# APPENDIX A

## FUTURE SCENARIOS AND PARKING DEMAND MODEL

# Appendix A: Future Scenarios and Parking Demand Model

## Introduction

As reported in Nelson\Nygaard's previous technical memorandum ("Parking Supply & Demand Assessment" attached as Appendix B), status quo continuation of current policies and programs is expected to result in a peak hour parking deficit by 2020. This projection was generated by creating a Baseline Scenario (that assumes continuation of status quo policies and programs) and running it through a demand assessment model developed by Nelson\Nygaard for UC Berkeley.

The present report was developed to help UC Berkeley decide how to address this projected parking shortage. There are two basic ways to eliminate a deficit: either reduce demand or increase supply. For this report, two new scenarios were developed in order to evaluate these two approaches. Each scenario was run through the multi-stage demand assessment model.

The two scenarios are:

- "**Build Parking Scenario**" assumes the University opts to increase supply through construction of a new parking garage to address the projected parking deficit.
- "**Enhanced TDM Scenario**" assumes that the University opts to reduce demand through an expansion of their TDM programs to address the projected parking deficit.

The model was designed to project how each scenario would affect parking supply and demand and to project the financial impacts of each scenario. In both scenarios, the University is assumed to raise permit prices to cover new costs associated with either building a parking garage or funding new/enhanced TDM programs.

This Appendix explains the assumptions that went into the model and the scenarios, as well as the results of each scenario.

## The Model

### How the Model Works

Most simply, the model was designed to evaluate how each scenario helps solve the projected parking deficit. Also important to the University, however, is how these scenarios impact the Parking and Transportation Department's revenues and expenses, and how the scenarios would affect its customers' finances (e.g., changes projected in parking prices and transit fares). The Parking and Transportation Department is required to maintain a financial reserve equal to at least 125% of its annual debt service payments. Therefore, the model simultaneously evaluates the impact that each scenario has on Parking and Transportation revenues, expenses, and reserves.

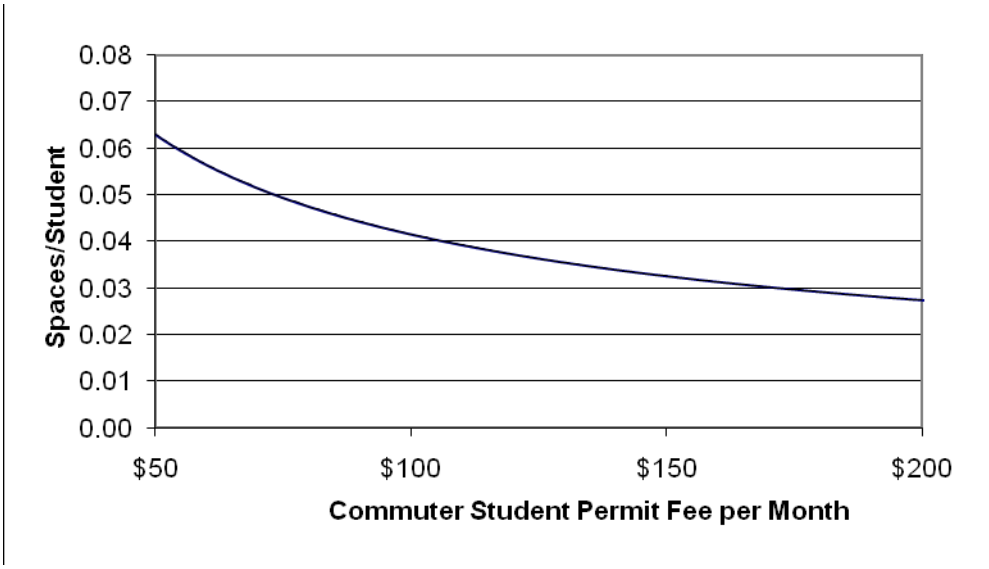
Inputs to the model (such parking permit prices and new garage construction) were adjusted, in an interative fashion, to simultaneously achieve two goals: to balance revenues and expenses and maintain an adequate account balance, and to eliminate the parking deficit. The model takes into account the fact that permit price adjustments simultaneously impact parking demand and parking revenue, and takes into account the additional costs associated with TDM measures or garage construction in each scenario. So, adjusting parking prices was a key lever used to make each scenario work.

## Basic Model Assumptions

The model assumptions include the following:

- **Price elasticity of parking demand:** A critical assumption in the model is that, all else being equal, *increasing the price of parking reduces demand for parking*. Price elasticity of parking demand was assumed to be -0.3. That is, a ten percent increase in real (i.e., inflation-adjusted) parking price yields a roughly three percent decrease in parking demand. This number represents a midpoint in values found in the national transportation research literature on parking demand elasticity with respect to price which range from -0.1 to -0.6, with -0.3 being the most frequently cited value.[1] This price elasticity assumption is illustrated below. The following three figures show demand curves for each type of commuter to illustrate the effect that price has on demand.

**Figure 1 Commuter Student Parking Demand Curve**




[1] Transit Cooperative Research Program, Report 95, Chapter 13, *Parking Pricing and Fees: Traveler Response to Transportation System Changes*, 2005

**Figure 2 Resident Student Parking Demand Curve**

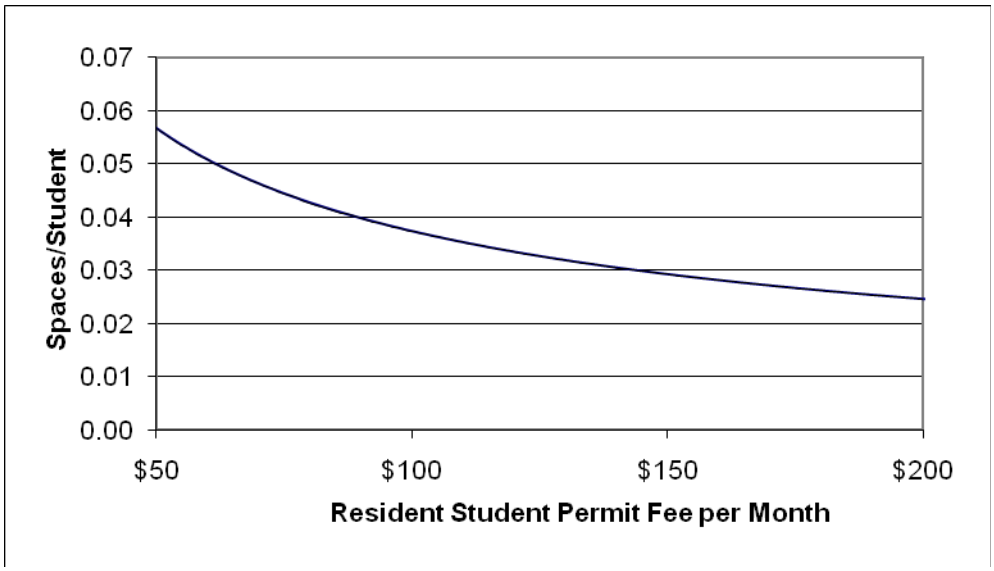
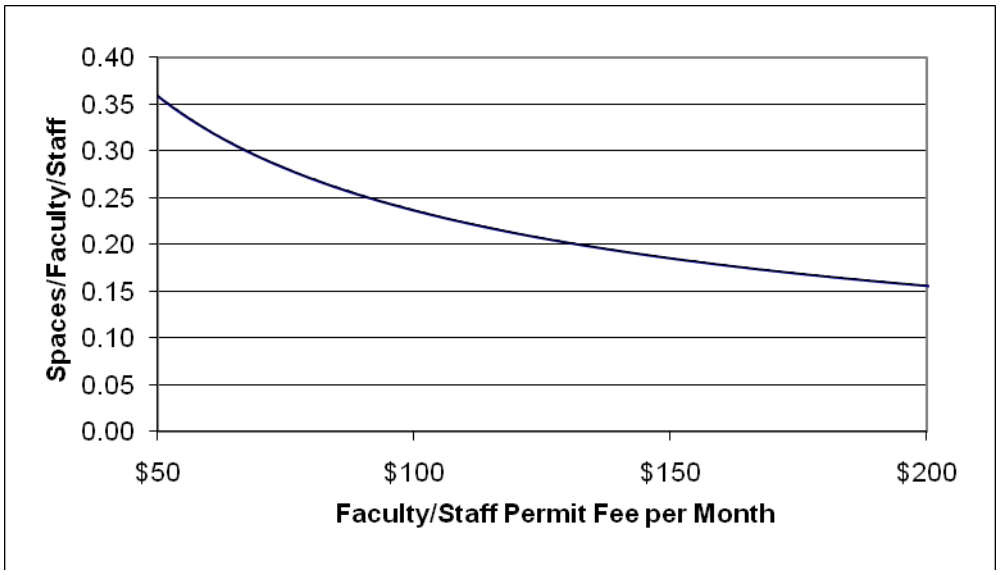



**Figure 3 Faculty/Staff Parking Demand Curve**




- **Permit Price Increases**: Permit prices were adjusted equally (i.e., an equal percentage point increase) for all campus permit holders.

- **Inflation**: The annual inflation rate is set at 3%. This is particularly important for parking permit prices which are shown in "Current Year Dollars" and "Real Dollars" (i.e. inflation-adjusted dollars). The primary implications of this for the model is that, in keeping with standard economic theory, price elasticity of parking demand is measured based on changes in real (i.e. after adjusting for inflation) changes in parking prices. For example, if

prices are increased only enough to keep pace with inflation, no reduction in demand due to the price change would be expected.

- **Areas of Campus**: Whereas the Parking Supply & Demand Assessment calculated baseline parking demand for the campus as a whole, this analysis of the two new scenarios calculates the parking demand for the main campus (west of Gayley Road/Stadium Rim Way) separately from the Hill Campus (east of Gayley Road/Stadium Rim Way).

- **Expense and Revenue Assumptions**:

    - Parking expense and revenue projections were provided by Parking and Transportation Services.

    - Parking and Transportation Services' revenue projections assume that the student Class Pass revenue stream is not reaffirmed in 2013. This assumption has been maintained in this analysis. If this revenue is available, it will be possible to decrease permit prices from those shown below.

    - Parking and Transportation Services' cost projections assumed the construction of the proposed University Hall West parking structure in 2014. The cost projections in this analysis assume parking construction in the "Build Parking" scenario when necessary, and in the amount necessary, to solve the shortage; the "Enhanced TDM" scenario includes no new garages.

## "Build Parking Scenario"

This scenario assumes that the University constructs a parking garage to fill the gap between supply and demand. Basic assumptions of this scenario are:

- **Year of Construction**: This scenario assumes the garage is completed and opened in 2017. This is the latest year that new spaces can come online without creating a supply deficit (taking into account a 5% buffer for turnover).
- **Size of Garage**: The scenario sets the size of the garage at 450 spaces; this is just large enough to re-balance supply and demand without creating a large parking surplus.
- **Per Space Cost**: The per-space project cost used in this scenario is $37,500 per space; this is based on the per space costs for the preferred design alternative described in the recent University Hall West Parking Garage Parking Study[2].

## "Enhanced TDM Scenario"

- **TDM Package**: This scenario assumes that the recommended package of TDM strategies and policies described in this report is adopted.
- **Year of Implementation**: The TDM program is assumed to go into effect in 2014; this is the latest year that the University can implement the programs (and thus incur the costs

[2] Walker Parking Consultants. *University Hall West Parking Garage Parking Study,* June 2, 2009. Attached as Appendix E.

associated with them) without creating a supply deficit. Like the garage scenario, the scenario was designed to postpone costs as long as possible without incurring a parking deficit.

- **Demand Reductions**: Parking demand reductions from new transportation demand management (TDM) measures were calculated at 5% for students and 10% for faculty/staff (with the greater figure for faculty/staff being primarily due to the implementation of a fully subsidized transit pass program). The new transportation demand management programs and their expected demand reduction effects are described in the Recommended Strategies chapter in the main body of the report.

# Outcomes of the Model

Outcomes of the model for each scenario are shown below. Parking demand projections and necessary permit price changes are described for both areas of campus (Main and Hill) and for the campus as a whole. Revenue outcomes for each scenario, however, are shown only for the campus as a whole since the Parking and Transportation accounts are not dealt with in a segmented way.

## Enhanced TDM Scenario

### Main Campus

**Parking Demand**: Under the Enhanced TDM Scenario, our analysis projects a parking demand of 4,364 spaces on the Main Campus in 2020, significantly lower than the demand in the Baseline Scenario. The reduction in demand is due to two factors:

a) demand reductions stemming from permit price increases necessary to pay for the package of TDM improvements according to the -0.3 price elasticity assumption (described in model assumptions above), and

b) the effects of the TDM programs themselves (as noted above, the new TDM measures were assumed to reduce student parking demand by 5% and 10% for faculty/staff).

Parking demand is shown in Table 1 and Figure 4 below.

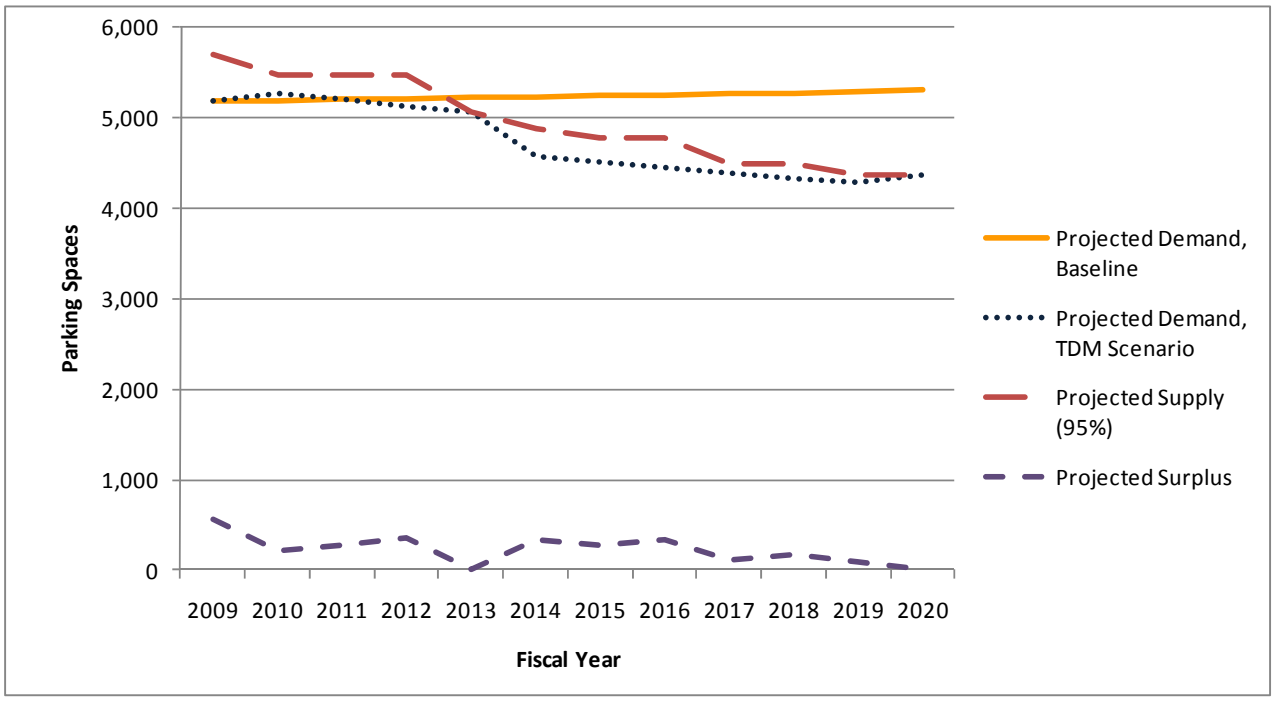
**Table 1 Main Campus Parking Demand & Supply Projections "Enhanced TDM Scenario"[3]**

| | Projected Parking Demand | Projected Supply | Projected Effective Supply (95%) | Projected Surplus/Deficit | Projected Effective Surplus/Deficit (95%) |
|---|---|---|---|---|---|
| 2009 | 5,173 | 6,000 | 5,700 | 827 | 555 |
| 2010 | 5,268 | 5,751 | 5,463 | 483 | 206 |
| 2011 | 5,198 | 5,751 | 5,463 | 553 | 279 |
| 2012 | 5,127 | 5,751 | 5,463 | 624 | 355 |
| 2013 | 5,058 | 5,334 | 5,067 | 276 | 9 |
| 2014* | 4,560 | 5,136 | 4,879 | 576 | 336 |
| 2015 | 4,499 | 5,016 | 4,765 | 517 | 280 |
| 2016 | 4,437 | 5,016 | 4,765 | 579 | 345 |
| 2017 | 4,378 | 4,721 | 4,485 | 343 | 113 |
| 2018 | 4,319 | 4,721 | 4,485 | 402 | 175 |
| 2019 | 4,278 | 4,595 | 4,365 | 317 | 92 |
| 2020 | 4,364 | 4,595 | 4,365 | 231 | 1 |

**2014 is the year the TDM program takes effect*

[3] The years shown in table and charts throughout this appendix refer to fiscal years. The year "2009," for example, refers to the fiscal year starting July 1, 2009.

**Figure 4 Main Campus Parking Demand & Supply Projections "Enhanced TDM Scenario"[4]**




**Permit Prices**: In order to balance parking demand and financial stability, parking permit prices go up 6% per year through 2018, 5% in 2019. It is worth noting that 3% of this increase is just accounting for inflation. In 2020, under this scenario, main campus permit prices will be as follows (shown in current year dollars):

- Commuter Student: $134/month
- Resident Student: $160/month
- Faculty/Staff "C" Permit: $203/month
- Faculty/Staff "F" Permit $147/month

(It is worth noting that looking at these price increases in current year dollars makes them look more extreme than they might "feel" in 2020. For example, in "real" inflation-adjusted dollars, commuter student permits would be $97/month and resident student permits would be $116/month).

## Hill Campus

**Parking Demand**: There is ample parking in the Hill Campus currently and this will continue to be the case under all Scenarios in the future. Under the Enhanced TDM Scenario, our analysis projects a parking demand of 402 spaces on the Hill Campus in 2020. Parking demand is shown in Table 2 and Figure 5 below.

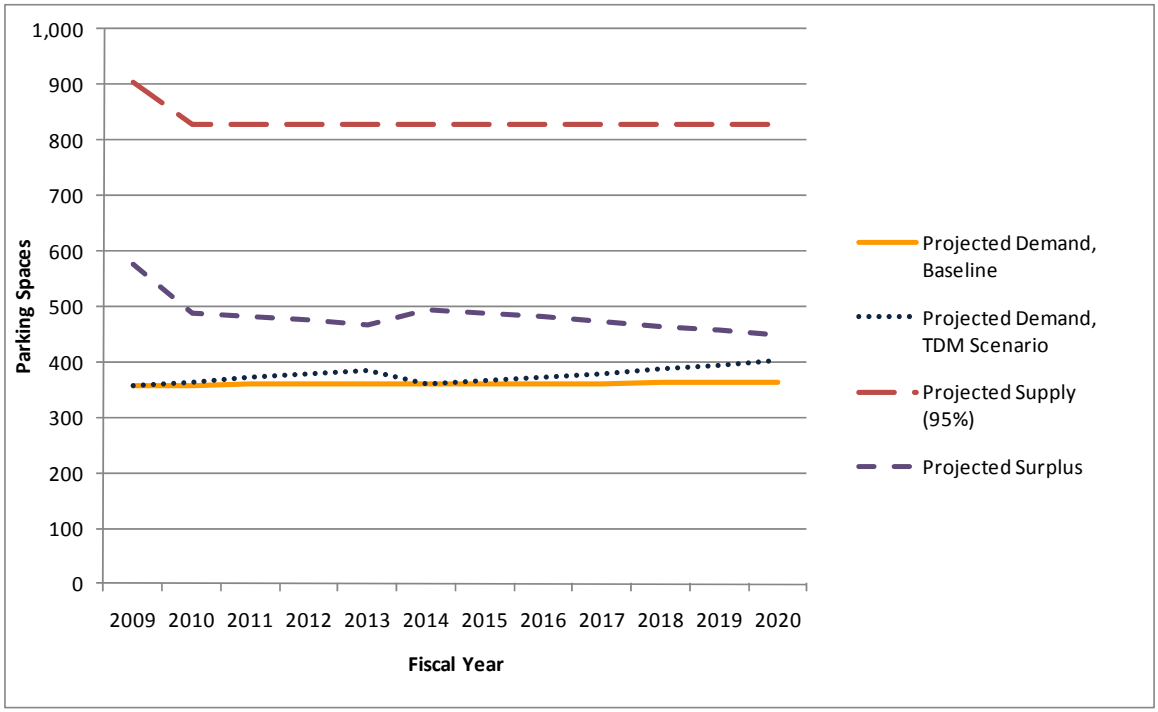
[4] The years shown in table and charts throughout this appendix refer to fiscal years. The year "2009," for example, refers to the fiscal year starting July 1, 2009.

**Table 2 Hill Campus Parking Demand & Supply Projections "Enhanced TDM Scenario"**

| | Projected Parking Demand | Projected Supply | Projected Effective Supply (95%) | Projected Surplus/Deficit | Projected Effective Surplus/Deficit (95%) |
|---|---|---|---|---|---|
| 2009 | 358 | 952 | 904 | 594 | 575 |
| 2010 | 365 | 872 | 828 | 507 | 488 |
| 2011 | 372 | 872 | 828 | 500 | 481 |
| 2012 | 378 | 872 | 828 | 494 | 474 |
| 2013 | 386 | 872 | 828 | 486 | 466 |
| 2014* | 359 | 872 | 828 | 513 | 494 |
| 2015 | 366 | 872 | 828 | 506 | 487 |
| 2016 | 372 | 872 | 828 | 500 | 481 |
| 2017 | 379 | 872 | 828 | 493 | 473 |
| 2018 | 387 | 872 | 828 | 485 | 465 |
| 2019 | 395 | 872 | 828 | 477 | 457 |
| 2020 | 402 | 872 | 828 | 470 | 449 |

**2014 is the year the TDM program takes effect.*

**Figure 5 Hill Campus Parking Demand & Supply Projections "Enhanced TDM Scenario"**



**Permit Prices**: Due to this projected surplus, no parking price increases were built into the model for this Scenario, even to account for inflation. This means permit prices in real terms will decline over time. In 2020, under this scenario, Hill permit prices will be same as current prices shown below:

- Commuter Student: $82/month
- Resident Student: $98/month
- Faculty/Staff "C" Permit: $124/month
- Faculty/Staff "F" Permit $90/month

(For illustration, in "real" inflation-adjusted dollars, commuter student permits would be $59/month in 2020 and resident student permits would be $71/month in 2020).

## Total Campus

**Parking Demand**: Under the Enhanced TDM Scenario, our analysis projects a parking demand of 4,766 spaces on the campus as a whole in 2020, significantly lower than the demand in the Baseline Scenario. As stated in the Main Campus section above, the reduction in demand is due to both price increases and the TDM package.

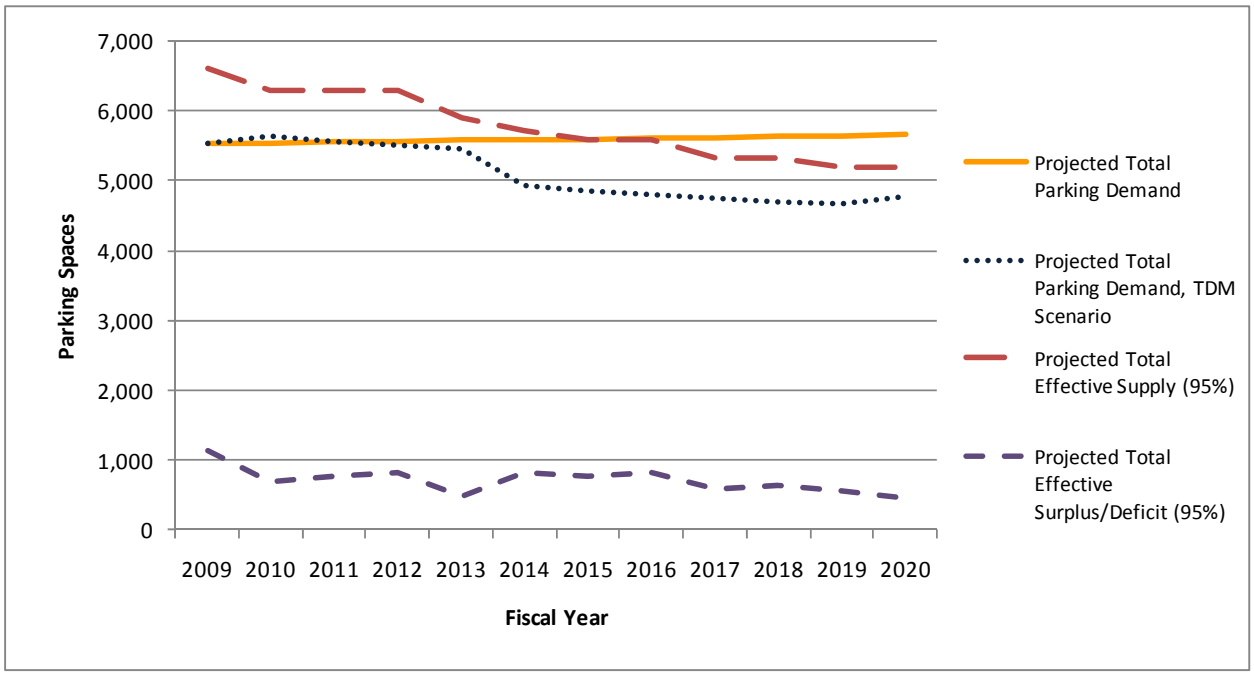
Parking demand for the whole campus is shown in Figure 6 and Table 3 below.

**Table 3 TOTAL Campus Parking Demand & Supply Projections "Enhanced TDM Scenario"**

| | Projected Total Parking Demand, TDM Scenario | Projected Total Supply | Projected Total Effective Supply (95%) | Projected Total Surplus/Deficit | Projected Total Effective Surplus/Deficit (95%) |
|---|---|---|---|---|---|
| 2009 | 5,531 | 6,952 | 6,604 | 1421 | 1130 |
| 2010 | 5,632 | 6,623 | 6,292 | 991 | 694 |
| 2011 | 5,570 | 6,623 | 6,292 | 1053 | 760 |
| 2012 | 5,504 | 6,623 | 6,292 | 1119 | 829 |
| 2013 | 5,444 | 6,206 | 5,896 | 762 | 475 |
| 2014* | 4,919 | 6,008 | 5,708 | 1089 | 830 |
| 2015 | 4,865 | 5,888 | 5,594 | 1023 | 767 |
| 2016 | 4,809 | 5,888 | 5,594 | 1079 | 826 |
| 2017 | 4,757 | 5,593 | 5,313 | 836 | 586 |
| 2018 | 4,706 | 5,593 | 5,313 | 887 | 640 |
| 2019 | 4,673 | 5,467 | 5,194 | 794 | 548 |
| 2020 | 4,766 | 5,467 | 5,194 | 701 | 450 |

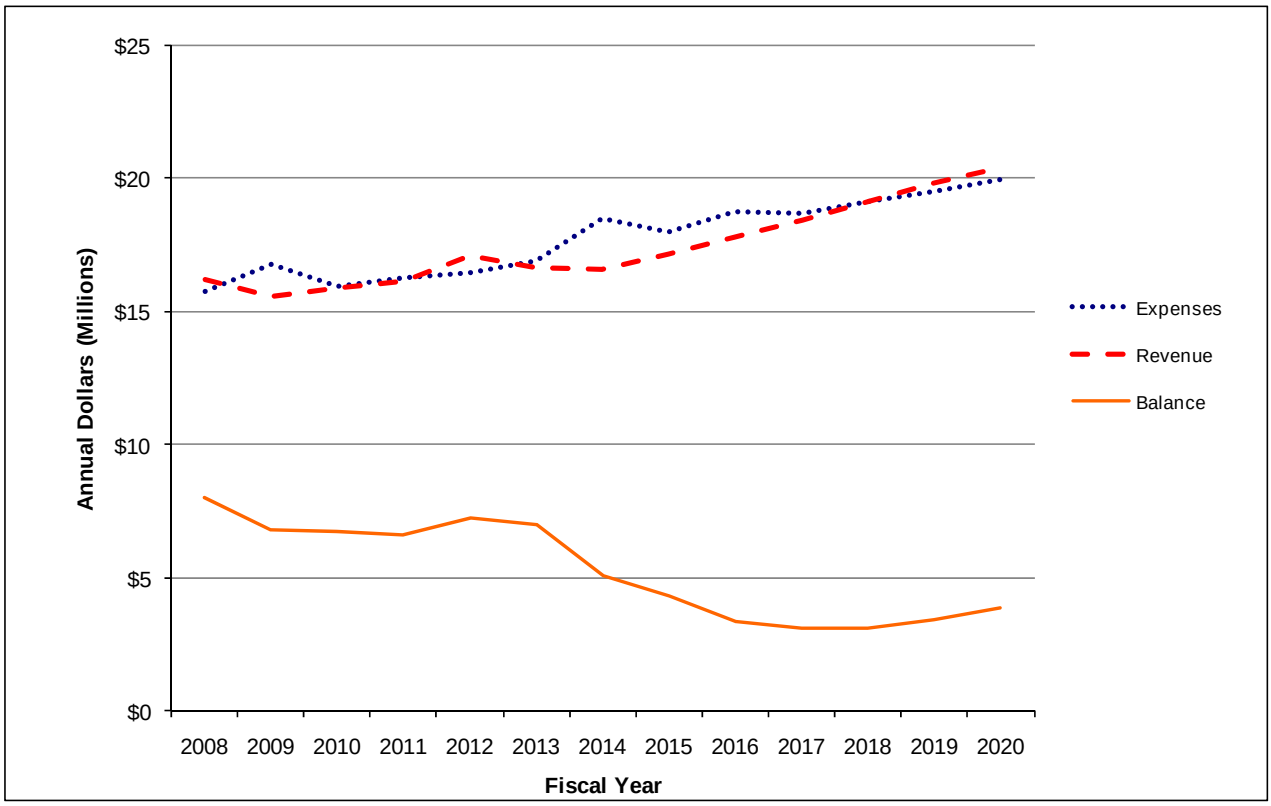
**2014 is the year the TDM program takes effect.*

**Figure 6 TOTAL Campus Parking Demand & Supply Projections "Enhanced TDM Scenario"**




**Financial Projections**: For this analysis, parking expense and revenue projections were developed which take into consideration the price adjustments necessary to finance the enhanced TDM package and to manage demand while also ensuring that the Parking and Transportation Department meets its fund balance requirement of 125% of annual debt service. By increasing permit prices on the Main campus as described above, while keeping the Hill Campus prices the same (actually declining in real terms) through 2020, a sufficient account balance is maintained as illustrated below in Figure 7 and Table. The expense information includes costs associated with new TDM programs: Faculty/Staff UPass, Marketing/TDM Coordinator, 200 bike share bikes, and Parking Cash-Out. Cost estimates assume TDM programs are implemented with the following budgets: faculty/staff Bear Pass - $297,700 per year; marketing - $51,000 per year; TDM Coordinator - $120,000 per year; bike sharing - $600,000 one-time fee. These beginning budgets for new TDM programs are budgeted to rise to keep pace with inflation and campus populations.

**Figure 7 Financial Projections "Enhanced TDM Scenario"**



## Table 4 Financial Projections Enhanced TDM Scenario

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| All Expenses (Salaries, Benefits, Previous Debt Service, etc.) | 13,417,193 | 13,173,356 | 14,705,510 | 14,951,175 | 15,421,908 | 15,594,951 | 15,912,923 | 16,331,936 | 16,925,007 | 16,884,304 | 17,274,760 | 17,620,255 | 17,972,660 |
| Capital Expenditures | - | 2,881,988 | 366,895 | 415,769 | 114,752 | 296,922 | 460,971 | 127,227 | 253,486 | 200,835 | 200,835 | 200,835 | 200,835 |
| Admin Reallocation to General Fund | 1,900,000 | - | - | - | - | - | - | - | - | - | - | - | - |
| Parking Administrative Full Costing | 354,337 | 584,785 | 672,044 | 701,454 | 756,193 | 788,218 | 821,324 | 855,547 | 890,927 | 927,502 | 965,315 | $ 1,003,927 | $ 1,044,084 |
| Citation Administrative Full Costing | 51,286 | 94,780 | 115,760 | 120,160 | 125,920 | 130,560 | 135,360 | 140,480 | 145,680 | 151,120 | 156,720 | $ 162,989 | $ 169,508 |
| Transit Ops Administrative Full Costing | 18,187 | 37,072 | 40,539 | 41,958 | 43,426 | 44,946 | 46,519 | 48,148 | 49,833 | 51,577 | 53,382 | $ 55,250 | $ 57,184 |
| F/S U-PASS | | | | | | | 297,699 | 297,700 | 297,700 | 297,700 | 297,700 | 297,700 | 297,700 |
| Marketing/TDM Coordinator | | | | | | | 171,465 | 171,439 | 171,414 | 171,388 | 171,362 | 171,337 | 171,311 |
| Bike Sharing (200 Bikes) | | | | | | | 600,000 | | | | | | |
| Parking Cash Out | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL | $15,741,002 | $16,771,980 | $15,900,747 | $16,230,516 | $16,462,200 | $16,855,597 | $18,446,260 | $17,972,478 | $18,734,046 | $18,684,426 | $19,120,074 | $19,512,293 | $19,913,283 |

| REVENUES | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Commuter Student Permits | $694,616 | $969,732 | $986,092 | $1,023,593 | $1,028,140 | $1,067,197 | $1,052,394 | $1,088,139 | $1,093,873 | $1,135,451 | $1,178,656 | $1,220,501 | $1,244,289 |
| Resident Student Permits | $212,424 | $293,145 | $300,675 | $313,731 | $338,523 | $353,221 | $350,139 | $366,734 | $393,809 | $410,925 | $428,796 | $446,278 | $460,250 |
| Faculty/Staff Permits - C | $2,191,471 | $2,187,360 | $2,231,131 | $2,329,041 | $2,431,270 | $2,538,009 | $2,384,511 | $2,489,239 | $2,598,586 | $2,712,758 | $2,831,965 | $2,949,065 | $3,004,037 |
| Faculty/Staff Permits - F | $2,467,840 | $3,018,600 | $3,079,004 | $3,214,122 | $3,355,200 | $3,502,502 | $3,290,672 | $3,435,198 | $3,586,100 | $3,743,659 | $3,908,168 | $4,069,768 | $4,145,630 |
| Other Annual Permits | $ 2,782,198 | $ 1,005,769 | $ 893,336 | $ 950,459 | $ 933,823 | $ 978,107 | $ 1,024,414 | $ 1,072,845 | $ 1,123,569 | $ 1,176,494 | $ 1,231,819 | $ 1,299,569 | $ 1,371,046 |
| Daily Permits | $ 817,899 | $ 817,899 | $ 830,167 | $ 859,223 | $ 889,296 | $ 920,421 | $ 952,636 | $ 985,978 | $ 1,020,487 | $ 1,056,204 | $ 1,093,171 | $ 1,131,433 | $ 1,171,033 |
| Lot Machine Parking | $ 1,175,992 | $ 1,175,992 | $ 1,275,992 | $ 1,320,652 | $ 1,366,875 | $ 1,414,715 | $ 1,464,230 | $ 1,515,478 | $ 1,568,520 | $ 1,623,418 | $ 1,680,238 | $ 1,739,046 | $ 1,799,913 |
| Special Event Parking | $ 1,562,136 | $ 1,585,568 | $ 1,609,352 | $ 1,338,603 | $ 1,668,311 | $ 1,701,677 | $ 1,735,710 | $ 1,770,425 | $ 1,805,833 | $ 1,841,950 | $ 1,878,789 | $ 1,916,365 | $ 1,954,692 |
| Campus Bicycle Plan Project | $ 75,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Parking Citation Revenue | $ 1,283,123 | $ 1,354,000 | $ 1,447,000 | $ 1,502,000 | $ 1,574,000 | $ 1,632,000 | $ 1,692,000 | $ 1,756,000 | $ 1,821,000 | $ 1,889,000 | $ 1,959,000 | $ 2,031,483 | $ 2,106,648 |
| Fare Box and Ticket Sales | $ 38,758 | $ 40,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Class Pass Revenue (Night Safety) | $ 735,881 | $ 882,000 | $ 882,000 | $ 882,000 | $ 1,026,000 | | | | | | | | |
| Bear Pass Revenue | $ 415,921 | $ 489,600 | $ 506,736 | $ 524,472 | $ 542,829 | $ 561,828 | $ 581,492 | $ 601,844 | $ 622,909 | $ 644,711 | $ 667,276 | $ 690,631 | $ 714,803 |
| BART Tickets | $ 1,705,872 | $ 1,755,342 | $ 1,806,247 | $ 1,858,628 | $ 1,912,528 | $ 1,967,991 | $ 2,025,063 | $ 2,083,790 | $ 2,144,220 | $ 2,206,402 | $ 2,270,388 | $ 2,336,229 | $ 2,403,980 |
| 19900 Driver Funding | $ 46,615 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| TOTAL REVENUES | $16,205,746 | $15,575,007 | $15,847,731 | $16,116,523 | $17,066,794 | $16,637,669 | $16,553,262 | $17,165,670 | $17,778,908 | $18,440,972 | $19,128,267 | $19,830,368 | $20,376,319 |
| BALANCE | $7,972,947 | $6,775,974 | $6,722,958 | $6,608,965 | $7,213,559 | $6,995,630 | $5,102,631 | $4,295,823 | $3,340,685 | $3,097,230 | $3,105,424 | $3,423,499 | $3,886,535 |

The revenue projections provided by Parking and Transportation Services only went through 2018. For the purposes of this analysis, Nelson\Nygaard extended the projections two additional years using the same assumptions used by UC, these are highlighted in yellow.

The green highlighted area in Class Pass revenue row highlights the assumption stated at the beginning of the Appendix that UC Parking and Transportation revenue projections assume that the student Class Pass revenue stream is not reaffirmed in 2013.

# Build Parking Scenario

## Main Campus

**Parking Demand**: Under the Build Parking Scenario, our analysis projects a parking demand of 4,776 spaces on the Main Campus in 2020, lower than the baseline scenario. The reduction in demand is due exclusively to the demand response from pricing increases necessary to pay for the garage.

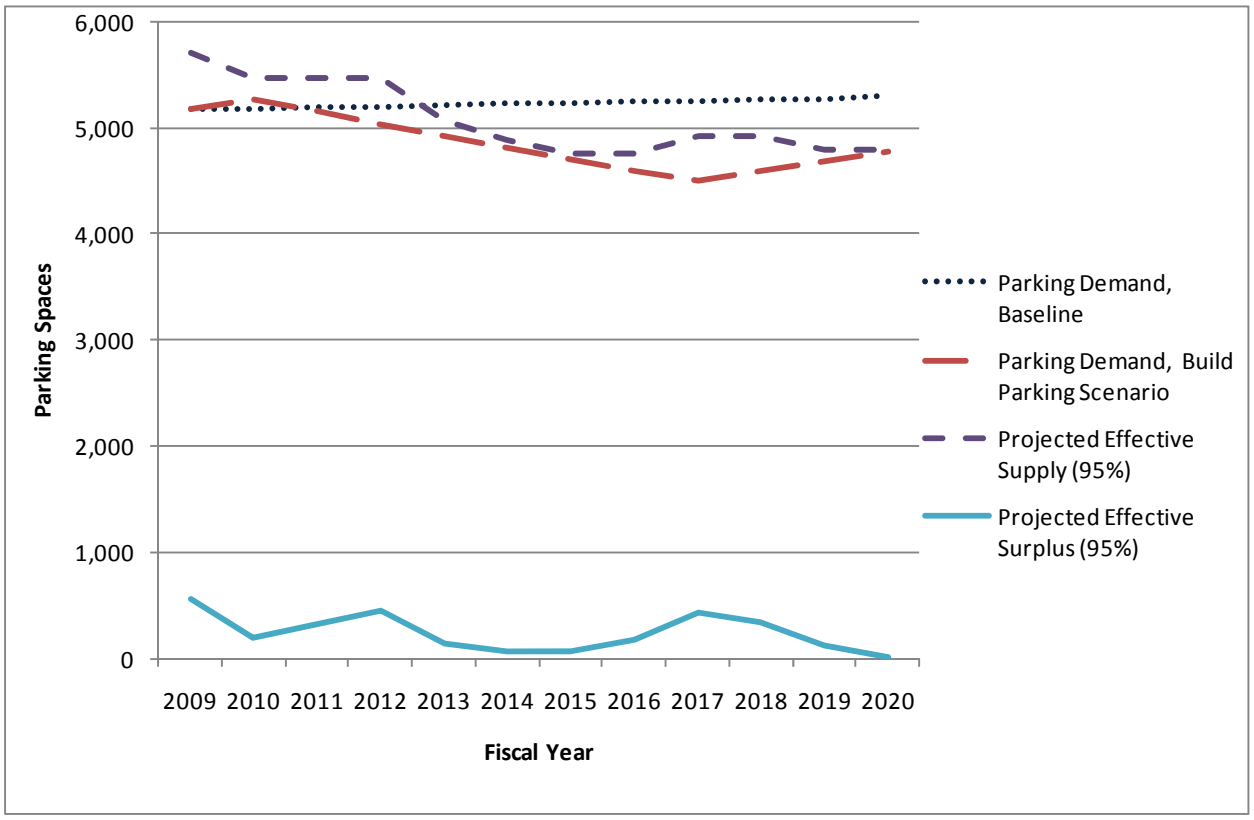
Parking demand is shown in Figure 8 and Table 5 below.

**Table 5 Main Campus Parking Demand & Supply Projections "Build Parking Scenario"**

| | Projected Parking Demand | Projected Supply | Projected Effective Supply (95%) | Projected Surplus/Deficit | Projected Effective Surplus/Deficit (95%) |
|---|---|---|---|---|---|
| 2009 | 5,173 | 6,000 | 5,700 | 827 | 555 |
| 2010 | 5,268 | 5,751 | 5,463 | 483 | 206 |
| 2011 | 5,151 | 5,751 | 5,463 | 600 | 329 |
| 2012 | 5,035 | 5,751 | 5,463 | 716 | 451 |
| 2013 | 4,923 | 5,334 | 5,067 | 411 | 152 |
| 2014 | 4,814 | 5,136 | 4,879 | 322 | 69 |
| 2015 | 4,707 | 5,016 | 4,765 | 309 | 62 |
| 2016 | 4,600 | 5,016 | 4,765 | 416 | 174 |
| 2017* | 4,498 | 5,171 | 4,912 | 673 | 436 |
| 2018 | 4,589 | 5,171 | 4,912 | 582 | 340 |
| 2019 | 4,682 | 5,045 | 4,793 | 363 | 117 |
| 2020 | 4,776 | 5,045 | 4,793 | 269 | 18 |

*2017 is the year the parking garage opens

**Figure 8 Main Campus Parking Demand & Supply Projections "Build Parking Scenario"**




**Permit Prices**: In order to balance parking demand and financial stability, parking permit prices go up 7% per year through 2017. It is worth noting that 3% of this increase is just accounting for inflation. This increase works out to the same ultimate permit prices in 2020 as the TDM scenario. Though the price escalation is slightly faster in this Scenario, it ends one year earlier.

## Hill Campus

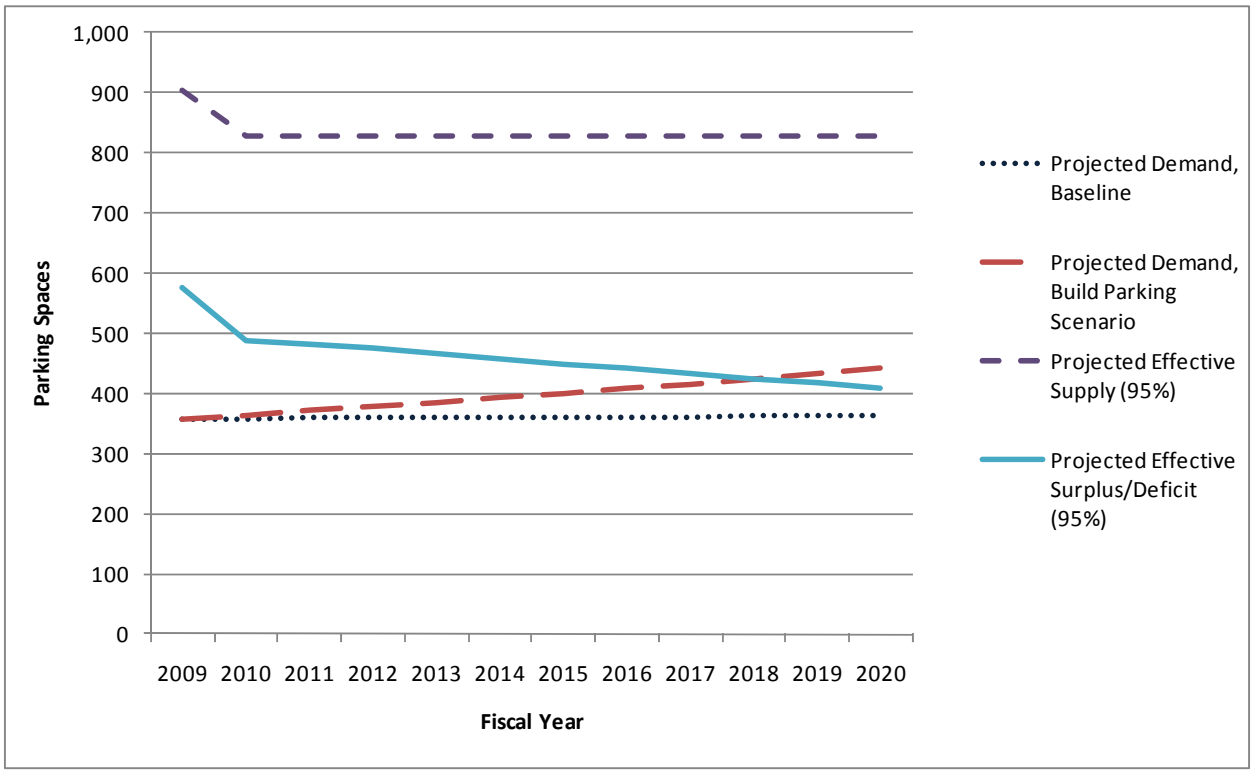
**Parking Demand**: As in the prior Scenario, there will continue to be ample parking in the Hill Campus through 2020. Our analysis projects a parking demand of 441 spaces on the Hill Campus in 2020 under this Scenario. Parking demand is shown in Table 6 and Figure 9 below.

**Table 6 Hill Campus Parking Demand & Supply Projections "Build Parking Scenario"**

| | Projected Parking Demand | Projected Supply | Projected Effective Supply (95%) | Projected Surplus/Deficit | Projected Effective Surplus/Deficit (95%) |
|---|---|---|---|---|---|
| 2009 | 358 | 952 | 904 | 594 | 575 |
| 2010 | 365 | 872 | 828 | 507 | 488 |
| 2011 | 372 | 872 | 828 | 500 | 481 |
| 2012 | 378 | 872 | 828 | 494 | 474 |
| 2013 | 386 | 872 | 828 | 486 | 466 |
| 2014 | 393 | 872 | 828 | 479 | 458 |
| 2015 | 401 | 872 | 828 | 471 | 450 |
| 2016 | 408 | 872 | 828 | 464 | 443 |
| 2017* | 416 | 872 | 828 | 456 | 434 |
| 2018 | 424 | 872 | 828 | 448 | 425 |
| 2019 | 433 | 872 | 828 | 439 | 416 |
| 2020 | 441 | 872 | 828 | 431 | 407 |

**2017 is the year the parking garage opens*

**Figure 9 Hill Campus Parking Demand & Supply Projections "Build Parking Scenario"**




**Permit Prices**: Hill permit prices in this scenario are identical to the prior Scenario. That is, they are kept unchanged.

## Total Campus

**Parking Demand**: Under the Build Parking Scenario, our analysis projects a parking demand of 5,217 spaces for the campus as a whole in 2020, somewhat lower than the demand in the Baseline Scenario. As stated in the Main Campus section above, the reduction in demand is due exclusively to the demand response from pricing increases necessary to pay for the garage.

Parking demand for the whole campus under the Build Parking Scenario is shown in Figure 10 and Table 7 below.

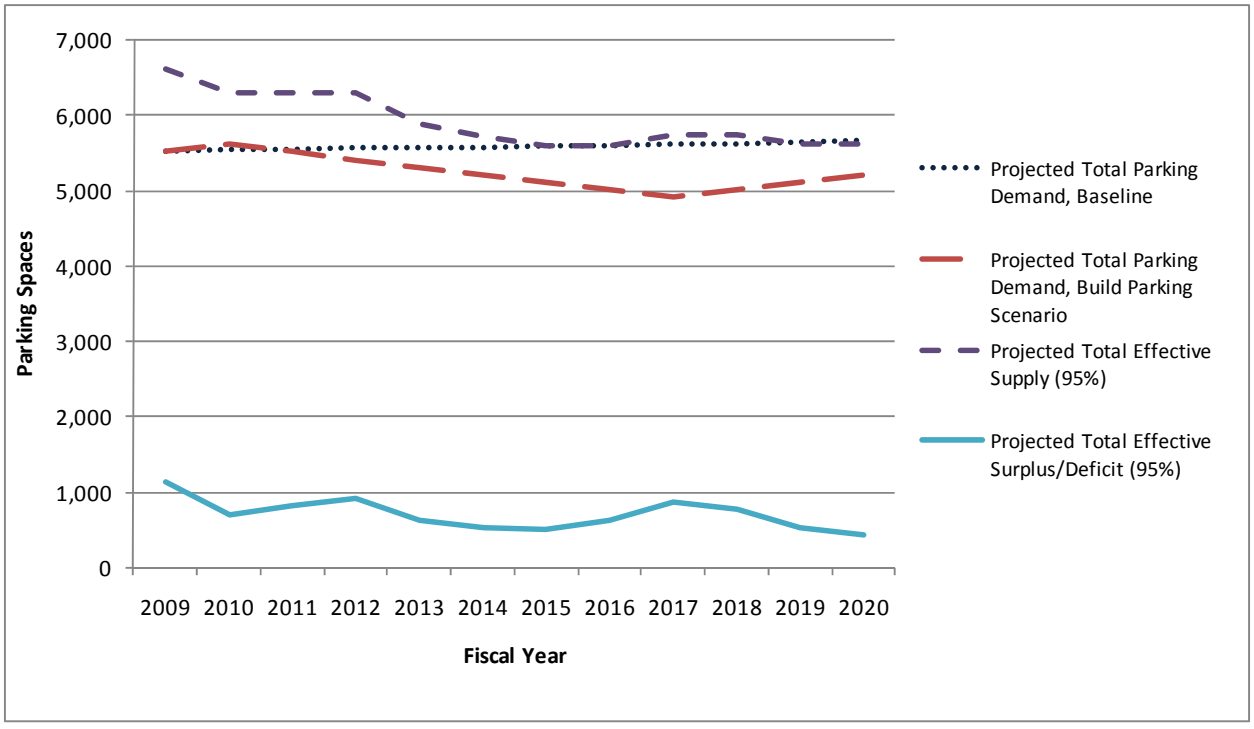
**Table 7 Total Campus Parking Demand/Supply Projections "Build Parking Scenario"**

| | Projected Total Parking Demand, Build Parking Scenario | Projected Total Supply | Projected Total Effective Supply (95%) | Projected Total Surplus/Deficit | Projected Total Effective Surplus/Deficit (95%) |
|---|---|---|---|---|---|
| 2009 | 5,531 | 6,952 | 6,604 | 1421 | 1130 |
| 2010 | 5,632 | 6,623 | 6,292 | 991 | 694 |
| 2011 | 5,523 | 6,623 | 6,292 | 1100 | 809 |
| 2012 | 5,413 | 6,623 | 6,292 | 1210 | 926 |
| 2013 | 5,308 | 6,206 | 5,896 | 898 | 618 |
| 2014 | 5,207 | 6,008 | 5,708 | 801 | 527 |
| 2015 | 5,108 | 5,888 | 5,594 | 780 | 511 |
| 2016 | 5,008 | 5,888 | 5,594 | 880 | 617 |
| 2017* | 4,914 | 6,043 | 5,741 | 1129 | 870 |
| 2018 | 5,013 | 6,043 | 5,741 | 1030 | 766 |
| 2019 | 5,115 | 5,917 | 5,621 | 802 | 533 |
| 2020 | 5,217 | 5,917 | 5,621 | 700 | 425 |

*

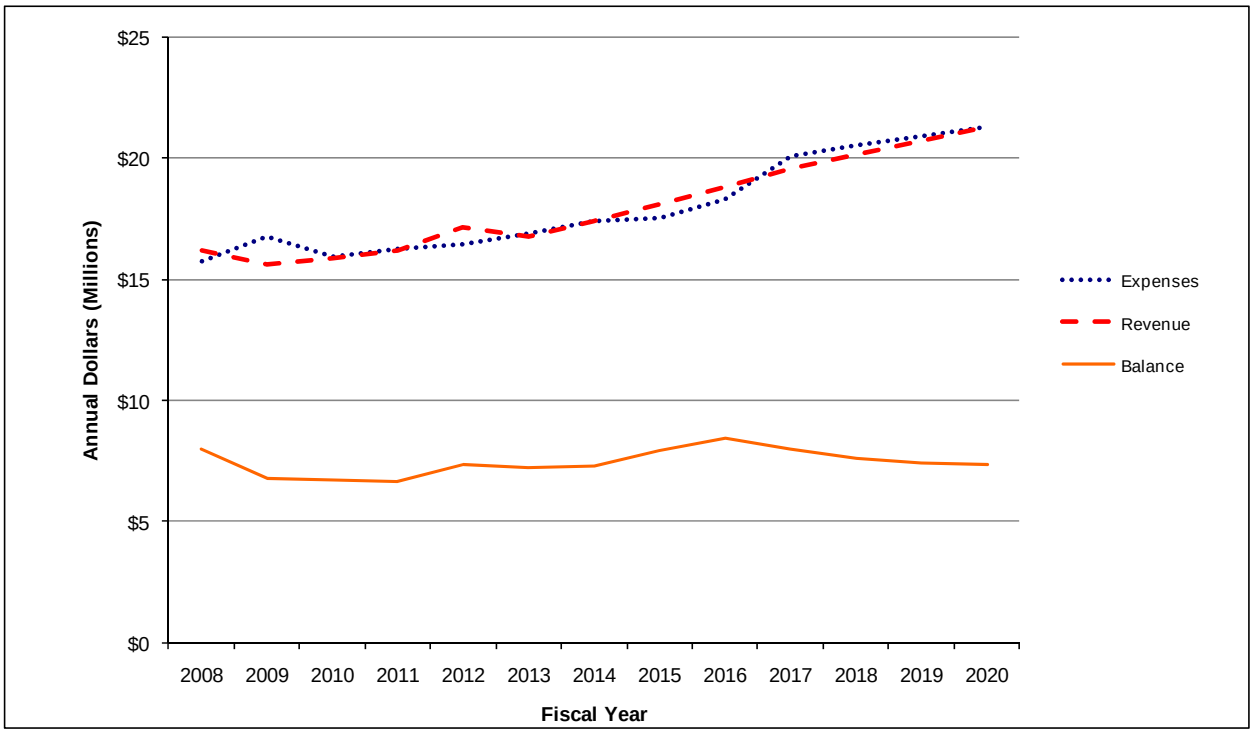
*2017 is the year the parking garage opens*

**Figure 10 Total Campus Parking Demand/Supply Projections "Build Parking Scenario"**



**Financial Projections**: Similar to the analysis done for the other Scenario, parking expense and revenue projections were developed which take into consideration the price adjustments necessary to finance the construction of a parking garage while also ensuring that the parking program meets its fund balance requirement of 125% of the annual debt service. By increasing permit prices on the Main campus as described above, while keeping the Hill Campus prices the same (actually declining in real terms) through 2020, a sufficient account balance is maintained as illustrated in Figure 11 and Table 8 below. The expense information includes costs associated with building the new 450-space parking garage in 2017.

**Figure 11 Financial Projections "Build Parking Scenario"**



# Table 8 Financial Projections "Build Parking Scenario"

| | | |
|---|---|---|
| Loan Period | 35 | years (industry standard) |
| Long-term interest rate: | 6.00% | UCB "Rev Exp Projections (12-23-08).xls (University Hall West) |
| Maintenance cost and ope | $75 | Walker Parking Consultants |
| Maintenance cost and ope | $536 | UCB "Rev Exp Projections (12-23-08).xls (University Hall West) |

SEE 10 YEAR PLAN PT PARKING EXPENDITURES AND REVENUES.XLSX FOR NUMBER REFERENCES

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Construction Cost Index | | | | | 1.00 | 1.03 | 1.06 | 1.09 | 1.13 | 1.16 | 1.19 | 1.23 | 1.27 | 1.30 | 1.34 | 1.38 | 1.43 |
| | Parking Capital Costs in Current $ | | | | Year Built | | | | | | | | | | | | |
| | Spaces Built | Cost per Space | Debt Service | Total | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| University Hall | 450 | $37,500 | $2,587 | $1,163,934 | | | | | | | | | | $1,518,670 | $1,518,670 | $1,518,670 | $1,518,670 |
| Tang | 637 | $33,250 | $2,293 | $1,460,884 | | | | | | | | | | | | | |
| Dana Durant | 203 | $48,750 | $3,362 | $682,583 | | | | | | | | | | | | | |
| Bancroft | 396 | $34,375 | $2,371 | $938,907 | | | | | | | | | | | | | |
| Upper Hearst | 135 | $34,743 | $2,396 | $323,508 | | | | | | | | | | | | | |
| SUBTOTAL | | | | | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $1,518,670 | $1,518,670 | $1,518,670 | $1,518,670 |
| | Parking Operations Costs in Current $ | | | | | | | | | | | | | | | | |
| | | Cost per Space | | | | | | | | | | | | | | | |
| | Spaces Built | Ops & Maintenance | | | | | | | | | | | | | | | |
| University Hall | 450 | $536 | | | | | | | | | | | | $314,711 | $324,153 | $333,877 | $343,894 |
| Tang | 637 | $536 | | | | | | | | | | | | | | | |
| Dana Durant | 203 | $536 | | | | | | | | | | | | | | | |
| Bancroft | 396 | $536 | | | | | | | | | | | | | | | |
| Upper Hearst | 135 | $536 | | | | | | | | | | | | | | | |
| SUBTOTAL | | | | | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $314,711 | $324,153 | $333,877 | $343,894 |
| All Expenses (Salaries, Benefits, Previous Debt Service, etc.) | | | | | 13,417,193 | 13,173,356 | 14,705,510 | 14,951,175 | 15,421,908 | 15,594,951 | 15,912,923 | 16,331,936 | 16,925,007 | 16,884,304 | 17,274,760 | 17,620,255 | 17,972,660 |
| Capital Expenditures | | | | | - | 2,881,988 | 366,895 | 415,769 | 114,752 | 296,922 | 460,971 | 127,227 | 253,486 | 200,835 | 200,835 | 200,835 | 200,835 |
| Admin Reallocation to General Fund | | | | | 1,900,000 | - | - | - | - | - | - | - | - | - | - | - | - |
| Parking Administrative Full Costing | | | | | 354,337 | 584,785 | 672,044 | 701,454 | 756,193 | 788,218 | 821,324 | 855,547 | 890,927 | 927,502 | 965,315 | $ 1,003,927 | $ 1,044,084 |
| Citation Administrative Full Costing | | | | | 51,286 | 94,780 | 115,760 | 120,160 | 125,920 | 130,560 | 135,360 | 140,480 | 145,680 | 151,120 | 156,720 | $ 162,989 | $ 169,508 |
| Transit Ops Administrative Full Costing | | | | | 18,187 | 37,072 | 40,539 | 41,958 | 43,426 | 44,946 | 46,519 | 48,148 | 49,833 | 51,577 | 53,382 | $ 55,250 | $ 57,184 |
| F/S U-PASS | | | | | | | | | | | | | | | | | |
| Marketing/TDM Coordinator | | | | | | | | | | | | | | | | | |
| Bike Sharing (200 Bikes) | | | | | | | | | | | | | | | | | |
| Parking Cash Out | | $1 | | | | | | | | | | | | | | | |
| TOTAL | | | | | $15,741,002 | $16,771,980 | $15,900,747 | $16,230,516 | $16,462,200 | $16,855,597 | $17,377,097 | $17,503,338 | $18,264,933 | $20,048,719 | $20,493,834 | $20,895,803 | $21,306,835 |
| REVENUES | | | | | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
| Commuter Student Permits | | | | | $694,616 | $969,732 | $986,092 | $1,029,329 | $1,039,714 | $1,085,297 | $1,132,943 | $1,178,068 | $1,191,012 | $1,243,333 | $1,264,081 | $1,285,192 | $1,310,241 |
| Resident Student Permits | | | | | $212,424 | $293,145 | $300,675 | $315,611 | $342,592 | $354,246 | $366,306 | $380,211 | $404,603 | $418,384 | $451,405 | $483,821 | $498,969 |
| Faculty/Staff Permits - C | | | | | $2,191,471 | $2,187,360 | $2,231,131 | $2,342,079 | $2,458,611 | $2,581,010 | $2,709,571 | $2,844,606 | $2,986,441 | $3,135,420 | $3,205,898 | $3,277,897 | $3,338,999 |
| Faculty/Staff Permits - F | | | | | $2,467,840 | $3,018,600 | $3,079,004 | $3,232,115 | $3,392,932 | $3,561,845 | $3,739,262 | $3,925,613 | $4,121,348 | $4,326,941 | $4,424,203 | $4,523,563 | $4,607,884 |
| Other Annual Permits | | | | | $ 2,782,198 | $ 1,005,769 | $ 893,336 | $ 950,459 | $ 933,823 | $ 978,107 | $ 1,024,414 | $ 1,072,845 | $ 1,123,569 | $ 1,176,494 | $ 1,231,819 | $ 1,299,569 | $ 1,371,046 |
| Daily Permits | | | | | $ 817,899 | $ 817,899 | $ 830,167 | $ 859,223 | $ 889,296 | $ 920,421 | $ 952,636 | $ 985,978 | $ 1,020,487 | $ 1,056,204 | $ 1,093,171 | $ 1,131,433 | $ 1,171,033 |
| Lot Machine Parking | | | | | $ 1,175,992 | $ 1,175,992 | $ 1,275,992 | $ 1,320,652 | $ 1,366,875 | $ 1,414,715 | $ 1,464,230 | $ 1,515,478 | $ 1,568,520 | $ 1,623,418 | $ 1,680,238 | $ 1,739,046 | $ 1,799,913 |
| Special Event Parking | | | | | $ 1,562,136 | $ 1,585,568 | $ 1,609,352 | $ 1,338,603 | $ 1,668,311 | $ 1,701,677 | $ 1,735,710 | $ 1,770,425 | $ 1,805,833 | $ 1,841,950 | $ 1,878,789 | $ 1,916,365 | $ 1,954,692 |
| Campus Bicycle Plan Project | | | | | $ 75,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Parking Citation Revenue | | | | | $ 1,283,123 | $ 1,354,000 | $ 1,447,000 | $ 1,502,000 | $ 1,574,000 | $ 1,632,000 | $ 1,692,000 | $ 1,756,000 | $ 1,821,000 | $ 1,889,000 | $ 1,959,000 | $ 2,031,483 | $ 2,106,648 |
| Fare Box and Ticket Sales | | | | | $ 38,758 | $ 40,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Class Pass Revenue (Night Safety) | | | | | $ 735,881 | $ 882,000 | $ 882,000 | $ 882,000 | $ 1,026,000 | | | | | | | | |
| Bear Pass Revenue | | | | | $ 415,921 | $ 489,600 | $ 506,736 | $ 524,472 | $ 542,829 | $ 561,828 | $ 581,492 | $ 601,844 | $ 622,909 | $ 644,711 | $ 667,276 | $ 690,631 | $ 714,803 |
| BART Tickets | | | | | $ 1,705,872 | $ 1,755,342 | $ 1,806,247 | $ 1,858,628 | $ 1,912,528 | $ 1,967,991 | $ 2,025,063 | $ 2,083,790 | $ 2,144,220 | $ 2,206,402 | $ 2,270,388 | $ 2,336,229 | $ 2,403,980 |
| 19900 Driver Funding | | | | | $ 46,615 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| TOTAL REVENUES | | | | | $16,205,746 | $15,575,007 | $15,847,731 | $16,155,170 | $17,147,510 | $16,759,137 | $17,423,628 | $18,114,858 | $18,809,943 | $19,562,257 | $20,126,268 | $20,715,230 | $21,278,206 |
| BALANCE | | | | $ 7,508,203 | $7,972,947 | $6,775,974 | $6,722,958 | $6,647,611 | $7,332,921 | $7,236,460 | $7,282,991 | $7,894,511 | $8,439,521 | $7,953,058 | $7,585,492 | $7,404,919 | $7,376,290 |

# APPENDIX B

## UNIVERSITY OF CALIFORNIA, BERKELEY
## PARKING SUPPLY & DEMAND ASSESSMENT:
## BASELINE (STATUS QUO) SCENARIO
## FINAL TECHNICAL MEMORANDUM

UNIVERSITY OF CALIFORNIA, BERKELEY

# Parking Supply & Demand Assessment:

# Baseline (Status Quo) Scenario

## Final Technical Memorandum

Nelson\Nygaard Consulting Associates
785 Market Street, Suite 1300
San Francisco, CA 94103

**May 2010**

Nelson|Nygaard
consulting associates

# Summary

This memorandum provides a preliminary assessment of future parking supply and demand at UC Berkeley, analyzing the period from the present day through the year 2020. It is intended to provide a "baseline scenario", describing what would happen if status quo parking and transportation policies were maintained for the next 10 years, even as the proposed campus building program goes forward. This report is designed as an interim, working document. Its purpose is to provide a baseline scenario against which proposed policy changes may be compared.

This memorandum does *not* provide recommendations. Recommendations about parking and transportation policies, facilities, programs and services will be provided in future reports.

In essence, this memorandum describes what can be expected to happen if current parking and transportation policies are left unchanged, current transit and transportation demand management programs are maintained at their current levels of service, and no new or replacement parking facilities are built, even as new buildings are built on campus. This “baseline scenario” makes the following basic assumptions[1]:

1. "Status quo" parking policies and prices will be maintained. Specifically, campus-managed permit parking prices for all user groups are assumed to increase at the rate of inflation, so that real (i.e. inflation-adjusted) prices remain unchanged, and therefore exert no influence on current behavior. Parking privileges for all groups are assumed to remain unchanged.

2. Parking prices for nearby, publicly available parking (in private and City-owned lots and garages) are also assumed to increase only at the rate of inflation, and the availability of these facilities to campus affiliates is assumed to remain unchanged.

3. Similarly, “status quo” transit prices and levels of transit service are assumed to continue. For example, the student Class Pass program, where all students pay a fee in exchange for unlimited access to all AC Transit buses, is assumed to continue.

4. Campus population shifts will occur, with the total headcount of faculty and staff growing from 15,016 in 2009 to 15,810 in 2020, while student population declines from 34,525 in 2009 to 33,450 in 2020, and the number of visitors projected to stay even at 2,000 (per the 2020 LRDP EIR Table 3.1-1). This means that overall, campus population is projected to slightly *decline*, from 51,549 people in 2009 to 51,260 in 2020.

5. The proposed campus building program will go forward, with built space increasing by approximately 10%, from roughly 13 million square feet in 2009 to 14.3 million square feet in 2020.

[1]Population, built square footage and parking facility displacement projections were provided by Physical & Environment Planning staff. Parking occupancy and inventory counts were provided by Parking & Transportation Services staff.

6. As existing surface parking lots and structures make way for new buildings, 1,485 campus-managed parking spaces will be displaced.

7. No replacement parking facilities are built, no transit service improvements are made, and no new transportation demand management programs are instituted.

Under these status quo assumptions, the following results can be expected to occur by the year 2020:

1. Although overall campus population is projected to *decrease* slightly, parking demand can be expected to *increase* slightly. This is because the projected decline in student population (and therefore in student parking demand) will be more than offset by growth in faculty/staff parking demand. While student population will decline by more than 1,000, since only 7% of commuter students drive alone to campus, and only 4% of resident students have campus parking permits, the effect of this population change on parking demand is fairly small. With faculty/staff population increasing by nearly 800, and a drive-alone rate among faculty/staff of 47%, the net result is that parking demand increases**. By 2020, peak-hour parking demand is expected to increase from 5,531 to 5,658 spaces.**

2. Currently, the campus has 6,952 parking spaces, 80% of which (5,531 spaces) are occupied at the peak hour. (Note that some campus parking facilities are currently in high demand, while others are underused, so that spot shortages and surpluses do exist.) **Removing 1,485 parking spaces to make way for new buildings would leave the campus with 5,467 spaces.**

3. **If no replacement parking facilities are built, no prices change (after adjusting for inflation), and no new transit services or transportation demand management programs are instituted, the net result would be a campus with 5,467 parking spaces and peak-hour parking demand for 5,658 vehicles.** Even if every single campus parking space were filled, 191 vehicles among the population who currently drive and use campus-managed parking would still be left unserved at peak hour.

4. Most parking system operators seek to have a cushion of available parking spaces left over even at the peak hour of parking demand, so that customers need not search the entire parking system to find the last available parking space, and to allow for a variety of other occurrences, such as temporary construction losses. Assuming that UC Berkeley should have at least 5% of the parking supply vacant at the peak hour, an appropriate parking supply to serve the projected peak hour parking demand of 5,658 parked vehicles would be 5,956 parking spaces (5,658 ÷ 95%). **Since only 5,467 spaces would be left on campus in 2020, and 5,956 would be needed to achieve a vacancy rate of 5% at the peak hour, the gap between supply and demand under the assumptions of this baseline scenario is 489 parking spaces.**

The pages that follow describe this parking supply and demand assessment in more detail. Cost estimates for replacement parking facilities are also provided. Future memoranda and reports will provide recommendations about how to close this identified "gap" between projected parking supply and parking demand.

# Introduction

In order to describe the current parking supply and demand at UC Berkeley and then estimate future parking supply and demand, a multi-stage model was developed as outlined below.

The steps in making the model are the following:

1. Review current parking supply (i.e. campus-managed permitted spaces) and demand and current population, by user group (faculty/staff, students);

2. Project future population for each user group;

3. Estimate peak-hour parking demand ratios for each user group;

4. Estimate resulting future parking demand for each user group;

5. Project parking supply changes;

6. Summarize locational parking impacts;

# Input Variables

The model requires numerous inputs. The sources for each input are listed in parentheses:

- Campus population of commuter students, resident students, and faculty/staff – current and projected (Office of Physical & Environmental Planning);

- Built space – current and projected (Office of Physical & Environmental Planning);

- Future campus parking displacement (Office of Physical & Environmental Planning);

- Growth in resident student beds (Office of Physical & Environmental Planning);

- Number of existing parking spaces on campus (Parking & Transportation Department);

- Parking utilization rates – current (Parking & Transportation Department);

- Parking permit sales – current (Parking & Transportation Department);

# Model Assumptions

In any model, a number of assumptions must be made. To create a baseline scenario, which projects what would happen if "status quo" parking and transportation policies were maintained, even as new campus buildings are built and population shifts occur, we employed the following assumptions:

- "Status quo" parking policies and prices will be maintained. Specifically, parking prices for all user groups are assumed to increase at the rate of inflation, so that real (i.e. inflation-adjusted) prices remain unchanged, and therefore exert no influence on current behavior.

- Parking privileges for all groups are assumed to remain unchanged.

- Parking prices for nearby, publicly available parking (in private and City-owned lots and garages) are also assumed to increase only at the rate of inflation, and the availability of these facilities to campus affiliates is assumed to remain unchanged.

- Similarly, "status quo" transit prices and levels of transit service are assumed to continue. For example, the student Class Pass program, which provides all students with free access to all AC Transit buses, is assumed to continue.

- For all parking spaces, this study uses an "effective parking supply factor" of 95%. Effective supply is defined as the total number of parking spaces in a lot, less the percentage of spaces that the parking operator wishes to have vacant even at the typical peak hour. Choosing an effective parking supply factor of 95% means that the operator wishes to have 5% of the parking supply vacant at peak hour. This provides a cushion of spaces to reduce the search time for the last few available parking stalls and to allow for vehicles moving into and out of parking stalls during peak periods. This cushion also allows for unanticipated variations in parking activity as well as the temporary loss of spaces due to improperly parked vehicles, construction or other factors. The effective supply cushion also compensates for the inefficiencies in the utilization of available supply due to the segregation of spaces for various user groups (e.g. special events).

## Parking Supply & Demand

The parking supply monitored by University staff showed a total campus parking inventory of 6,952 spaces.[2] The parking supply includes all space types: permitted (C, F, S), Resident Hall, Special Area, Department Reserved, Disabled Persons, Motorcycle, Physical Plant Reserved, Carpool, Public Parking, Loading/Unloading, and "Other". Parking occupancy counts conducted by Parking & Transportation staff in Fall 2009 show a peak-period demand of 5,531 occupied spaces (80% of total).[3] The parking occupancy also includes all vehicle and permit types. The parking supply and occupancy was as follows:

[2] Parking occupancy and inventory counts were provided by Parking & Transportation Services staff.
[3] Total spaces include attendant parking (i.e. spaces created by parking cars more than one car deep, using parking attendants to move vehicles).

**Figure 1 2009 Parking Inventory and Occupancies**

| Facility Name | Inventory | | Spaces Occupied | Occupancy Rate | Facility Name | Inventory | | Spaces Occupied | Occupancy Rate |
|---|---|---|---|---|---|---|---|---|---|
| | Marked Spaces | Attendant Spaces | | | | Marked Spaces | Attendant Spaces | | |
| Anna Head Annex | 16 | 0 | 8 | 50% | Haste/Channing Parking | 39 | 0 | 29 | 74% |
| Anna Head Lot | 55 | 0 | 51 | 93% | Hearst Gym | 8 | 0 | 8 | 100% |
| Anna Head Lot - West | 166 | 0 | 138 | 83% | Hearst Gym Westside | 2 | 0 | 2 | 100% |
| Bancroft 2111 Lot | 49 | 0 | 22 | 45% | Hesse Service Area | 10 | 0 | 9 | 90% |
| Bancroft Structure | 131 | 30 | 153 | 95% | Hildebrand | 14 | 0 | 14 | 100% |
| Bancroft/Fulton Lot | 225 | 54 | 268 | 96% | Hildebrand Loading | 1 | 0 | 1 | 100% |
| Bancroft/Fulton West Lot | 32 | 0 | 29 | 91% | Kleeberger Lot | 31 | 0 | 25 | 81% |
| Barker Hall lot | 6 | 0 | 5 | 83% | Kroeber Lot | 21 | 0 | 21 | 100% |
| Barrows annex | 4 | 0 | 2 | 50% | LHS - Circle | 10 | 0 | 1 | 10% |
| Barrows Hall - East | 2 | 0 | 2 | 100% | LHS - East Lot | 53 | 0 | 37 | 70% |
| Barrows Lane | 34 | 0 | 34 | 100% | LHS - Staff Lot | 85 | 0 | 51 | 60% |
| Bechtel Drive | 2 | 0 | 1 | 50% | LHS - Terrace 1 | 44 | 0 | 1 | 2% |
| Boalt Lot & Garage | 133 | 30 | 161 | 99% | LHS - Terrace 2 | 54 | 0 | 0 | 0% |
| Botanical Gardens Parking Lot | 79 | 0 | 34 | 43% | LHS - Terrace 3 | 53 | 0 | 1 | 2% |
| Bowles Lot | 70 | 0 | 70 | 100% | LHS - Vista Lot | 58 | 0 | 20 | 34% |
| Campanile Way | 9 | 0 | 8 | 89% | Lower Hearst Structure | 622 | 150 | 670 | 87% |
| Campbell Service Area | 4 | 0 | 4 | 100% | Manville Parking Lot | 18 | 0 | 13 | 72% |
| Carleton Street | 15 | 0 | 13 | 87% | Minor Hall Lane | 10 | 0 | 10 | 100% |

| Facility Name | Inventory | | Spaces Occupied | Occupancy Rate | Facility Name | Inventory | | Spaces Occupied | Occupancy Rate |
|---|---|---|---|---|---|---|---|---|---|
| | Marked Spaces | Attendant Spaces | | | | Marked Spaces | Attendant Spaces | | |
| Centennial Drive | 11 | 0 | 10 | 91% | MLK Student Union Garage | 107 | 0 | 72 | 67% |
| Centennial Lot | 3 | 0 | 1 | 33% | Moffit Loading Area | 5 | 0 | 4 | 80% |
| Clark Kerr - Bldg 20 | 32 | 0 | 21 | 66% | Moses Court | 9 | 0 | 9 | 100% |
| Clark Kerr - Bldg 23 | 2 | 0 | 0 | 0% | Mulford Lot | 10 | 0 | 7 | 70% |
| Clark Kerr - Bldg. 19 | 9 | 0 | 5 | 56% | Oxford Tract Lot North | 17 | 0 | 13 | 76% |
| Clark Kerr - Bldg. 4 Lot | 12 | 0 | 12 | 100% | Oxford Tract Lot South | 6 | 0 | 6 | 100% |
| Clark Kerr - Court St | 16 | 0 | 12 | 75% | Prospect Court | 67 | 0 | 64 | 96% |
| Clark Kerr - Golden Bear Lot | 23 | 0 | 17 | 74% | Ridge Lot | 21 | 0 | 21 | 100% |
| Clark Kerr - Heating Plant Lot | 17 | 0 | 16 | 94% | RSF Parking Garage | 237 | 67 | 287 | 94% |
| Clark Kerr - Horseshoe | 11 | 0 | 10 | 91% | Sather Lot | 7 | 0 | 7 | 100% |
| Clark Kerr - NW Lot | 40 | 0 | 26 | 65% | South Drive | 29 | 0 | 28 | 97% |
| Clark Kerr - Sports Lane | 16 | 0 | 10 | 63% | Sproul Lot | 20 | 0 | 19 | 95% |
| Clark Kerr - SW Lot | 167 | 0 | 121 | 72% | SSL - Access Road | 25 | 0 | 5 | 20% |
| Clark Kerr North Street | 16 | 0 | 13 | 81% | SSL - Loading | 2 | 0 | 1 | 50% |
| College Lot | 25 | 0 | 19 | 76% | SSL - Lower Lot | 29 | 0 | 6 | 21% |
| Dana/Durant Lot | 86 | 40 | 125 | 99% | SSL - Upper Lot | 48 | 0 | 40 | 83% |
| Donner Lab Lot | 13 | 0 | 11 | 85% | Stadium Lot | 33 | 0 | 32 | 97% |
| Donner Meters | 3 | 0 | 1 | 33% | Stadium Rimway Lot | 31 | 0 | 30 | 97% |
| Dwight Way Lot | 27 | 0 | 7 | 26% | Steam Plant Lot | 6 | 0 | 6 | 100% |
| Dwinelle Annex | 13 | 0 | 13 | 100% | Stern West Firelane | 1 | 0 | 0 | 0% |

| Facility Name | Inventory | | Spaces Occupied | Occupancy Rate | Facility Name | Inventory | | Spaces Occupied | Occupancy Rate |
|---|---|---|---|---|---|---|---|---|---|
| | Marked Spaces | Attendant Spaces | | | | Marked Spaces | Attendant Spaces | | |
| Dwinelle Lot | 90 | 30 | 116 | 97% | Tang Center Lot | 11 | 0 | 5 | 45% |
| Edwards Field South | 4 | 0 | 3 | 75% | Tolman Hall Breezeway | 18 | 0 | 14 | 78% |
| Edwards Track | 1 | 0 | 1 | 100% | Underhill Parking Structure | 1011 | 0 | 799 | 79% |
| Ellsworth Structure | 198 | 0 | 170 | 86% | Unit 1 Lot | 34 | 0 | 33 | 97% |
| Epworth Lot - West | 8 | 0 | 7 | 88% | Unit 2 Lot | 5 | 0 | 1 | 20% |
| Eshleman Road | 11 | 0 | 10 | 91% | University Drive | 17 | 0 | 14 | 82% |
| Etcheverry West | 9 | 0 | 7 | 78% | University Hall Structure | 258 | 73 | 324 | 98% |
| Eucalyptus Grove | 6 | 0 | 4 | 67% | University Hall Well | 19 | 0 | 19 | 100% |
| Evans Loading Dock | 4 | 0 | 3 | 75% | University Hall West | 29 | 0 | 26 | 90% |
| Extension Lot North | 8 | 0 | 7 | 88% | Upper Hearst Structure | 336 | 80 | 403 | 97% |
| Extension Lot South | 24 | 0 | 6 | 25% | Valley Life Sciences Service A | 4 | 0 | 2 | 50% |
| Faculty Club Lane | 7 | 0 | 6 | 86% | Warren Hall, NE Construction | 2 | 0 | 2 | 100% |
| Foothill Lot | 229 | 0 | 62 | 27% | Warren Hall, SE Construction | 2 | 0 | 2 | 100% |
| Frank Schlessinger Way | 82 | 0 | 66 | 80% | Wellman Court Yard | 42 | 0 | 36 | 86% |
| Genetics Garage | 321 | 0 | 269 | 84% | West Circle | 12 | 0 | 9 | 75% |
| Girton Hall North | 1 | 0 | 0 | 0% | West Crescent | 28 | 0 | 19 | 68% |
| Greek Theater | 5 | 0 | 5 | 100% | Wickson Road | 20 | 0 | 19 | 95% |
| Haas Pavilion Lot | 9 | 0 | 8 | 89% | Witter Field Lot | 113 | 0 | 29 | 26% |

| Facility Name | Inventory | | Spaces Occupied | Occupancy Rate | Facility Name | Inventory | | Spaces Occupied | Occupancy Rate |
|---|---|---|---|---|---|---|---|---|---|
| | Marked Spaces | Attendant Spaces | | | | Marked Spaces | Attendant Spaces | | |
| Haas School North | 2 | 0 | 2 | 100% | | | | | |
| Haas School South | 1 | 0 | 0 | 0% | Total | 6,398 | 554 | 5,531 | 80% |

Since University parking counts do not currently distinguish by permit type (e.g. student, faculty/staff), this analysis relies upon permit sales as a proxy to gauge current demand by group. As shown in Figure 2, peak parking demand by group was calculated by dividing the total parking demand by the total parking permits sold and multiplying that ratio by each group's number of permits sold. For example, out of a total of 5,913 parking permits sold, 1,314 (or 22.2%) were sold to commuter students. Therefore, 22.2% of total peak-period parking demand was estimated to be commuter student parking demand. Total peak-period parking demand was 5,531 spaces occupied: 22.2% of this figure equals 1,229 parking spaces used by commuter students. Using the same procedure, peak parking demand for resident students and faculty/staff was also estimated, as shown in Figure 2.

