to help inform context-specific parking demand, rather than relying on demand information that may not be relevant to the King County area.

Figure 3: Building & Parking Specification inputs for the Right Size Parking Calculator

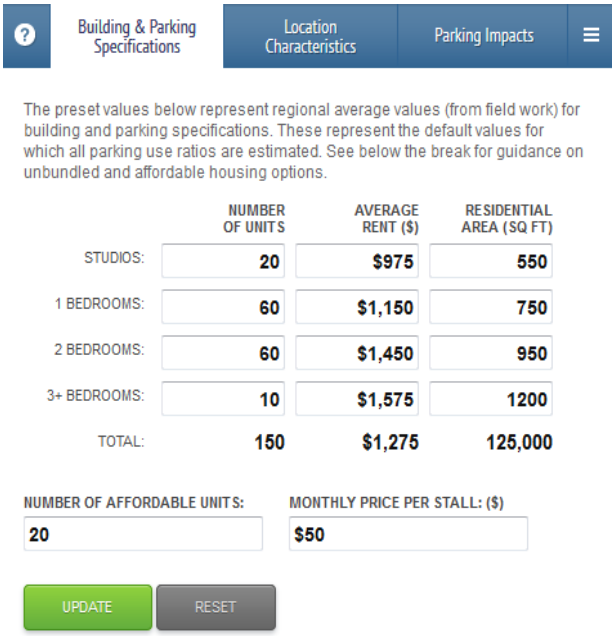

Image: www.rightsizeparking.org

The Right Size Calculator estimates the number of parking spaces that would be used under various conditions per residential unit (parking/unit ratio) for specific new developments and location characteristics. Therefore, the "right size" number of parking spaces per unit depends on the characteristics of the location and specifics of the development—such as the price of the development, price of parking, location of jobs, and transit access. The model also outputs estimated "parking impacts," providing average construction costs, vehicle miles traveled, and greenhouse gas emissions that the amount of parking will provide (**Figure 3**). Last, the model outputs estimates for trip generation reduction based on commute distance and journey to work mode split, data gathered from the U.S. Census. The Bay Area should seek to implement a similar calculator that decision makers can look at when examining potential reductions in parking requirements for specific projects.

The Calculator was created by first collecting parking-use data from hundreds of multi-family residential developments. A regression analysis was used to build the model based on characteristics of each residential building (such as average rent, units per square feet, and occupancy) as well as environmental characteristics (such as measure of transit service and population/job density). These variables were used to predict the demand for parking based on the dependent data: "observed vehicles per occupied residential unit."[19]

19 King County Multi-Family Residential Parking Calculator. http://www.rightsizeparking.org/background.php

Modeling Analysis

Travel Model One

Travel Model One is MTC's regional travel demand model. The analysis of model scenarios specifically focuses on how fees at Bay Area Rapid Transit (BART) parking facilities can affect the demand for parking and transit mode share. Additional factors analyzed include vehicle ownership, trip costs, and BART ridership. Nine BART stations were chosen to conduct this analysis: stations where it would be particularly feasible to develop TOD in place of current parking facilities.

Three scenarios were modeled for this analysis:

1. Baseline scenario with "no change" conditions and current parking maintained,
2. A no-parking scenario with all drive access removed at stations, and
3. A housing scenario with housing built at each station and current parking maintained.

The results found that removing all parking at a station reduces ridership by about 11,000 riders at nine stations; however, adding housing at each station increases riders by about 6,000 riders at each station. These findings suggest that transit-oriented development (TOD) expanded past just the BART station facility parking as well as generating additional commercial and office land uses is likely to generate more demand relative to parking. The Travel Model One results show that adding housing and maintaining the amount of parking provides more ridership. The analysis found that comparable ridership could be maintained or expanded without maintaining or expanding parking facilities, but instead by developing adjacent land next to parking lots, also helping increase office and commercial use.

More station access trips being generated by non-drive modes would also be provided. Without the option to drive, a portion of patrons who previously accessed the station by single-occupancy vehicle would likely take alternative modes. An additional factor when considering TOD replacement of commuter parking lots at BART stations is BART capacity. TOD development can generate more off-peak ridership, shifting demand towards other periods of the day and week and as BART ridership demand continues to increase while capacity is constrained in the near-term, this could help manage demand as well as increase development of more commuter transportation options, such as Transbay bus systems, carpooling, and Bus Rapid Transit.

UrbanSim Analysis

Bay Area UrbanSim is the Metropolitan Transportation Commission's (MTC's) regional land use model. The model is used to analyze how planning policies affect the location choices of households, businesses, and real estate developers over the long term. In addition to the methodology and results presented below, **Appendix D** outlines additional model assumptions.

UrbanSim was used to model the impact of a reduction or elimination of minimum parking requirements over a 15-year period on the location and type of development throughout the region. The implementation was designed in such a way that the assumptions can be adjusted and simulations rerun to analyze the sensitivity of development to changes in parking requirements. Three simulations were modeled, including:

1. A baseline scenario where parking requirements were set to a reasonable approximation of current parking requirements in the region,

2. A reduced requirement scenario where parking minimum requirements were halved within Transit Priority Areas (TPAs) and remain constant outside TPAs, and

3. An eliminated requirement scenario where parking minimum requirements were set to zero within Transit Priority Areas (TPAs) and remained constant outside TPAs.

Methodology

Data

There was an existing UrbanSim implementation in the Bay Area, which was developed for the 2014 Bay Area regional plan – Plan Bay Area – and associated Environmental Impact Report. For the existing implementation, the necessary parcel, building, household, and employment data were already available. Existing model specifications for residential and non-residential prices, as well as household and employment location choice models were also available. As the next Regional Transportation Plan (RTP) for the Bay Area is due in 2017, and UrbanSim is slated be a key component in testing alternative land use scenarios for the new plan, these model configurations are still subject to change for the next policy implementation.

Parking Requirement Assumptions

Parking requirements were defined for either residential, industrial, office, or retail building types. Parking requirements are per unit for residential uses and per 1000 square feet for non-residential uses. Current parking requirement assumptions for the "no project" scenario were specified based on parking requirement data for 51 cities within the Bay Area. Using the data from these 51 cities, the mean upper-minimum parking requirements for each land use type was used to create a reasonable default to represent regional average parking requirements (with the exception of San Francisco, where requirements were set lower). These averages were rounded to the nearest 0.5 spaces. Therefore, region-wide parking requirements were 3.0 spaces per residential unit (for San Francisco 1.0 spaces per residential unit); 4.5 spaces per 1,000 square feet of retail space; and 4.0 spaces per 1,000 square feet of office space.

With these assumptions, parking requirements vary by building type but not by jurisdiction (with the exception of the City of San Francisco, where parking requirements were specific to the City). If data on minimum parking requirements improves in the future, parking requirements can be specific to jurisdictions or even within jurisdictions, as the UrbanSim simulation is entirely parcel-based (with residential unit level representation also available). For now, data collection is insufficient to claim parcel-level understanding of parking requirements throughout the Bay Area. Setting the parking requirements to reasonable defaults means the assumptions can be simply and transparently communicated, and eliminates any bias that might exist to the locations for which we do know the actual parking requirements.

Scenarios

The assumptions specified by building type and density were applied to all proposed developments in the region. The modeling process includes a baseline "no project" simulation for comparison. The second scenario reduced parking requirements by half within TPAs, and for the third scenario parking requirements were reduced to zero. TPAs were used as the basic geography for reduction of parking requirements,.

Summary of Results

The relative amount of growth within areas where minimum parking requirements were reduced in TPAs was calculated in order to interpret the impact of change in minimum parking requirements in the simulations. The results of the scenarios are summarized by a metric representing the percentage of residential and non-residential *growth* in built space inside and outside of TPAs in the next 15 years. In other words, given that population and job growth is assumed to be constant across scenarios, the number of net residential units and net job spaces is roughly constant across scenarios as well. The simple metric of how much of that growth falls within TPAs for each of the three scenarios is a first estimate at the global impact of the reduction in parking on changes on the built environment. These simple summaries are provided below in Table 6.

The baseline model predicts that 73.2 percent of residential growth and 60.0 percent of non-residential growth will occur in TPAs throughout the nine-county San Francisco Bay Area region. When parking requirements are reduced by one-half, the amount of residential growth within the TPAs increases by 3.0 percent; non-residential growth within the TPAs increases by 5.2 percent. Similarly, when requirements are completely eliminated, both residential and non-residential growth within the TPAs increase by 4.8 percent and 6.7 percent, respectively. The reduction in built space due to reducing requirements by one-half has an incrementally larger impact relative to eliminating parking requirements, suggesting there might be a small nonlinear effect on the reduction in parking.

Table 6a: UrbanSim Model Results- Parking Minimum Requirement Scenarios, Residential Growth

	Residential Growth				
	Inside TPA	Outside TPA	Percent Increase in TPA[1]	Units Inside TPA	Units Outside TPA
1: Baseline (No Change)	73.2%	26.8%	--	137,609	50,381
2: Reduced Requirements	75.4%	24.6%	+3.0%	141,744	46,246
3: Eliminated Requirements	76.7%	23.3%	+4.8%	144,188	43,802

Note: increase in TPA is a raw percentage increase relative to Scenario 1 (baseline). Units in/out of TPA calculated using ABAG 2040 Housing Units estimate from Plan Bay Area 2040

Table 6b: UrbanSim Model Results-Parking Minimum Requirement Scenarios, Non-residential Growth

	Non-residential Growth		
	In TPA	Out TPA	Percent Increase in TPA1
1: Baseline (No Change)	60.00%	40.00%	--
2: Reduced Requirements	63.10%	36.90%	5.20%
3: Eliminated Requirements	65.80%	34.20%	6.70%

Limitations

As with most regional simulations, the accuracy of data is the largest potential limitation of the study. It is difficult to collect accurate data for an entire metropolitan region, though this analysis does use the latest and most accurate data available to the regional government and is the same model applied for regional EIR. In addition, as already discussed, the data on parking requirements is only available for about half of the Bay Area jurisdictions and none of this data involves information at a parcel-scale zoning level. As such, the scenarios described in this document are assumption-driven using reasonable assumptions for current conditions and potential reductions in parking requirements. Although the results of the simulations will not be parcel-accurate, the results are applicable to policy-oriented debates currently taking place in the Bay Area.

Additionally, there are a few assumptions that are made in the real estate model that should be acknowledged. For instance, specifications that are developed in actual real estate markets, such as residential unit types (1 bedroom, 2 bedroom, and 3 bedroom) and factors of building design including earthquake zones, high slopes, etc. are not represented. Nonetheless, it is thought that the UrbanSim real estate model is a best practices model of residential development and sufficient for the analysis described in this document.

A major limitation to the analysis with Bay Area UrbanSim stems from the difficulty in simulating user demand for less parking or no parking as well as the value of a parking space for different market segments. For now, an assumption that the amount of parking that will be built is equivalent to the parking requirements is used. It is clear that even in the case of no parking requirements, some amount of parking will be built nevertheless because of market demand. At this time, quality empirical data on how many people will pay for parking and how much they would pay in various situations is not available.

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

- There are many complexities to where development occurs, and a great deal of variation in conditions in the region. It can be very difficult to isolate the impact of parking requirements.
- The particular analyses using the modeling tools UrbanSim is cutting edge research and, as such, has not been done previously. The development of this model and the data input allows us to quickly generalize findings to a large area; however, results are not meant to be interpreted on smaller scales or for detailed assessments.
- Analyzing differences between cities with various parking policies is helpful for a qualitative review of how policies are used by cities. However, there are a variety of factors that influence the characteristics of each city and location, so while this information will be collected, correlations between key indicators and parking demand does not equate to causation.
- Private parking is often hard to capture in data collection due to lots that are not directly visible from the street and only accessible via private property. This could hinder data collection to understand discrepancies between actual parking inventory and the parking requirements.
- Analysis is based on generalized parking requirement information for the region. One challenge with this information—minimum parking requirements—is that the requirements do not always correspond with what is actually built. Therefore, general region-wide requirements were estimated for all jurisdictions within the Bay Area. For example, development may have been built before the requirements; received special permission to build lower amounts; or built in excess of required amounts.

Recommendations

- MTC should continue to develop new modeling tools and methods, working with cutting edge modelers from various parts of the world, and continue to analyze the potential impact of reduced parking minimums in helping achieve regional goals, especially regarding housing affordability and reduced VMT and GHG.

- Local jurisdictions should work with MTC to implement more realistic parking requirements that address individual situations and allow for individual choice, rather than use a one-size fits all approach.
- MTC should work with local agencies, Congestion Mitigation Agencies (CMAs) and developers to incentivize the use of more flexible and reduced parking requirement schemes, to reduce development/housing costs, increase population and housing density and reduce VMT for:
    - TOD based housing
    - Affordable housing; and
    - Mixed used housing and commercial developments

Policy Question 3: Residential Parking Demand

How much demand exists for housing with lower amounts of parking? At what prices and in which areas?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

Building excess parking for residential uses increases the total cost of a development, which is then passed on to the resident. If the resident doesn't use all of the parking, this construction is wasted, when the cost of the housing could have been lower or funds could have been applied to other amenities with more demand. In areas with alternative options for traveling—including public transit, walking, biking and carsharing—an increasing number of households are opting out of vehicle ownership and/or deciding to reduce the number of vehicles they own and increase the use of active modes, sharing and carpooling. However, excess free parking dis-incentivizes these decisions, and increases the cost of housing.

The regional agencies (MTC, ABAG) have goals for adequate levels of housing for low income households. In addition, they have goals to reduce the production of greenhouse gasses. To the extent that there is demand for lower cost housing with less parking, both goals can be addressed. MTC has some resources to put toward the development of low cost housing, such as through the Bay Area Transit-Oriented Affordable Housing Fund (TOAH), but these resources are very limited and would best be focused where there is high demand. 54 percent of Millennials surveyed said they would consider moving to another city if it had more and better options for getting around, and 66 percent said that access to high quality transportation was one of the top three criteria that would weight when deciding where to live.[20] New developments by the private sector with less parking could reduce rental and home purchase costs - if the local jurisdictions will allow it.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, we would like to know how the availability and cost of parking affects a person's housing choice. If parking cost is separated from rent, will that affect the demand for a particular housing development? If parking cost is included in rent, how does that affect demand for the development? Is there any difference in demand based upon geographic location or proximity to transit? One way to get at this information would be survey-based, asking individuals how much they would pay for a parking space if it were not included in their housing costs. This information could be compared to the amount that each parking space increases the cost of the development. Because parking costs would be set by the private market rather than parking requirements, studying unbundled parking could also be used to address this question.

However, because this project aimed to maximize supply and occupancy data across the San Francisco Bay Area, and was subject to budgetary limitations, a survey method was not used. This question was addressed with a combination of background research and data analysis. Household auto ownership rates by location and income level can be analyzed spatially (GIS) to visualize information about demand within the region. Collaboration with TransFORM, a local non-profit currently collecting inventory and occupancy data from multi-family residential buildings, allowed us to analyze parking

[20] https://www.rockefellerfoundation.org/about-us/news-media/access-public-transportation-top/

supply, prices and usage for many residential buildings. Additionally, future driverless cars may reduce demand for some parking, but may also increase some demand for automobile use and contribute to sprawl - the complex variety of factors does not yet allow for a clear vision of this phenomena.

Literature Review

Parking Demand and Demographics

A review of California parking requirements in TOD areas found that residential areas typically require 1-2 parking spaces per dwelling unit.[21] However, parking usage in these areas is typically much lower. Literature that specifically looks at parking demand within particular market segments and locations include:

- A 2010 publication by MTC, "Choosing Where We Live," evaluated the preferences of over 900 households seeking new homes in the Bay Area, using market research techniques to estimate demand for various types of housing. This effort found that approximately one third of the households were quite interested in living in transit oriented development; this group had low auto ownership and high interest in other neighborhood attributes, such as transit, affordable housing, and places to walk. Another third of the households might be interested in transit oriented development if it had the right amenities for them. The report describes the actions that local governments can partake to make their communities more attractive to these market segments. The market demand outstrips the supply for this type of housing/neighborhood, as seen when comparing these preferences to new development patterns and further evidenced by the high prices for living in walkable neighborhoods in San Francisco, as well as in smaller and other lively urban centers. This highlights the potential to revitalize urban areas, reduce greenhouse gasses and reduce traffic congestion by allowing for the construction of this type of housing.

- Research has pointed to recent trends in automobile usage for Millennials that could make significant impacts to parking demand in the near future. The percentage of young people with driver's licenses has been decreasing in recent years. [22] In 2011, the percentage of 16-to-24 year olds was lowest than it had been since 1963 (at 67%). Vehicle-miles traveled per capita have decreased for Americans as a whole since 2004; "Millennials" or "Generation Y" (age 16-34) are driving significantly less, due to shorter overall trips as well as fewer auto trips per person (National Household Travel Survey, 2011). At the same time, alternative transportation use for 16-to-24 year olds has increased. Looking at trends from 2001 to 2009, research by the Frontier Group (2012), finds that biking for this age group increased 24%, walking increased 16%, and public transit increased by 40%. Lower rates of driving and increased rates of alternative transportation use should signify a necessary change to existing parking requirements.

