

Walkways vs Cars and Bayview Affordability

Hayward Area Planning Association

Research by Sherman Lewis and Leilani Menyweather, 2019

Mini-Parks Plans	Walkways	Cars	Cars + Parking Underneath
ROW width	20	36	36
ROW and parking, square feet	146,060	225,792	225,792
Units	737	624	468
lot cost	\$24,668	\$29,135	\$38,846
housing price 3 BD TH	\$460,800	\$460,800	\$653,437
return on asset @ 10%	\$34.0 million	\$28.8 million	\$30.6 million
Affordability, 120% of median	All units		
Central Park Plans	Walkways	Cars	
ROW width	20	50	
total ROW and parking	161,760	298,000	
Units	742	571	

Executive Summary

In 2019, the City of Hayward is planning to develop “Parcel Group 6.” an old quarry which it owns near Cal State University East Bay Hayward. The main quarry area has 18.8 acres of developable land, on which the City hopes to build about 625 units, including 125 student apartments, 250 condominiums and 250 townhouses. The student apartments would be in “quads” with four-bedrooms.

Few people realize how much ROW (right-of-way) and parking is built for housing. This research quantified what happens when cars take area from housing on the same site. With walkways and reduced parking, there was more housing. There was less car dependency and household living costs (transportation, energy, and living space) would be far lower. The walkways approach was more sustainable and healthier and would have comparable mobility for its markets.

A Walkways Plan like Bayview Village would be more profitable than a Cars Plan. More land in streets and parking means fewer units. Parking underneath meant a higher cost per square foot of living space.

HAPA analyzed the quarry site using a land use design program, Design CAD, to change the ROW (right-of-way) and the units among plans. The areas for parks, setbacks, floorplans,

building height and so on were otherwise kept the same. We first studied two plans based on a central park with 1.5 acres, one with walkways and one with ROW (right-of-way) 50 feet wide.

The **Walkways in a Central Park Plan** had walkways 20 feet wide and 135 parking spaces in a parking lot 50 feet wide. This Walkways Plan held 742 units. The width between facing facades was 30 feet (20-foot ROW and 5-foot setbacks each side).

The **Cars in a Central Park Plan** had a ROW of 50 feet for streets, head-in parking on one side, sidewalks, and landscaping. It had 685 on-street parking spaces and held 571 units, 23 percent fewer than the Walkways Plan. The distance between facades along the streets was 60 feet: 50 feet of ROW and 5 feet setbacks on both sides.

Going from Walkways to Cars increased ROW costs by 97 percent; the greater length of the walkways was more than offset by the greater area of the streets. The Cars Plan increased parking costs by 144 percent. The costs per building were the same, but the Cars Plan with fewer units had a 22 percent lower net revenue than the Walkways Plan.

We then studied two plans based on mini-parks with the same total park area as the central park plans. The **Walkways in Mini-Parks Plan** was based on the Bayview Village project proposed by the Hayward Area Planning Association (HAPA). The Walkways with Mini-Parks used walkways 20 feet wide and a parking lot on one side of the site. It had 737 units and 100 parking spaces. The wall-to-wall width was 30 feet (20 feet of ROW and 10 feet of setbacks).

The **Cars Plan in Mini-Parks Plan** had narrow streets 36 feet wide, allowing ten-foot travel lanes and parallel parking 8 feet wide on both sides. The Cars Plan had 624 units and 660 parking spaces, and held 11 percent fewer units. The wall-to-wall width was 46 feet (36 feet ROW and 10 feet of setbacks). It had an eleven percent lower return on assets than Walkways, other things being equal.

We then added **parking underneath**, the units, one each for two-bedroom condos and two spaces under the townhouses. The building height of three stories, building depth of 32 feet, and living space were retained, so adding parking made the units wider. The number of units was reduced by the available total width for units in the Walkways Plan. The Cars Plan with parking underneath decreased the number of units possible to 468, 37 percent below walkways.

Lot costs went from \$24,700 to \$38,846 per unit, a 58 percent increase.

Using Building-Cost.net, the estimated cost of a three-bedroom townhouse with no parking was compared to one with two spaces underneath. Building costs went from \$199,000 to \$282,000, a 42 percent increase. The price of the townhouse went from about \$461,000 to about \$653,000, also a 42 percent increase.

As a result of the above and other savings, all the units in Bayview are affordable at 120 percent of Alameda County median, using the best data we could find for building and other costs.