**Figure 2 Parking Demand, Estimated by User Group**

| User (Pass) | Population 2009 (a) | Permits Sold (b) | Peak Parking Demand (c) | Parking Demand Ratio (d) = (c/a) |
|---|---|---|---|---|
| Commuter Student (S) | 26,253 | 1,314 | 1,229 | 0.05 |
| Resident Student (RH) | 8,272 | 334 | 312 | 0.04 |
| Faculty, Staff, and Visitors (F & C) | 17,016 | 4,265 | 3,989 | 0.23 |
| Total | 51,541 | 5,913 | 5,531 | 0.11 |

Based on the estimated peak parking demand of each group and their respective populations (i.e. potential number of parkers), we can derive basic demand ratios for campus-managed parking. In the 2009-2010 academic year, there were 26,253 commuter students, 8,272 resident students, and 17,016 faculty, staff, and visitors.[4] Using the ratio of peak period parking demand for each group to the population for each group, we can establish that the peak parking demand rates for these three groups are 0.05, 0.04 and 0.23 vehicles per person, respectively (0.11 for all groups combined). During the same academic year, the numbers of parking permits sold to each group were 1,314, 334 and 4,265, respectively (see Figure 2).

## Campus Growth

UC Berkeley is steadily growing in building space despite its land constraints, but its overall population is projected to *decline* slightly by 2020. As a result of growth in both education and research functions on campus, University staff project the total headcount of faculty and staff to grow from 15,016 in 2009 to 15,810 in 2020. Conversely, the number of students is anticipated to decline from 34,525 in 2009 to 33,450 in 2020 per the UC Berkeley 2020 LRDP.

Construction of new campus residential facilities will increase the residential student population, while the commuter student population will decline. The rise in faculty and staff is matched by a growth in built square footage as building space will grow from roughly 13 million square feet in 2009 to 14.3 million square feet in 2020. Figure 3 shows both the anticipated increases in population and square feet of built space through 2020.

[4] Population, built square footage and parking facility displacement projections were provided by Physical & Environment Planning staff.

It should be noted that the built space numbers include both projected residential housing development and planned academic structures such as the downtown Helios facility.

**Figure 3 Population & Building Space Projections[5]**

| Population/ Area | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| Commuter Students | 26,253 | 26,156 | 26,058 | 25,536 | 25,438 | 25,341 |
| Resident Students | 8,272 | 8,272 | 8,272 | 8,696 | 8,696 | 8,696 |
| Faculty | 6,361 | 6,407 | 6,452 | 6,497 | 6,543 | 6,588 |
| Staff | 8,655 | 8,682 | 8,709 | 8,735 | 8,762 | 8,789 |
| Visitors | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Campus Population | 51,541 | 51,516 | 51,490 | 51,465 | 51,439 | 51,414 |

| Population/ Area | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Commuter Students | 25,193 | 24,695 | 24,597 | 24,500 | 24,402 | 24,254 |
| Resident Students | 8,746 | 9,146 | 9,146 | 9,146 | 9,146 | 9,196 |
| Faculty | 6,633 | 6,679 | 6,724 | 6,769 | 6,815 | 6,860 |
| Staff | 8,816 | 8,843 | 8,870 | 8,896 | 8,923 | 8,950 |
| Visitors | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 | 2,000 |
| Campus Population | 51,388 | 51,362 | 51,337 | 51,311 | 51,286 | 51,260 |

The growth in resident students will take place gradually through 2020. Figure 4 shows the planned expansion of resident student facilities outlined by the University.

**Figure 4 Planned Resident Student Housing**

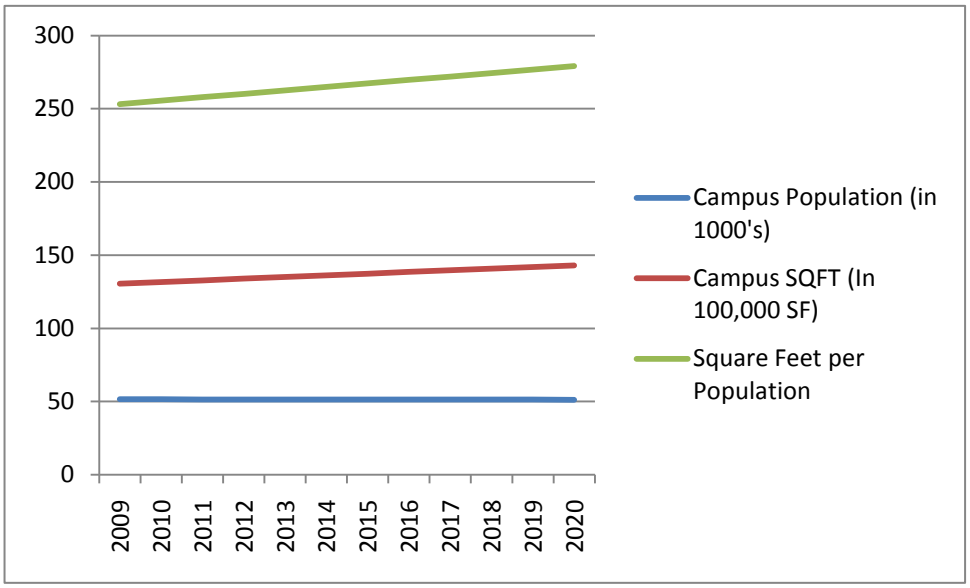
| Facility Location | Number of Beds | Year of Opening |
|---|---|---|
| Anna Head | 424 | 2012 |
| Bancroft/Fulton | 50 | 2015 |
| Channing/Ellsworth | 400 | 2016 |
| Dana Durant | 50 | 2020 |

The campus population is expected to decline from 51,541 to 51,260. As a result of this decline and the planned growth of campus buildings, including housing, the number of square feet per person will increase. Currently, there are 253 square feet of built space per person whereas by 2020, the campus will have 279 square feet per person. Newly

[5] Population projections assume a linear decrease from 2009 to 2020. Built space estimates include the potential maximum square footage of development on each of the following parking lots to close: Anna Head West (130,000), Ellsworth Structure (150,000), Memorial Stadium (150,000), Boalt Lot (100,000), Bancroft Structure (100,000), Dwinelle Lot (100,000), Dana Durant (100,000), Oxford DHS Lot (412,600), University Hall Structure (150,000), and Bancroft/Fulton (150,000).

constructed buildings can be expected to create new focal points of parking demand, but the growth in square feet per person shows that some of the new building users will simply be shifting from other points on campus rather than creating new demand for the campus as a whole, as shown in Figure 5.

**Figure 5 Campus Growth**




## Baseline Scenario

As described earlier, this baseline scenario projects parking supply and demand through 2020 assuming a continuation of existing policy conditions and an assumption that user behavior remains unchanged.

## Future Parking Demand

Using the parking ratios from Figure 2 in combination with population change estimates, we can estimate future parking demand under this "status quo" scenario. By 2020, total peak-period demand for campus-managed spaces is expected to rise from 5,531 to 5,658 spaces with the overall peak parking demand ratio staying level at 0.11. It should be noted that these figures are strictly based on current parking demand rates, and do not take into account changes in parking behavior due to higher permit price increases or highly incentivized transportation demand management measures.

**Figure 6 Projected Parking Demand in 2020**

| User | 2009 Population (a) | 2009 Peak Parking Demand (b) | 2009 Peak Parking Ratio (c) = (b/a) | 2020 Population (d) | 2020 Peak Parking Ratio (e) | 2020 Peak Parking Demand (f) = (d*e) |
|---|---|---|---|---|---|---|
| Commuter Student | 26,253 | 1,229 | 0.05 | 24,254 | 0.05 | 1,136 |
| Resident Student | 8,272 | 312 | 0.04 | 9,196 | 0.04 | 347 |
| Faculty, Staff, and Visitors | 17,016 | 3,989 | 0.23 | 17,810 | 0.23 | 4,176 |
| Total | 51,541 | 5,531 | 0.11 | 51,260 | 0.11 | 5,658 |

There are some UC affiliates parked off-campus. This includes some commuters who park in downtown garages because they work in downtown office space. It includes an unknown number of affiliates who park off-campus on the street or in other private lots.

## Future Parking Supply

Given the current and future peak parking demand figures, we can develop an estimate for the appropriate supply of parking under this baseline scenario. This study uses an "effective parking supply factor" of 95%. Effective supply is defined as the total number of parking spaces, less the percentage of spaces that the parking operator wishes to have vacant even at the typical peak hour. Choosing an effective parking supply factor of 95% means that the operator wishes to have 5% of the parking supply vacant at the peak hour. This provides a cushion of spaces to reduce the search time for the last few available parking stalls and to allow for the dynamics of vehicles moving in to and out of parking stalls during peak periods. This cushion also allows for unanticipated variations in parking activity as well as the temporary loss of spaces due to improperly parked vehicles, construction, and other factors. The effective supply cushion also compensates for the loss of utilization and efficiency due to the segregation of spaces for various user groups (e.g. special events). For example, there are currently 6,952 spaces supplied for the university with 5,531 spaces being occupied at peak hour. An appropriate amount of parking for this demand would be 5,822 spaces (5,531 ÷ 95%). Since there are 6,952 spaces currently built, there is presently an oversupply of 1,130 spaces more than is necessary to provide a 5% cushion.[6] By applying this 5% "cushion" in 2020, we estimate the total amount of parking needed to be 5,956 spaces (see Figure 7).

[6] The 95% effective parking supply factor is suitable for universities that experience relatively low parking turnover. Higher turnover uses, such as retail, should use a lower effective parking supply factor.

**Figure 7 Projected Parking Demand with Effective Supply Cushion in 2020**

| User | 2009 Population (a) | 2009 Peak Parking Demand (b) | 2009 Appropriate Parking Supply (c) = (b/.95) | 2020 Population (d) | 2020 Peak Parking Demand (e) | 2020 Appropriate Parking Supply (f) = (e/.95) |
|---|---|---|---|---|---|---|
| Commuter Student | 26,253 | 1,229 | 1,294 | 24,254 | 1,136 | 1,195 |
| Resident Student | 8,272 | 312 | 329 | 9,196 | 347 | 366 |
| Faculty & Staff | 17,016 | 3,989 | 4,199 | 17,810 | 4,176 | 4,395 |
| Total | 51,541 | 5,531 | 5,822 | 51,260 | 5,658 | 5,956 |

## Comparing Estimated Baseline Parking Demand to LRDP Estimates

The UC Berkeley 2020 Long Range Development Plan (LRDP) suggested that the campus parking supply should be increased up to 9,990 parking spaces.[7] As described in Table 3.1-2, Projected Space Demand, of the 2020 LRDP, the actual parking space count in 2001-2002 was 6900, a net additional 100 spaces were completed by March 2004, and an additional 690 were approved as of the writing of the LRDP, for a total of 7690 "Actual + Approved" spaces[8]. The LRDP estimated that to meet continuing demand not accommodated in the campus supply, and projected campus growth, would require up to 2300 net new parking spaces beyond the 7690 "Actual + Approved" spaces, for a total of 9990.[9]

As the LRDP explains:

> The projected campus growth under the 2020 LRDP could, at target drive-alone rates of 10% for students and 50% for employees, result in a demand by 2020 for up to 2,300 net new parking spaces beyond the current inventory and approved projects. However, while this figure includes substantial current unmet demand as well as future growth, it could be reduced if drive-alone rates could be improved through a combination of transit incentives and transit service improvements, as described below.
>
> As with housing, because the State provides no funds for university parking, the full cost of parking construction, operation and maintenance must be supported by revenues. Our objectives to improve the parking supply must therefore be balanced by the need to maintain reasonable fees for those who must drive to campus, and to avoid building surplus capacity. The 2020 targets may be

[7] *University Of California, Berkeley 2020 Long-Range Development Plan EIR*, Volume 3A, p. 3.1-28.
[8] *University Of California, Berkeley 2020 Long-Range Development Plan EIR*, Volume 3A, p. 3.1-14.
[9] Ibid. Note that the LRDP assumed that 500 of these new spaces could "be deferred until after 2020 if the AC Transit Bus Rapid Transit/Telegraph route is approved and the system is under construction by January 2010"; further, the LRDP Litigation Settlement Agreement between the campus and the City of Berkeley determined that only 1,270 net new parking spaces could be approved under the 2020 LRDP without preparation of a project-specific EIR. See pp 13-14 of the Agreement at lrdp.berkeley.edu.

> adjusted in the future to reflect changes in market conditions and parking demand.[10]

By comparison, using the methodology described in this memorandum, we estimate that *at current prices, under current policies, and without accommodating unmet demand that may currently be accommodated by other private, public, or on street parking,* the peak parking demand for campus-managed parking in the year 2020 will be 5,658 spaces, resulting in an appropriate parking supply of 5,956 spaces (see Figure 6 and 7). It should be noted that the methodology used in this memorandum is based upon comparing the number of vehicles observed to be parked in campus-managed parking facilities, at the peak hour, to campus population.

By contrast, the LRDP parking demand estimates employed a different methodology, and understandably, arrived at a different estimate of what future parking demand could be. Providing a detailed comparison of the reasons for the differences between the baseline scenario described in this working paper and the estimate provided in the LRDP is beyond the scope of work of this phase of work.

However, it is important to note that the assessment in this working document is intended only to provide a baseline estimate of future parking demand for campus-managed parking spaces. This memorandum estimates how many vehicles would park in campus-managed parking facilities in the future, *if current prices and current policies were to be maintained on campus and by local parking providers*. If current policies were to be changed, quite different results could be expected. For example, if parking prices for campus-managed parking facilities were substantially lowered, then the peak parking occupancy of these facilities could be expected to increase substantially. In that circumstance, with substantially lower prices, it is quite likely that parking permit sales would increase, and additional permit-holders would then park in campus-managed facilities.

The purpose of this working document is not, as stated earlier, to recommend parking prices or other policy changes. Its purpose is only to provide a baseline scenario against which proposed policy changes may be compared. Recommendations about parking and transportation policies, facilities, programs and services will be provided in future reports.

Although the LRDP offers a maximum on the amount of parking needed, the University is currently planning for the closure of several lots by 2020 to make way for new student housing and academic building use. Figure 8 shows the lots to be closed with their corresponding year of closure and number of spaces.

[10] *University Of California, Berkeley 2020 Long-Range Development Plan EIR*, Volume 3A, p. 3.1-28.

**Figure 8 Parking Lot Closures**[11]

| Parking Location | Year of Closure | Permit types served | Parking Spaces |
|---|---|---|---|
| Anna Head West | 2010 | Public Parking | 216 |
| Stadium | 2010 | C, F, S | 33 |
| Witter Lot | 2010-2012 | C,F,S, DP | 80 |
| University Hall Structure | 2013 | C, F, S, CP, DP | 138[12] |
| Bancroft Fulton | 2013 | C,F,S, CP, DP, DR | 279 |
| Ellsworth Structure | 2014 | C,F,S,RH,DP, OTH | 198 |
| Dwinelle Lot | 2015 | C,DR,DP | 120 |
| Boalt Lot | 2017 | C,DR,PP-CS,DP | 134 |
| Bancroft Structure | 2017 | C, DR, DP | 161 |
| Dana Durant | 2019 | F, DR, CP, OTH | 126 |
| TOTAL | | | 1,485 |

These lot closures will be combined with a gradual increase in parking demand as faculty and staff experience higher parking ratios than students (see Figure 2). If, as is assumed in the baseline scenario, parking prices are raised each year to simply keep real (inflation-adjusted) permit prices at current rates, parking demand would increase from 5,531 in 2009 to 5,658 in 2020, an increase in demand of only 2.3%. However, with the loss of almost 1,500 spaces, this would still result in a deficit of 489 spaces by 2020 taking into account the 95% effective parking supply factor discussed in the model assumptions.

[11] Population, built square footage and parking facility displacement projections were provided by Physical & Environment Planning staff. The Department of Health Services (DHS) lot on Shattuck Ave will also close in phases in 2010 and 2016. However, it has been omitted from this table as this recently purchased building's parking spaces were not included in the overall campus parking supply counts.

[12] University Hall Structure displacement includes 103 marked spaces and 35 attendant spaces.

**Figure 9 Projected Parking Supply & Demand**

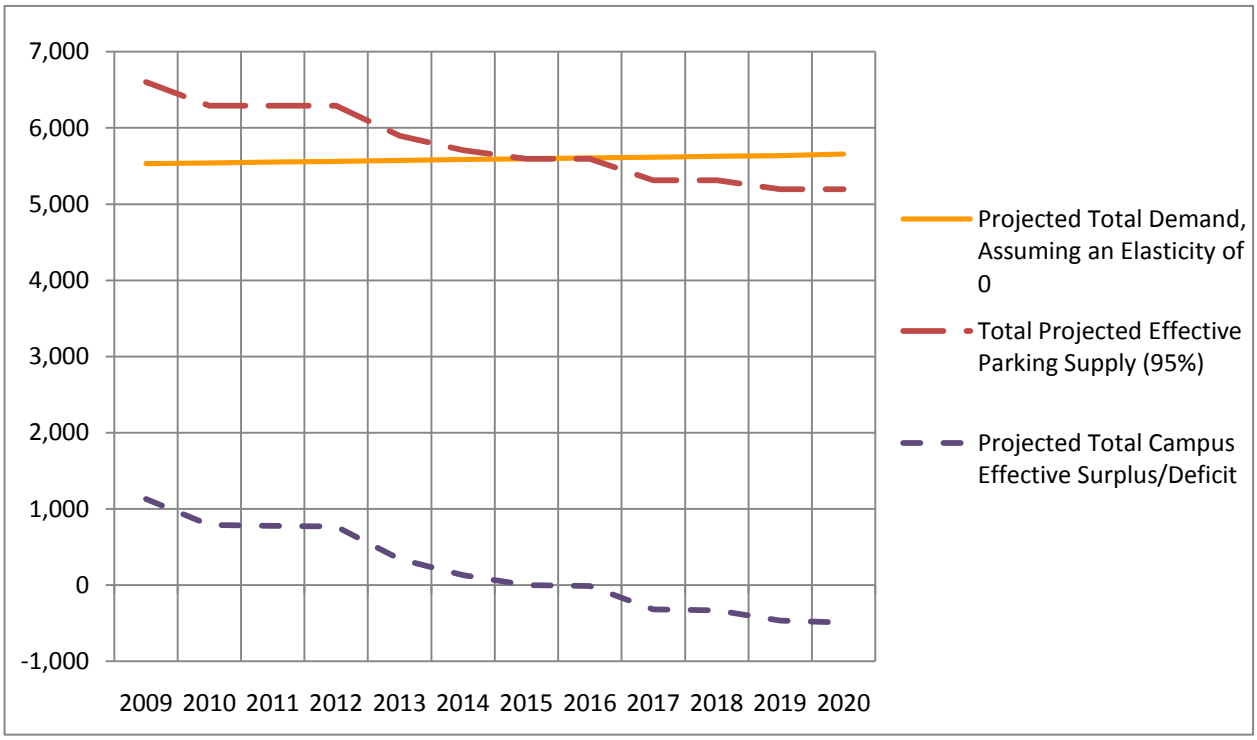



Figure 10 shows commuter student, resident student, and faculty/staff parking demand over time.

## Figure 10 Projected Baseline Parking Supply & Demand

| | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| **Commuter Students (S permits)** | 26,253 | 26,156 | 26,058 | 25,536 | 25,438 | 25,341 |
| **Resident Students (RH permits)** | 8,272 | 8,272 | 8,272 | 8,696 | 8,696 | 8,696 |
| **Faculty, Staff (C and F permits) and Visitors** | 17,016 | 17,088 | 17,161 | 17,233 | 17,305 | 17,377 |
| **Total School Population** | 51,541 | 51,516 | 51,490 | 51,465 | 51,439 | 51,414 |
| **Projected Commuter Student Parking Demand, Assuming an Elasticity of 0** | 1,229 | 1,221 | 1,214 | 1,206 | 1,198 | 1,190 |
| **Projected Resident Student Parking Demand, Assuming an Elasticity of 0** | 312 | 315 | 318 | 321 | 324 | 327 |
| **Projected Faculty/Staff Parking Demand, Assuming an Elasticity of 0** | 3,989 | 4,005 | 4,020 | 4,036 | 4,052 | 4,067 |
| **Projected Total Parking Demand, Assuming an Elasticity of 0** | 5,531 | 5,542 | 5,552 | 5,563 | 5,573 | 5,584 |
| **Projected Supply** | 6,952 | 6,623 | 6,623 | 6,623 | 6,206 | 6,008 |
| **Projected Effective Supply (95%)** | 6,604 | 6,292 | 6,292 | 6,292 | 5,896 | 5,708 |
| **Projected Total Campus Surplus/Deficit** | 1421 | 1081 | 1071 | 1060 | 633 | 424 |
| **Projected Total Campus Effective Supply Surplus/Deficit (95%)** | **1130** | **790** | **779** | **767** | **339** | **130** |

| | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| **Commuter Students (S permits)** | 25,193 | 24,695 | 24,597 | 24,500 | 24,402 | 24,254 |
| **Resident Students (RH permits)** | 8,746 | 9,146 | 9,146 | 9,146 | 9,146 | 9,196 |
| **Faculty, Staff (C and F permits) and Visitors** | 17,449 | 17,521 | 17,594 | 17,666 | 17,738 | 17,810 |
| **Total School Population** | 51,388 | 51,362 | 51,337 | 51,311 | 51,286 | 51,260 |
| **Projected Commuter Student Parking Demand, Assuming an Elasticity of 0** | 1,182 | 1,175 | 1,167 | 1,159 | 1,151 | 1,136 |
| **Projected Resident Student Parking Demand, Assuming an Elasticity of 0** | 330 | 333 | 336 | 339 | 342 | 347 |
| **Projected Faculty/Staff Parking Demand, Assuming an Elasticity of 0** | 4,083 | 4,098 | 4,114 | 4,129 | 4,145 | 4,176 |
| **Projected Total Parking Demand, Assuming an Elasticity of 0** | 5,595 | 5,605 | 5,616 | 5,627 | 5,637 | 5,658 |
| **Projected Supply** | 5,888 | 5,888 | 5,593 | 5,593 | 5,467 | 5,467 |
| **Projected Effective Supply (95%)** | 5,594 | 5,594 | 5,313 | 5,313 | 5,194 | 5,194 |
| **Projected Total Campus Surplus/Deficit** | 293 | 283 | (23) | (34) | (170) | (191) |
| **Projected Total Campus Effective Supply Surplus/Deficit (95%)** | **(1)** | **(12)** | **(319)** | **(330)** | **(467)** | **(489)** |

## Demand Distribution

As with many universities, UC Berkeley's parking demand distribution is spread unevenly across campus due to factors such as convenience, price, and even topography. Since prices are relatively similar across campus lots (respective to users), most motorists park in locations that are easily accessible to their destinations. As such, most users opt to park in the area bounded by Gayley Road, Durant Avenue, Shattuck Avenue and Ridge Road – essentially, the heart of campus. This concentration of parking demand leaves a considerable number of vacant parking spaces, particularly east of Gayley Road, which is a steeper incline and further removed from most destinations. See Figure 11 for graphic data.

With the closure of several lots and the opening of new resident and academic buildings through 2020, there will be a significant shift in demand to currently vacant spaces. A majority of the lots scheduled for decommission are located on the southside of campus. These parking losses, combined with all four major resident student housing projects occurring in this area (see Figure 4), will result in a constrained parking supply on the south side of campus if current parking policies, and therefore parking behavior, remain unchanged. It is also important to note that the decommissioning of the University Hall Parking Structure and the construction of the new Helios Energy Research Facility on the west side of campus may produce parking issues downtown. Future memoranda will address options and strategies.

**Figure 11 Campus and Downtown Parking Occupancy**

## Parking Construction Costs for Prospective Garages

In the event that additional parking construction is required to meet projected demand, it is necessary to weigh the costs of prospective garage sites. This analysis examines the *marginal cost* per driver (i.e., the cost to accommodate *one more* driver), rather than the *average cost* per driver (i.e., the total cost of a transportation program, divided by the total number of users). This approach was taken because on the financial side, perhaps the most significant potential change for UC Berkeley is the switch from surface parking lots to parking structures in order to be able to provide additional parking (or replacement of existing garages) to accommodate planned future growth.

The building of parking structures means that the marginal cost for parking (i.e., the cost to add one more parking space) is far higher than the average cost for parking. If a parking structure were built on the University Hall site, total project cost is estimated at $37,500 per space built, and $52,500 for each new space gained (a measure that takes into account the displaced parking spaces). Using typical parking industry assumptions, this translates into a life cycle cost per space gained of $4,157 per space per year, every year for the expected life cycle of the parking structure.

Figure 12 summarizes the results of our life cycle cost analysis for garage sites evaluated by Walker Parking Consultants.[13]

[13] See Walker Parking Consultants Parking Structure Concept Design Study (2005) and University West Parking Concept Study (2009). For the purposes of this analysis, we have examined the most cost-effective alternatives for each site.

**Figure 12 Life Cycle Cost Analysis for Proposed Parking Structures**

## Capital Costs

| | | University Hall (Scheme 2) | Tang (Alternate 1.3) | Dana Durant (Alternate 2.2) | Bancroft (Alternate 3.2) | Upper Hearst (Alternate 4.1) |
|---|---|---|---|---|---|---|
| a. | Spaces Built | 1071 | 637 | 203 | 396 | 73 |
| b. | Spaces Displaced | 306 | 230 | 89 | 131 | -62 |
| c. | Net Spaces Gained (c=a-b) | 765 | 407 | 114 | 265 | 135 |
| d. | Original Construction Costs | $32,130,000 | $16,944,200 | $7,917,000 | $10,890,000 | $3,752,200 |
| e. | Soft Costs | 25% | 25% | 25% | 25% | 25% |
| f. | Original Project Cost (f=d*(1+e)) | $40,162,500 | $21,180,250 | $9,896,250 | $13,612,500 | $4,690,250 |
| g. | Year Completed | 2012 | TBD | TBD | TBD | TBD |
| h. | Inflation Factor | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| i. | Project Cost in Current Dollars (i=f*h) | $40,162,500 | $21,180,250 | $9,896,250 | $13,612,500 | $4,690,250 |
| j. | Gross Cost per Space in Current Dollars (j=i/a) | $37,500 | $33,250 | $48,750 | $34,375 | $64,250 |
| **k.** | **Cost per Space Gained in Current Dollars (k=i/c)** | **$52,500** | **$52,040** | **$86,809** | **$51,368** | **$34,743** |

## Resulting Costs Per Space Per Year

| | | | | | | |
|---|---|---|---|---|---|---|
| | **Annual Debt Service, per Space**[14] | $3,621 | $3,589 | $5,988 | $3,543 | $2,396 |
| | **Operations, Maintenance & Insurance, per Space** | $536 | $536 | $536 | $536 | $536 |
| | **Total Annual Cost per Space per Year** | **$4,157** | **$4,125** | **$6,524** | **$4,079** | **$2,932** |
| | **Total Annual Cost per Space per Month** | **$346** | **$344** | **$544** | **$340** | **$244** |
| | **Total Annual Cost per Space per Workday** | **$15.95** | **$15.82** | **$25.02** | **$15.65** | **$11.25** |

[14] The parking structure debt service calculations assume a 6% interest rate over the 35 year useful life of the structure.

# APPENDIX C
## ALTERNATIVE TRANSPORTATION MARKET ANALYSIS MEMO

Nelson|Nygaard
consulting associates

785 Market Street, Suite 1300
San Francisco, CA 94103
(415) 284-1544 FAX: (415) 284-1554

# M E M O R A N D U M

**To:** Billy Riggs

**From:** Patrick Siegman, Brian Canepa and Francesca Napolitan

**Date:** August 20, 2010

**Subject:** Alternative Transportation Market Analysis

## Introduction

UC Berkeley provided Nelson\Nygaard with tabular data showing faculty, staff, and student addresses. This data was provided by the Parking and Transportation Department (P&T Department) and the Personnel Office and provides an address for approximately 5% of students and 72% of employees (providing 1,566 addresses for students, compared to the 2009 headcount of 34,525, and 10,753 addresses for employees, compared to the 2009 headcount figure of 15,016). It should be noted that student addresses come solely from the Parking and Transportation department, which collects address data for those campus affiliates who purchase parking permits or other transportation benefits, or sign up for other free-of-charge transportation benefits, thus the data compiled by this department does not cover all campus affiliates. Specifically, this address data includes campus affiliates who have come into contact with the department by engaging in one or more of the following activities:

- Purchasing a long-term commuter parking permit;
- Purchasing a residential parking permit;
- Purchasing an off-campus parking permit;
- Purchasing alternative transportation benefits;
- Purchasing vanpool benefits.

The list of addresses does *not* include campus affiliates who have not provided their addresses to the P&T or Personnel departments. For example, approximately 95% of students and 71% of faculty/staff currently *do not* purchase a long-term parking permit. This large group of campus affiliates who do not purchase a parking permit will have provided their addresses to the P&T Department only if they have purchased or signed up for one of the other transportation benefits or services listed above. In particular, the

following types of campus affiliates, who choose not to purchase a long-term parking permit, pre-tax transit passes or other benefits, may not be included in the data set:

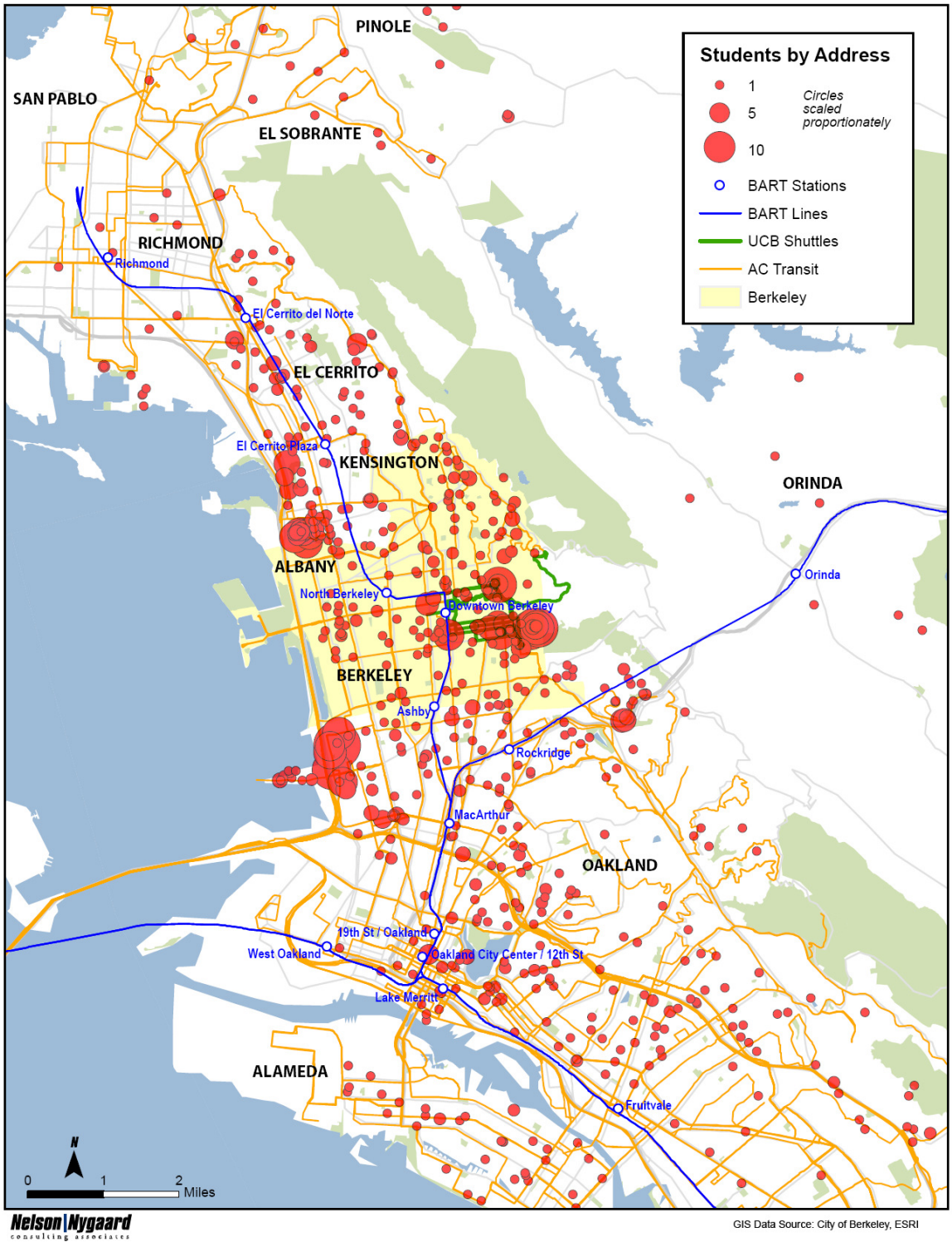
- Commuters who routinely bicycle or walk to campus;
- Commuters who are carpool passengers, rather than drivers;
- Resident students who do not purchase parking permits.

Although a majority of the addresses appear to be from home locations, there are a number of addresses that are from employment centers (e.g. there are four addresses listed at 1 Cyclotron Road, which is the address of LBNL). In addition, it is likely that some fraction of the student addresses refer to parents' homes (where a student may continue to receive mail but may or may not actually live). The limited number of student addresses available and the presence of employment addresses for faculty and staff present significant drawbacks to the data set.

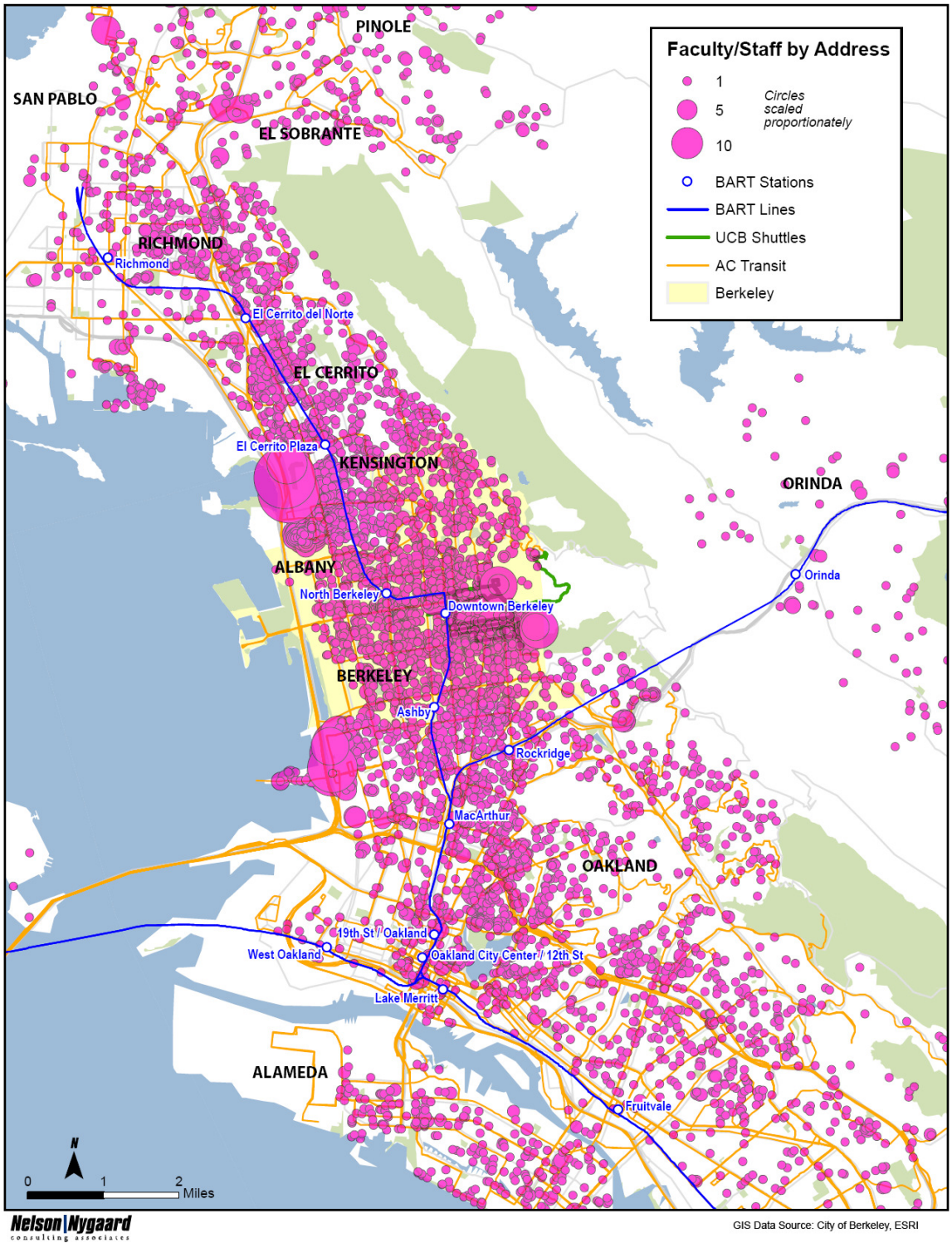
# Mapping Results

Nelson\Nygaard used Geographic Information System (GIS) software to map these locations. Figures 1 and 2 below show affiliate (student, faculty, and staff) locations, focusing on those within Alameda County. As shown in Figure 1 there is a significant clustering of students directly adjacent to the campus as well as in the nearby cities of Emeryville and Albany. Similarly, Figure 2 shows clustering of faculty and staff next to campus, Emeryville and Albany, however in general, faculty and staff addresses are more evenly distributed across Alameda County than students.

# Figure 1 Student Locations



## Figure 2 Faculty/Staff Locations




Nelson|Nygaard consulting associates

GIS Data Source: City of Berkeley, ESRI

## Affiliates' proximity to campus

Figures 3 and 4 provide additional information on the addresses of these students, faculty, and staff by showing the locations of affiliates in the immediate vicinity of the UC Berkeley campus. In general, a two-mile travel distance is considered a reasonable bicycling distance (although individuals' willingness to walk or bicycle a certain distance varies by individual, of course). In addition, it is important to note that current campus policy prohibits commuter students from purchasing parking permits if their residence is within two miles of campus unless there are extenuating circumstances.

### Figure 3 Affiliate distances from campus

| | Students | | Faculty/Staff | | Combined | |
|---|---|---|---|---|---|---|
| **Distance from center of campus** | **#** | **%** | **#** | **%** | **#** | **%** |
| Less than ¼ mile | 173 | 11% | 502 | 5% | 675 | 5% |
| Between ¼ to ½ mile | 37 | 2% | 274 | 3% | 311 | 3% |
| Between ½ to 1 mile | 45 | 3% | 560 | 5% | 605 | 5% |
| Between 1 and 2 miles | 151 | 10% | 1,202 | 11% | 1,353 | 11% |
| Between 2 and 5 miles | 443 | 28% | 2,596 | 24% | 3,039 | 25% |
| More than 5 miles | 717 | 46% | 5,619 | 52% | 6,336 | 51% |
| Total | 1,566 | 100% | 10,753 | 100% | 12,319 | 100% |

The figure above show that 26% of the student customer and 24% of faculty and staff customer addresses are within two miles of campus -- that is, within reasonably easy walking and/or bicycling distance. Given the fact that 18% of faculty/staff walk and bike, there may be potential to introduce programs that increase non-motorized mode use.[1]

## Affiliates' proximity to transit services

An analysis was performed in GIS to determine the proximity of affiliates to transit services including UC Berkeley shuttles, BART, and AC Transit bus service. Figure 4 shows the percentage of student, faculty, and staff addresses near a UC Berkeley shuttle route. The distances below are measured from the shuttle stops.

### Figure 4 Distance affiliates live from UC Berkeley shuttle routes

| | Students | | Faculty/Staff | | Combined | |
|---|---|---|---|---|---|---|
| **Distance from UC Berkeley Shuttle Routes** | **#** | **%** | **#** | **%** | **#** | **%** |
| Less than ¼ mile | 166 | 11% | 611 | 6% | 777 | 6% |
| ¼ to ½ miles | 51 | 3% | 278 | 3% | 329 | 3% |
| ½ to 1 miles | 50 | 3% | 598 | 6% | 648 | 5% |
| 1 to 2 miles | 156 | 10% | 1,171 | 11% | 1,327 | 11% |
| More than two miles | 1,143 | 73% | 8,095 | 75% | 9,238 | 75% |
| Total | 1,566 | 100% | 10,753 | 100% | 12,319 | 100% |

The data show that, in general, student locations are closer to a shuttle route than faculty and staff customers.

[1] The low number of student addresses makes an effective comparison to travel survey data infeasible.

Figure 5 shows the percentage of affiliate addresses near a BART station. Seventeen percent of affiliates are within walking distance of a BART station (walking distance is considered ½ mile). A slightly higher number of faculty and staff customer addresses (17%) are within walking distance of BART compared to student customers (13%).

## Figure 5 Distance affiliates live from a BART station

| | Students | | Faculty/Staff | | Combined | |
|---|---|---|---|---|---|---|
| **Distance from BART station** | **#** | **%** | **#** | **%** | **#** | **%** |
| Less than ¼ mile | 40 | 3% | 471 | 4% | 511 | 4% |
| ¼ to ½ miles | 151 | 10% | 1,449 | 13% | 1,600 | 13% |
| ½ to 1 miles | 352 | 22% | 3,065 | 29% | 3,417 | 28% |
| 1 to 2 miles | 604 | 39% | 3,033 | 28% | 3,637 | 30% |
| More than two miles | 419 | 27% | 2,735 | 25% | 3,154 | 26% |
| Total | 1,566 | 100% | 10,753 | 100% | 12,319 | 100% |

Figure 6 shows the percentage of affiliate locations near an AC Transit bus route. For this analysis, the distance from a bus route is measured as the crow flies. Over two-thirds of student, faculty and staff addresses are within walking distance of bus routes (walking distance is considered 1/4 mile). However, this analysis does not take into account which routes directly serve campus. Thus, a smaller percentage of this group live along bus routes that directly serve the campus.

## Figure 6 Distance affiliates live from an AC Transit bus route

| | Students | | Faculty/Staff | | Combined | |
|---|---|---|---|---|---|---|
| **Distance from AC Transit bus routes** | **#** | **%** | **#** | **%** | **#** | **%** |
| Less than ¼ mile | 1,015 | 65% | 7,043 | 65% | 8,058 | 65% |
| ¼ to ½ miles | 78 | 5% | 421 | 4% | 499 | 4% |
| ½ to 1 miles | 20 | 1% | 170 | 2% | 190 | 2% |
| 1 to 2 miles | 42 | 3% | 324 | 3% | 366 | 3% |
| More than two miles | 411 | 26% | 2,795 | 26% | 3,206 | 26% |
| Total | 1,566 | 100% | 10,753 | 100% | 12,319 | 100% |

# Conclusions

The ability to make conclusions about campus affiliates varies based on the individual user group. Whereas 72% of faculty/staff addresses are identified in the data set, only 5% of student addresses are available, which makes any substantial conclusions regarding students not viable. It is also important to reiterate that although nearly three-quarters of faculty/staff addresses are included in the data set, it is uncertain how many of those are locations of employment (particularly those addresses near campus). Despite these shortcomings, it is possible to draw some conclusions for faculty and staff.

1. Data show that 8% of faculty and staff live within ½ mile (i.e. walking distance) of campus and 16% live between ½ and 2 miles (i.e. biking distance) of campus. Meanwhile, travel survey data for this group reveal that 9% walk and 9% bike to campus. Although the

percentage of faculty/staff walking is roughly equal to those living within walking distance, there appears to be fewer faculty/staff biking than anticipated. Travel data show that 18% of faculty/staff living within two miles of campus drive alone to work (compared to 16% biking). Given this divide, it may be beneficial to institute bicycling incentives (similar to the campus' current transit incentives) or a bike sharing program on campus.

2. Affiliate addresses closely correspond to shuttle use, indicating that the present service is effective. This does not imply, however, that the shuttle service cannot be improved, but without more (student) addresses and guaranteed resident addresses (as opposed to employment) for faculty and staff close to campus, it is very difficult to determine precisely what enhancements can be made.

3. Although 17% of faculty and staff live within walking distance to a BART station, 51% of faculty and staff transit users commute by BART. It is very likely that many users drive to a station and travel to campus, and judging from these figures, it appears that the current transit incentive for BART riders is effective. If a universal transit pass program were available for BART riders in the future, it is possible that current drive alone commuters (particularly those living more than five miles from campus that drive alone at higher rates according to the travel survey) would use transit.

4. Over two-thirds of faculty and staff live within ¼ mile of an AC Transit route, whereas the transportation survey reveals that only 6% use it to travel to work. This gap in ridership presents a unique opportunity to promote transit use among faculty and staff who live near AC Transit routes, but currently opt to drive to work. Although only certain bus routes have direct service to campus, by instituting an AC Transit universal transit pass for faculty and staff that is fully subsidized, the campus would undoubtedly increase transit use. As a comparison, transit use increased by 62.5% at UCLA following implementation of its faculty/staff universal transit pass program.

Given these points, there are potential enhancements available to augment alternative mode use, particularly among faculty and staff. A more complete listing of student addresses would allow for a far more thorough analysis of that group and it is recommended that university staff use this data if it becomes available in the future in conjunction with current transportation survey responses to inform campus transportation policy.

# APPENDIX D
## EXISTING CONDITIONS FINAL TECHNICAL MEMORANDUM

UNIVERSITY OF CALIFORNIA, BERKELEY

# Existing Conditions

## Final Technical Memorandum

Nelson\Nygaard Consulting Associates
785 Market Street, Suite 1300
San Francisco, CA 94103

**February 2010**

Nelson|Nygaard
consulting associates

Cover Photo[1]

[1] Cover photo: http://www.flickr.com/photos/johnloo/2600856980/

# Introduction

Each day, thousands of students, faculty and staff, plus a number of visitors, arrive at and traverse the UC Berkeley campus and the surrounding neighborhoods. This movement of people to, from and about the campus speaks to the success of the university as an educational institution. With anticipated growth and development on campus, and in the adjacent neighborhoods of downtown Berkeley and the South Campus/Telegraph Avenue Business District, it is important to evaluate impacts to and plan enhancement of access to the campus, including parking.

This memo provides essential information on existing conditions of access to the UC Berkeley campus. It is intended to provide the basis for an innovative campus Parking Plan that will enable the University to manage growth while improving the multimodal accessibility of the campus and its environs. Discussion of the cost-effectiveness of various campus transportation programs will be central to this evaluation.

We begin by profiling the current population of UC Berkeley students, faculty, staff and visitors, and UC projections for growth in each sector, and development of additional student housing and campus-wide building square footage. Next, we:

- illustrate the inventory and ownership of all parking facilities on and around campus;
- detail projected changes in the supply of parking spaces on campus from 2009-2020, as lots are decommissioned to make way for campus growth and development;
- describe the prices of and eligibility for the various permit types available to UC commuters;
- map and analyze (a) effective daily parking prices, and (b) recently observed peak hour parking occupancy and availability, by lot. These key factors of commuter choice about where to park and what type of permit to buy, are mapped separately for regular and occasional auto commuters from each of the following groups, in order to demonstrate the unique set of prices, choices, and constraints facing each user group. Groups include:
    - Faculty and senior staff
    - Graduate and undergraduate students
    - Academic and non-management staff
    - Campus visitors and members of the general public

We conclude this memorandum by reporting (1) the share of UC and Downtown Berkeley commuters using each mode of travel, and (2) estimates of the ratios of parking permits sold, to (a) the population of commuters from each group eligible to buy them, and (b) the total inventory of spaces available for use by each group.

# Campus Population

Despite recent budget difficulties, UC Berkeley and its associated research centers and institutions are anticipated to grow substantially through 2020. The *2020 Long Range Development Plan* (LRDP), adopted in 2005, provides a framework for land utilization and capital investment necessary to meet the academic goals and objectives of UC Berkeley, the oldest campus of the University of California, through the year 2020. As a result of growth in both education and research functions on campus, the projected total headcount of faculty, staff, and students at UC Berkeley was anticipated to grow by 11.5% from 45,940 in 2001, to a total of 51,260 by 2020 (during regular terms).

However, growth was not projected evenly across the population. According to the LRDP, while the total student headcount was expected to increase only 5.1%, from 31,800 in 2002 to 33,450 in 2020, it projected a more substantial growth of 22.1% in the headcount of campus employees, to a total of 15,810. The highest rate of growth (66%) was projected for "campus visitors and vendors," who were anticipated to increase from a headcount of 1,200 in 2002 to 2,000 by 2020.[2] These different growth rates for different groups of people on campus are key considerations in planning for campus access and mobility because each group has unique transportation needs and patterns as described below.

More recent campus population growth and physical development projections based on actual enrollment numbers since 2002 are somewhat different than the growth patterns projected in the LRDP. This is shown in Figure 1.

Assuming the LRDP provides the framework for growth on the campus, the UC Berkeley Office of Physical and Environmental Planning projects that student enrollment will decrease and stabilize at the 33,450 target and that faculty and staff will increase slightly, growing by 72 individuals per year from 2009 to 2020 – a roughly 6% increase in faculty and staff over the 11-year period.

[2] See LRDP, p.14.

## Figure 1 Current Population Projections[3]

| Population/ Area | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 |
|---|---|---|---|---|---|---|
| Commuter Students | 26,253 | 26,156 | 26,058 | 25,536 | 25,438 | 25,341 |
| Resident Students | 8,272 | 8,272 | 8,272 | 8,696 | 8,696 | 8,696 |
| Faculty | 6,361 | 6,407 | 6,452 | 6,497 | 6,543 | 6,588 |
| Staff | 8,655 | 8,682 | 8,709 | 8,735 | 8,762 | 8,789 |
| Campus Population | 51,549 | 51,523 | 51,496 | 51,470 | 51,444 | 51,418 |
| Built space (interior sq. ft) | 13,047,400 | 13,161,918 | 13,276,437 | 13,390,955 | 13,505,473 | 13,619,991 |

| Population/ Area | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|
| Commuter Students | 25,193 | 24,695 | 24,597 | 24,500 | 24,402 | 24,254 |
| Resident Students | 8,746 | 9,146 | 9,146 | 9,146 | 9,146 | 9,196 |
| Faculty | 6,633 | 6,679 | 6,724 | 6,769 | 6,815 | 6,860 |
| Staff | 8,816 | 8,843 | 8,870 | 8,896 | 8,923 | 8,950 |
| Campus Population | 51,391 | 51,365 | 51,339 | 51,313 | 51,286 | 51,260 |
| Built space (interior sq. ft) | 13,734,509 | 13,849,027 | 13,963,546 | 14,078,064 | 14,192,582 | 14,307,100 |

To accommodate this anticipated growth in the population of students, and campus employees and visitors, UC Berkeley expects substantial growth in building space on campus, including expanded student housing. Figure 1 shows that UC Berkeley had a total of 13,047,400 square feet of built space (interior floor area) in December 2009, which is projected to grow to a total of 14,307,100 square feet by 2020[4].

## Projected Growth in Student Housing

As of 2001-2002, UC Berkeley owned, or had approved for development housing on-campus and in the adjacent "City environs," to accommodate a total of 7,234 "bed-spaces.[5]" This includes 585 bed-spaces at the International House, and 27 faculty units, but does not include the 956 bed-spaces that existed, or were under development at University Village in Albany, which is located more than two miles away from the Central Campus.

To accommodate the growth in the population of students, employees, and campus activities projected through 2020, the LRDP recommends adding an additional 2,600 bed spaces to reach a total supply of 9,834 spaces on campus and in the City Environs

[3] Projections from the UC Berkeley 2020 LRDP and Physical and Environmental Planning.
[4] UC Berkeley LRDP (2005)
[5] This total for current housing, taken from Page 14, of the UC Berkeley LRDP (2005), includes some 6004 bed spaces on the Central campus and in the adjacent "City Environs." This total includes some 27 faculty housing units

by 2020[6]. According to the Office of Physical and Environmental Planning, there are currently plans to accommodate an additional 924 bed-spaces by 2020.[7]

## Current Travel Patterns

Currently, on any given weekday, less than half of all commuters to the UC Berkeley/ Downtown Berkeley area reach their destination by driving alone. Figure 2 and 3 show the wide differences between user groups and their respective mode choices. Generally, UC faculty and staff and downtown employees drive alone at far higher rates than downtown residents and UC students. Conversely, those downtown residents and students walk a great deal more than faculty, staff, and downtown employees.

## Figure 2 Travel Mode Shares for UC/Downtown Berkeley Commuters and Residents

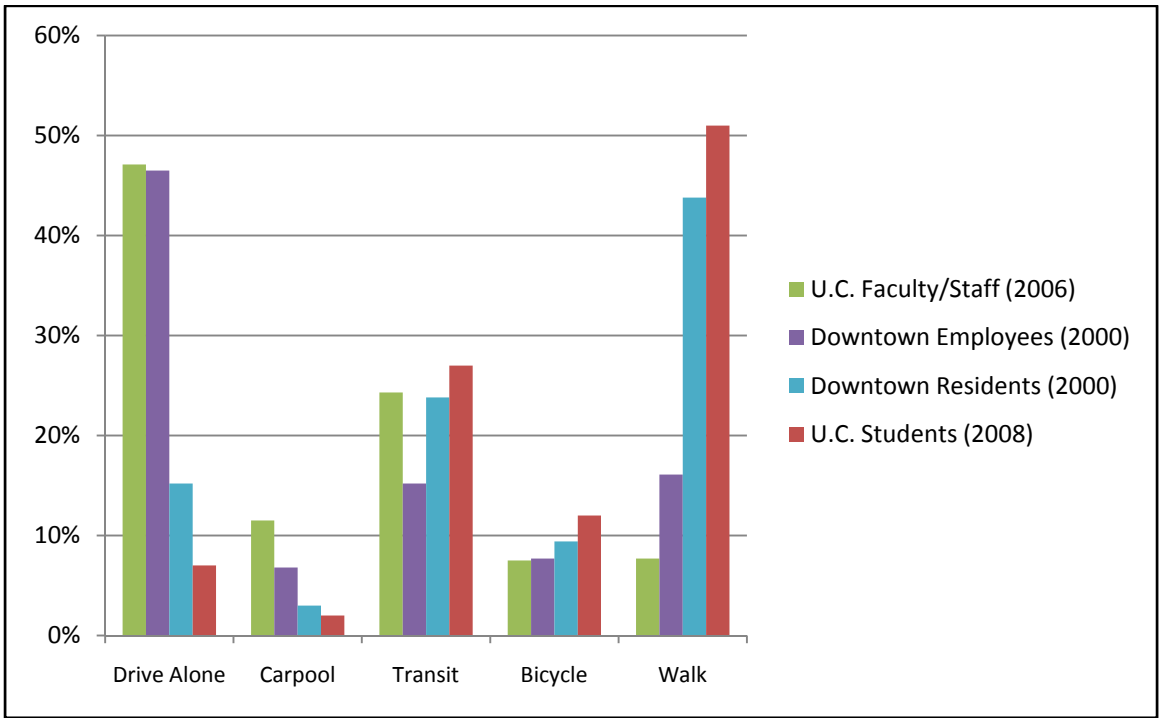
| Type of Commuter (Year) | Drive Alone | Carpool | Transit | Bicycle | Walk | Other |
|---|---|---|---|---|---|---|
| U.C. Students (2008) | 7.0% | 2.0% | 27.0% | 12.0% | 51.0% | 1.0% |
| U.C. Faculty/Staff (2006) | 47.1% | 11.5% | 24.3% | 7.5% | 7.7% | 1.9% |
| Downtown Employees (2000) | 46.5% | 6.8% | 15.2% | 7.7% | 16.1% | 7.7% |
| Downtown Residents (2000) | 15.2% | 3.0% | 23.8% | 9.4% | 43.8% | 4.8% |

*Sources: Census 2000: Journey to Work Data, 2000 Census Transportation Planning Package (CTPP), 2008 UC Campus Sustainability Assessment, 2008 UCB Housing & Transportation Survey*

[6] Again, this projection for 2020 excludes 956 units at University Village in Albany (which are counted as one bed space per unit for the purposes of calculating total UC affiliated housing supply). University Village units are not counted in the growth projections used for this parking and transportation analysis, because they are located far enough from the central campus to make residents a substantial part of the "off-campus" travel demand to and from the University. As such, residents of UC Village are treated as commuters for this analysis.

[7] New residential student beds include Anna Head (424 beds), Bancroft/Fulton (50 beds), Channing/Ellsworth (400 beds), and Dana Durant (50 beds).

## Figure 3 Travel Mode Shares for UC/Downtown Berkeley Commuters and Residents



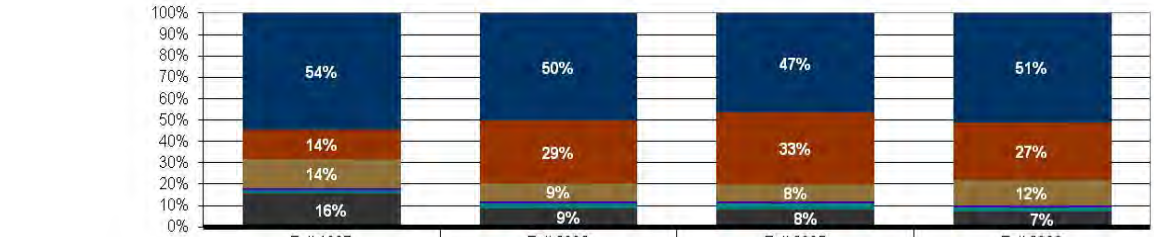

## Alternative Transportation Programs

UC Berkeley operates a robust transportation demand management (TDM) program for students, faculty, and staff that is similar to that of the City. For a combined package of transportation incentives and benefits, UC Berkeley has created the *New Directions Program* to boost interest in and adoption of alternative modes of transportation. Program participants are rewarded with parking discounts, transit subsidies, Emergency Rides Home and much more. These benefits have resulted in more than 50% of campus employees and 90% of students using alternative transportation to travel to and from the campus. Student trips alone account for 3.5 million rides and $2 million dollars revenue to AC Transit annually.[8]

UC Berkeley faculty and staff can purchase unlimited rides on all AC Transit lines for a deeply subsidized price, using pre-tax dollars, and students are eligible to ride free throughout the semester. The student Class Pass, which began as a pilot program in 1998, has had a profound effect on the campus' mode split: transit mode share has grown from 14% in 1997 to 27% in 2008, while the drive alone share fell from 16% to 7% during the same period.

[8] Office of Parking & Transportation, http://pt.berkeley.edu/pay/newdirections.

## Figure 4 UC Berkeley Student Mode Split, 1997-2008[9]




| | Fall 1997 | Fall 2002 | Fall 2005 | Fall 2008 |
|---|---|---|---|---|
| Ped (Walk or Wheelchair) | 54% | 50% | 47% | 51% |
| Transit | 14% | 29% | 33% | 27% |
| Bicycle | 14% | 9% | 8% | 12% |
| Other Modes | 1% | 1% | 1% | 1% |
| Carpool (2 or more) | 2% | 2% | 3% | 2% |
| Drive alone | 16% | 9% | 8% | 7% |

In addition, UC Berkeley operates BearTransit campus shuttles seven days a week on varying schedules with routes serving downtown Berkeley BART, campus parking facilities, campus perimeter, center of campus, the hill campus, and off-site facilities. These shuttles carry over 500,000 passengers annually. The campus also offers incentives for ridesharing and bicycle commuters.

# Parking

## Current Parking Inventory

Commuters and visitors who choose to drive to UC Berkeley have a variety of parking prices and facilities to choose from. Depending on their eligibility for different types of permits, the price they are willing to pay on a daily or annual basis, and the frequency with which they expect to drive to UC, travelers may park in various on-campus facilities (and on-street spaces within the campus), or off-campus, either on the street or in publicly- and privately-owned and managed lots and structures.

Figure 5 shows the ownership and capacity of all major off-street parking facilities in the UC Berkeley/Downtown Berkeley Area. The total inventory of parking spaces, displayed for each lot under UC Berkeley ownership, is based on data received from the UC Office of Parking and Transportation and includes all department reserve spaces, spaces dedicated to vehicles with disabled placards, and motorcycle spaces. The ownership and inventory shown for non-UC, off-street parking facilities is taken from the *Downtown Berkeley Parking Management Study (2007),* conducted by students at the UC Berkeley Department of City and Regional Planning.

## Projected Parking Inventory

### LRDP Projections of Parking Needs

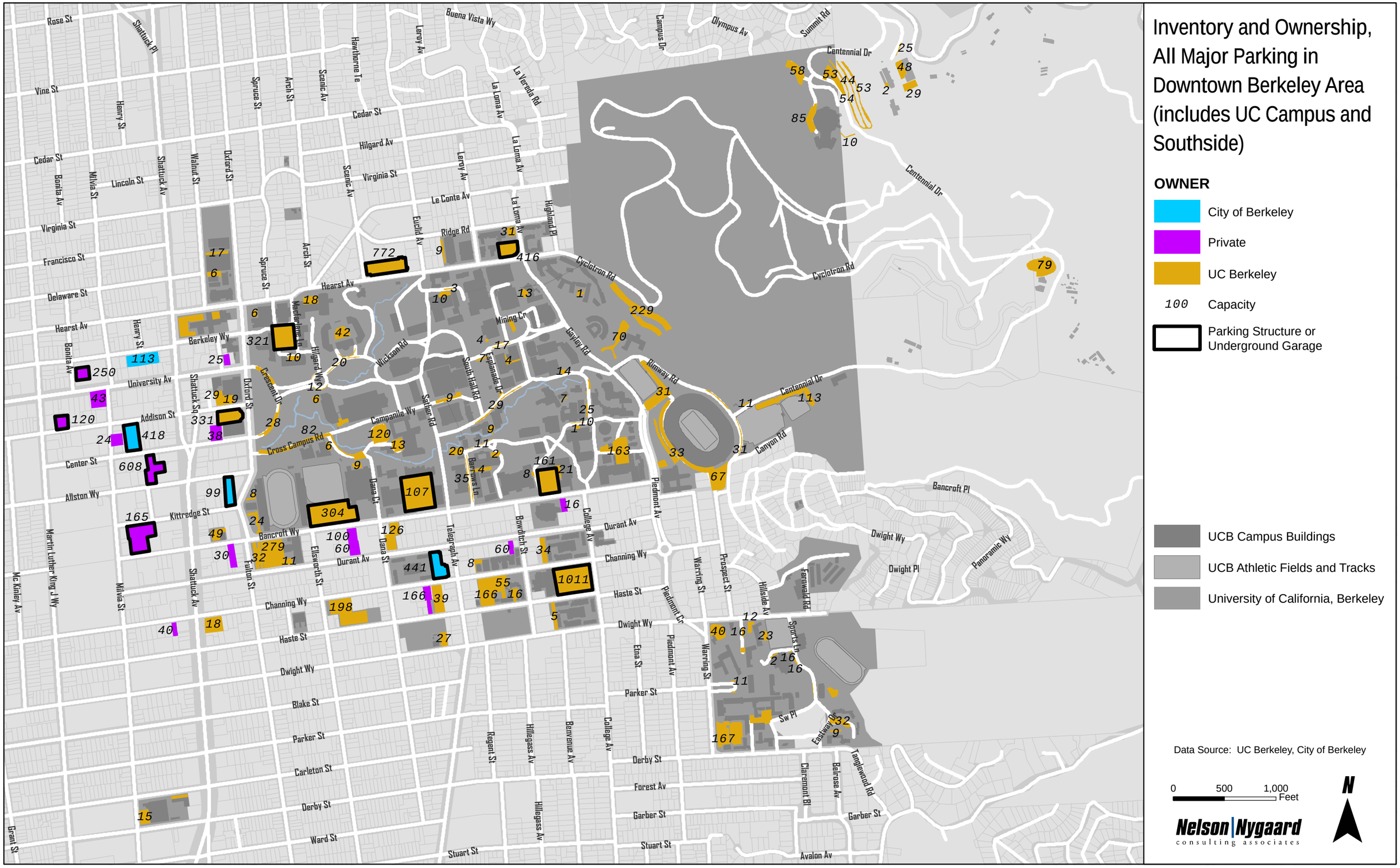
To satisfy the projected growth in campus population and floor area (both of which are indicators of increased demand for travel to and from campus), the LRDP projects that a net addition of 2,300 commuter and visitor parking spaces would be needed to satisfy

[9] UC Berkeley 2008 Housing & Transportation Survey.

demand through the year 2020. This projection was based on the assumptions that campus development would proceed according to the plan, and that permit prices would not increase beyond the rate of inflation. In addition, the LRDP contains a provision indicating that 500 of these 2,300 additional parking spaces "would be deferred until after 2020 if the AC Transit Bus Rapid Transit/Telegraph route is approved and the system is under construction by January 2010.[10]" As of January 2010, construction on the BRT Corridor is not yet underway, but funding is available and planning work is ongoing.

[10] *UC Berkeley, LRDP*, Table 2: Projected Space Demand, Page 14

## Figure 5 Inventory and Ownership of All Major Parking Facilities on the UC Berkeley Campus and Surrounding Areas



For a variety of reasons highlighted in this report, and yet to be elaborated in the Parking and Transportation Demand Analysis to follow as part of this study, the parking needs assessment generated as part of the LRDP should not be taken at face value as a precise or fixed estimate of future parking demand.

As we describe in further detail in subsequent sections, the *demand* for parking on campus can be expected to vary substantially with the price(s) charged, and the quality, and time and monetary cost of alternatives, including parking on-street, or in lots off campus, and/or using other modes of transportation such as bicycling, or taking BART, or the bus.

As we develop strategies for managing future demand for parking under various scenarios, we will also take into account available information and projections of changes to the supply of parking spaces at facilities on and surrounding campus.

Taken together, Figures 6, 7, and 8 illustrate the UC Office of Parking and Transportation's most recent projections of changes to the supply of marked parking spaces in UC owned and operated parking facilities in Berkeley, from 2009 to 2020. As a result of several lots being decommissioned to make way for planned development on and around campus, the total UC parking inventory is expected to decline from 6,589 marked spaces in 2009 to 4,991 marked spaces in 2020 (Note: these projections illustrate decline in supply from May 2009, and do not incorporate any plans or proposals for development of new campus parking facilities, or expansion of existing facilities).

Figure 8 shows where (which specific parking facilities) the University anticipates losing parking inventory. The total projected loss of 1,598 parking spaces from the UC supply, shown on an annual basis in Figures 6 and 7, includes a loss of 448 marked spaces on the Central Campus (also referred to as "Campus Park" in the LRDP), and 331 spaces to the west, in downtown Berkeley. The greatest loss of inventory – 819 marked spaces in all – is expected to occur in four major facilities on the Southside (the Bancroft/Fulton and Dana/Durant lots, the Ellsworth Structure, and the Anna Head West lot[11].

[11] Note that the Anna Head West Lot is slated to be decommissioned for redevelopment in 2010, and will result in an immediate loss of 166 marked parking spaces.

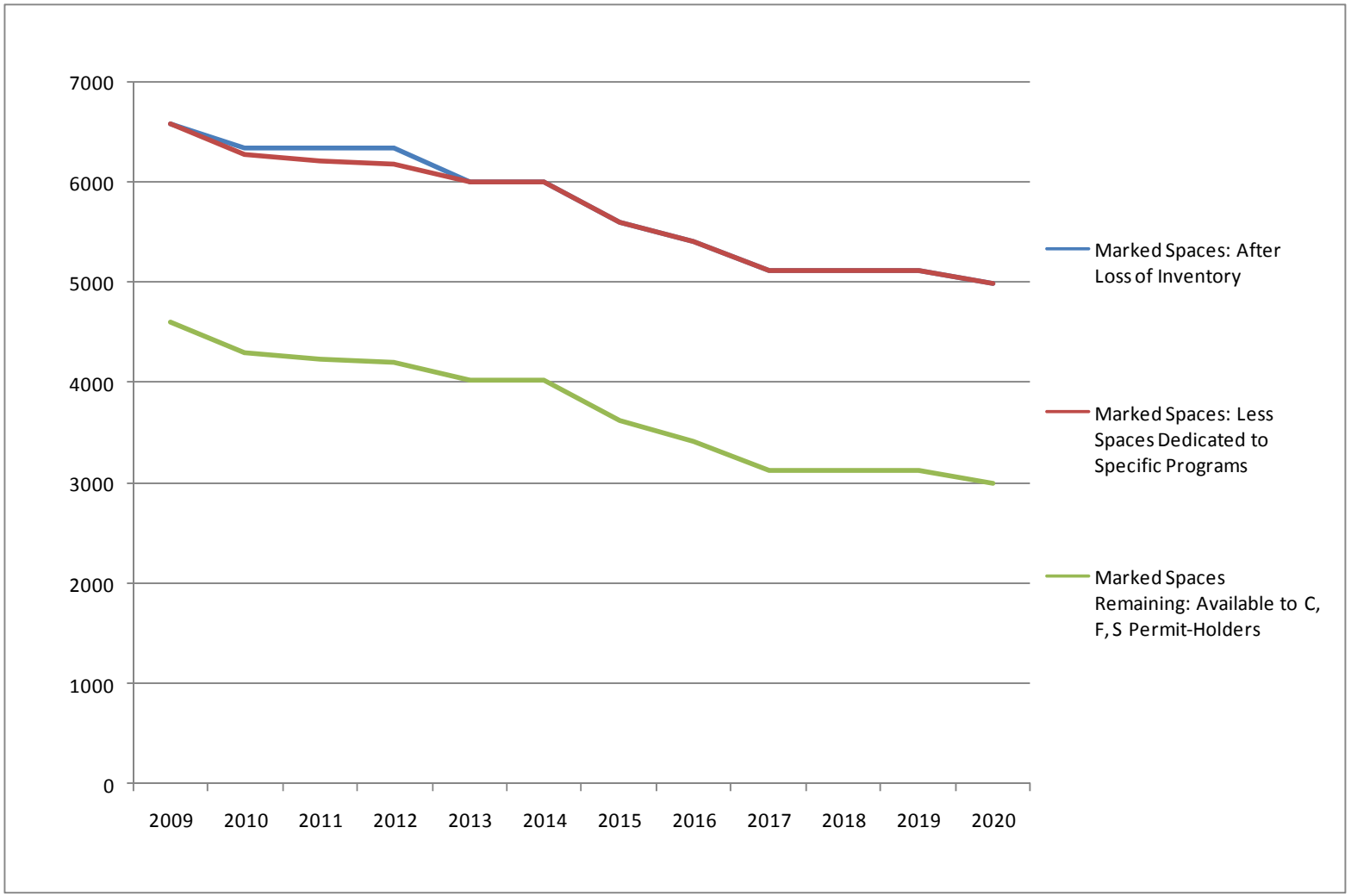
## Figure 6 Projected Changes to Supply of Marked Parking Spaces, 2009-2020

| Parking Supply* | 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Marked Spaces: Initial Supply | 6589 | 6589 | 6285 | 6220 | 6185 | 6009 | 6009 | 5610 | 5412 | 5117 | 5117 | 5117 |
| C,F,S permit spaces | 4603 | 4099 | 4034 | 3973 | 3822 | 3822 | 3475 | 3277 | 3007 | 3007 | 3007 | 2995 |
| Other spaces (Non C,F,S) | 1986 | 1986 | 1986 | 1986 | 1986 | 1986 | 1986 | 1986 | 1986 | 1986 | 1986 | 1986 |
| Loss of Inventory (from 2009 base) | 0 | -249 | -249 | -249 | -580 | -580 | -979 | -1177 | -1472 | -1472 | -1472 | -1598 |
| Total (After Loss of Inventory) | 6589 | 6340 | 6340 | 6340 | 6009 | 6009 | 5610 | 5412 | 5117 | 5117 | 5117 | 4991 |
| Loss of Spaces Dedicated to Specific Programs | 0 | -55 | -120 | -155 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Marked Spaces: Remaining After Loss of Inventory and Dedication to Specific Programs | 6589 | 6285 | 6220 | 6185 | 6009 | 6009 | 5610 | 5412 | 5117 | 5117 | 5117 | 4991 |
| Marked Spaces: Remaining After Loss of Inventory and Dedication to Specific Programs (Available for C,F,S Permit-Users) | 4603 | 4299 | 4234 | 4199 | 4023 | 4023 | 3624 | 3426 | 3131 | 3131 | 3131 | 3005 |

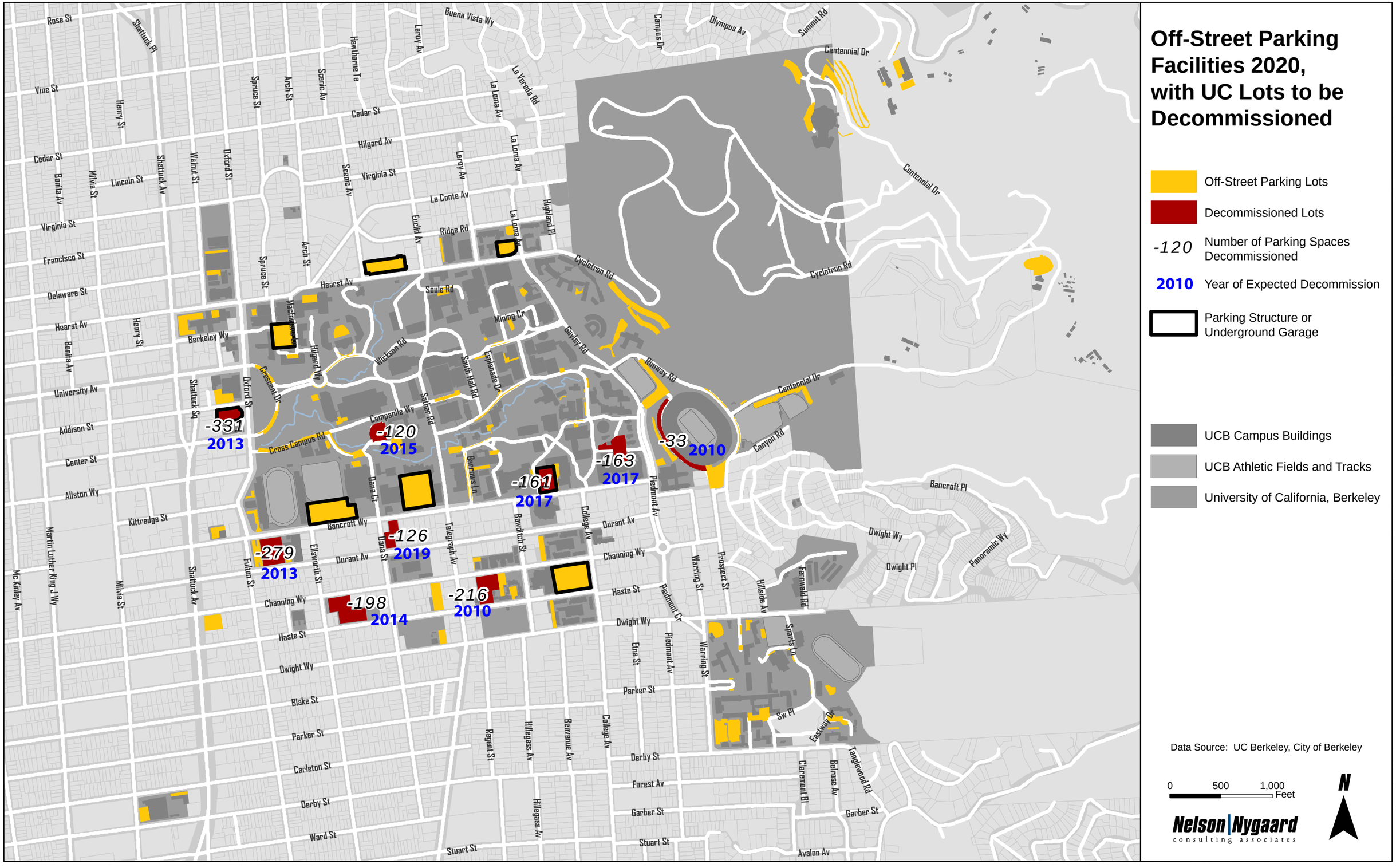
*Source: UC Office of Parking and Transportation, 2009

^Note that the UC Office of Parking and Transportation does not project any change in the number of “Other”/ “Non C, F, S, marked spaces on campus commensurate with either (a) the expected decline of the total inventory of parking spaces (due to decommissioning of, and/or development on surface parking lots), or the anticipated loss of spaces due to their dedication to specific campus programs.

## Figure 7 Projected Changes to Supply of Marked Parking Spaces, 2009-2020



## Figure 8 Off-Street Parking Facilities 2020, with Lots to Be Decommissioned




# Off-Street Parking Facilities 2020, with UC Lots to be Decommissioned

- Off-Street Parking Lots
- Decommissioned Lots
- -120 Number of Parking Spaces Decommissioned
- 2010 Year of Expected Decommission
- Parking Structure or Underground Garage

- UCB Campus Buildings
- UCB Athletic Fields and Tracks
- University of California, Berkeley

Data Source: UC Berkeley, City of Berkeley

0 500 1,000 Feet

N

Nelson|Nygaard consulting associates

## Parking Utilization

There are a variety of standards and methods to gauge current and future parking demand on the UC Berkeley campus. Parking planning studies are often been based on conservative figures that assume the current parking supply is appropriate to meet existing demand, resulting in current ratios (of parking inventory: population, or parking inventory: building floor space on campus) being used for future planning. This methodology is problematic because it does not take into account the actual campus-wide peak parking demand, which shows that nearly three out of ten parking spaces are vacant at the peak hour of utilization. Because it is based largely on an extension of current ratios to future growth, the LRDP's future needs analysis appears to overestimate the amount of parking necessary to meet demand.

## Overall Parking Occupancy

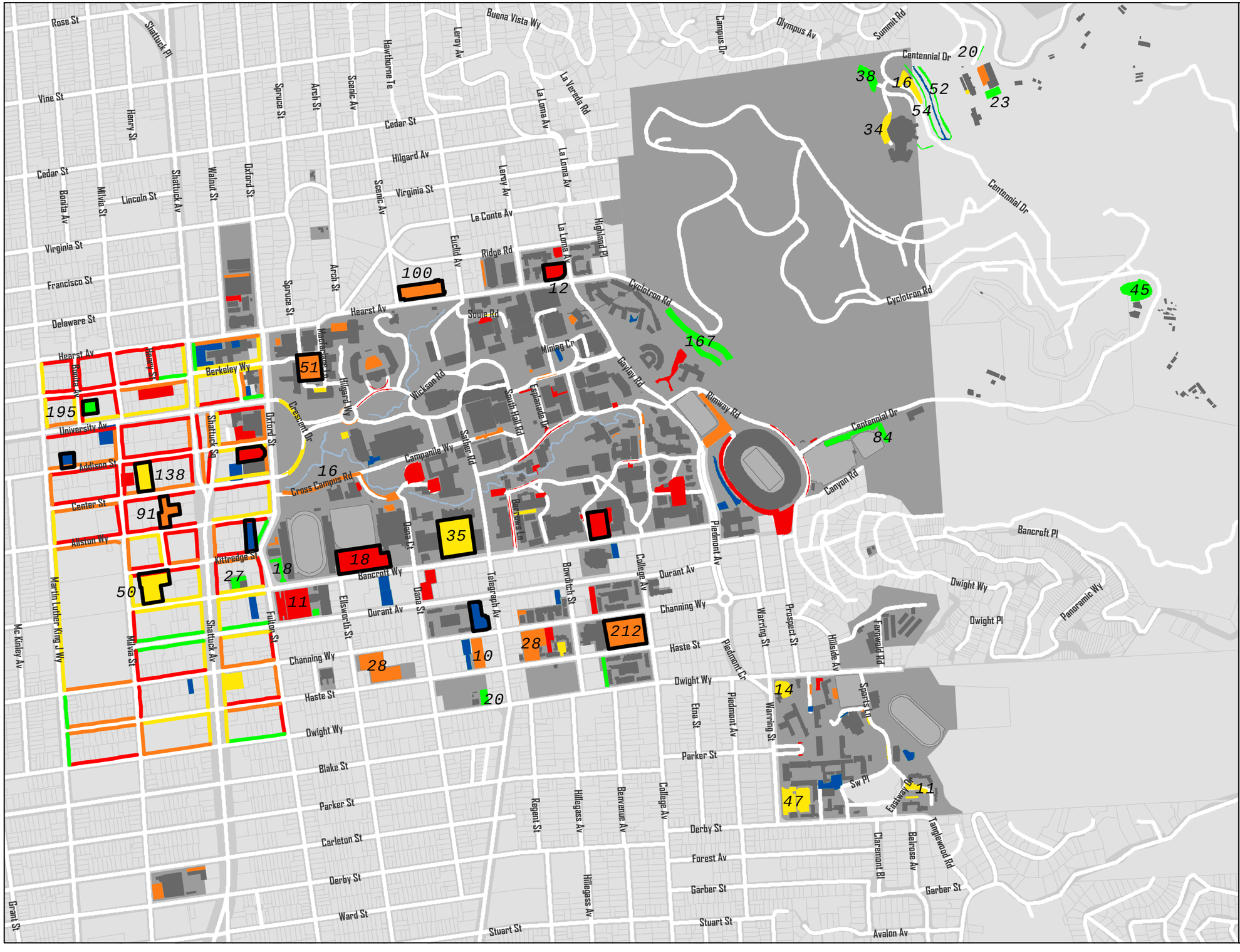
The occupancy or utilization of parking facilities on and around the UC Berkeley campus was surveyed by staff from the UC Berkeley Office of Parking and Transportation in both the Spring and Fall of 2009. Walking surveys of lots conducted during peak hour (12:00-1:00 pm) over several weekdays give a sense of the overall utilization of each lot, facility, and area available for vehicle parking on the UC Berkeley campus.[12] The Fall 2009 counts reveal that overall parking utilization peaked at 5,367 spaces, or 70.7% of the total 7,593 spaces available (Note that both the occupancy and capacity figures used in this calculation include attended parking). Figure 9 graphically illustrates these data, showing parking occupancy and supply by lot for all major campus parking facilities, as well as those off-campus facilities which are available to the public (and for which data are available).