- "Parking Demand and Zoning Requirements for Suburban Multifamily Housing" (Willson and Roberts, 2010) compares three methods of assessing parking demand in suburban residential areas—(1) field counts, (2) household surveys, and (3) vehicle availability from the U.S. Census American Community Survey (ACS). The study finds that ACS method was similar to

21 Sacramento Zoning Code Parking Update. 2009

[22] Benjamin David and Tony Dutzik, Frontier Group (2012). Transportation and the New Generation: Why Young People Are Driving Less and What it means for transportation Policy.

the other two and that minimum parking requirements significantly exceed all three measures of demand. This research supports using a simple method to more accurately assess parking demand needs to set requirements at local levels.

Expert Analysis

A panel of parking experts—including Donald Shoup, Elizabeth Deakin, Todd Litman, and Meea Kang—were interviewed and asked to give their experiences relating to this policy question. Expert panelist Meea Kang spoke specifically about residential parking demand (including reduced requirements and unbundling policies), as presented below. Bullet point summaries are provided below and detailed reviews of all expert panel discussions can be found in **Appendix F**.

Expert Panelist – Meea Kang

- We need to rethink parking standards, add flexibility, and drop the one size fits all approach. Existing codes do not recognize the different modes of transportation available today that were not around when they were first created, however, changing the codes is difficult because the constituents are controlling the dialogue and the NIMBY's do not want new developments

- AB 744, legislation I am working to pass through legislature, would: (1) eliminate minimum parking requirements for 100% affordable housing within a half-mile of transit; (2) For inclusionary housing under SB 1818 with a small percentage of affordability and the remainder market rate housing your parking ratio could go down to 0.5 per bedroom; and (3) for special needs or senior housing that is 100% affordable, regardless of location, parking requirements could be eliminated. The legislation has passed both the Assembly and Senate floors, and is currently awaiting signature by Governor Brown. (Note: a revised version of this bill was subsequently passed and signed into law by the Governor).

Data Analysis – TransForm

TransForm, a non-profit based out of Oakland, California, aims to build movement to transform communities and transportation. TransForm's GreenTRIP Parking Database has collected data from 68 multi-family residential sites (as of March, 2015). Data was collected during the middle of the night (approximately midnight to 5am) in order to understand residential home based parking demand. **Table 7** below give an overview of occupancy findings from the 68 sites.

Table 7: Summary of TransForm Parking Occupancy Data

	Total	Percent of total
Parking Spaces	9387	
Occupied	6494	69%
Unoccupied	2893	31%

Data analysis showed that for every additional required parking space per unit, there are 40 more unused spaces, or 9% more unused parking per residence. Demand stays relatively constant regardless of the size of the complex (a .05% reduction in demand for every 100 additional units). However, because bigger residential buildings provide more overall parking, the number of unused spaces increases significantly for larger buildings. For every increase in 100 residential units, there is a 26-space increase in unused parking spaces. This shows that parking should not be provided on a linear scale; more units means more potential for shared and unbundled parking. The analysis further shows the opportunity for housing with lower amounts of parking to succeed. For example in Evanston, Illinois,ith over 25 different residential parking districts, residents can purchase residential parking permits for their specified area; this serves to keep parking occupancy levels high while allowing for residents to reap the rewards of lower mandated parking requirements, like lower cost housing. [23]

Unbundled Parking

Overall, residences with unbundled parking provided 0.21 fewer spaces per unit, but overall occupancy of parking spaces was 4% less than units that bundled parking costs with rent costs. On average, units with unbundled parking had 0.62 occupied spaces per unit; because unbundled residences provided less parking per unit on average, there was an 68% overall occupancy. Units with parking bundled with rent had 0.76 occupied spaces per unit and 72% overall occupancy. However, only seven (7) of the 69 buildings unbundled parking, so the overall sample size is small.

Table 8: Occupied spaces for Bundled and Unbundled Residential Parking

	Available Spaces per Unit (average)	Occupied Spaces per Unit (average)	Overall Occupancy (average)
Bundled Parking	1.11	0.76	71%
Unbundled Parking	0.90	0.62	68%
Difference	0.21	0.14	4%

Parking Availability

Twenty-nine residential sites provided less than one parking space per housing unit, while 39 sites provided at least one parking space per housing unit. Even the residences with lower parking provided (less than one space per unit) only had a 75% occupancy of facilities. This was higher than residences with at least one parking space per unit provided—which had a 68% occupancy.

Parking Supply and Occupancy by Place Type

Each residential site within the TransForm dataset was characterized by a place type: Urban Neighborhood, Transit Town Center, Regional Center, Mixed-Use Corridor, and City Center. There are varying averages of availability per unit, and the utilization by percent typically decreases with

[23] http://www.cityofevanston.org/parking/residential-parking-permits/

decreasing availability per unit. However, for the transit town center land use (5 sites), the percent of unoccupied spaces is one of the highest, at 35%, despite an average availability per unit of 0.85 spaces. Table 7 below displays the findings.

There is a higher rate of car-free households among younger more urban households with rates as high as 60% in central areas of SF and Oakland/Berkeley.[24] The demand of car free households is primarily for rental housing in urban areas close to BART. Lower income households and seniors also have high rates of car-free lives. [25]

Table 9: Parking Supply and Occupancy by Place Type

	Number of sites	Available spaces per unit (average)	Percent unoccupied Spaces	Average number of unoccupied spaces per unit
Local Neighborhood	8	1.53	32%	62
Transit Neighborhood	6	1.35	31%	120
City Center	12	1.14	29%	118
Mixed-Use Corridor	10	1.13	29%	131
Urban Neighborhood	9	0.91	27%	85
Regional Center	17	0.86	25%	92
Transit Town Center	5	0.85	35%	72
Suburban Center	1	0.51	36%	32

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

While it appears from market research and analysis of building trends that there is more demand for housing with lower levels of parking than is currently available, the limited supply of such housing makes it difficult to fully assess the size of the market. Additionally, attitudes towards vehicle ownership may be changing quickly and are likely to change more in the next several years, as vehicle ownership trends are shifting.

An additional challenge with the analysis for this question is the availability of data on parking requirements, supply, and demand. A high number of TransForm residential sites are affordable housing sites, leading to lower parking requirements as well as a non-representative level of demand.

Recommendations

- MTC should pursue additional work with local jurisdictions and developers to support the planning for and construction of housing with lower levels of parking where there is market demand.
- Although studies examining Millennials and other group's future housing preferences are in their early stages, it is important that Bay Area cities provide flexibility to developers when it comes to parking requirements and not develop strict, one-size fits all approaches.

[24] GreenTRIP Traffic Reduction Strategies, by TransFORM

[25] GreenTRIP Traffic Reduction Strategies, by TransFORM

- MTC should work with local agencies, Congestion Mitigation Agencies (CMAs) and developers to incentivize the use of more flexible and reduced parking requirement schemes, to reduce development/housing costs, increase population and housing density and reduce VMT for:
    - TOD based housing
    - Affordable housing; and
    - Mixed used housing and commercial developments
- MTC should require the adoption of local smart parking policies, including elimination of parking minimums in locations with quality transit (TPAs), for regional funding programs, including OBAG 2/3, RM3, New Starts/Small Starts.

Policy Question 4: Unbundled Parking

What would be the impact of unbundling parking from rents on residential demand in urban areas, and how would it alter demand vis-à-vis less urban areas? What would be the transportation, environmental and financial impacts of a charge placed on parking spaces?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

Like Policy Question 3, the purpose of this question is to evaluate the potential for a policy that would increase the affordability of housing for low-income residents and for those who chose to not own a vehicle or own fewer vehicles compared to the minimum parking requirements. Because unbundled parking separates housing costs from parking costs, it allows residents to choose the number of parking spaces they wish to use and pay accordingly. Additionally, if residents decide to forego car ownership, or reduce their personal vehicle ownership, they can also save money by giving up their parking space. This incentivizes households to live car-free, or give up their first or second vehicle.

This question is intended to provide regional agencies with a sense of the impact of parking on development patterns, as a background for considering any regional parking policies. It is also intended to provide information for local jurisdictions in considering the potential impacts of local parking policies.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, we would like to know where people would choose to live under various situations of parking supply and prices for housing and parking. Additionally, we would like to know how vehicle ownership decisions change when the cost of parking is experienced directly and offered as an option rather than requirement. However, because this information is not easily gained, we will review best practice research and review the findings of unbundling applications as well as lessons learned from the experience of parking experts.

Best Practice Research

Unbundled Parking

Unbundled parking separates parking from housing costs. Typically in the United States, the cost of an apartment or condo unit includes one or more parking spaces, regardless of whether the tenant/owner wants to use them. Unbundling allows residents to choose the number of parking spaces to use and pay for accordingly. If residents decide to forego, give up, or reduce their personal vehicle storage, they can save money by giving up the parking space, allowing them to conserve or prioritize their household budget for other purposes. In recent studies surveying a range of areas, Littman (2006) found that unbundling parking produces impacts similar to parking pricing, reducing automobile ownership by 5-15%. Several options for unbundling parking include:

- Parking spaces are not included in the base rent/purchase cost, and are rented by the tenant/owner separately.
- Landlords/condo associations can provide a discount to renters/owners who do not want to use the standard number of parking spaces.

- Landlords/condo associations can create a secondary market for parking by renting unused spaces out as a separate commodity.

- Unbundling can be used as a municipal code tool that allows developers to reduce the amount of parking they are required to provide.

Policy Application: Carsharing & Unbundled Parking in San Francisco

A 2010 Value Pricing Pilot (VPP) project in San Francisco looked at unbundling parking in residential buildings combined with the policy of including carsharing spaces within the residential parking facilities.[26] The analysis found that this combined policies significantly reduced household vehicle ownership rates; apartments with the presence of carsharing and unbundled parking had an average vehicle ownership rate of 0.76 vehicles/unit compared to apartments without carsharing and unbundled parking that had an average vehicle ownership rate of 1.04 vehicles/unit. 22% of the residents surveyed responded that the presence of carsharing impacted their residential location choice. San Francisco's Planning Code relating to unbundled parking can be found in Section 167: "Parking costs separated from housing costs in new residential buildings."[27]

Policy Application: Unbundling in Multi-family Residential Developments

While San Francisco has taken bold steps with City-wide unbundling policies, several other places have allowed unbundled and parking requirements on a case-by-case basis. For example, approximately 50% of existing multi-family buildings in central Seattle have unbundled parking from rents.[28] Research has shown many successful examples of unbundling, yet the largest challenge includes clearly communicating the policies to buyers and rents. Some additional examples include:

- The Gaia Building in Downtown Berkeley has unbundled parking, separating rents from a monthly parking price of $150/space. When the apartment first opened, the apartment had 237 residents and 91 units, yet demand exists for only 20 spaces despite 42 available spaces (some spaces used for carsharing).[29]

- Arlington County, VA Transit-Oriented Development (TOD) corridor has taken several steps to manage and reduce parking demand. The Market Common development in the City of Clarendon has taken advantage of both reduced minimums through shared parking as well as unbundling parking costs from rents. The unbundled parking is $25/month for the first vehicle per unit, $75/month for the second, and $100/month for the third. Studies of parking use show that even at peak demand, parking facilities are less than 80% occupied.

- Downtown Bellevue, WA (located in the greater Seattle region) has implemented an unbundled parking policy by requiring multi-family residences to charge parking costs separate from rents in addition to establishing maximum parking requirements. The results of these policies have been a drive-alone commute rate decrease of 30% (some studies report higher rates[30]). In addition to multi-family residences, office buildings in downtown are also

[26] Adam Millard-Ball, "Putting on their parking caps", Planning, April 2002, v68 i4 p16; Nelson/Nygaard (2011). Cumulative Impacts of Carsharing and Unbundled parking on Vehicle Ownership and Model Choice
[27] MTC Smart Growth Technical Assistance: Parking Reform Campaign. http://www.mtc.ca.gov/planning/smart_growth/parking/6-12/Parking_Code_Guidance_June_2012.pdf
[28] http://www.duprescott.com/productsservices/articleinfo.cfm?ArticleId=609
[29] GreenTRIP Traffic Reduction Strategies, by TransFORM.
[30] Reducing Congestion and Greenhouse Gas Emissions through Public Parking, summary report of Senate Transportation and Housing hearing at the State Capital, 2/24/2009

required to unbundle parking costs from the costs to lease space. This policy makes it easier for employers to implement cash-out policies and incentivizes shared parking policies.

- Dudley Village in Dorchester, MA: In Massachusetts, the 2006 TOD Bond Program gave $2 million for Dudley Village (a mixed-use affordable housing development) in Dorchester, MA. The development has unbundled parking with only 0.7 parking spaces per unit.[31]
- In a St. Louis TOD condo project, close to a MetroLink transit stop, tenants were given the option to purchase a parking space for $18,000. Because of this option, developers are able to sell the "Ballpark Lofts" at relatively low costs compared to other units in the area for those who opt out of car-ownership. Given this choice, almost a quarter of the condo buyers decided against the purchase of a parking space. [32]

Policy Application: Foregoing Residential Parking Permits

Facing extreme crowding of city streets with cars from local residents, and a robust transit system heavily used to commute to jobs in New York City, the City of Hoboken, New Jersey developed a program to encourage residents to forego their residential parking permits (called "Surrender Your Permit"). Residents giving up their residential permits are provided a combination of discounted carshare usage, bicycle amenity discounts and a local bicycle map, temporary parking placards, discounted gym membership, and a discount on athletic apparel. Key to the program success has been the Corner Car program, which provides free carshare membership and is available within a 5 minute walk to more than 90 percent of city residents. Participation is on an annual basis, allowing for changes as needs change.[33] Although the inception of the program is recent, the City of Hoboken reached its first milestone of 21 residents-half the number of reserved spaces for their Corner Car program-giving up their car and surrendering their parking permit.[34]

Expert Analysis

A panel of parking experts—including Donald Shoup, Elizabeth Deakin, Todd Litman, and Meea Kang—were interviewed and asked to give their experiences relating to this policy question. Expert panelist Todd Litman spoke specifically about unbundled parking, presented below. A detailed review of all expert panel discussions can be found in **Appendix F**.

This panel discussed how efficient pricing of parking is the "second best" way to achieve congestion reduction compared with charging efficiently for roads, but may be more feasible. A city by definition is an area within a limited space and optimal density for vehicles is just as important to consider as the optimal density of people. The panel agreed that we need to redefine the problem by explaining how the average person is going to be better off with efficient parking management; we need to educate people to the fact that no parking is ever free – we pay for it either directly or indirectly (largely through our time searching for parking and through excess VMT and GHG); we also need to communicate the fact that underpriced parking is as economically inefficient and unfair as overpriced parking.

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[31] MAPC Smart Growth

[32] From mapc.org: Steve Patterson, "Downtown Still Going Strong; Neighborhoods and Inner Suburbs Need Leadership", Urban Review STL, November 20, 2006; http://www.urbanreviewstl.com/?p=2849. View PDF of the story by clicking here.

[33] http://www.hobokennj.org/departments/transportation-parking/surrenderyourpermit/

[34] http://www.hobokennj.org/2010/10/surrender-your-permit-program-results-in-fewer-cars-on-hoboken-streets/

Expert Panelist – Todd Litman

The most fundamental principle of good planning is that individual short-term decisions should be consistent with and support long-term strategic goals. Our goals include climate change emissions reduction, but also reduction in congestion and traffic incidents and social inequity. The challenge we have is about communication. Most people have never purchased a parking space as a separate item. Parking is included with the house we buy, included in the taxes we pay, included with our employment, included in the price of the item we buy from a store. Most people do not understand the true cost of a parking space. Most structured parking spaces cost more than the vehicle that occupies them and that is the message we need to communicate. We can communicate this easily by explaining that it is more rational to give away cars and charge the true cost of the parking space, than to charge for the car and give away the parking spaces. We need to turn this information into a positive statement – by charging directly for parking rather than having the cost of parking borne indirectly we are offering consumers a new way to save money that currently does not exist. The best example is unbundling parking. Are you better off paying $1,000/month for an apartment with a parking space or $900/month for an apartment and $100/month for a parking space that you actually use? Which makes people better off? The unbundled parking with the option to choose does, because it provides the consumer with choice. These are new opportunities to save money – unbundled parking or parking cash-out programs.

When it comes to supply parking, unbundling will let us use basic economic/market theory – where parking demand is defined at relative to the cost of providing that parking space. If consumers are willing to pay the real cost of that parking space, then they should get it. However, it does turn out that actual demand goes down 20% or more when you actually price the space at its true cost.