Report

Unit Floor Plans

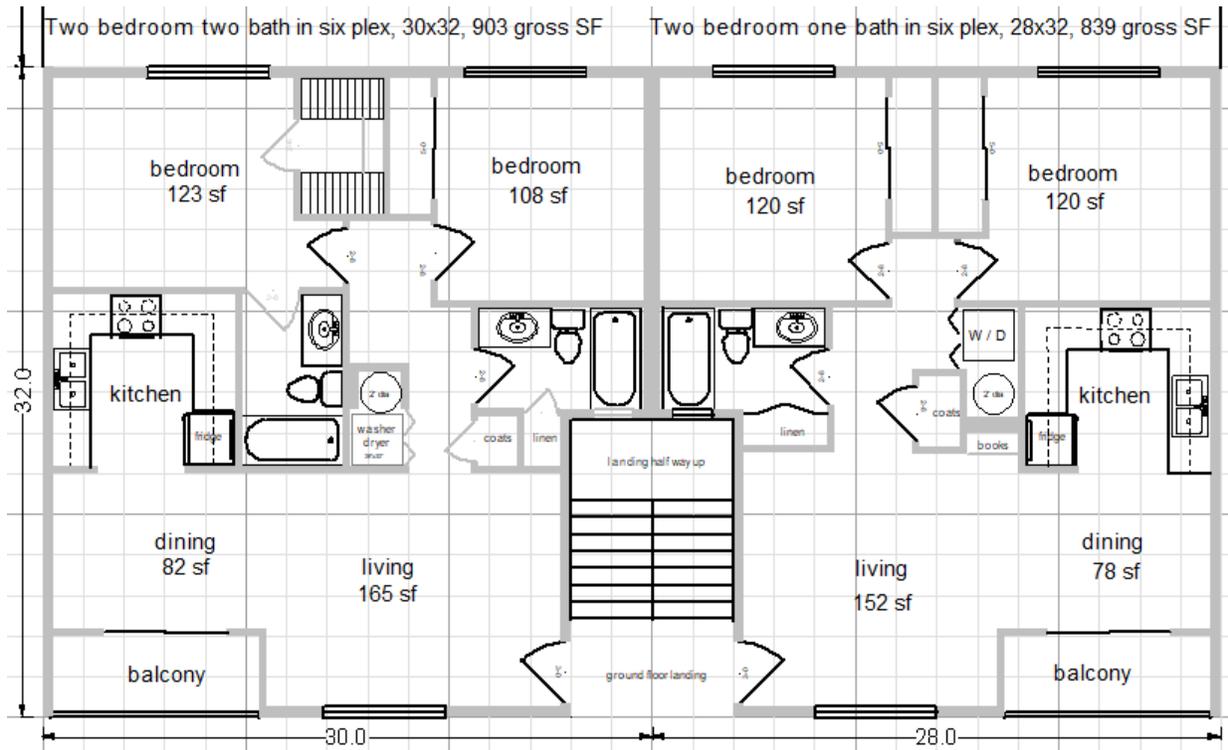
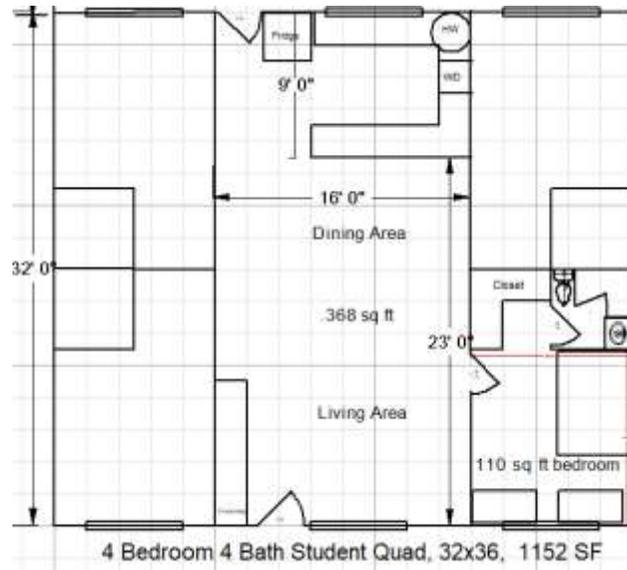
The same building types were generally used in all three Plans. Each building type had a 5-foot setback in front, 32 feet building depth and a 15-foot setback in back, for a uniform total