The total parking occupancy figures by lot, for the entire campus, provide a picture of the overall utilization of parking facilities on campus, and can help the University identify areas specific lots that are oversubscribed or underutilized during the peak hour. However, this map and the overall occupancy figures provided do not offer a complete depiction of parking *demand*, or the *availability* of parking facilities from a user's perspective.

Parking demand is a function of both the attractiveness of the University and adjacent land uses as a destination, the price of parking, and the price and attractiveness of alternatives to driving and parking on campus. For many commuters (in fact the majority of users) the most attractive alternative for accessing campus, given these considerations, is to take public transit, walk, or ride a bicycle. For others, the favored option might be to park in a City or privately-owned (but available to the public) facility

[12] A limited number of parking lot occupancy figures for City and private lots mapped in this memorandum are from the City's Downtown Area Plan EIR.

## Figure 9 Parking Occupancy, Weekday Peak (12 PM), All Parking




Peak Hour Occupancy, (12pm Weekday), All Major Parking Facilities, Downtown Berkeley Area (includes UC Campus and Southside)

**Off Street**

- 0% - 49%
- 50% - 74%
- 75% - 89%
- 90% - 100%
- Unknown
- Parking Structure or Underground Garage
- 15 — Vacant/Unused Spaces at Peak Hour *(values <10 not shown)*

**On Street**

- 0%-49%
- 50%-74%
- 75%-84%
- 85%-100

- UCB Campus Buildings
- UCB Athletic Fields and Tracks
- University of California, Berkeley

Data Source: UC Berkeley, City of Berkeley

0 500 1,000 Feet

N

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and walk to campus. The key point is that demand for parking in UC Berkeley facilities is not fixed based on current levels of parking utilization, nor can it be projected into the future on a straight line, parallel to growth in the campus population or building space. The occupancy figures presented in the maps that follow provide us with a snapshot of parking demand on the date and time that the survey was taken, given the supply of space, prices, alternatives, and other conditions at the time.

## Average Vehicles Parked in UC Berkeley Lots per Person

As shown graphically in Figure 9, 5,367 out of a total of 7,593 parking spaces were occupied during the Weekday Peak Hour (12:00 PM), in the Fall 2009 surveys of UC Berkeley Parking Facilities (70.6%). This means that that there were 0.107 vehicles parked on campus for each student, faculty and/or staff member on campus in 2009 (put another way, there were approximately 9.2 people on campus for every one vehicle parked at the peak hour). This number is low relative to other college campuses, and other employers in the Bay Area, and reflects the fact that UC Berkeley is located in a transit accessible location, with an array of transportation demand management and alternative transportation programs and services.

## Variables in Parking Availability and Price

To assess parking *availability* from the perspective of the distinct groups of travelers to the UC Berkeley campus, including graduate and undergraduate students, faculty, staff, and visitors, we have prepared a series of maps (Figures 14, 17, 20, 23, and 24). These maps show which parking facilities, both on- and off-campus, are open to the different classes of commuters defined by the parking permit and pricing system established by the UC Office of Parking and Transportation. Figure 10 shows the most common types of semester or annual parking permits sold by UC Berkeley, some of which define our analysis, as described below. Permits are listed by price per month and the number of permits sold in FY 2009.

## Figure 10 UC Berkeley Parking Permits and Eligibility[13]

| Permit | Eligibility | 2009 Annual Permit Price per Month | 2009 Annual Permit Price After 8% Reduction (Furlough) | Permits Sold FY 2009 | 2009 Daily Scratch Ticket Price (if available |
|---|---|---|---|---|---|
| E | Emiriti: Retired/Emeritus Faculty (E Permit holders may park in all "C" spaces/lots) | $38 | $35 | 284 | n/a |
| C | Central Campus Annual Permit: Staff with 20+ years of experience and certain faculty/staff title codes | $131 | $121 | 1323 | $16 |
| C CP | Central Campus Annual Carpool Permit: C permit eligible faculty/staff may purchase (each vehicle must have (a) 2 or more CP permits, at least one of which must be a C CP permit, or (b) one C CP permit + one dispensing machine (daily) ticket. | $47 (per person) | $44 (per person) | 132 | n/a |
| F | Faculty/Staff Annual Permit: Open to all faculty and staff (except UC Extension staff) | $94 | $87 | 1965 | $12 |
| F CP | Faculty/Staff Annual Carpool Permit: F permit eligible faculty/staff may purchase (each vehicle must have (a) 2 or more CP permits, at least one of which must be a C CP, or F CP permit, or (b) one C CP or F CP permit + one dispensing machine (daily) ticket. | $31 (per person) | $29 (per person) | 582 | n/a |
| S | Student Annual: Available to all graduate and undergraduate students residing at least two miles away. | $86 | $73 | 880 | $10 |
| S CP | Student Annual Carpool: S permit eligible students may purchase (To use in S lots, each vehicle must have (a) 2 or more CP permits (any type) or (b) one CP permit (any type) + one dispensing machine (daily) ticket. | $31 (per person) | $26 (per person) | 426 | n/a |
| RH | Residence Hall Permit: Students or Faculty/Staff residing in Residence Halls (criteria est. by UC Housing & Dining) | $105 | $98 | n/a | n/a |

## Occasional Parking Ticket/Permit Options

As noted in Figure 10, there are a number of parking options available to students, faculty, staff and visitors, depending on (a) their eligibility to buy different types of

[13] All permit pricing listed without Transportation Fee. Carpool permit holders do not pay the $3 Transportation Fee.

permits, and (b) how frequently they plan to drive to campus. The options for occasional parkers include:

1. **Purchasing daily "scratch tickets"** that can be used one time only, but which may be purchased in bulk, ahead of time (UC affiliates may only purchase those scratch tickets for which they are eligible, as defined in Figure 10, above (e.g. F-permit eligible staff may purchase Daily F-scratch tickets which they may use in lots and spaces marked as available for "F" permit holders; "C" permit eligible staff may purchase Daily "C", or Daily "F" scratch tickets for use in "C," or "F" lots respectively, etc.).

2. **Buying hourly parking permits from dispensing machines** ("Dispensing Machine Tickets" are sometimes referred to as "DMT") at selected lots throughout campus (Note that these are the tickets which are available to visitors and members of the general public). DMT rates are:

| | |
|---|---|
| 0-1 hours | $3.00 |
| 1-5 hours | $3.00 + $1.00 for each hour beyond the first |
| 5-8 hours | $7.00 + $2.00 for each hour beyond the fifth |
| Over 8 hours | $15.00 (maximum) |

3. **Paying an attendant** for parking on an hourly or daily basis at the entrance to one of several parking lots attended by UC Office of Parking & Transportation staff and/or contract employees (e.g. the MLK Student Union Garage). Attended parking rates are:

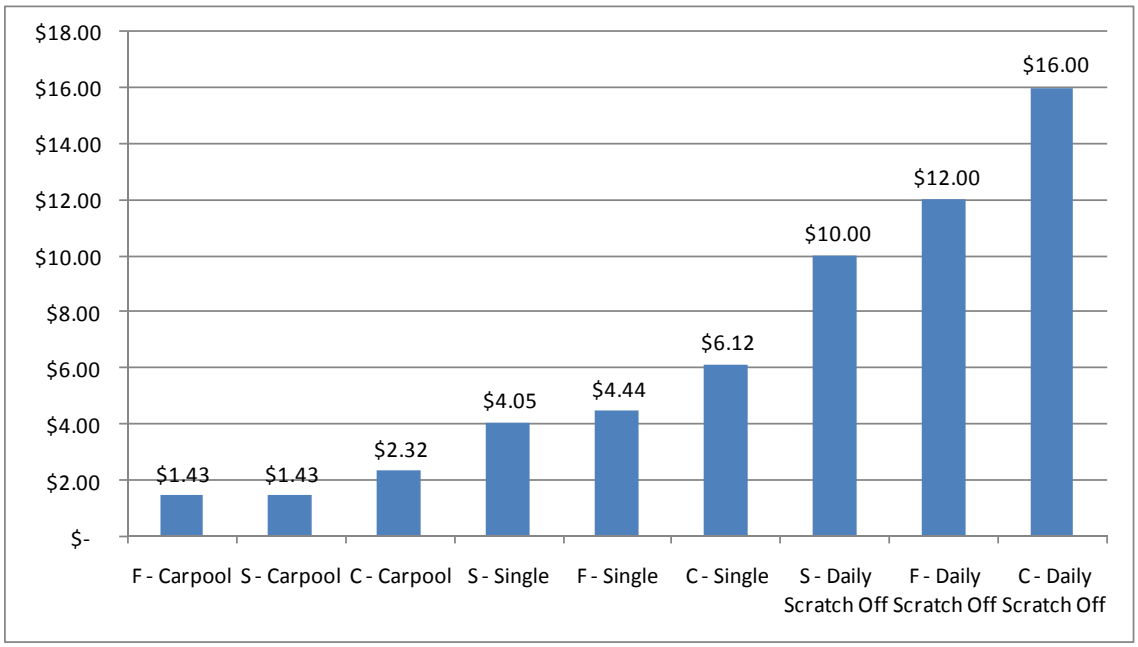
| | | | |
|---|---|---|---|
| 0-1 hours | $1.00 | 4-5 hours | $11.00 |
| 1-2 hours | $3.00 | 5-6 hours | $14.00 |
| 2-3 hours | $5.00 | Over 6 hours | $18.00 (max) |
| 3-4 hours | $8.00 | | |

Note that there are currently no daily discount parking permits or dispensing machine tickets available for carpool commuters to use on an occasional or informal basis. In addition, prices and permit eligibility for lots across campus vary during evenings, and weekends. However, because these are not typically periods of peak utilization, the permit types and utilization patterns unique to these time periods need not impact capital and operations planning to the same degree and consequently are not described in detail here.

The parking prices for different lots and permits can be confusing to commuters and visitors to UC Berkeley and difficult to compare from one facility or one permit-type to the next. Figure 11 shows the relative costs of the different types of daily and annual/semester parking passes available to UC commuters by showing the effective

daily parking price for each permit type. For daily scratch-off tickets ("S," "F," and "C") tickets the standard daily rates are shown. For each of the annual or semester permits shown (including single and carpool permits for "F," "S," and "C" permit eligible commuters) we have calculated the effective daily parking price by dividing the annual permit rate, by the number of school/work days per month.

## Figure 11 Effective Daily Parking Price by Permit Type




In fact, much like auto insurance, annual, semester and monthly parking charges are effectively bulk purchases of services which then appear as "sunk costs" to consumers and do not, consequently, factor into their day-to-day travel choices. Daily parking pricing on the other hand requires consumers to make a calculated decision to spend money by the hour or by the day for services as they are rendered and as such effectively act as a "variable cost." Because commuters who pay daily fees or use daily scratch-off tickets must spend the amount required for daily parking fees each time they choose to drive, and conversely can avoid spending, or *save* the same amount, each time they choose not to drive, they have a strong financial incentive not to drive each day when they make their choice about how to get to work or school.

Figure 11 shows that effective daily parking rates for annual "C," "F," and "S" permit-holders are all less than 50% of the cost of buying a daily scratch-off ticket for commuters with the same permit eligibility.

This pricing arrangement provides a strong financial incentive for commuters who think they may drive some or most days to purchase an annual or semester parking permit, which in turn encourages them (having already paid for parking) to drive – instead of taking public transit or using other alternatives – when they make their daily travel mode choice.

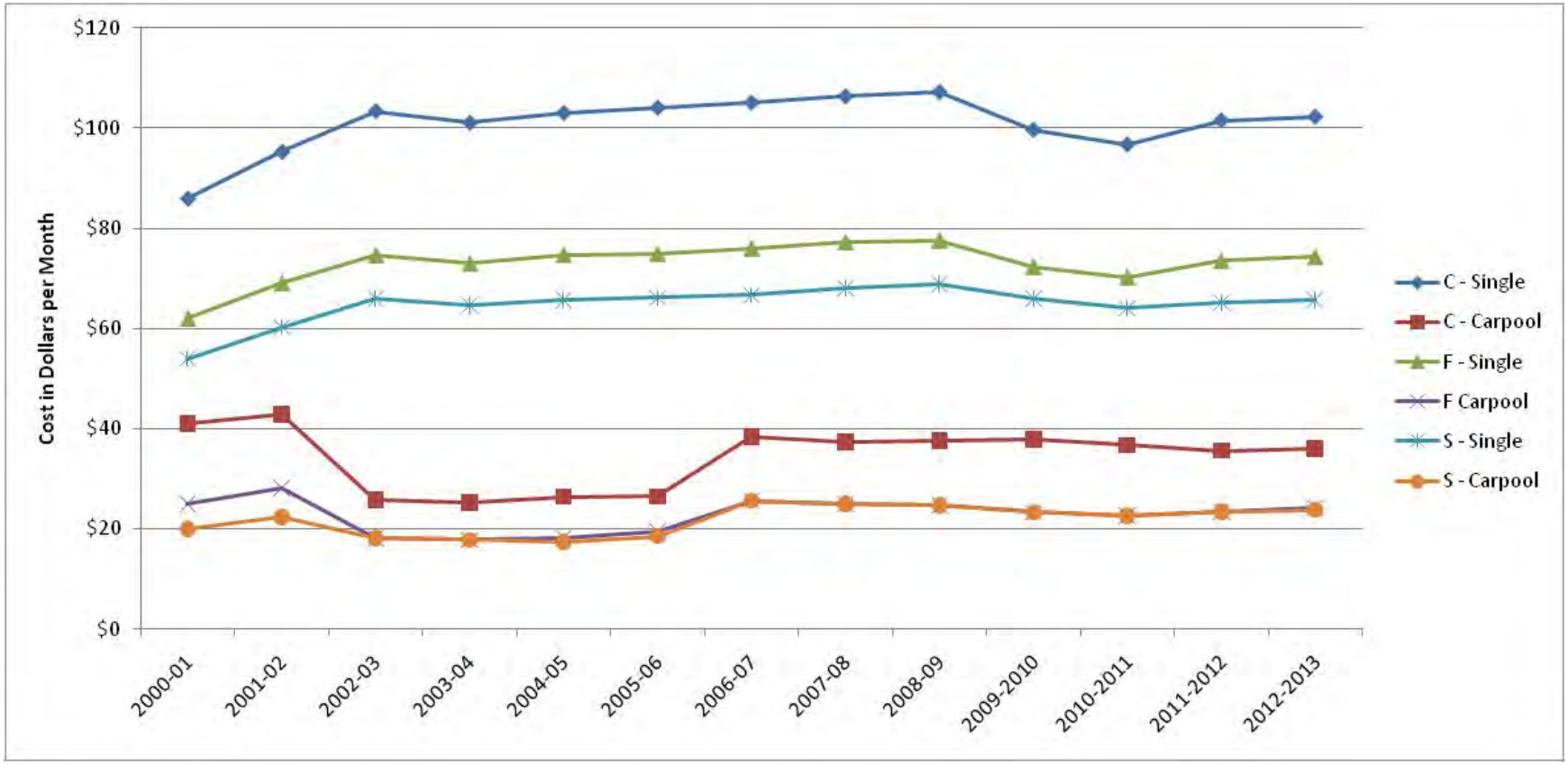
Figure 12 shows real, inflation-adjusted price *per month* of each of the major permit-types illustrated in Figure 11, from 2001-2010, as well as the anticipated price per month of each permit through 2012-2013. The chart makes clear that real permit prices have not changed at the same rate over time and are not expected to do so in the immediate future. Instead, we saw a sharp decline in the real price of all three types of carpool permits in 2001-2002, a change that was reversed with price hikes for carpool permit-holders in 2006-2007. Another notable change is the dip in C, F, and S permit prices from 2008 to 2009; a trend which is expected to continue into 2010.

## Overall parking prices

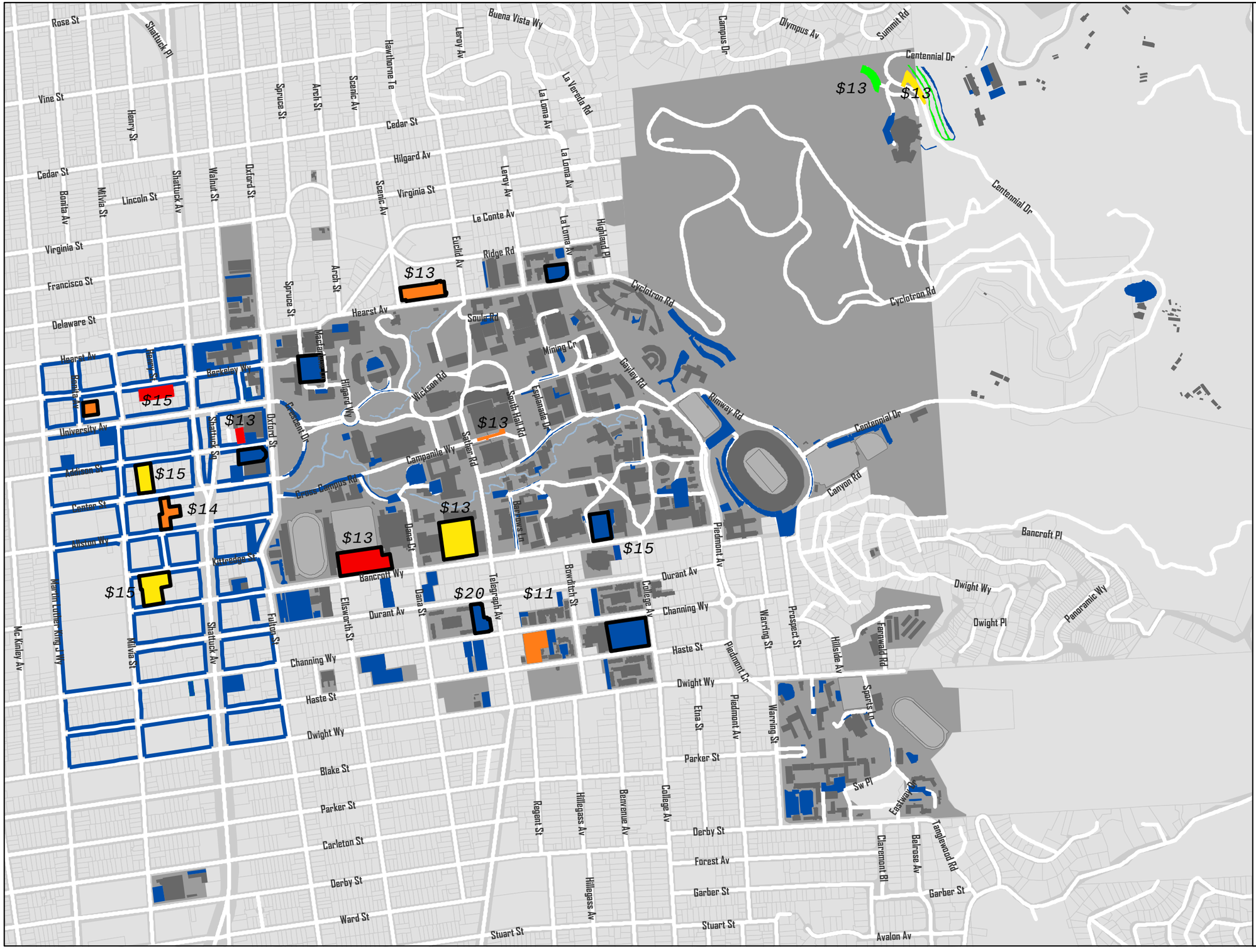
Figure 13 shows the effective daily parking prices for all parking facilities in the UC Berkeley/Downtown Berkeley area, including all off-street lots and structures owned by the University, the City, or private-held, and available for all-day (9:00 AM to 5:00 PM) commuter parking[14]. As illustrated in Figure 13, prices by lot range from $11 to $20 per day for occasional drivers, with the among the cheapest daily rates in some of the multi-level Central campus parking facilities including the RSF Garage, and the MLK Student Union Garage.

[14] The focus of this lot by lot price analysis on lots available for all-day parking led us to exclude most on-street parking, which throughout much of Downtown Berkeley and the Southside is time limited (in addition to being metered). Prices shown in Figure 13 are for occasional drivers purchasing daily scratch-off tickets, DMT, or paying an attendant to park in secured lots near the center of campus.

## Figure 12 Real (Inflation Adjusted) Permit-Prices by Year



## Figure 13 Daily Parking Prices, All Parking in UC and Downtown Berkeley Area




Daily Parking Prices, Lots Available to Occasional Drivers to Downtown Berkeley Area (includes UC Campus and Southside); Commuters without Monthly Permits

**Off Street Occupancy**

- 0% - 49%
- 50% - 74%
- 75% - 89%
- 90% - 100%

Unknown or Not Publicly Available for All-day Parking

Parking Structure or Underground Garage

$15 Daily Parking Price

UCB Campus Buildings

UCB Athletic Fields and Tracks

University of California, Berkeley

Data Source: UC Berkeley, City of Berkeley

Note: Golden Bear Garage occupancy data is for the Weekday, AM peak hour, source: IBI, 2005

0 500 1,000 Feet

N

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The unique classes of commuters for whom we have analyzed parking occupancy and price by lot, are determined by:

- whether or not they own a semester or annual parking permit;
- the type of semester or annual parking permit owned;
- if they do not own a semester or annual permit, the type of daily parking permit that they are eligible to purchase ("C," "F," "S," "RH," for UC affiliated students/employees, or hourly/daily parking tickets for members of the public).

Any UC employee, student, or campus visitor who wishes to park on or near campus for a typical eight-hour work day (i.e. from 9:00 AM to 5:00 PM) may ask:

"Where can I park, and what will I have to pay?" To answer these questions, Figures 14-25 show:

- which parking lots are available to "C," "F", "S," and "RH" permit-holders, and members of the public (and to occasional commuters who may be eligible to buy daily parking tickets for the same lots) (see Figure 5);
- the weekday peak hour (12:00 PM) occupancy of each of these available lots (see Figures 15, 16, 18, 21, 22); and
- the effective daily price a commuter will have to pay (see Figures 14, 17, 20 and 23, for prices for "C," "F," "S," and "RH" permit-holders, and "C," "F," "S" permit-eligible occasional commuters, and Figure 23 for visitors and members of the general public).

The occupancy information is vital because it shows which of the lots that are available to each type of commuter have vacancies, and which would be filled to capacity at the busiest hour of the day.

One of the limitations of the parking occupancy surveys conducted in the Spring and Fall of 2009 is the fact that utilization was recorded by lot, with no differentiation by the type of permit held by each occupant, or the permit-eligibility of the individual parking spaces used within each lot (e.g. we do not have access to information about the number of "C" permit holders who occupied spaces in the Upper Hearst Structure at the surveyed hour, only the total number of vehicles, including motorcycle, present). Consequently, the occupancy percentages shown on the maps in Figure 5, and Figures 15, 16, 18, 21, and 22, represent the total number of vehicles in the lot (occupants) divided by the total number of spaces in the entire lot (capacity, or inventory).

## Parking Price and Availability for "C" Permit Eligible Commuters

Figures 14-16 illustrate weekday peak hour (12:00 PM) occupancies for lots available to C-permit eligible commuters (Figure 14), and effective daily parking prices for C permit holders (Figure 15) and C-permit eligible commuters to the UC Berkeley campus.

These maps demonstrate that much of the inventory of parking spaces available to C permit holders is located within and immediately surrounding the Central Campus

whereas student “S” lots are generally located further afield. Prices for C-permit holders are constant for all UC owned parking facilities available to these commuters. Figure 16 shows that occasional drivers, who are eligible for C-permits have the option to park at selected lots in Downtown Berkeley and on the Southside, and could do so at a nominal savings of $1.00 to $2.00 per day.

Comparing Figures 15 and 16, the most important difference to note is that at just $6.12 per day, using a semester or annual C-permit is far cheaper than paying the daily rate at nearby City and private garages.

Peak occupancy varies significantly among the lots available to C-permit holders, with on-street parking spaces located within the Central Campus (aka “Campus Park”), as well as nearby lots/structures including the University Hall structure and the Stadium lots filled to more than 90% of capacity. Meanwhile, structured parking at Upper Hearst, and the RSF Garage, as well as surface lots, including Kleeberger and the Foothill lots appear underutilized.

## Parking Price and Availability for “F” Permit Eligible Commuters

Figures 17-19 illustrate weekday peak hour (12:00 PM) occupancies for lots available to F-permit eligible commuters (Figure 17), and effective daily parking prices for F permit holders (Figure 18) and C-permit eligible commuters to the UC Berkeley campus (Figure 19).

Most of the parking facilities available to F-Permit holders and F-permit eligible commuters are located outside of the Central Campus, with significant inventory in Southside lots and structures. The RSF Garage, the only major facility with significant inventory for F-permit eligible commuters on the Central Campus is under capacity at the peak hour, with only 73%, or 237 out of 304 spaces filled[15].

F-lots at or near capacity include the Stadium lots (what was left of them as of Fall 2009), and University Hall to the west of campus. As with the C-Permit eligible areas, significantly underutilized lots include Kleeberger and the Foothills lots, all located to the east of the Central Campus.

As shown in Figure 18, effective daily prices are the same for all UC lots available to annual/semester F-permit holders. Occasional drivers with F-permit eligibility may also choose to park in off-campus lots and structures, however these options cost between $2.00 and $8.00 more per day.

Comparing Figures 18 and 19, one can see that at just $4.44 per day, using a semester or annual F-permit is also far cheaper than paying the daily rate at nearby City and private garages.

## Parking Price and Availability for Students

Figures 20-23 illustrate weekday peak hour (12:00 PM) occupancies for lots available to commuter students (Figure 20), and students and staff living in residence halls (“RH”

[15] As with all other lots on the UC campus that have attended parking, the occupancy figure for the RSF Garage is calculated as a share of the total capacity of the Garage, including all attended parking spaces.

Permit-holders; Figure 23), and effective daily parking prices for "S" permit-holders (Figure 21) and "S"-permit eligible commuters to the UC Berkeley campus (Figure 22).

All "S" and "RH" permit parking inventory is located outside of the Central Campus (aka "Campus Park") of UC Berkeley. Among UC-owned lots available for "S" permit parking, the most utilized facilities are the Bancroft/Fulton lot and the Lower Hearst Structure. However, neither of these facilities had more than 90% of spaces occupied during peak hour surveys conducted in the Fall of 2009. Other major structures with significant "S" inventory, including the Ellsworth Structure and the Underhill Garage – both located on the Southside – were less than 75% full at the peak hour. Most residence hall parking facilities, all located on the Southside as well, were significantly under capacity at the midday peak hour, with 50%-75% occupancies.

Prices for "S" permit lots are constant across all UC-owned parking facilities, at $4.05 per day for semester and annual permit-holders and $10 per day for "S" permit-eligible occasional commuters. With downtown and Southside lots costing between $4.00 and $10.00 more per day than the $10 rate for "S" daily scratch-off tickets, and plenty of space available in most "S" lots, students have little incentive to park off-campus.

## Parking Price and Availability for Visitors and the General Public

Figures 24 and 25 show occupancy and price respectively for publicly available parking facilities located on and around the UC Berkeley campus, including UC lots and structures, City and privately owned lots and structures and on-street parking spaces.[16] Prices are shown for all facilities for which the data was readily available without new data collection.

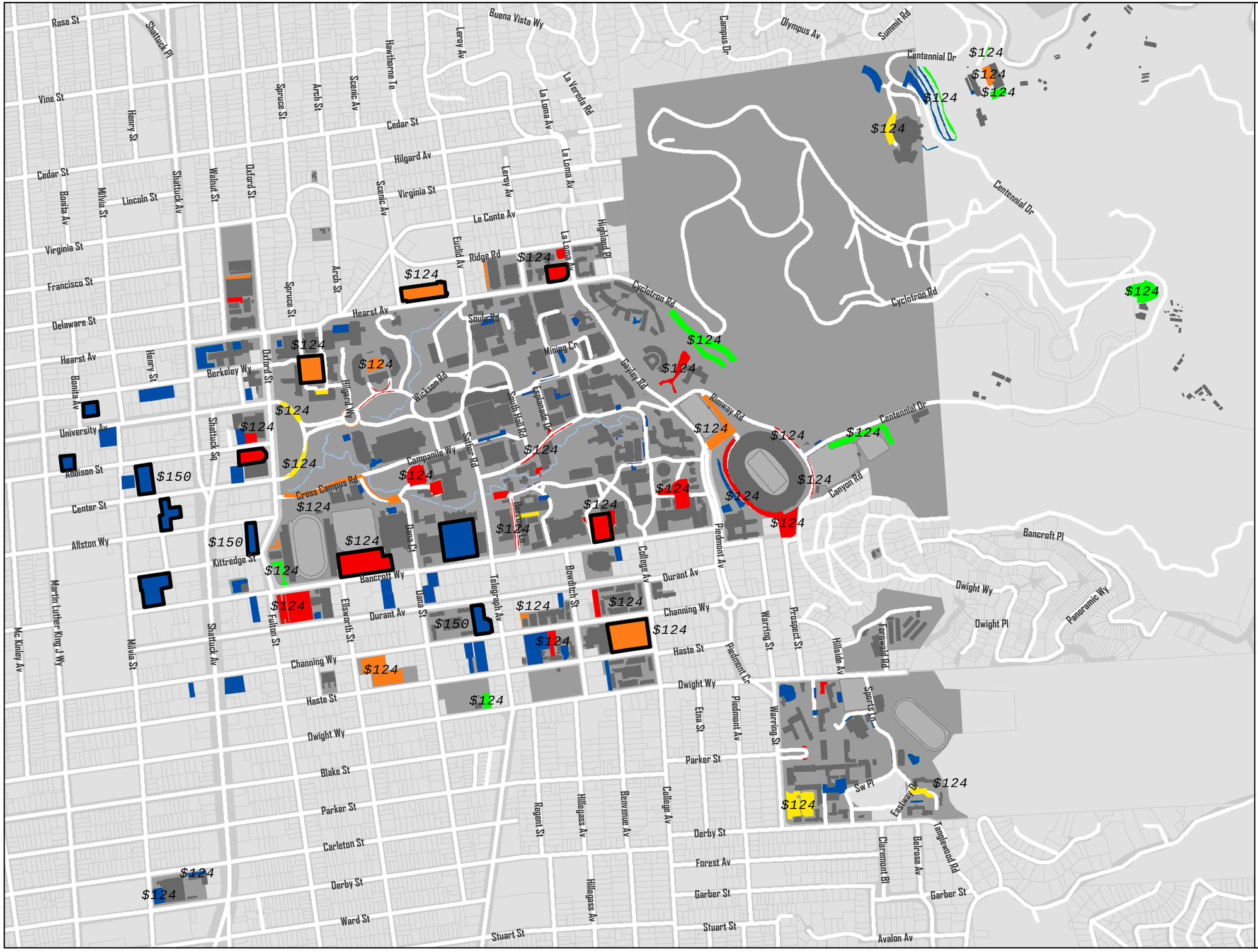
The most significant public parking facilities on the Central Campus are the attended parking facilities at the RSF Garage, and the Martin Luther King Student Union Building Garage – both of which were under 74% occupied at the time surveys were conducted in the Fall of 2009. Another public parking facility located on campus was the Lower Hearst Structure, which approached capacity during the peak hour surveyed.

Figure 24 shows that most of the on-street parking within downtown Berkeley – especially that north of Bancroft Avenue – was filled to between 74% and 100% of capacity at the peak hour. It should be noted that use of most of the on-street supply in this area is time limited (with either 30 minute, 1 hour, or 2 hour limits; even for block faces that are metered). These limits mean that on-street parking is in most cases not an option for commuters, who want to park all day.

Other options in the downtown, including the Center Street and Kittredge Garages, are no more than 74% occupied at the peak hour (Note that the Telegraph/Channing Structure on the Southside is underutilized to an even greater degree, with less than 50% of all spaces occupied at the peak hour). Given that prices for parking in downtown Berkeley and the Southside are between $15.00 and $18.00 per day (as compared to $13.00 for public parking in the largest on-campus facilities: RSF, MLK Students Union, and Lower Hearst), visitors to UC have both a time saving and financial incentive to park on campus.

[16] A majority of the data displayed in the figures is from Fall 2009 counts conducted by UC Berkeley. A limited number of parking lot occupancy figures for City and private lots mapped in this memorandum are from the City's Downtown Area Plan EIR.

## Figure 14 Parking Occupancy, Weekday Peak (12 PM), Lots Available to Drivers with "C" Permits with Monthly Prices




Monthly Parking Prices, Lots Available to UC "C" Permit-Eligible Commuters, Downtown Berkeley Area (includes UC Campus and Southside)

$100 Monthly Parking Price

Occupancy

- 0% - 49%
- 50% - 74%
- 75% - 89%
- 90% - 100%
- Other Lots
- Parking Structure or Underground Garage

- UCB Campus Buildings
- UCB Athletic Fields and Tracks
- University of California, Berkeley

Data Source: UC Berkeley, City of Berkeley

0 500 1,000 Feet

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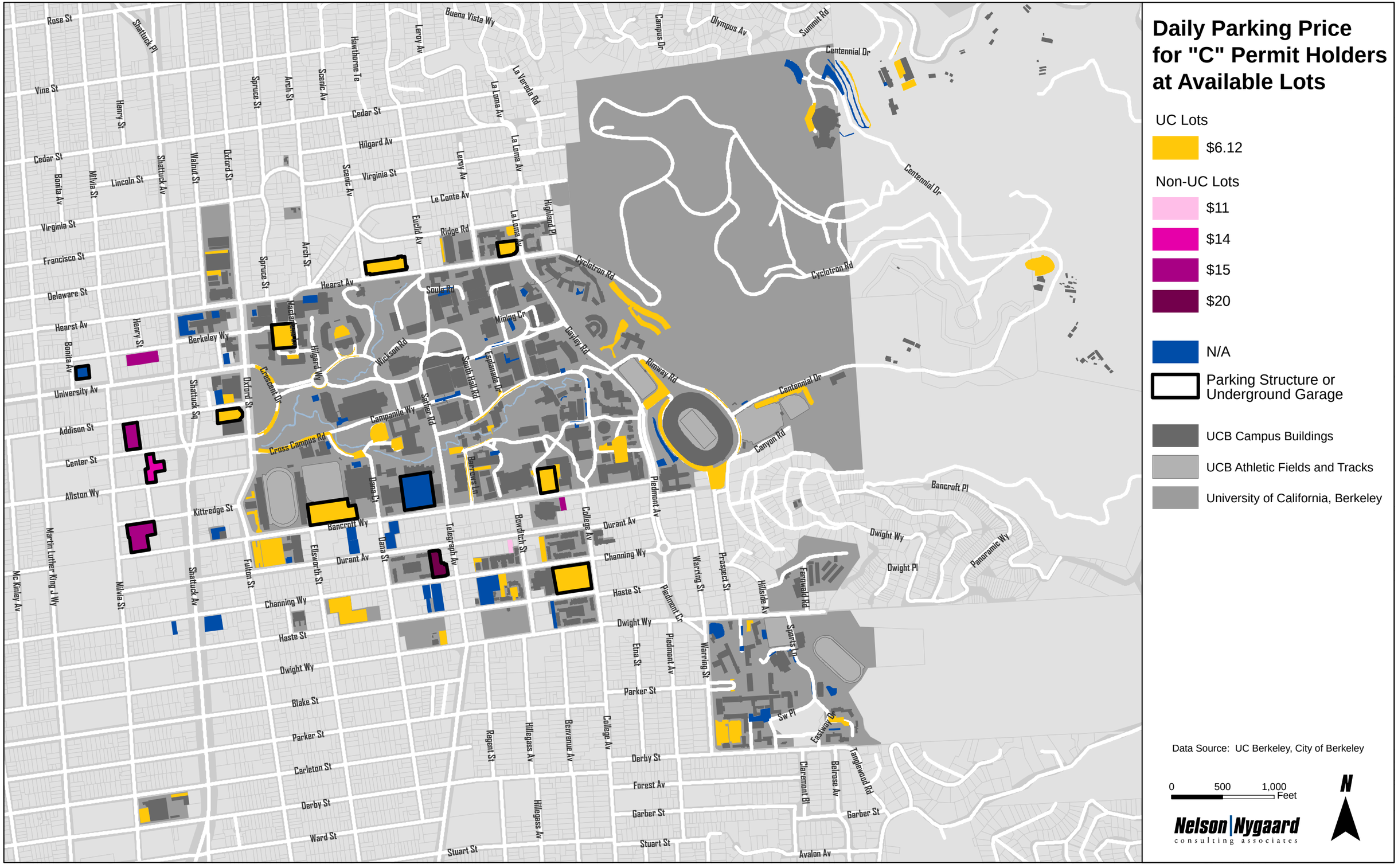
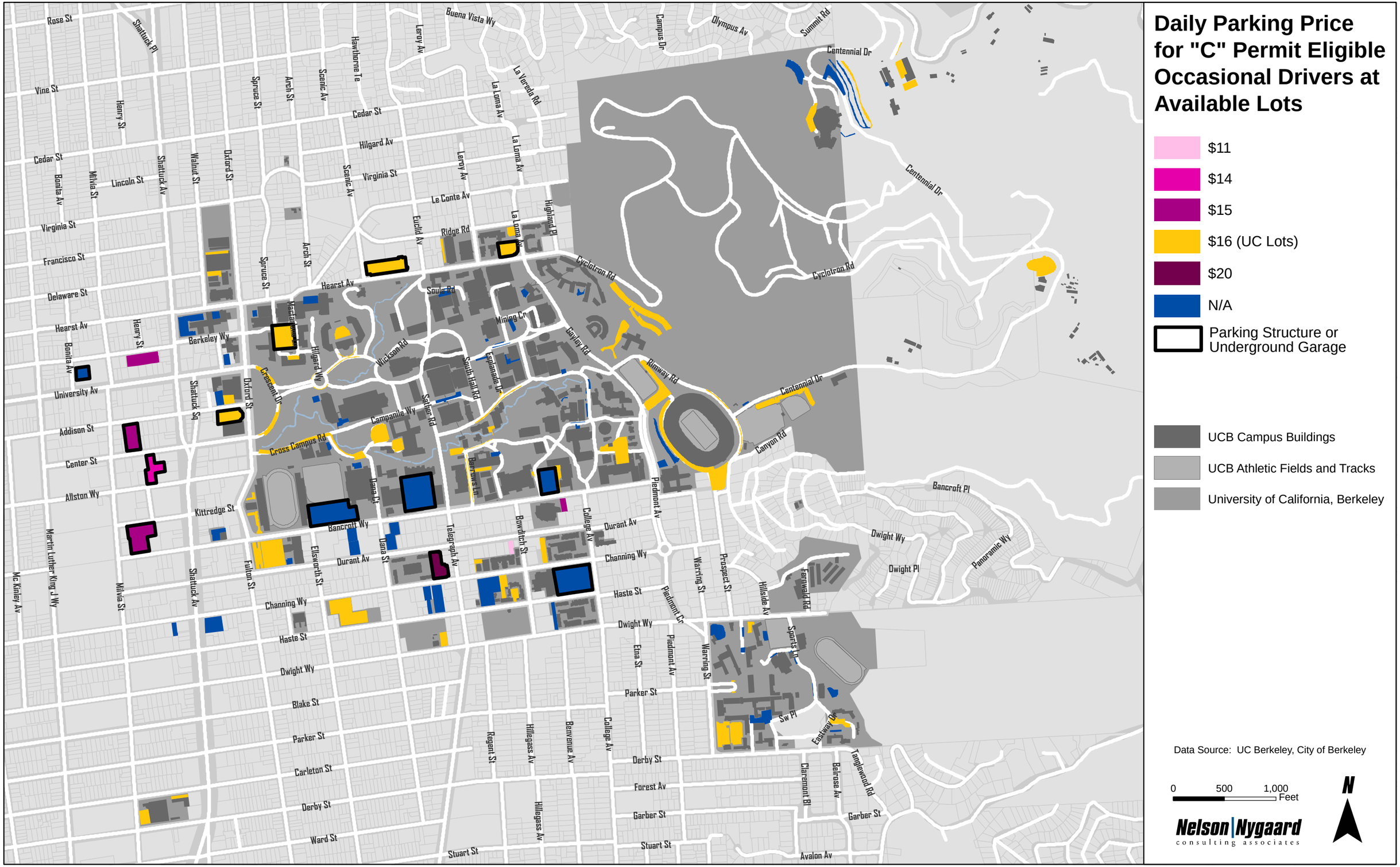
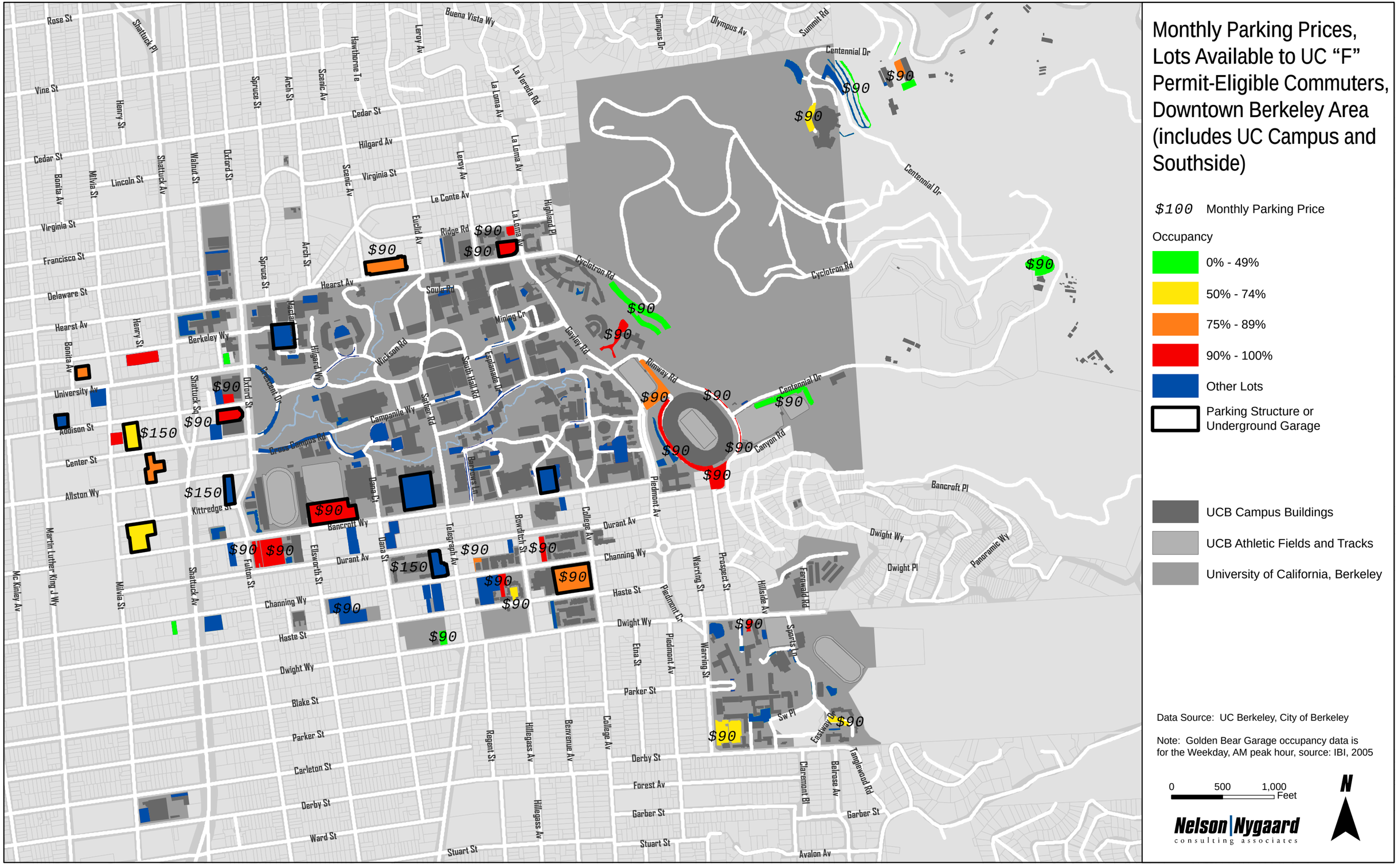
## Figure 15 Daily Parking Price for "C" Permit-Holders at Available Lots



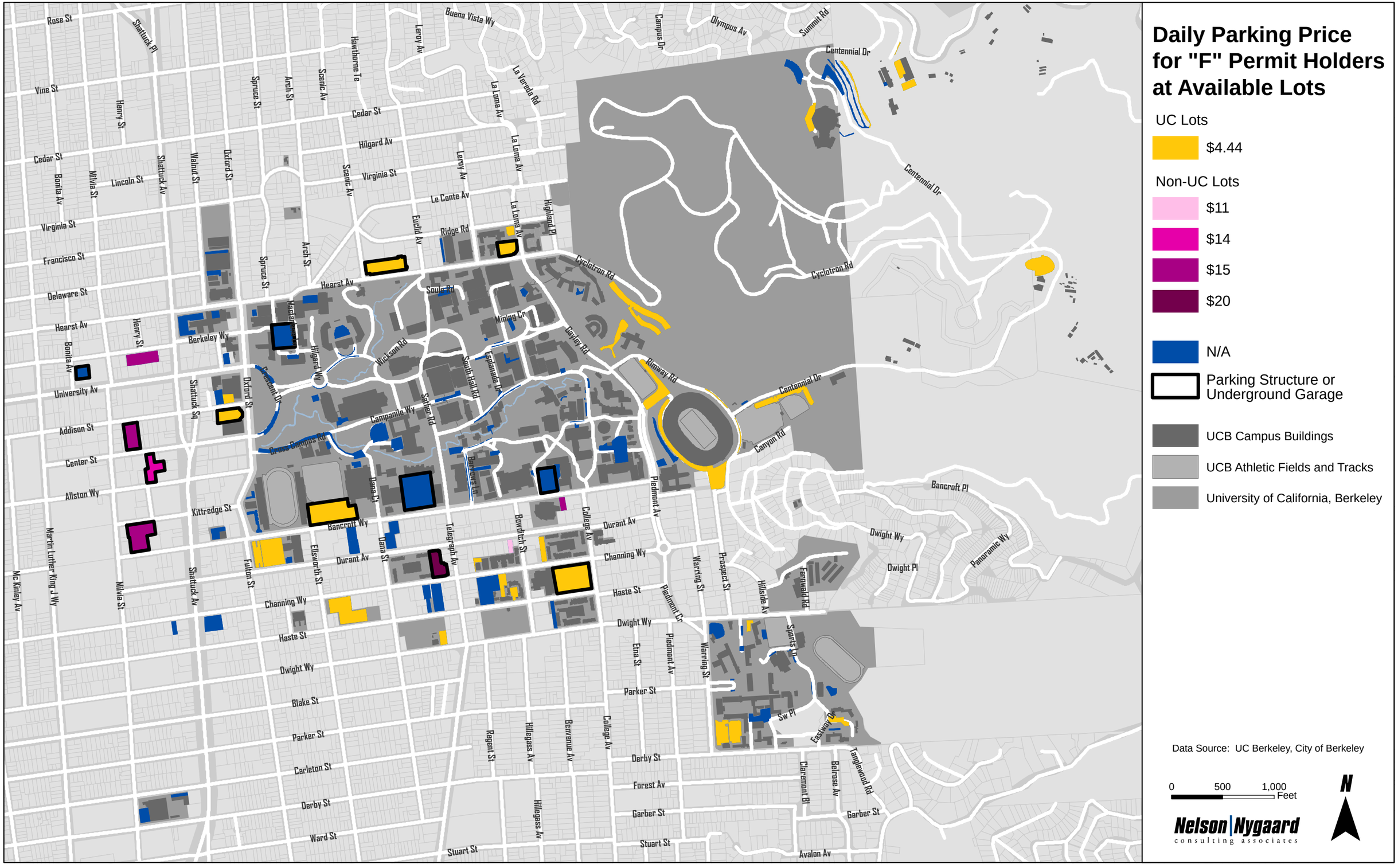
## Figure 16 Daily Parking Price for “C” Permit Eligible Occasional Drivers at Available Lots



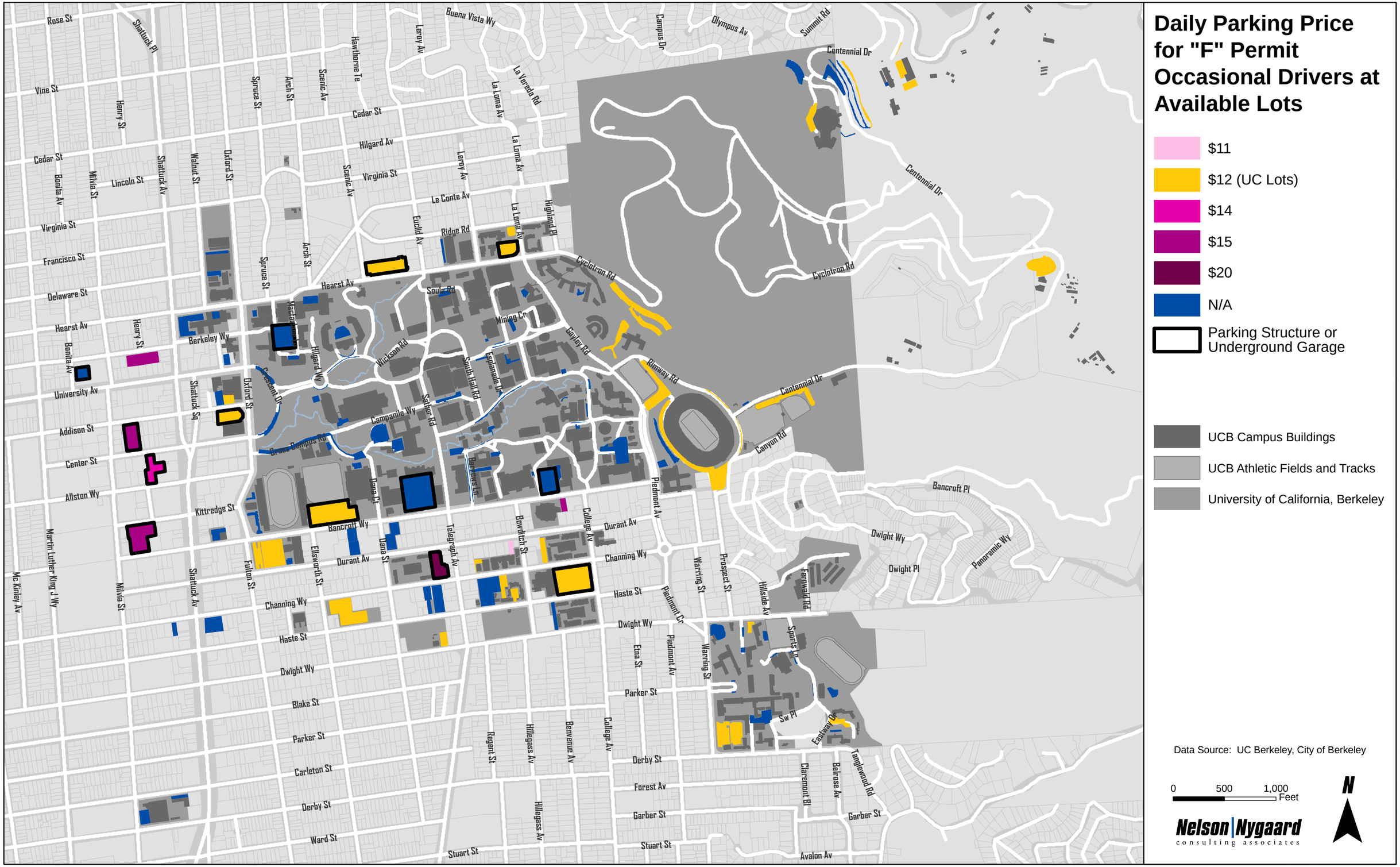
## Figure 17 Parking Occupancy, Weekday Peak (12 PM), Lots Available to Drivers with "F" Permits and Monthly Prices



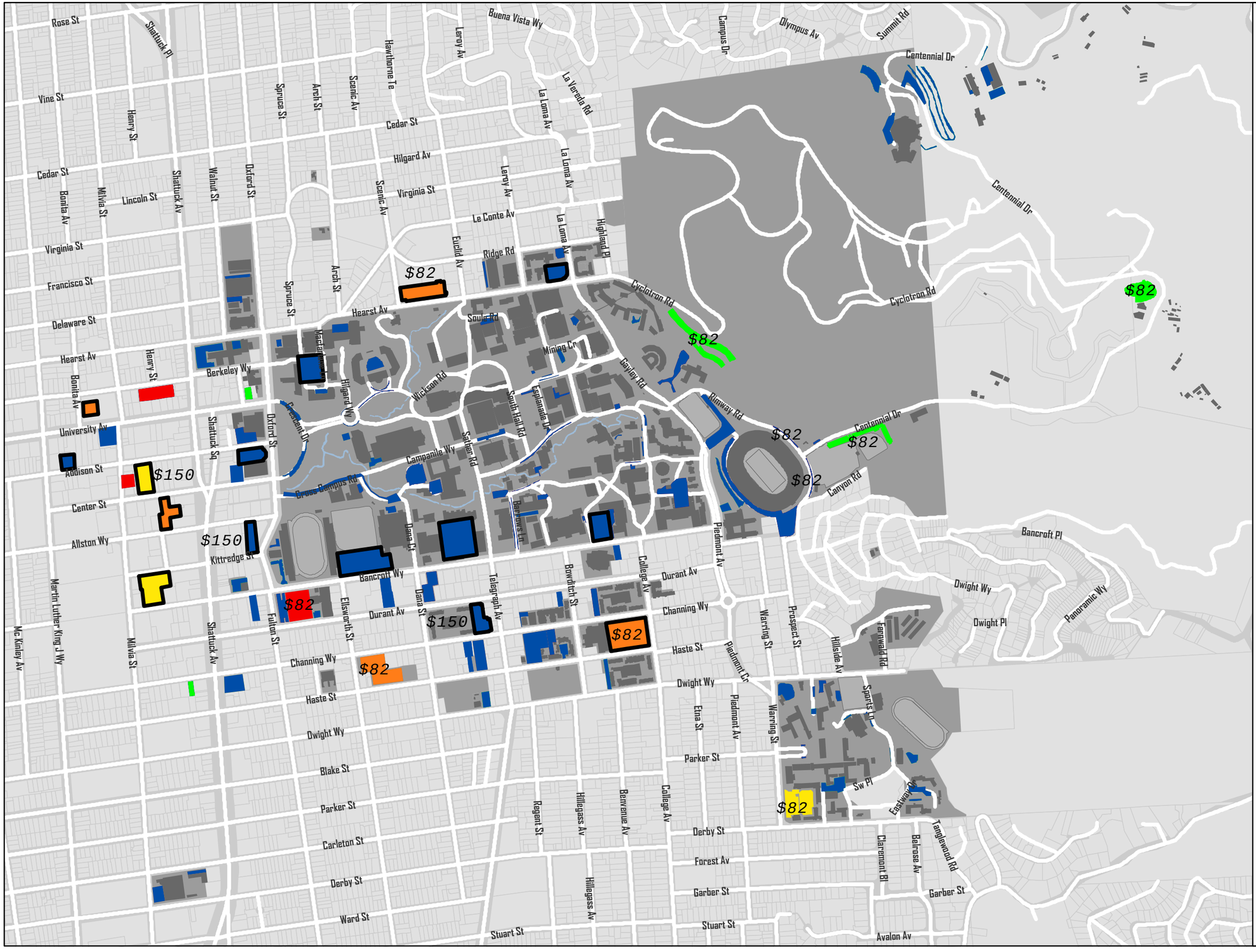
## Figure 18 Daily Parking Price for "F" Permit-Holders at Available Lots



## Figure 19 Daily Parking Price for “F” Permit Eligible Occasional Drivers at Available Lots



## Figure 20 Parking Occupancy, Weekday Peak (12 PM), Lots Available to Drivers with "S" Permits




Monthly Parking Prices, Lots Available to UC "S" Permit-Eligible Commuters, Downtown Berkeley Area (includes UC Campus and Southside)

$100 Monthly Parking Price

Occupancy

- 0% - 49%
- 50% - 74%
- 75% - 89%
- 90% - 100%
- Other Lots
- Parking Structure or Underground Garage

- UCB Campus Buildings
- UCB Athletic Fields and Tracks
- University of California, Berkeley

Data Source: UC Berkeley, City of Berkeley

Note: Golden Bear Garage occupancy data is for the Weekday, AM peak hour, source: IBI, 2005

0 500 1,000 Feet

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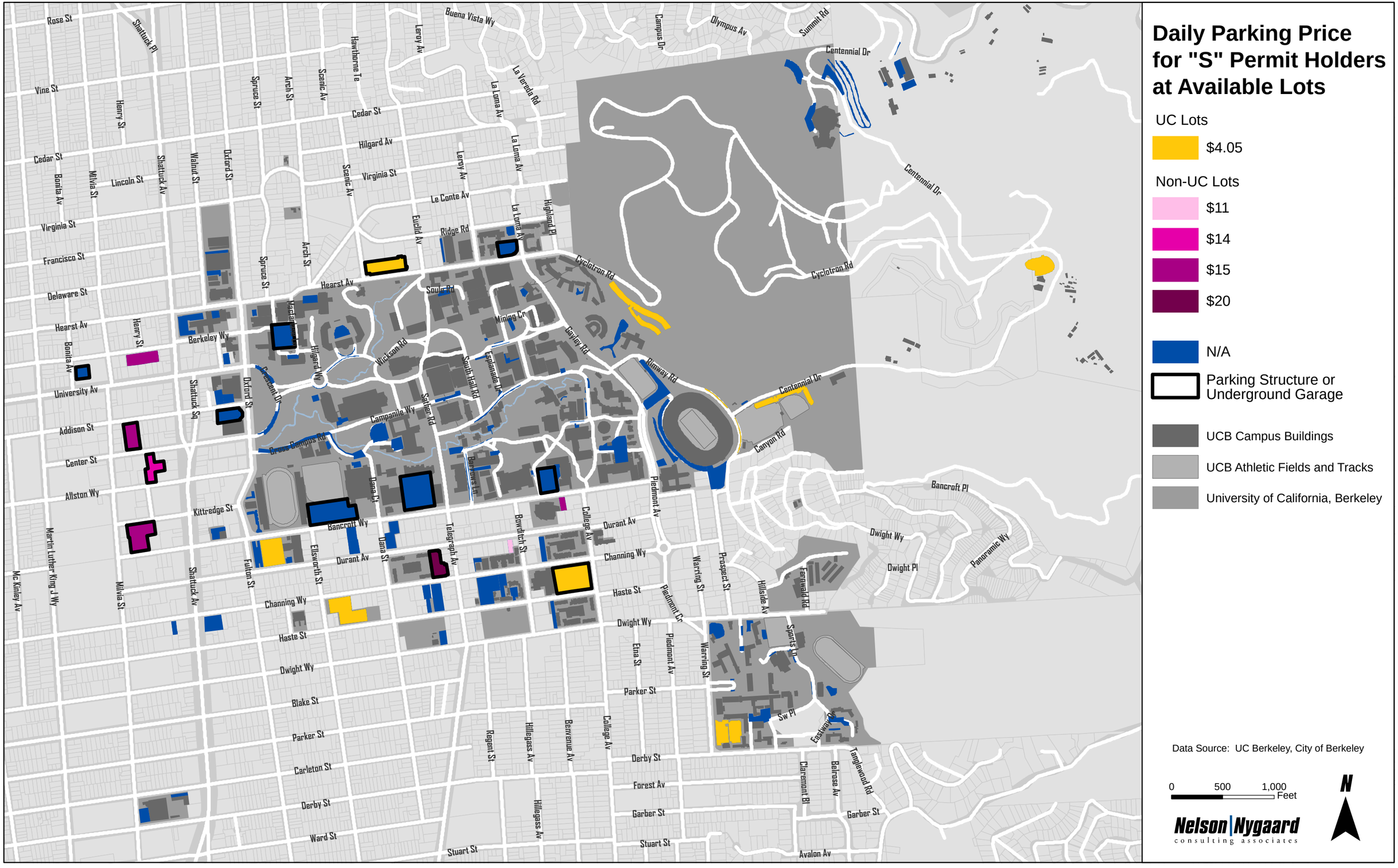
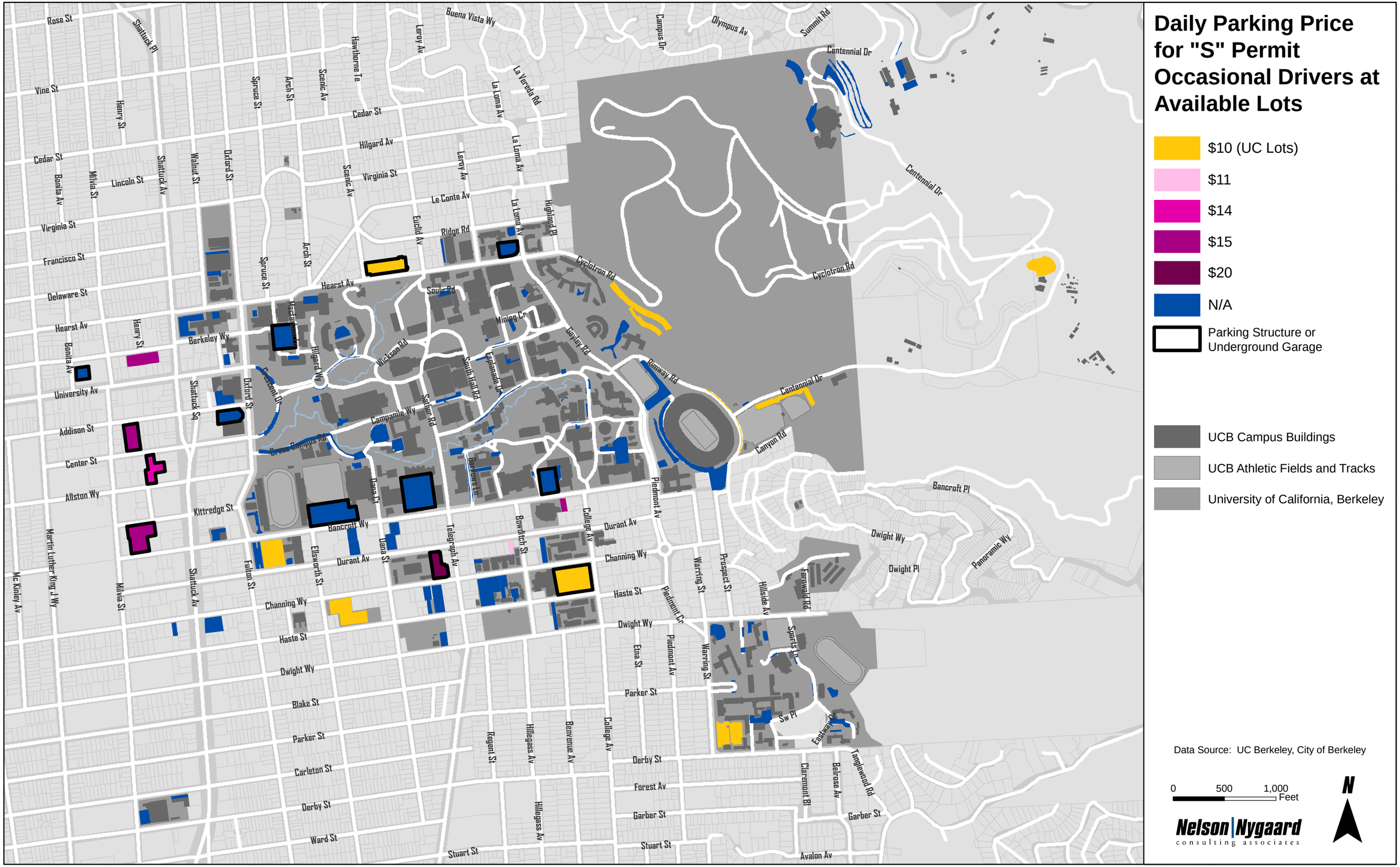
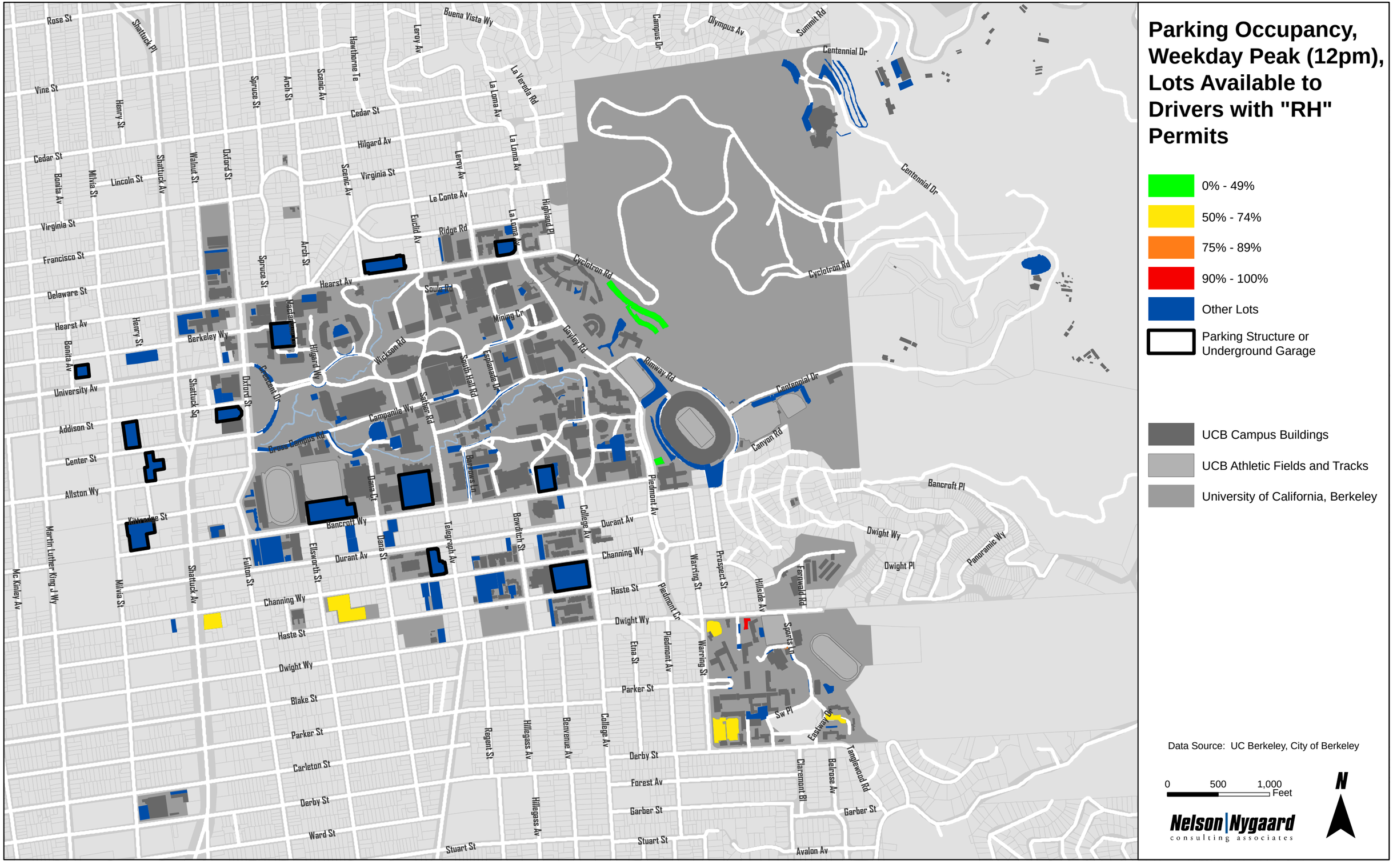
## Figure 21 Daily Parking Price for "S" Permit-Holders at Available Lots



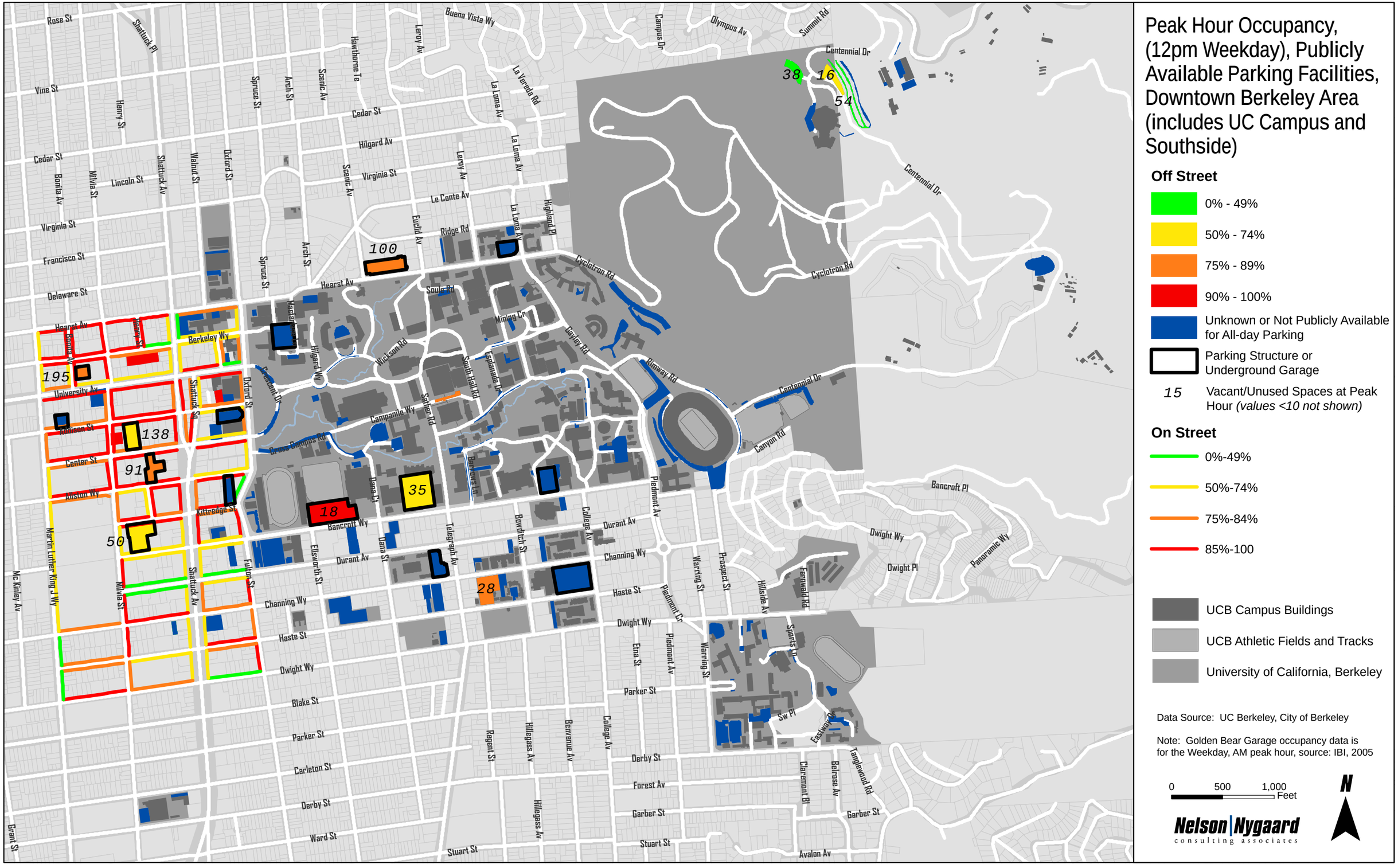
## Figure 22 Daily Parking Price for “S” Permit Eligible Occasional Drivers at Available Lots



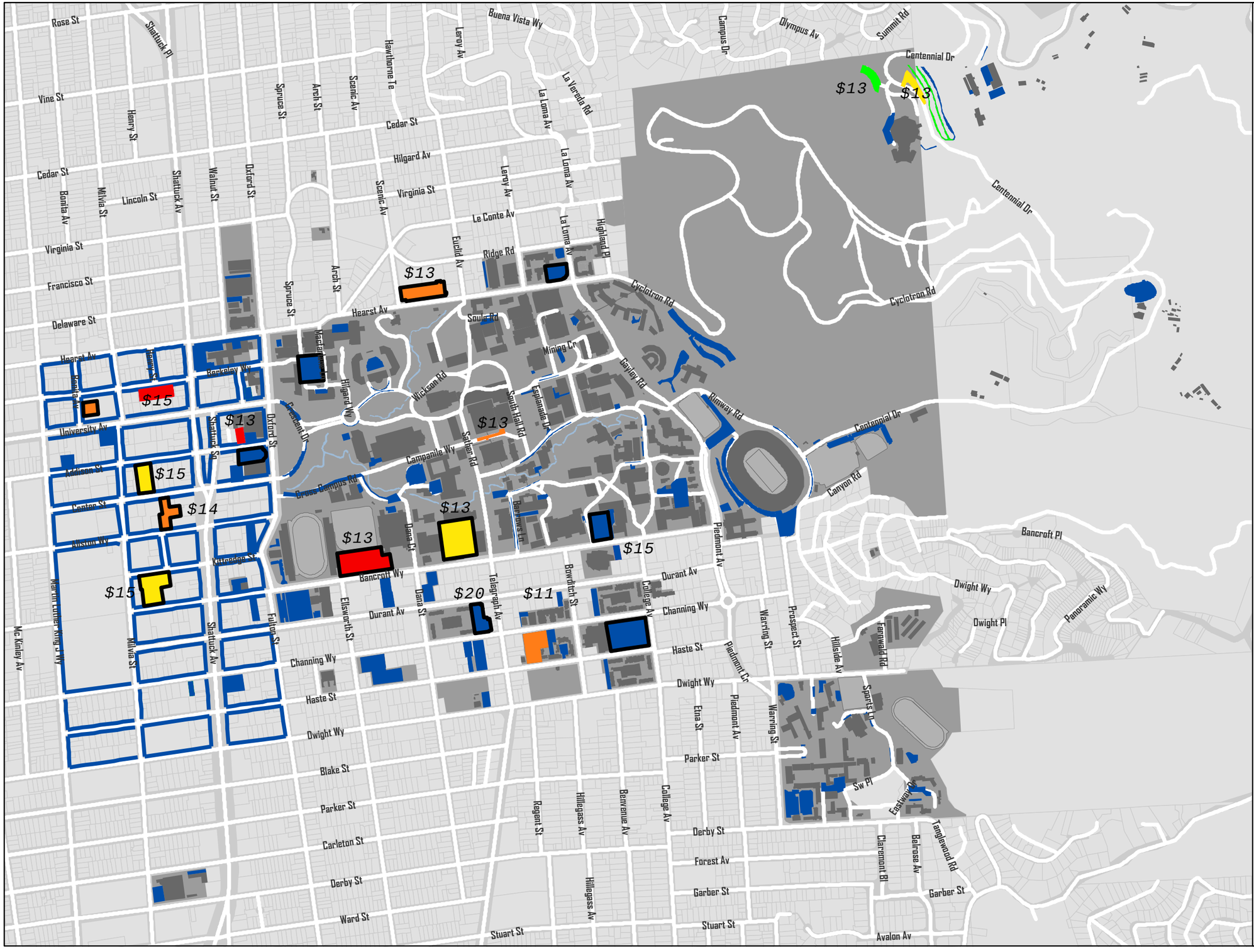
## Figure 23 Parking Occupancy, Weekday Peak (12 PM), Lots Available to Drivers with “RH” Permits



## Figure 24 Parking Occupancy, Weekday Peak (12 PM), All Publicly Available Parking



## Figure 25 Daily Parking Price, Occasional Drivers, All Publicly Available Parking




Daily Parking Prices, Lots Available to Occasional Drivers to Downtown Berkeley Area (includes UC Campus and Southside); Commuters without Monthly Permits

**Off Street Occupancy**

- 0% - 49%
- 50% - 74%
- 75% - 89%
- 90% - 100%

Unknown or Not Publicly Available for All-day Parking

Parking Structure or Underground Garage

$15 Daily Parking Price

UCB Campus Buildings

UCB Athletic Fields and Tracks

University of California, Berkeley

Data Source: UC Berkeley, City of Berkeley

Note: Golden Bear Garage occupancy data is for the Weekday, AM peak hour, source: IBI, 2005

0 500 1,000 Feet

N

Nelson|Nygaard consulting associates

## Figure 26 Parking Permit Ratios by User Group

| Parking Permit Ratios | Population, 2009 (a) | Permits Sold, FY 2009 (b) | Inventory: Spaces Marked for Specific Permit-Type, (c) | Inventory: All Spaces Available to Permit-Holder, 2007- (d) | Ratio: Permits Sold to Population (b)/(a) | Ratio: Permits Sold to Inventory of Spaces Marked for Specific Permit-Type (b)/(c) | Ratio: Permits Sold to Inventory of All Spaces Available to Permit-Holder (b)/(d) |
|---|---|---|---|---|---|---|---|
| Faculty and Management (C + CCP) | 2776 | 1470 | 1270 | 4795 | 0.53 | 1.16 | 0.31 |
| Non-Management Staff, Academic and Non-Academic (F + F CP) | 11792 | 2795 | 1580 | 3621 | 0.24 | 1.77 | 0.77 |
| Students (S, S CP, RH) | 34525 | 1648 | 307 | 2001 | 0.05 | 5.37 | 0.82 |
| Total (C, CCP, F, FCP, S, SCP, RH) | 49093 | 5913 | 3157 | n/a | 0.12 | 1.87 | n/a |

"Permits Sold" refers to semester and annual permit sales, including carpool permits, and does not include daily scratch-off ticket sales. Note that the population groups referenced in column (a) are the best possible proxy for, but are not exactly the same as the groups of UC students and employees who are eligible to purchase the permit-types shown in parenthesis (e.g. "Faculty + management [staff]" as defined in UC OPT calculations of change in campus population does not precisely equal the number or share of all campus employees eligible for purchasing "C" permits. However, this is the best proxy available given the available data).

# APPENDIX E

## SEISMIC ACTION PLAN FOR FACILITIES ENHANCEMENT AND RENEWAL (SAFER) - CAMPUS PARKING

**Campus Parking – Seismic Information**
Source: http://berkeley.edu/administration/facilities/safer/index.html

## Lower Hearst Structure (Parking Structure A)

**Program**

Use: Parking; PE Labs/Tennis; Rec Tennis

Description: Parking structure built in 1967 with loan funds (paid back out of parking revenue). Early 2000s rooftop tennis courts converted to parking use. Land was a 1940 gift from M.T. Morrison and a 1942 gift to UC from the Adolph Miller estate (the bulk of the estate went to fund the Miller Institute for Basic Research in Science, on the campus).

**Data**

| | |
|---|---|
| **Total Area ASF** | **NA** |
| **Total Area GSF** | **TBD** |
| **Efficiency Factor** | **NA** |
| **Seismic Rating** | **Good** |
| **Marked Spaces** | **622** |
| **Attended Spaces** | **150** |
| **Occupants (GSF)** | **Per FDX** |
| Intercollegiate Athletics | 0 |
| Recreational Sports | 0 |
| Physical Education | 22,651 |

## Bancroft / Kroeber Structure (Parking Structure B)

**Program**

Use: Parking; PE Labs/Tennis; Rec Tennis

Description: Bancroft/Hearst Tennis Courts, also referred to as Parking B or the "Campus Garage" (2005 SAFER), was design by Gardner A. Dailey and Associates in 1960. The site has approximately 22,651 GSF or 0.52 acres of space. Use is split between PE tennis and fitness classes and recreational tennis uses.

**Data**

| | |
|---|---|
| **Total Area ASF** | **NA** |
| **Total Area GSF** | **22,651** |
| **Efficiency Factor** | **NA** |
| **Seismic Rating** | **Poor** |
| **Marked Spaces** | **131** |
| **Attended Spaces** | **30** |
| **Occupants (GSF)** | **Per FDX** |
| Intercollegiate Athletics | 0 |
| Recreational Sports | 0 |
| Physical Education | 22,651 |

## Channing / Ellsworth Structure (Parking Structure C)

**Program**

Use: Parking; IA Tennis; PE Tennis; Rec Tennis; Clubs

Description: Land was acquired in 1950s (multiple purchases) and designated at the time for parking structure and recreational use in the LRDPs. Parking structure (with tennis deck above) constructed in 1961 using loan funds (paid back out of parking revenue).

Parking C, also referred to as the Ellsworth Parking Structure (198 parking spots), was built in 1961 and contains the Channing Tennis Courts. The structure is located at the corner of Channing and Ellsworth just to the south of central campus in Berkeley's Southside neighborhood. It has 8 courts covering approximately 0.39 acres (16,988 GSF).

| Data | |
|---|---|
| **Total Area ASF** | **NA** |
| **Total Area GSF** | **16,988** |
| **Efficiency Factor** | **NA** |
| **Seismic Rating** | **Good** |
| **Marked Spaces** | **198** |
| **Attended Spaces** | **0** |
| **Occupants (GSF)** | **Per FDX** |
| Intercollegiate Athletics | 16,988 |
| Recreational Sports | 0 |
| Physical Education | 0 |
| | |

## Underhill Field (Parking Structure D)

**Program**

Use: Parking; Rec Intramurals, Sports Clubs, unstructured play; IA summer camps.