Todd Litman, from the Victoria Transport Policy Institute, suggested applying these strategies to residential parking. One detail that often gets over-looked is that our residential zoning codes require off-street parking spaces. Often when we build an off-street parking space, we install a driveway and the driveway displaces one on-street parking space. This primary mechanism we use to provide parking spaces gives you almost zero net increase in parking supply for single –family housing in urban areas. It actually reduces our parking supply because the on-street space can be shared by others on the street. Almost everyone would be better off if instead of zoning codes requiring generous off-street parking, we simply managed the on-street parking more efficiently in residential areas.

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

While unbundling parking has been considered a best practice for several years now, City-wide applications are limited. Unbundling typically is implemented during the planning of a new residential development, therefore, before and after data collection is not possible and projects must rely on comparable project data, if available.

It is important to consider the interactions between policies. If developments are required to build parking in a building and to unbundle, the result may be unused parking in the building. Where parking is unbundled it is important to allow the construction of fewer parking spaces, since pricing will dampen demand, and/or to provide for alternative markets for the parking, i.e., rental to non-resident interests (e.g., commuters).

There is a lot of future potential to simulate the effects of unbundled parking with the regional land use and transportation model, UrbanSim. However, the capabilities of the UrbanSim model are still being tested as the development of the program progresses. Currently, the data availability in UrbanSim is not robust enough to model this question accurately.

Recommendations

- MTC should further consider approaches to supporting additional unbundling of parking costs from housing costs, including support for local zoning changes through technical assistance grants toward this purpose.

- MTC should develop a threshold/nexus for unbundled parking projects (for grant purposes) and establish a log of projects implementing the service to track and monitor long-term impacts.

Policy Question 5: Parking Structures

Could some planned or proposed parking structures be downsized through pricing and provision of other modes, without negative impacts on transit ridership/revenues and downtown retail?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

This question will provide MTC, transit agencies, and cities with information that would allow for better investment of funds through more cost conscious and appropriate sizing of parking structures; it will also give support for cost effective investments into alternative modes. Altogether, this question is intended to explore policies that will better utilize limited transportation funds, make better use of existing parking supplies, and encourage alternative travel modes in order to reduce the oversupply of underpriced parking spaces.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

This question is being addressed through a review of existing papers and an analysis of policy applications and related studies and supplemented with regional Travel Model One analysis. [35] In the abstract, this question would be answered by analyzing each case individually, assessing the need, cost, transit service and other alternative mode access to each site where parking structures are planned or proposed.

Background & Research

Best Practice: Pricing Parking near Transit Stations

In theory, pricing of parking at transit stations where the parking is regularly full to capacity could lead to increased transit ridership, through a couple processes. First, priced parking results in some local residents who otherwise drive to choose to walk, bicycle or take transit to a close station. Second, some riders from farther away will carpool to minimize their parking expense. In both cases this frees up the station parking for others who drive and park, some of whom were not taking transit previously due to the lack of parking availability. However, there has been only limited research to determine the size of this effect. This could be analyzed in a particular location using performance based parking to price at a level that achieves the target usage (e.g., 85% occupancy), so that it is neither under nor overpriced.

Replacing Parking with TOD

Several studies have looked at mode share in housing adjacent to transit stations. Lund, Cervero, and Willson (2004) find that residents living near transit stations are approximately five times more likely to travel to work via transit relative to an average resident in that city. However, this amount varies greatly by city and region. This study (Lund, Cervero, and Willson, 2004) found that about 19% of trips by residents near Pleasant Hill BART were by transit and 27% of trips by residents (N=176) near Alameda County BART stations were by transit (N=177).

[35] Recommendations within the MTC's Parking Structure Technical Report (Nelson\Nygaard and Dyett and Bhatia, 2011) provides further guidelines for a parking structure analysis toolkit, as detailed on page 5-10.

The Effects of TOD on Housing, Parking and Travel (TCRP Report 128, Arrington & Cervero, 2008) states that TOD residents are two to five times as likely to use transit modes. The authors found that the primary reason for this higher percentages in self-selection, whereby residents chose to live nearby transit due to their preferred access mode.

Fehr & Peers (2006) conducted a study of average household BART mode share and distance from station and found that residents within ½ mile from BART stations average a 16.4% BART mode share.[36] A study by Cervero (1993) found that residents adjacent to BART stations averaged 26.8% rail mode split (sites within 2/3 mile of BART station).[37]

Table 10: Summary of Mode Share by Station-area Residents

Study	Year	Summary
Lund, Cervero, and Willson	2004	Station-area residents are 5 times more likely to take transit (1) Pleasant Hill BART station residents surveyed have a 19.2% mode share. (2) South Alameda County BART station residents surveyed have a 27.4% mode share.
Arrington & Cervero	2008	TOD residents are two to five times more likely to use transit modes
Fehr & Peers	2006	Residents within ½ mile from BART stations average a 16.4% BART mode share.
Cervero	1993	Residents adjacent to BART stations averaged 26.8% rail mode split.

BART TOD and Replacement Parking Policies: In 2005, BART developed a modeling tool to evaluate replacement parking when new development impacts existing parking facilities around BART Stations. BART previously had a one-to-one parking replacement requirement, but came to realize that this policy was discouraging transit-oriented development around stations. This model looks at each scenario specifically, evaluating current conditions as well as future scenarios and visions for growth. Shared parking, pricing, or other supply and demand management policies are evaluated and incorporated into the planning process to determine how a replacement parking strategy should progress. However, the model does not consider regional-scale effects and instead takes a local approach by not incorporating system-wide parking supply and demand. In addition, BART now uses a corridor approach which identifies different roles for different stations along a line, identifying certain stations as key TOD opportunity sites and shifting parking demand to other stations.

Replacement Parking at VTA Light Rail Stations: Santa Clara Valley Transit Authority (VTA) evaluated how much parking should be replaced to accommodate proposed TOD development at 13 light rail stations in San Jose. This evaluation included various policy strategies to reduce parking demand, encouraging diverse station areas that are not automobile-oriented. After determining that overall in the system there is significant unused parking, and which stations do not have enough parking capacity to accommodate estimated future use at these free lots, VTA determined alternative methods to accommodate the projected demand. Rather than constructing additional parking facilities (a very high-cost option), VTA decided to (1) reduce parking demand by improving alternative-mode access and implementing Travel Demand Management (TDM) policies, and (2) implement shared parking with adjacent land uses that have unused parking during commute hours. In addition to balancing supply and demand, these policies aligned with the agency's TOD program goals.

[36] For home-based work and home-based other trips. Source: Parking vs. TOD: A Transit Provider's Perspective. Fehr & Peers (2006).

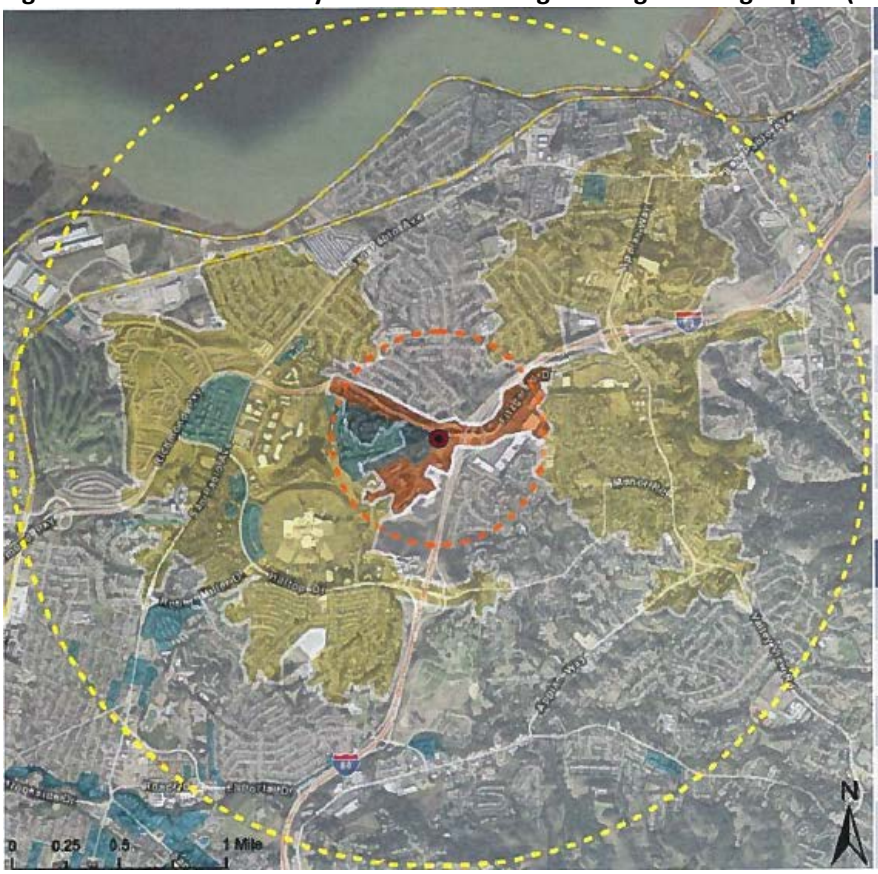
[37] Cervero (1993). Ridership Impacts of Transit-Focused Development in California

Best Practice: Parking Structure Analysis

MTC's Parking Structure Technical Report (Nelson\Nygaard and Dyett and Bhatia, 2011) http://www.mtc.ca.gov/planning/smart_growth/parking/6-12/MTC_Parking_Structure.pdf describes the opportunities and challenges that are related to parking structures. While parking structures can benefit a community in several ways, challenges with parking structures include (1) not enough demand to support the need for a structure, (2) high monetary, environmental, and opportunity costs, and (3) impacts to the community with design, circulation, and safety concerns. The purpose of this report is to provide guidance on fully evaluating the need for parking structures—a multimillion dollar investment—before the investment is made. This report provides a 6-step evaluation framework, and highlights three case studies where parking has been successfully reevaluated.

"Right Sizing" Parking (MTC): A 2012 report addresses characteristics of proposed new parking structures serving transit in the Bay Area. This study looks in depth at 19 parking structures that are planned or in progress and describes the net cost per new parking space, amount and source of funding, the purpose, and the potential for reduced parking. It applies network analyst to highlight the difference between theoretical and actual access for nearby populations within 10 minutes by bicycling and walking, suggesting the potential for specific infrastructure improvements to capture more riders through these modes. Opportunities for reduced parking, such as shared parking or nearby available parking supply are also identified. For example, the study identifies an opportunity for the Richmond Parkway Transit Center to reduce parking and increase bicycle/pedestrian access as a demand management strategy (**Figure 4**).

Figure 4: Station-area Analysis from MTC's "Right Sizing" Parking Report (2012).



Project Size:	
Current Spaces	207
Spaces To Be Built	710
Removed Spaces	207
Net New Spaces	503
Project Cost (for parking):	
Total	$17.5 M
$/Space	$24,713
$/Net Space	$34,883
Cost/Trip (Month)	$122
Cost/Trip (Day)	$5.64
Population Within:	
½ Mile Walk	1,354
½ Mile Radius	4,772
2 Mile Bike	23,394
2 Mile Radius	61,182
Housing Density	> 10 DU/Acre

Petaluma Station Area Plan Parking Policies: In 2012, Petaluma conducted station area plans for two SMART rail stations within the City that are slated for TOD developments for horizon year 2035. The evaluation showed that additional parking would be unnecessary, as current supplies were greater than the projected parking demand. The study resulted in several key findings, including:

- Opportunities to manage park-and-ride demand and increase transit-oriented development will potentially allow the initial parking supply to be replaced with new development and shared parking.
- Parking structures would be a significant cost-factor as well as a potential barrier against maximizing the value of the land.
- Rail and transit served locations will have lower parking requirements than conventional suburban parking ratios, provided that a parking management plan is in place.
- Shared parking, flexible use of supply, Transportation Demand Management plans, pricing, and Parking Benefit Districts were all recommended to manage the supply and demand of SMART Station Areas. http://cityofpetaluma.net/cmgr/pdf/final.parking.memo.pdf

Best Practice: Economic Assessment of Parking at Transit Stations

When the cost and ridership impacts of parking is compared to TOD development around suburban BART stations, a study funded by MTC (Wilbur Smith Associates, 2011) found that ridership generated by BART parking could be achieved with housing around stations instead of parking, and would generate more revenues for BART.[38] Even near suburban stations (assuming that 25-35% of total trips are via BART for households around stations), higher density housing can be competitive with parking lots in terms of generating riders. Additionally, analysis of parking costs and pricing showed that station parking lots are significantly underpriced, given the value of the station-area land as well as the cost of constructing the parking. Parking fees would need to be increased two to four times their current levels at BART lots and structures in order for BART to break even.

Best Practice: VTPI's Parking Costs, Pricing and Revenue Calculator

The Victoria Transport Policy Institute (www.vtpi.org) has created a spreadsheet tool to calculate the estimated costs for parking facilities, recovery pricing, and revenue generation. This tool is useful for estimating how much a new parking facility would cost to construct and operate; estimating the prices that a facility would need to charge to recover construction and operating costs; and estimating revenues and profits that are generated from charging various prices. This calculator is valuable in its inclusion of different land use types (suburban, urban, and central business district) and its ability to input more context-specific values—such as the cost of land and interest rates—if necessary. However, it is a cost-revenue analysis and does not include any user choice, supply, or demand information.[39]

[38] Wilbur Smiths Associates report for MTC Smart Parking Training, 2011. Parking 201: Economic Assessment of Structured Parking at Transit Stations.

39 Litman, Todd (2013). Transportation Cost and Benefit Analysis II – Parking Costs. Documentation available at: http://www.vtpi.org/tca/tca0504.pdf

Policy Application: Union City Park & Ride Pricing and Downsizing

In 2007, the City of Union City began Phase I of the Intermodal Station project, improving multi-modal station access as part of an effort to adapt the area for future TOD. This effort included improving bicycle, pedestrian, and transit facilities around the BART station and parking lot. Due to a high demand for parking, this effort was conducted to manage demand and avoid the expense of constructing a new parking facility. To encourage TOD development instead of increasing parking supply, the City began implementing paid parking in April 2010 by installing pay-stations throughout their on-street and off-street parking. They have priced their off-street city-owned lots adjacent to the BART station at $3/day or $0.50 per hour.

Before pricing implementation, BART station commuters were parking on-street all day and the lots were full; Union City's pricing strategy was successful in both reducing spillover into on-street spaces and also reducing overall parking demand. Analysis of ridership was conducted after parking pricing was implemented with pay-stations; the number of BART commuters did not decrease after the 2009 introduction, yet use of the parking lot decreased, suggesting that users switched to other modes. Now the City experiences approximately $450,000 in net revenues from parking per year. Additionally, the City experienced "almost no public outcry" after implementing the paid parking program.[40]

Best Practice: Shared Parking

Shared parking—where a single parking lot is used by multiple businesses or organizations—allows off-street resources to be used more efficiently. Often, shared parking can be used as a tool to reduce the number of total parking spaces used; MTC's "Right Sizing Parking" (2012), identifies many opportunities for planned or proposed parking structures in the Bay Area to be reduced by implementing shared parking. Shared parking makes use of the fact that nearby businesses often have different peak-periods throughout the day—such as a restaurant and a doctor's office—and also makes use of the fact that many parking facilities have a large portion of unused space during the off-peak periods. Shared parking often reduces the total amount of parking an area uses by 40-60%, reducing the land devoted to parking and therefore potentially improving pedestrian connections between businesses.

Shared parking between different sites can be negotiated by contractual agreements between nearby businesses that have different peak demand times. They can also be organized by parking management districts or BIDs. With both methods, businesses can overlap their parking capacity during these times and reduce the number of spaces that the combined business would otherwise require. Local municipalities can help facilitate shared agreements with private businesses with off-street parking with agreements and legal documentation that may be needed to allow access to other private entities. As a modest approach, local jurisdictions can modify their parking requirements to allow shared parking to count toward satisfaction of the city parking requirements.

Best Practice: Valet & Off-Site Parking

Rather than constructing parking on high-value land within mixed-use and commercial areas, lower-value adjacent parking may be available for valet parking. This is especially valuable in avoiding the construction of new facilities where there is underutilized parking supply nearby. Valet parking can be used to reduce the amount of space devoted to parking in pedestrian-friendly retail corridors and also reduce vehicle congestion from cars circling to find parking. This can also expand the supply of parking that is convenient in the most popular commercial areas during the peak period. In many

[40] Personal Communication, Mark Evanoff, City of Union City, October 2013.

areas, parking is built to accommodate the peak period(s) of the week or year, but is not used for the remainder of the time. In these cases, utilizing off-site lots in areas with different levels of demand for the time of day or week will help provide parking, at a much lower cost than building and maintaining new facilities. For example, parking structures that are primarily used for employees during regular business hours are often severely underutilized during other times of the day and week, and can serve as capacity for entertainment uses that have high demand during the evening period. Private businesses or commercial parking lots can also include valet parking attendants to park vehicles during especially busy periods. Litman (2006) estimates that valet parking can increase parking capacity by 20-40% compared with users parking their own vehicles.