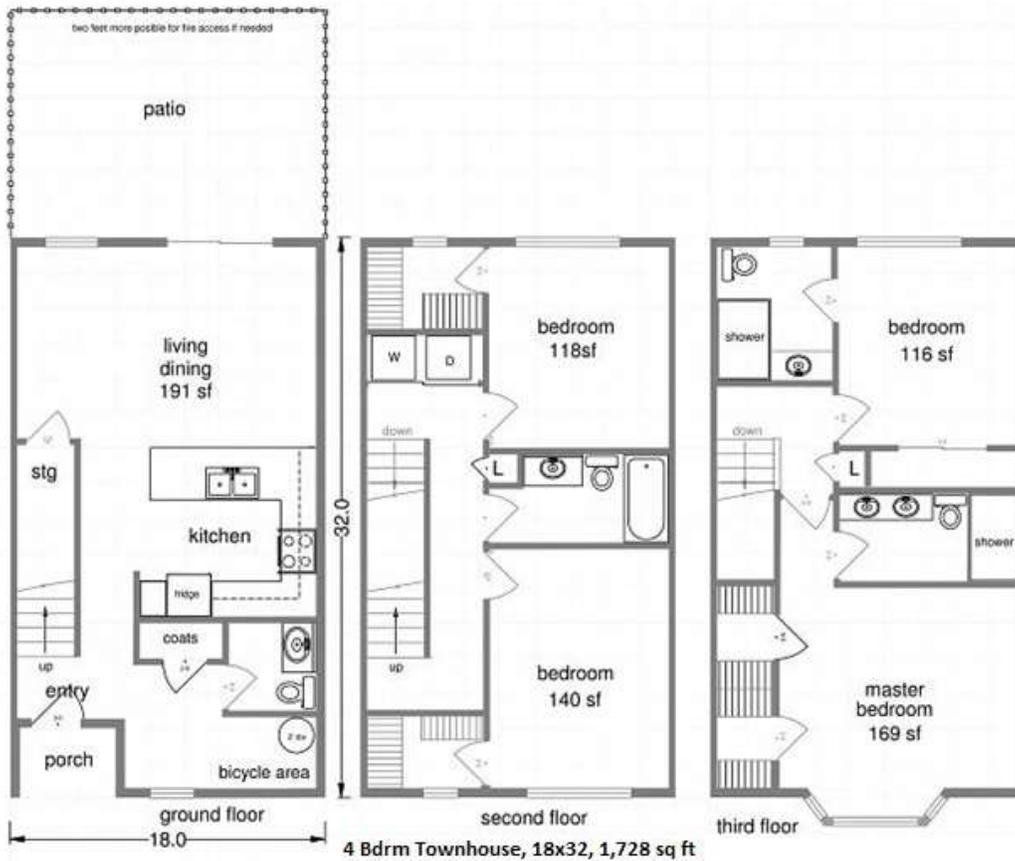
lot depth of 52 feet of each lot. There was no setback on the sides, so the variation of building lots was only in width. The buildings were all three stories high.

The dimensions were:

- Quad apartments in the Cars Plan were 44 feet wide by 30 feet in deep (1,320 sq. ft.). This was changed in the Walkways Plan and parking Underneath Plans to 36 feet wide by 32 feet deep (1,152 sq. ft.).
- Two-bedroom one bath condos were in sixplexes with three condo condos on each side 28 feet wide by 32 feet deep (896 sq. ft.).
- Two-bedroom two bath condos were in sixplexes with three condos on each side 30 feet by 32 feet deep (960 sq. ft.).

- Townhouses were all 32 feet deep, with three bedrooms 16 feet wide, four bedrooms 18 feet wide, and five bedrooms 22 feet wide.







Site Planning

We laid out the building lot areas, streets, parking, and walkways on the sites to try to reach City Planning targets. The City also had ROW estimates from BkF Engineering. They assumed a ROW of 42 feet: four feet of landscaping and four feet of sidewalk on both sides of a street 26 feet wide. We consider the BkF dimensions far too wide for efficient use of land in high density development. The Master Development Plan (MDP) had wall-to-wall widths of 70 feet (42 feet ROW and 28 feet of setbacks) in one drawing and 64 feet (42 feet ROW and 22 feet of setbacks) in the other (Attachment II p. 25).

In following the discussion below, one needs to keep track of several kinds of widths: ROW consisting of travel lanes, sidewalks, and landscaping; parking lanes 8 feet wide for parallel parking; parking spots 8 feet wide and 12 feet deep for head-in parking; set backs between ROW or parking and building facades, and distance between building facades.

For both Central Park Plans, we used a simplified mix of housing types—quads, two-bedroom/two-bath condos, and three-bedroom townhouses. The mix used the ratios sought by the City.