Description: Land acquired with University funds. Original structure built 1962. with "loan funds", presumably paid back out of parking revenue. Demolished circa 1994. Current structure completed in 2008, funded with parking revenue (separate funding for rooftop playing field).

Underhill field is 2.20 acres (95,832 GSF). It is located on College Avenue between Channing and Haste Streets. The field was opened in 2007 and designed on top of the Underhill Garage which has 900 spaces administered by UC Parking and Transportation. Primary uses are for Recreational Sports programs and leagues, including soccer lacrosse soccer, Frisbee, and jogging.

| Data | |
|---|---|
| **Total Area ASF** | **NA** |
| **Total Area GSF** | **95,832** |
| **Efficiency Factor** | **NA** |
| **Seismic Rating** | **Good** |
| **Marked Spaces** | **1011** |
| **Attended Spaces** | **0** |
| **Occupants (GSF)** | **Per FDX** |
| Intercollegiate Athletics | 0 |
| Recreational Sports | 95,832 |
| Physical Education | 0 |

## Upper Hearst Structure (Parking Structure H)

**Program**

Use: Parking; Rec tennis.

Description: Parking H, was built in 1971. It is located off the central campus at northeast corner of the intersection of La Loma and Hearst. The building has approximately 41,121 GSF or 0.94 acres of space devoted to recreational tennis.

| Data | |
|---|---|
| **Total Area ASF** | **NA** |
| **Total Area GSF** | **41,121** |
| **Efficiency Factor** | **NA** |
| **Seismic Rating** | **Good** |
| **Marked Spaces** | **336** |
| **Attended Spaces** | **80** |
| **Occupants (GSF)** | **Per FDX** |
| Intercollegiate Athletics | 0 |
| Recreational Sports | 41,121 |
| Physical Education | 0 |

## University Hall Structure (Parking Structure U)

**Program**

Use: Parking

Description: University owned commercial building on site appears to have been demolished in 1959/60. Replaced with University Hall parking structure in 1960. “Loan funds” used for structure construction, presumably indicating that the project was financed with parking revenue.

| Data | |
|---|---|
| **Total Area ASF** | **NA** |
| **Total Area GSF** | **TBD** |
| **Efficiency Factor** | **NA** |
| **Seismic Rating** | **Good** |
| **Marked Spaces** | **258** |
| **Attended Spaces** | **73** |
| **Occupants (GSF)** | **Per FDX** |

# APPENDIX F

## PARKING STRUCTURE CONCEPT DESIGN STUDY - WALKER PARKING CONSULTANTS


Final Report

# Parking Structure Concept Design Study

University of California

*Berkeley, CA*

prepared for:
UNIVERSITY OF CALIFORNIA
September 2, 2005

WALKER PARKING CONSULTANTS

CHONG | PARTNERS ARCHITECTURE

table of contents

2 September 2005

# table of contents



2 September 2005

# executive summary

2 September 2005

The University of California at Berkeley desires to establish at a conceptual level of design, the capacity of four University owned sites to accommodate enlarged or new parking structures and the estimated (in 2005 dollars) cost per space for each concept at each of the four sites. All four sites studied are on or within a block of the Campus Park, and are directly served by city streets.

The sites studied for the University are the Tang Lot, Dana/Durant Lot, Bancroft Structure and the Upper Hearst Structure. The following is a summary of study findings:

## TANG LOT

Tang Lot is an existing surface lot for permit users with entry/exit lanes on both Bancroft and Durant Streets. The site slopes up 13 feet from the southwest corner to the northeast corner and runs through the block with street frontage on Bancroft and Durant, both one-way streets. The lot is set back from both streets with a landscape strip and low shrubs. All three parking layouts provide a Level of Service (LOS) C.

### 1. ALTERNATE 1.1

The parking structure will provide approximately 325 spaces on two parking levels, including one partially underground level and one supported level. The structure will displace 230 existing space with a net gain of 95 spaces. The opinion of probable construction cost for this alternate is $8,630,000 and this translates to a $90,800 construction cost per net gain stall.

### 2. ALTERNATE 1.2

The parking structure will provide approximately 296 spaces on two parking levels, including one partially underground level and one supported level. The structure footprint will be similar to Alternate 1.1 except that a sports field is added at the roof level. The structure will displace 230 existing spaces with a net gain of 66 spaces. The opinion of probable construction cost for this alternate is $13,162,000 and this translates to a $199,400 construction cost per net gain stall.

### 3. ALTERNATE 1.3

The parking structure will provide approximately 637 spaces on four parking levels, including one partially underground level and three supported aboveground levels. This alternate has a larger footprint than Alternates 1.1 and 1.2, however, it will maintain the 60-foot deep retail space desired by the University. The structure will displace 230 existing spaces with a net gain of 407 parking spaces. The opinion of probable construction cost for this alternate is $16,957,000 and this translates to a $41,700 construction cost per net gain stall.

## DANA/DURANT LOT

Dana/Durant Lot is an existing surface lot with a valet parking component. The lot is configured in a backward "Z" shape with entry/exit lanes on both Bancroft and Dana Streets. The site slopes 11 feet from the low point at the corner of Dana and Durant Streets to a high point at the northeast corner. The lot is set back from Durant with a landscape strip and low shrubs. The double-sided bays will provide for a LOS C, however, the single sided bays will have a lower LOS, between C and D.

### 1. ALTERNATE 2.1

The parking structure will provide approximately 132 spaces on two parking levels, including one partially underground level and one supported level. The site consists of two adjacent rectangular sections connected in the north-south direction. The structure will displace 84 existing space with a net gain of 48 spaces. The opinion of probable construction cost for this alternate is $4,137,000 and this translates to a $86,200 construction cost per net gain stall.

### 2. ALTERNATE 2.2

The parking structure will provide approximately 203 spaces on three and one-half parking levels, including one partially underground level and three supported level. The site footprint will be similar to Alternate 2.1. A retail component is added to the Bancroft Street frontage and internal ramps are provided to access the upper parking levels. The new structure will displace 84 parking spaces with a net gain of 119 spaces. The opinion of probable construction cost for this alternate is $7,919,000 and this translates to a $69,500 construction cost per net gain stall.

## BANCROFT STRUCTURE

The Bancroft Structure is an existing deck with rooftop tennis courts. Parking is provided on ground level below the rooftop tennis courts. Entry/exit lane is provided at Bancroft Street. Vehicles can also drive down Kroeber Hall service access to enter the parking area that is open on all sides. For both alternates, the 90-degree two-way drive aisle module will provide a LOS C, however, the one-way 60-degree bay will provide a LOS D.

### 1. ALTERNATE 3.1

The new parking structure will provide approximately 213 spaces on two parking levels, including one ground level and one supported level. The new structure will displace 131 existing parking spaces with a net gain of 82 spaces. A sports field will be constructed on the roof level of this parking structure. An elevator/stair is provided at the northwest corner for pedestrian access to the tennis court and parking levels. The opinion of probable construction cost for this alternate is $7,303,000 and this translates to an $89,100 construction cost per net gain stall.

### 2. ALTERNATE 3.2

The parking structure will provide approximately 396 spaces on four parking levels, including one ground level and three supported above-grade levels. The new structure will displace 131 existing parking spaces with a net gain of 265 spaces. A retail component is located along the west section on the Bancroft Street frontage. Roof parking level will be extended over the retail component of this structure. The opinion of probable construction cost for this alternate is $10,905,000 and this translates to a $41,200 construction cost per net gain stall.

## UPPER HEARST SITE

The Upper Heart Structure Expansion will include the Upper Hearst Structure and the Upper Hearst Lot located at the corner of La Loma and Ridge Streets. The existing structure is a four level parking structure with tennis courts on the roof level (fifth level). The structure currently has separate entrances for each level. The surface parking lot has access from Ridge Street. Both parking concepts for this site provide a Level of Service C.

### 1. ALTERNATE 4.1

The parking structure expansion area provides approximately 73 spaces on three parking levels, including one grade level and two below-grade levels. Conversion of the roof level to parking and displacement of the surface lot will result in a net gain of 135 spaces. Access to Level One will be maintained. However, all entrances to the upper levels will be closed off except for the Level three entrance. Access to other levels will be provided via the internal speed ramp. The opinion of probable construction cost for this alternate is $3,753,000 and this translates to a $27,800 construction cost per net gain stall.

### 2. ALTERNATE 4.2

The parking structure will be similar to Alternate 4.1 except that there will be no parking on Level Five, as it will remain as tennis courts. However, the tennis courts will be expanded to cover the footprint of the parking expansion area. Two parking levels will be provided at the expansion area with a net gain of 31 spaces. The opinion of probable construction cost for this alternate is $3,912,000 and this translates to a $126,200 construction cost per net gain stall.

2 September 2005

Walker Parking Consultants and our subconsultant Chong Partners Architecture were contracted by the University of California, Berkeley to assist the University to determine, at a conceptual level of design, the capacity of four UC-owned sites to accommodate enlarged or new parking structures, and the projected construction cost (in 2005 dollars) at each of the study sites. The four sites included in the study are Tang Lot, Dana/Durant Lot, Bancroft Structure and Upper Hearst Structure.

Parking space capacity was determined for each site as well as the number of levels and typical floor layouts including ground level retail space or rooftop sport surfaces in some cases, and/or other features specific to each site.

The projected construction cost per space reflects not only the basic structure, but also a level of architectural finish and landscape treatment determined in collaboration with UC Berkeley staff. The estimated cost per space would be used for comparative purposes only, to assess differences in cost per space due to the specific characteristics and potential capacity of each site, and thereby aid the University in establishing investment priorities.

The University furnished the general boundaries for each site. Since all sites are sloped, visual surveys were conducted for each site, to obtain the necessary information to be able to support the concept-level studies for the four sites.

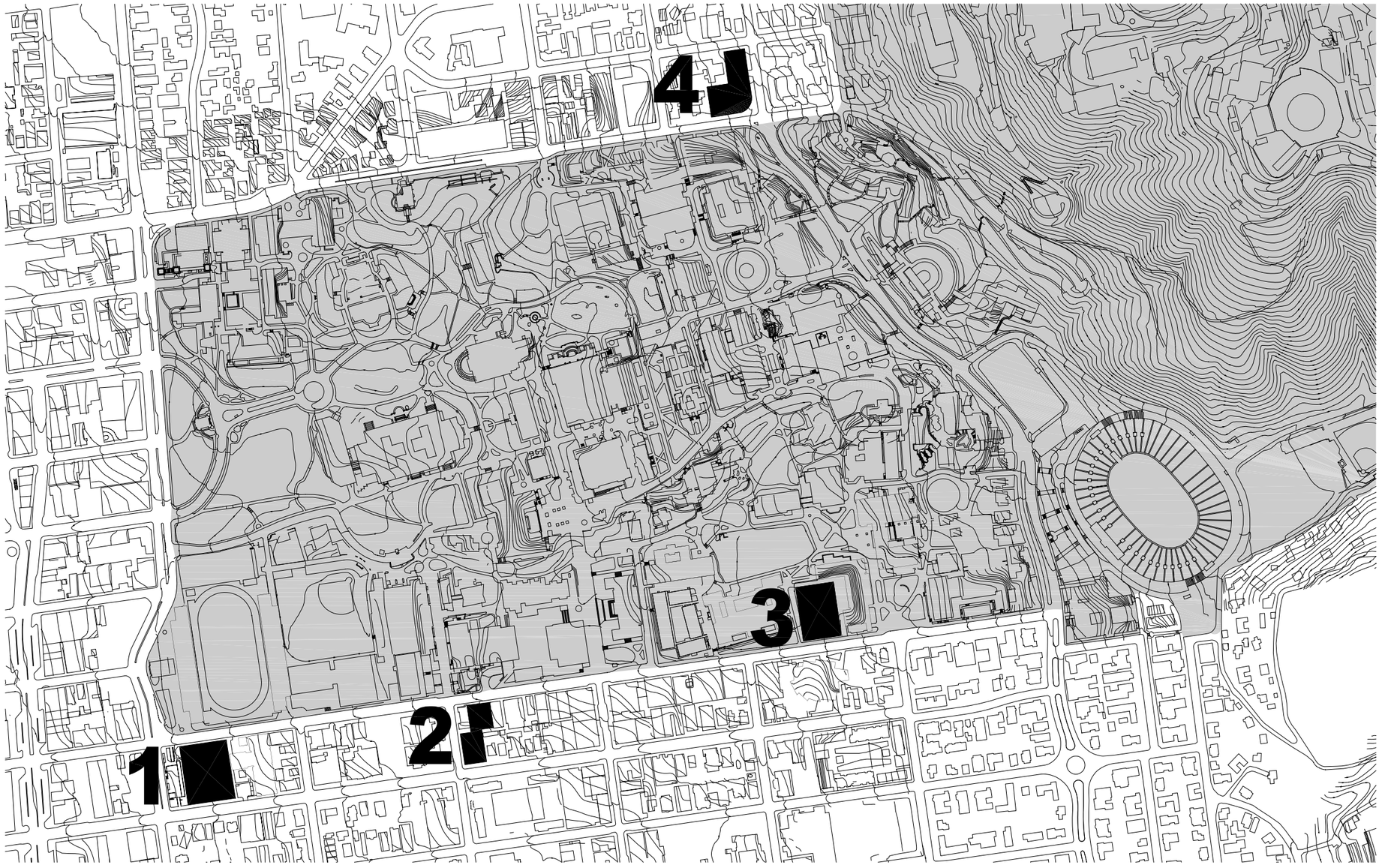
The opinion of probable construction cost for the alternates are expressed in total construction costs for the alternate and construction cost per net gained parking stall.

**LEVEL OF SERVICE APPROACH**

For each site and concept alternates, Walker used the Level of Service approach to define the characteristics of the parking concept functional design. The Level of Service (LOS) approach has been used by Walker over the years to present a quantitative approach to defining the characteristics of a functional design of parking structures. This approach was patterned after the level of service system used by traffic engineers to describe the degree of traffic congestion on streets and at intersections. For traffic engineers, the highest level of service, LOS A, indicates virtually free flow of traffic, while the lowest level of service, LOS E, indicates the maximum flow of cars that can be accommodated before gridlock occurs. Similarly, Walker has identified various parking structure design parameters that affect user comfort and convenience, and assigned values to these parameters that correspond to levels of service. These range from the highest level of service (LOS A) to the lowest acceptable level of service (LOS D). This level of service criteria is used by Walker in developing parking structure functional designs as a means of quantifying the degree of user comfort and convenience being provided.

The parking structure design parameters that affect user comfort and convenience encompass not only the basic stall and parking aisle dimensions addressed in most zoning codes, but also a number of other parameters, including:

- Lane widths for straight lanes and turns
- Turning radii
- Express ramp dimensions
- Ramp slopes
- Clearances to obstructions
- Entry/exit lane widths




**1 Tang Lot**
currently a surface lot, no attendant.

**2 Dana Durant Lot**
currently a surface lot with parking attendants

**3 Bancroft Lot**
currently elevated tennis courts with parking below platform, no attendant

**4 Upper Hearst Lot**
currently a three level structure with rooftop tennis courts. surface parking on adjacent lot to north, with attendants.

N

main campus

# figure / ground not to scale

2 September 2005

tang lot

2 September 2005

Tang Lot is an existing surface lot for permit users with entry/exit lanes on both Bancroft and Durant Streets. The site slopes up 13 feet from the southwest corner to the northeast corner and runs through the block with street frontage on Bancroft and Durant, both one way streets. The lot is set back from both streets with a landscape strip and low shrubs.

## URBAN AND ARCHITECTURAL DESIGN ISSUES

Tang Lot is located between two university buildings. On the West is the Office of Public Affairs, a low, modern, painted, concrete masonry "object" building set into the landscape. Underneath the building is Bancroft/Fulton West Parking, which is accessed by drives on Bancroft and Durant and by stairs on Fulton. The parking's light well is adjacent to the study lot. On the opposite, east side, is the three-story, T-shaped Tang Center for University Health Services. It is a concrete and steel building covered with terracotta-colored stucco and blue metal storefront incorporating regional design elements used by Bernard Maybeck. Constructed in 1992, it provides urgent and primary care for the students of UC Berkeley and selected services to the faculty and staff. The North courtyard has Tang's Career Center in the 1942 Founder's building and an outdoor garden. The south courtyard has the urgent care parking lot. Between the study lot and the Tang Center is a tree-lined pedestrian walkway connecting Bancroft and Durant.

Across Bancroft Street is the 1932 concrete Edwards Track Stadium/Goldman Field, home to the California track and field and soccer teams. Across from the lot on tree-lined Durant Street are mostly single family homes. These small buildings and the residential quality of the street are an opportunity for landscape screen with street trees to provide a transition to the residential and pedestrian environment.

Beyond the Tang Center the buildings along Bancroft begin a low-rise commercial district. The Bancroft edge of the lot could support retail, while the Durant edge should receive a landscape solution with plantings, street trees, etc. Since the Tang Center is already a tall building, a multi-story structure would not be out of scale.

Quality of finishes is important. This west wall would form a back-drop for the Office of Public Affairs. The neighborhood is well-maintained. The entire structure would be visible from the bleachers in the Edwards Track Stadium.

A key circulation node for a new parking structure is the northeast corner adjacent to the outdoor garden.

Appendix A illustrates representative examples of architectural solutions for pedestrian circulation (stairs and elevators), integrating these structures into urban environments and providing appropriate lighting solutions.

## ALTERNATE 1.1 CONCEPT

This parking structure concept will provide approximately 325 spaces on two parking levels, including one partially underground level and one supported level. The two levels will have separate entrances and do not have access from each other. The structure will be long span construction with an outside length in the north/south direction of 238'-6" and an outside width in the east/west direction of 220'-0". The structure will displace 220 existing space with a net gain of 95 spaces.

### PARKING GEOMETRICS

The structure will include four parking bays on each level, with 70-degree parking spaces and one-way traffic on the parking bays The parking module will be 54'-6" in the inner bays and 55'-6" in the outer bays. The parking layout is based primarily on uniform sized parking spaces of 8'-6" wide x 18' long and a 26'-0" wide drive aisle for two-way traffic and a 16'-6" drive aisle for one-way traffic.

The parking facility will meet Americans with Disabilities Act (ADA) and California CCR, Title 24 requirements. Four accessible parking spaces are located on the first level with direct pedestrian access to Durant Street. There are also four accessible parking spaces on the supported second level with direct pedestrian access from Bancroft Street. The accessible spaces are 14'-0" wide including the five foot passenger loading zone. A 17'-0" wide space including an eight foot loading zone is provided at van accessible stalls in each level in accordance with the California Accessibility Standards.

With the accessible spaces located on the First Level, an 8'-2" minimum headroom clearance for vehicular access to the accessible parking spaces is required to meet the ADA requirement.

**ENTRY/EXIT AREAS**
With the site sloped more than 10 feet at two corners of the lot at Bancroft and Durant, the design of the parking level elevation will be such that it will match the elevation of the entrances. The first level will be accessible from Durant Street only. Vehicles will enter from the southwest corner of the structure and exit at the southeast corner. With separate entry and exit points to the garage, traffic can be distributed than if there were a single entry and single exit point. The supported level is accessible from Bancroft Street only. Vehicles will enter from the northeast corner of the structure and exit at the northwest corner. Note that both Durant and Bancroft Streets are one-way streets with Durant vehicles exiting at the east driveway would be permitted to only make a left turn eastbound on Durant. The Bancroft vehicles exiting at the west driveway will make a left turn westbound on Bancroft.

**INTERNAL CIRCULATION**
Vehicles entering the garage either circulate the First Level in the clockwise direction on the two outer bays, or counter-clockwise on the inner bays to look for a parking space. (See Tang Lot Alternate drawing A1.1 on page 9.)

**OPINION OF PROBABLE COST OF ALTERNATE**
The opinion of probable construction cost for this alternate is $8,630,000 and this translates to a $90,800 construction cost per net gain stall. Breakdown of these costs are included in Appendix B.

## ALTERNATE 1.2 CONCEPT

The parking structure will provide approximately 296 spaces on two parking levels, including one partially underground level and one supported level. The structure footprint will be similar to Alternate 1.1 except that a sports field is added at the roof level. To support the roof level, it is assumed that short-span construction type will be used for this alternate with columns located between parking spaces as shown on drawing A1.2 on page 11. Stair/elevator will be located on Bancroft and Durant Street adjacent to the drive aisles to provide pedestrian access to the sports field and the two parking levels. The structure will displace 230 existing spaces with a net gain of 66 spaces.

**PARKING GEOMETRICS**
The parking geometrics are similar to concept Alternate 1.1 with four parking bays on each level, with 70-degree parking spaces.

**ENTRY/EXIT AREAS**
The entry/exit drive lanes will be similar to concept Alternate 1.1.

**INTERNAL CIRCULATION**
Vehicles circulation will be similar to concept Alternate 1.1.

**OPINION OF PROBABLE COST OF ALTERNATE**
The opinion of probable construction cost for this alternate is $13,162,000 and this translates to a $199,400 construction cost per net gain stall. The above total construction cost includes an estimated cost of $3,778,900 for the roof level sports field. Breakout of these costs are included in Appendix B.

## ALTERNATE 1.3 CONCEPT

The parking structure will provide approximately 637 spaces on four parking levels, including one partially underground level and three supported above-ground levels. The structure has overall or out-to-out length in the north/south direction of 238'-6" and an outside width in the east/west direction of 227'-0". This alternate has a larger footprint than Alternates 1.1 and 1.2, however, it will maintain the 60-feet deep retail space fronting Fulton Street, that is desired by the University. The structure will displace 230 existing spaces with a net gain of 407 parking spaces.

**PARKING GEOMETRICS**
The structure has four parking bays, two outer and one inner bay on each level, with 70-degree parking spaces and one-way traffic along the flat parking bays. Those bays have a parking module of 55'-4". A parking ramp connecting the levels will be located on the eastern interior bay, with two-way traffic, 90-degree parking spaces and parking module of 62'-0". The parking layout is based primarily on uniform sized parking spaces of 8'-6" wide x 18' long and a 26'-0" wide drive aisle for two-way traffic and a 16'-6" drive aisle for one-way traffic.

The parking facility will meet Americans with Disabilities Act (ADA) and California CCR, Title 24 requirements. A total of 13 accessible parking spaces are provided, four spaces on the first level and three spaces each on the supported levels.

With van accessible spaces located on the First Level, an 8'-2" minimum headroom clearance for vehicular access to accessible parking spaces would be required to meet the ADA requirement. A minimum clearance of 7'-0" on the upper floors will satisfy the minimum design vertical clearance of the Uniform Building Code (UBC) and California Building Code (CBC).

**ENTRY/EXIT AREAS**

Similar to Alternates 1.1 and 1.2, entry/exits lanes will be located on 2 different levels of the structure. The First Level will be accessible from Durant Street only. Vehicles will enter from the southwest corner of the structure and exit at the southeast corner. Vehicles will circulate between the different levels via the internal 2-way ramp. Another set of entry/exit lanes will be available from Bancroft Street which will access Level Two of the structure. At Bancroft Street, vehicles will enter from the northeast corner of the structure and exit at the northwest corner.

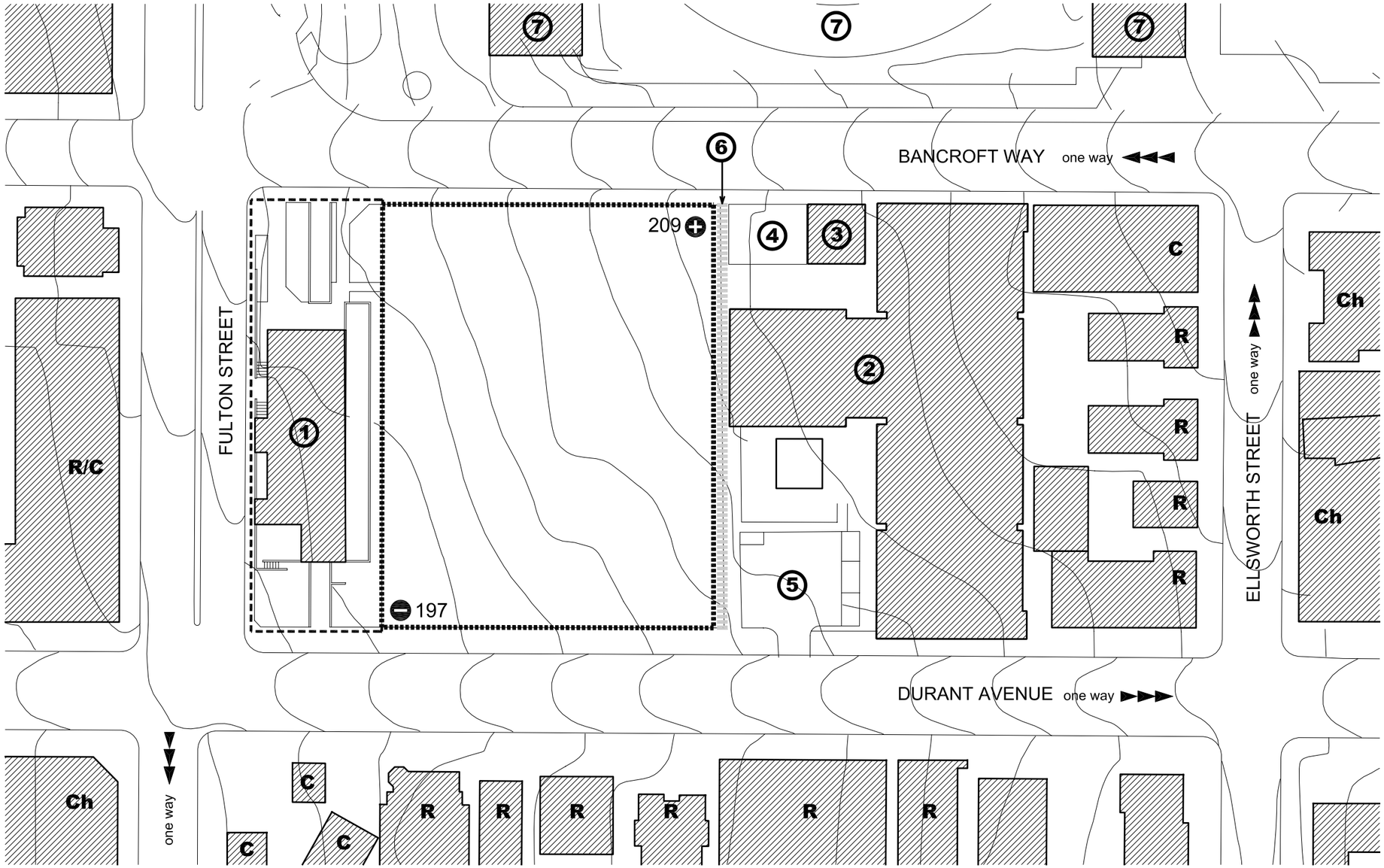
**INTERNAL CIRCULATION / RAMPING**

Vehicles entering the structure either circulate the First Level in the clockwise direction on the two outer bays, drive up the interior ramped bay to the upper levels to look for a parking space. The ramped parking bay has a slope of 6%. (See an isometric sketch of the ramping system on page 13.)

When driving up onto Levels Two and Three from the ramped bay, vehicles can turn right or left to look for a parking space along the flat bays. The only decision point occurs at the south end of the garage where the driver must decide whether to search for a space in the level they are on or continue up to the ramped bay to the next level. In the meantime, exiting traffic driving down the middle ramp can only turn right at the bottom of the ramp and circulate along the west outer bay to the top of the ramp leading to the next lower level. This configuration provides some separation between vehicles circulating the garage looking for a parking space from the exiting vehicular traffic trying to get out of the garage quickly.

**OPINION OF PROBABLE COST OF ALTERNATE**

The opinion of probable construction cost for this alternate is $16,957,000 and this translates to a $41,700 construction cost per net gain stall. Breakout of these costs are included in Appendix B.




1. Office of Public Affairs over Bancroft/Fulton West Parking
2. Tang Center University Health Services
3. Career Center (Founder's Building)
4. Outdoor Garden / Plaza (North Courtyard)
5. Urgent Care Clinic Surface Lot
6. Mid-block Pedestrian Walkway
7. Edwards Track Stadium / Goldman Field

**R** residential
**C** commerical
**R/C** residential over grade level commercial
**Ch** religious institution

⊕ site high point
⊖ site low point
▪▪▪▪▪ site
- - - - site (scheme 3)

N

# site plan

scale 1:70

2 September 2005

**a** : Edwards Track Stadium across Bancroft Way.

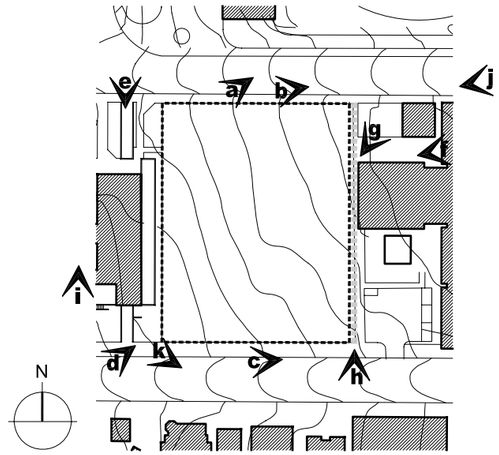
**b** : looking east on Bancroft at Stadium, Field House and Recreational Sports Facility.

**c** : Tang Center from Durant Avenue.

**d** : Residential neighborhood across Durant.


**e** : Office of Public Affairs Building with parking below, exit ramp to Bancroft (entry ramp on Durant).

**f** : looking at site between Tang Center and Founder's Building (outdoor seating to right).




# site photos

2 September 2005

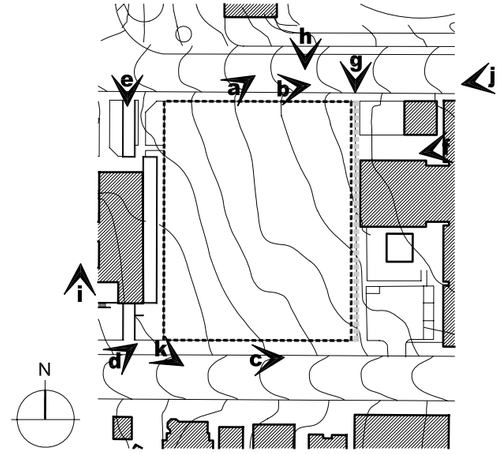
**g** : mid-block pedestrian connector between Tang and surface parking lot. Open air plaza to left.


**h** : exisitng surface lot entry from Bancroft (Tang Center to right).

**i** : looking north on Fulton (Office of Public Affairs on right)

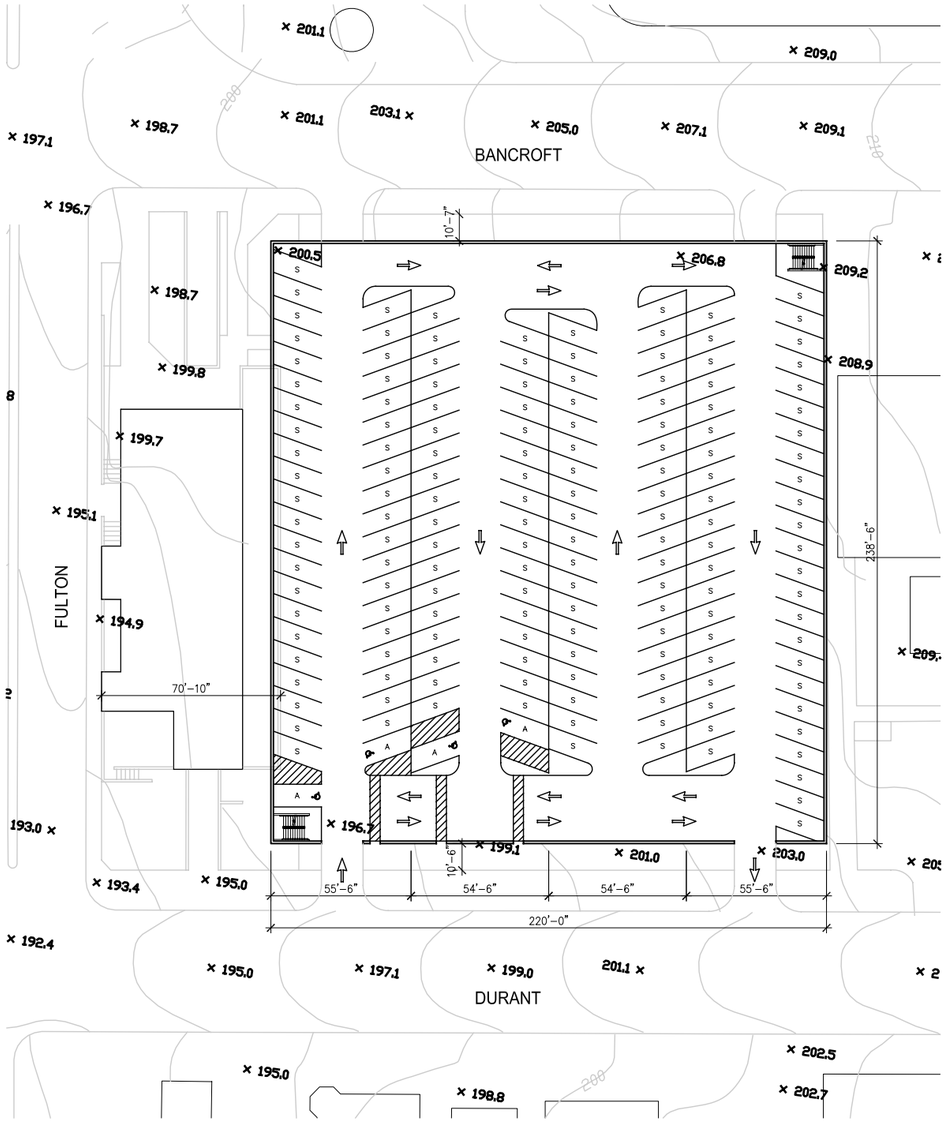
**j** : view west on Bancroft. Tang Center, Founder's Building and trees on study lot beyond.


**k** : residential buildings on Durant, across the street from the lot.

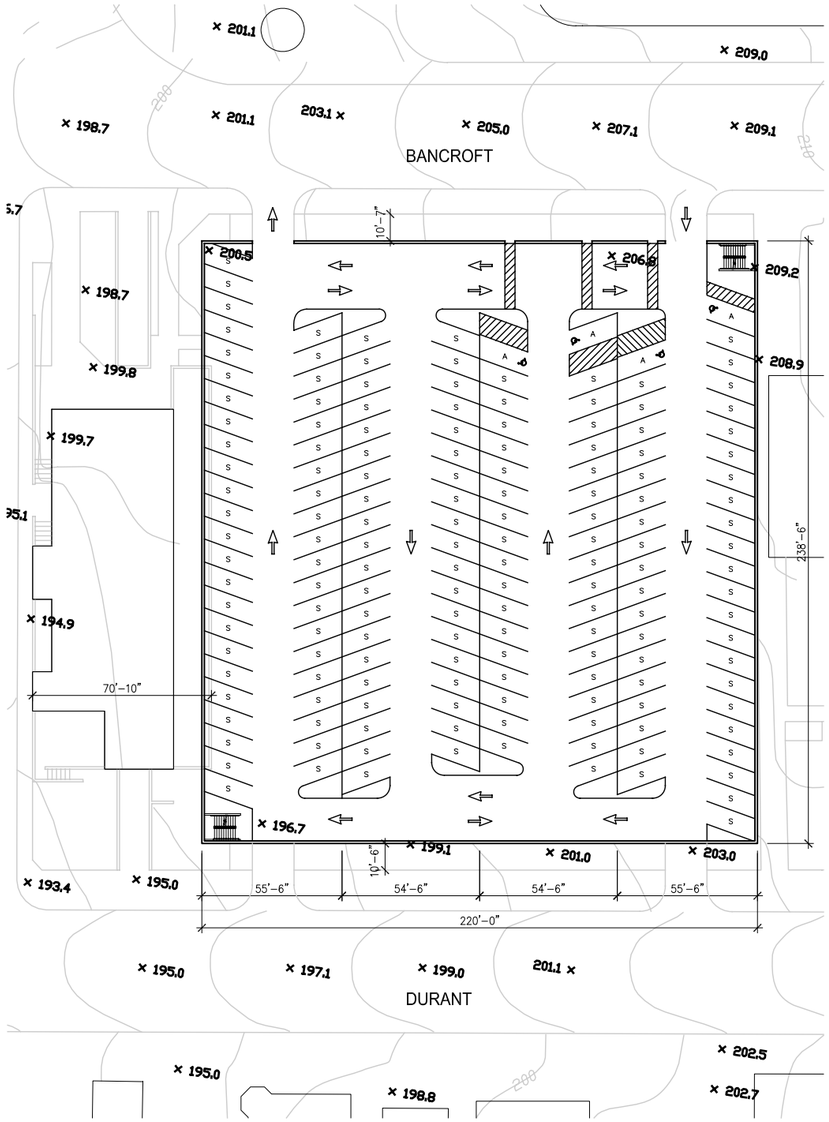



# site photos

2 September 2005




**First Level Plan**




**Second Level Plan**

# tang lot

# Alternate 1.1

## CAR COUNT

8'–6" 70° STANDARD CAR SPACE
9'–0" 70° ACCESSIBLE PARKING SPACE

| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING SPACES | NET GAIN/LOSS |
|---|---|---|---|---|---|
| FIRST | 159 | 4 | 163 | 230 | (67) |
| SECOND | 158 | 4 | 162 | – | 162 |
| TOTAL | 317 | 8 | 325 | 230 | 95 |

AREA: 104,970 SQ. FT.
EFFICIENCY: 323 SQ. FT. PER SPACE


ISOMETRIC

concept drawings scale 1:60

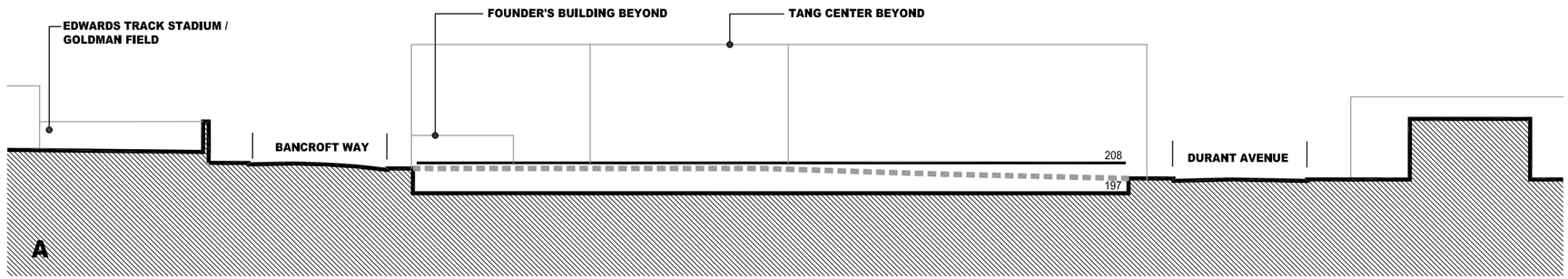
2 September 2005

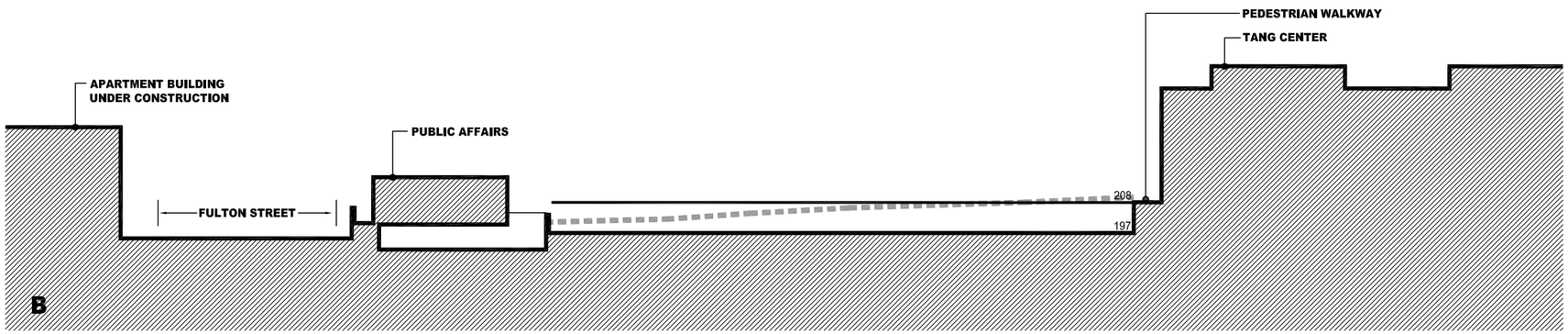
N

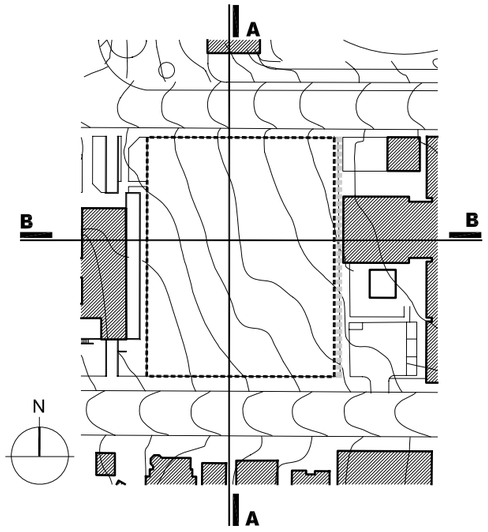




WALKER PARKING CONSULTANTS with
CHONG | PARTNERS ARCHITECTURE

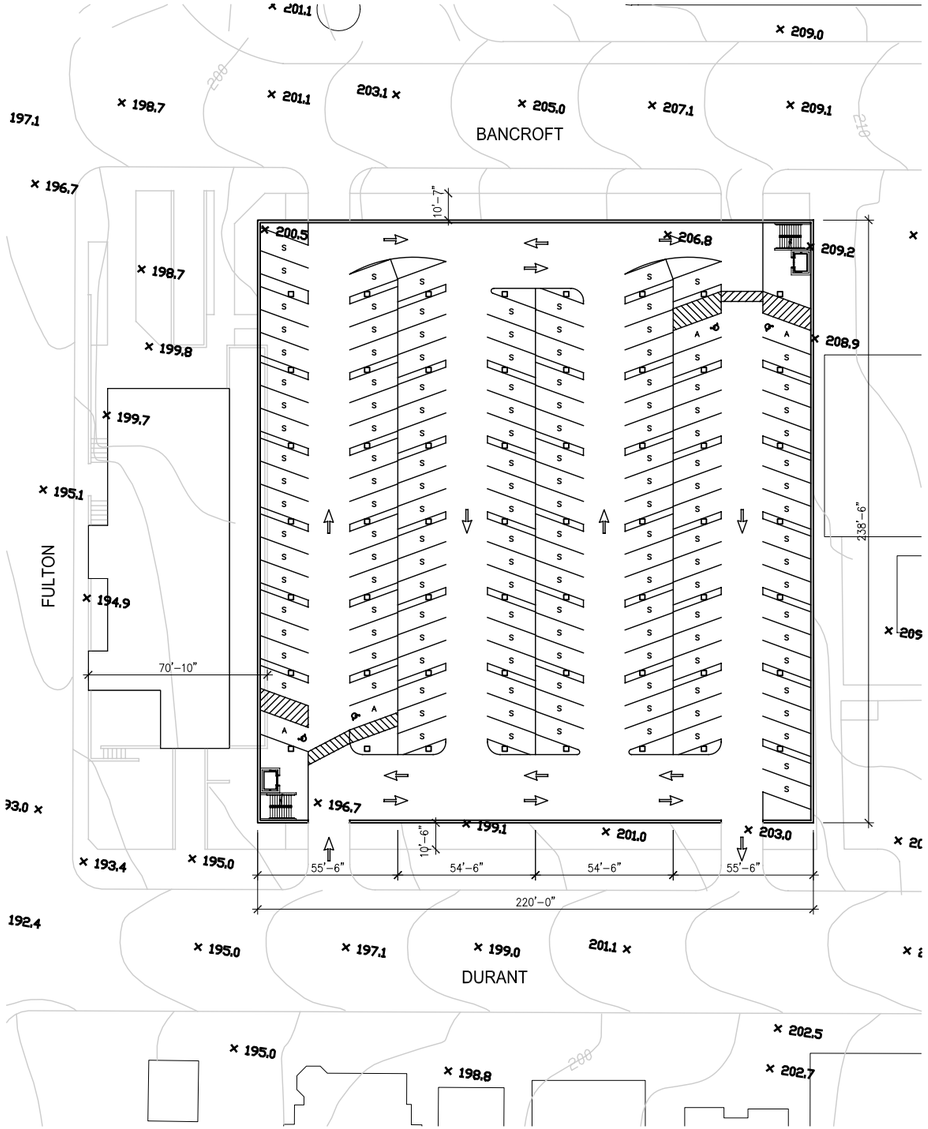


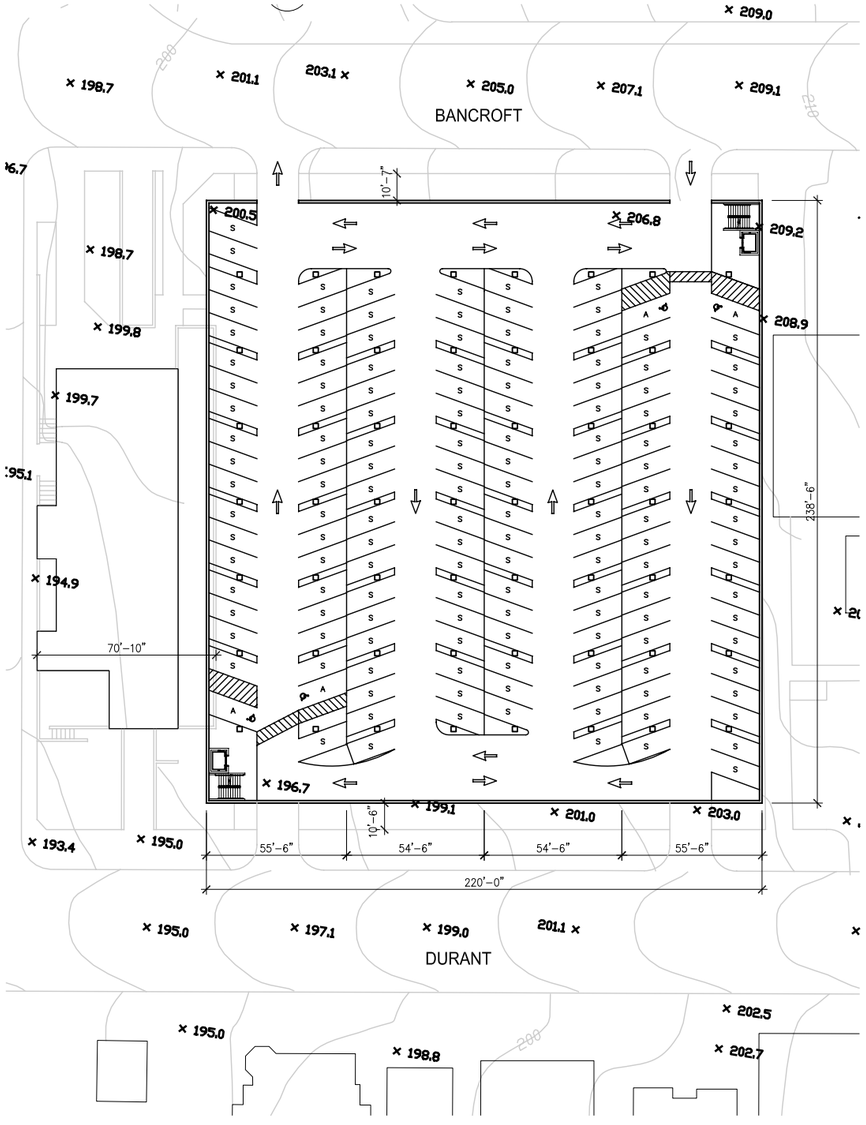




# site sections scale 1:50

2 September 2005




**First Level Plan**




**Second Level Plan**

# tang lot

# Alternate 1.2

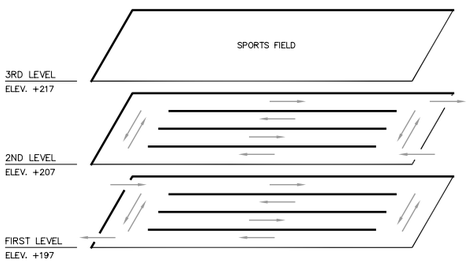
## CAR COUNT

8'–6" 70° STANDARD CAR SPACE
9'–0" 70° ACCESSIBLE PARKING SPACE

| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING PARKING | NET GAIN/LOSS |
|---|---|---|---|---|---|
| FIRST | 144 | 4 | 148 | 230 | (82) |
| SECOND | 144 | 4 | 148 | – | 148 |
| TOTAL | 288 | 8 | 296 | 230 | 66 |

* SPORTS FIELD ON THIRD LEVEL (ROOF)

AREA: 104,970 SQ. FT.
EFFICIENCY: 355 SQ. FT. PER SPACE




ISOMETRIC

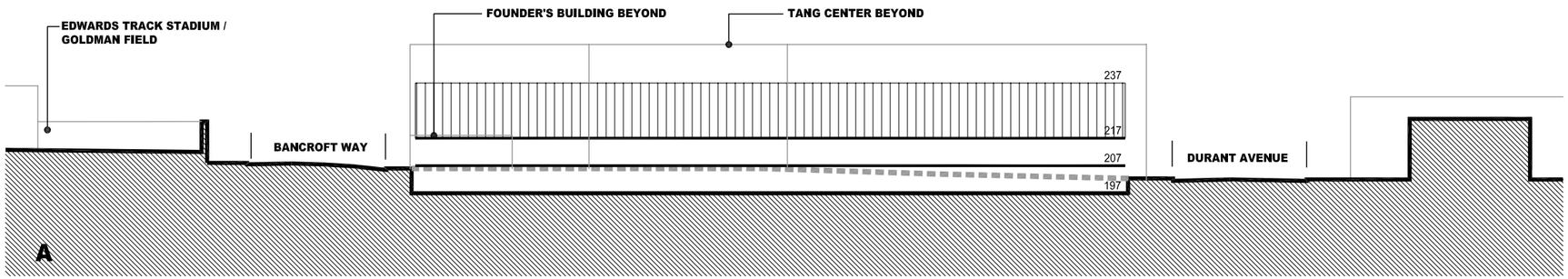
# concept drawings scale 1:60

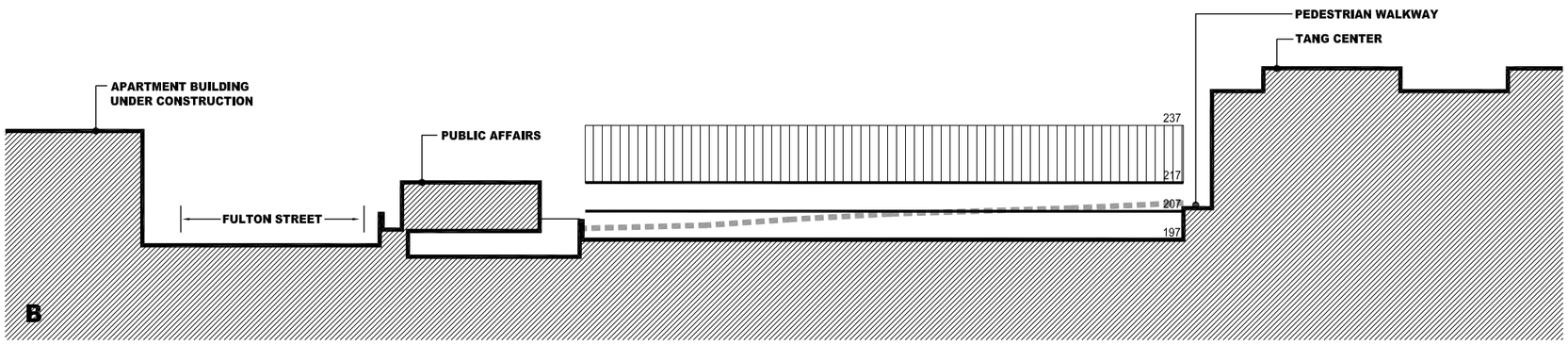
2 September 2005





**WALKER** PARKING CONSULTANTS with
**CHONG | PARTNERS** ARCHITECTURE



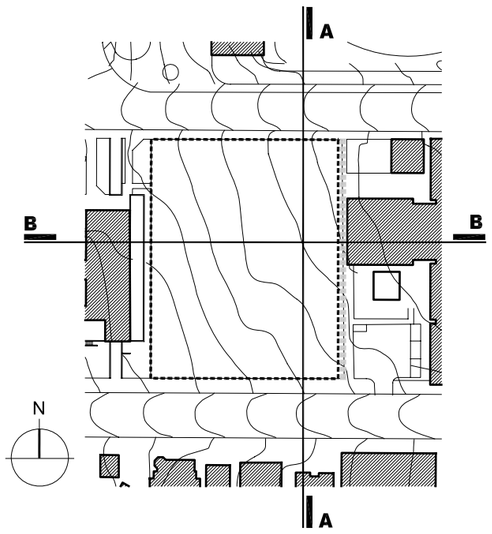



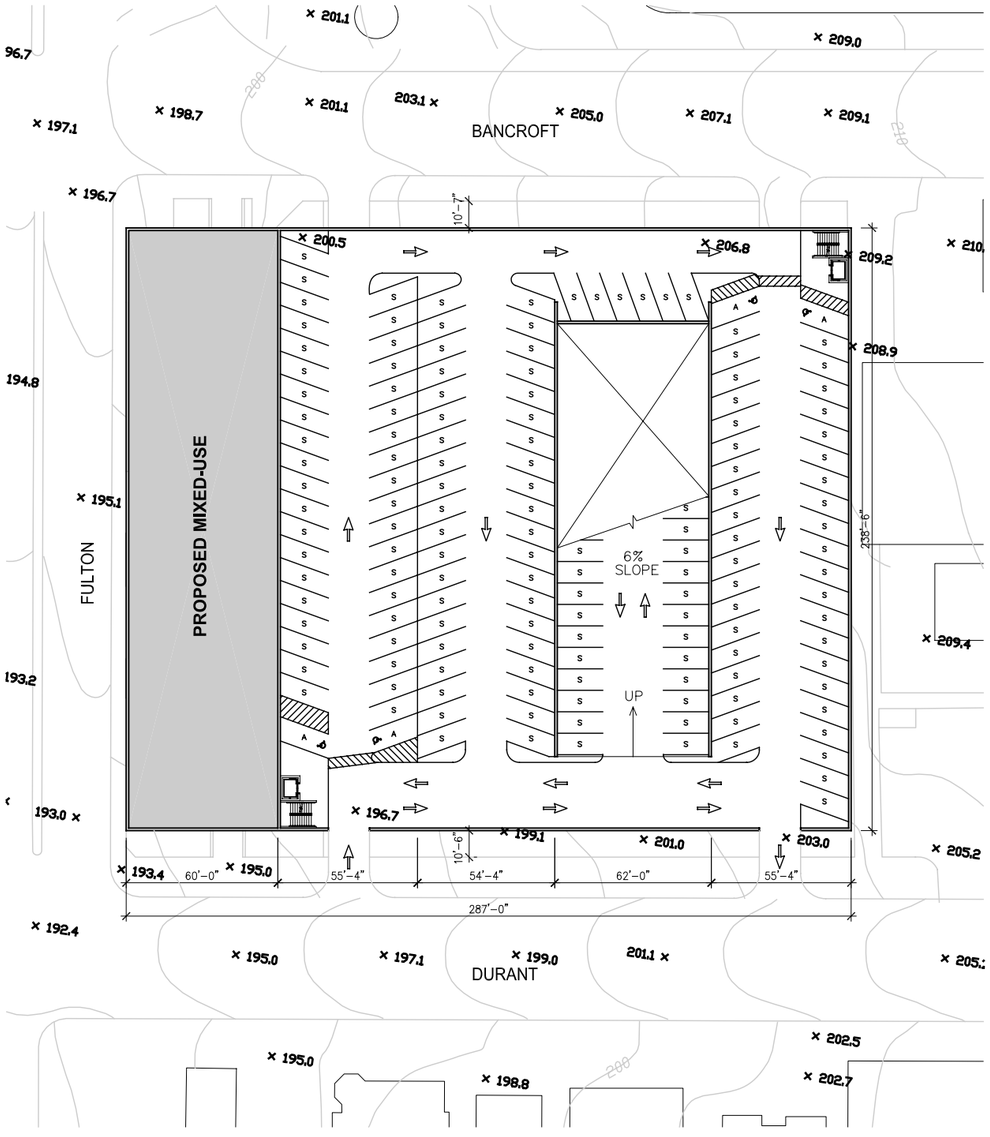

# site sections scale 1:50

2 September 2005

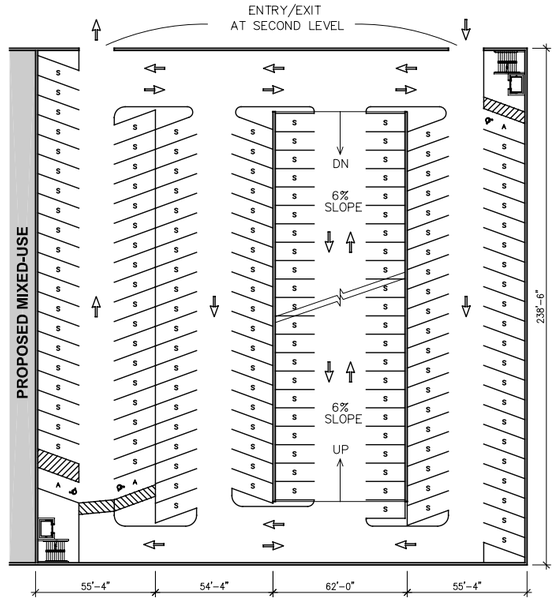
tang lot

Alternate 1.2

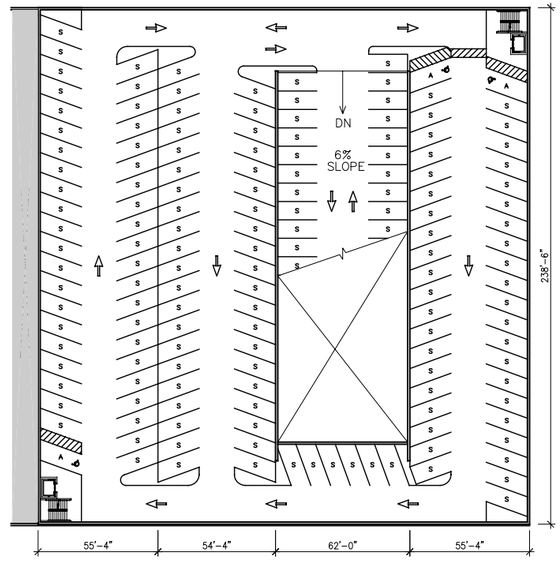





**First Level Plan** scale 1:60




**Second Level Plan** scale 1:70




**Upper Level Plans** scale 1:70

# concept drawings scale : various

2 September 2005

N

# tang lot

# Alternate 1.3

## CAR COUNT

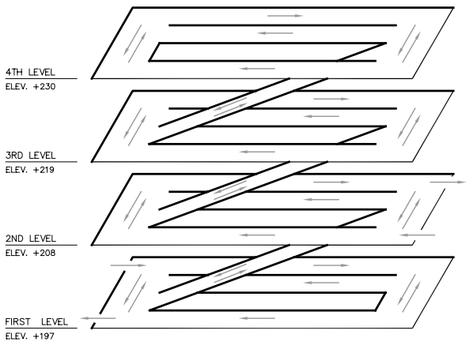
8'–6" 70° STANDARD CAR SPACE

9'–0" 70° AND 90° ACCESSIBLE PARKING SPACE

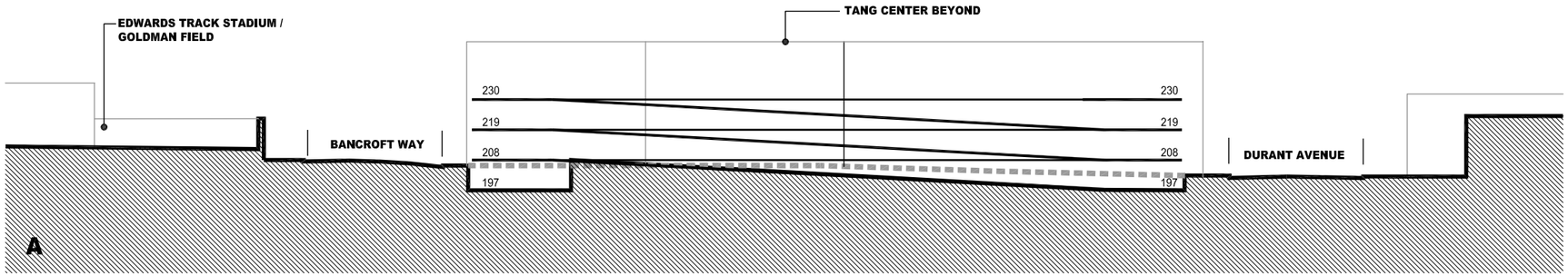
| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING PARKING | NET GAIN/LOSS |
|---|---|---|---|---|---|
| FIRST | 147 | 4 | 151 | 230 | (79) |
| SECOND | 161 | 3 | 164 | – | 164 |
| THIRD | 165 | 3 | 168 | – | 168 |
| FOURTH | 151 | 3 | 154 | – | 154 |
| TOTAL | 624 | 13 | 637 | 230 | 407 |

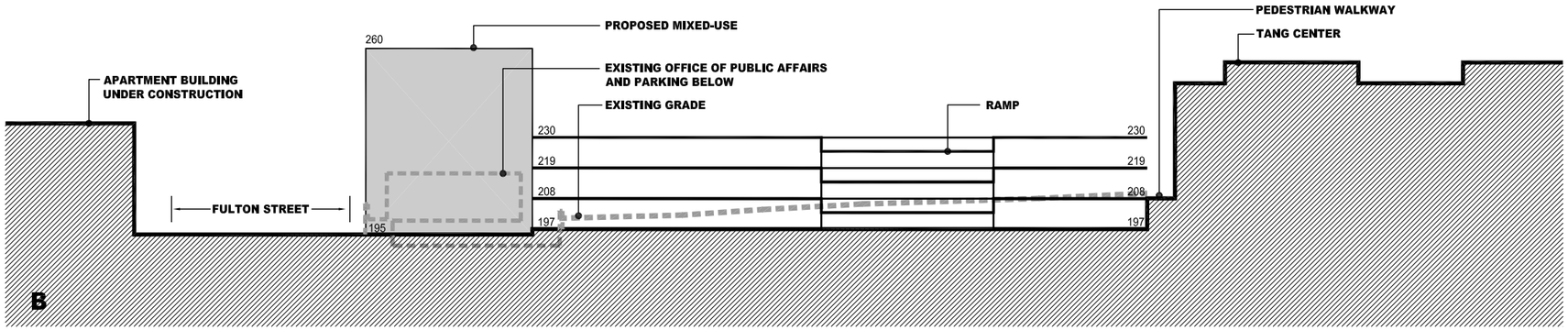
AREA: 207,230 SQ. FT.

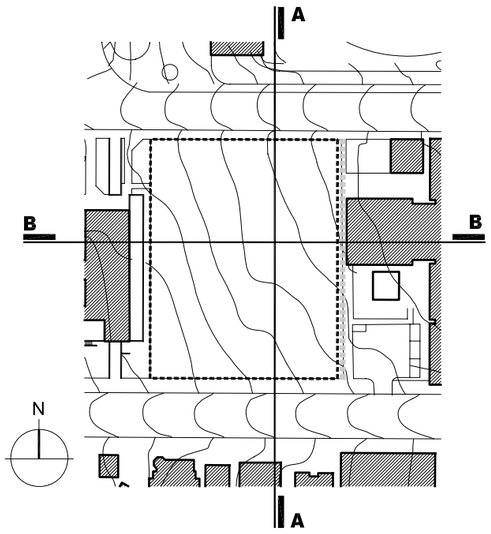
EFFICIENCY: 325 SQ. FT. PER SPACE




ISOMETRIC




# site sections scale 1:50

2 September 2005





WALKER PARKING CONSULTANTS with
CHONG | PARTNERS ARCHITECTURE

2 September 2005

Dana/Durant Lot is an existing surface lot with a valet parking component. The lot is configured in a backward "Z" shape with entry/exit lanes on both Bancroft and Dana Streets. The site slopes 11 feet from the low point at the corner of Dana and Durant Streets to a high point at the northeast corner near Bancroft Street. The lot is set back from Durant with a landscape strip and low shrubs. Vehicles enter and exit the lot from Bancroft and Dana. Pedestrians leave the lot via openings on Durant and the drives on Bancroft.

## URBAN AND ARCHITECTURAL DESIGN ISSUES

The lot has a narrow band of landscape between the parked cars and the sidewalk. The trees along Durant are mature. There are a number of trees in the lot around which cars are parked, which would have to be reviewed.

Bancroft is a commercial corridor serving the campus across the street. The edge of the site opens onto Bancroft. Across the street is the former First Unitarian Church, an arts and crafts building and a driveway to the underground parking lot beneath the MLK Student Union Garage.

The Dana/Durant Lot is a tight site within a varied context. To the east is a two story commercial building (apartments above). This building has a mural painted on the property line side of the building. Moving around the site clock-wise, the lot is bounded by a single story garage behind a three story six-flat. Next the site is up against the six-flat's side yard walkway. Further along on that side of the street are a single family home and some low-rise apartment buildings. The south edge of the lot fronts onto Durant. Across the street is Norton, a high-rise student housing tower, part of a complex of university housing. On the opposite corner is a colonial style church. Across Durant Street is a gothic style Methodist Church, whose front doors open onto Durant. The west side of the lot first has street frontage on Durant. Further north is Stiles Hall and its surface parking lot. Stiles is a two-story masonry building. The back side has windows, while the property-line wall on the east is solid.

Retail would work well on the Bancroft street edge. The street edge has a zero-set back. The buildings are two-plus stories high. The other street edges should receive a landscape solution with plantings, street trees, etc. especially with respect for the Methodist church across the street and the six-flat apartment building next door.

Appendix A illustrates representative examples of architectural solutions for pedestrian circulation (stairs and elevators), integrating these structures into urban environments and providing appropriate lighting solutions.

## ALTERNATE 2.1 CONCEPT

The parking structure will provide approximately 132 spaces on two parking levels, including one partially underground level and one supported level. The site consists of two adjacent rectangular sections connected in the north-south direction. The north section has an outside length in the north/south direction of 114'-10" and an outside width in the east/west direction of 100'-0". The south area has an outside length in the north/south direction of 136'-0" and an outside width in the east/west direction of 100'-0". See concept drawing Alternate A2.1 on page 20.

### PARKING GEOMETRICS

The structure has one and one half parking bays on each level, with 90-degree parking spaces and two-way traffic, with a parking module of 59'-0" in the full bay and 39'-0" in the half bay, meaning only one side of the drive aisle has parking spaces. The parking layout is based primarily on uniform sized parking spaces of 8'-6" wide x 18' long and a 23'-0" wide drive aisle at the full bay and 21'-0" drive aisle for the single loaded bay.

The parking facility will meet Americans with Disabilities Act (ADA) and California CCR, Title 24 requirements. Three accessible parking spaces are located on the First Level with direct pedestrian access to Durant Street. Two accessible parking spaces are located on the supported level with direct pedestrian access to Bancroft Street.

### ENTRY/EXIT AREAS

Since the site is sloped over 10 feet, entry/exits will be located on two different levels of the structure, similar to the Tang Lot Structure. The First Level will be accessible from Durant Street only. First Level vehicles will circulate between the north and south sections. The supported level will be accessible from Bancroft Street. Second Level vehicles will also circulate between the north and south sections.

### INTERNAL CIRCULATION/RAMPING

Vehicles entering the First or Second Levels will circulate in the clockwise or counter-clockwise directions. When driving into the garage, vehicles can go straight or turn right or left to look for a parking space. Drivers will have a good view of any available space. The configuration allows vehicles to circulate once and quickly exit if no spaces are available.

### OPINION OF PROBABLE COST OF ALTERNATE

The opinion of probable construction cost for this alternate is $4,137,000 and this translates to a $86,200 construction cost per net gain stall. A breakout of these costs are included in Appendix B.

**ALTERNATE 2.2 CONCEPT**

The parking structure will provide approximately 203 spaces on three and one-half parking levels, including one partially underground level and three supported level. The site footprint will be similar to Alternate 2.1 concept. A retail component is added on the Bancroft Street frontage and internal ramps are provided to access the upper parking levels. With the addition of the retail component, the north parking section has an outside length in the north/south direction of 82'-0" and an outside width in the east/west direction of 100'-0". The south section will be similar to Alternate 2.1. The new structure will displace 84 parking spaces with a net gain of 119 spaces. See concept drawing A2.2 on page 22.

**PARKING GEOMETRICS**

The structure has one and one half parking bays on the south section and one bay on the north section with 90-degree parking spaces and two-way traffic on the parking bays. The north area will have a dead end parking bay but since it is a short drive aisle, drivers will easily see if there are spaces available or not. The parking bay will be 59'-0" in the full bay and 39'-0" in the half bay in the south parking area. The north parking area will be a 60'-0" bay. The parking layout is based primarily on uniform sized parking spaces of 8'-6" wide x 18' long and a 21'-0" to 23'-0" wide drive aisle will be provided.

The parking facility will meet Americans with Disabilities Act (ADA) and California CCR, Title 24 requirements. Seven accessible parking spaces are located on the ground, second and third levels with pedestrian access to Bancroft Street via the stair/elevator located inside the retail component. A minimum clearance of 8'-2" on the ground level and 7'-0" on the upper levels will satisfy the minimum design vertical clearance of the Uniform Building Code (UBC) and California Building Code (CBC).

**ENTRY/EXIT AREAS**

The addition of the retail component will eliminate the entrance from Bancroft. The current entry/exit lane at Dana Street will be maintained to access the new structure. This configuration will provide the ramping and allow drivers to immediately turn right and drive up the ramp to search for parking spaces in the upper levels.

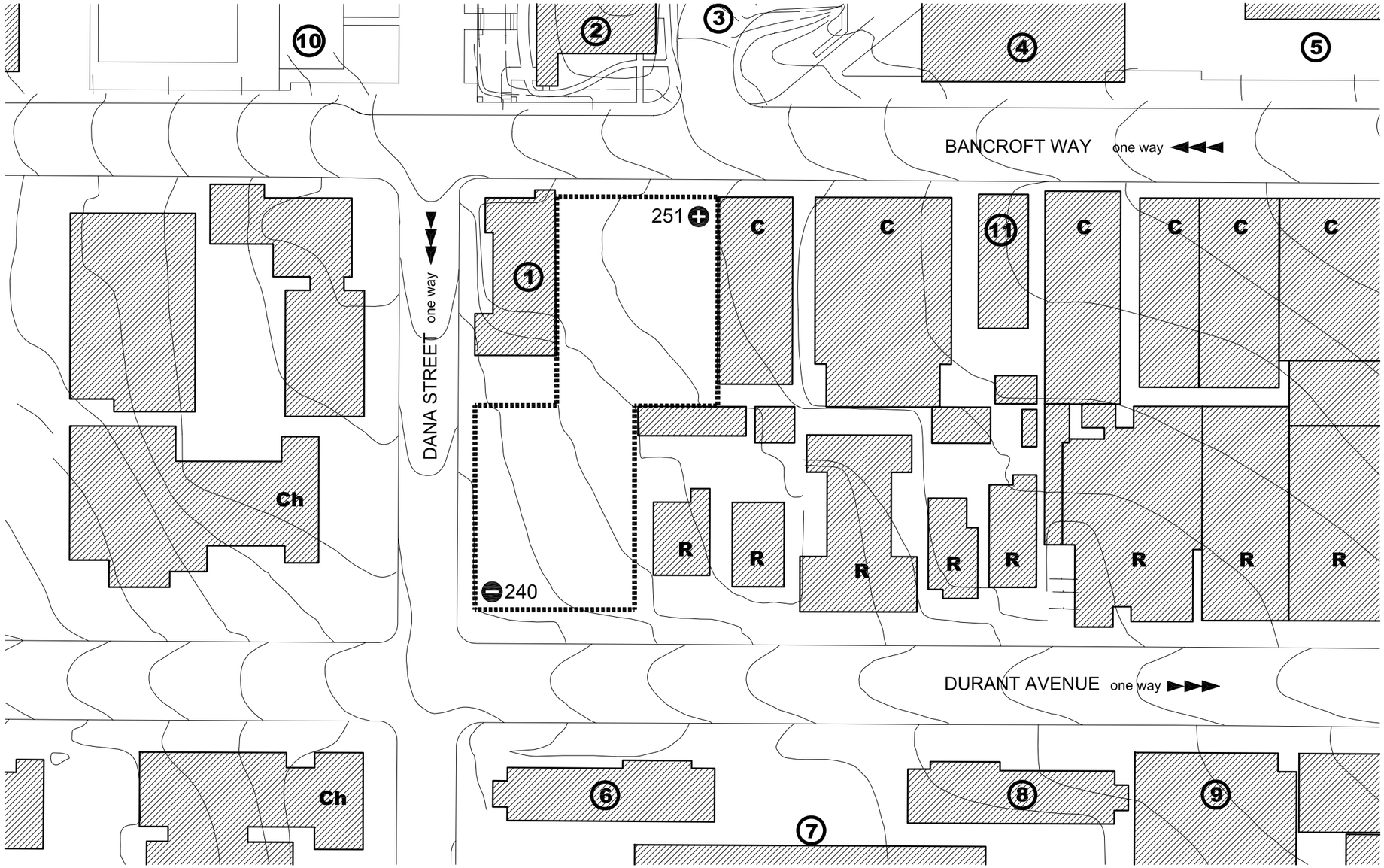
**INTERNAL CIRCULATION/RAMPING**

Vehicles entering the garage will circulate in the counter-clockwise direction on the south section to search for a parking space. The parking ramps have a slope of 6%. (See an isometric sketch of the ramping system on page 22.)

The only decision point occurs at the north end of the south section where the driver must decide whether to search for a space in the dead end north section or continue up to the next level. In the meantime, exiting traffic driving down the ramp can only keep turning right until they get down to the Ground Level.

**OPINION OF PROBABLE COST OF ALTERNATE**

The opinion of probable construction cost for this alternate is $7,919,000 and this translates to a $69,500 construction cost per net gain stall. Included in the above total cost is an estimated cost of $810,000 for the retail component. A breakout of these costs are included in Appendix B.




1. Stiles Hall
2. 2401 Bancroft (Zellerbach Playhouse and Hall to N)
3. Driveway to MLK Student Union Public Parking Garage (underground)
4. Eshleman Hall
5. Martin Luther King Student Union
6. Norton Residence Hall
7. Residence Halls No. 3
8. Spens-Black Residence Hall
9. Public Parking
10. Spieker Aquatics Complex
11. University Relations / 2440 Bancroft

**R** residential
**C** commerical
**R/C** residential over grade level commercial
**Ch** religious institution
site high point
site low point
site

N

# site plan

scale 1:70

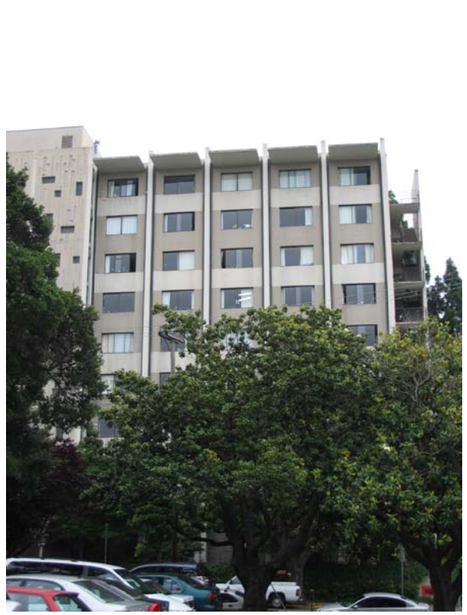
2 September 2005


**a** : view of parking behind Stiles and driveway onto lot, back of apartment buildings beyond.


**b** : view of lot from corner of Dana and Durant.


**c** : View of project lot across Durant. Six flat apartment building to right.

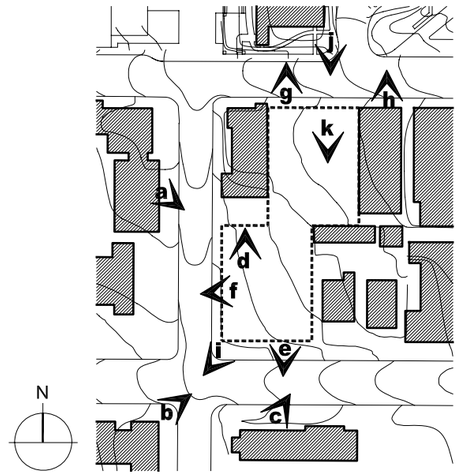
**d** : Rear of Stiles Hall and parking lot.



**e** : Norton Residence Hall across Durant.

**f** : Methodist Church across Dana (church entry and plaza)

# dana / durant lot




# site photos

2 September 2005

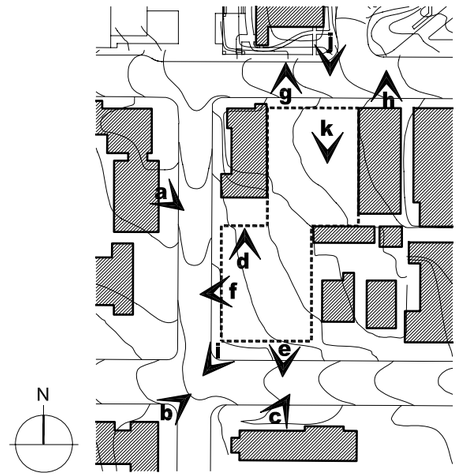
**g** : 2401 Bancroft (across Bancroft from site), formerly the First Unitarian Church built in 1898. This Arts and Crafts building now houses the University Dance Studio.

**h** : driveway to parking beneath MLK Student Union Garage (Zellerbach beyond)

**i** : Church across Dana and Durant.

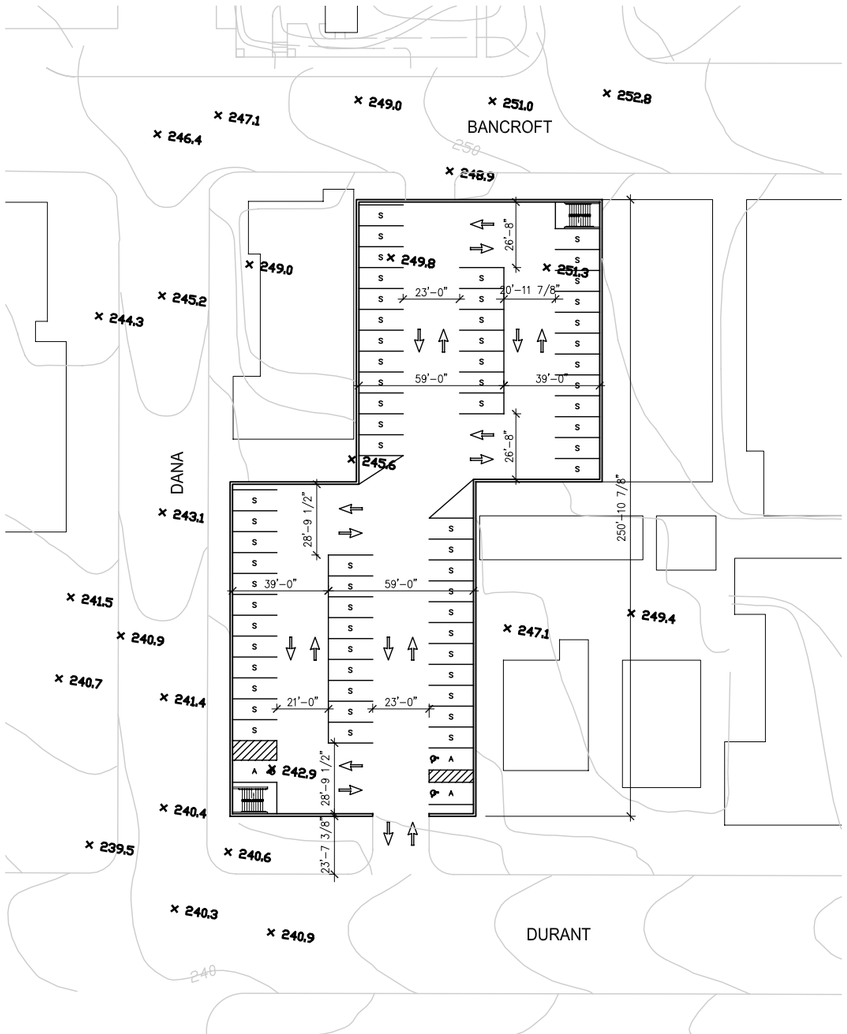

**j** : commercial building with property-line mural on adjacent lot.

**k** : mural on commercial building next door, one story garage and backs of buildings facing Durant. Student housing beyond.

