

## Chapter 4

# Parking Supply Augmentation Analysis

This chapter examines two possible methods for expanding the public parking supply in Downtown Los Altos. One option is to redesign/restripe the existing parking plazas to improve their overall efficiency and increase the number of available spaces. The second option which was considered is the construction of a new parking garage on one of the parking plazas.

## 4.1 Restriping Analysis

An analysis of each of the parking plazas was performed to explore the potential to add additional parking and perhaps improve overall circulation. The analysis looked at both 9'-wide spaces (the current City standard) and 8.5' foot wide spaces. The use of a 45-degree, 60-degree, and 90-degree parking angle or layout was explored. Currently the plazas are laid out for 45-degree parking. Typically, a 60-degree or 90-degree parking layout would yield a higher number of spaces than a 45-degree configuration.

All of the parking plazas have landscaped islands, which were constructed to match the 45-degree parking space layout. Consequently, simply repainting the parking spaces at either the 60-degree or the 90-degree parking angles will not work with the 45-degree angle landscaped islands. To achieve the desired increase in the number of spaces in each parking plaza, each parking plaza would need to be reconstructed with new landscaped islands at the appropriate angle for the parking layout, so all of the landscaping including the mature trees would need to be removed. In some cases power poles and other physical features would also have to be relocated. There was no one restriping design (i.e. angle of spaces) that was best for all the plazas, so to maximize the number of added spaces, one would need to have a different type of striping in each plaza. Another issue is that many of the reconfiguration options eliminate the loading zones for the adjacent commercial buildings.

The analysis determined that reconfiguring the City's parking plazas could result in creating an additional 75 City-standard 9'-wide parking spaces in all ten of the parking plazas combined, or an average of about 8 spaces per plaza. If the City modified its standard parking space width to 8.5', an additional 134 parking spaces, or about 14 spaces per plaza, could be created. These additional parking spaces would be realized by changing the existing 45-degree parking layout to either a 60-degree or a 90-degree parking layout. The cost to reconstruct each of the parking plazas is approximately \$20.90 per square foot. As shown in Table 4-1 the smaller parking plazas (Plazas 4 or 5) would cost about \$450,000 to reconstruct and the larger parking plazas (Plazas 1, 2, 7, 8, or 9) would cost about \$900,000 to reconstruct. Parking Plaza 6 would cost about \$590,000 to reconstruct and Parking Plaza 3, being the largest plaza, would cost about \$1.7 million to reconstruct.

Table 4-1 also shows the cost for each new space. These costs vary dramatically, ranging from \$41,000 up to almost \$450,000 per new space depending on the characteristics of each of the parking plazas. It is clear from the analysis that reconfiguring the plazas as a means to gain parking will be quite expensive even if the most cost effective plazas solutions (Plazas 4 and 5) are chosen. Detailed layouts and cost analysis of the parking plazas are provided in Appendix 4A.

**Table 4-1 Parking Plaza Reconfiguration Costs (9.0' wide stalls)**

Plaza #	Area (SF)	Total Cost	Cost/Space	Cost/Additional New Space	Net New Spaces
1	42,600	\$890,000	\$6,700	\$148,300	6
2	42,900	\$897,000	\$6,900	\$179,400	5
3	82,200	\$1,718,000	\$11,000	\$101,100	17
4	21,700	\$454,000	\$6,200	\$41,300	11
5	21,900	\$457,700	\$7,200	\$59,900	9
6	28,600	\$597,700	\$8,800	\$199,200	3
7	43,200	\$902,900	\$6,800	\$100,300	9
8	42,800	\$894,500	\$6,600	\$149,100	6
9	43,900	\$917,500	\$6,500	\$458,750	2
10	29,200	\$610,300	\$6,400	\$87,200	7
Total	399,000	\$8,339,600	\$7,367	\$111,195	75

The pavement in the parking plazas are currently in reasonable condition. The existing landscaping is in good health and is not creating any major problems for the pavement areas adjacent to the landscaped islands. The parking plazas could be maintained for at least another ten years with a routine slurry seal of the pavement areas and repainting the parking spaces markings. The cost for this maintenance effort would be significantly less than reconstructing even one of the parking plazas.

Assuming there are no major issues with the pavement structure (asphalt and/or base material under the asphalt) or the underground utilities that pass through the parking plazas which would require a major reconstruction of part or all of a parking plaza and the few number of additional parking spaces that could be realized in each plaza, it would be best to continue the annual maintenance of the parking plazas and not reconstruct the parking plazas until such time that a major issue (pavement failure or underground utility replacement) requires a major reconstruction of a significant portion of a parking plaza.

## 4.2 Parking Garage Estimate

The second approach to adding additional public parking supply would be to construct a parking structure in the downtown area on one of the parking plaza sites. The Downtown Los Altos Public Parking Plazas Opportunity Study took an extensive look at the options for expanding parking via construction of a parking structure. This analysis draws upon information from that study as well as more recent parking structure construction cost information for the Bay Area.