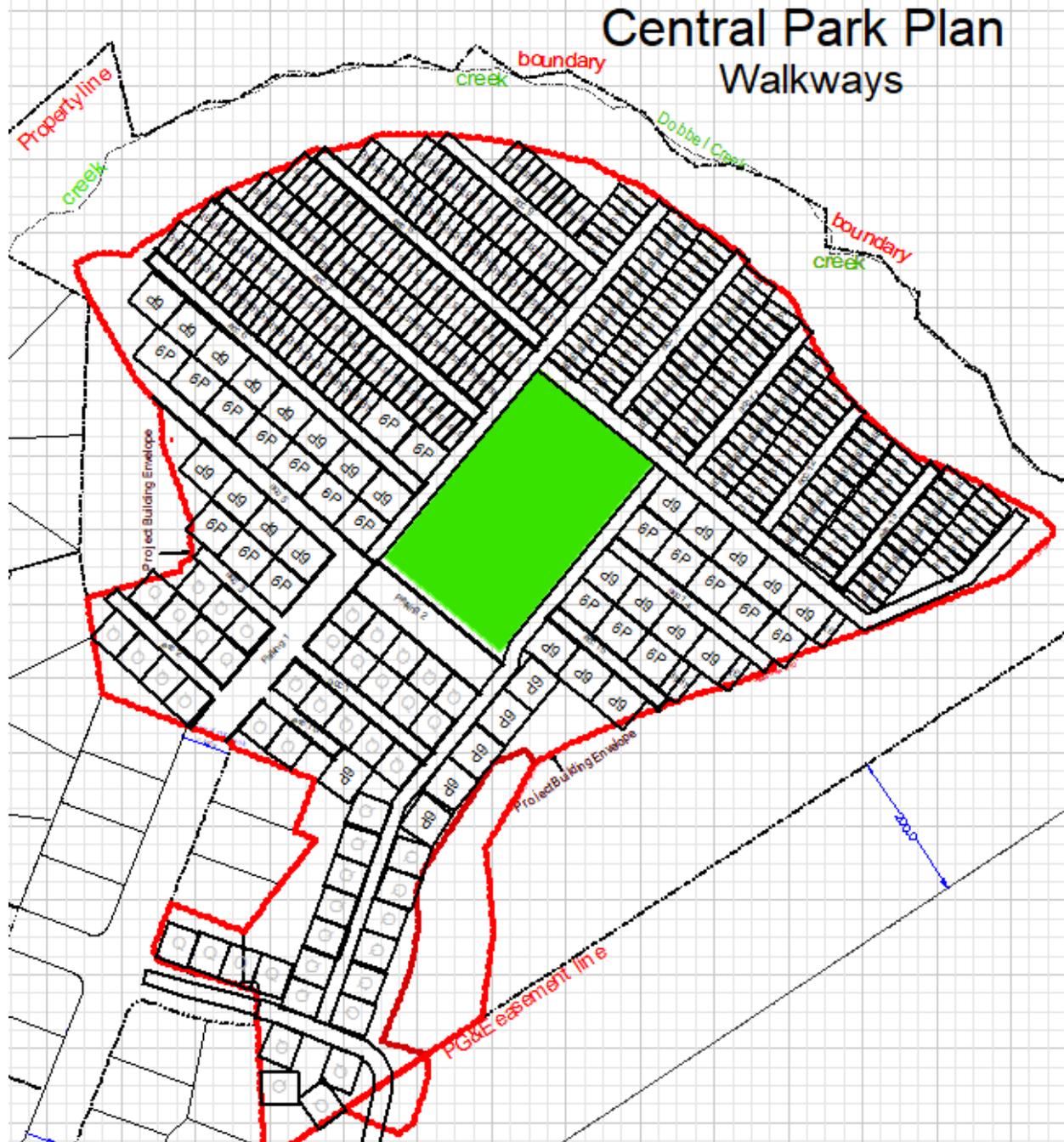
Walkways in Central Park Plan

The walkways were 20 feet wide with no vehicle traffic and no on-street parking. The walkways were wide enough for emergency vehicle access and moving vans. Walkways and building lots were moved around and added to the site, which was able to hold 147 student

apartments, 300 two-bedroom two bath condos, and 295 three-bedroom townhouse units for a total of 742 units.

We put two parking areas with 135 spaces in the Walkways Plan. These areas were 50 feet wide (8 foot by 15-foot parking spaces and 20-foot access aisles) with parking on both sides of the aisles.