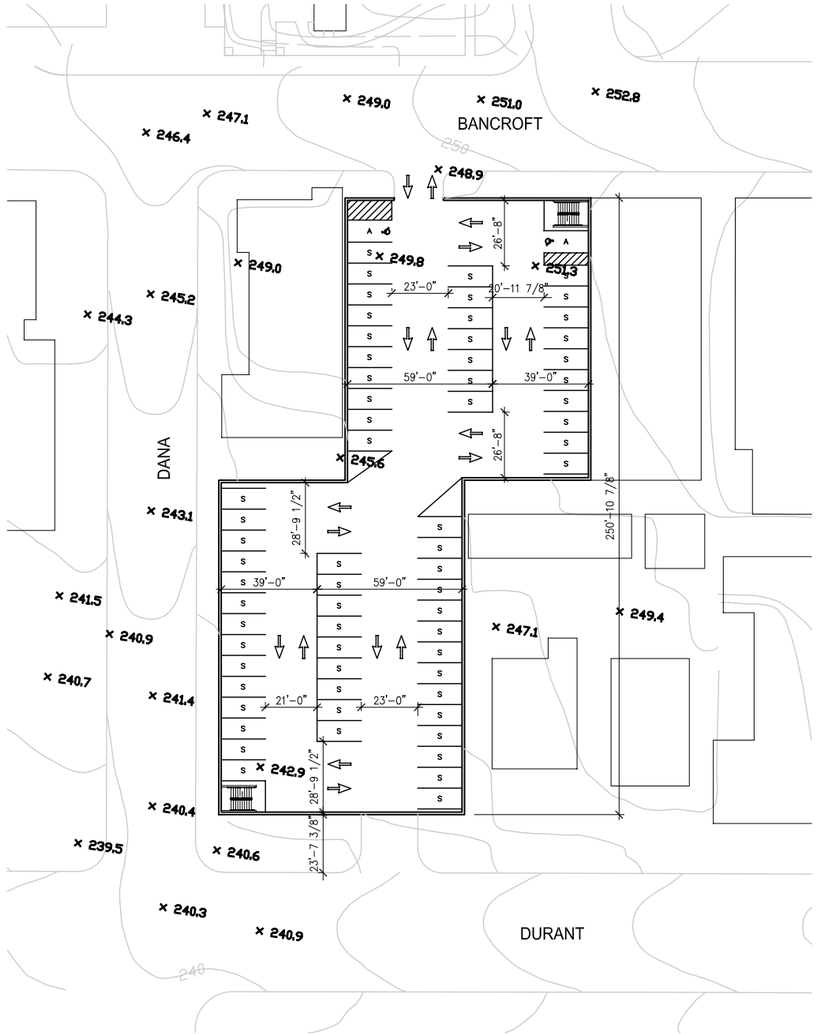



# site photos

2 September 2005




**First Level Plan**




**Second Level Plan**

# dana / durant lot

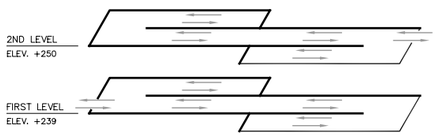
# Alternate 2.1

## CAR COUNT

8'–6" 90° STANDARD CAR SPACE
9'–0" 90° ACCESSIBLE PARKING SPACE

| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING PARKING | NET GAIN/LOSS |
|---|---|---|---|---|---|
| FIRST | 63 | 3 | 66 | 84 | (18) |
| SECOND | 64 | 2 | 66 | – | 66 |
| TOTAL | 127 | 5 | 132 | 84 | 48 |

AREA: 50,180 SQ. FT.
EFFICIENCY: 380 SQ. FT. PER SPACE




ISOMETRIC

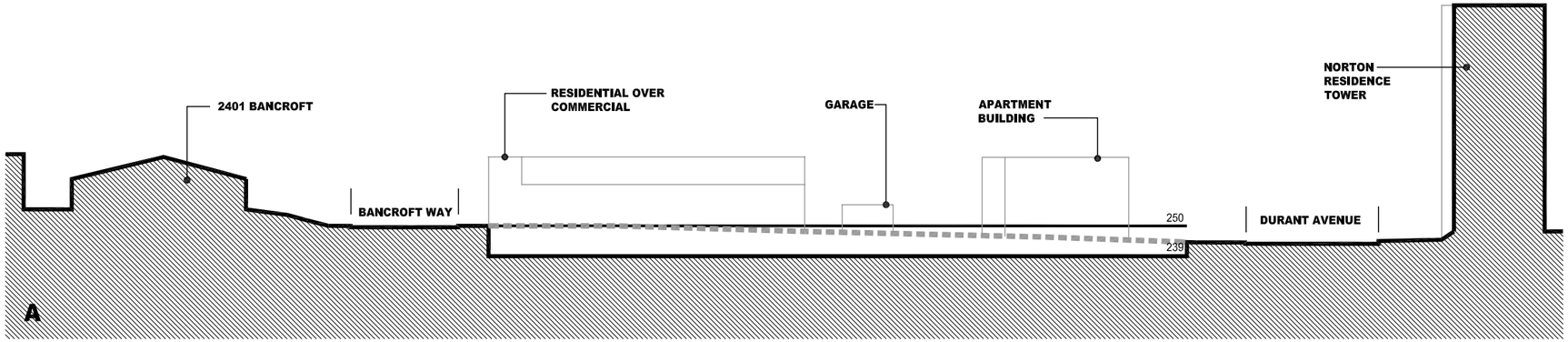
# concept drawings scale 1:60

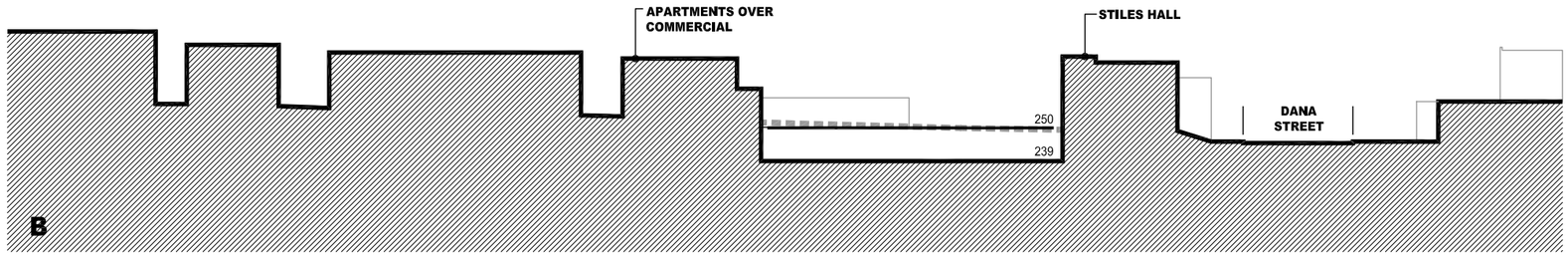
2 September 2005

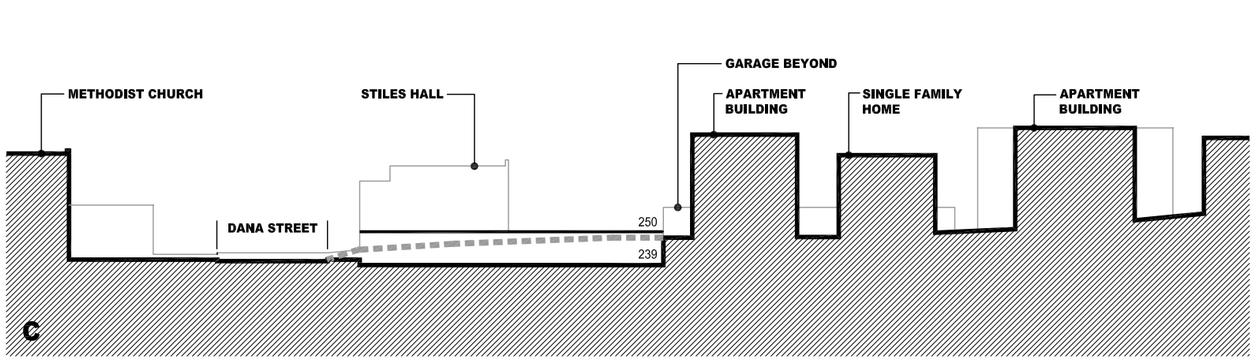


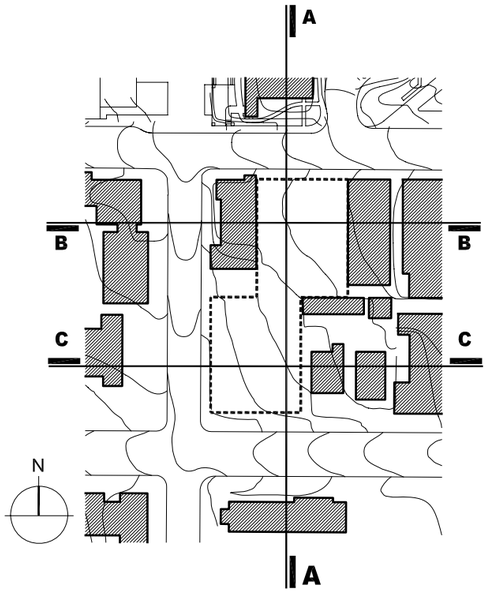


**WALKER** PARKING CONSULTANTS with
**CHONG | PARTNERS** ARCHITECTURE



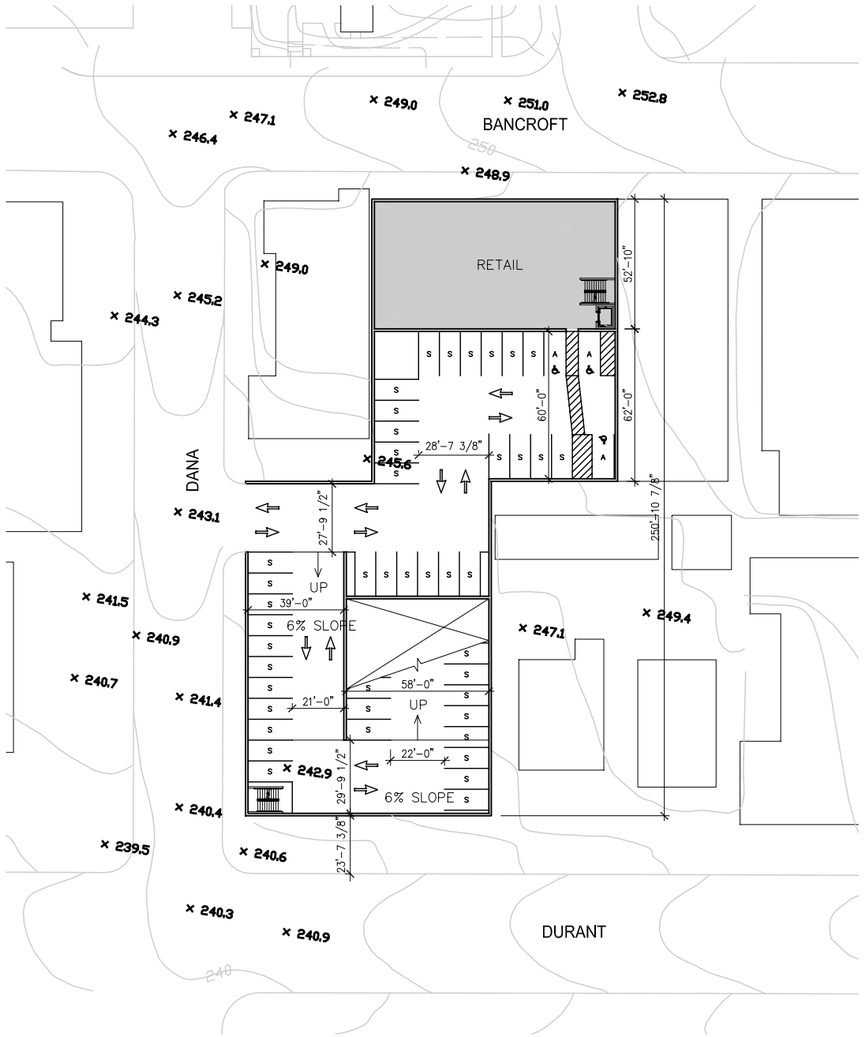




# site sections scale 1:50

2 September 2005

# dana / durant lot

# Alternate 2.2




**First Level Plan**

**Second Level Plan**

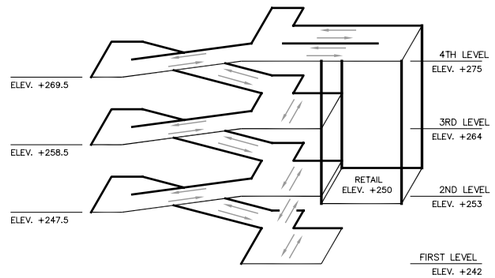
**Third Level Plan**

## CAR COUNT

8'–6" 90° STANDARD CAR SPACE
9'–0" 90° ACCESSIBLE PARKING SPACE

| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING PARKING | NET GAIN/LOSS |
|---|---|---|---|---|---|
| GROUND | 43 | 3 | 46 | 84 | (38) |
| SECOND | 54 | 2 | 56 | – | 56 |
| THIRD | 54 | 2 | 56 | – | 56 |
| FOURTH | 45 | 0 | 45 | – | 45 |
| TOTAL | 196 | 7 | 203 | 84 | 119 |

AREA: 75,830 SQ. FT.
EFFICIENCY: 374 SQ. FT. PER SPACE

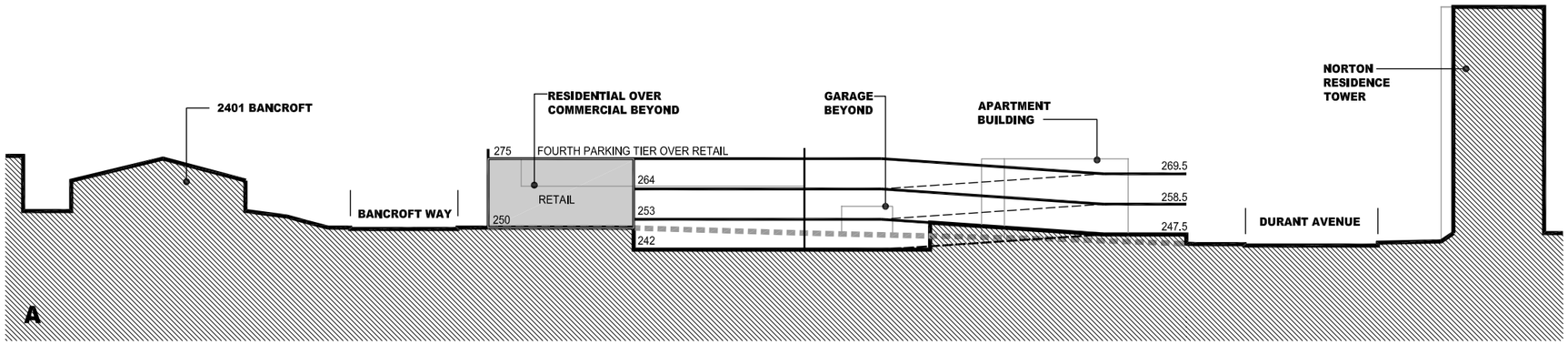


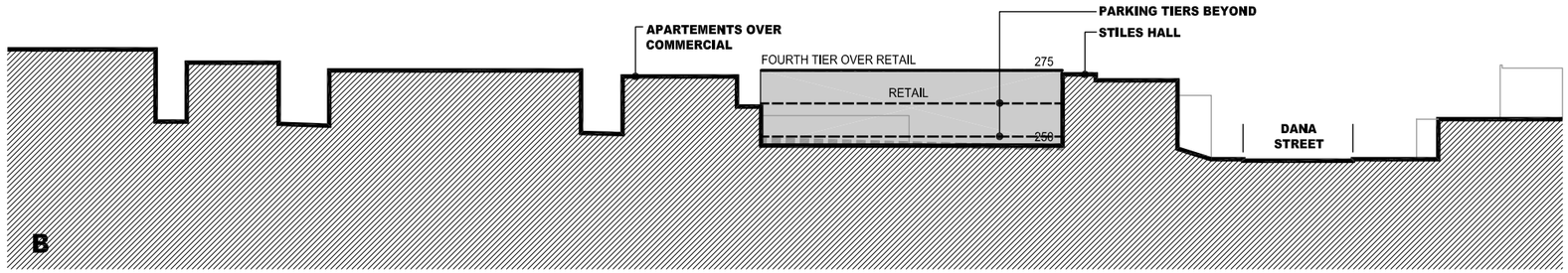

ISOMETRIC

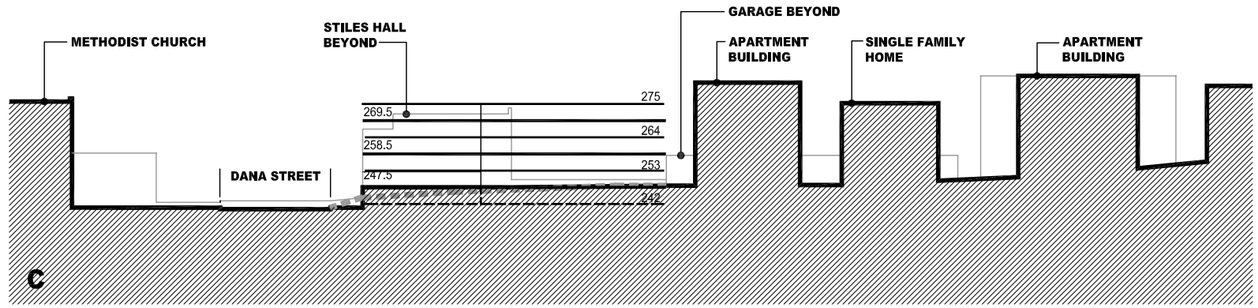
concept drawings scale 1:60
2 September 2005

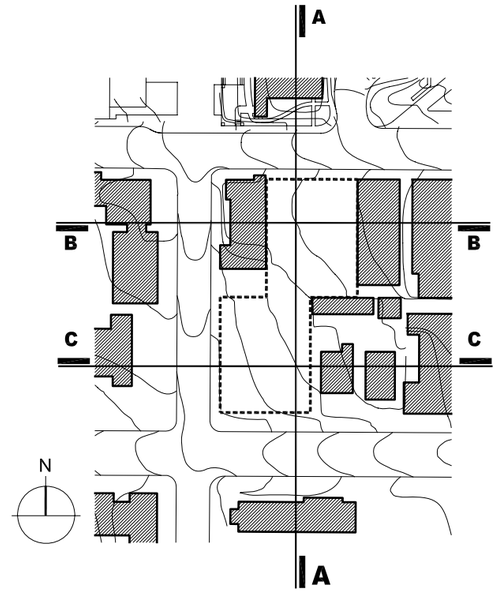
dana / durant lot

Alternate 2.2




# site sections scale 1:50

2 September 2005

bancroft structure

2 September 2005

The Bancroft Structure is an existing structure with ground level parking and roof level tennis courts. Entry/exit lane is provided at the southwest corner of Bancroft Street. Vehicles can also drive down Kroeber Hall service access to enter the ground level parking area from the north end.

## URBAN AND ARCHITECTURAL DESIGN ISSUES

This existing parking structure is really a concrete deck with rooftop tennis courts. Permit parking is below. The structure is open on all sides. The entry/exit into the parking structure is from Bancroft. Vehicles drive down, into the service area for Kroeber Hall and the Phoebe Hearst Museum of Anthropology and then turn into the parking area. The parking area is flat.

Once the cars are parked pedestrians walk to the northwest corner of the lot and onto an asphalt walkway which is also a service drive for university vehicles. Several paths then lead from that point into the campus.

The building is on the main campus. The north corner of the site opens to the campus. To the east is Kroeber Hall, a four story, L-shaped building from 1959. The lot fronts on Bancroft. Across the street is the fan-shaped, concrete UC Berkeley Art Museum. To the west is a walkway / service drive and beyond it is the Hearst Memorial Gym, a beaux arts, two-story building.

Any new structure will be a significant object that sits behind Kroeber Hall. On the west side, it will be part of the campus landscape and will face a beautiful, monumental building. The pedestrian path between the site and the gym is a low-key entry to the campus. The landscape is green with many trees. The Bancroft edge should "meld into the trees" rather than have retail. At this point on Bancroft the commercial corridor has ended. Additionally, the commercial buildings are on the opposite side of the street. Although retail is being considered, we would recommend against it from an urban design standpoint. The UC Berkeley Art Museum is a concrete object nestled into the landscape. It serves the campus and not the street.

Appendix A illustrates representative examples of architectural solutions for pedestrian circulation (stairs and elevators), integrating these structures into urban environments and providing appropriate lighting solutions.

## ALTERNATE 3.1 CONCEPT

The new parking structure will provide approximately 213 spaces on two parking levels, including one ground level and one supported level. The facility has an out-to-out length in the north/south direction of 235'-0" and an out-to-out width in the east/west direction of 166'-0". Each parking level has dedicated entry/exit lanes and no vehicular circulation between levels. The new structure will displace 131 existing parking spaces with a net gain of 82 spaces. Tennis courts or a sports field will be constructed on the roof level of this parking structure. A elevator/stair is provided at the northwest corner for pedestrian access to the tennis court and parking levels. See Concept Drawing A3.1 on page 29.

### PARKING GEOMETRICS

The structure has three parking bays on each level, with 60-degree parking spaces on the outer bays and 90-degree spaces on the middle bay. The outer bays will be one-way traffic, with a parking module of 51'-0". The middle bay will be two-way traffic with a parking module of 62'-0". The parking layout is based primarily on uniform sized parking spaces of 8'-6" wide x 18' long and a 26'-0" wide drive aisle for two-way traffic and a 16'-6" drive aisle for one-way traffic.

The parking facility will meet Americans with Disabilities Act (ADA) and California CCR, Title 24 requirements. A total of six accessible parking spaces are provided, three spaces on the ground level and three spaces each on the second level.

With the van accessible spaces located on the Ground Level, an 8'-2" minimum headroom clearance for vehicular access to these accessible parking spaces will be required to meet the ADA requirement. A minimum clearance of 7'-0" on the upper floor will satisfy the minimum design vertical clearance of the Uniform Building Code (UBC) and California Building Code (CBC).

### ENTRY/EXIT AREAS

There will be dedicated entry/exit lanes to each level. The entry/exit lanes to the ground level parking will be maintained at the current location at the west end of the parking structure. Vehicles entering/exiting the supported level will enter and exit from the east end of the structure via the Kroeber hall service ramp.

### INTERNAL CIRCULATION

Vehicles entering either levels of the structure circulate in the counter-clockwise direction on all three bays to search for parking spaces. The outer bays are one-way in the counter-clockwise direction and the middle parking bay is two-way traffic. With a dedicated entry/exit lanes for each parking level, an internal ramp for vehicular circulation between levels is not provided.

**OPINION OF PROBABLE COST OF ALTERNATE**
The opinion of probable construction cost for this alternate is $7,303,000 and this translates to an $89,100 construction cost per net gain stall. The total estimated cost of the structure includes the tennis courts/sports field cost of $2,808,700. A breakout of these costs are included in Appendix B.

## ALTERNATE 3.2 CONCEPT

The parking structure will provide approximately 396 spaces on 4 parking levels, including one ground level and 3 supported above-grade levels. The facility has an out-to-out length in the north/south direction of 238'-6" and an out-to-out width in the east/west direction of 227'-0". The new structure will displace 131 existing parking spaces with a net gain of 265 spaces.

A retail component is located along the Bancroft Street frontage. The retail building will have two floors with a footprint of 122'-0" by 40'-0". The Fourth (top) parking level will be extended over the retail building component. See Concept Drawings on page 31.

**PARKING GEOMETRICS**
The structure has three parking bays on each level, with 60-degree parking spaces and one-way traffic along the outer parking bays, with a parking module of 51'-0". The middle bay will be a ramped parking bay with 60'-0" parking module and 5% slope. The outer bays are sloped at 5 % along a short section on the north end to provide a ramped slope that permits parking on this bay. The parking layout is based primarily on uniform sized parking spaces of 8'-6" wide x 18' long and a 26'-0" wide drive aisle for two-way traffic and a 16'-6" drive aisle for one-way traffic.

The parking facility will meet Americans with Disabilities Act (ADA) and California CCR, Title 24 requirements. A total of eight accessible parking spaces are provided, two spaces each on every level of the structure.

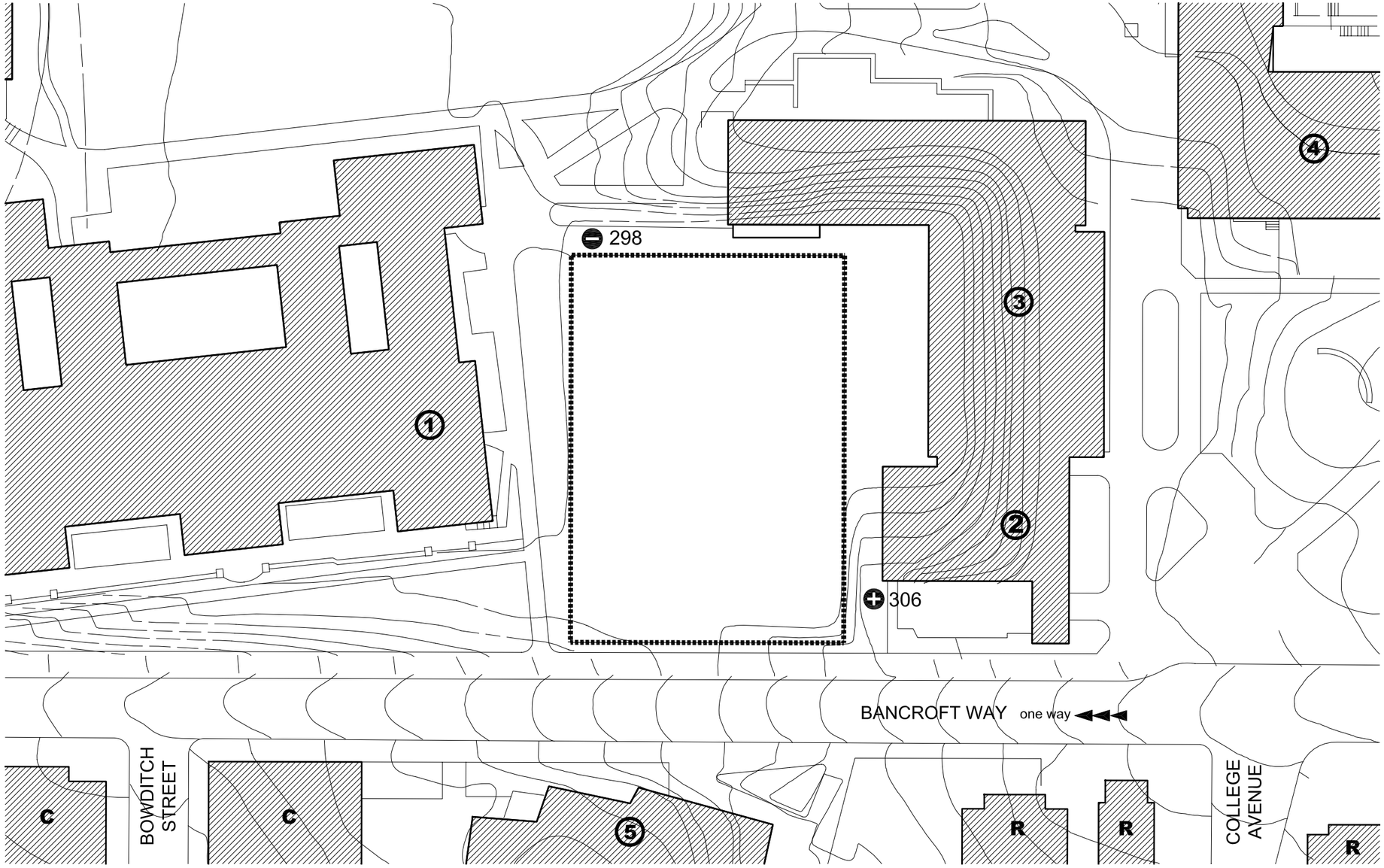
With the van accessible spaces located on the First Level, an 8'-2" minimum headroom clearance for vehicular access to these accessible parking spaces on the Ground Level will be required to meet the ADA requirement. A minimum clearance of 7'-0" on the upper floors will satisfy the minimum design vertical clearance of the Uniform Building Code (UBC) and California Building Code (CBC).

**ENTRY/EXIT AREAS**
For this alternate, entry/exit lanes are provided on the southeast corner of the structure off Bancroft Street to access the Second Level of this structure.

**INTERNAL CIRCULATION/RAMPING**
Vehicles entering Second Level of the structure can search for parking spaces on the upper levels by turning left at the end of the one-way drive aisle upon entering the structure or drive around the outer bays and drive down the ramp to the ground level from the south end of the structure. All ramps are at a 5% slope. (See an isometric sketch of the ramping system on page 31.)

Circulation for this facility is counter-clockwise and separate circulation route is provided between upbound and downbound traffic to minimize interaction between the two traffic patterns.

**OPINION OF PROBABLE COST OF ALTERNATE**
The opinion of probable construction cost for this alternate is $10,905,000 and this translates to a $41,200 construction cost per net gain stall. The total estimated construction cost of the structure includes an estimated cost of $732,000 for the retail component. A breakout of these costs are included in Appendix B.




# bancroft structure

1. Hearst Memorial Gym
2. Phoebe Hearst Museum of Anthropology
3. Kroeber Hall
4. Wurster Hall
5. UC Berkeley Art Museum / Pacific Film Archive

**R** residential
**C** commerical
**R/C** residential over grade level commercial
**Ch** religious institution
site high point
site low point
site

N

## site plan scale 1:70

2 September 2005





WALKER PARKING CONSULTANTS with
CHONG | PARTNERS ARCHITECTURE

**a** : UC Berkeley Art Museum / Pacific Film Archive across Bancroft

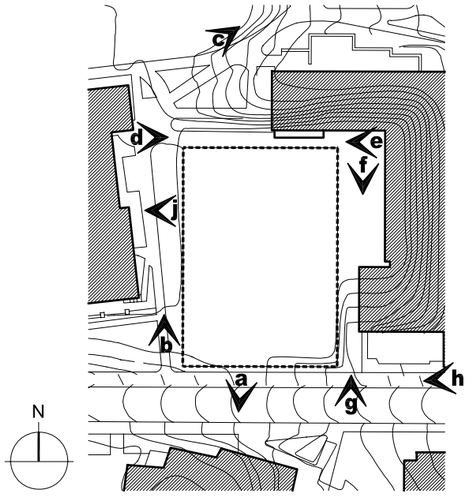
**b** : view north down walkway / service drive.

**c** : pedestrian paths converging, Hargrove Music Library beyond.

**d** : existing parking behind Kroeber Hall, exit to service drive.


**e** : existing parking drive connection to service drive, Hearst Memorial Gym beyond.


**f** : entry to parking and back-of-house for Hearst Museum of Anthropology. Parking for museum and military.




# site photos

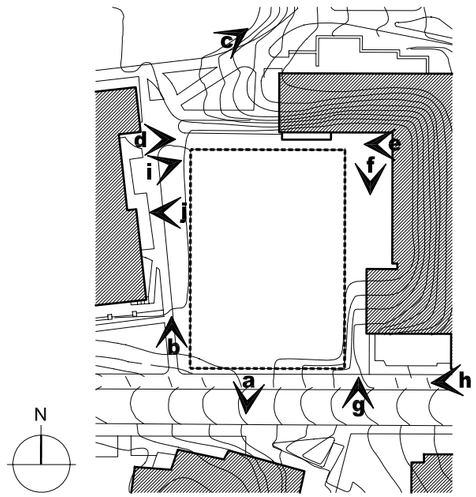
2 September 2005


**g** : view down entry looking at back of Kroeber Hall.


**h** : view of existing parking west down Bancroft.


**i** : existing parking at service drive / pedestrian walkway.

**j** : view of Hearst Memorial Gym from service drive entry.

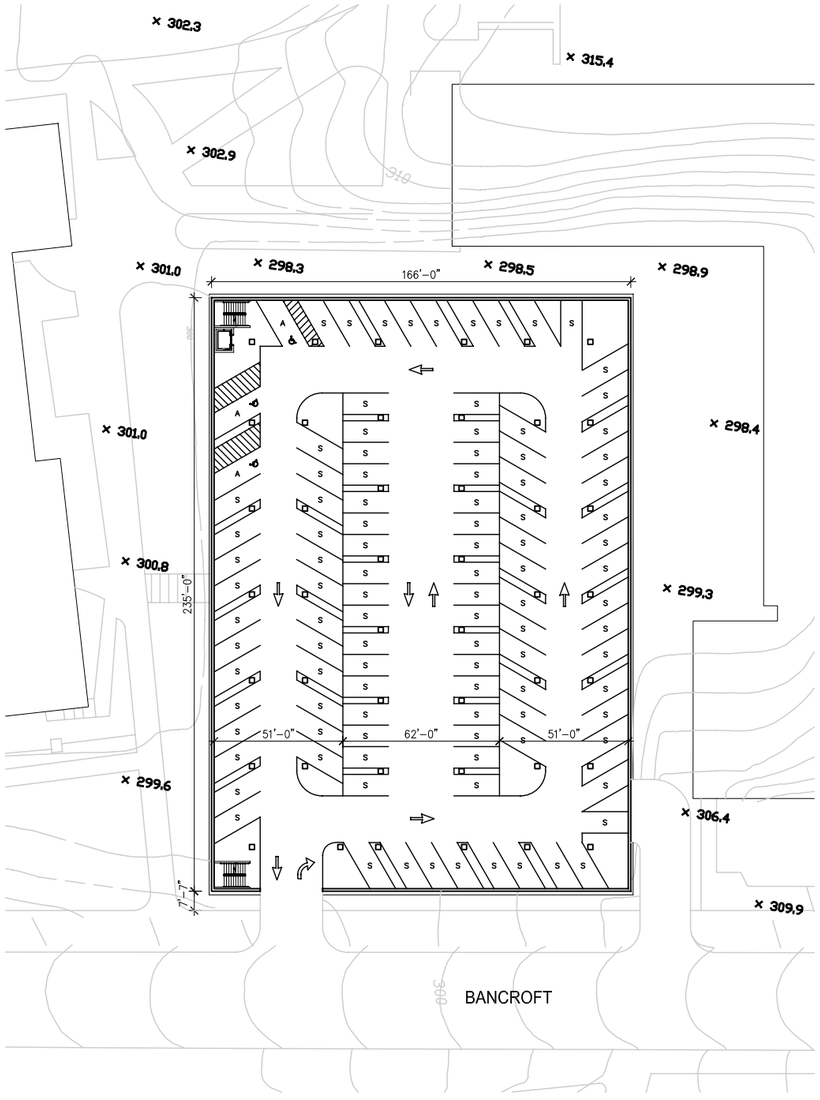



# site photos

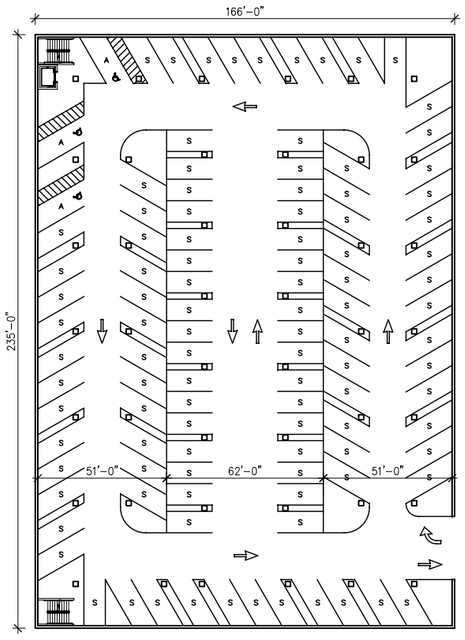
2 September 2005

# bancroft structure

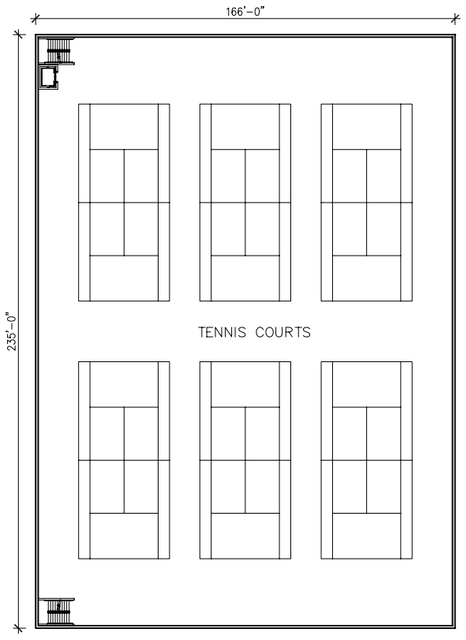
# Alternate 3.1




**Ground Level Plan**




**Second Level Plan**




**Roof Level Plan**

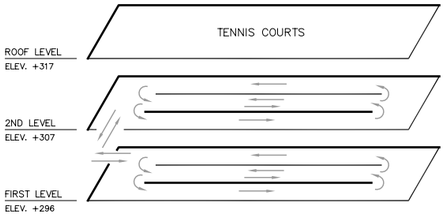
## CAR COUNT

8'–6" 60° STANDARD CAR SPACE
9'–0" 60° AND 90° ACCESSIBLE PARKING SPACE

| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING PARKING | NET GAIN/LOSS |
|---|---|---|---|---|---|
| GROUND | 103 | 3 | 106 | 131 | (25) |
| SECOND | 104 | 3 | 107 | – | 107 |
| TOTAL | 207 | 6 | 213 | 131 | 82 |

AREA: 78,020 SQ. FT.

EFFICIENCY: 366 SQ. FT. PER SPACE




ISOMETRIC

# concept drawings scale 1:60

2 September 2005

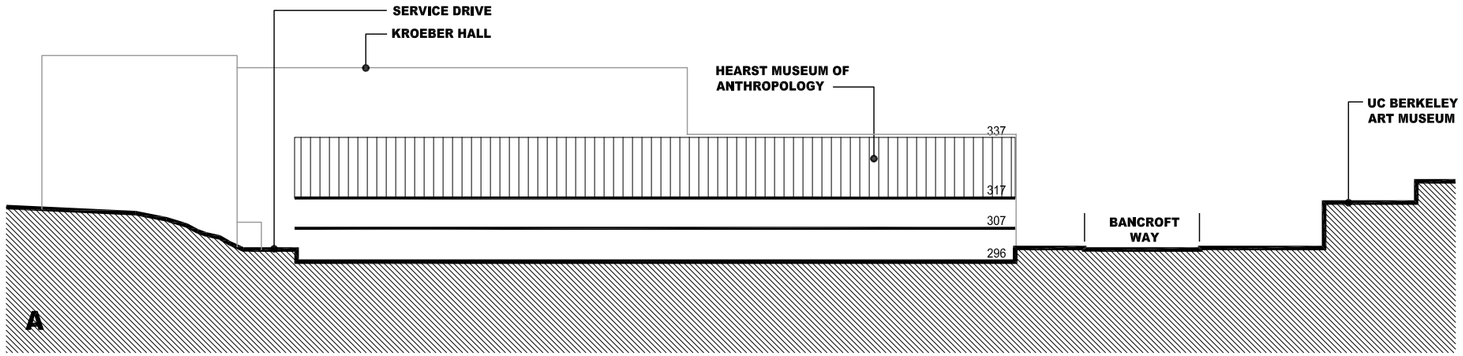


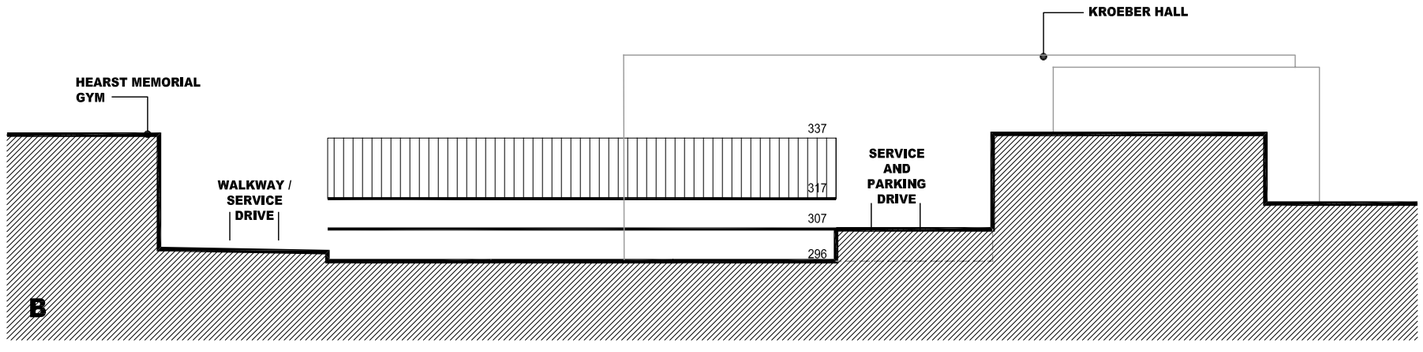


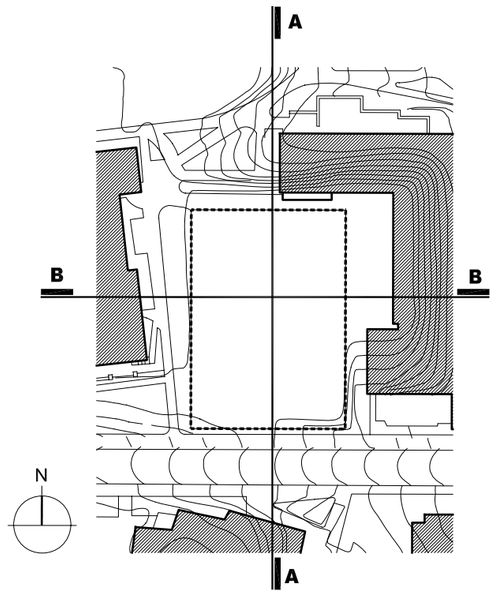
**WALKER** PARKING CONSULTANTS with
**CHONG | PARTNERS** ARCHITECTURE

bancroft structure

Alternate 3.1




# site sections scale 1:50

2 September 2005

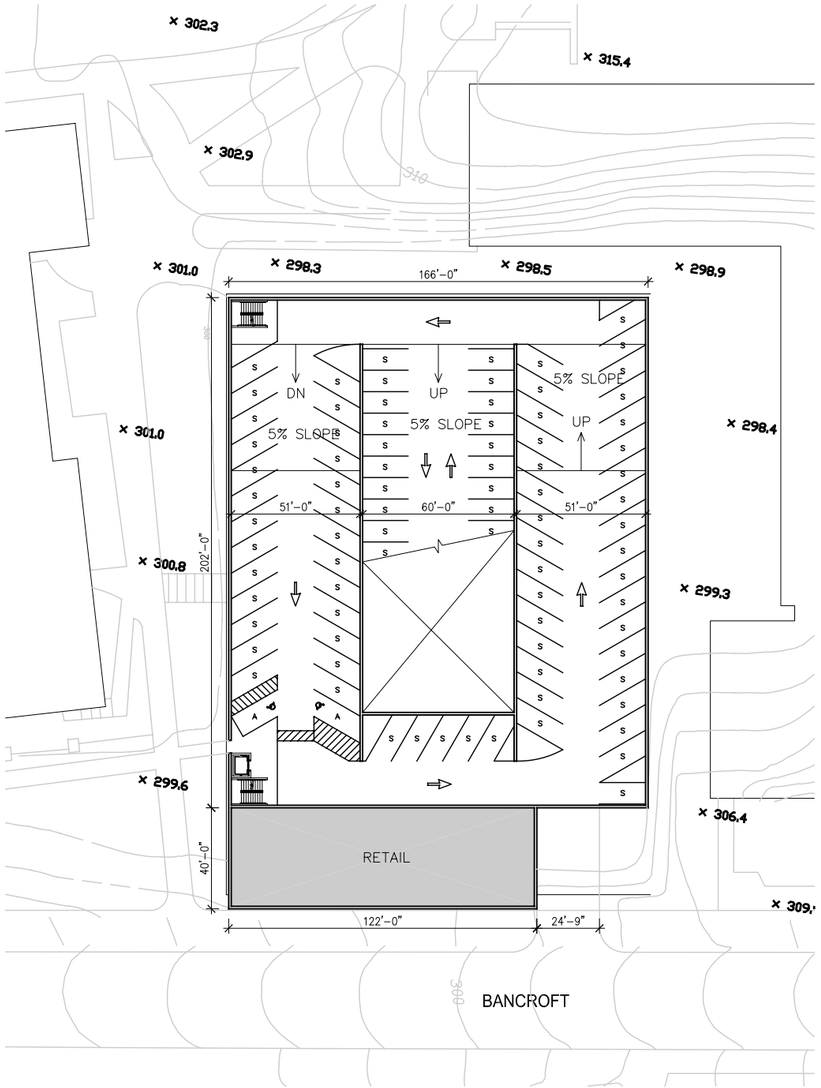




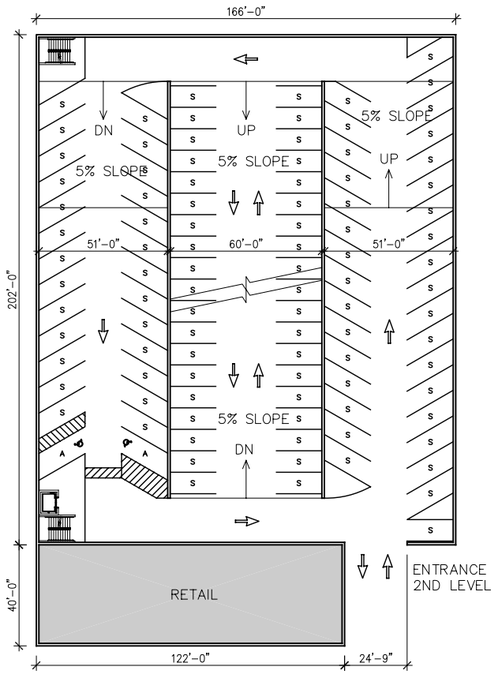
WALKER PARKING CONSULTANTS with CHONG | PARTNERS ARCHITECTURE

# bancroft structure

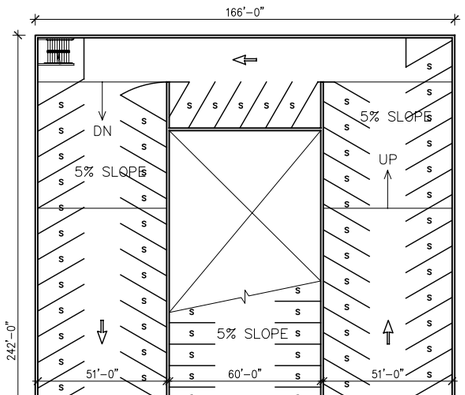
# Alternate 3.2




**Ground Level Plan**




**Second Level Plan**




**Fourth (top) Level Plan**

## CAR COUNT

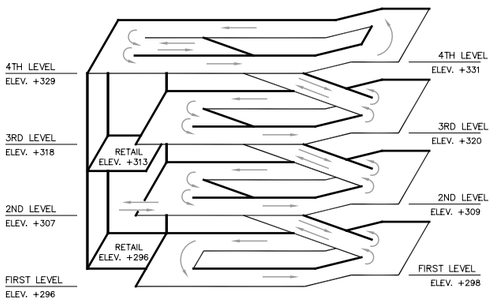
8'-6" 60° STANDARD CAR SPACE

9'-0" 60° AND 90° ACCESSIBLE PARKING SPACE

| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING PARKING | NET GAIN/LOSS |
|---|---|---|---|---|---|
| GROUND | 84 | 2 | 86 | 131 | (45) |
| SECOND | 98 | 2 | 100 | – | 100 |
| THIRD | 98 | 2 | 100 | – | 100 |
| FOURTH | 108 | 2 | 110 | – | 110 |
| TOTAL | 388 | 8 | 396 | 131 | 265 |

AREA: 132,875 SQ. FT.

EFFICIENCY: 336 SQ. FT. PER SPACE




ISOMETRIC

concept drawings scale 1:60

2 September 2005

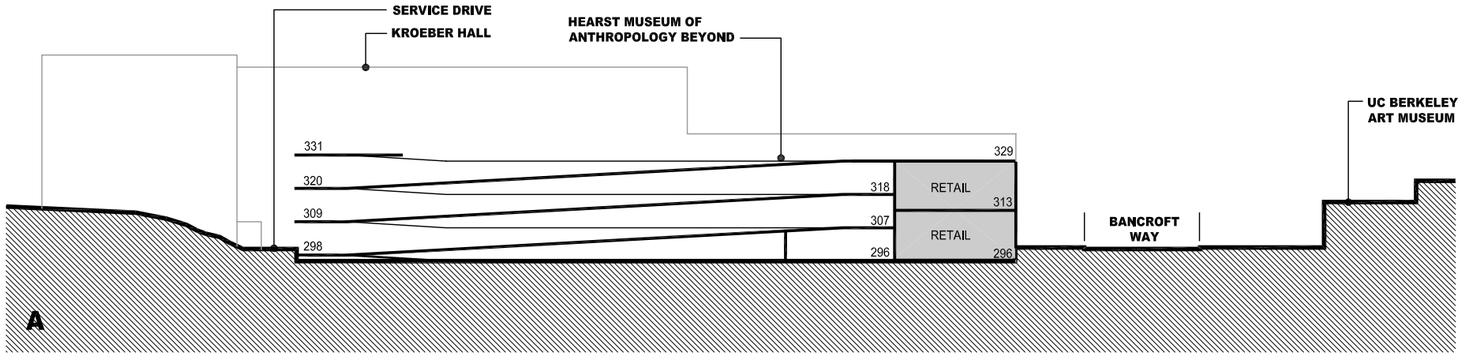


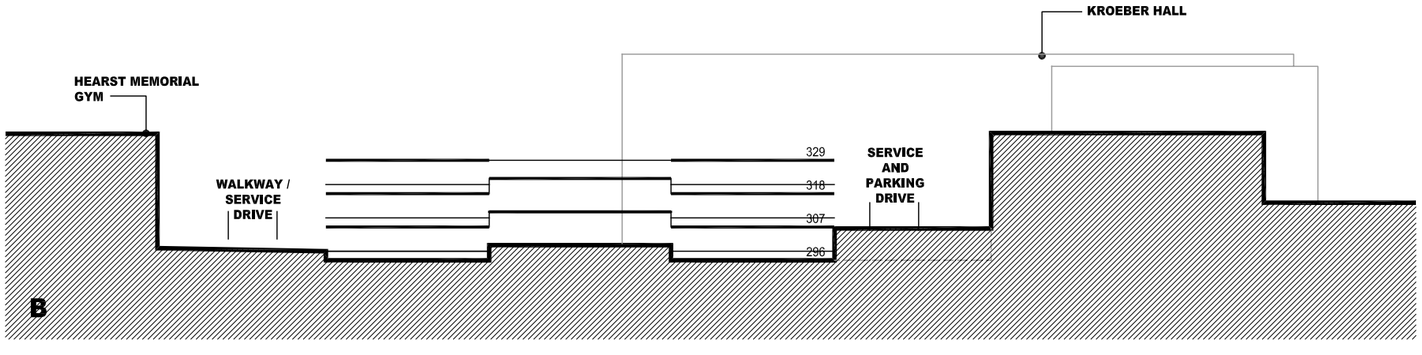


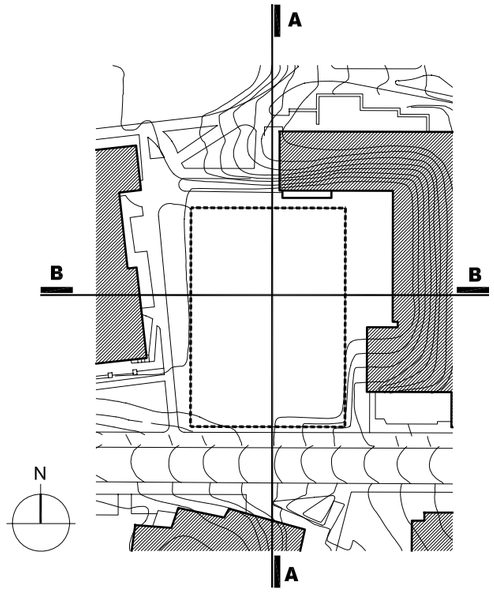
WALKER PARKING CONSULTANTS with CHONG | PARTNERS ARCHITECTURE

bancroft structure

Alternate 3.2




# site sections scale 1:50

2 September 2005





WALKER PARKING CONSULTANTS with CHONG | PARTNERS ARCHITECTURE

upper hearst structure

2 September 2005

The Upper Hearst Structure Expansion will include the Upper Hearst Lot located at the corner of La Loma and Ridge Streets. The existing Upper Hearst structure is a four level parking structure with tennis courts on the roof level (fifth level). The structure currently has separate entrances for each level and no internal ramp for vehicular circulation between levels. The surface parking lot has access from Ridge Street.

## URBAN AND ARCHITECTURAL DESIGN ISSUES

The Upper Hearst Alternate has two components: the existing four level parking structure with tennis courts and a surface lot connected to the north. The current structure has four vehicular street entries, some with ramps.

There is a 22 foot elevation change across the site. It is directly across the street from the main campus. The block the study lot is on, as well the blocks to the west and east, are occupied by UC Berkeley buildings. Pedestrians exit the lot and walk south into the campus.

The site has street frontage on Ridge and La Loma. Directly across the street on Ridge are single family homes and a small apartment building. Across the street on La Loma are the University's Foothill Residence Halls, which are five-story buildings. South is the existing structure and to the west is the three-story wood shingled, Cloyne Court Co-op, currently student housing and formerly a hotel and apartment complex. A drive-way and surface parking for the co-op are between the site and Cloyne's building.

This strategy is to continue to screen the structure with street trees and to minimize the scale of the northern addition. The addition is a continuation of the existing building and materials should match.

Appendix A illustrates representative examples of architectural solutions for pedestrian circulation (stairs and elevators), integrating these structures into urban environments and providing appropriate lighting solutions.

## ALTERNATE 4.1 CONCEPT

The parking structure expansion area provides approximately 75 spaces on three parking levels, including one-half ground level and two one-half below-ground levels. Conversion of the roof level to parking and displacement of the surface lot will result in a net gain of 135 spaces. The expanded section has an out-to-out length in the north/south direction of 140'-0" and an out-to-out width in the east/west direction of 94'-8". Access to Ground Level will be maintained. However, all entrances to the upper levels will be closed off except for the Level Three entrance. Access to other levels will be provided via the internal speed ramp (See Alternate 4.1 isometric drawing on page 38).

### PARKING GEOMETRICS

The expanded structure has one parking bay and one speed ramp on each level with 90-degree parking spaces and two-way traffic along the parking bays and ramps. The parking module will be 61'-8" and the speed ramps will have an 11% slope. The parking layout is based primarily on uniform sized parking spaces of 8'-6" wide x 18' long and a 25'-8" wide drive aisle for two-way traffic.

The parking facility will meet Americans with Disabilities Act (ADA) and California CCR, Title 24 requirements. Four additional accessible parking spaces are provided to bring total to 9 spaces.

### ENTRY/EXIT AREAS

The existing entry/exit lane on Level Three will be maintained and will provide access to Levels Two, Four and Five via the internal ramp. The Ground Level will be accessible from Hearst Street only.

### INTERNAL CIRCULATION/RAMPING

Vehicles entering the garage at Level Three can turn left to search for parking on the existing Level Three parking area or turn right and circulate to the lower or upper levels. The clockwise circulation is upbound while the counter-clockwise circulation will be downbound. The internal speed ramp slope of 11% and the available ramp width will not allow for parking on the ramp.

### OPINION OF PROBABLE COST OF ALTERNATE

The opinion of probable construction cost for this alternate is $3,753,000 and this translates to a $27,800 construction cost per net gain stall. A breakout of these costs are included in Appendix B.

**ALTERNATE 4.2 CONCEPT**
The parking structure layout will be similar to Alternate 4.1 concept except that there will be no Level Five parking. This level will remain as tennis courts. However, the tennis courts will be expanded to cover the footprint of the parking expansion below. Two parking levels will be provided at the expansion area with a net gain of 31 spaces. The extended section has an out-to-out length in the north/south direction of 140'-0" and an out-to-out width in the east/west direction 94'-8". See Concept Drawing on page 40.

**PARKING GEOMETRICS**
The expanded structure will be similar to Alternate 4.1 except that there will be no internal ramp to Level Five.

The parking facility will meet Americans with Disabilities Act (ADA) and California CCR, Title 24 requirements. Two additional accessible parking spaces will be added to the expanded section to bring the total to eight accessible parking spaces.

**ENTRY/EXIT AREAS**
Entry/exit configuration will be similar to Alternate 4.1.

**INTERNAL CIRCULATION/RAMPING**
Internal circulation/ramping will be similar to Alternate 4.1 except that there will be no ramp to Level 5 (See Alternate 4.2 isometric drawing on page 40).

**OPINION OF PROBABLE COST OF ALTERNATE**
The opinion of probable construction cost for this alternate is $3,912,000 and this translates to a $126,200 construction cost per net gain stall. The total estimated construction cost of the structure includes an estimated cost of $954,200 for the added tennis court component on Level Five. A breakout of these costs are included in Appendix B.


1 GSPP / Goldman School of Public Policy
2 Cloyne Court Co-op
3 Foothill Residence Halls
4 Cory Hall
5 Soda Hall

**R** residential
**C** commercial
**R/C** residential over grade level commercial
**Ch** religious institution
site high point
site low point
site

# site plan

scale 1:70

2 September 2005

N

**a** : looking north at "party wall", handicap ramp to GSPP and intersection beyond.

**b** : hearst elevation with car entry.

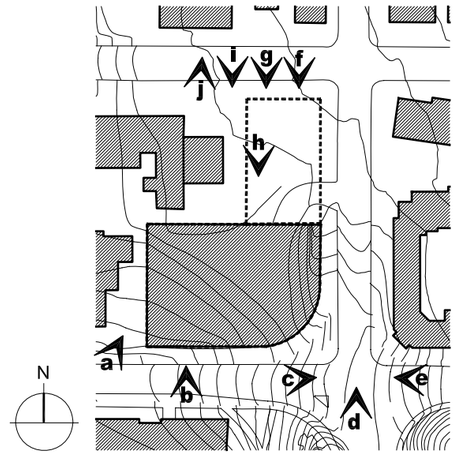
**c** : hearst elevation looking west.

**d** : looking north on La Loma, existing parking structure to left, Foothills Student Housing to right.

**e** : looking west down Hearst, Cory Hall to left, existing structure to right.

**f** : looking at surface lot and back of existing parking structure.

upper hearst structure




# site photos

2 September 2005

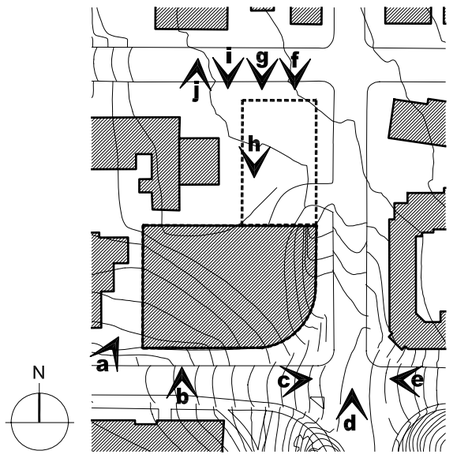
**g** : entry/exit to lowest level of existing parking structure from Ridge.

**h** : bottom of ramp (from Ridge) to lowest level of existing parking structure.

**i** : Cloyne Court parking ramp / parking / single story component and main building. Existing parking structure beyond.

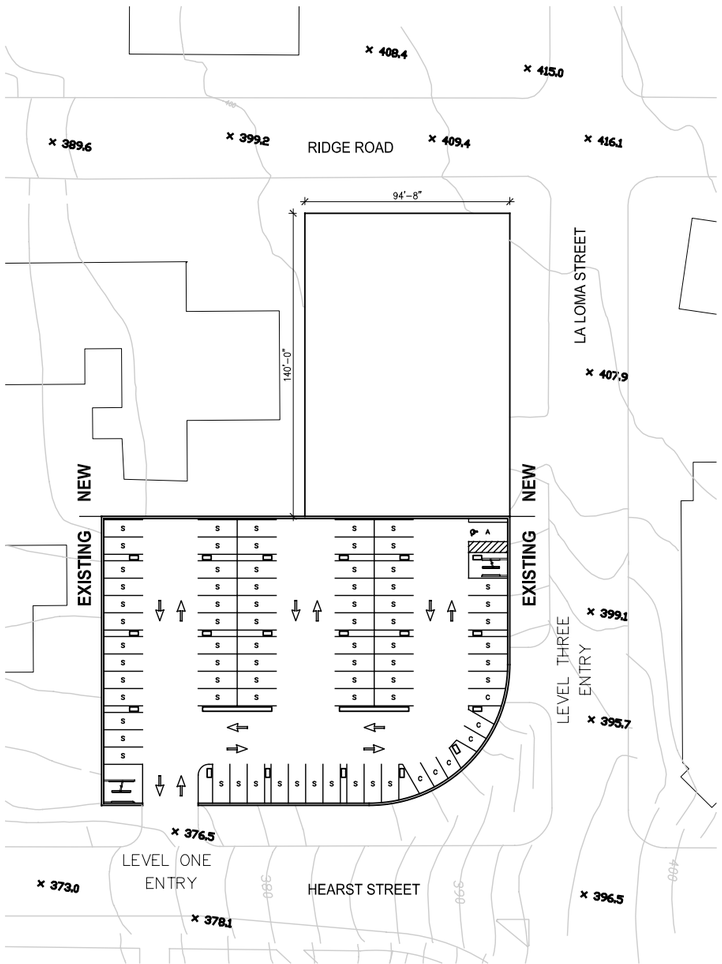
**j** : residential (mostly single family) across the street on Ridge.

upper hearst structure

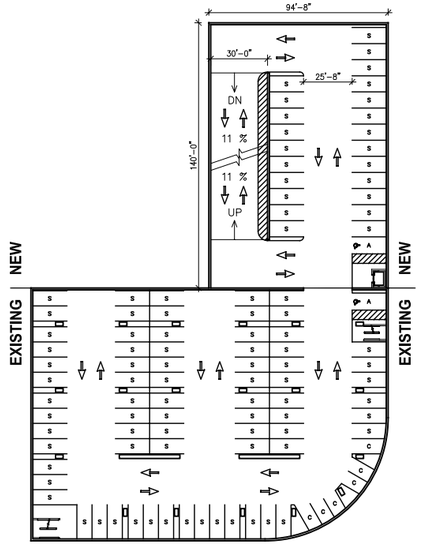



# site photos

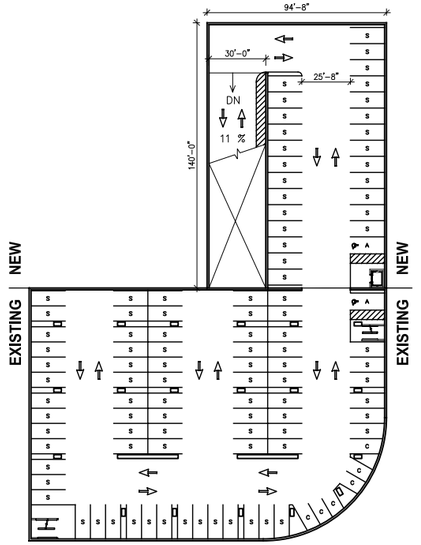
2 September 2005



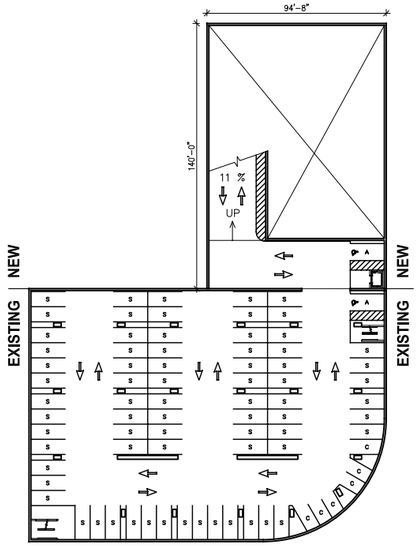

**Ground Level Plan** scale 1:70



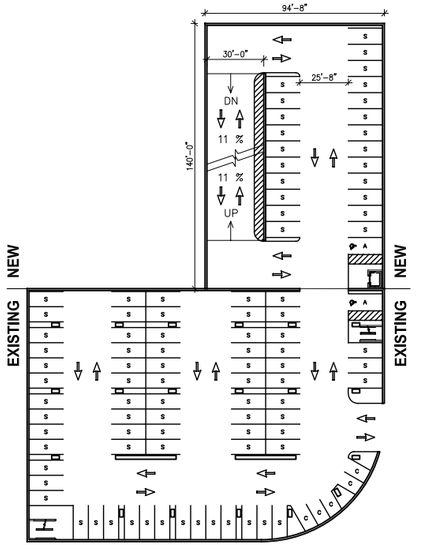

**Second Level Plan** scale 1:80




**Third Level Plan** scale 1:80




**Second Level Plan** scale 1:80




**Third Level Plan** scale 1:80

# concept drawings scale : various

2 September 2005

# upper hearst structure

# Alternate 4.1

## CAR COUNT

8'–6" 90° STANDARD CAR SPACE

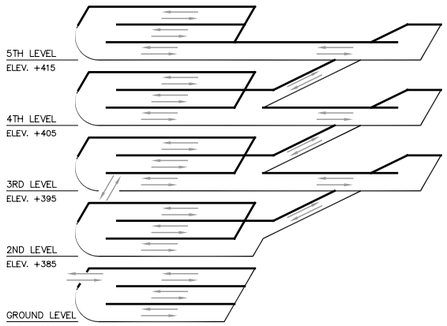
9'–0" 90° ACCESSIBLE PARKING SPACE

| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING PARKING | NET GAIN/LOSS |
|---|---|---|---|---|---|
| GROUND | 75 | 1 | 76 | 77 | (1) |
| SECOND | 78 | 2 | 80 | 78 | 2 |
| THIRD | 97 | 2 | 99 | 74 | 25 |
| FOURTH | 101 | 2 | 103 | 79 | 24 |
| FIFTH | 104 | 2 | 106 | 21* | 85 |
| TOTAL | 455 | 9 | 464 | 329 | 135 |

AREA: 164,810 SQ. FT.

EFFICIENCY: 355 SQ. FT. PER SPACE

(NOTE: * INDICATES SPACES AT UPPER HEARST LOT)




ISOMETRIC

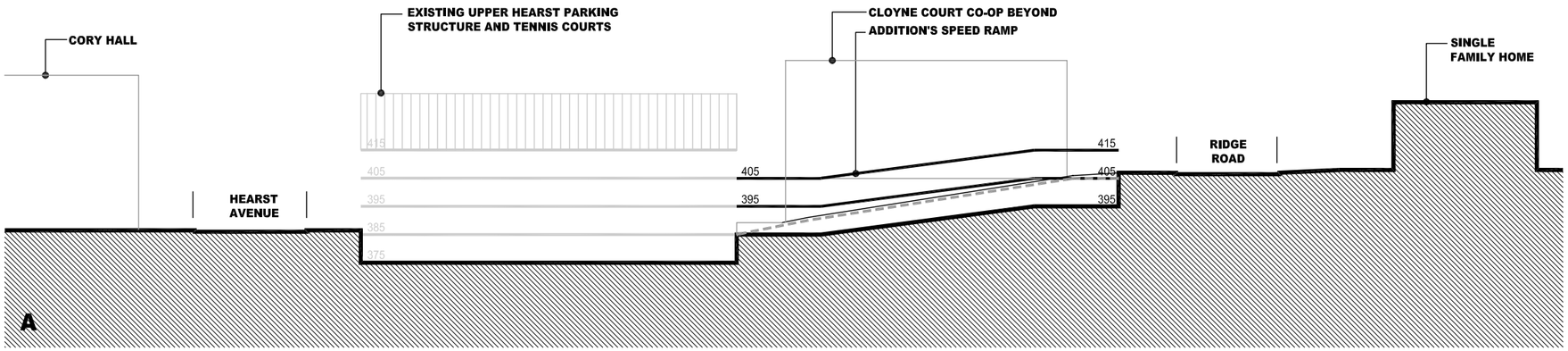


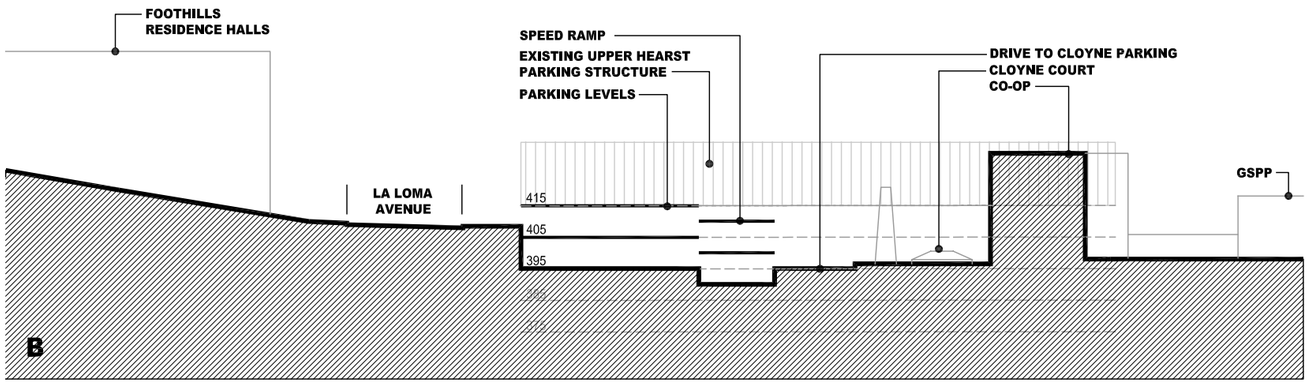


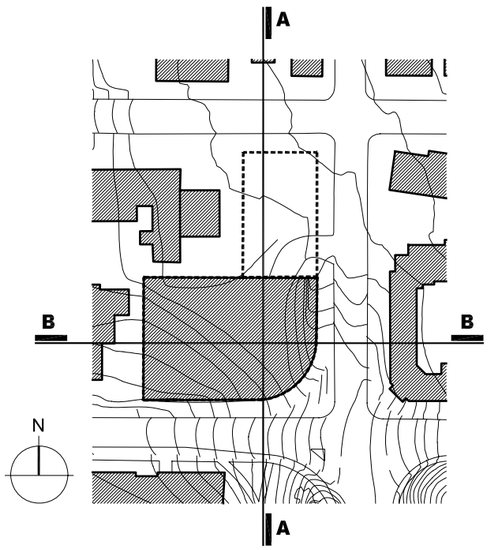
WALKER PARKING CONSULTANTS with CHONG | PARTNERS ARCHITECTURE

upper hearst structure

Alternate 4.1

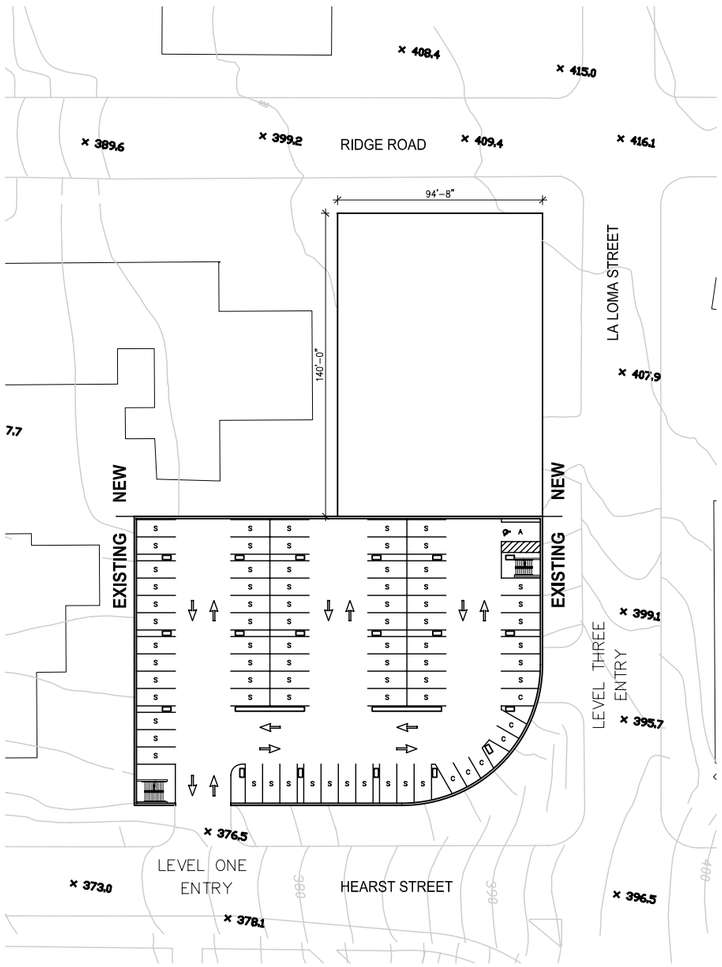


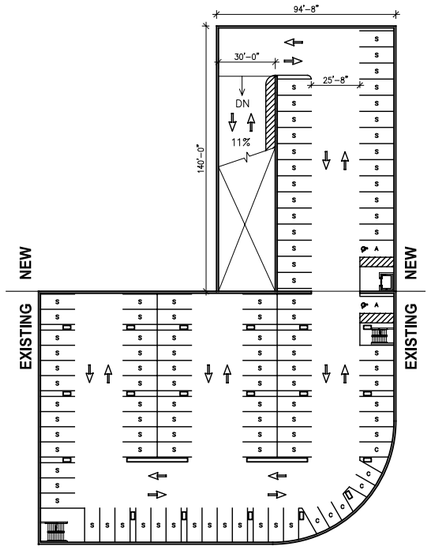




# site sections scale 1:50

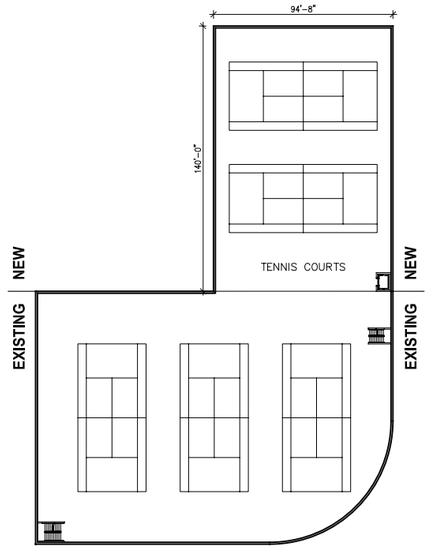
2 September 2005



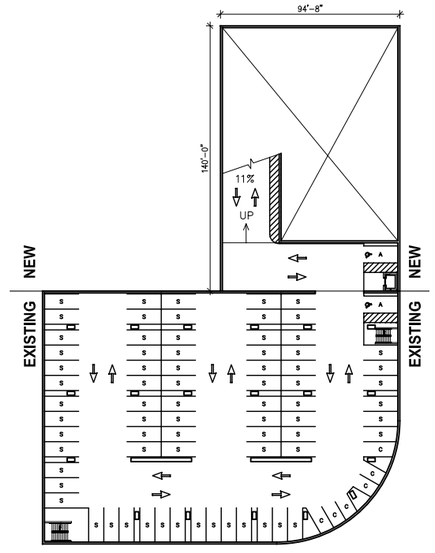

**Ground Level Plan** scale 1:70




**Second Level Plan** scale 1:80




**Third Level Plan** scale 1:80

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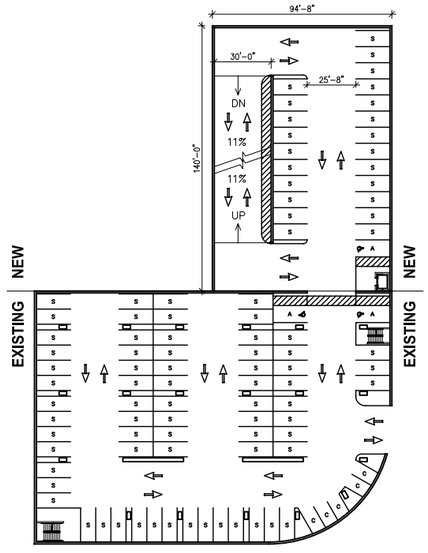



**Third Level Plan** scale 1:80

# concept drawings scale : various

2 September 2005

# upper hearst structure

# Alternate 4.2

## CAR COUNT

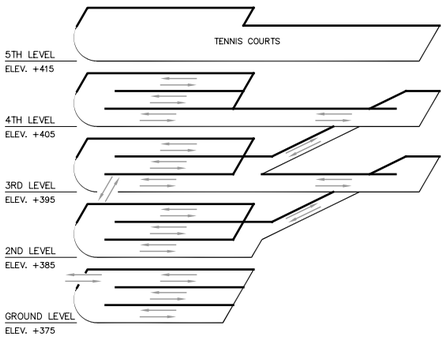
8'–6" 90° STANDARD CAR SPACE

9'–0" 90° ACCESSIBLE PARKING SPACE

| LEVEL | STANDARD CAR | ACCESSIBLE PARKING | TOTAL | EXISTING PARKING | NET GAIN/LOSS |
|---|---|---|---|---|---|
| GROUND | 75 | 1 | 76 | 77 | (1) |
| SECOND | 78 | 2 | 80 | 78 | 2 |
| THIRD | 95 | 3 | 98 | 74 | 24 |
| FOURTH | 104 | 2 | 106 | 79 | 27 |
| SURFACE LOT | – | – | – | 21 | (21) |
| TOTAL | 352 | 8 | 360 | 329 | 31 |

AREA: 126,940 SQ. FT.

EFFICIENCY: 353 SQ. FT. PER SPACE




ISOMETRIC

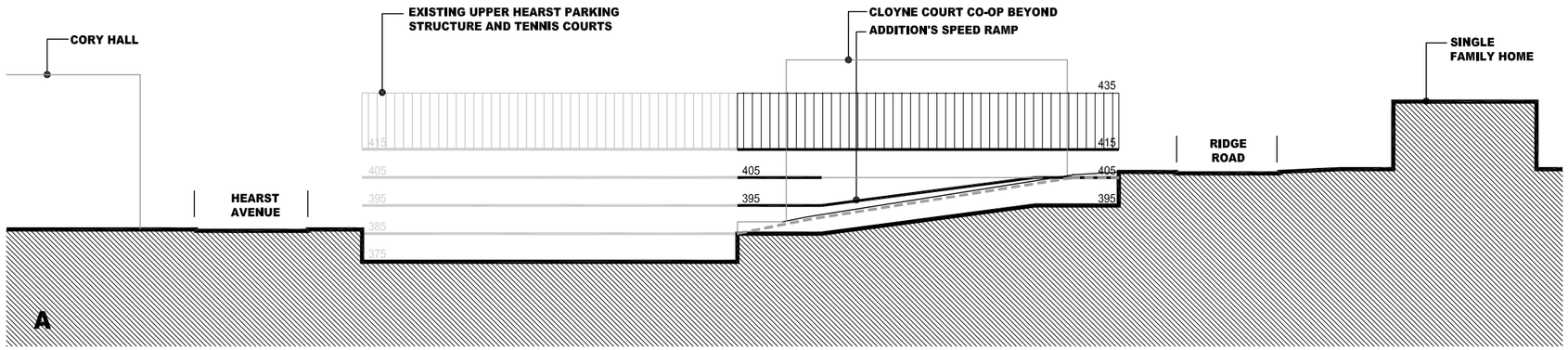


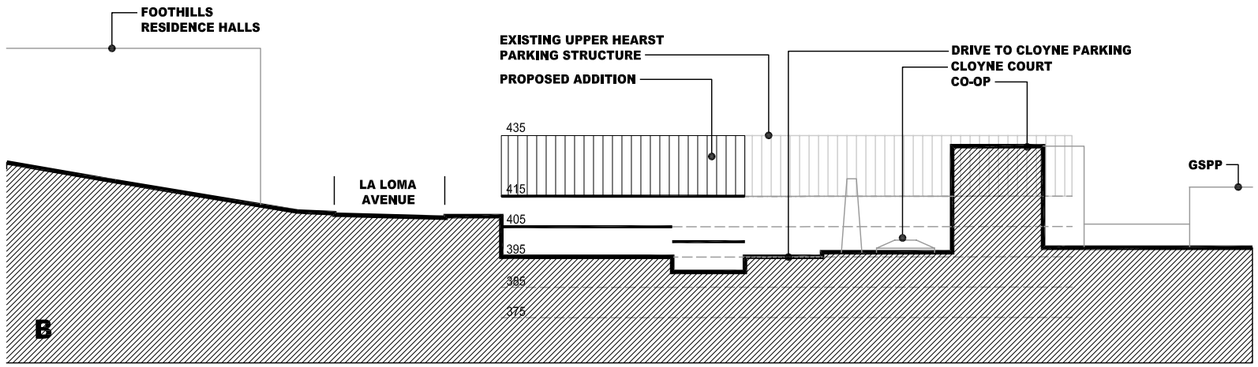


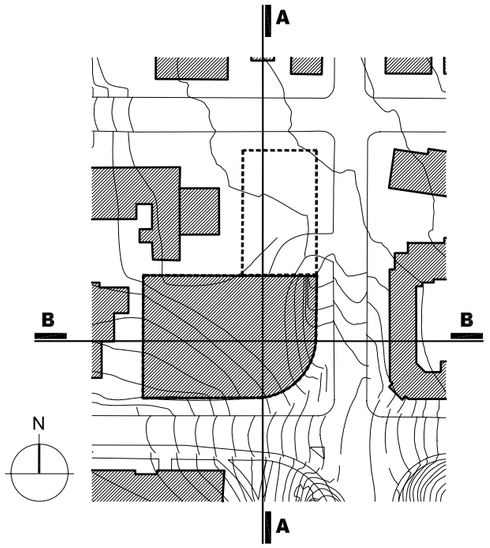
WALKER PARKING CONSULTANTS with
CHONG | PARTNERS ARCHITECTURE

upper hearst structure

Alternate 4.2




site sections scale 1:50

2 September 2005





WALKER PARKING CONSULTANTS with CHONG | PARTNERS ARCHITECTURE

appendix A

# Examples of

# Architectural Solutions and Finishes

2 September 2005


examples of
architectural solutions
and finishes

Stairs and elevators are more than necessities, they are opportunities. A thoughtfully located, wide, well-designed staircase will often be used instead of an elevator, especially for short trips.