### 4.2.1 Cost of Parking Construction

The cost of supplying parking either in an above ground structure, below grade lot, or as part of a mixed use development will vary around a wide range of factors. If the structure is enclosed or underground then it must be ventilated, which is a major construction and operating expense. While this section focuses primarily on determining the actual costs of parking construction, it is important to consider how construction costs relate to the more general set of factors that comprise the total cost of providing parking. Table 4-2 describes the full range of costs associated with providing parking in a structure or underground garage and details some of the different factors that contribute to each.

**Table 4-2 Components of Parking Facility Cost**

Cost Component	Notes
Land Acquisition Costs	Land costs for a parking facility include the cost of acquisition as well as the costs of securing any easement or additional property necessary to build the parking facility.
Construction	Construction costs will include demolition and site preparation, basic construction costs, and substantial additional costs for improved architectural finishes and landscaping. Construction costs will also increase through contingency costs, contractor's overhead, and cost escalation during the course of construction. Actual construction costs will vary enormously depending on the facility's location, size, whether it is below or above grade, and how many levels it has. The level of aesthetic finishes on the exterior of a parking structure can also significantly increase construction costs.
Planning and Design	Planning and design "soft costs" can include initial demand and planning studies as well as surveying and soils engineering and architectural and structural engineering fees.
Financing Costs	Financing costs will vary depending on the mechanism used to finance construction but can include legal fees, the cost of securing and repaying bonds, the interest on construction loans. Between financing costs and planning and design expenses, Todd Litman of the Victoria Transportation Planning institute estimates that "soft costs" can increase the cost of a parking facility by as much as 30-40% for a standalone project. <sup>33</sup>
Equipment and Furnishings	The level of equipment and furnishings provided within the structure including barrier gates, elevators, ticket spitters, and payment stations can range into the hundreds of thousands of dollars and can affect both the initial cost of a parking facility as well as upkeep and maintenance costs.
Maintenance and Operations	Maintenance and operation costs include cleaning, lighting, maintenance, repairs, security, landscaping, fee collection, enforcement, insurance, labor and administration. Typical costs per space can run anywhere between \$200 for basic maintenance of a surface lot to as high as \$800 per space for a facility with attendants and additional security and lighting needs. <sup>34</sup>

As indicated in Table 4-2, several components can affect the cost of a parking structure. Based on previous studies by CDM Smith, construction cost ranges for various types of parking structures are shown in Table 4-3. These studies examined the cost of providing additional parking to existing lots and/or garages, the cost per space (hard cost only) are provided. It is important to note that these are not actual cost estimates for the City of Los Altos and are given to provide insight into the costs of parking construction.

<sup>33</sup> Litman, Todd, "Transportation Costs and Benefit Analysis: Techniques, Estimates and Implications: Parking Costs." Victoria Transport Policy Institute. [www.vtpi.org/tca/tca0504.pdf](http://www.vtpi.org/tca/tca0504.pdf)

<sup>34</sup> Victoria Transport Policy Institute. Parking Cost, Pricing, and Revenue Calculator. [www.vtpi.org/parking.xls](http://www.vtpi.org/parking.xls)

**Table 4-3 Cost Estimates of Parking Structures**

Facility Structure Type	Cost Per Space (Construction Cost Only)
Surface Lot	\$6,000 - \$9,000
Above grade open parking structure (3-4 levels)	\$20,000 - \$28,000
Above grade ventilated parking structure (3-4 levels)	\$24,000 - \$35,000
Below grade ventilated parking structure (2-3 levels)	\$42,000 - \$58,000

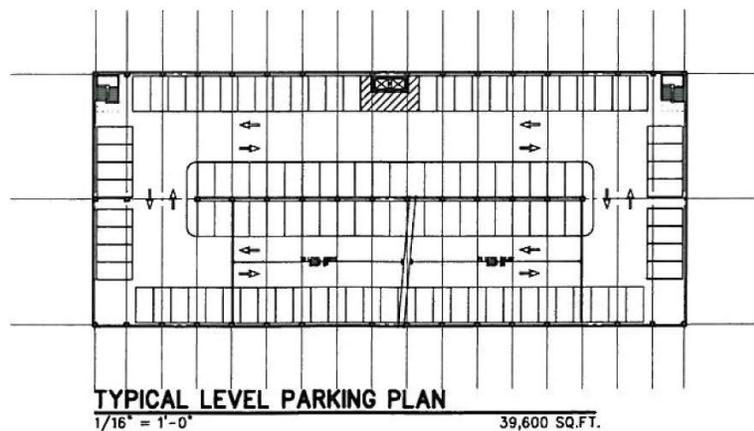
Sources : Los Altos Parking Supply Analysis (2013), Burlingame Parking Structure Analysis (CDM Smith, 2013), Mountain View Downtown Parking Study (2011), Watry Parking Garage Estimator.

### 4.2.2 Estimate for New Parking Garage

The parking demand analysis indicated that there would be a need for long term supply of an additional 141 spaces in the downtown parking district in order to maintain an overall district occupancy of 85 percent.