An alternative to valet parking is providing shuttle service for parkers to ride in on from a satellite (off-site) parking lot. Like valet parking services, off-street capacity can help reduce traffic in pedestrian retail centers. Like valet services, a shuttle service could be used to supplement parking supplies only during the times of peak demand. If shuttle service was from a shared parking lot with a complementary demand period to create the commuter lot, it would eliminate the need to expand overall parking supply.

Policy Application: Valet Parking in Redwood City

To accommodate high demand at discrete time periods, Redwood City initiated a valet parking program to take advantage of underutilized parking supplies that were located outside of the highly-demanded downtown area.[41] Parking supply was adequate to serve patrons during most of the week, but was constrained during the peak period. If a new parking structure was constructed, it would have been underutilized for most time periods, and likely would have required substantial on-going subsidies. So instead of constructing new supplies within the downtown, Valet parkers make use of the underutilized parking supplies that were only a quick drive outside of the downtown area, without the inconvenient of parking farther away for patrons. The Redwood City Pilot Valet Parking Program was an effort spearheaded by a local theater owner, in response to overwhelming parking demand in the downtown area during weekend evenings.

In order to get the service started, the business owner worked with City of Redwood City, fellow businesses, and the Downtown Business Association. The program started with a Pilot Valet Program, working with businesses to establish drop off zones and off-site parking lot locations. Since then it has become a successful parking service boasting more than 20 participating businesses.[42] While the valet program was open to all Downtown patrons, the patrons of member businesses received $5 discount validation for the program. This approach encouraged greater participation from downtown businesses.

Best Practice: Using Taxes to Affect Private Parking Usage

As implemented successfully by the City of Union City, pricing can be a strong tool to manage parking usage and reduce the construction of new parking structures. However, existing stocks of private parking are more difficult to manage directly by public agencies. New parking is possible to regulate with zoning and parking maximums. However, there are many ways off-street private parking lots can be managed. Local governments can control off-street garage prices with increased taxes, which are typically passed on to the garage user in the form of increased parking rates. San Francisco taxes all off-street parking spaces at a rate of 25% of the total parking charges. These taxes are common

[41] The initial valet pilot began in a private leased lot (County History Museum) and expanded to the public Marshall garage.

[42] http://www.redwoodcity.org/valetParking.html

throughout the U.S.; the Baltimore Parking Authority, for example, collects a higher tax for parking facility transactions in order to increase the user's cost equivalent to $14 per month.[43] The highest parking tax in the country is in Pittsburgh, PA, at 40% of the total parking charges.[44]

Travel Model One Analysis

Modeling Overview

While Policy Question #5 is not fully addressed via modeling methods, this question is partially addressed through MTC's regional travel demand model, Travel Model One (TMO). The analysis of model scenarios specifically focuses on how pricing fees at Bay Area Rapid Transit (BART) parking facilities can affect the demand for parking and transit mode share. Additional factors analyzed include vehicle ownership, trip costs, and BART ridership. Some restrictions on the modeling include:

- Vehicle-access to stations does not distinguish between single-occupancy vehicles, carpools/rideshares, and kiss-and-ride (passengers getting dropping off at stations).
- Impact on retail and other land uses is not included in the model.
- Parking within model is limited to a Yes/No analysis; the number of parking spaces at each station is not defined.
- Government-set on-street parking prices and market-driven private off-street lot prices are not distinguished.

Several steps were taken to set up the model and establish the scenarios to be analyzed. First, in order to focus the analysis, a few select stations were chosen. Nine BART stations chosen for the TMO analysis were evaluated based on a qualitative analysis of the UrbanSim regional model's results was conducted to select a set of stations where it would be feasible to develop TOD in place of parking facilities.[45] While all stations were evaluated in terms of impact, the stations where daily fee changes were being implemented include: Ashby, Bay Fair, Coliseum/Oakland Airport, El Cerrito Plaza, Glen Park, Lafayette, Lake Merritt, North Berkeley, Orinda, San Leandro, and West Oakland.[46]

The parking costs per station were added to TMO to create a baseline comparison that includes current parking costs. The cost of parking and users willingness-to-pay was evaluated to establish scenarios based on additional parking fee amounts. Last, the MacArthur BART station development was used as a model to estimate additional housing development if the land currently used for parking were instead used for housing. The residential TOD estimates assume the same density of housing as the MacArthur Transit Village Parcel D in Oakland, CA. This development of 5-stories, consisting of 90 units of affordable family housing on 0.78 acres including 2 studios, 22 one-bedroom, 29 two-bedroom, and 37 three-bedroom units (density of 115 du/acre).

Altogether, the analysis of these factors led to the development of four scenarios to evaluate.

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[43] http://www.dot.wisconsin.gov/localgov/docs/smart-growth-parking.pdf

[44] http://www.spur.org/publications/article/2008-09-01/more-work-less-waste

[45] UrbanSim. The results analyzed assumes that the region largely evolves along the line envisioned by the Metropolitan Transportation Commission's (MTC) Preferred Plan. The Preferred Plan referred to the Jobs-Housing Connection Strategy of Plan Bay Area. BART station parking lot acreage is estimated based on count of parking spaces (BART, 2013), assuming 125 spaces/acre

[46] In order to focus on a select few stations, this analysis was limited to East Bay BART stations.

Travel Model One Scenarios & Results

Three scenarios were modeled and compared for this analysis: (1) baseline scenario with "no change" conditions and current parking maintained, (2) a no-parking scenario with all drive access removed at stations, and (3) a housing scenario with housing built at each station and current parking maintained. The amount of housing built is assumed to equal the approximate acreage of current BART parking facilities. Scenario 4 was created by combing a no-parking scenario with a housing scenario—therefore, all parking is removed, but housing is added. These scenarios are built in order to estimate the effect of replacing parking with housing.

Table 11: Travel Model One Scenarios and Results

	Scenario 1: Baseline (no change)	Scenario 2: Removing drive access	Scenario 3: Adding housing at each station	Scenario 4: Replacing parking with housing
Ridership	325,710	314,695	331,415	320,400
Change from baseline	+0	-11,015	+5,705	-5,310

Travel Model One Summary & Discussion

Transit-oriented development (TOD) expanded past just the BART station facility parking as well as generating additional commercial and office land uses is likely to generate more demand relative to parking. The Travel Model One results show that adding housing and maintaining the amount of parking provides more ridership. The analysis found that comparable ridership could be maintained or expanded without maintaining or expanding parking facilities, but instead by developing adjacent land next to parking lots, also helping increase office and commercial use.

Additional benefits of more station access trips being generated by non-drive modes would also be provided. Without the option to drive, a portion of patrons who previous accessed the station by single-occupancy vehicle would likely take alternative modes.

An additional factor when considering TOD replacement of commuter parking lots at BART stations is BART capacity. TOD development generates more off-peak ridership, shifting demand towards other periods of the day and week.[47] As BART ridership demand continues to increase while capacity is constrained in the near-term, this could help manage demand as well as increase development of more commuter transportation options, such as transbay bus systems, carpooling, and Bus Rapid Transit. The development of high density job centers along BART with reduced parking requirements will provide an increase in reverse commute figures, to help ease the overcrowding already occurring during peak-travel times.[48]

Cities and transit agencies should consider the benefits of providing TOD development in the place of parking near BART stations. The ridership generated from housing alone replacing the parking lot space is shown to already be half the total ridership gained from the parking facilities. If development demand is higher, providing TOD land uses will (1) encourage development in transit-accessible areas, and (2) generate further demand for more development surrounding stations. There is significant variation depending on the specifics of the location, so that good estimates of the likely ridership

[47] http://reconnectingamerica.org/assets/Uploads/UCTC-765.pdf
[48] http://www.spur.org/publications/article/2010-01-01/thriving-tod

impact of various alternatives of housing or mixed use development and parking requires analysis of individual locations.

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

It is difficult to apply the same analysis to all parking structures and all areas due to varying land use contexts. Additional work is needed on developing an approach or methodology for evaluating the level of parking and the pricing policies that are effective for different types of land uses in each of the place types. The challenge is to create theoretically robust and operationally effective analytical and policy tools that can be applied to add value in different situations.

The challenges with analyzing the effects of removing parking, pricing parking, building a structure and/or adding TOD is very difficult to do in any model. Many factors are very difficult to predict given limited data and forecasting of the model:

- If parking were removed, would some demand be accommodated with private commuter lots or nearby on-street parking?
- To what extent would TOD development spur a vibrant transit neighborhood, improving businesses revenues as well as increasing development for restaurants, retail, and other commercial uses?
- How many residents who previous drove to the station would switch to alternative modes to access the station?
- How would additional amenities and services, such as increased bus access and improved bicycle access, as well as decreased convenience of driving to the station increase non-automobile access?

Question such as these are context-specific, dependent on many factors and would vary from station-to-station. Previous research highlighted below can help us predict changes, and the travel demand model can be used to suggest high-level shifts, but these questions are based on factors such as demographics, land use, timing, as well as planning and implementation. Local analysis would be required to establish an efficient level of parking and appropriate policies (e.g. pricing).

Recommendations

- MTC should require a robust analysis of proposed parking structures that includes parking demand and multi-modal access to the service area as well as financial proforma of the proposed facility prior to MTC commitment of regional funds.

- MTC should work with local agencies to develop an approach or methodology for evaluating the level of parking and the pricing policies that are effective for different types of land uses in each of the place types.

- MTC should support a “Use What We Have” strategy that encourages local jurisdictions to be creative with how they handle parking issues and to erect a new parking structure facility only after all other parking management strategies have been tried and exhausted. Innovative parking strategies like those discussed in this section can provide the necessary facilities a city may require without the capital funding associated with need of a new parking structure.

Policy Question 6: Parking Cash-out

What would be the impact on employment location and types, and on employees' income, of a regional parking cash-out program?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

Employee based pricing or incentive programs create a choice between a free parking space and cash, incentivizing employees not to park at work, and instead use alternative modes such as carpool, transit, walk, or bicycle. Beneficial impacts of these programs have been seen, yet implementation has been limited and employers appear to be resistant to change without incentive. This question can provide information to MTC and other regional agencies, as well as local governments and employers, on the efficacy and impacts of a regional parking cash-out program. In addition, the State of California could be interested in relation to the State Parking Cash-out law.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, this question would be studied by taking before and after data of a range of parking cash-out programs, then simulating regional results through the regional land use and travel models. Because no cases of parking cash out implementation are available to study in the Bay Area, this question is addressed primarily through review of parking cash-out programs in other locations, results of programs bearing similarities to parking cash-out, relevant existing papers, new case studies, and expert analysis. In the future, the analysis could be used for modeling changes in incomes based on commuter mode choice.

Given the limited implementation of parking cash-out programs, similar programs such as commuter benefit programs and other trip reduction strategies are also reviewed for useful indications of the potential effectiveness of parking cash out programs.

Background & Research

Literature Review: Parking Cash-out

Each parking space that an employer provides has a cost (typically born by the employer), yet whether an employee parks at work or not, each employee is affected similarly by this cost. This cost is often indirect for employers and they are unaware of it as it is bundled into rent. This cost for employers is usually an indirect cost for employees, yet even the employees who aren't parking at work are paying equally for this space. Employee based pricing or incentive programs create a choice between the free parking space and cash value that incentivizes employees to carpool, take transit, walk, or bicycle to work.

A 1990 study compared employees before and after free parking was eliminated. In five locations analyzed, drive-alone mode share fell by 41% when employees had to pay to park.[49] Additionally, a survey of Bay Area commuters conducted in 2000 found that 77% of commuters with free parking drove alone, while only 39% of those who had to pay drove alone. It is not easy to determine the

[49] Willson and Shoup (1990). Parking Subsidies and Travel Choices: Assessing the Evidence. UCTC No. 34

extent to which this effect is directly due to the cost of parking, and how much is due to other correlating factors, notably superior transit service in areas with paid parking.

Willson (1991) used a multinomial logit model to estimate how employees will commute differently in response to being charged for parking. Willson's model estimates that 25-34% fewer vehicles would be driven to work when employees are charged for parking, rather than receiving free parking. Fewer vehicles driven to work would also encourage a cultural shift towards public transit and alternative modes of transportation. With such a cultural shift, total demand may decrease for parking for non-commuting trips as well.

Policy Application: California's Parking Cash-out Law

Enacted in 1992, California's Parking Cash-out Law (AB 2109, Katz)[50] requires employers with more than 50 employees (and certain additional qualifying characteristics) to offer a parking cash-out program.[51] An analysis of eight employers who complied with the law resulted in a 17% decrease in single-occupancy drivers after the cash-out program (Shoup, 1997). Additionally, these eight employers saw an average carpooling increase of 64%, transit ridership increase of 50%, and walk/bike mode share increase of 33%. While large impacts were seen from the few employers who do participate, the California legislation did not make a sizable impact statewide as the state has not taken steps to enforce the law, leaving it instead to the local municipalities (Sorensen et al., 2008). Additionally, many employers find exemptions due to the specific criteria for those required to participate. For example, parking owned rather than leased by employers is exempt from the law. Hill and Long (2002) estimate that only 3% of all employers are required to participate.[52]

A study by the CA Center for Sustainable Communities (2013) assesses the potential impact if 25%-50% of employers with 50 or more employees were to participate in the parking cash-out program. [53] The study's analysis estimates a 2.7-7.8% reduction in automobile commutes (which average 13.2 miles per day and consist of about 23% of all driving in California).

Policy Application: Santa Monica's Parking Cash-Out Policies

While significant impacts were seen from the few employers who do participate in California's Parking Cash-out Law, the legislation has not made a sizable impact as the state has not taken steps to enforce the law.[54] Since 1996, the City of Santa Monica has taken steps to enforce the state's parking cash-out law, requiring employees to comply as part of their Emissions Reduction Plan. One-third of all employers with at least 100 employees were participating as of the City's 1998 survey. This survey found that of all participants, 20% of employees chose to rideshare to work and take the parking cash-out.[55] This increased effort to enforce the state parking cash-out law could be applied on a wider scale, increasing the effectiveness and reach of the program throughout the entire region.

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50 CA.gov (2011). California's Parking Cash-Out Law. Available at http://www.arb.ca.gov/planning/tsaq/cashout/cashout.htm

[51] Employers also have to be in an air basin where the area does not meet certain standards.

[52] Legislative Analyst Office, Elizabeth Hill and Rebecca Long (2002). A Commuter's Dilemma: Extra Cash or Free Parking? http://www.lao.ca.gov/2002/parking/031802_cash_or_parking.pdf

[53] Juan M. Matute, Ha H. Chung, and Stephanie S. Pincetl. (2013) Parking Cash-out programs at Employment Sites. California Center for Sustainable Communities at UCLA.

[54] Sorensen et al., 2008

[55] Legislative Analyst Office, Elizabeth Hill and Rebecca Long (2002). A Commuter's Dilemma: Extra Cash or Free Parking? http://www.lao.ca.gov/2002/parking/031802_cash_or_parking.pdf

Policy Application: Washington's Commute Trip Reduction Law

Similar to the Bay Area Commuter Benefits Program detailed in Policy Question 7, in 1991 the State of Washington passed the Commute Trip Reduction law in 1991, requiring large companies to take steps to reduce automobile trips by employees. Washington's Commute Trip Reduction (CTR) Law focuses on reducing drive-alone mode share by requiring larger employees to participate in programs that encourage employees to take alternative modes. Washington's law requires employees to create and manage their own programs, based on guidelines by local jurisdictions. With 1,050 worksites and 530,000 employees currently participating, the program has been successful in (1) saving fuel and time costs by reducing traffic delays during rush-hour (2) reducing total driving by a total of 154 million miles from 2007-2013, and (3) preventing 69,000 metric tons of GHG emissions.[56]

In response, SAFECO Insurance Company offered transit passes and ridesharing incentives to all employees in order to reduce demand for parking. With flexible parking requirements, city officials allowed the company to increase development density and reduce the number of required parking spaces in SAFECO's new building in Redmond, WA. Since the program's start in 1997, SAFECO has kept drive-alone trips below 60%, while the county's average rate is 81%. In addition to the environmental benefits of fewer vehicle emissions and reduced runoff from less paved area, the company saves an estimated $491,000 per year from parking construction and maintenance costs.[57]

Policy Application: Boulder Colorado Transit Passes

An alternative to offering employees cash as a substitute for their parking space is offering a transit pass. Boulder, Colorado offers free transit passes (the EcoPass) to full-time employees located within BID boundaries. These free employee Eco Passes are funded by parking fees in the downtown. The City of Boulder was looking to increase their transit ridership as the core benefit, rather than make more parking available for customers.[58] However, this is another benefit to areas with constrained on-street parking resources.

In analyzing the feasibility of a free employee transit pass program, Boulder acknowledged that the cost of bus fare can be a significant barrier to using transit for car owners. However, the cost of commuting by vehicle is still high and can be a barrier to low-wage earners. The EcoPass improves access to jobs while also reducing an employee's dependence on their private vehicle.