An elevator hoist way can be a sign that orients the pedestrian to the location of the main stair.

Successful stairs are elegant and yet provide the user with visibility, transparency and a sense of security.

# circulation

2 September 2005



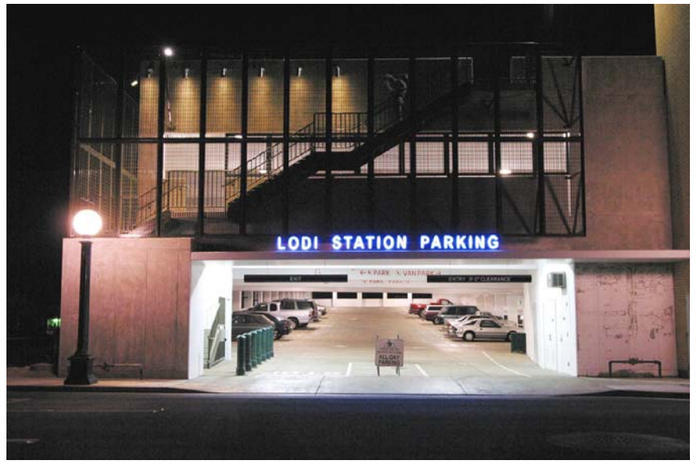



# examples of architectural solutions and finishes

Ideas for how to integrate parking structures into an urban environment such as the edges of the Berkeley campus are shown. Elegant, well-detailed materials are important since people will be walking very close to them. Use of landscape softens the edge and echos the setbacks of adjacent properties. Having a retail component continues the street usage.

## street wall

2 September 2005




examples of
architectural solutions
and finishes

Well-lit stair cases, and interiors provide security to the users. Care needs to be taken to limit spill affecting neighbors. Since the lots are used by permit parkers, signage is less important than in public lots.

# lighting

2 September 2005

appendix B

# Opinion of

# Probable Cost of Concepts

2 September 2005

| ***Estimated Unit Construction Cost ($/SF)*** | |
|---|---|
| Above Grade Parking Structure Level | $55.00 |
| Exterior Architecture | $7.00 |
| One Below Grade Parking Structure Level | $82.00 |
| Retail Space, Core and Shell | $150.00 |
| Sports Field Level | $72.00 |
| Site Preparation / Development Cost | $10.00 |
| On Grade Parking Structure Level | $5.00 |

## *TABLE C-1 : Opinion of Probable Construction Costs for Concepts*

| Concept | No. of Parking Levels | No. of Stalls | No. of Net Stalls Gained | Footprint (S.F.) | Retail Core (S.F.) | Sports Field (S.F.) | Site Cost | Above Grade Parking Levels | On Grade Parking Levels | Partial Below Grade Parking Level | Below Grade Parking Level | Retail Space, Core & Shell | Sports Field | Estimated Concept Construction Cost | Contingency Associated with Design Development (@15%) | Owner's Construction Contingency (@5%) | ***Total Concept Construction Cost*** | Estimated Cost Per Stall (Based on total # of stalls provided) | Estimated Construction Cost Per Net # of Stalls Gained |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ***Tang Lot*** | | | | | | | | | | | | | | | | | | | |
| Alternate 1.1 | 2 | 325 | 95 | 52,485 | 0 | 0 | $524,900 | $3,254,100 | $0 | $3,411,500 | $0 | $0 | $0 | $7,191,000 | $1,079,000 | $360,000 | ***$8,630,000*** | $26,600 | $90,800 |
| Alternate 1.2 | 2 | 296 | 66 | 52,485 | 0 | 52,485 | $524,900 | $3,254,100 | $0 | $3,411,500 | $0 | $0 | $3,778,900 | $10,969,000 | $1,645,000 | $548,000 | ***$13,162,000*** | $44,500 | $199,400 |
| Alternate 1.3 | 4 | 637 | 407 | 54,140 | 0 | 0 | $541,400 | $10,069,900 | $0 | $3,519,100 | $0 | $0 | $0 | $14,130,000 | $2,120,000 | $707,000 | ***$16,957,000*** | $26,600 | $41,700 |
| ***Dana / Durant Lot*** | | | | | | | | | | | | | | | | | | | |
| Alternate 2.1 | 2 | 132 | 48 | 25,168 | 0 | 0 | $251,700 | $1,560,400 | $0 | $1,635,900 | $0 | $0 | $0 | $3,448,000 | $517,000 | $172,000 | ***$4,137,000*** | $31,300 | $86,200 |
| Alternate 2.2 | 3.5 | 203 | 114 | 25,168 | 5,400 | 0 | $251,700 | $3,901,000 | $0 | $1,635,900 | $0 | $810,000 | $0 | $6,599,000 | $990,000 | $330,000 | ***$7,919,000*** | $39,000 | $69,500 |
| ***Bancroft Site*** | | | | | | | | | | | | | | | | | | | |
| Alternate 3.1 | 2 | 213 | 82 | 39,010 | 0 | 39,010 | $390,100 | $2,418,600 | $468,120 | $0 | $0 | $0 | $2,808,700 | $6,086,000 | $913,000 | $304,000 | ***$7,303,000*** | $34,300 | $89,100 |
| Alternate 3.2 | 4 | 396 | 265 | 40,172 | 4,880 | 0 | $401,700 | $7,472,000 | $482,064 | $0 | $0 | $732,000 | $0 | $9,088,000 | $1,363,000 | $454,000 | ***$10,905,000*** | $27,500 | $41,200 |
| ***Upper Hearst Site*** | | | | | | | | | | | | | | | | | | | |
| Alternate 4.1 | 3 | 73 | 135 | 13,253 | 0 | 0 | $132,500 | $821,700 | $0 | $0 | $2,173,500 | $0 | $0 | $3,128,000 | $469,000 | $156,000 | ***$3,753,000*** | $51,400 | $27,800 |
| Alternate 4.2 | 2 | 49 | 31 | 13,253 | 0 | 13,253 | $132,500 | $0 | $0 | $0 | $2,173,500 | $0 | $954,200 | $3,260,000 | $489,000 | $163,000 | ***$3,912,000*** | $79,800 | $126,200 |

***Notes***

1) These cost estimates are based on historical data and experience with similar types of projects and are in 2005 dollars. If projects are intended to be implemented in future, appropriate escalations shall be applied
2) Estimated costs may vary due to time of year, local economy, or other factors.
3) Estimated costs do not include phasing of project, inflation, financing costs, and other owner "soft costs"
4) Assumes 80% below-grade and 20% on-grade construction cost.

## Walker Parking

150 Executive Park Blvd. Suite 3750
San Francisco, CA 94134
415.330.1895 tel
415.330.1898 fax
**www.walkerparking.com**

## Chong Partners Architecture

405 Howard Street, 5th Floor
San Francisco, CA 94105
415.433.0120 tel
415.433.4368 fax
**www.chongpartners.com**

# APPENDIX G

## UNIVERSITY HALL WEST PARKING GARAGE PARKING STUDY - WALKER PARKING CONSULTANTS

# EXECUTIVE SUMMARY

## ES-1: INTRODUCTION

UC Berkeley is exploring plans for a new, consolidated parking facility on a university-owned site west of University Hall in downtown Berkeley. The facility would replace the spaces eliminated by the demolition of the University Hall parking lot, the site of the new Berkeley Art Museum (BAM). A parking facility at the site might also be designed to increase the supply of short-term and long-term parking for the campus, an objective of the 2020 LRDP[1].

This study was commissioned to analyze various scenarios for the facility – specifically their technical and financial feasibility. The primary goal of the study was to asses: (1) site capacity, (2) market supply and demand, and (3) preliminary financial strategies for delivery and operation. This executive summary provides an overview of the study for campus decision-making.

## ES-2: SITE CAPACITY

The Downtown Area Plan (DAP) governs capacity on the site, allowing for maximum building height of 100 to 110 feet (10 floors) on the site. Assuming appropriate setbacks for fire and emergency vehicles access, ground-floor commercial spaces and two levels of below-grade parking[2] the site capacity would be approximately:

- 1,130 spaces for a 100 foot structure (10 stories).

Although this indicates the maximum capacity of the site based on the DAP, because of design limitations related to the proximity to the new BAM, the capacity of a 70 foot structure was also assessed. It yields approximately:

- 840 spaces for a 70 foot structure (7 stories).

Other options were evaluated to increase parking capacity by removing street-level commercial or by using technology solutions (i.e.; automated mechanical garages and stack-parking lifts), however after being evaluated they were removed from consideration because they did not meet key DAP design standards or level-of-service (LOS) standards for exiting the structure.

## ES-3: MARKET SUPPLY AND DEMAND

There is anticipated market demand of roughly 2,196 spaces of additional parking in downtown Berkeley during the midday peak hours. Estimates indicate that 1,481 of those spaces could be captured by a new garage facility. Combined with the demand from the 29 public and 360 university spaces[3] that will be eliminated as a result of the new Berkeley Art Museum the total demand for spaces rises to 1,870 spaces.

This intended 'user-base' for the parking facility was determined using existing data from UC Berkeley, the City of Berkeley, a physical count of available on-street parking, and anticipated future parking demand based on DAP land uses within an distance of 1200 feet from the project site, a distance recommend as a normal parking 'catchment' area by the consultant.[4]

## ES-4: FINANCIAL STRATEGIES FOR DELIVERY

The preliminary financial strategy indicates that a facility between 70 and 100 feet is financially viable based on the mix of market-rate to UC long-term parking in the facility. This was determined by calculating anticipated operating revenues, less expenses and debt service, and accommodating the University priorities as listed in the adjacent textbox (see right). As can be seen in the summary tables on the following page, the mix of high-revenue market/public spaces (short-term spaces) to lower-revenue University spaces (long-term spaces) is critical to the financial viability of the project.

**UC Berkeley Parking Priorities**

1. Replace University Hall Long-term Spaces (360)
2. Provide Long-term Spaces for Gateway Building (200)
3. Provide Market Spaces for Mike's Bikes (20)
4. Long-term Spaces for DHS / Other UC Needs (unspecified)
5. Market Demand for:
    a. Art Museum/Cultural Attendee (130)
    b. Hotel (150)
6. Market Demand:
    a. Meeting Attendees / Short-term University Spaces
    b. Hotel Visitors
    c. Game-day, Residential, Off-peak Uses
    d. Demand from Downtown Land Uses
    e. Restaurant Patrons
    f. Retail Patrons

[1] The LRDP suggests parking in the downtown area to meet a total estimated demand of 2,300 spaces (see page 22 and 47): http://www.cp.berkeley.edu/LRDP_2020.pdf.
[2] Half of the existing site is excavated with capacity for below-grade parking; alternatives assume the remainder of the site is excavated.
[3] The sum of University Hall marked spaces (258), University Hall tandem spaces (83) and University Well marked spaces (19).
[4] Local parking generation standard established in 2007 by the Metropolitan Transportation Commission and Wilber Smith: http://www.mtc.ca.gov/planning/smart_growth/parking_seminar.htm

**ALTERNATIVES (a)**

**100 Feet (10 Floors)**

| Description (b) | Total Spaces (c) | Mix of Spaces UC | Mix of Spaces Market | Capital Costs | Operating Revenue | Operating Expenses | Debt Service | Net Opp. Income | Profit or (Shortfall) / Debt Cov. Ratio |
|---|---|---|---|---|---|---|---|---|---|
| Option C/D UC + Market (d) | 1,134 | 380 | 754 | $46,061,000 | $4,065,309 | $580,537 | $3,445,126 | $3,484,772 | $39,646 / 1.01 |
| Option E UC Object. (e) | 1,134 | 960 | 174 | $46,061,000 | $2,524,955 | $580,537 | $3,445,126 | $1,944,418 | ($1,500,708) / 0.56 |

**70 Feet (7 Floors)**

| | Total Spaces | Mix of Spaces UC | Mix of Spaces Market | Capital Costs | Operating Revenue | Operating Expenses | Debt Service | Net Opp. Income | Profit or (Shortfall) / Debt Cov. Ratio |
|---|---|---|---|---|---|---|---|---|---|
| Option A UC + Market (f) | 836 | 244 | 592 | $36,002,000 | $3,302,979 | $574,607 | $2,692,787 | $2,728,372 | $35,585 / 1.01 |
| Option B UC Object. (g) | 836 | 816 | 20 | $36,002,000 | $2,040,785 | $574,607 | $2,692,787 | $1,466,178 | ($1,226,609) / 0.54 |

**Notes:**

(a) All alternatives assume that 'market' parking spaces provided within the garage also serve the University short term parking needs. All alternatives include appropriate setbacks for fire and emergency vehicles access, ground-floor commercial spaces, two levels of below-grade parking, and count no tandem spaces. These alternatives were developed based on 'Scheme 2' in the body of the report. Scheme 2 included two sub-options that explored a larger footprint with no building setback to the west, and two basement parking options – 2A, mechanized basement parking (3 stories below grade) and 2B conventional ramped basement parking (2 stories below grade). These options provided an additional 257 or 66 spaces, respectively, but did not significantly impact the financial models. For clarity they have been omitted from this summarizing discussion.

(b) Names reflect alternatives in the body of the report; description is provided in the notes.

(c) Although accommodations can be made for tandem or attended parking, these are not included in space capacity numbers.

(d) This alternative uses market-rate spaces to provide for the primary UC Berkeley priorities in the most financially viable manner. These basic priorities include 360 spaces replaced from University Hall and University Well, as well as 20 spaces dedicated to Mike's Bikes / commercial per prior agreement. All market demand priorities (Art/Cultural/Hotel) are met.

(e) This alternative focuses primarily on UC priorities. It was developed to show the financial impact if all foreseeable UC Berkeley needs and objectives were met. The scenario assumes a significant increased demand from the Gateway and DHS sites, a factor which may warrant additional consideration based on unknown revenue increases from this additional parking. It meets Art/Cultural/Hotel priorities but contains few high-revenue market spaces.

(f) Similarly to 'Option C/D', this alternative uses market-rate spaces to provide for the primary UC Berkeley priorities in the most financially viable manner but limits height to 70 feet. The number of replaced University spaces is limited to 244.

(g) This alternative attempts to meet all UC priorities and objectives in a 70 foot structure; it does not accommodate Art/Cultural/Hotel priorities.

## ES-5: FINDINGS AND NEXT STEPS

As indicated previously the key finding from this assessment was that the construction of a downtown parking facility is financially viable assuming that a significant portion has market-based pricing. There is existing and latent demand in Berkeley's Downtown Area to support a parking facility. Key findings include:

- **Site Capacity:** 1,130 at 100 foot (10 stories) and 840 spaces at 70 foot (7 stories);
- **Demand:** 1,870 market and UC spaces needed;
- **Financial Strategies:** Various combined university and market options perform well financially; UC-only structured parking is not financially viable without market-rate parking; In order to provide UC spaces, a minimum of approximately 830 spaces must be constructed to break even financially.

These key findings must be framed within the context of the our current knowledge of campus parking needs. The campus 2020 LRDP projected a need of 1,800 to 2,300 additional spaces, however according to Parking and Transportation it is unclear if this demand remains – whether providing such quantities of parking would provide a solid return-on-investment given that (1) the number of parking permits sold has steadily declined over recent years and (2) the University has continued to invest in Transportation Demand Management (TDM) and alternative transit programs (such as the faculty-staff BearPass) that encourage and prioritize other modes of transportation. It is unsure that building more parking would result in increase in permit sales, a question that might be made more clear by doing a campus-wide parking master plan to assess the true demand for spaces.

This and other remaining issues warrant exploration and financial assessment prior to campus selection of a preferred alternative for construction and approval. As such, next steps might include:

1) Determining the exact height and mix of market-to-university and short-term to long term parking spaces;
2) Further refinement financial models and account structures;
3) Exploration of and planning for campus-wide parking supply and demand.

WALKER
PARKING CONSULTANTS

PARKING STUDY

# UNIVERSITY HALL WEST PARKING GARAGE

BERKELEY, CA

Prepared for:
University of California – Berkeley
Capital Projects:
Physical and Environmental Planning


Prepared: June 2, 2009

WALKER
PARKING CONSULTANTS

135 Main Street, Suite 1030
San Francisco, CA 94105

Voice: 415.644.0630
Fax: 415.644.0637
www.walkerparking.com

June 2, 2009

William Riggs, AICP, LEED® AP
Principal Planner
Physical and Environmental Planning
Room 300, A&E Building, MC 1382
Berkeley, CA 94720-1382

Re: *University Hall West Parking Garage – Parking Study:*
*_X_ Parking Concept Development & Massing Study*
*_X_ Parking Market Analysis*
*_X_ Preliminary Financial Analysis*

Dear Billy,

Attached you will find our final report for the parking study performed regarding the University Hall West Parking Garage. The final report incorporates the comments, discussions and input attained from previous reviews and iterations of the conceptual parking structure design alternatives, the parking market analyses, and the preliminary financial analyses.

Thank you for your effort and involvement in the project. You and your colleagues' contributions were instrumental in the preparation of the final report.

Sincerely,

WALKER PARKING CONSULTANTS

Ezra D. Kramer
Parking Consultant

EDK:edk
Enclosure

Cc: Sanjay Pandya

WALKER
PARKING CONSULTANTS

PARKING STUDY

# UNIVERSITY OF CALIFORNIA - BERKELEY

BERKELEY, CA

Prepared for:
UNIVERSITY OF CALIFORNIA - BERKELEY

PROJECT # 33-1599.00

JUNE 2, 2009

## TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

## EXECUTIVE SUMMARY

Walker Parking Consultants ("Walker") was retained by the University of California at Berkeley ("UCB") to perform parking consulting services related to the feasibility of a parking facility to be located adjacent to the current University Hall. The block is bounded by University Avenue to the north, Oxford Street to the east, Shattuck Avenue to the west, and Addison Street to the south.

Walker's approach was to first define the possible size of the parking facility given the site dimensions. Then concept designs were tested for viability based on meeting a set of criterion established through meetings with UCB staff, and general design guidelines (Level of service approach). Walker provided a demand analysis for the market that would be impacted by the new facility. The final step is to pair the market demand with the facility based on possible capture, then project operating revenues and expenses for the facility.

Testing the concept designs for viability yielded three basic designs that would meet the criteria and have an acceptable level of service; those are Scheme 2, 2A, and 2B.

- Scheme 2 consists of a conventional above-grade parking facility with 5,000 SF of street-front commercial space.
- Scheme 2A is basically the same as Scheme 2, but includes a below-grade mechanical section of the garage.
- Scheme 2B consists of is also similar to Scheme 2, but includes a traditional below-grade section.

The bounds for the parking demand analysis are based roughly on a five-minute walking distance, or 1,200 feet. To simplify the analysis Walker defined the bounds using full blocks (which could be adjusted based on capture later). The streets that create the boundary for the market area are Hearst Avenue to the north, Oxford Street to the east, Milvia Street to the west, and Allston Way to the south.

Prior studies have been performed in this area of downtown Berkeley, and Walker was asked to review and utilize as much information as possible from those prior studies. Of particular importance was the case study performed for the Metropolitan Transportation Commission titled "Parking Profile and Policy Recommendations – Berkeley". The study is fairly recent (April 2007) and provides parking demand ratios for the varied land uses found in downtown Berkeley. These ratios were paired with the proposed new projects within the market area as provided within the Downtown Area Plan and UCB-based projects.

Given the proposed net changes, even a facility built to the maximum allowable height of 100' would not accommodate the projected new parking demand between downtown "market" projects and UCB projects. Scheme 2 would yield 1,071 spaces at 100'. The market demand and new UCB demand is estimated to reach 1,870. The result would be a 799-space excess demand. Therefore, UCB has the option of setting and adjusting the mix of user groups and users to best suit their needs both from a space perspective and from a financial perspective.

Walker provided a preliminary financial analysis for the three concept design schemes (2, 2A, and 2B). The body of the report outlines Walker's methodology in projecting the operating revenues, operating expenses, and debt service payments for Scheme 2. Given assumptions provided in Appendix C, the result of the analysis for Scheme 2 yields operating revenues of $4,348,400, operating expenses of $658,400. The result is a net operating income of $3,690,000. The projected debt service payment for this design would be $2,814,425, which results in a $875,575 profit for the project once stabilized (2012). The pro forma operating statements for Scheme 2A and 2B are found in Appendix B for a full comparison. Scheme 2 and 2B are projected to be profitable designs given the assumptions found in Appendix C.

Upon issuance of Walker's draft report, UCB staff requested that Walker adjust the mix of proposed parkers for the facility and test additional scenarios in an attempt to gain insight into how altering the mix of user groups and facility height would impact the financial viability of the parking garage. Each of these scenarios is based roughly on the Scheme 2B design. The summary table at the end of the Additional Scenarios section provides a menu of options from which the University may choose from both a structure height perspective and parker mix. As there are no definitive findings regarding which scenario performs best, it is suggested that the reader review this brief final section.

# 1. INTRODUCTION

## BACKGROUND

Previous studies have documented the parking supply and demand conditions on the University of California at Berkeley ("UC Berkeley") campus. These studies provide findings regarding unmet parking demand and/or parking supply deficits on the University campus. According to the Parking Policy & Planning Options Study conducted by Wilbur Smith Associates in 1999, the parking deficit for the University community alone was over 4,000 spaces, a number which has increased based on the loss of parking inventory over recent years. The University's 2020 Long Range Development Plan projects that a net increase of 1,800 to 2,300 parking spaces is needed for the University community within the next 10 to 12 years. Although the University has made great strides in mitigating the parking deficit by implementing a number of successful transportation demand management measures, a significant shortage still exists today.

Case studies for downtown Berkeley transit indicate that localized parking supply deficits also exist in downtown Berkeley, adjacent to the UC Berkeley campus. Future developments are proposed in downtown Berkeley near campus which will further compound the existing parking supply deficit. These developments are anticipated to increase the local parking demand and in some cases reduce the number of publicly available parking spaces.

Given the apparent existing parking supply deficit for both UC Berkeley and downtown Berkeley, the University would like to explore their options regarding construction of a parking structure on a University-owned site on the block bounded by University Avenue to the north, Oxford Street to the east, Shattuck Avenue to the west, and Addison Street to the south. This site is referred to as the University Hall West Parking Garage site.

Although the parking shortfall is a concern, it is not the sole consideration for the potential redevelopment of this site, as it serves as a gateway between the campus and downtown. It is near the eastern terminus of the City of Berkeley's "Arts District" and provides a central location for those wanting convenient automobile access to the downtown area. These factors have also played into the discussion regarding how this site should be developed. The University has indicated the desire to continue to keep the streetscape activated through street-front commercial spaces and would like a design that reflects the transition from the City of Berkeley (and Arts District) to the UC Berkeley campus.

The ultimate design will be tempered by the financial feasibility of the project, as the overall financial feasibility comes down to capital cost to build the facility (ultimately debt service) versus net operating income (operating revenues less operating expenses). Debt service is driven by the design of the facility and its resulting construction and financing costs, and the cost of financing. Operating revenue is based on size, parking demand, parking rates, and parking management policies. Operating expenses are based on size, design, and operation of the facility.

UC Berkeley retained Walker Parking Consultants/Engineers, Inc. ("Walker") to conduct a parking study for the site and surrounding market. The specific questions that Walker has been tasked with answering include:

1. What are feasible design options for the site?
2. How do feasible design options compare to one another in resolving the existing parking shortfall?
3. How do feasible design options compare to one another financially?

These questions will be answered within the three main sections of this report: Parking Concept Development & Massing Analysis, Parking Market Analysis, and Preliminary Financial Analysis.

The purpose of this Study is not to update the campus wide parking supply and demand of the previous studies, but to analyze future parking conditions, to explore conceptual design alternatives for a specific project site located immediately to the west of the University Hall building, and to determine what this site means in terms of meeting both University needs and private market demand.

## MARKET AREA

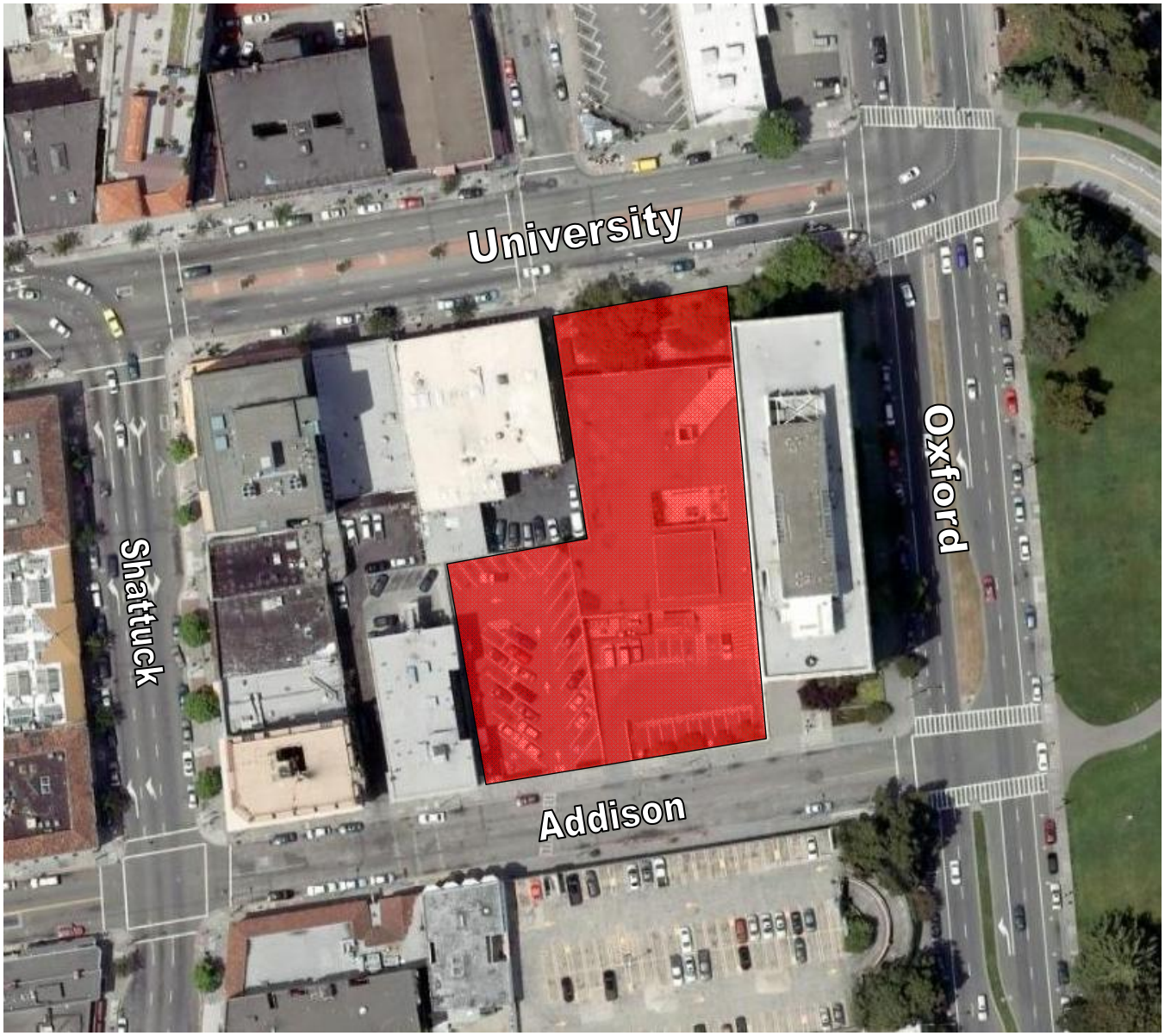
Aside from providing parking for UC Berkeley, our initial meeting identified other new developments that will rely on the public parking market to meet the parking demand generated by their patrons and employees. A reasonable market area was established given walking distance and capture. The market area is bounded by Hearst Avenue to the north, Oxford Street to the east, Milvia Street to the west, and Allston Way to the south. These bounds are represented in Figure 1 on the following page.

Figure 1: Market Area


*Source: Google Earth Pro, 2008.*

The market area was established using a 5-minute walking distance, or 1,200 feet. The 13-block market area will not capture all parking demand generated within this area, but it is reasonable to assume that at least a portion for each block may be accommodated within the University Hall West Parking Garage. We will discuss capture within the parking market analysis.

Figure 2: Project Site




*Source: Google Earth Pro, 2008.*

## REPORT ORGANIZATION AND METHODOLOGY

This report is set in three main sections: the Parking Concept Development & Massing Study, the Market Analysis, and the Preliminary Financial Analysis. The Parking Concept Development & Massing Study provides varying layout options given site restrictions, desired UCB programming, and a level of service analysis. The Market Analysis studies the parking supply and parking demand within the prescribed project area and will discuss the intended users of the parking facility. The Financial Analysis projects the impact of adding a new parking facility within downtown Berkeley that will serve both as a public parking facility and as part of the UCB parking system based on select schemes identified in the Parking Concept Development and Massing Study.

### *PARKING CONCEPT DEVELOPMENT & MASSING ANALYSIS*

The Parking Concept Development & Massing Analysis provides varying layout options (schemes) given the site constraints of height, setbacks, ramping issues, inclusion of ground floor retail, etc. The study will include an analysis of the number of space that each scheme would generate as well as utilize a level of service approach to determine whether the ramping, and entry/exits could provide an adequate level of service for varying number of spaces.

### *PARKING MARKET ANALYSIS*

First, we survey parking supply and occupancy levels to determine the overall demand for parking in the study area under current conditions. Then, using proposed new development program data, we project future demand for downtown parking. Adding these projected new parkers to the "baseline" occupancy established during the surveys, we arrive at a projection of future parking demand in the area. We then assess how the projected future parking demand will be allocated within the proposed future public parking supply. Ultimately that will lead to how the proposed new parking structure would help to resolve the existing parking shortfall. A single scheme will be discussed through the body of the report for clarity, but all options will be provided in the appendix for comparison purposes.

### *PRELIMINARY FINANCIAL ANALYSIS*

Financial impacts are based on the projected changes in the parking market on operating revenues, expenses and debt service capacity. The new parking structure would be operated by UCB Parking & Transportation; therefore the financial impacts will be measured as they related to the UCB parking system.

The revenue analysis uses the information from the Market Analysis to project revenue over the next five years as parking and other development occurs in downtown Berkeley. A parking rate analysis will also be provided to set an assumed rate structure for the facility; public parkers will pay market rates while UCB parkers will pay UCB rates.

For the expense side of the Financial Analysis, we study historical expenses to see trends in inflation as well as other impacts to the operating budget. We then project expenses over the next five years utilizing those inflationary trends.

Finally, our Financial Analysis looks at the addition of the new parking structure regarding its impact on net operating income, debt service, and reserves.

### *DATES OF FIELDWORK*

Walker performed occupancy counts of the on-street parking within the project area on Wednesday, October 29, 2008. Counts were performed hourly at the beginning of each hour from 9AM to 6PM.

# 2. PARKING CONCEPT DEVELOPMENT AND MASSING ANALYSIS

A Parking Concept Development & Massing Analysis considers the site restrictions on development, any specific requests from UC Berkeley, and finally a Level of Service ("LOS") analysis. Walker has also prepared an estimate of probable cost for all feasible options which will be presented in comparison tables at the end of this report.

Walker was given the following site restrictions based on the City of Berkeley zoning code:

- A maximum building height of 100 feet which conforms to the proposed zoning for the area.
- Appropriate setbacks for fire and emergency vehicles access of 20 feet adjacent to the University Hall Building.

Given these bounds, Walker was asked to provide layouts that would maximize the number of space within the footprint, circulate correctly, and include the following specific requests from UC Berkeley:

- Incorporate street-front commercial spaces,
- Limit the garage encroachment towards adjacent buildings when possible, and
- Evaluate technological and/or mechanized solutions (i.e.; automated mechanical garages and stack-parking lifts) that could increase parking capacity while decreasing the height and bulk of the garage.

For each concept alternative, Walker used the LOS approach to define the characteristics of the parking concept functional design. The LOS approach has been used by Walker over the years to present a quantitative approach to defining the characteristics of a functional design of parking structures. This approach was patterned after the level of service system used by traffic engineers to describe the degree of traffic congestion on streets and at intersections. For traffic engineers, the highest level of service, LOS A, indicates virtually free flow traffic, while the lowest level of service, LOS E, indicates the maximum flow of cars that can be accommodated before gridlock occurs. Similarly, Walker has identified various parking structure design parameters that affect the user comfort and convenience, and assigned values to these parameters that correspond to levels of service. These range from the highest level of service (LOS A) to the lowest acceptable level of service (LOS D). This level of service criteria is used by Walker in developing parking structure functional designs as

a means of quantifying the degree of user comfort and convenience being provided.

The parking structure design parameters that affect user comfort and convenience encompass not only the basic stall and parking aisle dimensions addressed in most zoning codes, but also a number of parameters, including:

- Lane widths for straight lanes and turns
- Turning radii
- Express ramp dimensions
- Ramp slopes
- Clearances to obstructions
- Entry/exit lane widths

The parking plans or layouts for each of the schemes described below are shown in Appendix A.

## DESCRIPTION OF ALTERNATIVES

### *SCHEME 1:*

This design signifies the maximum parking capacity of a conventional ramp-type parking structure with above grade parking within the height and side setback criterion. The design yields 1,135 spaces with no street-front commercial space. This alternative is used as a benchmark to determine a maximum capacity for a conventional ramp-type garage and is eliminated from further consider because it does not incorporate any street-front commercial space.

### *SCHEME 2:*

This design is similar to Scheme 1, but with the build-out of 5,000 square feet of street-front commercial space. Scheme 2 provides 1,071 parking spaces, which is a reduction of 64 spaces compared to Scheme 1.

### *SCHEME 2A:*

This design expands upon the design of Scheme 2 by incorporating three basement levels of automated mechanical parking and reducing the side setback on the western property line. The entire property footprint is used for the three basement levels to maximize the parking

spaces count in the basement levels. This design provides 1,328 parking spaces plus 176 tandem spaces. An additional 176 to 352 spaces could be gained if stack-parking lifts are installed in the area of the tandem spaces. A stack-parking lift is a device that parks cars in tandem vertically.

*SCHEME 2B:*

This design expands upon the design of Scheme 2 by incorporating two basement levels of conventional parking and reducing the side setback on the western property line on the upper levels. Unlike Scheme 2A, no additional spaces would be gained by utilizing the entire property footprint on the two basement levels. This design provides 1,134 parking spaces plus 168 tandem spaces. An additional 168 to 336 spaces could be gained if stack-parking lifts are installed in the area of the tandem spaces.

*SCHEME 3:*

This design takes Scheme 2 and expands the street-front commercial space by 8,500 square feet to a total of 13,500 square feet. Scheme 3 provides 874 parking spaces, which is a reduction of 197 spaces compared to Scheme 2.

*SCHEME 4:*

This design incorporates the merger of two different types of garages; an automated mechanical garage constructed above a conventional garage. The benefit of such a design is to capture the strengths of each type of garage; i.e., the space efficiency of the mechanical garage and the lower construction cost of the conventional garage. This alternative, which produces 1,238 parking spaces, is removed from further consideration as it does not meet Walker's minimum level of service rating for egress until the garage capacity drops to 963 spaces.

*SCHEME 5:*

This design provides the maximum parking capacity compared to the other presented schemes. Scheme 5 provides 2,098 parking spaces in a fully mechanized parking structure and includes 5,000 square feet of street-front commercial. This alternative is removed from further consideration because it does not meet Walker's minimum level of service rating for egress until the garage capacity drops to 641 spaces.

## LEVEL OF SERVICE EVALUATIONS

In order to determine the most suitable alternative for the project, each scheme was evaluated on a set of level of service criteria; including ingress queuing, egress queuing, cashiering, and ramp capacity. Table 3 shows the maximum attainable rating of each scheme for each criterion.

Table 3 shows that Scheme 1, Scheme 3, Scheme 4 and Scheme 5 are rejected of eliminated from further considerations. This leaves Scheme 2, 2A, and 2B for further study.

Table 1: Level of Service

| Scheme | Maximum Capacity[1] | Height at Maximum Capacity | Ingress[2] | Egress[2] | Cashiering[2] | Ramp[3] | Comments |
|---|---|---|---|---|---|---|---|
| 1 | 1,135 | 100' | A | A | A | C | Rejected-No Commercial |
| 2 | 1,071 | 100' | A | A | A | C | *Passed-For Financial Analysis* |
| 2A (Mechanical) | 1,328 | 100' | A | B | A | C | *Additional Design Consequent of Scheme 4 for Financial Analysis* |
| 2B (Conventional) | 1,137 | 100' | A | A | A | C | *Additional Design Consequent of Scheme 4 for Financial Analysis* |
| 3 | 874 | 100' | A | A | A | B | Rejected-Low Capacity, unviable commercial |
| 4 | 963 | 80' | A | C | A | B | Rejected-Revisited as 2A |
| 5 | 641 | 50' | A | C | A | N/A | Rejected-Low Capacity |

Note 1 - Maximum Capacity is due to height limitations or Level of Service of C

Note 2 - Design queue is maximum queue expected in the peak hour and is used to design reservoir.
Average queue is converted to average delay and is used to determine Level of Service

| Average wait | LOS | |
|---|---|---|
| 0 to 10 seconds | A | |
| 11 to 30 seconds | B | |
| 31 to 60 seconds | C | |
| 61 to 120 seconds | D | Not recommended by Walker |
| >120 seconds | F | Not recommended by Walker |

Note 3 - Analysis is based on methodology adapted by Walker Parking Consultants ("Walker") per *Parking Structures* Third Edition
Level of Service is based on percent of capacity "used" (v/c) by the expected traffic volume at the critical points for traffic flow.

| v/c | LOS | |
|---|---|---|
| <60 percent | A | |
| 61 to 70 percent | B | |
| 71 to 80 percent | C | |
| 81 to 90 percent | D | Not recommended by Walker |
| >90 percent | F | Not recommended by Walker |

*Source: Walker Parking Consultants, 2008.*

# 3. PARKING MARKET ANALYSIS

The University Hall West Parking Garage is intended to serve both UC Berkeley parkers and public parkers. Walker was provided with prior reports, analyses and case studies related to both the campus and downtown Berkeley. These studies indicate that there is currently unmet parking demand both on campus and in downtown Berkeley.

As referenced in the introduction, the Parking Policy & Planning Options Study indicated there is a UC Berkeley parking deficit of roughly 4,450-spaces during peak hours. The study suggested that 11% of the 4,450 spaces (1,255 spaces) be provided to accommodate currently unmet parking demand and the remainder of the unmet demand be shifted to other modes of transportation through a transportation demand management plan.

The University's 2020 Long Range Development Plan projects that a net increase of 1,800 to 2,300 parking spaces is needed for the University community within the next 10 to 12 years.

The UC Berkeley campus has continued to evolve since these studies were performed. The changes on campus have further reduced the amount of parking on campus while introducing new parking demand generators. Parking on the UC Berkeley campus has become increasingly impacted over the past 3-5 years given these changes.

In 2001 UC Berkeley and the City of Berkeley jointly commissioned a study performed by Nelson/Nygaard Consulting Associates titled Southside/Downtown Transportation Demand Management Study. This study indicated that localized parking supply deficits also exist in downtown Berkeley, adjacent to the UC Berkeley campus.

The Metropolitan Transportation Commission funded a study titled Reforming Parking Policies to Support Smart Growth. As a part of this research, case studies were performed in Bay Area communities, which included the City of Berkeley. The case study provided parking occupancy counts for downtown Berkeley and was also cited in the Berkeley Downtown Area Plan – Preliminary Traffic Impact Analysis. The results suggested that on-street parking supply has localized deficits during the peak period (which were not quantified), and off-street publicly available parking is also impacted during peak periods. Observed occupancies dating back to studies from 1992 indicate that publicly available parking reaches 85 percent occupied. More recently, in 2005 MTC commissioned a new study to determine parking demand within downtown Berkeley; the results of that study also indicated an 82% occupancy rate in the weekday morning, and 88% in the weekday early afternoon. These numbers are near what is

considered the effective capacity for public parking; the perception of public parkers in this case would be that there is little to no parking in downtown Berkeley.

Future developments are proposed in downtown Berkeley near campus. These developments are anticipated to increase the local parking demand and in some cases reduce the number of publicly available parking spaces. Therefore, the existing deficit is anticipated to be compounded as new development occurs. These conditions suggest that there is a significant need for increased parking supply in this market area. This analysis considers the total amount of public parking generated by proposed new developments first. Although the number of spaces available for these users may not match what they would require, we will provide an assumed capture. UCB staff has provided a hierarchy of which user groups from UCB-based projects should be accommodated within the facility.

Given this approach, Walker's Market Analysis is intended to answer the following question:

*Under proposed future conditions, how much parking demand could be accommodated within the existing parking market and how much could be captured within a proposed new UC Berkeley parking structure?*

## EXISTING CONDITIONS

As it currently exists, the parking market in downtown Berkeley (as well as the UC Berkeley campus) is impacted at several times throughout the day, week, and year. Walker presents the existing parking supply to identify the current pool of parking spaces available to the public. Observed and extrapolated parking demand found within this supply is provided to indicate how the current pool of publicly available parking spaces is being utilized. When these are combined we find the current parking adequacy in the market. An understanding of the current adequacy will help reveal the possible number of spaces available to capture proposed future parking demand within the market.

## *PARKING SUPPLY*

The publicly available parking supply in downtown Berkeley consists of on-street parking (metered and unmetered), off-street parking lots, and off-street parking structures. The space counts for on-street parking and each facility are provided in Error! Not a valid bookmark self-reference..

Figure 3: Parking Supply

| Location | Type | Spaces |
|---|---|---|
| Onstreet | On-street | 600 |
| 1 Berkeley Way Lot | Lot | 111 |
| 2 Allston Way Garage | Garage | 612 |
| 3 Center Street Garage | Garage | 420 |
| 4 University Hall West | | 29 |
| TOTAL SPACES | | 1,772 |

| Location | Type | Spaces |
|---|---|---|
| 5 University Hall | Garage | 258 |
| Tandem | Non-striped | 83 |
| 6 University Well | Lot | 19 |
| TOTAL SPACES | | 360 |


*Source: Google Earth, 2008.*

Note that we have not included two of the existing UCB parking facilities found within the market area; University Hall Garage and University Well Lot. Although these spaces will be removed once development overtakes them, they are not available for public parking during the peak weekday period and will not be counted in this portion of the analysis.

EFFECTIVE SUPPLY

Another important concept in determining the required number of spaces is effective supply. A parking system operates at optimum efficiency at somewhat less than its actual capacity. It is unrealistic to expect an arriving parker to find the last available parking space in a system without significant frustration and the resulting perception that parking is inadequate. Therefore it is important to have a cushion of extra spaces in the supply to account for operating fluctuations, vehicle maneuvers, mis-parked vehicles, broken glass, minor construction, etc. That proposed cushion is the effective supply as it is known in the parking industry. We propose the following effective supply based on the number of spaces, user groups, and restrictions within the parking supply.

Table 2: Existing Effective Parking Supply

| Supply Type | Spaces | Eff. Supply | |
|---|---|---|---|
| Onstreet | 600 | 95% | 570 |
| Offstreet | | | |
| Allston Way Garage | 612 | 85% | 520 |
| Center Street Garage | 420 | 85% | 357 |
| Berkeley Way Lot | 111 | 90% | 100 |
| University West Lot | 29 | 90% | 26 |
| TOTAL SPACES | 1,772 | | 1,573 |

*Source: Walker Parking Consultants, 2008.*

## *PARKING DEMAND*

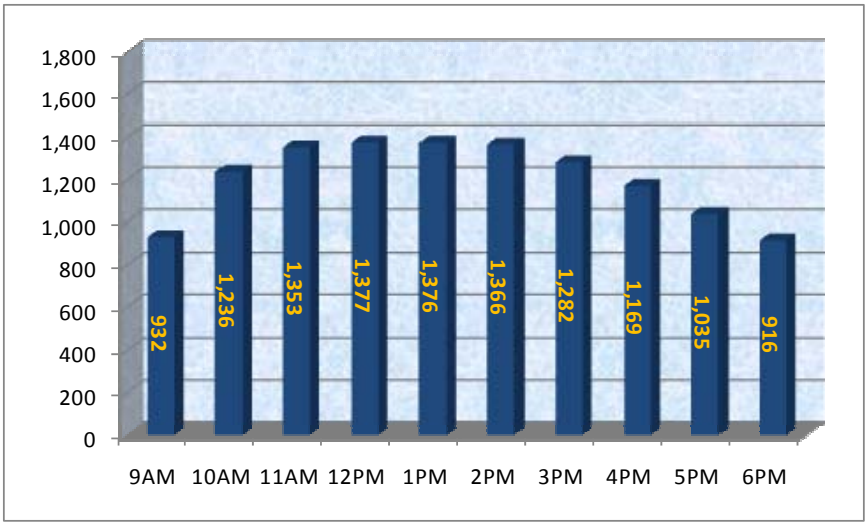
Walker performed occupancy counts of the on-street parking in the market area from 9AM until 6PM on Wednesday, October 29, 2008. Counts included both sides of the bounding streets and the blocks found within those streets.

Walker also performed off-street counts for the Berkeley Way Lot while performing the on-street parking occupancy counts.

Additionally, Walker was able to obtain hourly parking accumulation data for the Allston Way Garage and the Center Street Garage for an average weekday. This data was used to extrapolate hourly estimates of parking demand occupancy for each facility. These data were consistent with those provided in the background studies.

The overall peak public parking demand in the market area occurred between noon and 1PM. The peak period for on-street parking occurred at 6PM due to fewer restrictions on those spaces in the evening.

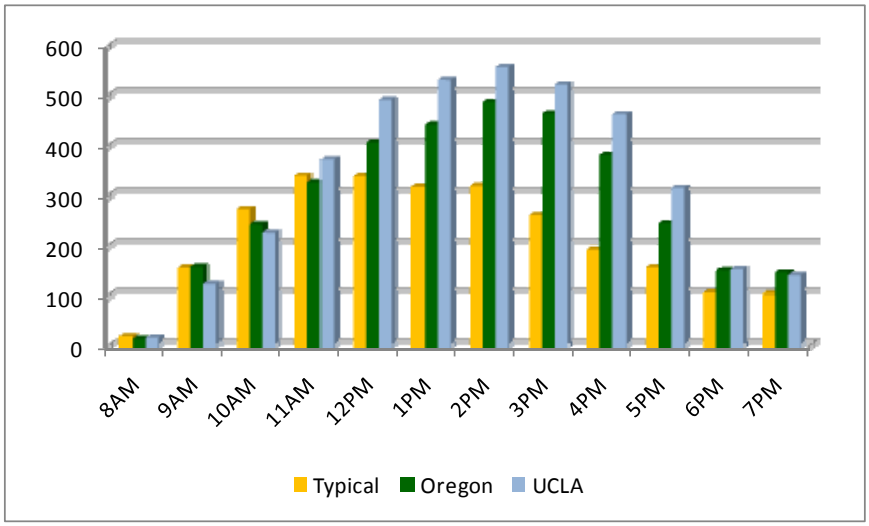
Figure 4: Existing Parking Demand




*Source: Walker Parking Consultants, 2008.*

Public parking during the weekend was generally not impacted unless there is a UC Berkeley sporting event planned for that day. Walker was able to obtain data for the Allston Way Garage and Center Street Garage for: an average Saturday, a non-rivalry football Saturday (Oregon), and a rivalry football Saturday (UCLA). The increase in transient parkers is presented in the following figure.

Figure 5: Weekend Demand Differential




*Source: Walker Parking Consultants, 2008.*

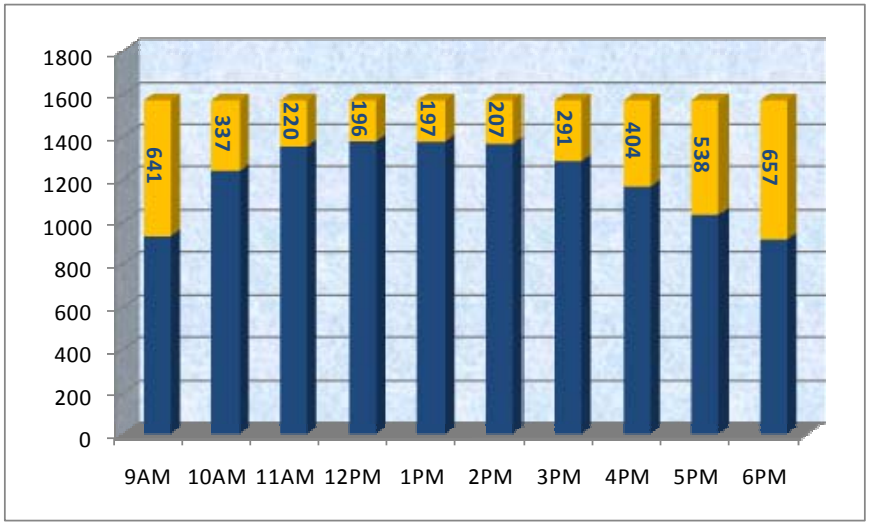
The 2008 football season included seven home games, two of which were against rivals. These single-day parking demand increases are fairly significant considering the distance of each facility to the stadium.

The University Hall Garage is available to the public on most weekends. Note that the existing University Hall Garage is also utilized on game days by season ticket holders. Transportation and Parking receives payment for the spaces utilized by ticket holders for basketball and football. The University compensates Parking & Transportation for 215 spaces for each home basketball game and 189 spaces for each home football game. Although these parkers do not impact parking adequacy (as they are during off-peak periods) it is important to note all possible demand for the new facility.

## *PARKING ADEQUACY*

Parking adequacy is a measure of the number of available spaces that realistically could absorb additional parking demand if new demand is generated. Given the new projects within the market area, there will be some parkers who will opt to park in the existing parking supply. But, the majority of the proposed land uses will also generate parking during the market's peak period (weekdays between noon and 1PM), which means that additional parking supply will be required to adequately park proposed future demand.

Figure 6: Existing Parking Adequacy




*Source: Walker Parking Consultants, 2008.*

Aside from the number of spaces available, Walker will also consider proximity and price in determining which parkers will utilize the proposed new parking facility.

## PROPOSED FUTURE CONDITIONS

Several new developments are proposed for downtown Berkeley which will require that additional public parking supply be made available. UC Berkeley intends to provide a portion of the public parking supply needed to support these proposed developments. The existing parking adequacy determined through the analysis of existing conditions will help gauge our findings regarding how the projected new parking demand should be allocated between the existing parking supply and the proposed new parking facility.

### *PARKING SUPPLY*

Although several concept alternates have been provided, for ease we have elected to move through the body of the report utilizing the assumptions from Scheme 2, a conventional garage with 5,000 SF of commercial space. A comparison of schemes is available in Appendix A. Scheme 2 would provide 5,000 square feet of street-front commercial space and 1,071 parking spaces in a 100' structure (no subterranean levels).

The redevelopment of the project site will remove two parking lots, University Hall West and University Hall Well. University Hall West is a public lot while University Hall Well is set aside for UC Berkeley Faculty or reserved for a specific departments. The removal of these lots along with the proposed removal of the existing University Hall Garage would displace between 306 and 389 (when valet tandem spaces are being used) parkers. During the peak period valets will fill the tandem spaces, so an estimate of 389 displaced parkers at peak is reasonable.

### *PARKING DEMAND*

Walker was provided with a list of proposed changes to land use quantities as given in the Environmental Impact Report for the Downtown Area Plan ("DAP"). The list included a block –by-block breakdown of anticipated new development as well as some reductions due to teardowns and/or reuse of existing space. Figure 7 provides the DAP block numbering as well as the proposed new development within the market area for this study.

Given the land use quantities from the DAP, we then calculate the parking demand related to these changes. The ratios utilized in this study come from the Metropolitan Transportation Commission funded study titled Reforming Parking Policies to Support Smart Growth. As a part of this research, case studies were performed in Bay Area communities, which included the City of Berkeley. The case study presented a tailored parking demand model for downtown Berkeley and suggested the parking demand ratios in Table 3 would accurately project parking demand based on the characteristics of the Berkeley market. The study provided ratios for the midday peak for the market, and also a peak ratio for each individual land use as each land use may not generate peak parking demand during that period.

Figure 7: Proposed New Land Uses – DAP Block Numbering


| Location | Residential | Hotel | Restaurant | Retail | Office | Conference | Museum |
|---|---|---|---|---|---|---|---|
| Block 3 | 10 | | | | (3,200) | | |
| Block 4 | 20 | | 1,500 | 2,500 | 1,000 | | |
| Block 5* | | | | 20,000 | 400,000 | | |
| Block 8 | 450 | | | 10,500 | | | |
| Block 9 | 150 | | 2,000 | 3,000 | 10,000 | | |
| Block 10** | | | | 10,000 | 190,000 | | |
| Block 12 | 250 | | 15,500 | (6,000) | 5,500 | | |
| Block 13 | | | | | | | |
| Block 14 | 80 | | | | | | |
| Block 16 | 150 | | 2,000 | 6,000 | 25,000 | | |
| Block 17 | 20 | | | | | | |
| Block 18*** | 50 | 200 | | 20,000 | | 16,000 | 150,000 |
| Block 20 | 110 | | | | 25,000 | | |
| Block 21 | 140 | | | | 25,000 | | |
| TOTALS | 1,430 | 200 | | 66,000 | 678,300 | 16,000 | 150,000 |

*400,000 SF of Office is reuse of State Health Building and was not included in the DAP data.
**190,000 SF of Office is construction of University Gateway project and was not included in the DAP data.
***150,000 SF of Museum is for the Berkeley Art Museum and was not included in the DAP data.

## Table 3: MTC Case Study Demand Ratios

| | | Midday Peak Adjusted | | | Land Use Peak Adjusted | | |
|---|---|---|---|---|---|---|---|
| Land Use | Unit | ST | LT | Total | ST | LT | Total |
| Single Family Residential | DU | 0.15 | 1.35 | 1.50 | 0.15 | 1.35 | 1.5 |
| Multi-Family Residential | DU | 0.10 | 0.90 | 1.00 | 0.1 | 0.90 | 1 |
| Hotel | Rooms | 0.03 | 0.26 | 0.29 | 0.0975 | 0.88 | 0.975 |
| Retail | Ksf | 1.90 | 0.21 | 2.11 | 2.106 | 0.23 | 2.34 |
| Auto Repair | Ksf | 0.30 | 0.30 | 0.60 | 0.6 | 0.60 | 1.2 |
| Restaurant | Ksf | 0.66 | 0.07 | 0.73 | 0.729 | 0.08 | 0.81 |
| Banks | Ksf | 1.86 | 0.21 | 2.07 | 2.0655 | 0.23 | 2.295 |
| Office-General | Ksf | 0.54 | 1.26 | 1.80 | 0.675 | 1.58 | 2.25 |
| Office-Government | Ksf | 0.41 | 1.62 | 2.03 | 0.45 | 1.80 | 2.25 |
| Office-Medical | Ksf | 1.05 | 1.58 | 2.63 | 1.5 | 2.25 | 3.75 |
| Church | Ksf | 0.08 | 0.08 | 0.16 | 0.75 | 0.75 | 1.5 |
| Theater | Ksf | 0.23 | 0.06 | 0.29 | 2.328 | 0.58 | 2.91 |
| Fast Food | Ksf | 2.62 | 0.29 | 2.91 | 2.916 | 0.32 | 3.24 |
| Convalescent | Ksf | 0.40 | 0.60 | 1.00 | 0.4 | 0.60 | 1 |
| Indoor Entertainment | Ksf | 0.40 | 0.10 | 0.50 | 1.98 | 0.50 | 2.475 |
| Conference/Meeting | Ksf | 0.78 | 0.78 | 1.56 | 0.975 | 0.98 | 1.95 |
| Museum | Ksf | 0.18 | 0.05 | 0.23 | 0.924 | 0.23 | 1.155 |
| Community College | Ksf | 0.65 | 0.16 | 0.81 | 0.72 | 0.18 | 0.9 |
| Commercial-Other | Ksf | 0.41 | 1.62 | 2.03 | 0.45 | 1.80 | 2.25 |
| Library | Ksf | 0.99 | 0.11 | 1.10 | 1.4175 | 0.1575 | 1.575 |

*Source: Reforming Parking Policies to Support Smart Growth - Berkeley Wilbur Smith Associates, 2007*

When the parking demand ratios for Berkeley are applied to the proposed new program data for the market we find the additional parking demand as provided in Table 4. The parking demand is represented in the midday market peak as well as the peak for each land use. We use the midday peak to test the number of spaces needed to supply market demand. The parking demand generated from the land use peak provides a basis to estimate overall parking volume for the day (which then translates to revenue).

## Table 4: New Market Parking Demand

| Market Demand<br>Market Peak | Residential* | Hotel | Restaurant | Retail | Office | Conference | Museum |
|---|---|---|---|---|---|---|---|
| Project Area | 700 | 200 | 21,000 | 66,000 | 678,300 | 16,000 | 150,000 |
| ST ratio | 0.100 | 0.030 | 0.660 | 1.900 | 0.540 | 0.780 | 0.180 |
| LT Ratio | 0.900 | 0.260 | 0.070 | 0.210 | 1.260 | 0.780 | 0.050 |
| ST Demand | 70 | 6 | 14 | 125 | 366 | 12 | 27 |
| LT Demand | 630 | 52 | 1 | 14 | 855 | 12 | 8 |

| LU Peak | Residential* | Hotel | Restaurant | Retail | Office | Conference | Museum |
|---|---|---|---|---|---|---|---|
| Project Area | 700 | 200 | 21,000 | 66,000 | 678,300 | 16,000 | 150,000 |
| ST ratio | 0.100 | 0.098 | 0.729 | 2.106 | 0.675 | 0.975 | 0.924 |
| LT Ratio | 0.900 | 0.878 | 0.081 | 0.234 | 1.575 | 0.975 | 0.231 |
| ST Demand | 70 | 20 | 15 | 139 | 458 | 16 | 139 |
| LT Demand | 630 | 176 | 2 | 15 | 1,068 | 16 | 35 |

*Reduced to DAP Blocks 9, 10, 12, 13, 14, 16, 17 and 18.
Note: ST = Short Term, LT = Long Term. In general, ST will include patron and visitor groups and LT will include en

*Source: Reforming Parking Policies to Support Smart Growth - Berkeley Wilbur Smith Associates, 2007 and DAP EIR Data, 2008*

The MTC study indicates that the midday peak and land use peak are the same for residential units. While this may be accurate, the University has the right to manage the parking supply as it sees fit. Other area parking structures have recently begun a monthly residential parking program that requires the resident to enter after 6PM and exit by 9AM for a rate of $100 per month. This type of program would work very well for the University Hall West Garage given the amount of midday required parking from the market and UC Berkeley. The following table shows the number of parkers that are anticipated to be captured within the University Hall West Garage.

Table 5: New Demand - Midday Market Peak

| User Groups | Market Peak Demand | Capture % | Capture # |
|---|---|---|---|
| Long Term Users | | | |
| Resident* | 630 | 60% | 378 |
| Hotel Guest | 52 | 100% | 52 |
| Area Employee | 134 | 85% | 114 |
| DHS Site | 504 | 100% | 504 |
| University Gateway | 240 | 100% | 240 |
| Conference Attendee | 12 | 100% | 12 |
| | 1,572 | | 1,300 |
| Short Term Users | | | |
| Resident Guest | 70 | 60% | 42 |
| Hotel Visitor | 6 | 95% | 6 |
| Restaurant Patron | 14 | 90% | 13 |
| Retail Patron | 125 | 90% | 113 |
| Office Visitor | 48 | 90% | 43 |
| DHS Site | 216 | 95% | 205 |
| University Gateway | 102 | 95% | 97 |
| Meeting Attendee | 16 | 95% | 15 |
| Cultural Attendee | 27 | 95% | 26 |
| | 624 | | 559 |
| Total New Parking Demand | 2,196 | | 1,859 |
| Less: Resident Parking | | | 1,481 |

*Only considers DAP Blocks 9, 10, 12, 13, 14, 16, 17 and 18

*Source: Walker Parking Consultants, 2009.*

Another consideration is the large amount of square footage from both the DHS site and the proposed University Gateway project. UC Berkeley staff believes that the parkers generated by this space will be new to the UC Berkeley parking system. Therefore we have included that square footage at the Berkeley office parking ratios regarding parking demand generation. *From Walker's experience most buildings on a university campus are built to replace existing space, and unless that space is backfilled, there are no net new parkers and the parking demand does not change based on the addition of square footage.* Regardless, we have included these two office buildings as

generating new parking demand per direction from UC Berkeley staff. The risk of including these users as new parking demand is that it is highly likely that they currently park elsewhere in the UCB parking system and therefore will not generate net new revenue, so although this specific facility may be picking up revenue from these parkers, there is a zero sum gain for the UCB parking system as a whole.

### *PARKING ADEQUACY & ALLOCATION*

Given the compression of the parking supply within the market, roughly 29 public parkers and 360 UC Berkeley parkers would be displaced from their current parking supply. The public parkers are likely generated by proximate land uses and therefore should be added back to the parking demand that would be accommodated in the University Hall West Garage. The UC Berkeley parkers should also be accommodated within the new garage based on proximity to their current parking supply and the fact that the facility fill (even valet spaces) during the midday peak period.

The new demand during the market peak period (midday) is estimated to reach 2,196 spaces. Based on user group types, location in comparison to other publicly available parking, and the availability of other parking supply we assume that this facility would have the ability to capture 1,481 vehicles during the peak period.

When the existing (displaced) parking demand is combined with the estimated new parking demand that could be captured by this facility if an unlimited number of spaces were available we find a total of 1,870 parkers.

Table 6: Future Parking Demand

| User Group | Demand |
|---|---|
| Market Demand (Less Residents) | 435 |
| DHS Site | 709 |
| University Gateway | 337 |
| Existing Public | 29 |
| Existing UC Berkeley | 360 |
| TOTAL | 1,870 |

*Source: Walker Parking Consultants, 2009.*

With a parking supply of 1,071 spaces, this facility would only be able to accommodate a portion of the future parking demand that it could possibly capture. This design falls short by an estimated 799 spaces. Because there is more parking demand in the market than can be captured within the new facility, UCB may be able to adjust the mix of parkers in the future to offset any unforeseen financial

shortfalls. Increasing the number of spaces available for market demand and reducing the number of UCB-available spaces would correct financial issues.

# 4. PRELIMINARY FINANCIAL ANALYSIS

The goal of a financial analysis is to understand the amount of net operating income available to put toward debt service (or added to an overall parking system). To reach this goal we must project both the parking revenues and parking expenses generated through the operation of a parking supply. Parking revenue is the result of matching the projected parking demand to an assumed parking rate structure. Parking expenses are based largely on labor-related expenses, insurance, utilities, and repairs and maintenance.

## OPERATING REVENUES

Operating revenues consist of those revenues generated through the operation of the parking facilities. This includes all transient, monthly, and event revenue as well as revenue from retail leases within the garages. Parking revenue is produced when a rate structure is applied to the appropriate length of stay for a given parking user group. Walker performed a rate survey to identify market rates and suggest a rate structure and applied those rates to the parkers anticipated to be accommodated within the University Hall West Parking Garage.

### *MARKET PARKING RATE ANALYSIS*

As we have already discussed, we must provide an assumed rate structure that would be applied to public parking demand projections to generate revenue. Walker was scoped to survey market parking rates for public off-street parking facilities within the market area. The Berkeley Way Lot and University Hall West Lot both utilize the pay-and-display method of payment. The Allston Way Garage and Center Street Garage are cashiered pay-on-exit facilities. Therefore the most direct comparison would come from the two garages. Because of the numerous rate categories, etc. the current rates for those garages are provided in Appendix D.

The proposed market rate structure for the proposed new parking garage is given in Table 7. Also note that the proposed rate structure may need to be adjusted based on possible rate increases in the market by the time this facility opens.

Table 7: Proposed Market Parking Rates

| | |
|---|---|
| Hourly Rates | |
| Period | Mon-Sat |
| Up to 1 Hour | $1.50 |
| 2 Hrs | $1.50 |
| 3 Hrs | $6.00 |
| 4 Hrs | $10.00 |
| Over 4 Hrs | $15.00 |
| Evening Flat Rate (after 5PM) | $5.00 |
| Overnight Parking Charge | Additional $15.00 |
| | |
| Monthly Rates | |
| Regular Monthly Parking | $160.00 |
| Reserved Monthly Parking | $195.00 |
| Resident Parking (after 5PM, before 9AM) | $100.00 |
| | |
| Special Events | |
| Football, Basketball, Graduation | Up to $25.00 |

*Source: Walker Parking Consultants, 2008.*

## *PARKING DEMAND*

Parking demand for this facility comes from several sources. Demand comes from the existing downtown public parkers, existing UC Berkeley parkers, existing event parkers, new downtown public parkers, and new UC Berkeley parkers.

Within the Parking Market Analysis we provided a breakdown of parking users groups for each of these components, as some are short-term parkers and others are long-term parkers. Also, within the short-term parking category there are several land use types which generate parking for a different average length of stay than another. The number of turns (total volume / peak demand) also varies from one user group to the next. All of these parker characteristics are accounted for within this demand analysis which will be used to generate parking revenue.

Given that there is existing parking demand in this location we will begin by identifying the source of the demand as well as the historical revenue generated by that source. The University Hall West Lot is publicly available and revenues are collected through a pay-and-display machine located on the lot. The University Hall Garage is also open to the public after 5PM and on weekends (when not being used for a special event). Table 8 shows the revenues generated by these

parking spaces. We have provided a revenue-per-space estimate for the existing publicly available supply based on the University Hall West Lot as it would give the most accurate information regarding public parking in this location.

Table 8: Publicly Available UC Berkeley Parking Revenue

| | YTD Thru November | | |
|---|---|---|---|
| Location | 2005/2006 | 2006/2007 | 2007/2008 |
| Univ. Hall West | $77,457 | $91,018 | $90,796 |
| Univ. Hall Garage | $17,321 | $15,053 | $14,508 |
| Total Area | $94,778 | $106,072 | $105,304 |
| Est. Revenue per Space* | | | $3,363 |

*Based on University West Lot

*Source: UC Berkeley – Parking & Transportation, 2008.*

Aside from publicly available parking UC Berkeley uses the University Hall Garage for athletic events on campus. Season ticket holders are provided parking, and the University compensates University Parking & Transportation for the use of those spaces. Parking demand and revenue numbers are provided below for sporting event use of the University Hall Garage.

Table 9: Athletic Event Revenue

| Sport | Spaces | Rate | Per Game | Games | Est. Revenue |
|---|---|---|---|---|---|
| Basketball | 215 | $13 | $2,795 | 18 | $50,310 |
| Football | 189 | $10 | $1,890 | 7 | $13,230 |
| Total Annual Revenue from Athletics | | | | | $63,540 |

*Source: UC Berkeley – Parking & Transportation, 2008.*

There may be some additional parking demand generated for sporting events or other special events in the evening or weekends, but Walker was not provided with information indicating any current event revenue for the University Hall Garage that would transfer over to this new facility other than for basketball and football games. Given the added capacity in the new facility it is also likely that additional parkers could be accommodated, but there is no indication from our findings for event days at other downtown facilities that there is a parking shortfall for these events.

The remaining demand within these facilities comes from UC Berkeley faculty and staff. Although parking fees are not collected on a facility-by-facility basis for the majority of campus, Walker was able to obtain from UC Berkeley a count of the number of spaces available for different permit types during the midday peak as well as the number of

permits sold by permit type. This data provided information regarding the oversell factor throughout the campus. An oversell factor is the number of permits sold divided by the number of spaces available for that permit type. The University can oversell parking based on vacations, days off, and day-to-day variation in course schedules. Table 10 details that breakdown and provides an estimate of the revenue generated by those spaces in the University Hall Garage and University Well Lot.

Table 10: University Hall Garage Oversell and Revenue

| | Existing Total | | | Lost (University Hall Area) | | | |
|---|---|---|---|---|---|---|---|
| Type | Permits | Spaces | Oversell | Spaces | Permits | Rate | Revenue |
| Central Campus* | 1,607 | 1,420 | 1.13 | 76 | | | |
| Central Campus Carpool | 132 | 5 | 26.4 | 0 | | | |
| ALL | 1,739 | 1,425 | 1.22 | 76 | 93 | $131 | $12,183 |
| | | | | | | | |
| Faculty/Staff | 1,965 | 1,829 | 1.07 | 249 | 339 | $94 | $31,866 |
| Faculty/Staff Carpool | 582 | 38 | 15.32 | 7 | 10 | $31 | $310 |
| ALL | 2,547 | 1,867 | 1.36 | 256 | 349 | | $32,176 |
| | | | | | | | |
| TOTAL | 4,286 | 3,292 | 1.3 | | | Monthly Revenue Loss | $44,359 |
| | | | | | | Annual Revenue Loss | $532,308 |

*Includes Emeriti

*Source: UC Berkeley – Parking & Transportation, 2008.*

Once the existing parking demand and revenue have been identified, we turn our focus to the projected parking demand and revenue from new sources. These new sources include new market demand such as the Charles Hotel development, University Gateway, rehab of the California Health Services Building, Berkeley Art Museum, and several other projects proposed to be built in the market area.

## *GROSS OPERATING REVENUE*

Given the proposed rate structure and projected annual parking volumes we project the gross revenue that could be collected from parking activity at the proposed new parking facility. This amount is shown as Total Market, in Table 11. The amount that could be captured in a facility at this site is roughly $5.2M. The facility would need to be an estimated 2,170 spaces to accommodate the peak parking demand.

We also removed some of the UC Berkeley parkers from the facility based on the proposed parking space count of 1,071. This amount is given as Accommodated. Revenue for the Scheme 2 option would generate a projected $3,819,475 in gross revenue from parking.

## Table 11: Gross Operating Revenue – Total Market

| User Groups | LU Peak Demand | Capture % | # | Turns/Oversell | Volume | Avg LOS | Rate | Annual Rev |
|---|---|---|---|---|---|---|---|---|
| Existing Users | | | | | | | | |
| Public Parkers | 29 | 100% | 29 | 4.5 | 131 | 1Hrs | $2 | $95,265 |
| UC Berkeley F/S | 332 | 100% | 332 | 1.3 | 432 | Monthly | $103 | $532,308 |
| Basketball Attendees | 215 | 100% | 215 | 1 | 215 | Daily | $13 | $50,310 |
| Football Attendees | 189 | 100% | 189 | 1 | 189 | Daily | $10 | $13,230 |
| | 765 | | 765 | 1.26 | 966 | | | $691,113 |
| Long Term Users | | | | | | | | |
| Resident* | 630 | 60% | 378 | 1 | 378 | Monthly | $100 | $453,600 |
| Hotel Guest | 176 | 100% | 176 | 1.2 | 211 | Daily | $15 | $792,000 |
| Area Employee | 191 | 85% | 162 | 1.3 | 211 | Monthly | $150 | $379,899 |
| State Health Building | 504 | 100% | 504 | 1.3 | 655 | Monthly | $103 | $808,082 |
| University Gateway | 240 | 100% | 240 | 1.3 | 312 | Monthly | $103 | $384,801 |
| Conference Attendee | 16 | 100% | 16 | 1 | 16 | Daily | $15 | $60,000 |
| | 1,757 | | 1,476 | 1.02 | 1,783 | | | $2,878,382 |
| Short Term Users | | | | | | | | |
| Resident Guest | 70 | 60% | 42 | 3 | 126 | 2Hrs | $4 | $126,000 |
| Hotel Visitor | 20 | 95% | 19 | 3 | 57 | 1Hr | $2 | $28,500 |
| Restaurant Patron | 15 | 90% | 14 | 3 | 41 | 2Hrs | $4 | $40,500 |
| Retail Patron | 139 | 90% | 125 | 3 | 375 | 2Hrs | $4 | $375,300 |
| Office Visitor | 60 | 90% | 54 | 3 | 162 | 2Hrs | $4 | $162,000 |
| State Health Building | 216 | 95% | 205 | 2 | 410 | 2Hrs | $4 | $410,400 |
| University Gateway | 102 | 95% | 97 | 2 | 194 | 2Hrs | $4 | $193,800 |
| Meeting Attendee | 16 | 100% | 16 | 3 | 48 | 2Hrs | $4 | $48,000 |
| Cultural Attendee | 139 | 95% | 132 | 3 | 396 | 2Hrs | $4 | $396,150 |
| | 777 | | 704 | 2.33 | 1,809 | | | $1,780,650 |

*Includes only blocks 9, 10, 12, 13, 14, 16, 17 and 18.

**Transient parker turns for other public facilities rouglhly 4.5.

## Table 12: Gross Operating Revenue – Scheme 2 Capacity

| User Groups | LU Peak Demand | Capture % | # | Turns/Oversell | Volume | Avg LOS | Rate | Annual Rev |
|---|---|---|---|---|---|---|---|---|
| Existing Users | | | | | | | | |
| Public Parkers | 29 | 100% | 29 | 4.5 | 131 | 1Hrs | $2 | $95,265 |
| UC Berkeley F/S | 332 | 0% | 0 | 1.3 | 0 | Monthly | $103 | $0 |
| Basketball Attendees | 215 | 100% | 215 | 1 | 215 | Daily | $13 | $50,310 |
| Football Attendees | 189 | 100% | 189 | 1 | 189 | Daily | $10 | $13,230 |
| | 765 | | 433 | 0.70 | 535 | | | $158,805 |
| Long Term Users | | | | | | | | |
| Resident* | 630 | 60% | 378 | 1 | 378 | Monthly | $100 | $453,600 |
| Hotel Guest | 176 | 100% | 176 | 1.2 | 211 | Daily | $15 | $792,000 |
| Area Employee | 191 | 85% | 162 | 1.3 | 211 | Monthly | $150 | $379,899 |
| DHS Site | 504 | 0% | 0 | 1.3 | 0 | Monthly | $103 | $0 |
| University Gateway | 240 | 90.0% | 216 | 1.3 | 281 | Monthly | $103 | $346,321 |
| Conference Attendee | 16 | 100% | 16 | 1 | 16 | Daily | $15 | $60,000 |
| | 1,757 | | 948 | 0.62 | 1,097 | | | $2,031,820 |
| Short Term Users | | | | | | | | |
| Resident Guest | 70 | 60% | 42 | 3 | 126 | 2Hrs | $4 | $126,000 |
| Hotel Visitor | 20 | 95% | 19 | 3 | 57 | 1Hr | $2 | $28,500 |
| Restaurant Patron | 15 | 90% | 14 | 3 | 41 | 2Hrs | $4 | $40,500 |
| Retail Patron | 139 | 90% | 125 | 3 | 375 | 2Hrs | $4 | $375,300 |
| Office Visitor | 60 | 90% | 54 | 3 | 162 | 2Hrs | $4 | $162,000 |
| DHS Site | 216 | 95% | 205 | 2 | 410 | 2Hrs | $4 | $410,400 |
| University Gateway | 102 | 95% | 97 | 2 | 194 | 2Hrs | $4 | $193,800 |
| Meeting Attendee | 16 | 100% | 16 | 3 | 48 | 2Hrs | $4 | $48,000 |
| Cultural Attendee | 139 | 95% | 132 | 3 | 396 | 2Hrs | $4 | $396,150 |
| | 777 | | 704 | 2.33 | 1,809 | | | $1,780,650 |

## OPERATING EXPENSES

As noted in the introduction to the Financial Analysis, operating expenses are largely made up of four major categories: Labor (and benefits), Utilities, Repairs & Maintenance, and Operations (and supplies). The following table lists the projected operating expenses for the University Hall West Parking Garage under Scheme 2.

### Table 13: Operating Expenses – Scheme 2

| | |
|---|---|
| Personnel Costs | |
| Payroll Expenses | 178,120 |
| Valet Expenses | |
| Payroll Taxes | 13,715 |
| Sub-Total | 191,835 |
| Health & Welfare | |
| Health Insurance | 53,880 |
| Pension | 75,161 |
| Worker's Compensation Insurance | 23,156 |
| Others | |
| Sub-Total | 152,196 |
| Utilities | |
| Gas and Electric | 41,800 |
| Water | 2,400 |
| Telephone | 2,400 |
| Garbage | 3,000 |
| Sub-Total | 49,600 |
| Supplies | |
| Office (stationery) | 2,000 |
| Parking (tickets, ribbons, validations, gate arms) | 3,600 |
| Garage (light fixtures & tubes) | 1,500 |
| Sub-Total | 7,100 |
| Repair and Maintenance | |
| Garage (elevator contract,janitorial equipment, plumbing, signs) | 30,000 |
| Parking Access and Revenue Control System | 45,000 |
| Sub-Total | 75,000 |
| Operations | |
| Uniforms | 3,510 |
| Security | 4,320 |
| Insurance | 37,200 |
| Bank Charges (account fee and credit cards charges) | 13,228 |
| Signs and Graphics | 1,000 |
| Marketing | 1,000 |
| Licenses and Permits | 1,000 |
| Management Fees | 48,000 |
| Sub-Total | 109,258 |
| Grand Total Operating Expenses (2008) | 584,990 |
| Grand Total Expenses with Escalation @ 3% per annum (2012) | 658,411 |

*Source: Walker Parking Consultants, 2008.*

## NET OPERATING INCOME

Net operating income ("NOI") is the result of parking operating revenues less parking operating expenses. We assume a stabilized year of activity in 2012. At this time parking demand will reach its foreseeable maximum; any further increase in operating revenue is assumed to be a result of rate increases (2015 and 2018). Operating expenses will increase by a rate of 3% annually. This results in an NOI of roughly $3.69M in the first stabilized year (2012).

## DEBT SERVICE

Debt service is driven by the design of the facility and its resulting construction and financing costs, and the cost of financing. Given the design of the Scheme 2 facility we believe the development cost will break down as follows:

Table 14: Development Cost – Scheme 2

| | |
|---|---|
| Structure | 25,990,688 |
| PARCS | 450,000 |
| Sub-Total | 26,440,688 |
| Contingency (10%) | 2,644,069 |
| Total Hard Costs | 29,084,756 |
| | |
| Soft Cost | 7,271,189 |
| | |
| Total Hard and Soft Costs (2008) | 36,355,945 |
| Owner's Escalation | 2,589,452 |
| Total Hard and Soft Costs (2010) | 38,945,398 |

*Source: Walker Parking Consultants, 2008.*

Walker assumes that UC Berkeley will issue tax-exempt bonds for this entire amount. We tested the development cost above at a rate of 6% for a term of 30 years (semi-annual payments). The resulting debt service is roughly $2,814,425 per year.

## PRO FORMA OPERATING STATEMENT

With a baseline of financial performance established for the first stabilized year of operation for the proposed new parking facility we now adjust that baseline to project the financial operation of the facility over a five-year period.

Table 15: Pro Forma – Scheme 2

| | Year 1 2012 | Year 2 2013 | Year 3 2014 | Year 4 2015 | Year 5 2016 |
|---|---|---|---|---|---|
| Operating Revenue | | | | | |
| Existing Users | $158,800 | $158,800 | $158,800 | $174,700 | $174,700 |
| Long Term Users | $2,031,800 | $2,031,800 | $2,031,800 | $2,235,000 | $2,235,000 |
| Short Term Users | $1,780,700 | $1,780,700 | $1,780,700 | $1,958,700 | $1,958,700 |
| | $3,971,300 | $3,971,300 | $3,971,300 | $4,368,400 | $4,368,400 |
| Operating Expenses | | | | | |
| Personnel | $215,900 | $222,400 | $229,100 | $235,900 | $243,000 |
| Benefits | $171,300 | $176,400 | $181,700 | $187,200 | $192,800 |
| Utilities | $55,800 | $57,500 | $59,200 | $61,000 | $62,800 |
| Supplies | $8,000 | $8,200 | $8,500 | $8,700 | $9,000 |
| Repairs & maint. | $84,400 | $86,900 | $89,600 | $92,200 | $95,000 |
| Operations | $123,000 | $126,700 | $130,500 | $134,400 | $138,400 |
| | ($658,400) | ($678,100) | ($698,600) | ($719,400) | ($741,000) |
| Net Operating Income | $3,312,900 | $3,293,100 | $3,272,800 | $3,648,900 | $3,627,400 |
| Capital Improvements | $0 | $0 | $0 | ($100,000) | $0 |
| Debt Service | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) |
| Debt Service Ratio | 1.18 | 1.17 | 1.16 | 1.30 | 1.29 |
| Profit/Loss | $498,400 | $478,700 | $458,300 | $834,500 | $812,900 |
| Retained Earnings | $498,400 | $977,100 | $1,435,500 | $2,270,000 | $3,082,900 |

*Source: Walker Parking Consultants, 2008.*

## SUMMARY OF ALTERNATIVES

Walker also ran the same analysis for Scheme 2A and 2B. The capital costs for each varies based on the overall square footage, and if mechanical systems would be utilized at the basement level. From a parking demand standpoint (and therefore revenue) it was necessary to adjust for the number of spaces available to capture parking demand. Also, some operating expenses are tied to the number of spaces in a facility as well, and those expenses were necessarily adjusted to account for the space count each scheme.

The following table provides insight into the total number of spaces, how those spaces are intended to be utilized, and the revenue and profit generated by that mix and size of facility.