Table 4-4 summarizes the estimated costs for a hypothetical above ground garage to be constructed on either Plaza 2 or Plaza 7 to meet the needs of the parking deficit projected in the long term parking demand analysis. Figure 4-1 illustrates the typical level parking layout which these estimates were based upon. This structure which has a very efficient floor plan would have 396 total spaces representing a net of 276 spaces if built on Plaza 7, or 278, if built on Plaza 2. It should be noted that the garage that was estimated has three levels of parking in a two-story above ground structure: ground floor, second floor, and one rooftop floor. This structure would be approximately 25 to 28 feet in height.

**Figure 4-1 Typical Level Parking Layout<sup>35</sup>**



<sup>35</sup> Downtown Los Altos Public Parking Plazas Opportunity Study, Figure 21: Public Private Test Cast C.

The total estimated cost for the garage is just over \$10.5 million, with an annualized cost of \$1.170 million over a 30 year estimated financing period. The cost per net new parking space would be \$38,000.

Potential financing mechanisms and funding sources are discussed in sections 5.2 and 5.3.

**Table 4-4 Hypothetical 3-Level Parking Garage Cost Estimate**

	Cost Element	Cost/Details/Rates
<b>Garage details</b>	Description:	Ground level parking plan from Opportunity Study (Plazas 2 or7)
	Spaces/floor	132
	Site Area (SF)	39,600
	New Structure Levels	3
	Total spaces	396
	Ground Floor Ceiling Height	15
	Existing Spaces	120
	Total floor area	118,800
	Total parking spaces	396
	Net Added new spaces	276
	SF/space	300
<b>Construction Costs</b>	Base Construction Costs	\$ 5,906,475
	Base construction cost/SF	\$ 50
	Overhead, contingency, bond, and insurance costs (45%)	45% \$ 2,657,914
	Design and Engineering (18%)	18% \$ 1,541,590
	Escalation (4%)	4% \$ 404,239
	Total Construction Cost	\$ 10,510,268
	Cost/SF	\$ 88
	Cost/Stall	\$ 26,541
	Cost/Net new stall	\$ 38,081
<b>Annualized Costs</b>	Annual maintenance cost for entire structure (\$537.62 annual operating cost/space) 2012 dollars	\$ 537.62 \$ 212,897.52
	Maintenance cost at 30 years	30 \$ 516,758.16
	Annual operating cost per parking space	\$ 1,304.94
	Average annual maintenance cost for 30 year lifecycle (3%)	3% \$ 364,827.84
	Average Annual Debt Service for Capital Cost for 30 Years (6.5%)	6.50% \$ 454,507
	Annualized capital cost (30 years)	\$ 350,342.25
	Annualized total cost (30 years)	\$ 1,169,677.25
<b>Funding Gap</b>	Anticipated additional annual revenue (\$0 per space/year)	0
	Current annual downtown parking revenue (employee permits)	\$ 31,350.00
	Annual Funding gap	\$ (1,138,327.25)
	Percent increase in parking revenue necessary to fund parking structure	3731%

Notes:

1. Plazas 2 and 7 sites originally analyzed for 2009 Opportunity Study.
2. 3 level structure, with 3rd floor of parking on roof.
3. Long Span Structural System and Dual Frame and Wall Support system.
4. High Quality Façade Design

## 4.3 Parking Supply Recommendations

In comparing the two options for parking supply augmentation a number of considerations need to be taken into account. These are indicated in Table 4-5 below:

**Table 4-5 Comparison of Parking Supply Augmentation Options**

Factor	Plaza Reconfiguration	Parking Structure Construction
New Parking Spaces Gained	75	276
Construction Cost per New Space	\$111,000	\$38,000
Location of Parking	Dispersed throughout the Downtown	All in one location
Impacts on Business Loading Access	Impact in several plazas	Impacts in one plaza
Impacts on Landscaping	Requires removal and replanting in all plazas	Impacts in one plaza
Construction Impacts	Plaza reconstruction would have to be phased	Impacts would be all in one plaza
Maintenance Costs	Limited annual expense	Significant annual cost of operations and maintenance

The parking structure option is far more cost effective than the plaza reconfiguration approach and it would yield substantially more new parking spaces. The disadvantages of the parking structure approach is that all the new parking would be in one location. This would mean the benefit would not be spread equally throughout the Downtown. The impacts of the structure in terms of maintaining business loading access, impacts on landscaping and construction impacts would all be confined to one plaza, and mitigations could be developed to focus on those specific issues. A disadvantage of a parking structure is that there are significant cost of annual operation such as utilities, added insurance costs, security costs, and building maintenance costs.

The advantage of the reconfiguring the plazas is that the new parking would be dispersed throughout the Downtown, although most of the additional parking would be in Plazas 3 and 4. The total amount of added parking would be small and would come at a very large cost. The construction impacts of reconfiguring the plazas would be very significant. It would not be practical to do them all at once, so there would be a very long period of construction to complete them all, or even just a few of them. Similarly, the other types of impacts related to plaza reconstruction, such as loading access to business and removal/replacement of landscaping would be felt throughout the Downtown, rather than just in one location.

Consideration of all these factors suggests that the best approach to expanding the parking supply in the Downtown would be to develop structured parking, rather than attempting to gain parking by reconstructing the parking plazas.