In February 2014, a study on the feasibility of expanding the Eco Pass program to the wider community was completed, estimating that the program could increase transit ridership between 22 and 64 percent, depending on the amount of resources put into the effort. The existing program has resulted in approximately 7.85 million additional transit boardings per year and 865 million reduced vehicle-miles traveled per year in the City of Boulder.

Policy Application: Genentech's gRide Rewards program

Genentech's South San Francisco and Oceanside campuses offer employees $4/day per passenger not to drive alone to work (including carpool, vanpool, transit, and non-motorized modes). This is approximately $80/month or $1,000/year. In 2012, the program reported that it saved more than 100 million miles of commuting, taking many vehicles off the road. Each month, more than 3,000 employees participate in gRide Rewards; 41% of the office's employees take modes other than drive-alone (an increase from 2006 of 22%). To make this program easier, Genentech also offers 38 shuttle

[56] Washington State Department of Transportation, CTR Overview. http://www.wsdot.wa.gov/Transit/CTR/overview.htm#HowItWorks
57 http://www.epa.gov/dced/pdf/EPAParkingSpaces06.pdf, p 50.
[58] https://www-static.bouldercolorado.gov/docs/communitywide-eco-pass-faqs-1-201402251110.pdf

buses, or GenenBuses to provide rides to employees. It should be noted that Genentech is operating under the trip reduction policy goals of the San Mateo City/County Association of Governments (C/CAG), and has a major financial incentive to expand their business while not increase the number of employee commute trips.

Expert Analysis

A panel of parking experts—including Donald Shoup, Elizabeth Deakin, Todd Litman, and Meea Kang—were interviewed and asked to give their experiences relating to this policy question. Expert panelist Donald Shoup spoke specifically about Parking Cash-out as presented below. **Donald Shoup is a distinguished Professor of Urban Planning, UCLA/Institute of Transportation Studies.** Professor Shoup has written many publications on parking, most notably The High Cost of Free Parking, and has brought economics into the parking policy discussion. A detailed review of all expert panel discussions can be found in Appendix B. A summary of Donald Shoup's discussion is presented below:

> 'In 1992, the California legislature passed the Parking Cash-Out law (AB 2109): if certain employers offer free parking to commuters then they must also offer employees the cash value of the parking if they do not use the parking. When a commuter does choose cash over a parking space, the employer saves money by not paying for that space and the commuter receives the cash.
>
> The California Air Resources Board (ARB) hired me to do a study of 1,700 employees who were offered the cash-out option. Of those employees, 17% of the solo drivers took the cash-out and many began carpooling, which reduced solo drivers. The study found that the cash-out program benefited woman, minorities, and low-income commuters most. The surprising thing is most employers have not heard of California's parking cash-out program and there is no penalty for violating the law. In 2010, the legislature passed another law saying the local Air Quality Management District or local governments can enforce penalties if employers do not offer cash-out. Yet no local entity is enforcing this law. For the firms who participated in the ARB study, they said cash-out program is very simple to implement – employees receive either a parking permit or the cash value for that permit. It treats everyone fairly – low-income and high-income commuters, transit riders and solo drivers. The Legislative Analyst study estimated the parking cash-out program removes 100,000 tons of carbon dioxide annually. This is an easy way for local jurisdictions to reduce greenhouse gas emissions by enforcing the parking cash-out program.'

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

While there are several studies and examples, a full analysis of the impact of such a program is difficult. While there is a lot of potential in the future for simulating regional effects of parking cash-out in UrbanSim, the capabilities and sensitivity of the parking submodel are uncertain and not yet ready for implementing testing. Additionally, the slow or limited implementation of parking cash-out policies may be due to a combination of lack of financial motivation by employers, lack of full or direct control of parking resources, and organizational/institutional inertia – all of which are difficult to model.

It should be noted that the environment for effective parking cash–out may be limited by the separation of financial responsibilities between employers and owners of parking, and thus limited opportunities for anyone to directly take advantage of efficiencies in pricing parking. For example, if an employer owns their own parking and there is a market for use of extra parking, or if an employer may choose to lease less parking, then they have an incentive to reduce the amount of parking used by the employees and to lease out the excess parking. Parking cash-out could work well in this situation. Parking cash-out could also work well if an employer/property owner wishes to expand operations and is allowed to build on land that is freed up through parking reduction programs. However, most employers do not own the parking used by their employees, and/or many do not have a choice as to how much parking to lease with an option of savings for the employer. Therefore if such an employer with fixed costs for parking for employees offers financial incentives for employees to not park at work, the employer may incur the cost of the incentive and yet derive no financial benefit from the reduced use of parking.

Recommendations

- MTC should work to clear up misconceptions employers and employees may have about parking cash-out programs through factsheets and educational workshops.
- MTC should consider additional approaches to enforcing parking cash-out in partnership with the Air District, and potentially expanding the program for regional implementation.
- MTC should study the potential for a local model of enforcement, collection of fees, and guidelines for how the fees will be used.

Policy Question 7: Effective Regional Policies

What are the most effective actions the regional agencies can take to support pricing parking policies?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

The purpose of this question is to develop recommendations for the regional agencies to support the creation of effective regional parking policies within the economic and political environment of the Bay Area. Parking policies are typically implemented by local jurisdictions, yet these local parking policies impact regional transportation and land use patterns—including the use of transit and vehicles, traffic congestion and greenhouse gas (GHG) emissions in the short run, and development patterns and land use/development prices in the long run.

Transportation issues are addressed at the local, county and regional level in the Bay Area. MTC/ABAG are required by state law to address specific housing and GHG goals in the regional transportation plan, and also have a number of other goals that are potentially impacted by parking policies, including housing affordability and transportation costs. Approximately 40% of GHG emissions come from the transportation sector in the SF Bay Area. Given State requirements to reduce GHG, the regional agencies are seeking approaches on all fronts to help achieve these goals.

A number of Bay Area cities have successfully demonstrated the efficacy of parking pricing and management through reforms to local parking policies, including San Francisco, Berkeley, Redwood City, and Union City. Many cities in the Bay Area currently do not charge for parking, despite high demand and/or recurring construction of costly parking facilities. It appears that widespread local adoption of parking pricing and related policy reforms may not occur within the near term without additional action at the regional level. Key impediments appear to be a lack of understanding of the dynamics of parking costs due to the hidden nature of parking subsidies for both the public and many planners; a general resistance to change to long accepted parking policies by professionals; a lack of local constituents in favor of priced and other reformed parking policies; the perception that cities need to compete for businesses and retail customers through the use of free parking; and a lack of familiarity and knowledge of the shifting demand market for housing with less parking.

A very effective long-term strategy to encourage pricing is to reform and/or eliminate parking requirements and to adopt development policies that allow development on excess parking lots.[59] The question for regional entities is the ways in which they can accelerate that reform process. Parking requirements are part of local zoning authority that resides with cities unless the State of California intervenes. Regional entities can provide information and expertise, and in some cases can strongly incentivize changes in parking policies.

At the macro level, a regional oversupply of parking represents an underutilization of valuable land resources. Regional parking policies could potentially benefit the region by creating more economic efficiency through better use of land and reduced subsidies for parking. Regional parking pricing policies can also address potential consistency issues in parking policies across city boundaries. For example, issues sometimes arise due to cities competing because they fear that businesses will lose customers to neighboring cities if they start charging for parking.

[59] http://www.mtc.ca.gov/planning/smart_growth/parking/parking_seminar/Toolbox-Handbook.pdf

Analysis of the most effective actions regional agencies will provide basis for development of regional policies by MTC/ABAG and potentially other regional or state agencies such as the Bay Area Quality Management District (BAAQMD) and Caltrans that are effective under conditions of limited staff time and political sensitivity.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

Ideally, the project would provide an extensive analysis of successful parking pricing programs in other regions or other parts of the world, including results/impacts, along with an analysis of the economic/political context and the extent to which certain policies might be feasible and effective in the Bay Area. The project would incorporate this information into the regional models and compare their impact side-by-side as well as qualitatively evaluate their political feasibility.

Due to a lack of directly comparable situations, i.e. regional agencies creating parking pricing and management systems, this question is addressed through review of examples of other parking pricing policies as well as in a discussion-based context, including expert panel discussions and feedback from local and regional representatives. The project focuses on a detailed review of key examples of regional approaches to pricing policies to provide the most value to the region.

Background & Research

Addressing this question requires thorough analysis and review of actions that regional agencies can take to support parking pricing. This includes analyzing a range of reports and activities conducted by the regional agencies and others in the Bay Area. These materials will inform specific policies that are recommended as the most effective regional actions for the Bay Area. The best practices below highlight some of the key research and reports that will be used in the full analysis of this question.

MTC has initiated a number of programs to provide information, analytical tools, workshops, and research on parking policies and strategies. These efforts are working on the critical issue – parking supply – and they should be redoubled to set the basis for encouraging parking pricing. Regional efforts to encourage parking requirement reform could include funding local parking requirement consulting studies, educational material regarding the effects of minimum parking requirements, and developing regional standards for parking requirements (by area type), and tying funding allocations to compliance with regional standard. Regional entities can highlight best practice cities to show jurisdictions how reform works and the positive economic development, urban design, social justice, and VMT reduction benefits.

Mixed land uses lend themselves to shared parking and greater efficiency. Therefore, regional support for local reform should include support for mixed land use policies that support shared parking. In addition, design regulations should require pedestrian and bicycle access between sites to support alternative modes and to facilitate shared parking. Regional entities can provide best practice models, fund planning efforts and zoning rewrites, fund pilot implementation projects, and tie other forms of funding to the reform of local planning.

Currently the regional agencies use a combination of funding support for specific local projects (particularly those with air quality and greenhouse gas (GHG) benefits), planning processes, extensive expert studies and analyses of parking policies and their impacts, and cooperative work with congestion management agencies (CMAs), transit agencies, other regional agencies, local jurisdictions, and non-profit / advocacy groups. This section includes descriptions of some key policies and

programs, as well as potential to expand them or use similar tools to continue working towards similar goals to price and manage parking.

Commuting in the Bay Area is a region-wide issue. About half of the commuting in the Bay Area crosses county lines. **Table 12** below shows that in many counties, less than half of the employees also live within their county of employment (with the exception of Santa Clara, Sonoma, and Napa).

Table 12: Cross County Commuting in the Bay Area

County	Total Employed Residents	Percent who Work in their County of Residence	Percent who Work Outside County of Residence	Total Employees by County	Percent who Live in their County of Employment	Percent of Workers Who Work in Selection Area, but Live Outside
Santa Clara County	708,375	69.94%	30.06%	804,359	61.59%	38.41%
Alameda County	595,518	48.10%	51.90%	604,522	47.40%	52.60%
Contra Costa County	399,789	39.20%	60.80%	309,427	50.60%	49.40%
San Francisco County	356,170	60.90%	39.10%	538,759	40.30%	59.70%
San Mateo County	302,934	39.30%	60.70%	303,529	39.20%	60.80%
Sonoma County	175,173	61.00%	39.00%	157,154	68.00%	32.00%
Solano County	154,882	35.50%	64.50%	111,942	49.20%	50.80%
Marin County	91,693	39.60%	60.40%	93,214	38.90%	61.10%
Napa County	56,052	52.80%	47.20%	57,692	51.30%	48.70%
Total	**2,840,542**	**52.90%**	47.10%	**2,980,598**	**50.40%**	**50.40%**

Source: 2011, Longitudinal Employer-Household Dynamics

Bay Area Regional Parking Research

MTC conducted a study directly addressing the question of what regional strategies would be effective in supporting widespread parking reform in the Bay Area, as reported in *Regional Parking Strategies for Climate Protection*, January 2010. This report provides a solid foundation for addressing this question of which actions are most effective regional by assessing the interests, authorities and relationships between various stakeholders and policy makers. The study presents and applies criteria for evaluating potential policies, and recommends strategies for policy implementation (**See Table 13**), including an approach for monitoring and evaluating implementation and performance.

MTC has conducted a range of studies in the last several years relating to policies that involve parking or focus entirely on parking policies, as shown in **Appendix B.** MTC's parking policy efforts have included toolboxes for parking reform, new models for estimating parking in mixed use/ urban context, case studies and best practices, parking code documentation, surveys of local parking requirements and local interests in reform, economic assessments of alternatives to parking, workshops, communication strategy tips, and other innovative analytical work.

Table 13: Strategy Recommendations

Regional Strategies for Implementation	Expanded Notes
Lead by example	Implement full-cost/market-based parking pricing, parking cash out, and transportation demand management (TDM) programs for all JPC/regional agency employees
Expand technical assistance and regional clearinghouse functions	Expand current local technical assistance programs for local governments to help developers, lenders, property owners, and employers implement climate friendly parking policies.
Initiate a Green Parking Certification Program	Recognize and reward local governments that successfully implement parking reforms.
Provide grants to local governments to encourage local reforms	
Offer performance-based vehicle trip reduction grants	Innovative employers, local governments, and third-party entrepreneurs who can demonstrate results in reducing trips within specific corridors, similar to the "Corridor Trip Reduction" program operated by the Washington State Department of Transportation (WSDOT), which sets a price per trip reduced and pays based on performance.
Engage CMAs as key partners	Support climate friendly parking policies directly through project evaluation and selection and by managing and providing support efforts by local jurisdictions
Engage transit agencies	Support climate friendly parking policies through agency parking policies, station area development plans and coordination with local jurisdictions.
Air District Regulation	If the Air District is vested with authority to regulate GHG emissions by the federal government, Nelson\Nygaard recommends that the agency enact requirements that cities amend their zoning and municipal codes to implement a selection of the effective municipal parking reforms identified in Appendix A or directly regulate the supply and management of parking on private property as indirect sources of GHG emissions.
Levy climate change impact fees on parking	The region may be able to encourage parking reforms by local government, employers, and property-owners by levying a per-space climate change impact fee on parking under the Air District's existing authority to regulate "indirect sources," of pollution, its GHG emissions cost recovery fee, or by securing new authority for MTC, through legislative action, using graduated payment schedules that correspond to pricing policies. Fee revenue could be returned to local governments for expenditure on transportation projects and/or programs that reduce per capita GHG emissions.
Condition distribution of transportation funding on local reforms	As part of, or similar to MTC's Transit Oriented Development (TOD) Policy ("Resolution 3434"), MTC could condition distribution of various regional transportation funding on the adoption at the local level of "smart" parking management policies.
Require 'unbundling' and vehicle trip reduction ordinances	Through the Sustainable Communities Strategy (SCS), ABAG could require or provide incentives to its member cities to: (a) implement selected TDM programs, and parking policy and management reforms from a checklist of options and/or (b) adopt legislation requiring the unbundling of parking spaces from leases for commercial and residential space.

Source: 2011, http://www.mtc.ca.gov/planning/smart_growth/parking/MTC_Parking_Strategies.pdf

Regional Policy Tools to Address Employee and Resident Dynamics

MTC's Climate Initiatives Program

The Climate Initiatives Program is a joint effort by the regional agencies: the Association of Bay Area Governments, the Bay Area Air Quality Management District, the Bay Conservation and Development Commission, and the Metropolitan Transportation Commission (One Bay Area, 2014). These agencies have funded a number of major demonstration projects to test the most innovative strategies to promote changes in driving and travel behaviors, providing an opportunity to learn what kinds of strategies can most effectively reduce GHG emissions. A number of projects have a parking policy component, including goBerkeley and the Integrated Public-Private Transportation Demand Management Project. The regional agencies are learning from these innovations as well as promoting other innovations in future projects, and local jurisdictions can benefit from these experiments and analyses in innovation.

MTC recently developed a small new pilot funding program focused on implementation of Transportation Demand Management in the Climate Initiative Program which prioritizes parking management strategies that reduce vehicle miles of travel and greenhouse gasses. This program will assist with equipment costs for smart meters, detection systems, wayfinding and enforcement programs. This is a new program, and future steps will depend on the effectiveness of this pilot project.

PDA Planning and Plan Bay Area

The regional transportation plan (Plan Bay Area) assists jurisdictions seeking to implement Plan Bay Area at the local level by providing funding for Priority Development Area (PDA) planning and transportation projects, technical assistance, and funding to support local professional staffing for such efforts. There is currently guidance regarding analysis of parking for PDA plans; this guidance could potentially be strengthened to include more requirements for priced and managed parking.

Plan Bay Area also provides jurisdictions with the option of increasing the efficiency of the development process for projects consistent with the plan and other criteria included in SB 375. Policies could also be developed, related to this policy or as a stand-alone, to directly encourage or mandate the reduction in local parking requirements for development in transit priority places (TPPs), as was considered in AB 904 (Skinner) in 2011-12 session (which was withdrawn).

TransForm GreenTRIP

TransForm's GreenTRIP program includes a tool for estimating levels of parking usage in various residential developments based on observation counts. This tool could be used to help reduce the cost of housing by eliminating underutilized parking spaces. The regional agencies can use this information and support further development and utilization of such tools.