Table 16: Summary of Alternatives

| | | Demand Mix | |
|---|---|---|---|
| Scheme | Spaces | Market | UC Berkeley |
| 2 | 1,071 | 553 | 518 |
| 2A | 1,328 | 553 | 774 |
| 2B | 1,137 | 553 | 585 |

| | | Revenue Contribution | |
|---|---|---|---|
| Scheme | 2012 | Market | UC Berkeley |
| 2 | $3,971,300 | $3,020,800 | $950,500 |
| 2A | $4,381,200 | $3,020,800 | $1,360,400 |
| 2B | $4,077,800 | $3,020,800 | $1,057,000 |

| | | Profitability | |
|---|---|---|---|
| Scheme | 1st Year of Profitability | 10-Year Returns (millions) | 10-Year Average Debt Service Ratio |
| 2 | 2012 | $9.028 | 1.32 |
| 2A | 2021 | ($11.695) | 0.78 |
| 2B | 2012 | $7.241 | 1.23 |

*Source: Walker Parking Consultants, 2009.*

In comparing these alternatives it is important to note the following key findings:

General

1. A financial analysis for most stand-alone parking structures will result in a loss when capital costs to build and maintain the facility are taken into account.
2. The downtown Berkeley parking market allows for a profitable parking facility, which is also the reason why other privately-owned publicly-available facilities exist there.
3. Charging market rates for a facility that will accommodate market parkers at this site will result in a profitable facility, but

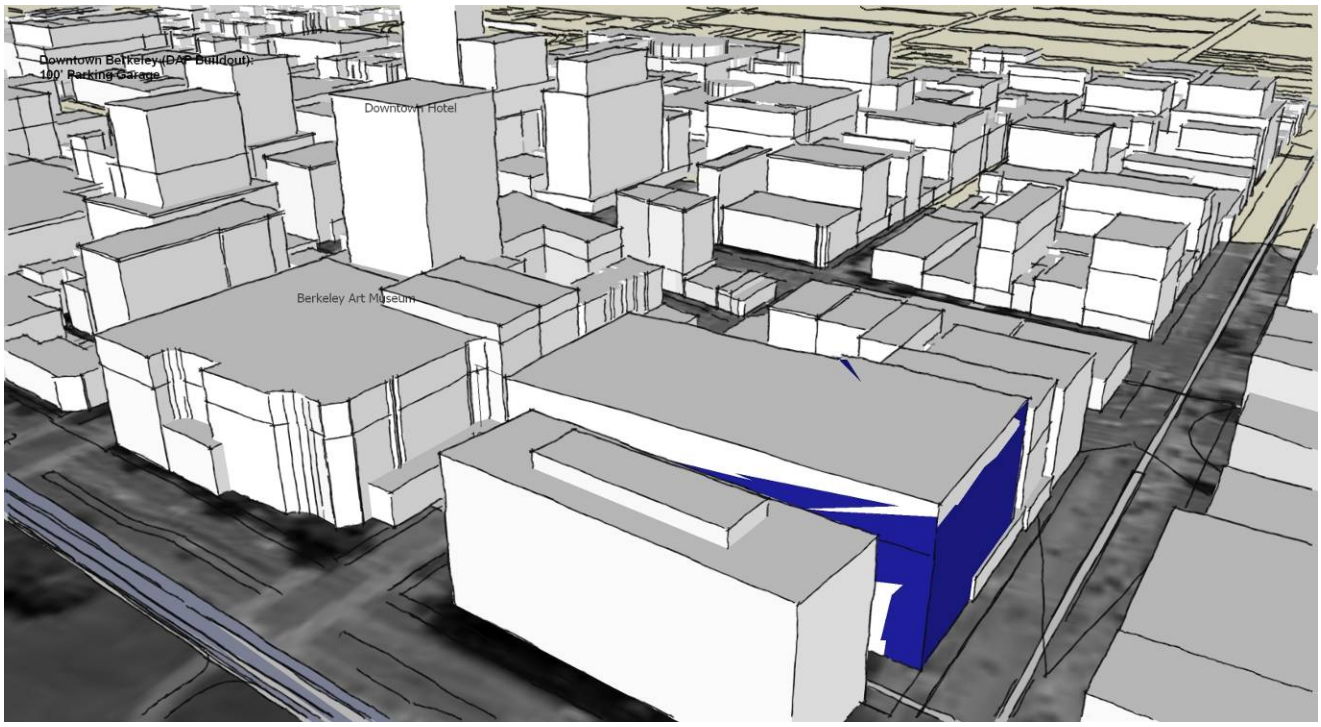
will also limit the amount of University-generated parking accommodated onsite.

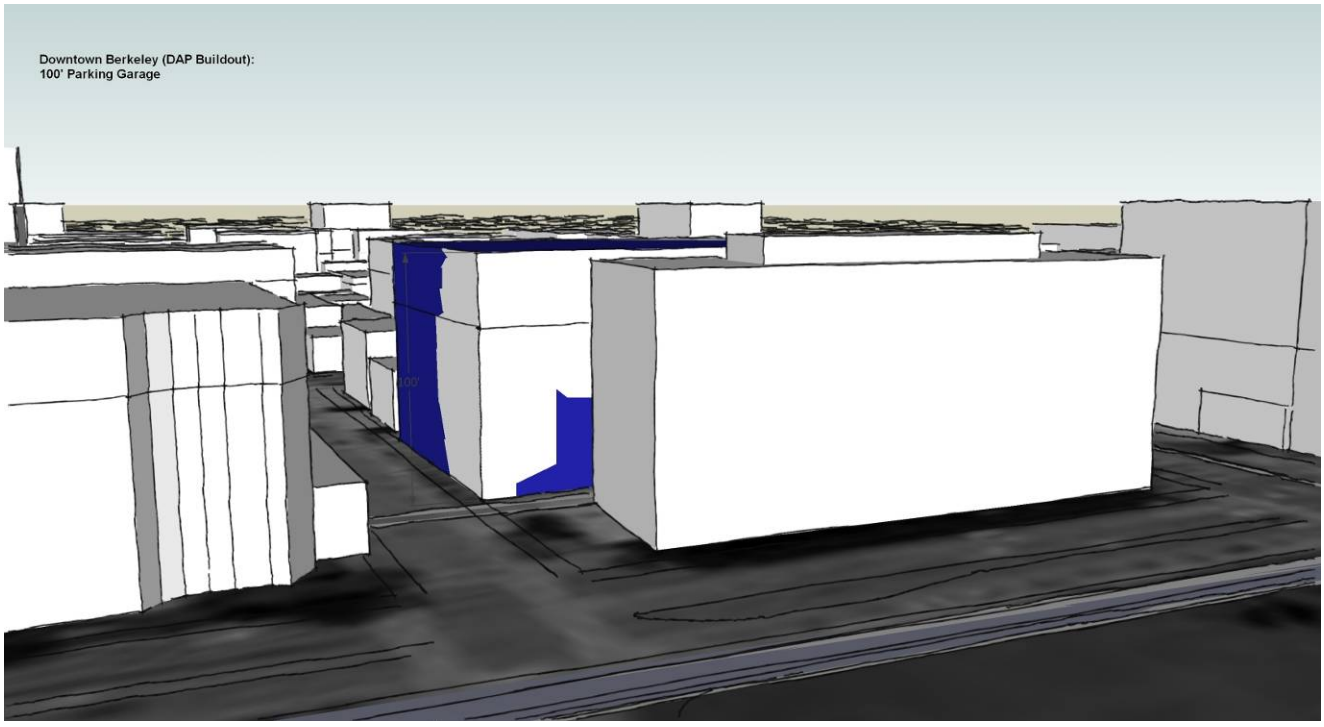
Specific

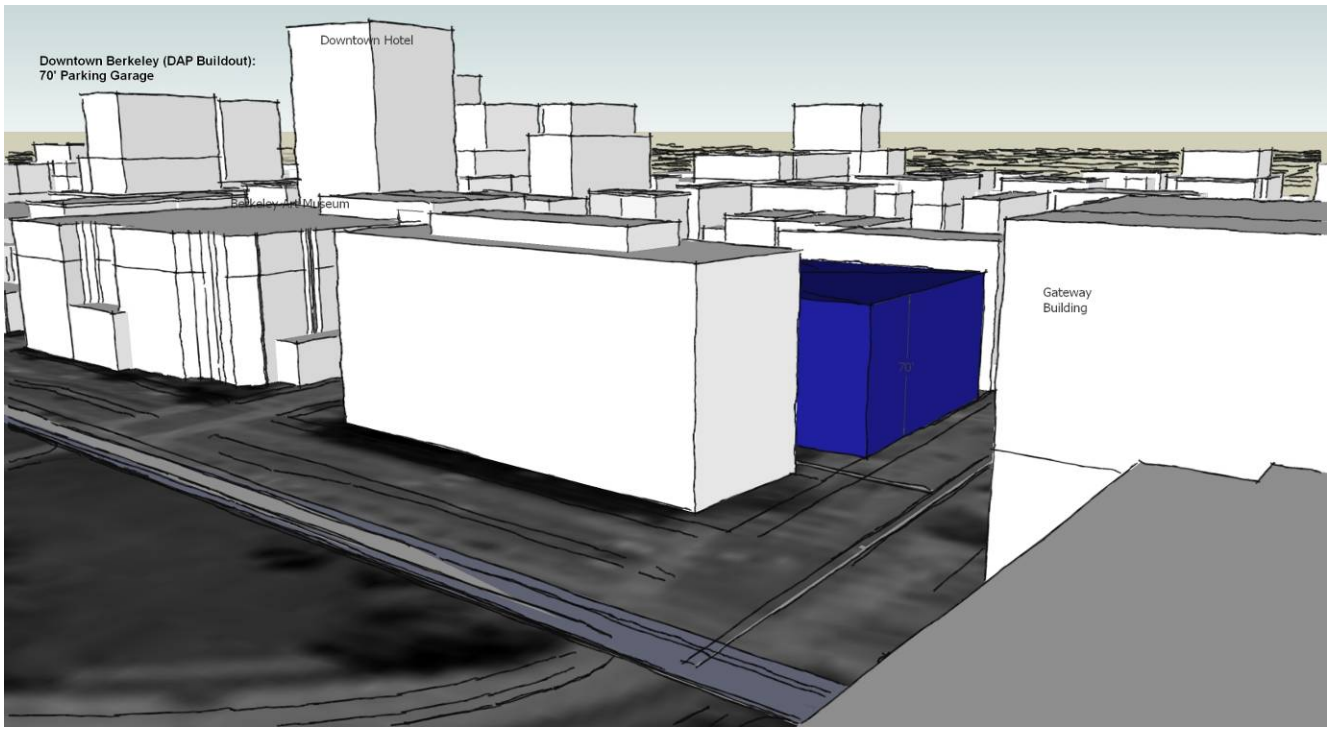
4. The capital costs related to adding spaces beyond the 1,071 in Scheme 2 go up fairly significantly. Scheme 2B would include the additional cost of excavation. Scheme 2A would include additional costs of excavation and mechanical systems.
5. The marginal increase in captured demand (from Scheme 2 to 2A and 2B) comes from the long-term UCB parkers. These parkers currently pay a subsidized rate compared to monthly rates within the Berkeley market. Therefore, marginal increase in revenue cannot offset the marginal cost increase for those spaces.

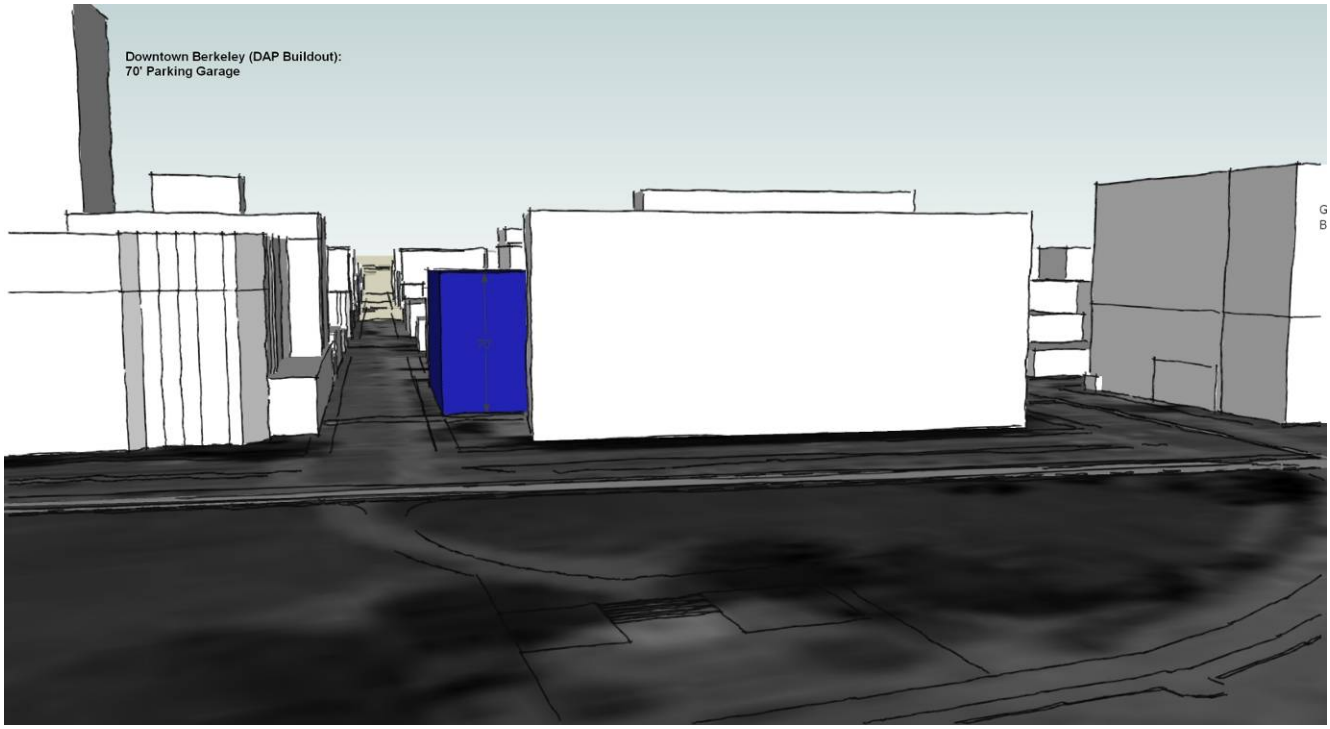
# APPENDIX A - CONCEPT DESIGN SCHEMES

## MASSING STUDY




Downtown Berkeley (DAP Buildout):
70' Parking Garage
Downtown Hotel
Gateway
Building
70'

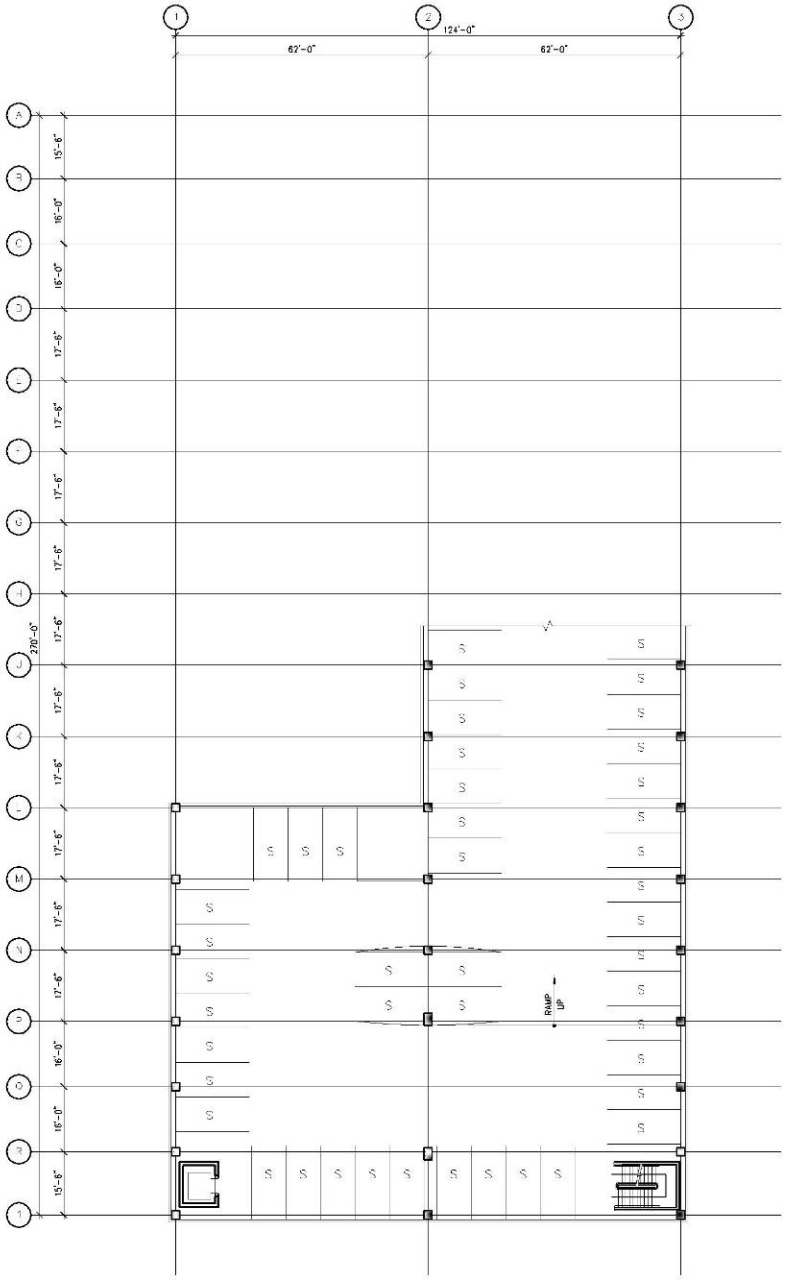

Downtown Berkeley (DAP Buildout):
70' Parking Garage

CAR COUNT
8'-6" 90° STANDARD SPACE

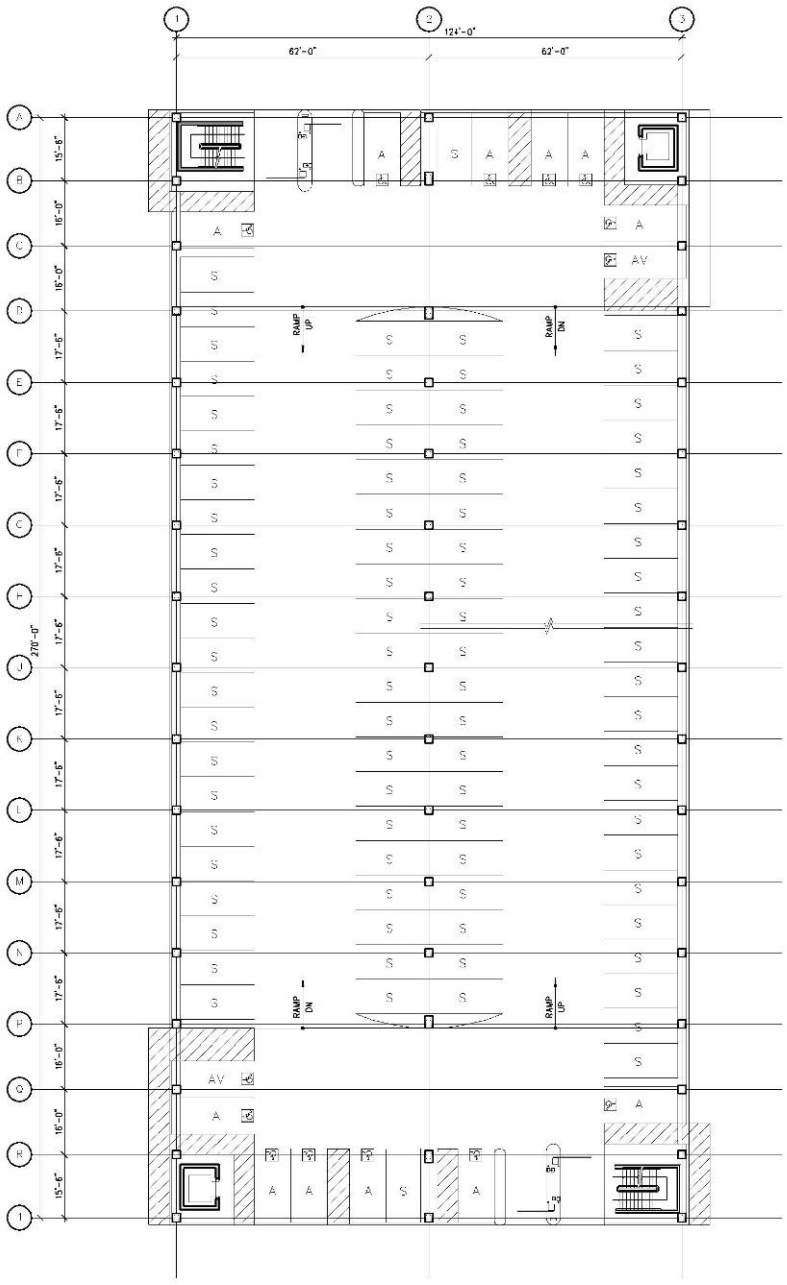
| TIER | ELEVATION | STANDARD | CAR ACCESSIBLE | VAN ACCESSIBLE | TOTAL |
|---|---|---|---|---|---|
| BASEMENT | -11'-4" | 44 | 0 | 0 | 44 |
| GROUND | 0'-0" | 86 | 12 | 2 | 100 |
| SECOND | 11'-4" | 112 | 0 | 0 | 112 |
| THIRD | 21'-6" | 112 | 0 | 0 | 112 |
| FOURTH | 31'-8" | 112 | 0 | 0 | 112 |
| FIFTH | 41'-10" | 112 | 0 | 0 | 112 |
| SIXTH | 52'-0" | 112 | 0 | 0 | 112 |
| SEVENTH | 62'-2" | 112 | 0 | 0 | 112 |
| EIGHTH | 72'-4" | 112 | 0 | 0 | 112 |
| NINTH | 82'-6" | 112 | 0 | 0 | 112 |
| TOP | 92'-8" | 95 | 0 | 0 | 95 |
| TOTAL | | 1121 | 12 | 2 | 1135 |

## SCHEME 1/CONCEPTUAL DESIGN ALTERNATIVES

This design signifies the maximum parking capacity of a conventional ramp-type parking structure with above grade parking within the height and side setback criterion. The design yields 1,135 spaces with no street-front commercial space. This alternative is used as a benchmark to determine a maximum capacity for a conventional ramp-type garage and is eliminated from further consider because it does not incorporate any street-front commercial space.

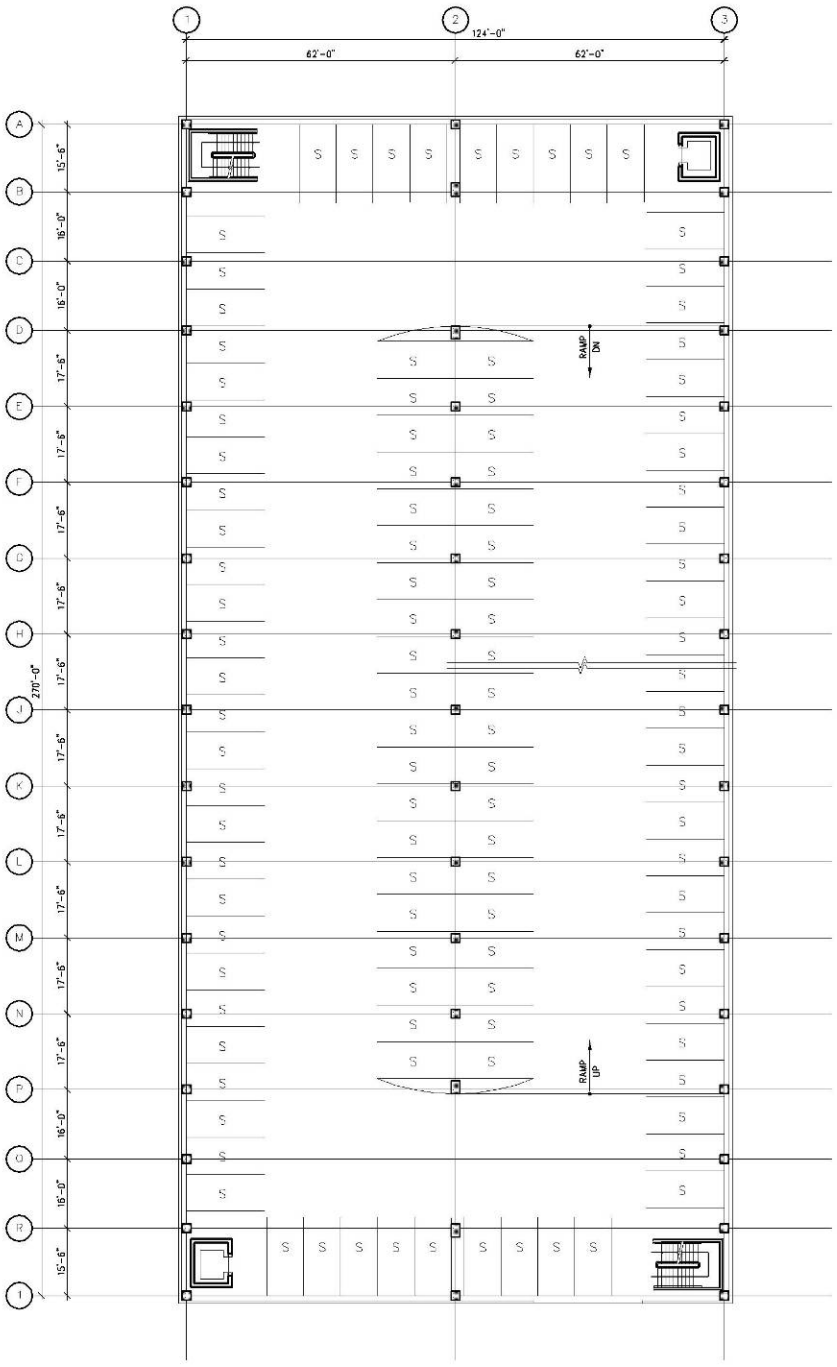



BASEMENT LEVEL



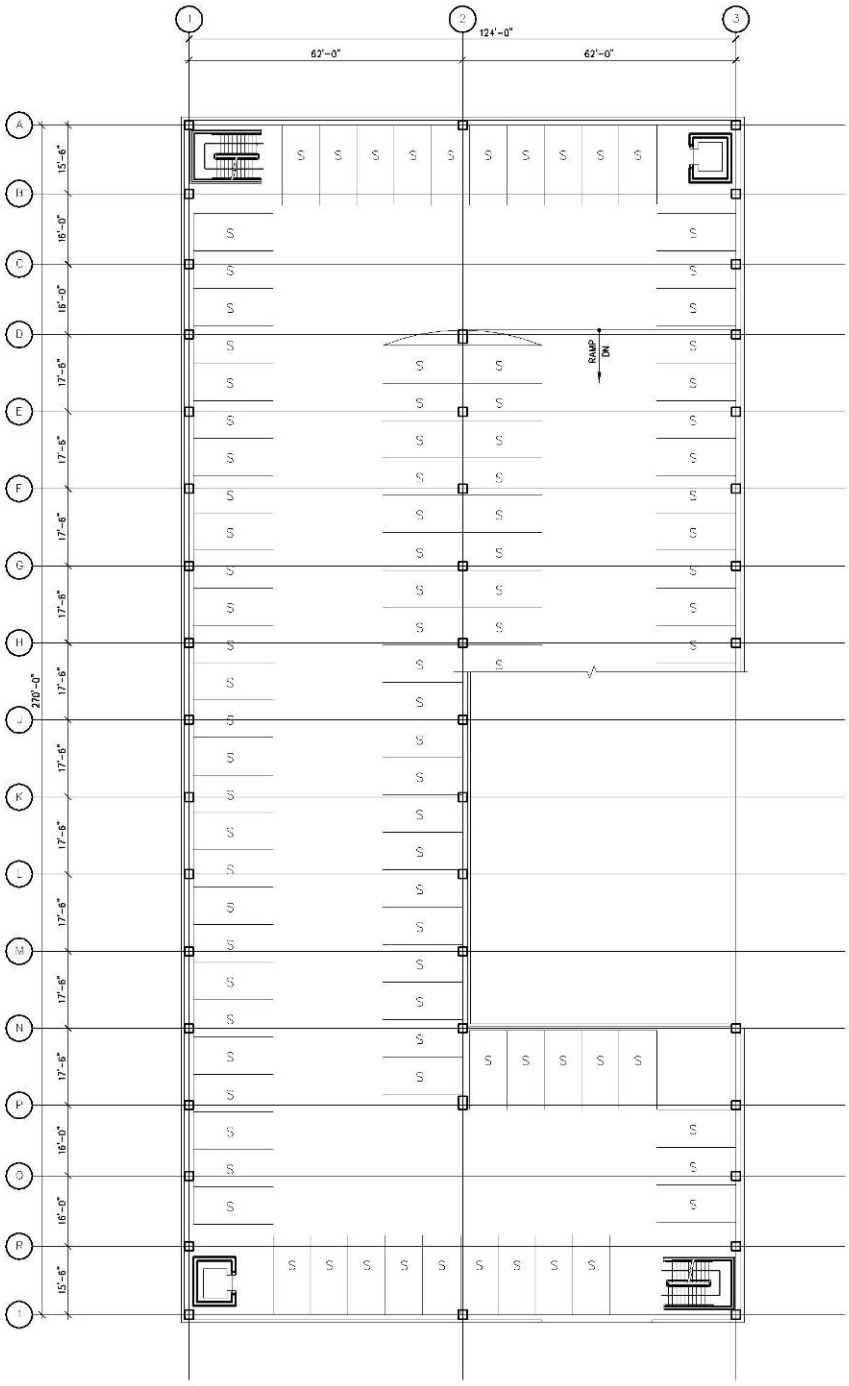

GROUND LEVEL

NORTH




TYPICAL LEVEL
(3RD THRU 9TH)

NORTH




TENTH (TOP) LEVEL

NORTH

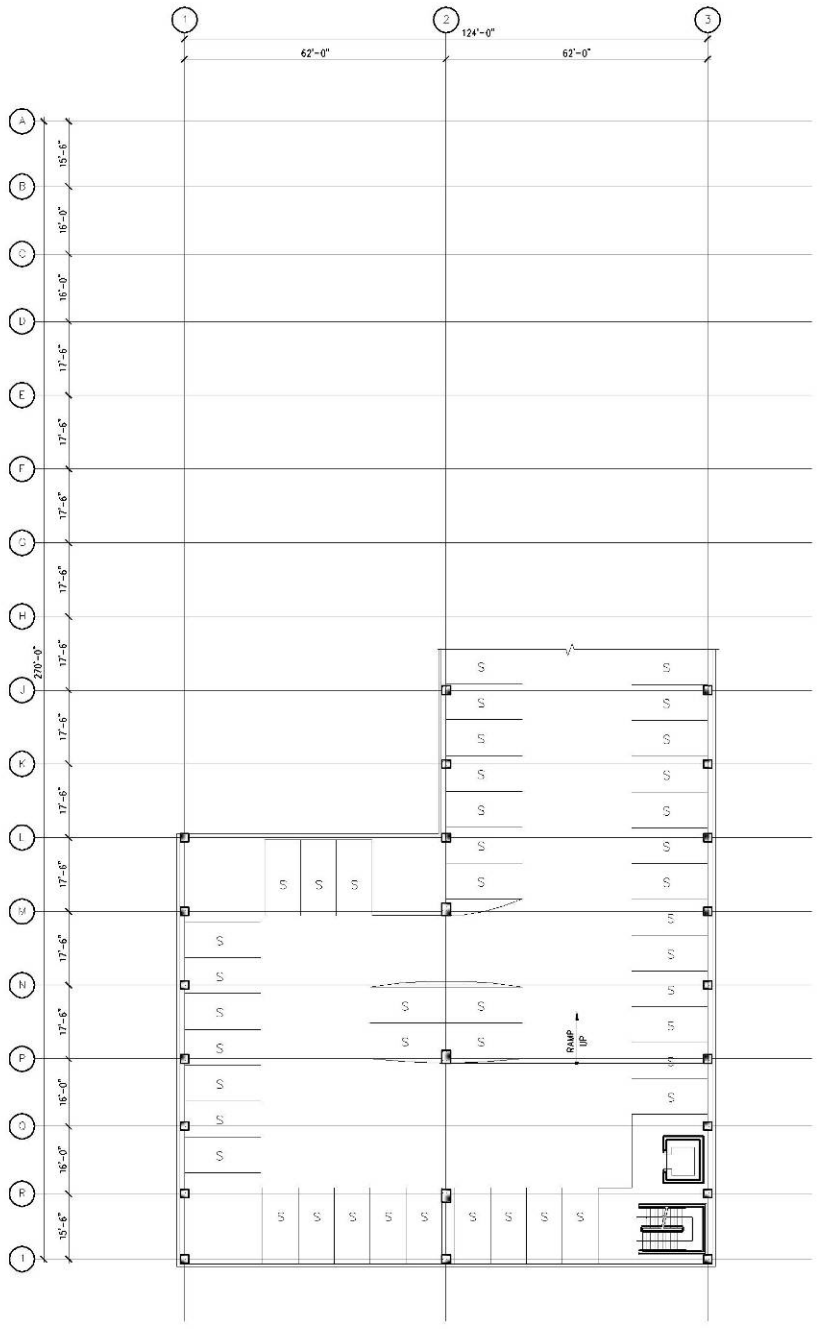
CAR COUNT

8'–6" 90° STANDARD SPACE

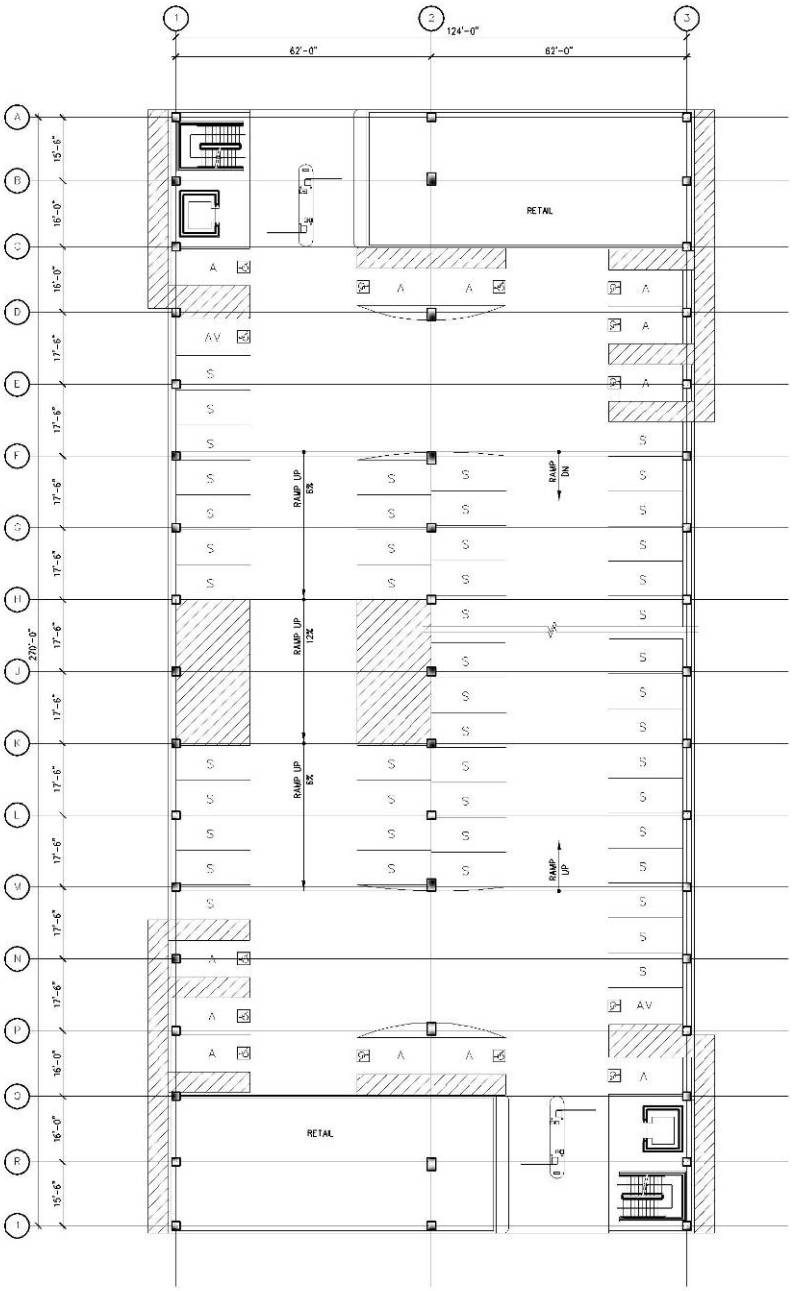
| TIER | ELEVATION | STANDARD | CAR ACCESSIBLE | VAN ACCESSIBLE | TOTAL |
|---|---|---|---|---|---|
| BASEMENT | –11'–4" | 44 | 0 | 0 | 44 |
| GROUND | 0'–0" | 48 | 12 | 2 | 62 |
| SECOND | 15'–0" | 109 | 0 | 0 | 109 |
| THIRD | 25'–2" | 109 | 0 | 0 | 109 |
| FOURTH | 35'–4" | 109 | 0 | 0 | 109 |
| FIFTH | 45'–6" | 109 | 0 | 0 | 109 |
| SIXTH | 55'–8" | 109 | 0 | 0 | 109 |
| SEVENTH | 65'–10" | 109 | 0 | 0 | 109 |
| EIGHTH | 76'–0" | 109 | 0 | 0 | 109 |
| NINTH | 86'–2" | 109 | 0 | 0 | 109 |
| TOP | 96'–4" | 93 | 0 | 0 | 93 |
| TOTAL | | 1057 | 12 | 2 | 1071 |

## SCHEME 1/CONCEPTUAL DESIGN ALTERNATIVES

This design is similar to Scheme 1, but with the build-out of 5,000 square feet of street-front commercial space. Scheme 2 provides 1,071 parking spaces, which is a reduction of 64 spaces compared to Scheme 1.

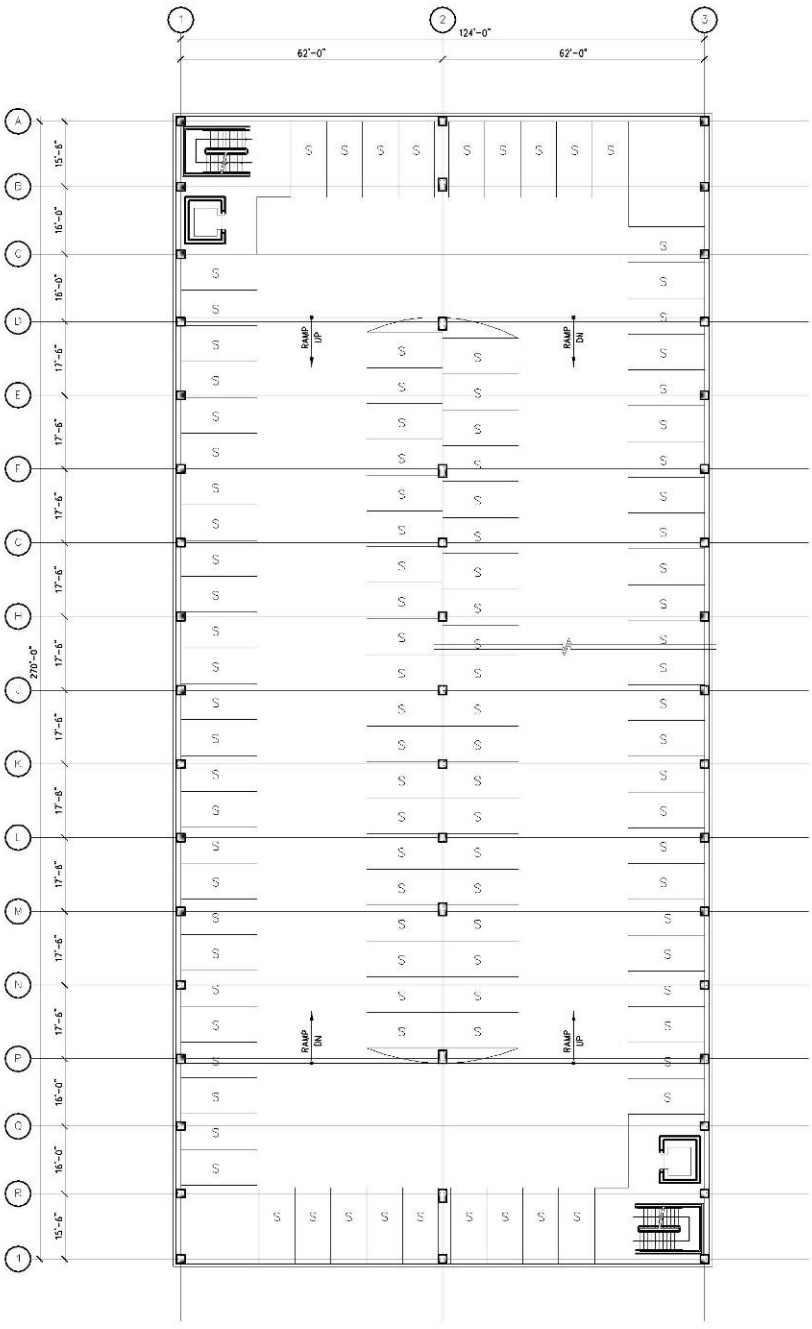



BASEMENT LEVEL

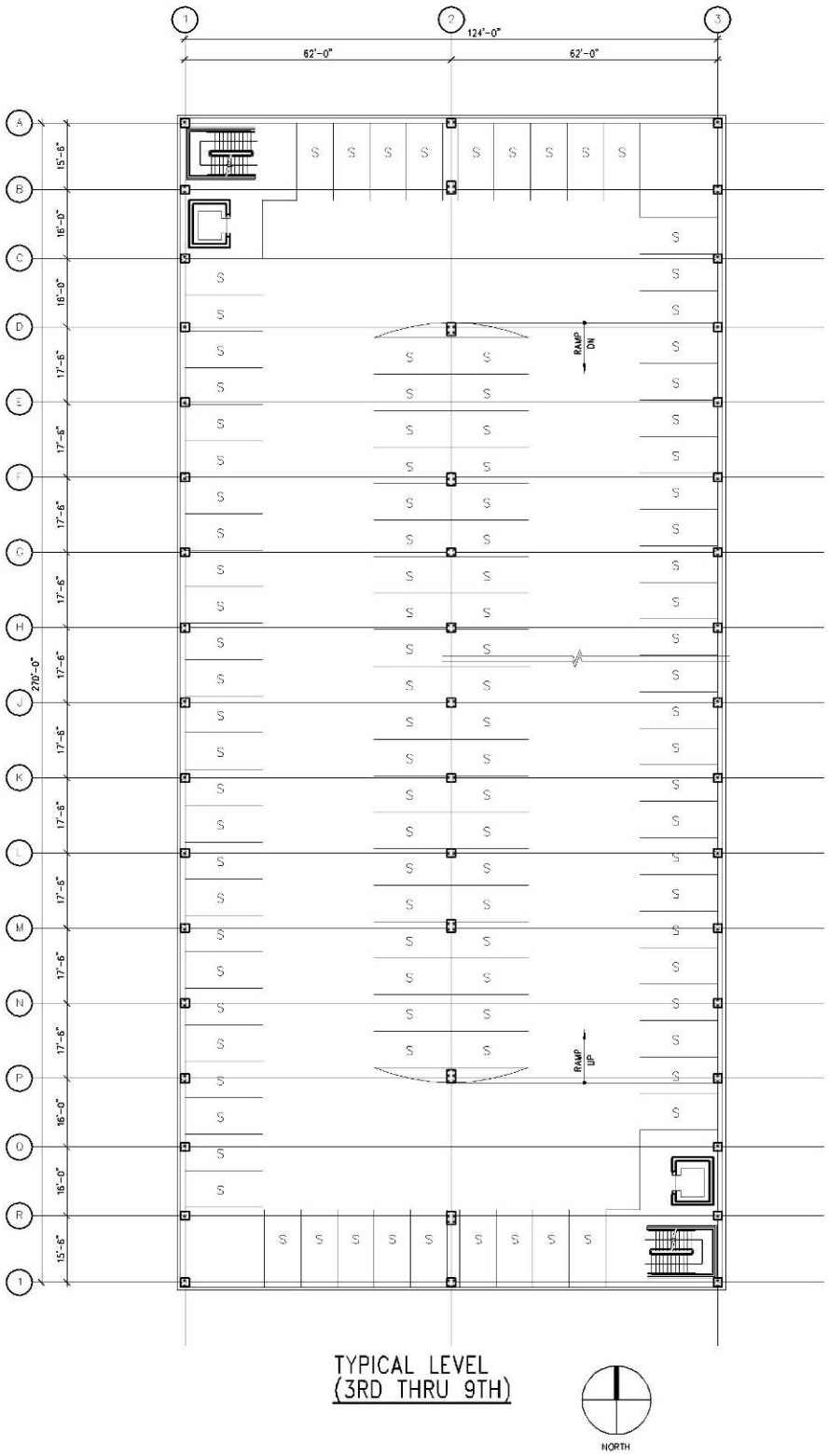



GROUND LEVEL

NORTH

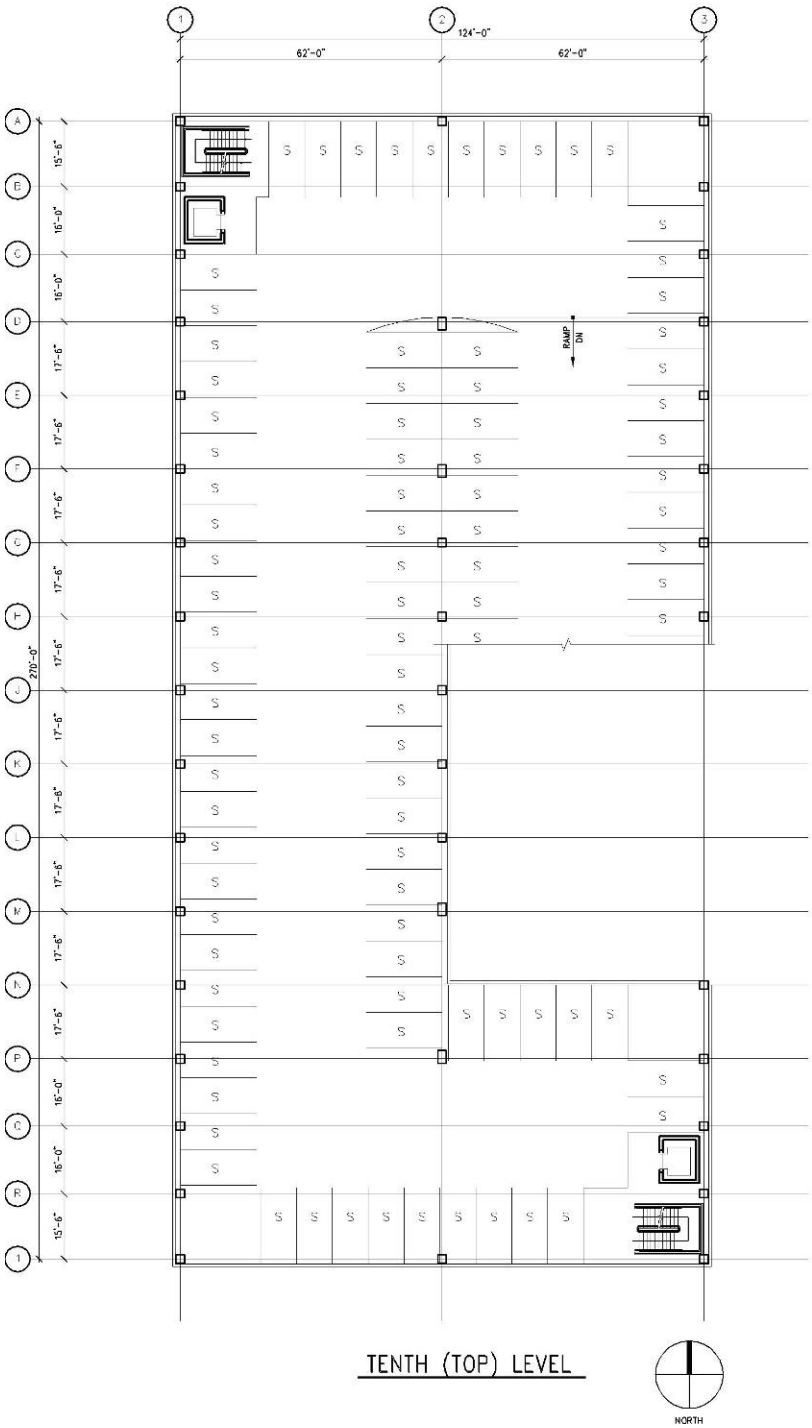



SECOND LEVEL




TYPICAL LEVEL
(3RD THRU 9TH)

NORTH

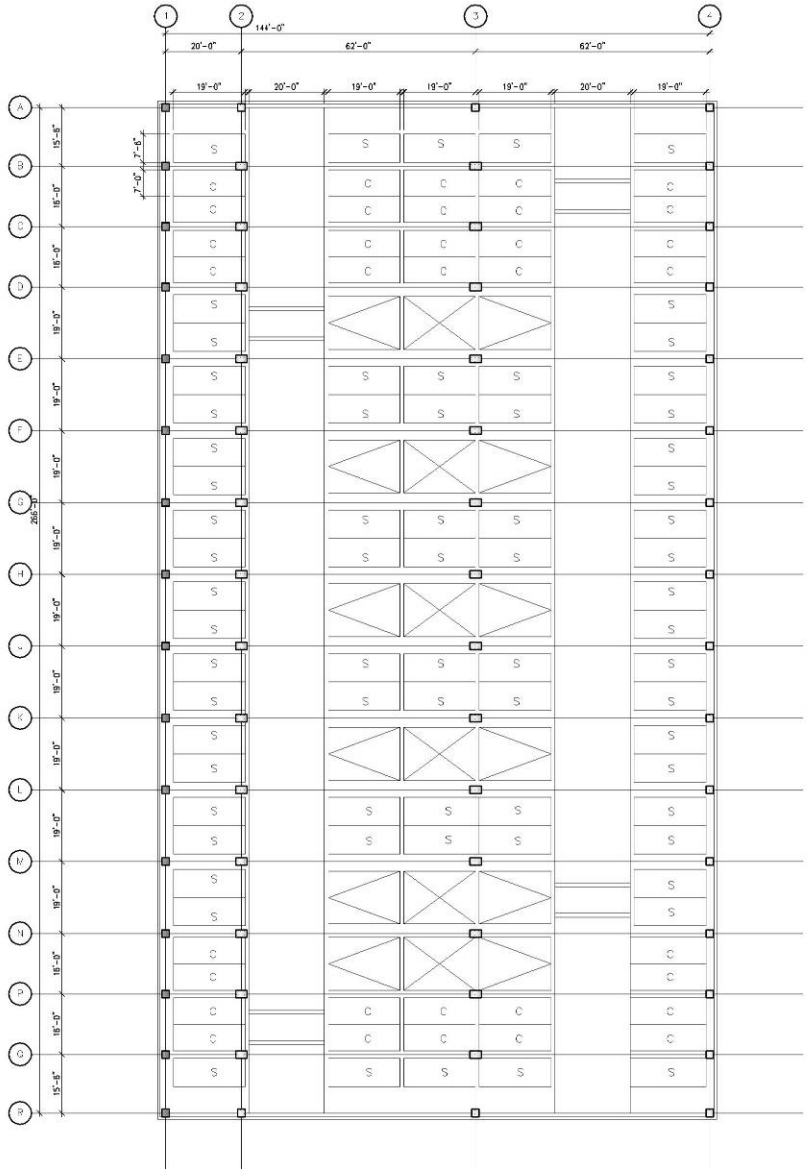

1
2
3
124'-0"
62'-0"
62'-0"
A
B
C
D
E
F
G
H
J
K
L
M
N
P
Q
R
T
15'-6"
16'-0"
16'-0"
17'-6"
17'-6"
17'-6"
17'-6"
17'-6"
17'-6"
17'-6"
17'-6"
17'-6"
16'-0"
16'-0"
15'-6"
270'-0"
RAMP DN
TENTH (TOP) LEVEL
NORTH

CAR COUNT
8'-6" 90° STANDARD SPACE

| TIER | ELEVATION | STANDARD | COMPACT | UNASSISTED SELF PARK | CAR ACCESSIBLE | VAN ACCESSIBLE | TOTAL | TANDEM | LIFT |
|---|---|---|---|---|---|---|---|---|---|
| BASEMENT B3 | -22'-2" | 70 | 34 | 0 | 0 | 0 | 104 | 0 | 0 |
| BASEMENT B2 | -15'-2" | 70 | 34 | 0 | 0 | 0 | 104 | 0 | 0 |
| BASEMENT B1 | -8'-2" | 70 | 34 | 0 | 0 | 0 | 104 | 0 | 0 |
| SUB-TOTAL MECHANICAL | | 210 | 102 | 0 | 0 | 0 | 312 | 0 | 0 |
| GROUND | 0'-0" | 5 | 0 | 0 | 11 | 2 | 18 | 0 | 0 |
| SECOND | 13'-6" | 105 | 0 | 0 | 2 | 2 | 109 | 0 | 0 |
| THIRD | 24'-10" | 88 | 0 | 22 | 4 | 0 | 114 | 22 | 22 |
| FOURTH | 36'-2" | 88 | 0 | 22 | 4 | 0 | 114 | 22 | 22 |
| FIFTH | 47'-6" | 93 | 0 | 22 | 0 | 0 | 115 | 22 | 22 |
| SIXTH | 58'-0" | 93 | 0 | 22 | 0 | 0 | 115 | 22 | 22 |
| SEVENTH | 68'-6" | 93 | 0 | 22 | 0 | 0 | 115 | 22 | 22 |
| EIGHTH | 79'-0" | 93 | 0 | 22 | 0 | 0 | 115 | 22 | 22 |
| NINTH | 89'-6" | 93 | 0 | 22 | 0 | 0 | 115 | 22 | 22 |
| TOP | 100'-0" | 64 | 0 | 22 | 0 | 0 | 86 | 22 | 22 |
| SUB-TOTAL CONVENTIONAL | | 815 | 0 | 176 | 21 | 4 | 1016 | 176 | 176 |
| TOTAL | | 1025 | 102 | 176 | 21 | 4 | 1328 | 176 | 176 |

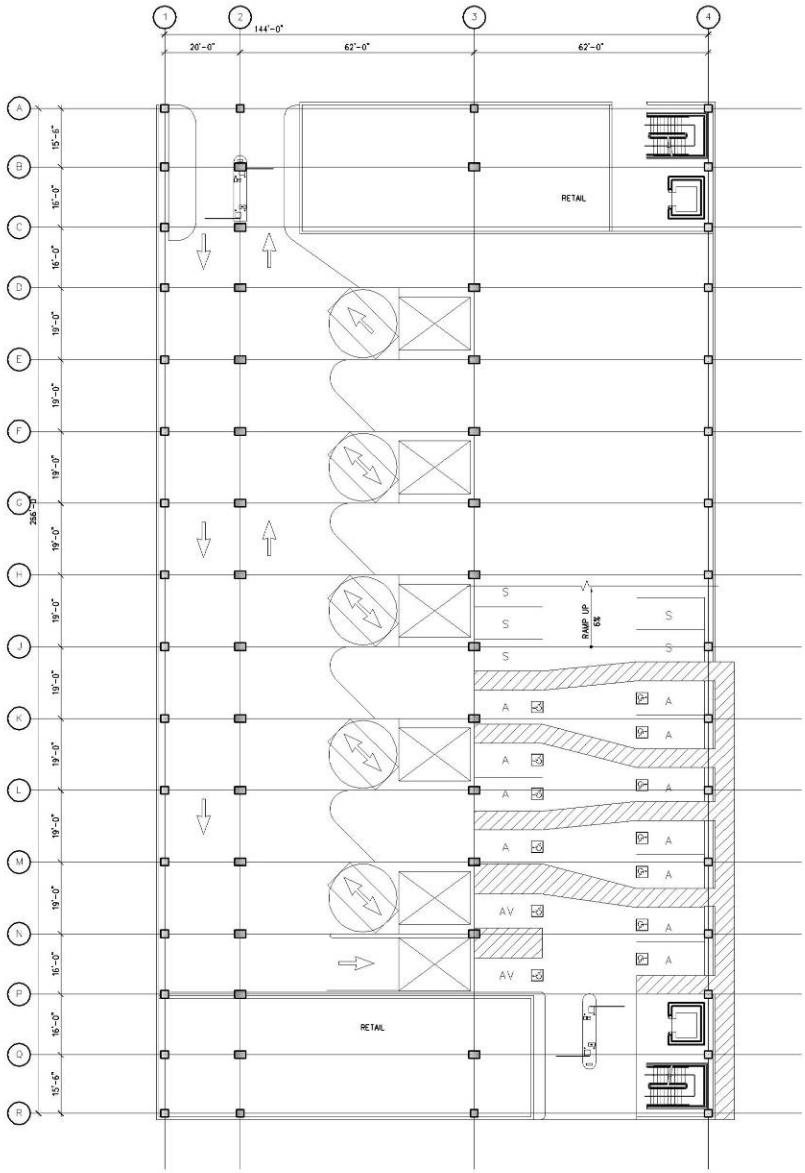
## SCHEME 2A/CONCEPTUAL DESIGN ALTERNATIVES

This design expands upon the design of Scheme 2 by incorporating three basement levels of automated mechanical parking and reducing the side setback on the western property line. The entire property footprint is used for the three basement levels to maximize the parking spaces count in the basement levels. This design provides 1,328 parking spaces plus 176 tandem spaces. An additional 176 to 352 spaces could be gained if stack-parking lifts are installed in the area of the tandem spaces. A stack-parking lift is a device that parks cars in tandem vertically.

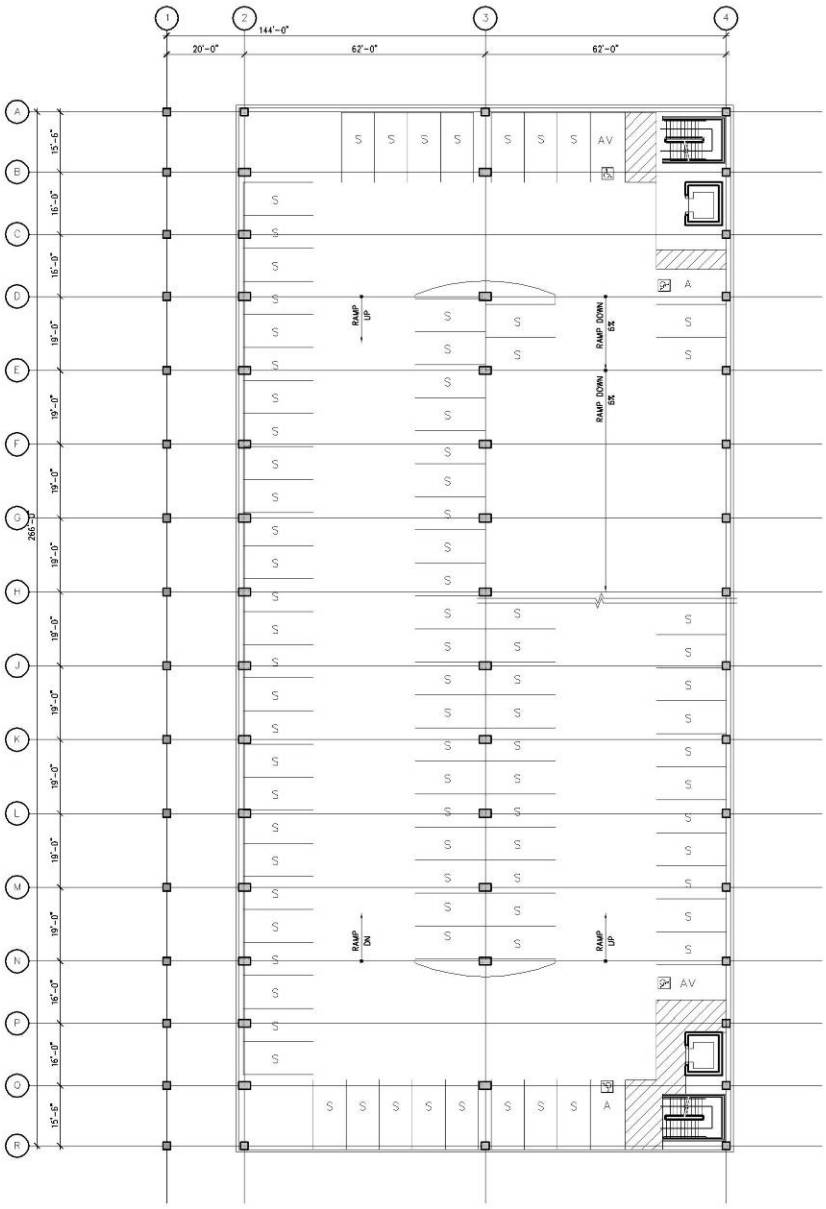


TYPICAL BASEMENT
LEVEL (B3 THRU B1)

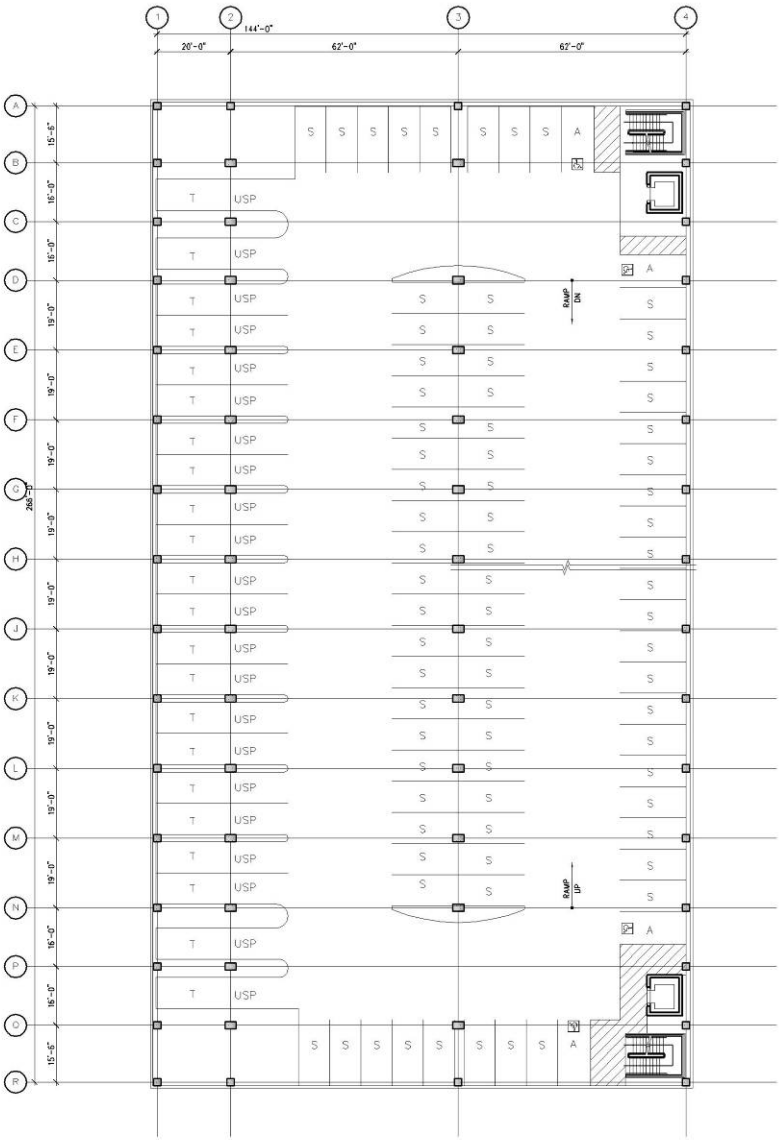
NORTH




GROUND LEVEL

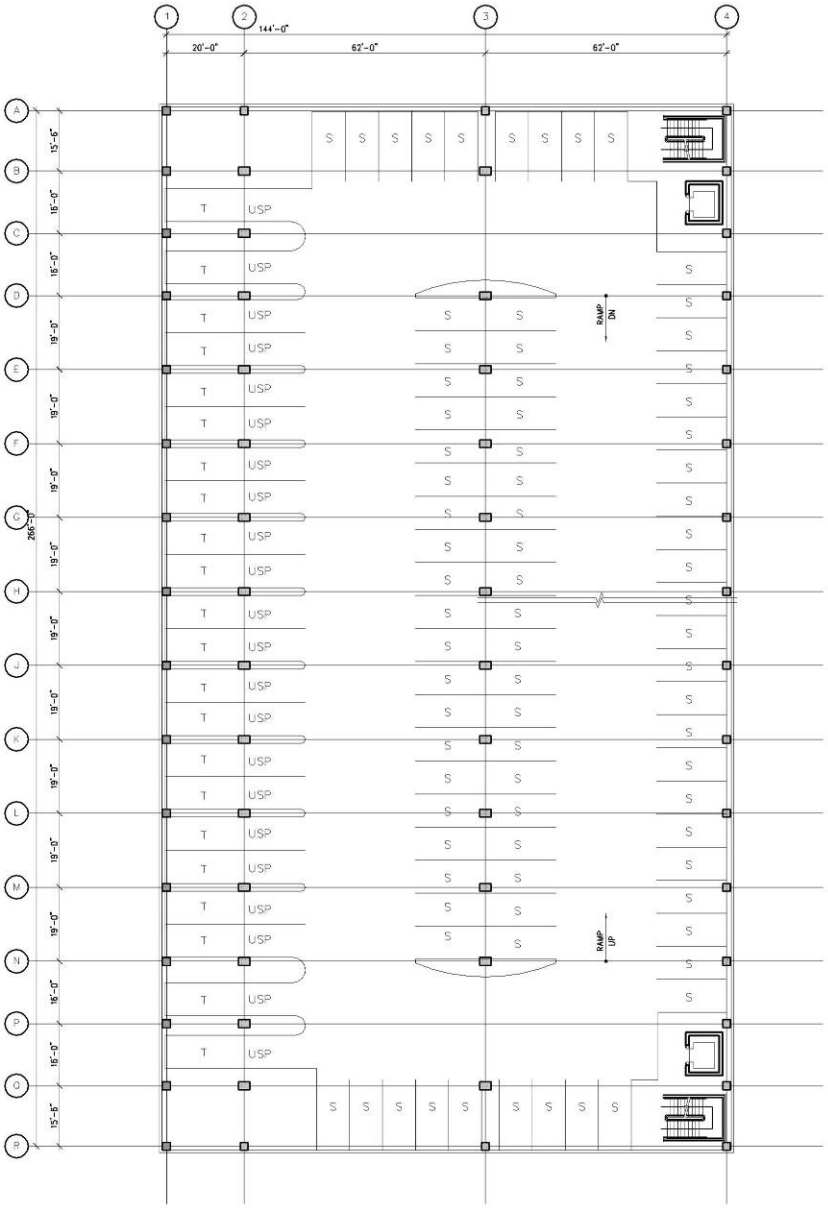



SECOND LEVEL



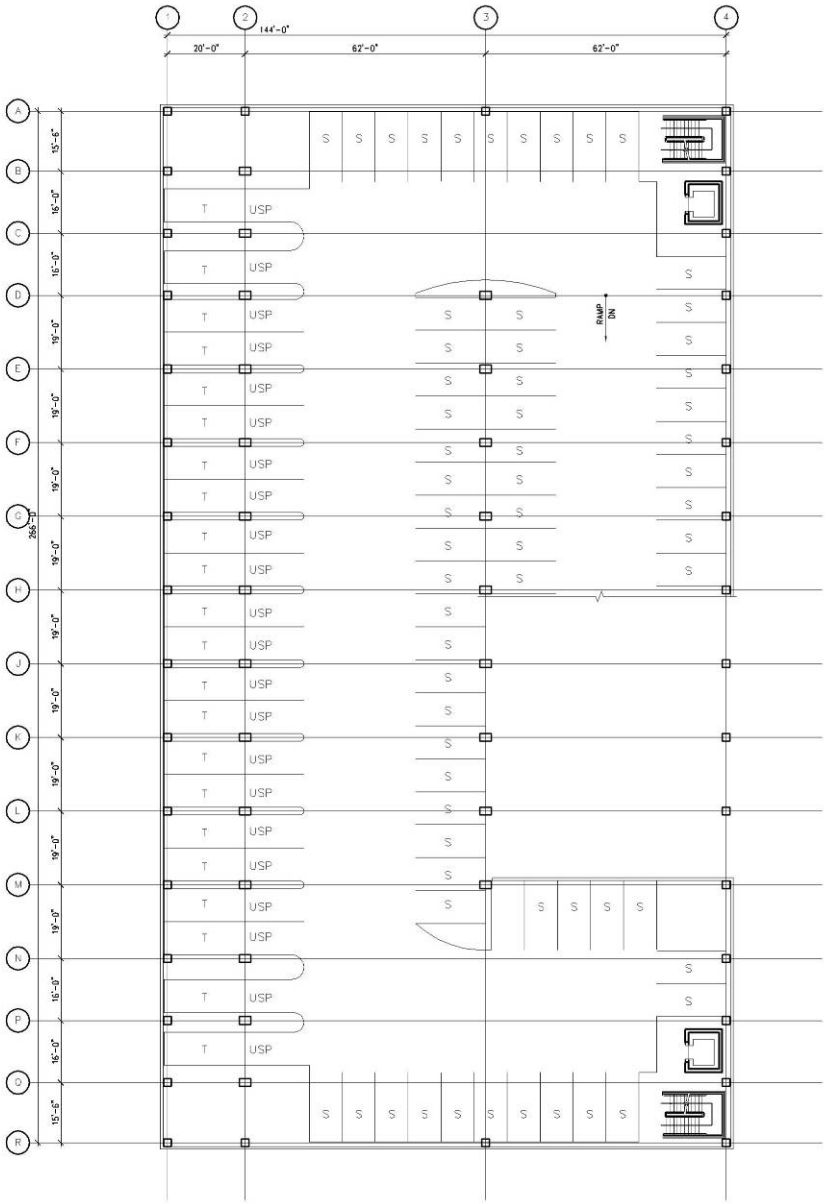

3RD & 4TH LEVEL

NORTH




TYPICAL LEVEL
(5TH THRU 9TH)

NORTH




TENTH (TOP) LEVEL

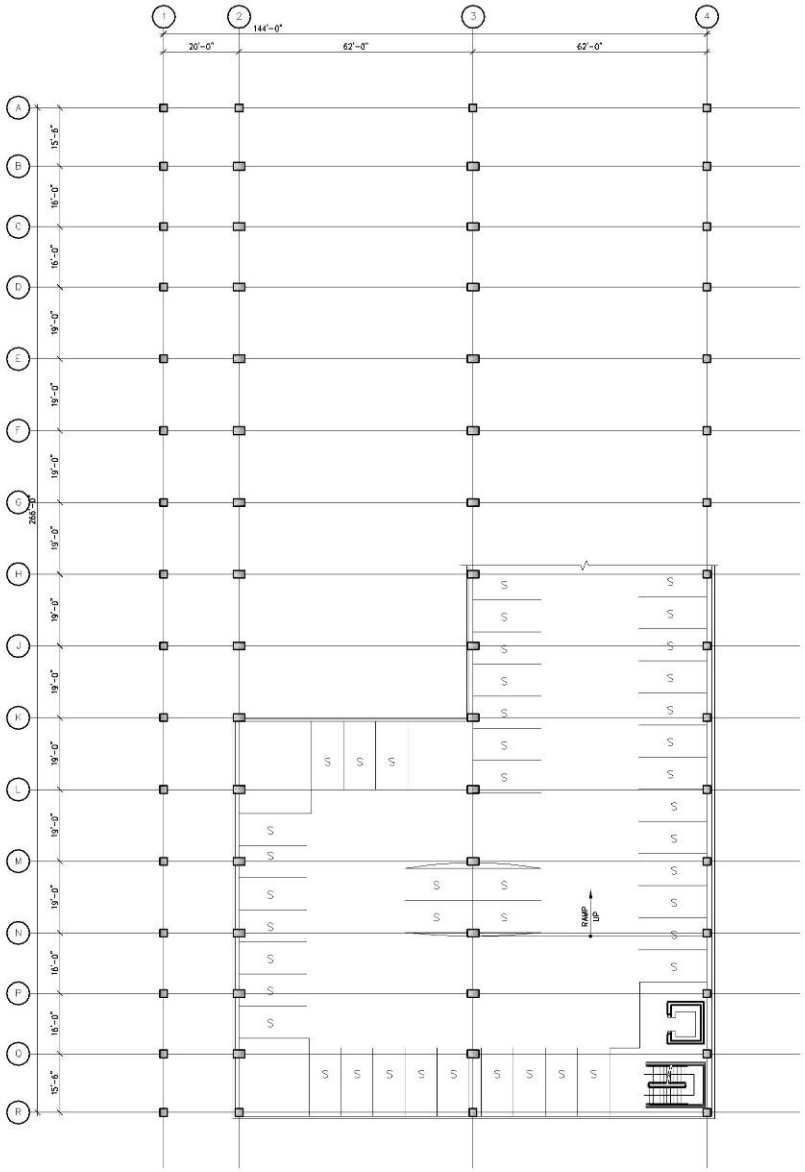
NORTH

CAR COUNT
8'-6" 90° STANDARD SPACE

| TIER | ELEVATION | STANDARD | UNASSISTED SELF PARK | CAR ACCESSIBLE | VAN ACCESSIBLE | TOTAL | TANDEM | LIFT |
|---|---|---|---|---|---|---|---|---|
| BASEMENT B2 | -21'-6" | 43 | 0 | 0 | 0 | 43 | 0 | 0 |
| BASEMENT B1 | -11'-4" | 91 | 0 | 10 | 0 | 101 | 0 | 0 |
| SUB-TOTAL BASEMENT | | 134 | 0 | 10 | 0 | 144 | 0 | 0 |
| GROUND | 0'-0" | 45 | 0 | 11 | 3 | 59 | 0 | 0 |
| SECOND | 15'-0" | 108 | 0 | 0 | 0 | 108 | 0 | 0 |
| THIRD | 25'-6" | 84 | 21 | 0 | 0 | 105 | 21 | 21 |
| FOURTH | 36'-0" | 84 | 21 | 0 | 0 | 105 | 21 | 21 |
| FIFTH | 46'-6" | 84 | 21 | 0 | 0 | 105 | 21 | 21 |
| SIXTH | 57'-0" | 84 | 21 | 0 | 0 | 105 | 21 | 21 |
| SEVENTH | 67'-6" | 84 | 21 | 0 | 0 | 105 | 21 | 21 |
| EIGHTH | 78'-0" | 84 | 21 | 0 | 0 | 105 | 21 | 21 |
| NINTH | 88'-6" | 84 | 21 | 0 | 0 | 105 | 21 | 21 |
| TOP | 99'-0" | 67 | 21 | 0 | 0 | 88 | 21 | 21 |
| TOTAL | | 942 | 168 | 21 | 3 | 1134 | 168 | 168 |

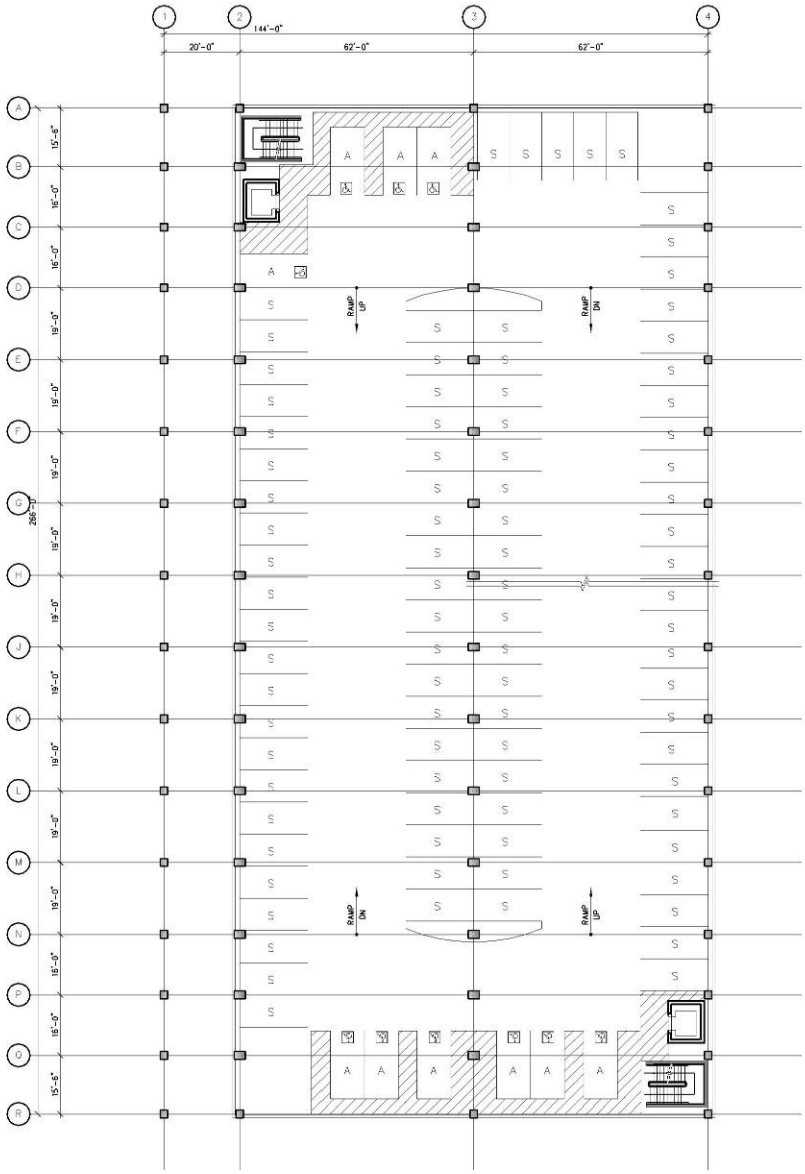
## SCHEME 2B/CONCEPTUAL DESIGN ALTERNATIVES

This design expands upon the design of Scheme 2 by incorporating two basement levels of conventional parking and reducing the side setback on the western property line on the upper levels. Unlike Scheme 2A, no additional spaces would be gained by utilizing the entire property footprint on the two basement levels. This design provides 1,134 parking spaces plus 168 tandem spaces. An additional 168 to 336 spaces could be gained if stack-parking lifts are installed in the area of the tandem spaces.



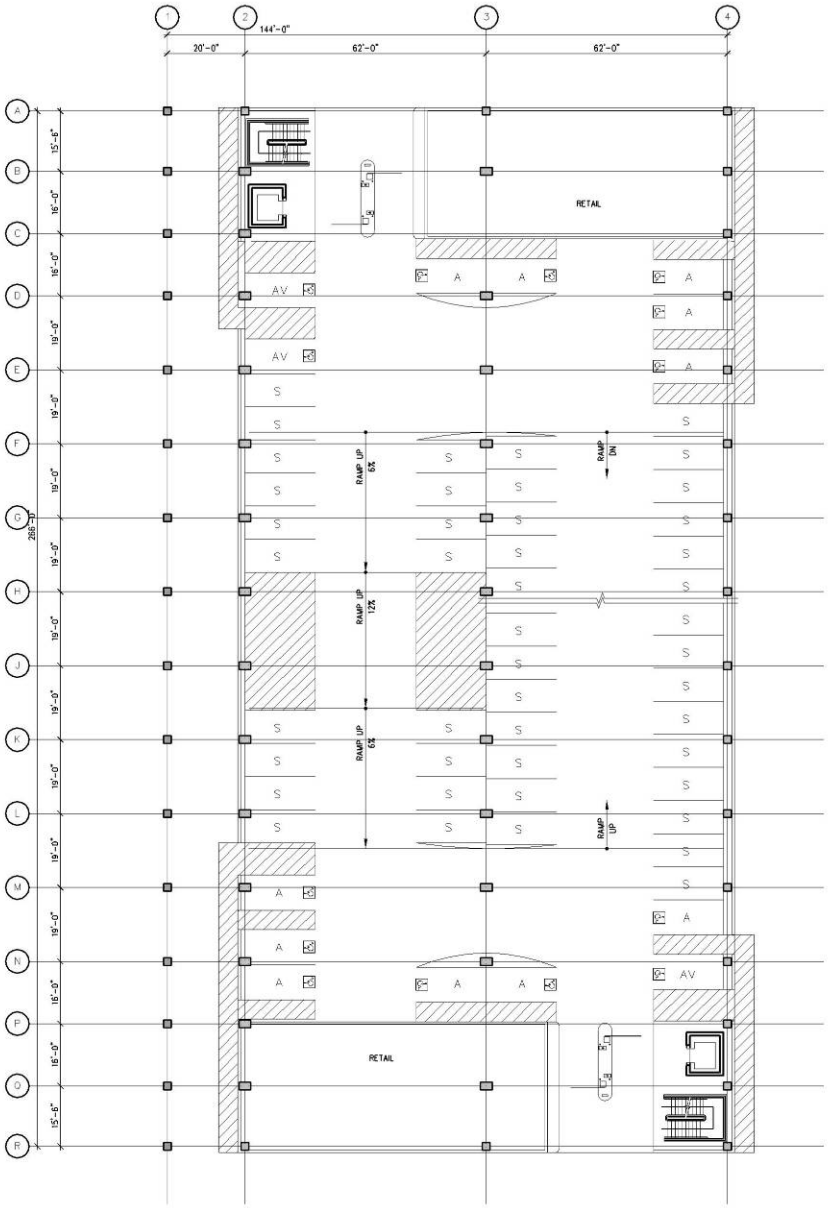

BASEMENT LEVEL B2

NORTH



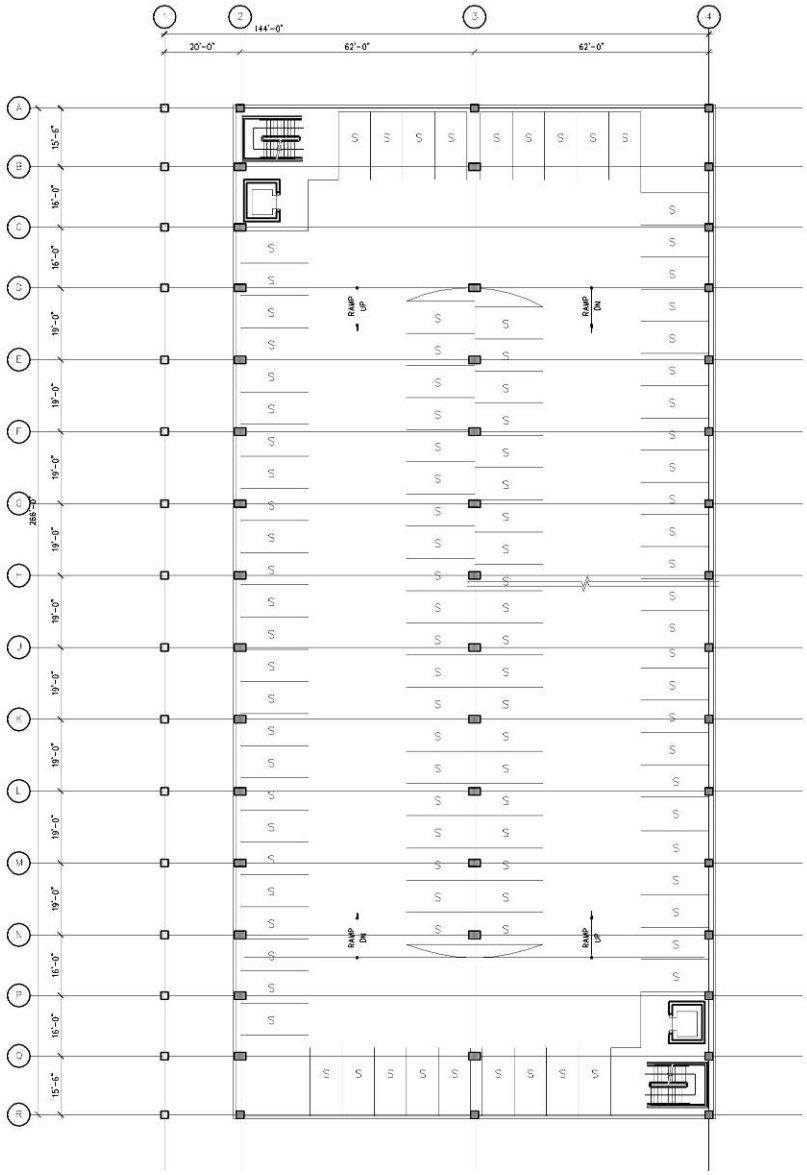

BASEMENT LEVEL B1

NORTH



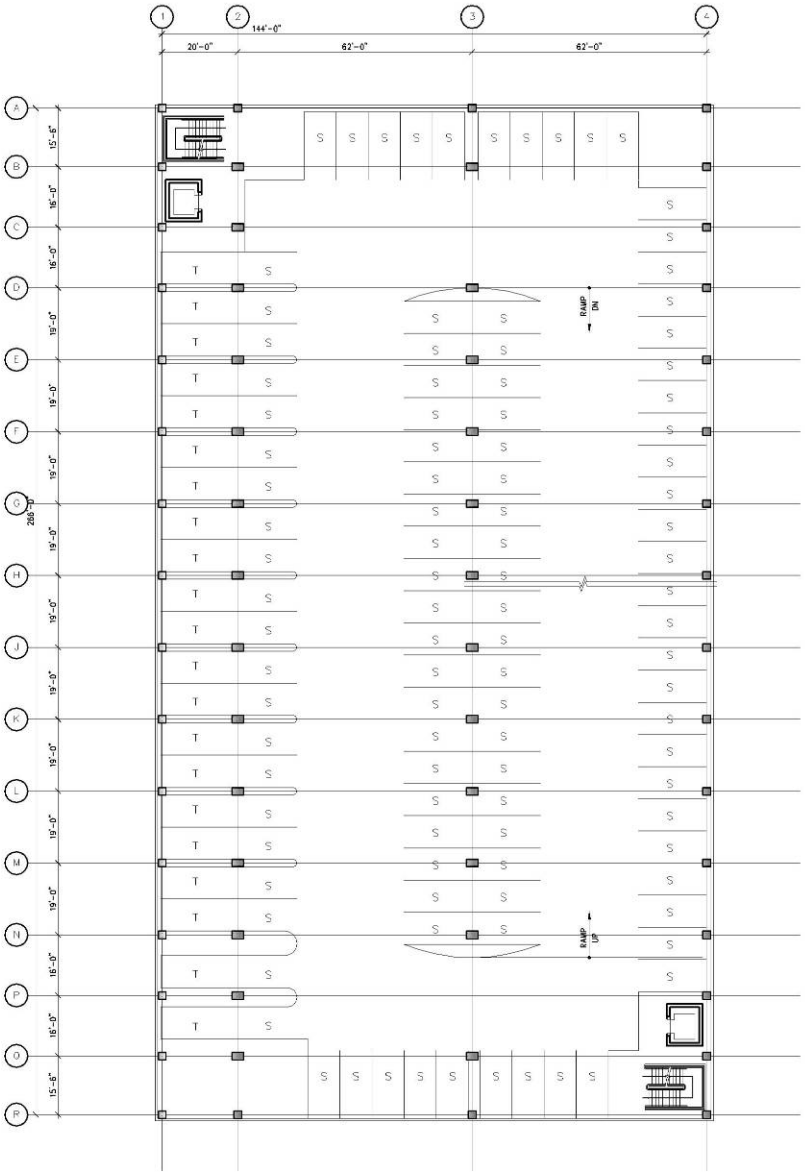

GROUND LEVEL

NORTH

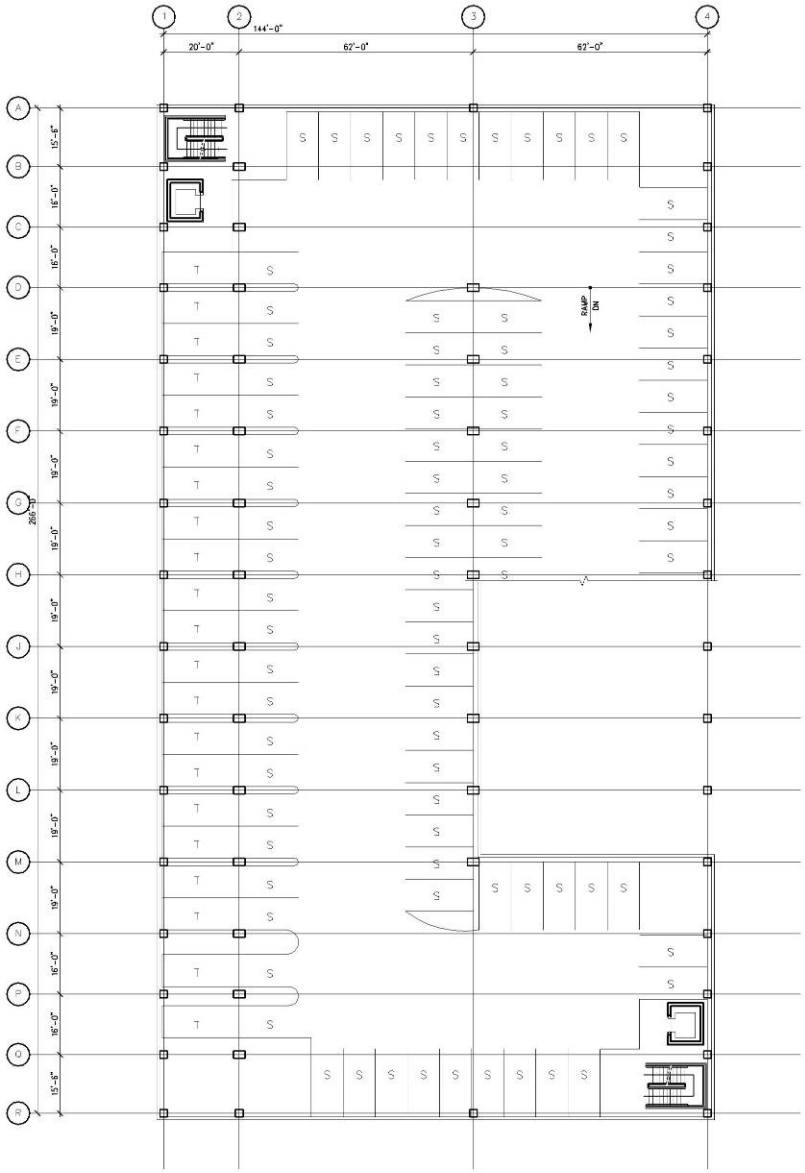



SECOND LEVEL

NORTH




TYPICAL LEVEL
(3RD THRU 9TH)




TENTH (TOP) LEVEL

NORTH

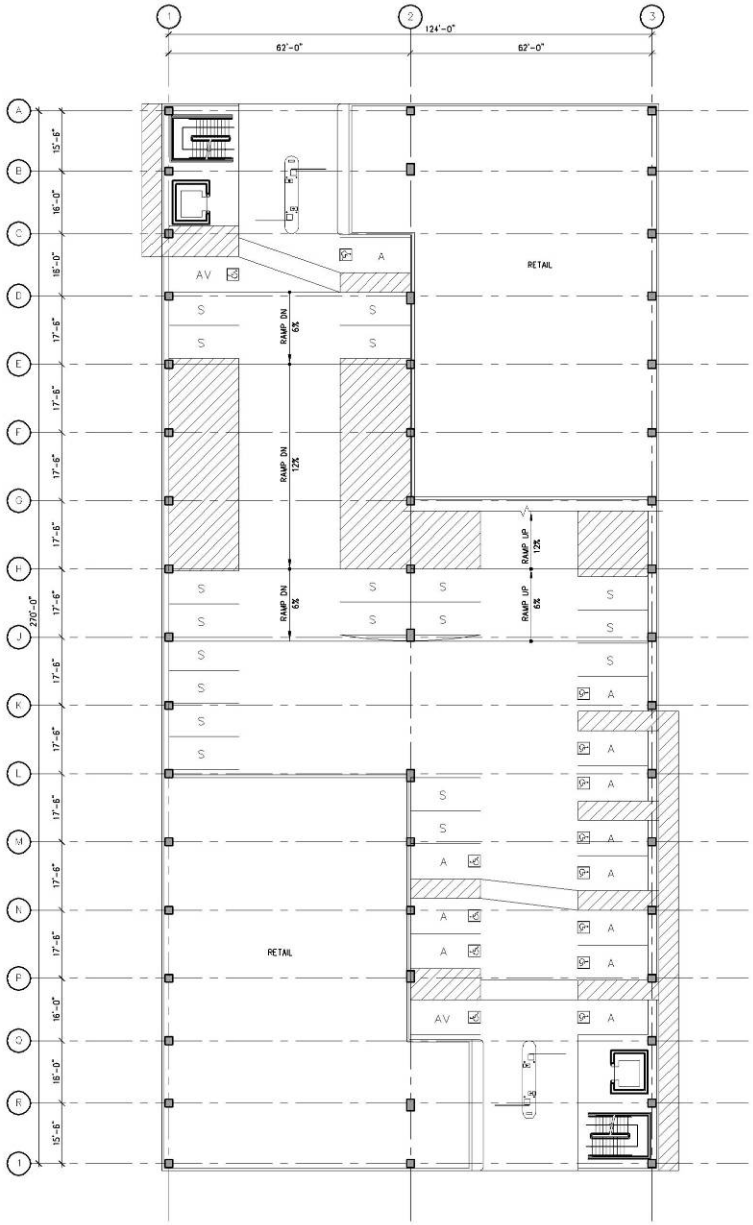
CAR COUNT

8'-6" 90° STANDARD SPACE

| TIER | ELEVATION | STANDARD | CAR ACCESSIBLE | VAN ACCESSIBLE | TOTAL |
|---|---|---|---|---|---|
| GROUND | 0'-0" | 19 | 12 | 2 | 33 |
| SECOND | 15'-0" | 46 | 0 | 0 | 46 |
| THIRD | 25'-2" | 109 | 0 | 0 | 109 |
| FOURTH | 35'-4" | 109 | 0 | 0 | 109 |
| FIFTH | 45'-6" | 109 | 0 | 0 | 109 |
| SIXTH | 55'-8" | 109 | 0 | 0 | 109 |
| SEVENTH | 65'-10" | 109 | 0 | 0 | 109 |
| EIGHTH | 76'-0" | 109 | 0 | 0 | 109 |
| NINTH | 86'-2" | 109 | 0 | 0 | 109 |
| TOP | 96'-4" | 32 | 0 | 0 | 32 |
| TOTAL | | 860 | 12 | 2 | 874 |

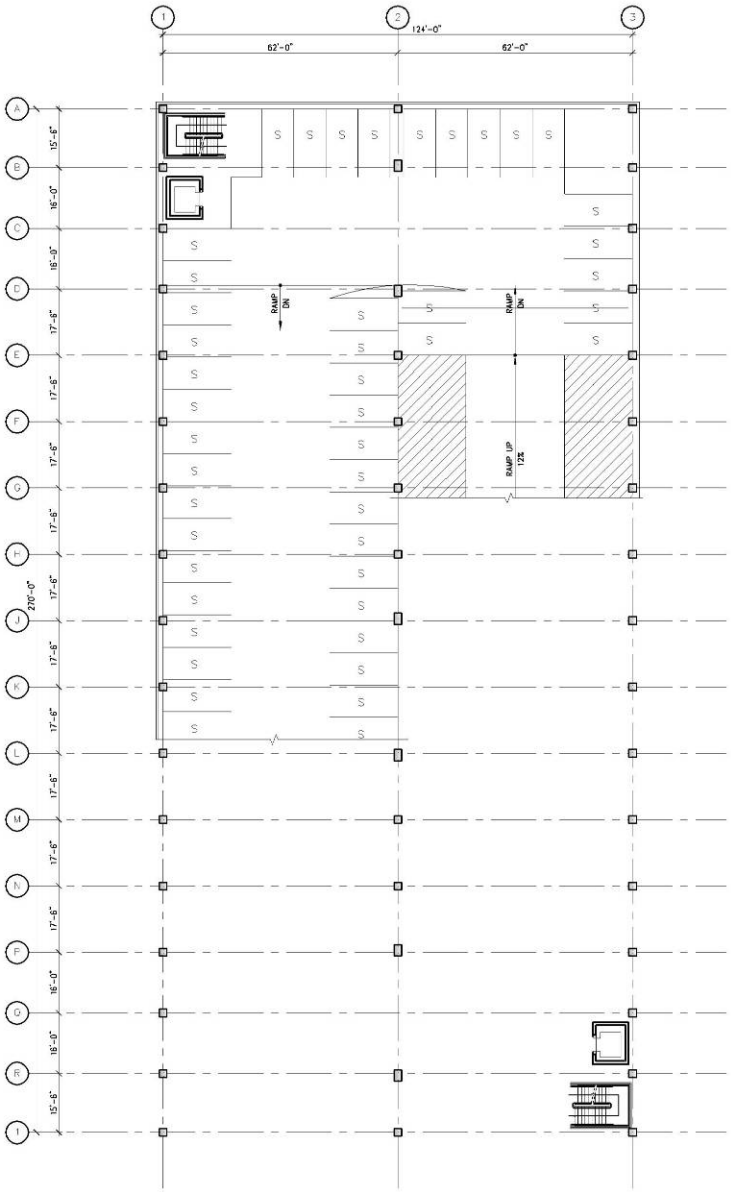
## SCHEME 3/CONCEPTUAL DESIGN ALTERNATIVES

This design takes Scheme 2 and expands the street-front commercial space by 8,500 square feet to a total of 13,500 square feet. Scheme 3 provides 874 parking spaces, which is a reduction of 197 spaces compared to Scheme 2.



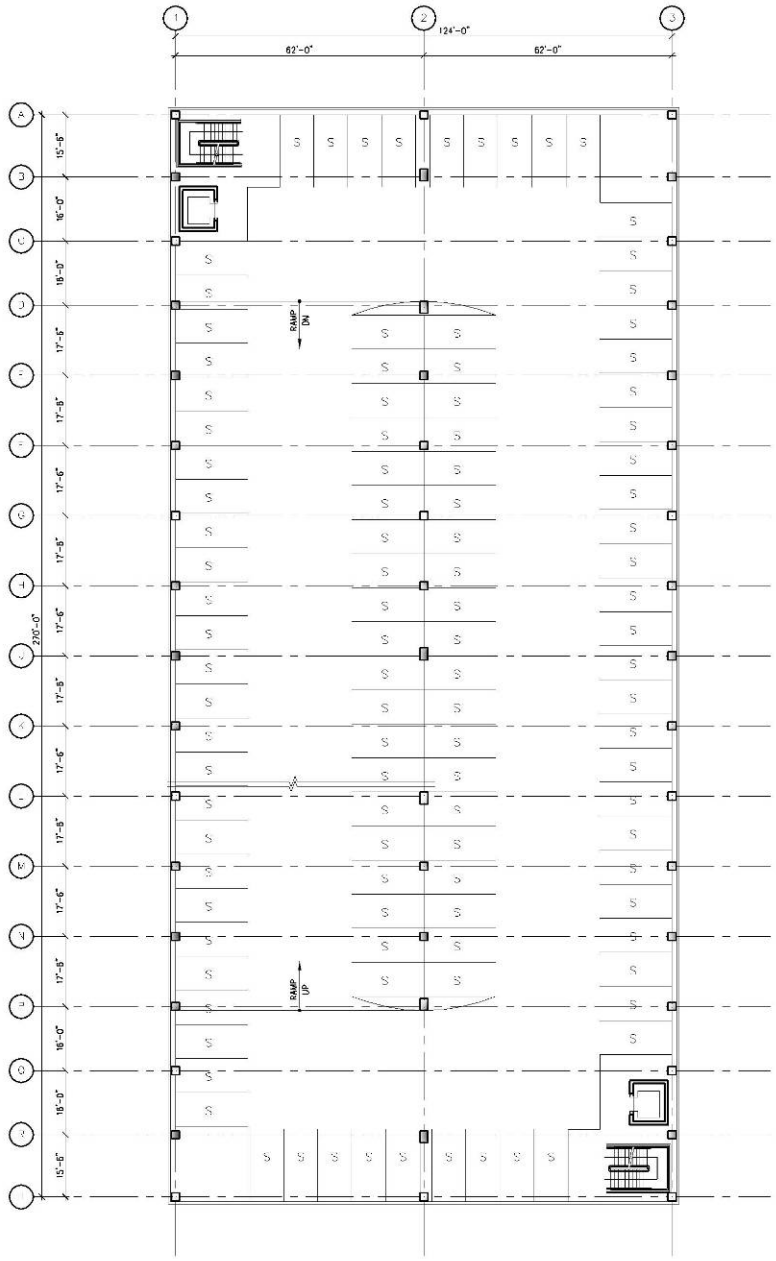

GROUND LEVEL

NORTH



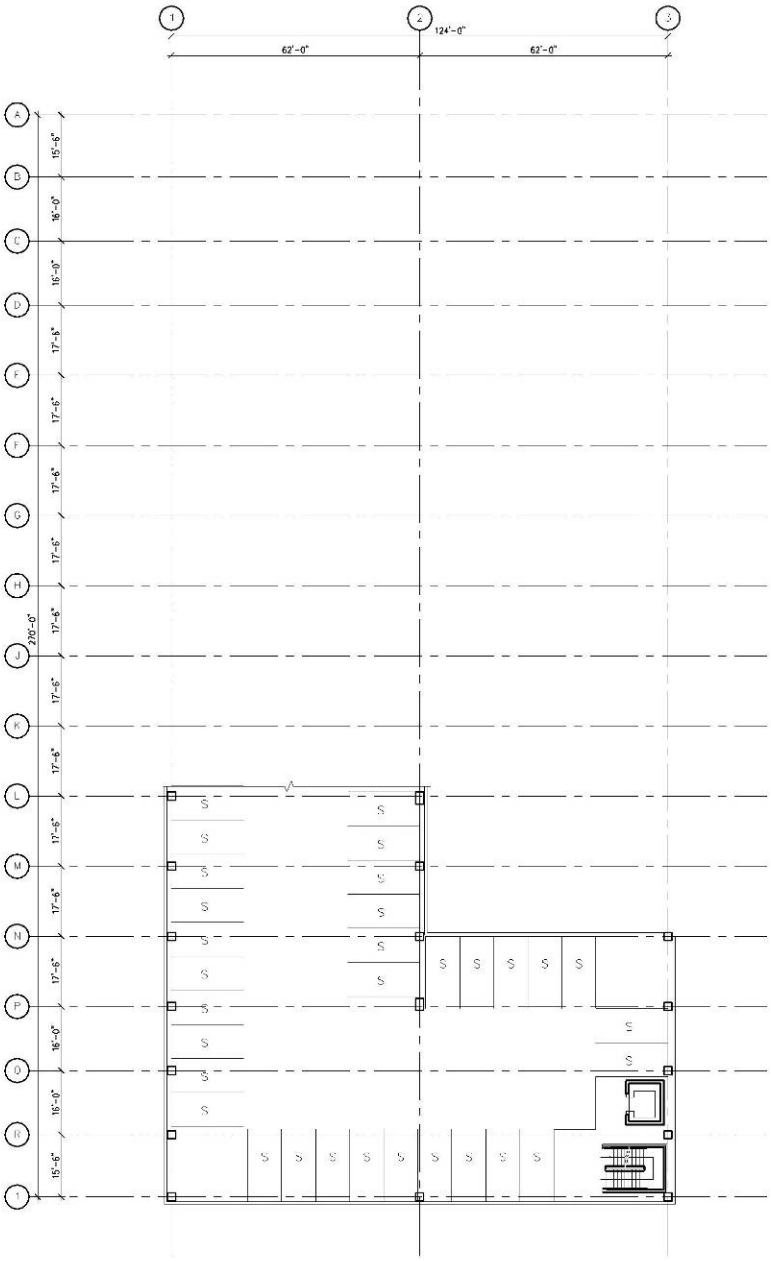

SECOND LEVEL

NORTH




TYPICAL LEVEL
(3RD THRU 9TH)

NORTH




TENTH (TOP) LEVEL

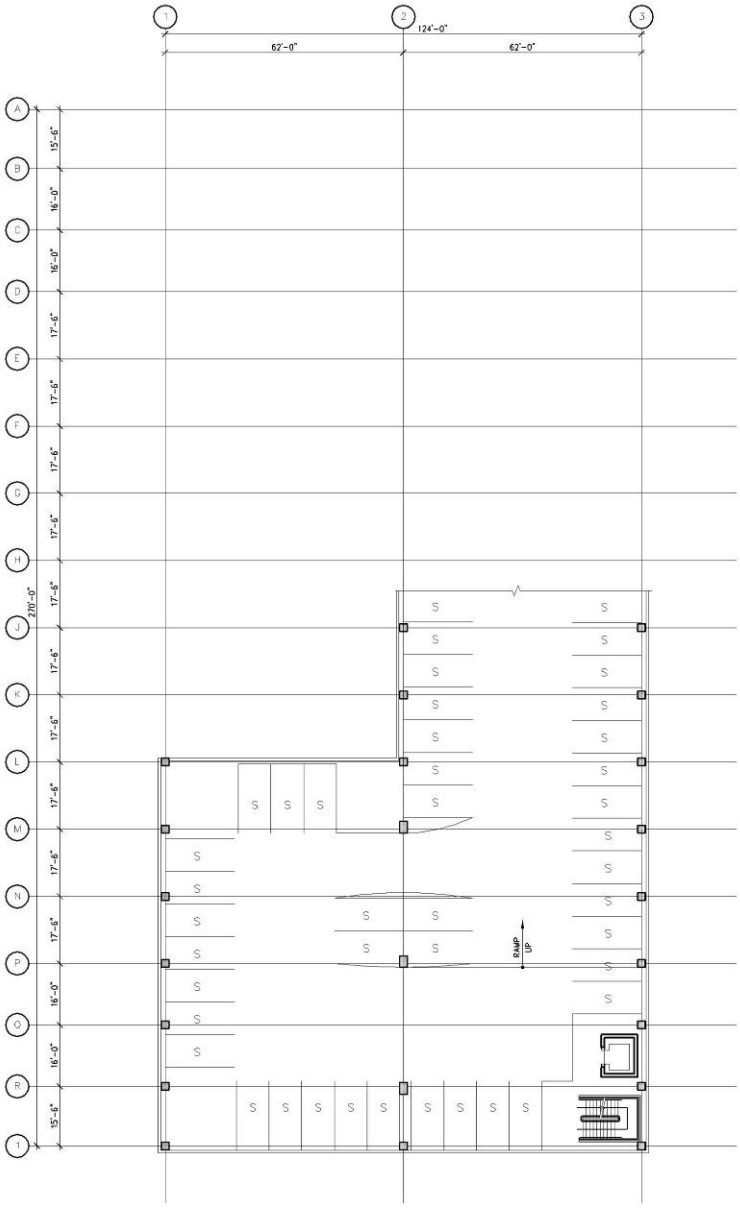
CAR COUNT

8'-6" 90° STANDARD SPACE

| TIER | ELEVATION | STANDARD | CAR ACCESSIBLE | VAN ACCESSIBLE | TOTAL |
|---|---|---|---|---|---|
| BASEMENT | -11'-4" | 44 | 0 | 0 | 44 |
| GROUND | 0'-0" | 48 | 12 | 2 | 62 |
| SECOND | 15'-0" | 109 | 0 | 0 | 109 |
| THIRD | 25'-2" | 109 | 0 | 0 | 109 |
| FOURTH | 35'-4" | 109 | 0 | 0 | 109 |
| FIFTH | 45'-6" | 30 | 0 | 0 | 30 |
| SUB-TOTAL CONVENTIONAL | | 449 | 12 | 2 | 463 |
| SIXTH | 55'-8" | 15 | 0 | 0 | 15 |
| SEVENTH | 62'-8" | 190 | 0 | 0 | 190 |
| EIGHTH | 69'-8" | 190 | 0 | 0 | 190 |
| NINTH | 76'-8" | 190 | 0 | 0 | 190 |
| TENTH | 83'-8" | 190 | 0 | 0 | 190 |
| ELEVENTH | 90'-8" | 190 | 0 | 0 | 190 |
| TWELFTH | 97'-8" | 190 | 0 | 0 | 190 |

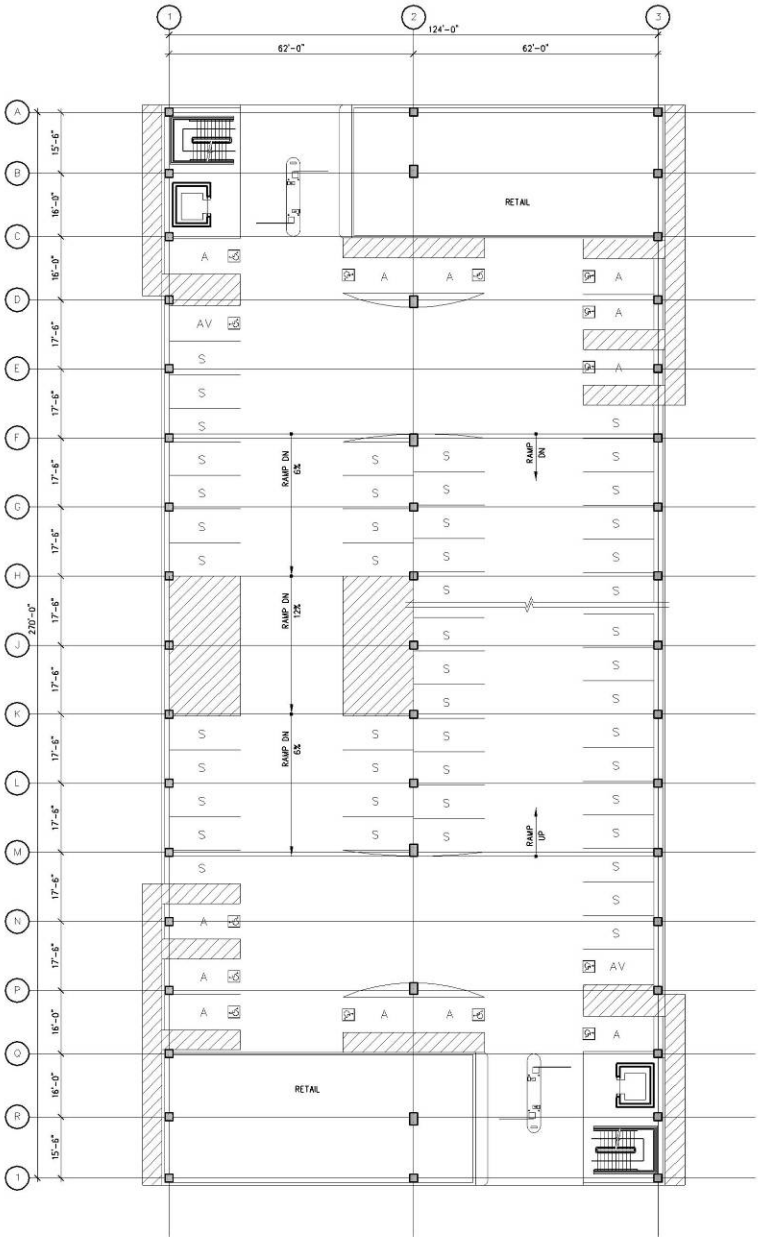
## SCHEME 4/CONCEPTUAL DESIGN ALTERNATIVES

This design incorporates the merger of two different types of garages; an automated mechanical garage constructed above a conventional garage. The benefit of such a design is to capture the strengths of each type of garage; i.e., the space efficiency of the mechanical garage and the lower construction cost of the conventional garage. This alternative, which produces 1,238 parking spaces, is removed from further consideration as it does not meet Walker's minimum level of service rating for egress until the garage capacity drops to 963 spaces.



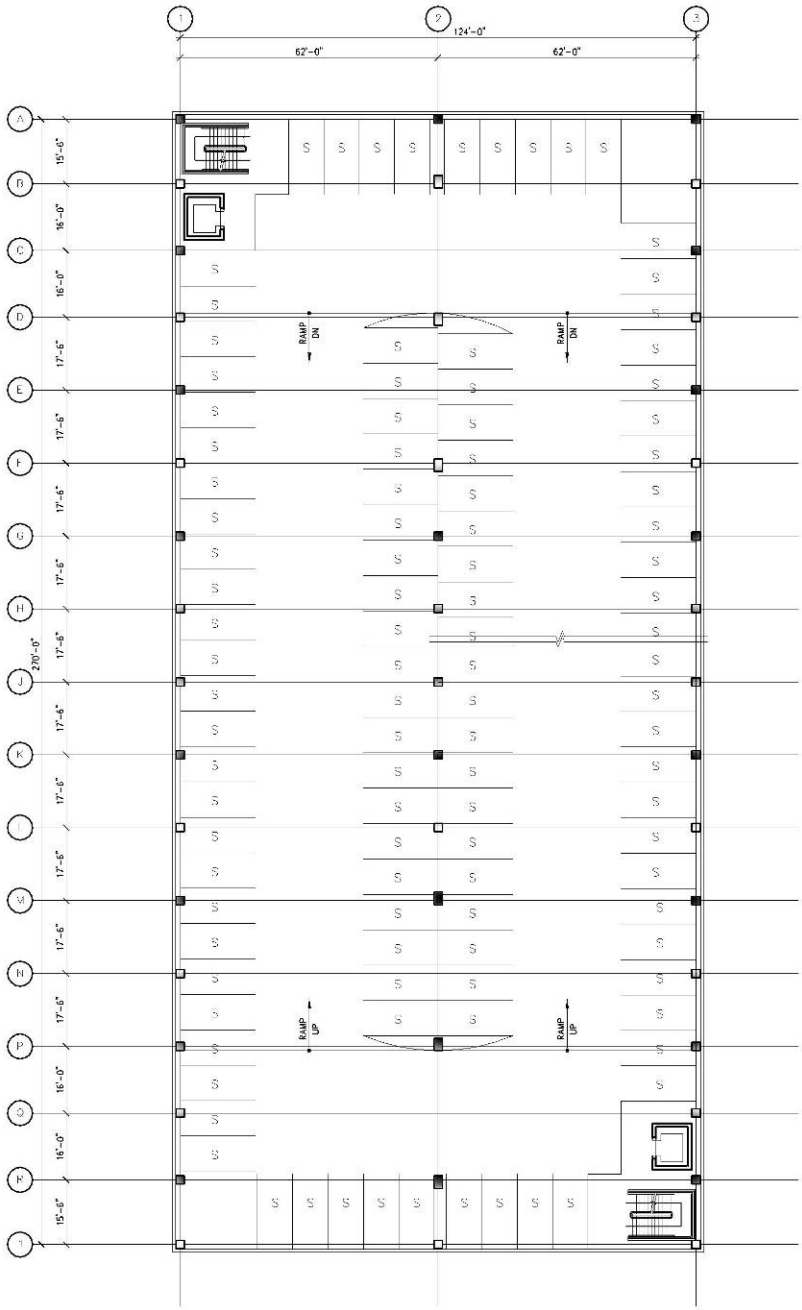

BASEMENT LEVEL

NORTH

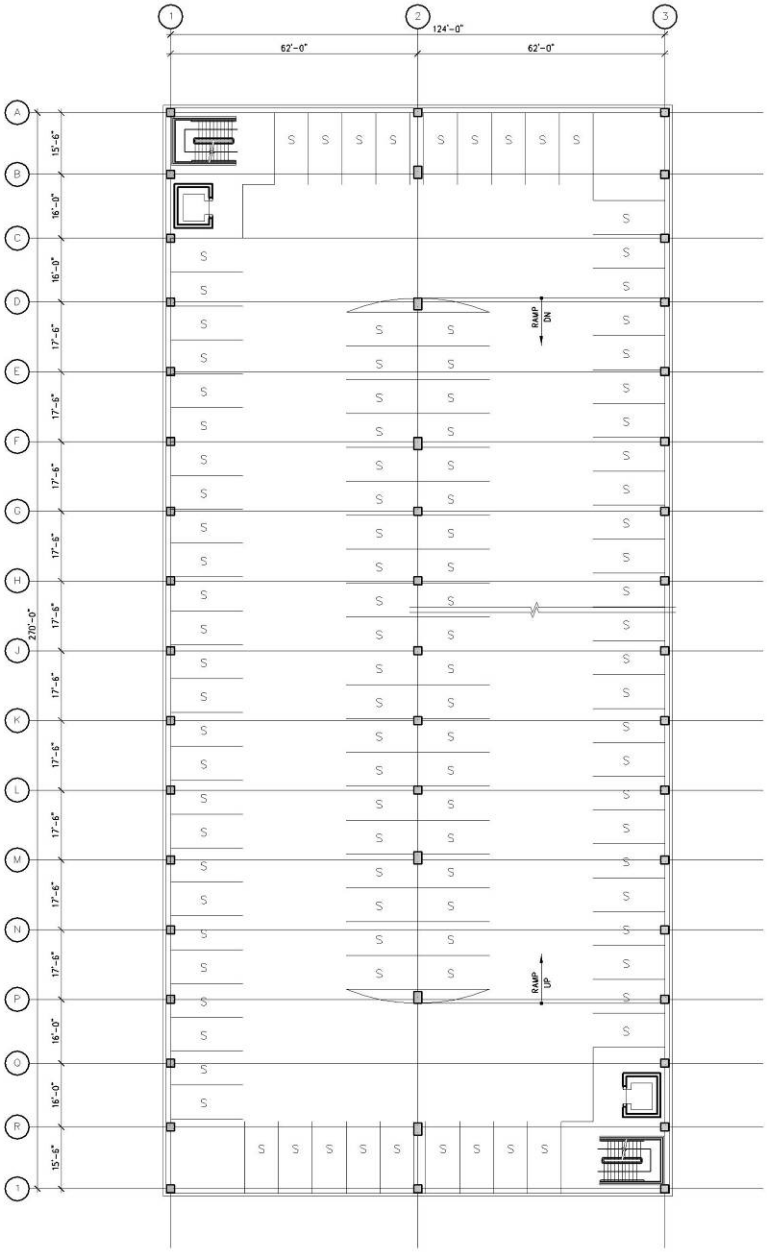



GROUND LEVEL

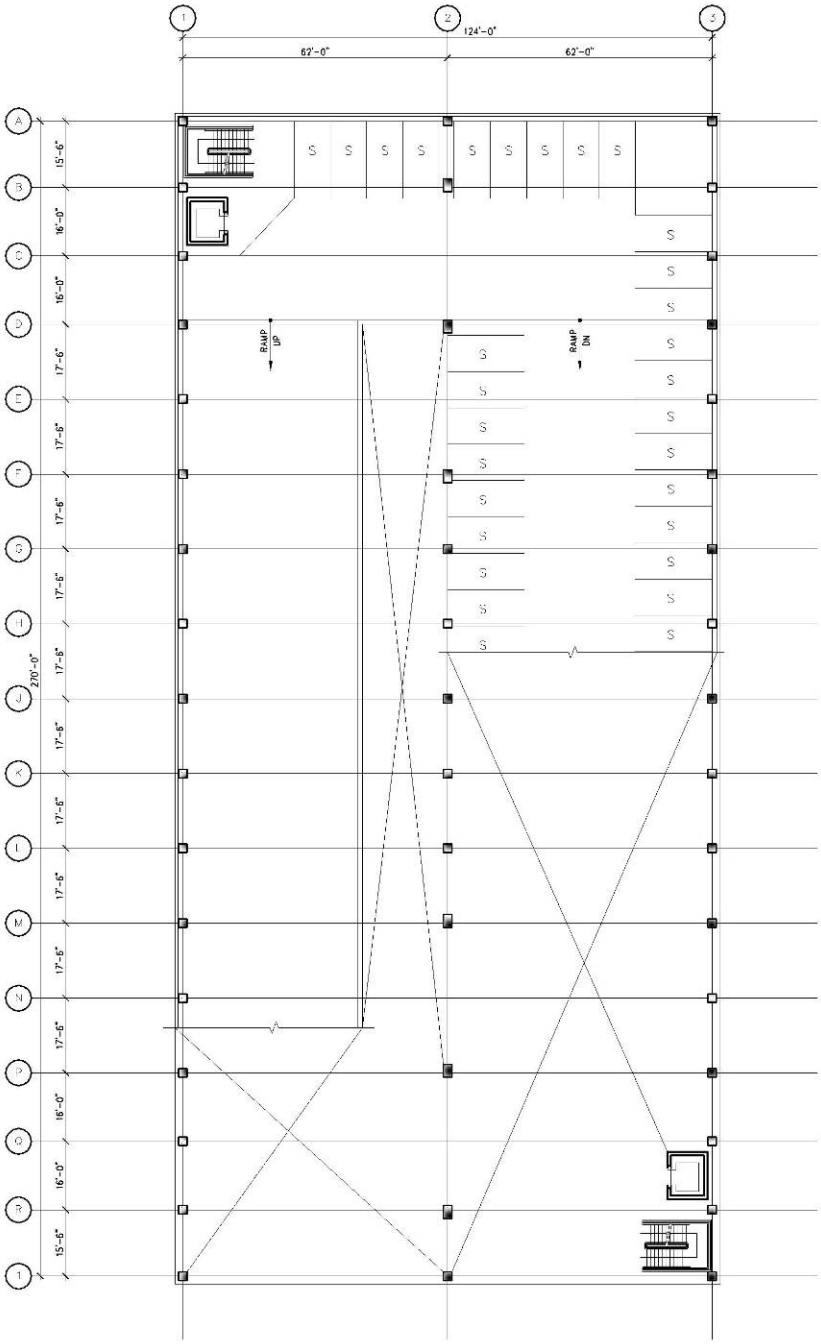
NORTH




SECOND LEVEL

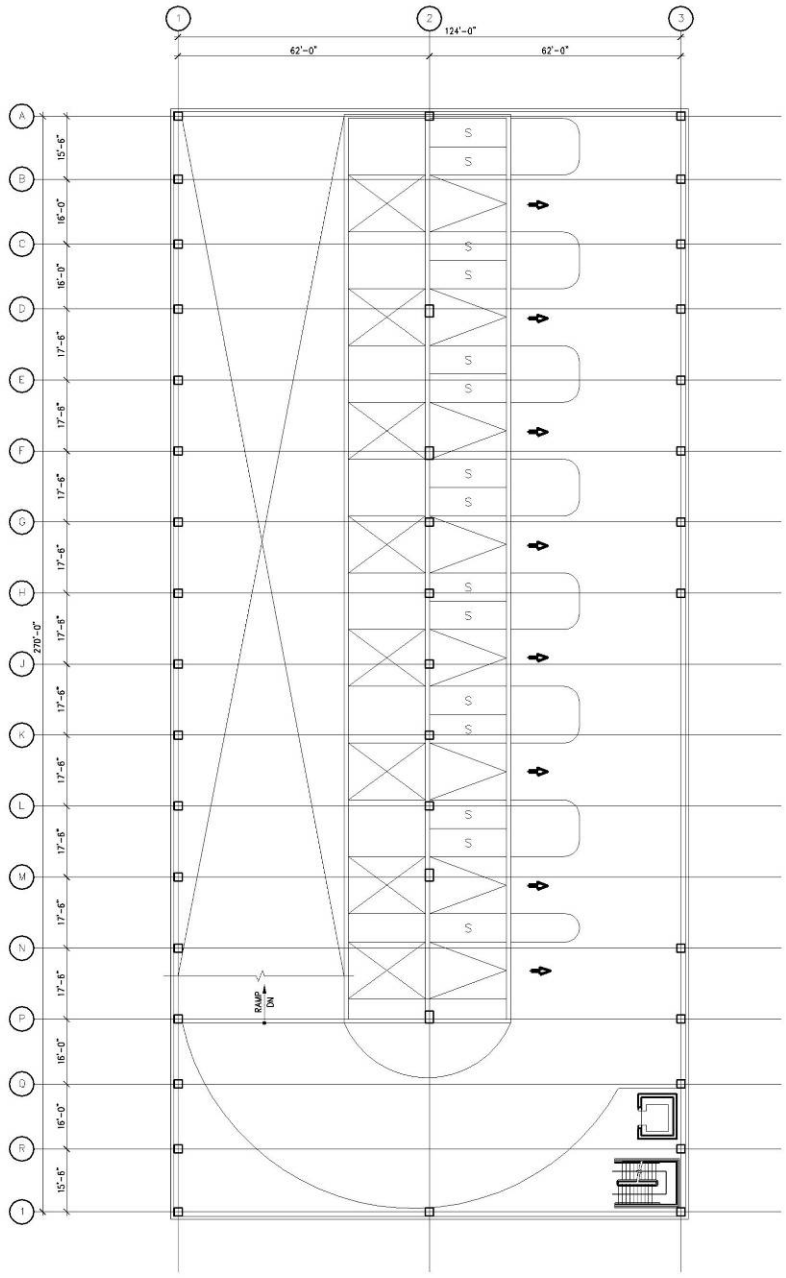



THIRD & FOURTH LEVEL

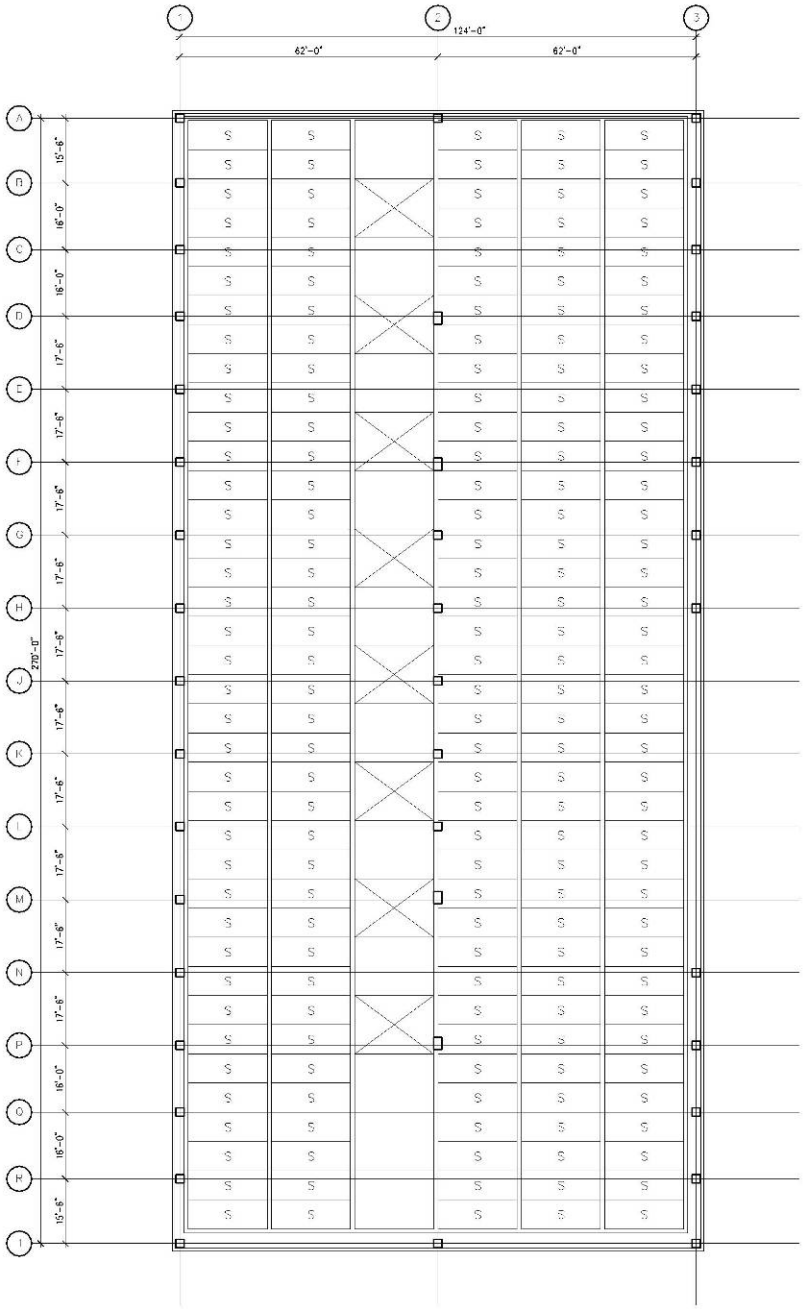



FIFTH LEVEL

NORTH

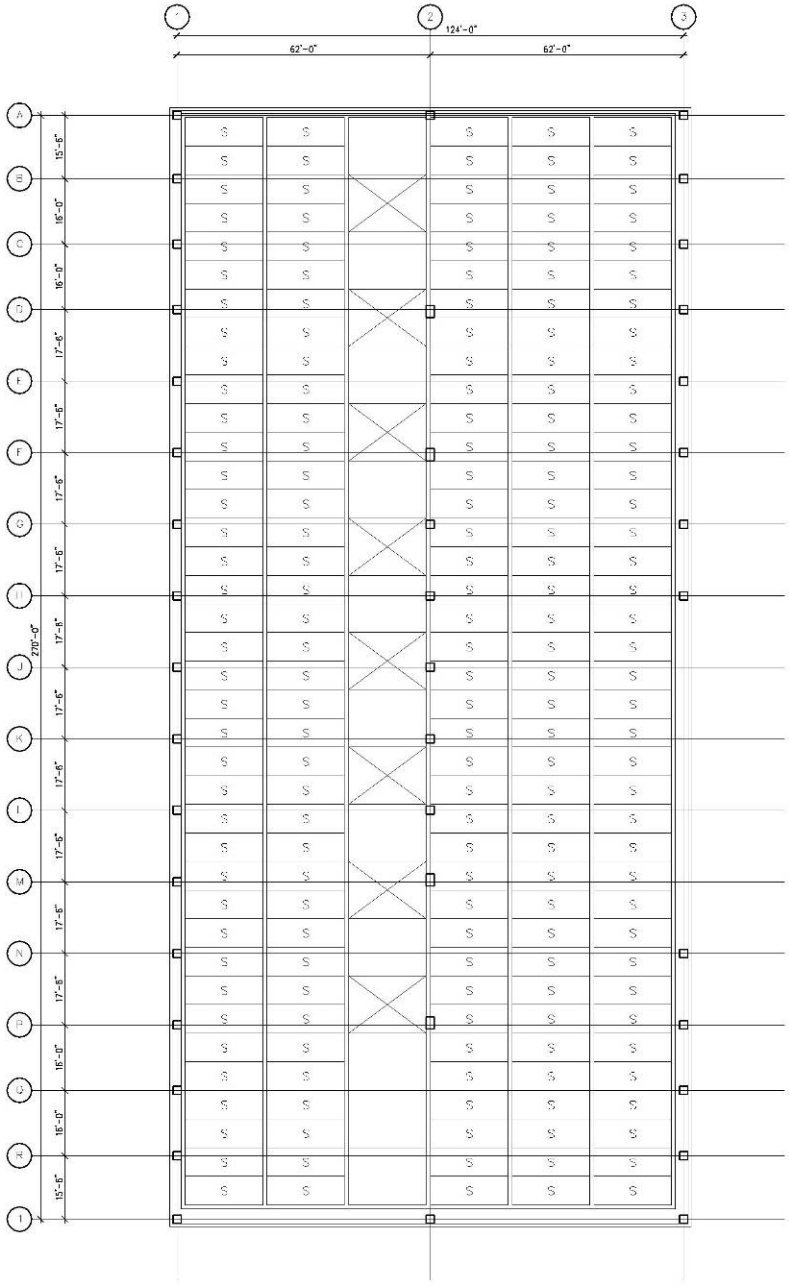



MECHANICAL
SIXTH LEVEL




MECHANICAL
TYPICAL LEVEL (7TH THRU 11TH)

NORTH



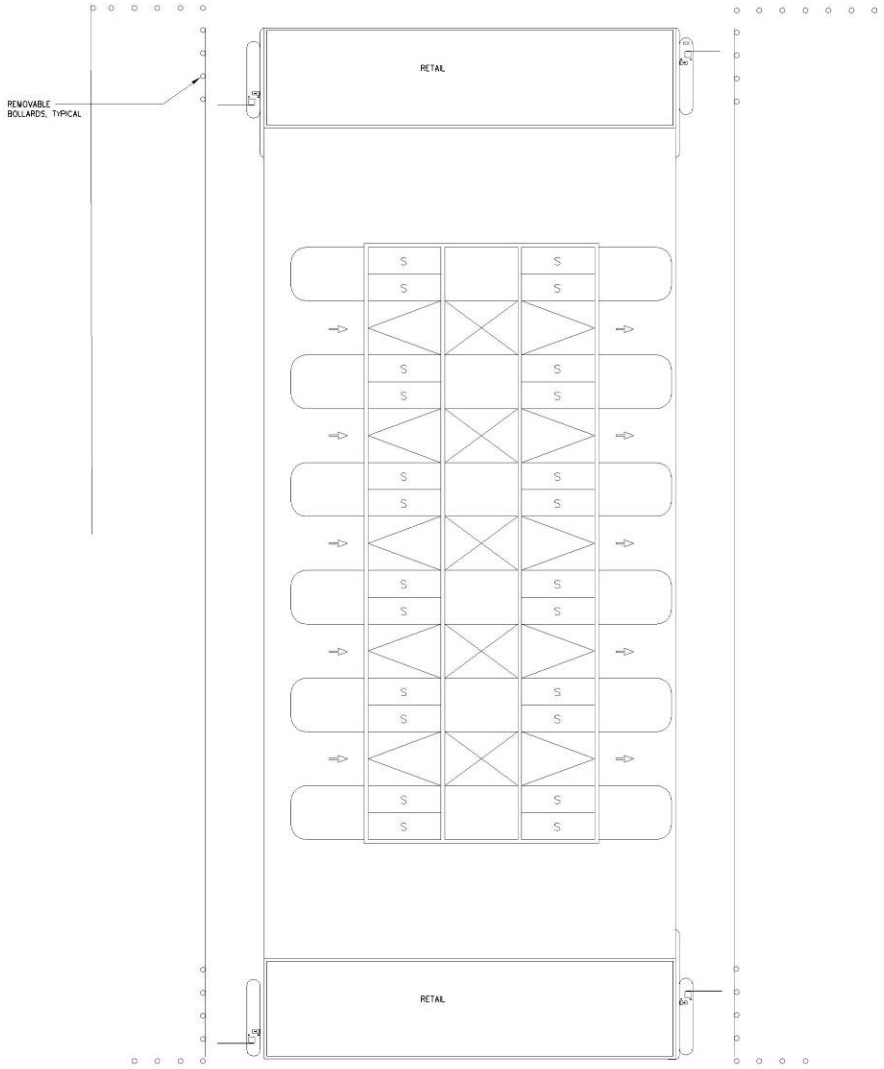

MECHANICAL
TWELFTH LEVEL

NORTH

| TIER | ELEVATION | STANDARD | TOTAL |
|---|---|---|---|
| GROUND | 8'–0" | 24 | 24 |
| SECOND | 15'–0" | 24 | 24 |
| THIRD | 22'–0" | 150 | 150 |
| FOURTH | 29'–0" | 190 | 190 |
| FIFTH | 36'–0" | 190 | 190 |
| SIXTH | 43'–0" | 190 | 190 |
| SEVENTH | 50'–0" | 190 | 190 |
| EIGHTH | 57'–0" | 190 | 190 |
| NINTH | 64'–0" | 190 | 190 |
| TENTH | 71'–0" | 190 | 190 |
| ELEVENTH | 78'–0" | 190 | 190 |
| TWELFTH | 86'–0" | 190 | 190 |
| TOP | 95'–0" | 190 | 190 |
| TOTAL | | 2098 | 2098 |

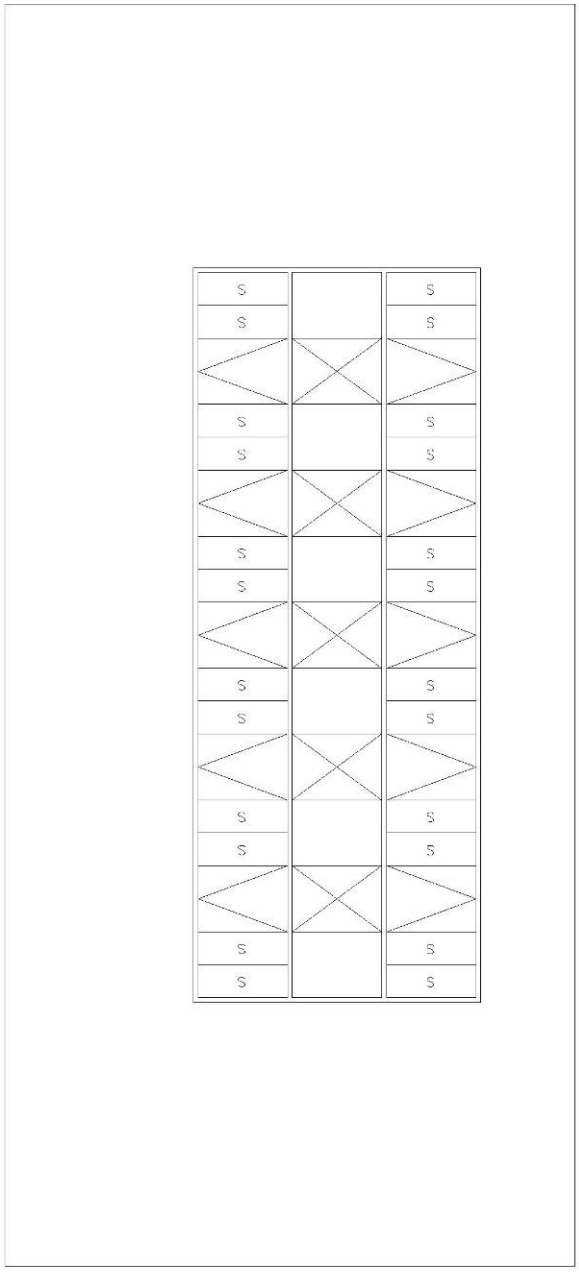
## SCHEME 5/CONCEPTUAL DESIGN ALTERNATIVES

This design provides the maximum parking capacity compared to the other presented schemes. Scheme 5 provides 2,098 parking spaces in a fully mechanized parking structure and includes 5,000 square feet of street-front commercial. This alternative is removed from further consideration because it does not meet Walker's minimum level of service rating for egress until the garage capacity drops to 641 spaces.



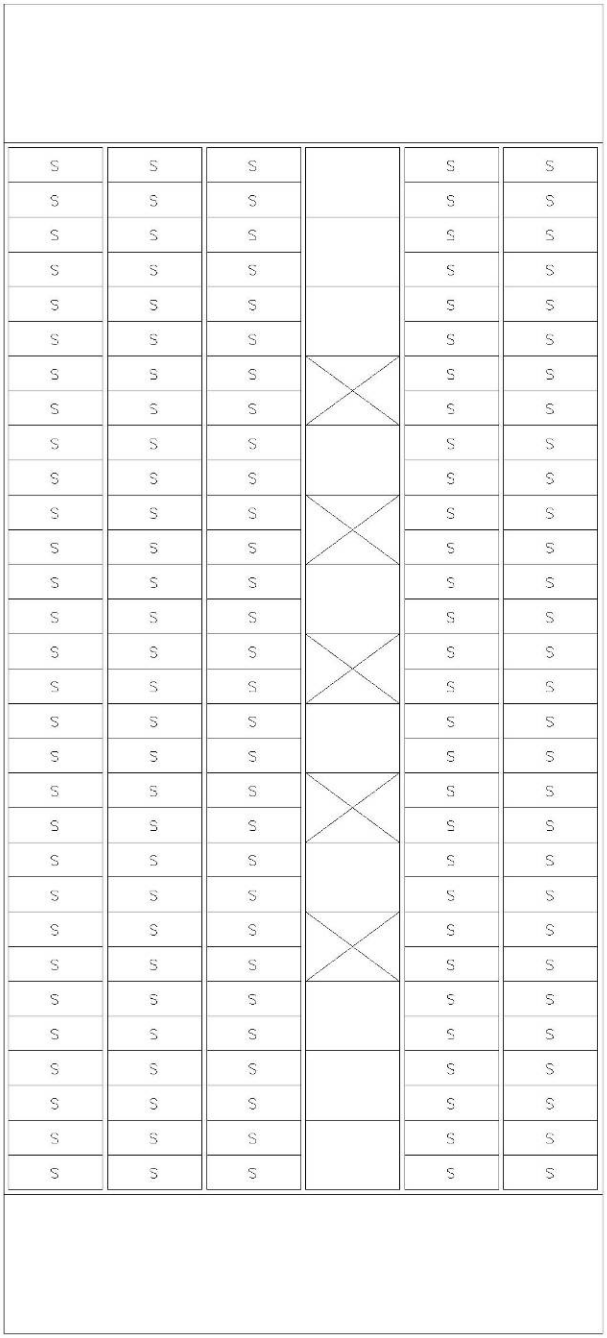

GROUND LEVEL

NORTH



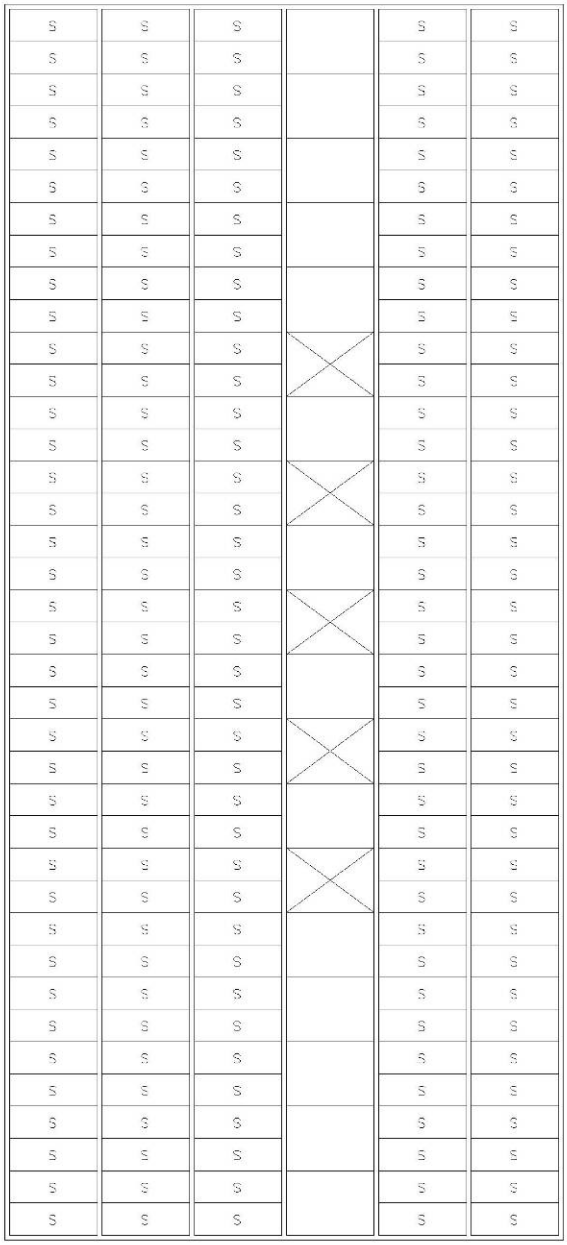
SECOND LEVEL

NORTH



THIRD LEVEL

NORTH



FOURTH THROUGH
THIRTEENTH (TOP) LEVEL

NORTH

# APPENDIX B - COMPARISON OF SCHEMES

TABLE B1: Ten-Year Pro Forma – Scheme 2

| | Year 1 2012 | Year 2 2013 | Year 3 2014 | Year 4 2015 | Year 5 2016 | Year 6 2017 | Year 7 2018 | Year 8 2019 | Year 9 2020 | Year 10 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Operating Revenue | | | | | | | | | | |
| Existing Users | $158,800 | $158,800 | $158,800 | $174,700 | $174,700 | $174,700 | $192,200 | $192,200 | $192,200 | $211,400 |
| Long Term Users | $2,031,800 | $2,031,800 | $2,031,800 | $2,235,000 | $2,235,000 | $2,235,000 | $2,458,500 | $2,458,500 | $2,458,500 | $2,704,400 |
| Short Term Users | $1,780,700 | $1,780,700 | $1,780,700 | $1,958,700 | $1,958,700 | $1,958,700 | $2,154,600 | $2,154,600 | $2,154,600 | $2,370,000 |
| | $3,971,300 | $3,971,300 | $3,971,300 | $4,368,400 | $4,368,400 | $4,368,400 | $4,805,300 | $4,805,300 | $4,805,300 | $5,285,800 |
| Operating Expenses | | | | | | | | | | |
| Personnel | $215,900 | $222,400 | $229,100 | $235,900 | $243,000 | $250,300 | $257,800 | $265,500 | $273,500 | $281,700 |
| Benefits | $171,300 | $176,400 | $181,700 | $187,200 | $192,800 | $198,600 | $204,500 | $210,700 | $217,000 | $223,500 |
| Utilities | $55,800 | $57,500 | $59,200 | $61,000 | $62,800 | $64,700 | $66,700 | $68,700 | $70,700 | $72,800 |
| Supplies | $8,000 | $8,200 | $8,500 | $8,700 | $9,000 | $9,300 | $9,500 | $9,800 | $10,100 | $10,400 |
| Repairs & maint. | $84,400 | $86,900 | $89,600 | $92,200 | $95,000 | $97,900 | $100,800 | $103,800 | $106,900 | $110,100 |
| Operations | $123,000 | $126,700 | $130,500 | $134,400 | $138,400 | $142,600 | $146,800 | $151,200 | $155,800 | $160,400 |
| | ($658,400) | ($678,100) | ($698,600) | ($719,400) | ($741,000) | ($763,400) | ($786,100) | ($809,700) | ($834,000) | ($858,900) |
| Net Operating Income | $3,312,900 | $3,293,100 | $3,272,800 | $3,648,900 | $3,627,400 | $3,605,100 | $4,019,100 | $3,995,500 | $3,971,200 | $4,426,700 |
| Capital Improvements | $0 | $0 | $0 | ($100,000) | $0 | $0 | $0 | $0 | ($500,000) | $0 |
| Debt Service | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) | ($2,814,400) |
| Debt Service Ratio | 1.18 | 1.17 | 1.16 | 1.30 | 1.29 | 1.28 | 1.43 | 1.42 | 1.41 | 1.57 |
| Profit/Loss | $498,400 | $478,700 | $458,300 | $834,500 | $812,900 | $790,700 | $1,204,600 | $1,181,100 | $1,156,800 | $1,612,300 |
| Retained Earnings | $498,400 | $977,100 | $1,435,500 | $2,270,000 | $3,082,900 | $3,873,600 | $5,078,200 | $6,259,300 | $7,416,100 | $9,028,300 |

TABLE B2: Ten-Year Pro Forma – Scheme 2A

| | Year 1<br>2012 | Year 2<br>2013 | Year 3<br>2014 | Year 4<br>2015 | Year 5<br>2016 | Year 6<br>2017 | Year 7<br>2018 | Year 8<br>2019 | Year 9<br>2020 | Year 10<br>2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Operating Revenue | | | | | | | | | | |
| Existing Users | $568,700 | $568,700 | $568,700 | $625,600 | $625,600 | $625,600 | $688,100 | $688,100 | $688,100 | $756,900 |
| Long Term Users | $2,031,800 | $2,031,800 | $2,031,800 | $2,235,000 | $2,235,000 | $2,235,000 | $2,458,500 | $2,458,500 | $2,458,500 | $2,704,400 |
| Short Term Users | $1,780,700 | $1,780,700 | $1,780,700 | $1,958,700 | $1,958,700 | $1,958,700 | $2,154,600 | $2,154,600 | $2,154,600 | $2,370,000 |
| | $4,381,200 | $4,381,200 | $4,381,200 | $4,819,300 | $4,819,300 | $4,819,300 | $5,301,200 | $5,301,200 | $5,301,200 | $5,831,300 |
| Operating Expenses | | | | | | | | | | |
| Personnel | $215,900 | $222,400 | $229,100 | $235,900 | $243,000 | $250,300 | $257,800 | $265,500 | $273,500 | $281,700 |
| Benefits | $171,300 | $176,400 | $181,700 | $187,200 | $192,800 | $198,600 | $204,500 | $210,700 | $217,000 | $223,500 |
| Utilities | $71,500 | $73,600 | $75,800 | $78,100 | $80,400 | $82,900 | $85,300 | $87,900 | $90,500 | $93,300 |
| Supplies | $9,000 | $9,300 | $9,600 | $9,800 | $10,100 | $10,400 | $10,800 | $11,100 | $11,400 | $11,700 |
| Repairs & maint. | $154,800 | $159,400 | $164,200 | $169,100 | $174,200 | $179,400 | $184,800 | $190,300 | $196,000 | $201,900 |
| Operations | $131,300 | $135,200 | $139,300 | $143,500 | $147,800 | $152,200 | $156,800 | $161,500 | $166,300 | $171,300 |
| | ($753,800) | ($776,300) | ($799,700) | ($823,600) | ($848,300) | ($873,800) | ($900,000) | ($927,000) | ($954,700) | ($983,400) |
| Net Operating Income | $3,627,400 | $3,604,800 | $3,581,500 | $3,995,600 | $3,970,900 | $3,945,500 | $4,401,200 | $4,374,200 | $4,346,400 | $4,847,800 |
| Capital Improvements | $0 | $0 | $0 | ($100,000) | $0 | $0 | $0 | $0 | ($500,000) | $0 |
| Debt Service | ($5,239,000) | ($5,239,000) | ($5,239,000) | ($5,239,000) | ($5,239,000) | ($5,239,000) | ($5,239,000) | ($5,239,000) | ($5,239,000) | ($5,239,000) |
| Debt Service Ratio | 0.69 | 0.69 | 0.68 | 0.76 | 0.76 | 0.75 | 0.84 | 0.83 | 0.83 | 0.93 |
| Profit/Loss | ($1,611,600) | ($1,634,200) | ($1,657,500) | ($1,243,300) | ($1,268,100) | ($1,293,500) | ($837,800) | ($864,800) | ($892,600) | ($391,100) |
| Retained Earnings | ($1,611,600) | ($3,245,800) | ($4,903,200) | ($6,146,600) | ($7,414,600) | ($8,708,100) | ($9,545,900) | ($10,410,700) | ($11,303,300) | ($11,694,500) |

TABLE B3: Ten-Year Pro Forma – Scheme 2B

| | Year 1 2012 | Year 2 2013 | Year 3 2014 | Year 4 2015 | Year 5 2016 | Year 6 2017 | Year 7 2018 | Year 8 2019 | Year 9 2020 | Year 10 2021 |
|---|---|---|---|---|---|---|---|---|---|---|
| Operating Revenue | | | | | | | | | | |
| Existing Users | $265,300 | $265,300 | $265,300 | $291,800 | $291,800 | $291,800 | $321,000 | $321,000 | $321,000 | $353,100 |
| Long Term Users | $2,031,800 | $2,031,800 | $2,031,800 | $2,235,000 | $2,235,000 | $2,235,000 | $2,458,500 | $2,458,500 | $2,458,500 | $2,704,400 |
| Short Term Users | $1,780,700 | $1,780,700 | $1,780,700 | $1,958,700 | $1,958,700 | $1,958,700 | $2,154,600 | $2,154,600 | $2,154,600 | $2,370,000 |
| | $4,077,800 | $4,077,800 | $4,077,800 | $4,485,500 | $4,485,500 | $4,485,500 | $4,934,100 | $4,934,100 | $4,934,100 | $5,427,500 |
| Operating Expenses | | | | | | | | | | |
| Personnel | $215,900 | $222,400 | $229,100 | $235,900 | $243,000 | $250,300 | $257,800 | $265,500 | $273,500 | $281,700 |
| Benefits | $171,300 | $176,400 | $181,700 | $187,200 | $192,800 | $198,600 | $204,500 | $210,700 | $217,000 | $223,500 |
| Utilities | $55,800 | $57,500 | $59,200 | $61,000 | $62,800 | $64,700 | $66,700 | $68,700 | $70,700 | $72,800 |
| Supplies | $8,000 | $8,200 | $8,500 | $8,700 | $9,000 | $9,300 | $9,500 | $9,800 | $10,100 | $10,400 |
| Repairs & maint. | $84,400 | $86,900 | $89,600 | $92,200 | $95,000 | $97,900 | $100,800 | $103,800 | $106,900 | $110,100 |
| Operations | $119,900 | $123,500 | $127,200 | $131,000 | $135,000 | $139,000 | $143,200 | $147,500 | $151,900 | $156,500 |
| | ($655,300) | ($674,900) | ($695,300) | ($716,000) | ($737,600) | ($759,800) | ($782,500) | ($806,000) | ($830,100) | ($855,000) |
| Net Operating Income | $3,422,400 | $3,402,700 | $3,382,500 | $3,769,400 | $3,747,900 | $3,725,800 | $4,151,500 | $4,128,100 | $4,103,900 | $4,572,400 |
| Capital Improvements | $0 | $0 | $0 | ($100,000) | $0 | $0 | $0 | $0 | ($500,000) | $0 |
| Debt Service | ($3,116,600) | ($3,116,600) | ($3,116,600) | ($3,116,600) | ($3,116,600) | ($3,116,600) | ($3,116,600) | ($3,116,600) | ($3,116,600) | ($3,116,600) |
| Debt Service Ratio | 1.10 | 1.09 | 1.09 | 1.21 | 1.20 | 1.20 | 1.33 | 1.32 | 1.32 | 1.47 |
| Profit/Loss | $305,800 | $286,100 | $265,900 | $652,800 | $631,300 | $609,200 | $1,035,000 | $1,011,500 | $987,300 | $1,455,800 |
| Retained Earnings | $305,800 | $591,900 | $857,800 | $1,510,600 | $2,142,000 | $2,751,200 | $3,786,100 | $4,797,600 | $5,784,900 | $7,240,700 |

# APPENDIX C - ASSUMPTIONS

## ASSUMPTIONS

When performing a parking market analysis and a preliminary financial analysis there are several factors that are either not definitively determinable, or are based on proposed future conditions which cannot be measured and will likely vary in some degree from the best information available. Because of these factors it is therefore necessary to make assumptions that will aid in guiding the analysis. These assumptions are based on the best available information and are not exhaustive, but do give a framework for the foundation of Walker's analysis. The assumptions used to project parking demand and parking revenue are provided below:

1. Walker assumes that the list of proposed changes to the market from the DAP EIR process, as delivered by W. Riggs on 11/04/08 are accurate and will come to full fruition within the next 3 years.
2. Walker assumes that the demand ratios provided within the MTC Case Study for the City of Berkeley are accurate and will remain accurate for the pro forma period.
3. Walker assumes that the Berkeley Art Museum will be built within the next 3 years and will consist of 150,000 SF. It will necessitate the removal of the existing University Hall Garage.
4. Walker assumes that the University Gateway project will be built and occupied within the next 3 years and will consist of 190,000 SF. Walker has also accounted for the spaces allocated to the first floor retail space in this building. The tenants of the office space will be UC Berkeley faculty and staff and will generate parking at the general office rates provided within the MTC Case Study from Wilbur Smith and Associates. These parkers will pay the UC Berkeley parking rates for their monthly permits. Per W. Riggs, the resulting parking demand from this space will be net new parking for the UC Berkeley parking system.
5. Walker assumes the California Department of Health Services building will be rehabbed and occupied within the next 3 years and will consist of 400,000 SF. The tenants of the office space will be UC Berkeley faculty and staff and will generate parking at the general office rates provided within the MTC Case Study from Wilbur Smith and Associates. These parkers will pay the UC Berkeley parking rates for their monthly permits. Per W. Riggs, the resulting parking demand from this space will be net new parking for the UC Berkeley parking system.
6. Walker assumes that the existing University Well and University Hall West parking lots will be removed for the construction of the University Hall West Parking Garage.
7. Walker assumes that the rate structure provided within the body of the report (which is based on current market rates) will be reasonable at the time the University Hall West Parking Garage opens.
8. Walker assumes that demand will go unaffected if rates are increase by 10% every three years to keep pace with increasing operating expense costs.
9. Walker assumes that operating expenses will increase by 3% annually through the pro forma period. While some line items may not increase, others may increase at a higher rate, but we believe that 3% is reasonable.
10. Walker assumes that the University Hall West Parking Garage will be managed in a way to maximize revenue from market demand and fill other available spaces with UC Berkeley parking demand (which would be charged a subsidized rate).

# APPENDIX D - MARKET RATES

**Center Street Garage**

| Hourly Rates | | |
|---|---|---|
| Period | M-F (exit by 11AM) | M-F (exit by 11AM) |
| Up to 1 Hour | $1.50 | $1.00 |
| 2 Hrs | $1.50 | $3.00 |
| 3 Hrs | $6.00 | $6.00 |
| 4 Hrs | $10.00 | $10.00 |
| Over 4 Hrs | $15.00 | $15.00 |
| Evening Flat Rate (after 5PM) | $5.00 | |
| Overnight Parking Charge | Additional $15.00 | |

| | Sat | Sat (after 2PM) |
|---|---|---|
| Up to 1 Hour | $1.50 | $1.50 |
| 2 Hrs | $1.50 | $3.00 |
| 3 Hrs | $6.00 | $6.00 |
| 4 Hrs | $10.00 | $10.00 |
| Over 4 Hrs | $15.00 | $15.00 |
| Evening Flat Rate (after 5PM) | $5.00 | |
| Overnight Parking Charge | Additional $15.00 | |

| Monthly Rates | |
|---|---|
| Regular Monthly Parking | $150.00 |
| Carpool Parking | $45.00 |

| | |
|---|---|
| Merchant Validations | EZ Park Validation given at Garage Exit |

| Special Events | |
|---|---|
| Football, Basketball, Graduation | Up to $25.00 |

**Allston Way Garage**

| Daily Rates | |
|---|---|
| Per Hour | $2.50 |
| Daily Max - good until closing | $14.00 |
| Early Bird Daily Max - in before 8:30AM out by 6PM, Mon-Fri | $8.00 |
| Evening and Overnight - in after 6PM out by 8AM next day, Mon-Fri | $5.00 |
| Weekend Daily Max | $5.00 |

| Mothly Rates | |
|---|---|
| Regular | $160.00 |
| Reserved | $195.00 |

| Validation Sitckers | |
|---|---|
| Hourly | $250/100 |
| All Day | $280/20 |

# APPENDIX E - ADDITIONAL SCENARIOS ADDENDUM

## ADDITIONAL SCENARIOS

Walker was asked to test additional scenarios based on the Scheme 2B design. The design would be altered slightly to remove possible valet spaces. The following assumptions provided by UCB for the additional scenarios vary from those which were used for prior analysis.

1. Assume 130 spaces and using MTC Study for generation rates based on use for Berkeley Art Museum.
2. Assume 150 spaces for hotel/meeting.
3. Assume actual spaces replaced (260) but indicate what currently valet capacity is (340); ensure all use long-term (LT) rates for University Hall Garage; assume University Well and University Hall West spaces replaced as market, short-term (ST) spaces.
4. Assume for Gateway project static number of spaces generated (200) but indicate what MTC Study generates and rationale – (1) the spaces are not new user demand on system and (2) there is declining permit income; assume 20 spaces for Mike's Bikes within the provisions for ST market spaces.
   *Note: Accommodation rate should be changed and generation rate should be validated in Table 11.*
5. Assume that new garage managed to maximize parking spaces for the University for market demand, and other available spaces filled with market spaces to allow for financing.
   Alternatives:
   - Assume all alternatives height variations for a buildable facility that maximizes university parking.
   - Conventional Garage with Basement (two levels) and roughly 5,000 GSF of ground floor retail.

### *OBJECTIVES*

The new set of objectives were provided as follows (in priority order):

UC Objectives

1. Replace University Hall Structure spaces (LT) 260 spaces
2. Provide for the Gateway
   a. 200 LT spaces
   b. 20 market spaces for Mike's Bikes (included in market provisions below)
3. Provide for LT DHS/other University
4. Market
   a. Art Museum/Cultural Attendees
      - 130 spaces (market rate at MTC generation)
   b. Hotel
      - 150 spaces (market rate per direction)

Other

5. Market Demand
   a. Meeting Attendees/ST for University West/Wells/Gateway
   b. Hotel visitor

c. Game-day, residential, off-peak uses
d. Downtown land use
e. Restaurant patron
f. Retail patron

## *ALTERNATIVES*

The four alternatives that Walker was asked to test are described below:

A. 70 ft or less – Break Even Using Market Pricing
   - 7 full above grade levels
   - Include enough market rate spaces to make financially viable, but no more; the rest should be University spaces added in the priority order listed above, starting with LT spaces for University Hall and the Gateway Building.

B. 70 ft or less – Accommodate all University Objectives
   - 7 full above grade levels
   - Meet all specific UC development objectives first, then if applicable, fill the rest of the capacity with market rate spaces.
     *Note: it is ok if this alternative fails we want to understand how badly it would fail if it met all the University's needs, i.e. how much subsidy it might need.*

C. Height TBD – Break Even and Accommodate all University Objectives
   - Meet specific UC development objectives and still have buildable/viable project; height determined by ability to (1) meet UC objectives and (2) have enough market to be financially viable.

D. 100 ft – Break Even and Accommodate all University Objectives
   - Include enough market rate spaces to make financially viable, but no more; the rest should be University spaces using the objective priorities above.

## *ADDITIONAL SCENARIO FINDINGS*

Walker prepared analyses for the four requested additional scenarios using the assumptions and prioritized objectives given from UCB staff. The analyses have been summarized in Table 17 for comparison purposes.

Table 17: Additional Scenarios Summary

| | ALTERNATIVES | | | |
|---|---|---|---|---|
| FACILITY CHARACTERISTICS | A | B | C/D | E* |
| Floors | 7 | 7 | 10/Top | 10/Top |
| Height | 67'- 6" | 67'- 6" | 99'- 0" | 99'- 0" |
| Total Spaces | 836 | 836 | 1,134 | 1,134 |
| FACILITY DEMAND | | | | |
| Weekday Revenue Sources | | | | |
| UCB LT Spaces | | | | |
| Existing U-Hall | 244 | 260 | 260 | 260 |
| Gateway | 0 | 200 | 120 | 200 |
| DHS | 0 | 356 | 0 | 500 |
| Non-UCB Spaces: | | | | |
| Mike's Bikes | 20 | 20 | 20 | 20 |
| Art Museum | 130 | 0 | 130 | 130 |
| Hotel | 150 | 0 | 150 | 0 |
| Other** | 292 | 0 | 454 | 24 |
| Total Spaces | 836 | 836 | 1,134 | 1,134 |
| Weekend Revenue Sources | | | | |
| Non-UCB LT Spaces | | | | |
| Mike's Bikes | 20 | 20 | 20 | 20 |
| Art Museum | 130 | 130 | 130 | 130 |
| Hotel | 150 | 0 | 150 | 0 |
| Other | 177 | 177 | 177 | 177 |
| | 477 | 327 | 477 | 327 |
| Overnight/Events | | | | |
| Overnight Spaces | 378 | 378 | 378 | 378 |
| Sporting Events | | | | |
| Football Spaces | 189 | 189 | 189 | 189 |
| Basketball Spaces | 215 | 215 | 215 | 215 |
| FACILITY FINANCIALS | | | | |
| Operating Revenue | $3,302,979 | $2,040,785 | $4,065,309 | $2,524,955 |
| Operating Expenses | $574,607 | $574,607 | $580,537 | $580,537 |
| Net Operating Income | $2,728,372 | $1,466,178 | $3,484,772 | $1,944,418 |
| Debt Service | $2,692,787 | $2,692,787 | $3,445,126 | $3,445,126 |
| Coverage Ratio | 1.01 | 0.54 | 1.01 | 0.56 |
| Profit/(Shortfall) | $35,585 | ($1,226,609) | $39,646 | ($1,500,708) |

*Alternative E is an effort to show the financial impact if we attempt to achieve all UCB objectives in order (within a 100' facility). Hotel is not possible due to massive parking demand from DHS site.

**Includes ST parkers from market and from Gateway & DHS site.

*Source: Walker Parking Consultants, 2009.*