CEQA and Parking

SB 743 makes several changes to CEQA so that most projects located in PDAs in the Bay Area are no longer be required to consider adequacy of parking under CEQA. SB 743 provides that "parking impacts of a residential, mixed use residential, or employment center project on an infill site within a transit priority area shall not be considered significant impacts on the environment." To avoid this consideration, a project must meet the following three criteria: (1) it is in a transit priority area; (2) it

is on an infill site; and (3) it is a residential, mixed-use residential, or an employment center.[60] This success was made possible by several efforts by San Francisco and the Bay Area to recognize that parking supply in transit-oriented and high density areas should not be evaluated by the same methods and/or criteria as lower-density, automobile-oriented areas.

TransLink for TOD (T4T) Pilot Program

MTC conducted a pilot project, in concert with AC Transit, to evaluate the long term impacts of a short term free transit pass program for residents of transit oriented developments.[61] The pass program resulted in both immediate and long term reductions in automobile trips and immediate and long term increases in the use of transit, significantly reducing greenhouse gas emissions. Pilot programs have the potential to expand throughout the Bay Area transit system with partnership between transit agencies and regional planning agencies. Transit subsidies and incentives for residents and employees of transit oriented developments could be implemented in several ways to reduce parking demand.

Commuter Benefits Program

Partially in response to the low level of participation in the State Parking Cash-out Program described above, and inspired by local commuter benefit ordinances (for examples, see the programs in San Francisco, Richmond, Berkeley, and San Francisco International Airport), MTC and the Bay Area Bay Area Air Quality Management District sought and received State authorization to implement the Bay Area Commuter Benefits Program. The program is being piloted from January 1, 2013 through December 31, 2016 with the goal of reducing drive-alone commute trips to Bay Area worksites and therefore decreasing traffic congestion and greenhouse gas (GHG) emissions, while saving employees (and potentially employers) money. The Program requires employers with at least 50 full-time employees to offer 1 of 4 commuter benefits options: (1) up to $130 per month tax-free transit or vanpool costs, (2) up to $75 per month employer-provided transit or vanpool subsidy (3) Employer-provided free or low cost bus, shuttle or vanpool service (4) or an alternative commuter benefit of the employer's choice that is as effective in reducing drive-alone mode share.[62]

This program is currently being evaluated; results will be analyzed in proposing the next step. Similar programs in place by individual employers have been studied. The 2010 Commuter Benefit Impact Survey found that employees were twice as likely to use an alternative mode of transportation if their workplace offered tax-free transit.[63] A report by the Transit Cooperative Research Program (2005) found significant impacts from commuter benefits programs, including a typical transit mode share increase of 10% or more.

MTC's Resolution 3434 TOD Policy

MTC's Resolution 3434 TOD policy, adopted in 2005, allocates regional funds to select local agencies that plan for at least minimum threshold levels of residential development around future transit expansions. This requirement is a condition for readiness to move forward and provides funding for planning toward this purpose. This policy supports transit ridership by increasing development around stations, specifically in the ½-mile station area, aiming to improve transit investments and ease the Bay Area housing shortage by creating vibrant communities around transit.

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[60] http://sfmea.sfplanning.org/CEQA%20Update-SB%20743%20Summary.pdf
[61] http://www.mtc.ca.gov/planning/smart_growth/tod/T4T/T4T_Executive_Summary.pdf
[62] Bay Area Commuter Benefits Program. https://commuterbenefits.511.org/#options
[63] Bay Area Commuter Benefits Program Staff Report (January 2014) http://files.mtc.ca.gov/pdf/commute/03_StaffReport.pdf

While this program is almost complete, such apolicy should be considered for future programs to to include analysis of multi-modal access, as well as pricing and management policy options. A regional focus on transit ridership and increased residential and mixed use development around stations could be supported with several parking policies, including eliminated parking requirements, unbundling, pricing, and employee transit passes. With increased requirements for the intensity of development, regional agencies can give bonuses or establish requirements for funding mandating that TOD areas reduce the subsidizes for.

Expert Analysis

A panel of parking experts—including Donald Shoup, Elizabeth Deakin, Todd Litman, and Meea Kang—were interviewed and asked to give their experiences relating to this policy question. Each expert was asked 'Do you have a favorite regional parking policy that MTC/regional agencies should consider pursuing?' A summary of responses is given below.

Regional Policy Input – Expert Donald Shoup

> Parking cash-out programs. One note about parking Cash-Out programs is that every City can pass their own penalty for violating the program, but the Air Quality Management District can set the penalty at the regional level. The law has already been passed; all that needs to be done is to set the penalty for violating the law. When it comes to parking, "I am pro-choice".

Regional Policy Input – Expert Elizabeth Deakin

> I think it would be helpful if MTC would work on parking technologies that make it easier to have very low pricing, flexibility in pricing, and easier and less-expensive enforcement of parking, etc. because cities are trying to solve these problems. A regional approach to study technology options, improved technology, create best management practices (BMPs) for parking technologies, etc., because it is more cost efficient, effective and avoids duplication, to do this on a regional basis than city by city. There are examples of cities purchasing equipment that did not have the appropriate software security (i.e. enable flexible pricing strategies, enforcement, etc.) or equipment costing lots of money to repair, etc.

Regional Policy Input – Expert Todd Litman

> I agree with what all the previous panelists already stated, and MTC could help with implementation by providing the tools and information needed at the point that a decision is made. For example, the City of Seattle/Puget Sound Regional Council developed the Right Size Parking Calculator - a terrific device that allows the developer to identify the right amount of parking for their project. Communicating to the public about these approaches, strategies and the benefits others are experiencing would be helpful. MTC can help produce information via factsheets, brochures, websites, and calculators that are understandable to the public that focus on the direct benefits to various stakeholders of implementing these strategies. I think we are failing in terms of implementation and communication.

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

Development of regional parking policies is a new innovation, being developed in response to the need to address GHG and housing supply while maintaining a strong economy, and the need to develop

policies that go beyond the boundaries of the individual local jurisdictions to address the widespread impacts. The political relationships within the San Francisco Bay Area are complex, involving many public, private, and non-profit entities. While there are quantitative measurements we can gather from modeling policies, many elements of a policy that make it effective are qualitative in nature—such as feasibility and political acceptance, making this a very challenging issue.

Recommendations

We have combined lessons learned from regional efforts, case studies from throughout the country and world, parking best practices research, travel models, and policy analyses with input from experts and transportation professionals to create a series of potential strategies and recommendations to reduce parking demand, encourage pricing policies, reduce housing costs and reduce GHG. Ideas range from simple extensions of current activities to new innovative strategies. The development of recommendations for regional actions to address the urgent nature of climate change in the multi-jurisdictional and highly charged world of regional transportation politics is complex. These ideas reflect the input of many dedicated professionals, and this approach is expected to result in new innovative policies to address these important concerns. Through this process we are hoping to develop effective, regional strategic actions to assist in the curbing of excessive GHGs in the shortest time frame possible.

The following recommendations are arrayed generally from the most incremental, i.e. minor extensions and slight expansions of current programs, to the boldest, i.e. development of new innovative regional programs and strategies. Many of these approaches, especially the bolder proposals, would require close collaboration with transit agencies, cities, CMAs, the Air District, development and business interests, advocacy groups, and other partners.

- Incorporate parking supply, policy and usage information and policy options (pricing, changes in requirements) from the VPP project into MTC/ABAG modeling (UrbanSim, TravelModelOne) for the next regional land use/transportation plan and environmental analysis, and in analyses of major programs and projects.
- Collect and publicize code and policy language of examples of strategies that address each of the major parking concerns that were identified by cities in the 2011 MTC Parking Survey.
- Engage local jurisdictions in a process to understand the meaning of the SB 743 CEQA changes, how these affect their community and planning process, and guidance for TOD and infill projects. Also engage in a publicity campaign for implementation of AB 744 (reduced minimums for residential developments for low income/senior/handicapped residents close to quality transit) if it is signed by the Governor and becomes law. Support new legislative efforts to reform parking policies.
- Increase support for local planning projects that address parking policies, with improved guidance for pricing and reduced / eliminated minimums, for priority development areas, transit station areas, and other defined area, or entire cities, or stand-alone parking policy analyses. Establish a regionally run parking certification program to recognize communities, employers and developers who implement appropriate parking reforms.
- Increase support for operational / implementation parking projects, such as the recent Climate Initiative Project to address VMT and GHG. Fund new technologies for pricing and

wayfinding, along with supportive TDM strategies. Develop pilot programs for Parking Benefit Districts, and other innovations.

- Enforce the State parking cash-out law at a regional level; if this is not possible then create models and support for local enforcement of parking cash-out. Refine the next iteration of the Bay Area Commuter Benefit Ordinance to emphasize parking cash out and parking pricing. Continue recent expansions in Clipper Card integration to create a subsidy program for eligible TOD residents and/or employees who opt out of vehicle ownership.
- Require a robust analysis of proposed parking structures that includes parking demand and multi-modal access to the service area as well as financial proforma of the proposed facility prior to MTC contribution of regional funds. Consider establishing policy requirements, such as elimination of parking minimums and required unbundling. Consider development of threshold requirements,
- Require local adoption of smart parking policies, including elimination of parking minimums in transit priority areas (TPAs), for transportation and development funding programs, including the One Bay Area Grant (OBAG) 2 and 3, and future Regional Measure 3, New Starts, Small Starts, Transit Oriented Affordable Housing (TOAH) projects, Affordable Housing and Sustainable Communities (AHSC) program, and other federal, state and regional programs and projects.
- Explore the development of a new regional parking fee or tax program, potentially with proceeds being returned to local jurisdictions for use on TDM projects. Parking taxes can be levied in a variety of ways to turn some of the indirect costs of parking back on the owner and/or user of parking, and can be used to support alternative access modes and other local livability improvements.[64]
- Work with the Air District to explore the development of an Indirect Source Rule (ISR), to establish a fee on parking spaces (using a VMT / GHG estimate), and/or develop a regional parking cap and trade approach.

[64] Litman, T. Parking Taxes: Evaluating Options and Impacts. *Victoria Transportation Policy Institute*, 2013.

Policy Question 8: Local Policy

Under what conditions might cities and transit agencies want to enact or enforce various priced parking policies?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

Answers to this question will provide perspective and information to MTC/ABAG regarding where to effectively focus funding support for local parking policy activities, and to local jurisdictions and transit agencies regarding conditions that are likely to result in effective parking pricing strategies. These conditions range from specific locational land use and transportation characteristics, local trends regarding employment and residential growth, as well as the supply and demand factors in particular areas where policies have been implemented successfully.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, an extensive inventory of priced parking policies as well as their impacts and the conditions that led those areas to enact the policy successfully would be collected to answer this question. However, because of the qualitative nature and limited project resources, key examples of policy applications are collected and they are used as examples for the basis for gathering further advice and information from our expert panel.

Background & Research

Conditions where cities or transit agencies may want to enact or enforce various priced parking policies are itemized below in **Table 14**. These are conditions that are directly observed through the project's data collection and/or anecdotal evidence within cities throughout the Bay Area. This includes excess demand for free or underpriced parking, i.e. high occupancy (above 85%), double parking, heavy cruising, as well as areas where unmanaged parking is hurting business. Potential policies to address these conditions are listed along with corresponding references to further research within this report.

These will be used as the basis for discussion with the Project's expert panel.

Table 14: Conditions and Policies for Various Priced Parking Policies

Condition	Policy	Background and Research
Demand is greater than supply		
	Introduce pricing for locations with highest demand - implement on-street metering using performance based pricing to achieve desired (e.g., 85%) occupancy	Policy Question #1: Supply, Demand, and Price
	Implement time limits and ensure adequate enforcement reduces violation rates.	Policy Question #11: Time Limits & Enforcement Hours
	Coordinate prices for meters and lots/structures to achieve target occupancy rates	Policy Question #11: Demand-dependent Pricing Structures Policy Question #7: Variable Pricing
	Tax or charge impact fees to private facilities, encouraging or requiring that the cost is passed on to users	Policy Question #5: Taxing to Manage Private Parking

Condition	Policy	Background and Research
Demand is greater than supply		
	Enact parking pricing along with a Parking Benefit District	Policy Question #9: Parking Benefit Districts
	Facilitate shared parking agreements	Policy Question #7: Shared Parking
High demand in specific areas or during peak periods is causing overcrowding		
	Use variable rate pricing, charging higher rates during peak periods	Policy Question #11: Demand-dependent Pricing Structures Policy Question #7: Variable Pricing
	Use tiered pricing between facilities to encourage price-sensitive long-term parkers to park in areas with lower-demand	Policy Question #11: Tiered Pricing Structures
	Support valet parking programs	Policy Question #11: Valet & Off-site Parking
There is high on-street demand for short-term, yet these spaces are being used by employees and other long-term parkers		
	Implement on-street metering	Policy Question #1: Supply, Demand, and Price
	Implement time limits and ensure adequate enforcement reduces violation rates.	Policy Question #11: Time Limits & Enforcement Hours
	Use increasing rates to provide discounts for the first hour, therefore encouraging higher turnover	Policy Question #11: Demand-dependent Pricing Structures Policy Question #7: Variable Pricing
	Set competitive off-street rates to encourage long-term parkers to move to off-street facilities	Policy Question #11: Off-street Parking Pricing
	Develop employee programs that charge for parking and provide discounted/free transit and alternative modes	Policy Question #7: Employee-Based Parking
Supply is greater than demand		
	Lower or reduce minimum requirements to encourage development and affordable housing for individuals who are not car owners	Policy Question #2 Policy Question #7: Reduced and Flexible Parking Requirements
	Avoid excess parking supply and constructing new facilities when they are not necessary	Policy Question #5
	Implement an in-lieu fee program	Policy Question #11: In-lieu Fees
Travel Demand Management policies are needed to help reduce traffic congestion and environmental externalities from subsidized parking		
	Require or incentivize employers to offer parking cash-outs to employees	Policy Question #6
	Require or incentivize employers to offer transit passes in placement of parking spaces	Policy Question #6 Policy Question #7: Employee-Based Parking
	Provide free parking for carsharing vehicles	Policy Question #3 Flexible Parking Requirements & Carsharing

Regional Best Practice Application: 2011 MTC Parking Survey

In 2011, a survey administered by MTC asked Cities how they rank concerns relating to implementing new parking policies and also asked how certain strategies would help. Examples of concerns include: neighborhood spillover, diminished retail competiveness, and lack of resources and leadership. Examples of support that cities ranked as most useful include grants, information sessions, and consultant assistance. Cross-analysis of concerns with research into conditions for cities to implement parking policies will help gain insight into what conditions are also barriers against policy implementation.

Analysis of 25 Sites

This question is addressed in tandem with Policy Question #1 and Policy Question #10. The conditions under which cities and transit agencies want to enact or enforce various priced parking policies are analyzed across the Project's data collection within 25 areas to understand how common they are.

Define Conditions

- ***Policy Question #8:*** *Under what conditions might cities and transit agencies want to enact or enforce various priced parking policies?*

Analyze Conditions in the Bay Area

- ***Policy Question #1:*** *Where is local parking supply greater than demand, and where is local demand greater than supply, and at what prices for parking does this hold?*
- ***Policy Question #10:*** *How common are the conditions that would lead to successful local parking pricing policies in the San Francisco Bay Area?*

Within the 25 sites analyzed, policies to price parking were recommended for 13 of the 25 cities. Pricing policies are typically used to manage high demand (above 85% occupancy). These periods of high demand typically occur during specific times of days or days of week. Enforcement should align to what times and days pricing policies are most relevant. The conditions that lead to enacting or enforcing various parking policies are:

- High demand exists throughout an area
- A small "hot spot" of high demand exists within an area
- High demand exists along a single corridor
- High demand exists in an area that is unregulated adjacent or nearby an area that is priced

There are also conditions were pricing fees might currently exist, but enforcement or price is not adequate set. These conditions include:

- High demand exists where pricing is currently enacted, suggesting that current fees are too low.
- Pricing enforcement hours and days does not cover the periods of high demand

The analysis of 25 sites showed that there are many conditions where enacting pricing policies could improve parking management. There are also conditions where pricing policies exist but are not needed. In all of the cities analyzed, on-street pricing fees were between $0.50 and $2.00. In many cities, this price is too low for properly manage this parking. Cities where very high demand still existed in at least a portion of the priced areas include Santa Rosa, Sausalito, Vallejo, Alameda, Burlingame, and San Jose.

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

There are numerous examples of pricing policies that exist today and unique conditions apply to each such as degree of political support and implementation process. The challenge in answering this question is in organizing the approach and choosing which applications are the most relevant and useful.

Recommendations

- MTC should continue or increase funding to local jurisdictions to implement better parking pricing and management to achieve local and regional goals.
- MTC should maintain flexible parking policies to allow for individual cities and agencies to respond to parking issues in a manner that best suits the local needs.
- It should develop a regional parking management system plan for local jurisdiction, including reduced parking minim.
- MTC should monitor, summarize, analyze local strategies, evaluate technologies, and promote successful approaches.
- MTC should limit/prioritize funding to projects with appropriate parking policies and strategies and increase requirements for AHSC.
- Work with the Air District to explore the development of an Indirect Source Rule (ISR), to establish a fee on parking spaces (using a VMT / GHG estimate), and/or develop a regional parking cap and trade approach.
- MTC should maintain strong support for legislative reforms that reduce minimum parking requirements.

Policy Question 9: Public Perception

Under what conditions do individuals perceive parking pricing policies to be appropriate?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

Civic engagement and public outreach are important, and often very challenging, elements of implementing parking policies. However, without political or public support, policies are unlikely to become successful. This answer will help policy makers at MTC, ABAG, local governments, and transit agencies better understand the perspectives of the public and better find policies that will be acceptable. The results of this analysis will offer a resource for staff to use when considering the steps needed in order to implement a new policy.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, public surveys and focus groups throughout the Bay Area in a range of different types of cities would help answer this question best. Due to limited resources, research and outreach examples, findings from surveys that have been conducted in recent years that include stated-preference responses to policy questions are reviewed. Additionally, the research to address this question includes successful examples from local jurisdictions who have successfully worked with the public to implement a pricing policy.

Background & Research

Best Practice: Research from MTC's Choosing Where We Live

MTC's *Choosing Where We Live* can help pinpoint the areas and demographics where parking pricing policies may be seen more favorable. The research surveys households looking for new housing in the Bay Area, and describes the interests of various market segments. Market segments that placed more emphasis on walkability, transit access and neighborhood quality, and placed less emphasis on driving and parking convenience, are likely to be more easily attracted to TOD. 38% of respondents—"Transit-Preferring," "Urban Double-Income No Kids," and "Young Brainiacs"—are within market segment groups that are more easily attracted to TODs and own one or fewer vehicles on average.

This research can be used to apply strategies to attract target market segments. By considering specific conditions that transit-preferring market segments (such as travel minimization, service frequency, and walkscore), particular policies that support those characteristics can be focused on.

Best Practice: MTC 2012 Parking Initiative

In 2012, MTC gathered a panel of parking experts including developers, cities, transit agencies, academics, parking consultants and regional agencies. This panel was part of a multimedia project that included videos and posters that used compelling animations and visual graphics to promote discussions about parking reform and pricing policies. This effort won several awards from the Transportation Research Board (TRB) in 2013 annual meeting for its success in communication policy solutions (Parking Policy for Smart Growth, 2012).

Best Practice: Public Outreach

Policy Application: goBerkeley Public Outreach

The City of Berkeley's goBerkeley pilot program (discussed in detail in Policy Question 7), included an extensive outreach and marketing component. One element of this outreach included a survey to employees who stated willingness to try alternative modes of travel to get to work. Outreach targeted these businesses and included face-to-face interviews to gather information about barriers to using those alternative modes. This allowed goBerkeley staff to create plans that provided resources for alternative mode usage that specifically addressed employee's needs.[65] Employee Travel Demand Management Benefits that goBerkeley will provide includes free AC Transit bus passes and discounted car-share memberships.

In addition to providing incentives to employees, the goBerkeley program took special effort to communicate the advantages of parking pricing to business owners. Parking in Downtown Berkeley during peak evening periods was very difficult to find before the policy change. Because City staff clearly communicated that demand-based pricing and time-limit restrictions would make it easier for customers to find parking as well as increase the number of visitors by increasing the turnover of the most convenient on-street spaces, the goBerkeley program was able to gather support from many local business owners.

Policy Application: San Mateo's Intercept Surveys and Community Outreach

The City of San Mateo's outreach process in 2013 is a good example showing that when the purpose of pricing policies are clearly communicated, support for these policies often increase substantially. In May 2013, the City of San Mateo conducted community outreach to understand how individuals are responding to current parking conditions. After explaining that price increases would increase availability, the survey found high support (over 50%) for increases in on-street pricing. Overall, the attitudes expressed during the stakeholder and public outreach meetings -- where an effort was made to explain the concepts behind parking demand management and how pricing and enforcement effect people's behavior and the supply of parking – were generally supportive of market-based pricing.

Policy Application: Vallejo Park and Ride Survey Analysis

Vallejo's Curtola Park and Ride Facility's Parking Management Plan is an example of a local best practice showing that even small-scale studies can be very informative in gathering information about conditions where users are willing to pay for parking. In July 2013, intercept surveys were conducted to evaluate pricing and amenities within the Curtola Park and Ride facilities. The survey found that 66% of parkers were willing to pay a daily fee to use the lot. Additionally, there was a high demand for additional amenities, with 72% of respondents supporting on-site security patrol with 45% of these respondents willing to pay for this service. If parking pricing were to be enacted, the survey found that Clipper-enabled pay stations were very a popular payment method among users.

Best Practice: Parking Benefit Districts

One successful public outreach tool that can help individuals understand the benefit of parking pricing policies is Parking Benefit Districts (and Business Improvement Districts, BIDs). Parking Benefit Districts can be used as an economic development, business development, and public outreach tool to use parking revenues to directly improve the people and businesses around the specific area where the parking revenues were collected. Because the funds are going directly to back to the area, such a

[65] http://www.berkeleyside.com/wp-content/uploads/2013/06/2013-06-11-Worksession-Item-01-goBerkeley-Pilot-Program-1.pdf

pricing program is more transparent, increasing public support. Funds collected from public parking can be used to improve sidewalks, landscaping, and other aesthetic amenities. Alternatively, funds can be used to decrease the automobile dependence for employees by offering free transit, or eco-passes, to employees who work in the district. This will not only save employees the cost of parking, but will free up available spaces for customers. Overall, such a policy reduces the demand for parking, which will reduce the need to construct new and costly parking garages as a commercial district becomes more popular.

Policy Application: "Old Pasadena's" Parking District

In 1993, the historic district of Pasadena, California has used funds from parking meters to revitalize the neighborhood, supporting visitors and businesses alike. One reason behind the on-street pricing was to increase turnover in front of store fronts so that parking would more likely be used by short-term users rather than long-term parkers such as employees. The residents and store owners of Old Pasadena were much supportive of the program when they were offered a dedicated funding source that could be invested directly back into street furniture, historic light fixtures, and regular maintenance. As the improvements brought more visitors to the area resulting in the need for increased maintenance, the demand for parking raised prices, bringing in more money to keep up with increased demand. All the while, businesses benefited from increased sales.[66]

Expert Analysis

A panel of parking experts—including Donald Shoup, Elizabeth Deakin, Todd Litman, and Meea Kang—were interviewed and asked to give their experiences relating to this policy question. Each expert was asked 'What can local jurisdictions do to increase community support for local changes to parking requirements?' A summary of responses relating to public perception is given below.

Local Perception Input – Expert Donald Shoup

> You will never get people to say they want to pay for parking and that it is a good idea, but you can convince people they want to charge for parking. Offer neighborhoods a 'parking benefit district' where you install meters and the revenue from those meters funds sidewalk repairs, installation of historic street furniture, graffiti removal, and other things the neighborhood wants then people will consider it. Old Pasadena was the first place to do this program. You cannot talk about pricing parking without thinking about what happens to the revenue. If you communicate your commitment to using that revenue to fund public services on those streets you will get more support. New technology also allows you to give residents a discount at those parking meters (i.e. Miami Beach, Monterey).

Local Perception Input – Expert Elizabeth Deakin

> If you spend parking revenue on things that benefit the people in the town that will make a huge difference. Complete Streets policies are something that could use more money in California. UCB graduate students did surveys for City of Oakland's Temescal neighborhood regarding the Complete Streets project for Telegraph Avenue – merchants were concerned customers would be driven away. What they found was the majority of customers were actually residents of the area, more people were walking or taking transit to the area, and those people were spending more money

[66] http://www.uctc.net/access/23/Access%2023%20-%2002%20-%20Small%20Change%20into%20Big%20Change.pdf

than the customers that drove to the area. So focusing on offering free parking in a business area may actually give you less money in some places. We are going to study this in other areas and we will see if the data continues to show that. When we work with other cities (Oakland, Berkeley and San Francisco) to study who is actually shopping in the area and how do they get there we routinely find that merchants believe if we alter the parking people will stop coming to the area. Yet what we find is the people driving to the area and taking up parking are not spending the most amount of money, but instead it is the local area residents who are walking, bicycling, etc. and making repeated trips that are spending the most money. I encourage every city to study how people are arriving to their business areas.

Parklets may generate more business than free street parking. We are hoping to do a University/City of Berkeley partnership study of this on Solano Avenue and test the results of parklets being proposed.

Do not over react to the idea that parking supply is so critical. Spending your money on things that make your city a better place or more livable city will get you a lot farther.

Local Perception Input – Expert Todd Litman

Where did Don Draper end up at the end of Mad Men? California! It is time to fire a few engineers and hire more marketing professionals to sell the benefits of parking management. Redefine the issues to highlight the benefits of affordable infill housing with reduced parking requirements and make paying directly rather than indirectly for parking seem attractive.

It really is more economically efficient and equitable to manage parking efficiently. Whether you are considering strategic objectives, such as traffic congestion, air quality, building more affordable housing, we could be doing much better by applying the strategies we are discussing. It is up to us to apply a new paradigm and reframe the questions being asked about parking.

We have positive stories about the effectiveness and benefits of the results – Pasadena, Vallejo, good case studies from non-profit organizations. We actually have positive stories to tell. How well are we doing in sharing this information to the public? Not well, and we need to do much better.

Local Policy Input – Expert Meea Kang

Pursue parking pilot programs because it helps us experiment with different options. There is no one size fits all and pilots allow you to customize and try new approaches. We often wait for the "perfect" solution instead of trying "good" options and seeing what happens. We need to take the first step. There is enough academic research and regional support with MTC and ABAG, to start pilot programs. We have a fear of change and we need to take that first step and see what happens. New York City ran pilot programs to experiment with regaining public spaces for pedestrians and cyclists by removing or streamlining areas to cars, such as Times Square, etc.

John Caner/Downtown Berkeley Association

In addition to the panel of parking experts, Downtown Berkeley Association president John Caner spoke about his experiences with the goBerkeley project. His experiences, as stated during the Project's expert panel, are described below:

> The business community was skeptical of the goBerkeley. We initially thought it was an opportunity to increase prices and limit parking. We were thrilled when we worked with the goBerkeley team to learn the pilot focused on value priced parking and rationing and allocating a scarce resource. The main highlights were:
>
> - Parking demand management shifted people from the premium to the value areas opening spaces up in the inner areas.
> - Keeping it simple – by simplifying policies, improved signage, robust communication and outreach – we did not get one complaint.

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

Surveys relating to this question are based on stated-preference answers and include several biases. Stated preferences may not be accurately aligned with a user's actual reaction to an implemented policy. Locational biases due to specific data collection areas do not allow for a representative sample of respondents. Additionally, attitudes are highly varied by demographics, location and lifestyle choices and they also change over time. Challenges in gathering data from local City staff and professionals arise due to time lapses between interviews and the potential change in circumstances from when the originally interviewed individual dealt with the policy issues.

Recommendations

- MTC should continue to work with local jurisdictions and the public to better understand how to effectively communicate the value to their communities of parking pricing and management strategies, and develop appropriate outreach campaigns to better make the case and address concerns.
- Successful programming in the Bay Area, like goBerkeley, should be highlighted and used as an example of what is possible when pricing policies are implemented correctly with significant public feedback.
- When implementing a pricing policy initiative, the responsible agency should be transparent with how potential future funds will be allocated and keep it simple by accompanying any pricing policies with the necessary signage and outreach.

Policy Question 10: Common Conditions for Successful Pricing Policies

How common are the conditions that would lead to successful local parking pricing policies in the San Francisco Bay Area?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

This question is to provide guidance for MTC, ABAG, cities, and transit agencies to assess the potential for local parking pricing policies to be applied to the Bay Area. The conditions that led to those policies will be assessed for application to other cities and be used to support the program and assess the potential applicability and/or success for various parking pricing policies.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, the project would look at all locations that have successful programs or elements of programs from various areas, look for reasons why they are successful, look at limits to success or implementation and then look to how this could apply in our region.

This question is answered in conjunction with Policy Question 8, which assesses the specific conditions that lead to a successful pricing policy. Therefore, the answers found from the analysis for Policy Question 8, are cross analyzed with various conditions within the Bay Area to determine how common these conditions are. Methods of improving this analysis may include surveying local jurisdictions and/or making a check-list tool for local jurisdictions to use to determine how common these conditions are in their cities.

Background & Research

What information are we aware of that we can use to address this question?

Best Practice: MTC 2012 Smart Parking Workshop Survey

Policy changes require support from City staff, developers, advocates, and/or private citizens in order to initiate change. The conditions that lead to successful parking policies are not wholly based on the physical parking conditions, but largely based on political openness and readiness. In June 2012, MTC held a workshop on parking reform. A survey of local representatives (with a range of stakeholders, local representatives and citizens) after the workshop showed that 65% of respondents are likely to support parking reform in their cities. Over 50% of respondents stated that their Cities are considering and/or pursuing shared parking and employee programs.

Best Practice: Local Parking Pricing Policy Interest

In 2011, a survey administered by MTC asked 86 individuals representing 63 local jurisdictions if different parking policy actions were: currently implemented, short term interest, long term interest, or no interest. Many cities—including Sonoma, Martinez, Alameda, Mountain View, Emeryville, Hayward, and South San Francisco—stated parking pricing as a short term interest despite no current pricing policies. 49% reported updating their parking policy within the last five years. Other cities stated other indirect parking pricing policies in their short term interests. The town of Windsor,

Campbell, and San Carlos, for example, stated reduced parking requirements in their short term interests. 30 respondents stated reduced parking requirements as a short-term interest for their jurisdiction, second only to walkability and wayfinding.[67]

Research & Analysis

This question will be addressed in tandem with Policy Question #8 and Policy Question #1. The conditions under which cities and transit agencies want to enact or enforce various priced parking policies are analyzed across the Project's data collection of 25 cities to understand how common they are.

Define Conditions

- ***Policy Question #8:*** *Under what conditions might cities and transit agencies want to enact or enforce various priced parking policies?*

Analyze Conditions in the Bay Area

- ***Policy Question #10:*** *How common are the conditions that would lead to successful local parking pricing policies in the San Francisco Bay Area?*

Analysis of 25 Sites

The analysis of 25 cities showed that conditions that would lead to successful local parking pricing policies are relatively common in the Bay Area. These conditions, detailed under policy question 8, include the need to manage overall demand as well as balance demand from areas of high occupancy to areas of low occupancy. Cities where implementing fees or expanding the areas of pricing would be successful are: Millbrae, South San Francisco, Hayward, Sausalito, Albany, El Cerrito, Martinez, and Emeryville. **Appendix B** includes detailed analysis and recommendations for each city.

In addition to the conditions that would lead to implementation of successful pricing policies, there are also conditions where increasing current pricing would be beneficial to some areas. These are areas where pricing is implemented, but the fee is set too low and very high demand still exists. These areas include Santa Rosa, Sausalito, Vallejo, Alameda, Burlingame and San Jose.

Additionally, some cities have pricing or other restrictions implemented already, but are not enforcing during evenings and/or during weekends. Of the 25 cities analyzed, seven cities would particularly benefit from this: Millbrae, South San Francisco, Santa Rosa, Sausalito, Albany, San Jose, and Gilroy. For many of these cities, the peak period of demand is during the weekend or evening periods. However, enforcement of regulations or pricing does not extend to these periods.

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

Many of our expert panel are experts in the field of parking policies and have a wide range of knowledge on the conditions that lead to successful policies. However, understanding the full range of where these conditions apply in the 101 Bay Area cities may not be the best use of the expert panel's knowledge base, since it is more of a local jurisdiction issue. Land use, population and job density, as well as area-specific demographic data can help address areas that are not covered with surveys,

[67] Metropolitan Transportation Commission, et al, (2011). Parking Fundamentals training session materials.

however, this type of analysis may not be able to capture a range of attitudes—such as political acceptability towards parking pricing policies—that are important aspects of conditions that lead to successful policies.

Recommendations

- MTC should continue to work with local jurisdictions to increase data collection and analysis to assist in implementing better pricing and management to achieve local and regional goals.
- MTC should provide necessary funding for pilot programs in cities seeking to implement new parking pricing policies.
- MTC, in partnership with local jurisdictions, should set regional targets for parking pricing policies and establish threshold for regional funding of parking structures to achieve greater environmental, social, and economic impacts.

Policy Question 11: Specific Approaches to Parking Policies

What are the specific approaches to parking pricing programs and the components that are most important for a successful program?

Question Purpose

What is the purpose of this question, why is it important, and who is the intended audience?

This question will provide guidance for MTC, ABAG, cities, and transit agencies in developing policies and programs. Understanding the specific approaches and components that are most important will support the answers to Policy Question #8, Policy Question #9 and Policy Question #10 to provide a range of information agencies may need in order to assess how pricing policies will relate to different contexts. Together, these three questions will address:

1. Under what conditions policies are enacted;
2. Where these conditions exist in the Bay Area; and
3. The approaches and components that are more important for a successful program.

Overview of Analysis

How is this question being addressed? What approach is best, given limitations?

In the abstract, an extensive inventory of parking pricing policies and the approaches and components that led to those policies becoming successful would be collected to answer this question. For the VPP Parking Project, the question is answered with background research of select successful applications. A synthesis of the expert panel analysis—included in Policy Question #3, #4, #6, #7, and #9—also contribute to this question. The majority of this research is completed within the research for the Project's wide set of policy questions. The policy applications describing successful parking pricing policies in this report include analysis in order to gain an understanding of exactly what led to its success (or prevented its success).

Background & Research

What information are we aware of that we can use to address this question?

Table 15 below provides a list of local pricing policies where specific approaches and components necessary to implement each policy will be detailed in order to address this question. For policies where background research and best practice information is not addressed in previous sections, additional discussion relating to these policies is provided below.

Table 15: Local Pricing Policies and Background Research for Specific Approaches

Policy	Background Research for Specific Approaches
Direct Pricing Policies	
▪ On-street metering to achieve a target occupancy rate	▪ Policy Question 1: Supply, Demand, and Price
▪ Variable rate pricing to distribute "hot spots" or smooth peak periods	▪ Policy Question 7: Variable Pricing
▪ Tiered pricing between facilities to encourage price-sensitive long-term parkers to park in areas with lower-demand	▪ Policy Question 11: Tiered Pricing Structures
▪ Coordination of on-street and off-street rates to encourage long-term parkers to move to off-street facilities	▪ Policy Question 11: Off-Street Parking Pricing
Indirect Pricing Policies	
▪ Impact fees to private facilities, encouraging or requiring that the cost is passed on to users	▪ Policy Question 5: Taxing to Manage Private Parking
▪ Reduced or eliminated minimum parking requirements for unbundled and/or shared parking in residential development, and/or in locations with quality transit, walking and biking	▪ Policy Question 7: Reduced and Flexible Parking Requirements, Policy Question 2
▪ Enforcement for time-limit restrictions to ensure low violation rates	▪ Policy Question 11: Time Limits & Enforcement Hours
▪ In-lieu fee program	▪ Policy Question 11: In-lieu Fees
▪ Parking cash-outs to employees	▪ Policy Question 6: Parking Cash-out
▪ Free parking for carsharing vehicles	▪ Policy Question 3: Flexible Parking Requirements & Carsharing
▪ Parking Benefit Districts with parking pricing	▪ Policy Question 9: Parking Benefit Districts

Parking Technology

Technological solutions can help cities manage resources and implement pricing policies more efficiently. In addition to parking technologies such as pay stations and dynamic wayfinding signage, some parking technologies do not include costly infrastructure. For example, an online permit purchasing system can be more convenient for the user and also reduce labor costs. Permit holders can set up accounts to renew daily monthly permit pass purchases. Email reminders or information notices and changes can be sent out to permit holders. Additionally, waitlists systems for permit holders can be smoothly administered. Technology development should be considered in the context of existing and planned transportation technology, including FasTrak and Clipper, along with smart phones and other new approaches.

- Multi-space meters—including pay-by-space, pay-by-ID, pay-by-plate, and pay-and-display systems—provide one meter to collect fares for many parking spaces. Pay-by-ID and pay-by-plate systems require users to enter a unique identification number or license plate number into the payment machine. Pay-and-display spaces print a receipt that users place on their dashboard.

- Infrastructure that could use Clipper Integration includes multi-space payment machines where users type in their serial number. With a customer machine, a sensor could read the Clipper serial number on the Clipper card's embedded chip. MTC could work with the

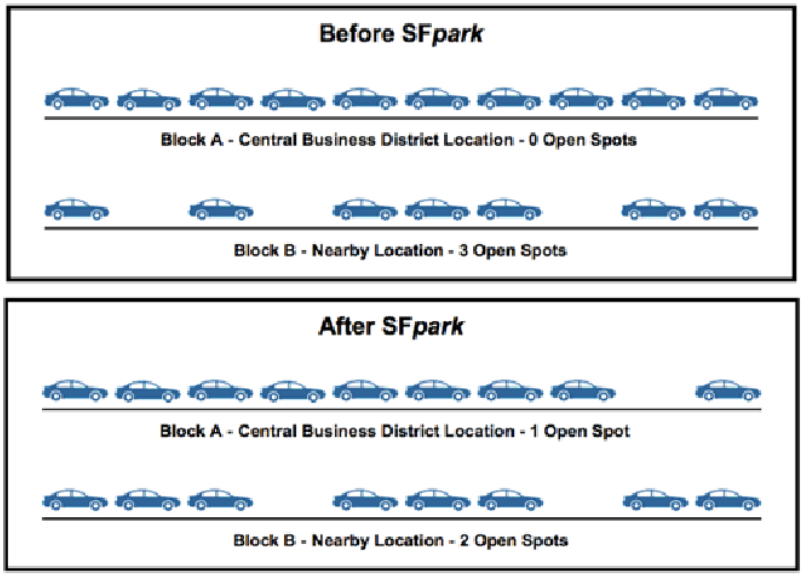
proposed project in order to ensure that it will be run smoothly, and will not compromise the Clipper brand.

- Wayfinding and parking guidance signage allows drivers to understand and navigate through a parking system with effective signage and information. Recognizable and consistent wayfinding will ensure that drivers can quickly recognize the facility as an available parking location.

Demand-Dependent Pricing Structures

Demand-based pricing can be implemented by applying higher meter prices to areas with higher demand. SFpark (detailed within the discussion for Policy Question #7) and Los Angeles' ExpressPark program each work to implement dynamic pricing strategies, using pavement-embedded sensors to study which areas have the highest demand or locate "hotspots" of particularly high demand. Prices are then raised in high-demand locations and lowered in low-demand areas, encouraging parkers to shift towards adjacent blocks with available parking (**Figure 5**).

Figure 5: On-Street Hotspot (SFpark)[68]



While demand, supply, and a parker's willingness to pay a certain price is not simple to measure exactly, programs that are measuring changes in demand have recognized stabilization patterns and trends that can be approximated. Therefore, raising prices on more popular streets and/or lowering prices on streets with fewer vehicles can be a feasible policy action without the costly resources required to take exact measurements throughout the day.

Parking Taxes

Parking taxes can be levied in a variety of ways to disincentivize parking supply and use. The economic concept behind parking taxes is that they impose some of the indirect costs of parking back on the owner and/or user of parking including foregone tax revenue, and environmental effects such as greenhouse gasses, runoff and urban heat island effects

[68] Pierce, Gregory & Shoup, Donald (2013).Getting the Prices Right: an evaluation of pricing parking by demand in San Francisco. *The Journal of the American Planning Association*. Volume 79, Number 1, Winter 2013.

In some cities, a parking tax is levied on the parking charge, such as a 10% charge on the fee paid in the City of Los Angeles. This type of policy only has an effect when there is a direct payment for parking, and therefore is limited to a subset of users in primarily urban areas. Unfortunately in implementation it's been found to encourage the undesirable practice of bundling of parking with rents. An alternative approach is to levy a tax on the square footage of parking lots and structures. This means that the tax is paid regardless of whether there are parking charges or whether the parking is occupied. For example, Montreal, Canada has instituted a parking tax of $19.80 per square meter for surface lots in the central business district and $4.95 per square meter for surface lots in suburban areas. The tax rates can be structured to disincentivize surface parking or parking areas where a strong multimodal parking program is in place. Property owners will find parking to be a less desirable use of land and therefore consider alternative uses. If parking taxes are passed on to the end user, parking demand will be reduced according to the price elasticity of demand for parking with respect to price, which generally lies between -0.1 and -0.4. This is a complex policy area, due to efficiency and equity issues between different areas, and legal considerations such as nexus requirements. Regional entities can do the legal research to identify the potential for regional parking taxes, and then consider the advantages and disadvantages of various approaches, including various types of regional and local parking taxes.

Tiered Pricing Structures

Tiered pricing schemes based on per-hour charges are implemented by charging higher rates for longer time stays. Several cities within the Bay Area use tiered pricing structures to help manage parking demand. For example, San Mateo uses tiered pricing, increasing metered rates for a vehicle's third and fourth hour.[69] Therefore, unlike time-limits, vehicles have the option of parking for longer periods of time, but at an increased hourly rate.

Off-street Parking Pricing

A common problem in many areas with congested on-street parking is that vehicles will circle around looking for on-street parking rather than heading directly to unused off-street parking. Pricing strategies can be used to make off-street parking more competitive, reducing this traffic congestion and reducing unnecessary circling. Setting on-street parking prices higher relative to off-street prices can be used to manage demand for on-street parking by encouraging longer-term parkers to utilize off-street lots.

Calthorpe and Proost (2006) research how drivers choose to park on-street and off-street, given relative prices. There is a balance between having to search for on-street parking and being able to park closer to one's destination; the relative costs and parking time-restrictions of the two parking facilities also plays into the decision. Similarly, Kobus et al. (2012) used parking data to calculate the elasticity for on-street parking prices when adjacent garage parking was available. They found that higher on-street parking prices relative to off-street garages encourage longer-duration parkers to use garages. This study found strong evidence that drivers are willing to pay additional for on-street parking, with a calculated price elasticity of demand for on-street parking of -0.4.

Many of the areas included in this VPP study demonstrated the pattern of on-street congestion and available capacity in off-street garages and lots, suggesting that a combination of coordinated pricing and wayfinding/information systems could be effective strategies to improve the efficiency of the

69 Policies are currently being re-evaluated and likely to change in 2014.

parking system, reduce excess street congestion and driving, and reduce production of greenhouse gasses.

In-lieu Fees

An alternative to minimum parking requirements for individual businesses is allowing or requiring business owners and developers to pay in-lieu fees to fund public parking facilities or to pay for alternative access modes, for example, universal transit passes or complete street improvements, rather than requiring them to construct their own private parking. Pasadena, San Francisco, Toronto, Vancouver, and Seattle are some examples of cities where developers can pay in in-lieu fee instead of providing required parking.[70]

Often, to set the in-lieu fee amount, cities either (1) determine the appropriate fee amount based on the cost of developing parking for each project, or (2) have a uniform fee or cost per space for all projects. More often, cities apply the latter based on its simplicity, and often these costs are lower than the true costs of providing the parking (Shoup, 1999). When setting in-lieu fees, planners must be cautious not to set the amount too low or too high. A fee that is too low will encourage all developers to opt-in to the program, but will not cover the costs of constructing and maintaining the amount of parking needed to accommodate demand. The level of user parking fees must also be considered in the calculation of parking demand; a decision whether or not to subsidize parking for a particular location is an important policy question that should entail consideration of options and broader costs and benefits. A fee that is too high will discourage most developers from taking advantage of the benefits of the in-lieu fee, and rather opt to build the required parking or not develop at all.

Policy Application: In-lieu fees in Santa Monica, California

The Third Street Promenade commercial district in Santa Monica, California (**Figure 6**) allows developers to pay a set a "Parking Developer Fee" of $1.50 per year per square foot of floor area in-lieu of parking. This money is used to construct and maintain public parking garages behind the stores. The result of the policy has led to many commercial uses with typically high requirements to come to the area—including movie theaters, restaurants, and shops—that draw many patrons to the district. The fee, first established in 1986, has been adequate to provide parking for the area and has also resulted in creating a vibrant and pedestrian-friendly commercial district.[71]

Figure 6: Pedestrians on the Third Street Promenade

Policy Application: In-lieu fees in Pasadena, California

The City of Pasadena implemented an in-lieu fee program for Old Pasadena so that property owners in the area could find a way to meet the Old Pasadena's parking requirements. Therefore, new development can make use of existing parking structures instead of meeting their parking requirements. The goal of the program was not to generate revenue, but to cover the cost of constructing parking for the residents. City staff

[70] Parking Best practices: A Review of Zoning Regulations and Policies in Select US and International Cities. NYC Department of City Planning Transportation Division 2011.
[71] Shoup, Donald (2005), The High Cost of Free Parking, *Planners Press, American Planning Association*, Chapter 9, p. 235.

report that approximately $330,000 per year is collected from the program.[72] As of 2012 the fee was $155.00 per space per year, and is adjusted for inflation annually.

Policy Application: Land Banking in Palo Alto, CA

One policy that has been used when parking need is uncertain is land banking, which puts aside the required land for parking as public space, giving the security that it is available to be converted to parking if needed. Palo Alto, CA allows reductions up to 50% of the minimum parking requirements for land banking. [73] The California Park Apartment development, for example, was required to build 95 parking spaces by city code, but used the area for 22 of these spaces and set it aside for a communal recreational space—including a family play area, picnic benches, and a barbeque area. None of the land banked space set aside for parking in Palo Alto has yet to be needed for parking.[74]

Shared Parking

Application: Arlington County's Shared Parking

Arlington County, Virginia, has enacted a Travel Demand Management (TDM) program to discourage assigned parking and maximize sharing of parking spaces. In the 2009 Comprehensive Plan, Arlington County set to limit reserved parking to less than 20% of the total supply and have identified four types of shared parking to encourage as follows:

- Complementary Hours: Shared parking within users with different peak hours of utilization
- Off-site Agreements: Parking within facilities with more spaces than required can contract to serve another user.
- Public Parking: Parking facilities with more spaces than required can open the facility to the public for use.
- Unreserved Spaces: If a parking facility does not use reserved spaces, they can accommodate additional vehicles.

Policy Application: Shared Parking in the Portland Metropolitan Area

The Portland Metropolitan Area has taken several steps to increase the efficiency of its land use by encouraging shared parking agreements between businesses and within districts. A few examples are included below.[75]

- The Lloyd District in Northeast Portland—a Business District consisting predominantly of offices with private parking and also the Lloyd Center mall—has added more than 1,000,000 square feet of commercial property yet reduced its total amount of parking in the last 10 years by taking advantage of shared parking agreements.

[72] Robert Montano, Economic Development Division. City of Pasadena. Phone conversation April 24, 2012.
[73] U.S. Environmental Protection Agency (2006). Parking Spaces/Community Places: Finding the Balance through Smart Growth Solutions. Published by the Development, Community, and Environment Division, Washington, DC.
[74] U.S. Environmental Protection Agency (2006). Parking Spaces/Community Places: Finding the Balance through Smart Growth Solutions. Published by the Development, Community, and Environment Division, Washington, DC.
75 Shared Parking in the Portland Metropolitan Area. Available at: https://www.alexandriava.gov/uploadedFiles/planning/info/SharedParkingInThePortlandMetropolitanArea.pdf

- Recognizing the different peak-demand times, the National College of Naturopathic Medicine in southeast Portland has significantly reduced its on-site parking by entering into formal agreements with two local churches adjacent to the campus.
- The Parks Bureau within the City of Portland has established shared parking arrangements with private businesses, a hospital, and a college, so that visitors and residents can use the recreation park space without having to turn some of the greenspace to concrete surface lots.

Parking Trade

Parking trades retain minimum parking requirements but allows the requirement to be fulfilled by supply off-site. Shared parking facilities are generally required to be within a one-block to three-block walking distance of the proposed site (approximately 1/4 mile). Shared parking facilities may be entitled up to 1.5 spaces per off-site parking space as part of the conditional use permit with parking rights specified for a set period of time. This program would create incentives for new development to enter agreements with existing building owners/managers to meet the parking requirement. Reducing the practice of dedicating parking to users, either in offices or residential, makes shared parking possible.

Challenges

What (if any) impediments inhibit our ability to answer the question entirely?

In addition to a wide range of priced policies, there are many different examples of approaches and components that have led to their success. Many of these components are complex and nuanced, including very significant local political factors; the challenge in answering this question is to grasp the most important aspects of each policy that has led to its success.

Recommendations

- MTC should continue to work with national innovators in parking pricing and management approaches to achieve regional goals, including consideration of parking taxes and fees, cap and trade, indirect source rules, implementation of regional parking cash-out, and other bold regional approaches in order to develop solutions capable of regional impact.
- MTC should continue to provide support to local jurisdictions implementing innovative pricing policies through its funding cycle and seek out alternative funding sources to increase the number of pricing policy pilots and permanent installations.

Conclusion

This Project has documented parking conditions in key locations in the Bay Area (see details in Appendix B), illustrated problems in current parking policies in the Bay Area, offered examples of innovation and best practices from throughout the country for local and regional approaches, and made recommendations for changes at the local and especially the regional level. These recommended strategies offer the potential to significantly improve local parking conditions, support local businesses, shape land use and impact travel choices, with the subsequent positive impacts on housing, congestion, vehicle miles of travel and greenhouse gasses. While local actions are necessary, a stronger regional role is also needed to make significant progress in reforming parking policies. This report provides the foundation for a strong, new, regional role in reforming parking policies in the Bay Area.

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