Central Park Plan for Walkways



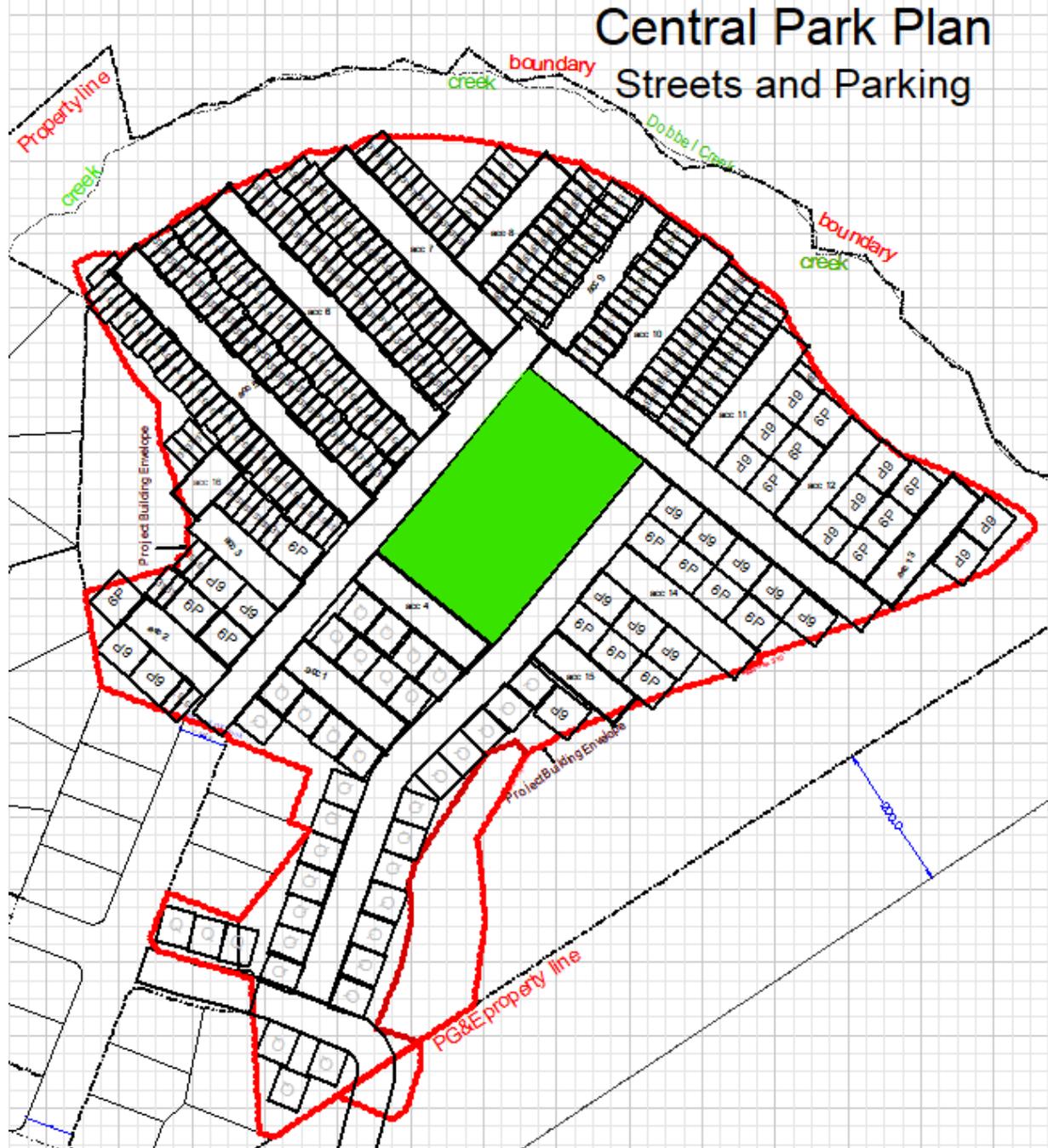
Cars in Central Park Plan

Parking:

- Each quad had 2 parking spots (2 bedrooms had parking; 2 did not).
- Each two-bedroom condo had one parking space per condo.
- Townhouses had one space per townhouse.

Central Park Plan for Cars

Planning parking for the site got complicated. Using BkF dimensions, the ROW was 42 feet wide (26' travel lanes, 4' sidewalk each side, 4' landscaping each side). For parking we added an



eight-foot parking lane, for a total width of 50 feet. Parallel parking takes 20 feet of length compared to 15 feet for head-in. We wanted to get one space per condo and per townhouse, and two spaces per student quad.

Parallel parking did not work. We could meet the need for only 217 spaces when we needed 684. To keep the ROW of 50 feet constant, we shifted four feet of width from sidewalks and landscaping to parking, making the parking 12 feet wide for head-in parking instead of parallel parking.

The goal of this research was to use city expectations in the MDP and BkF estimates to define the Cars Plan. We perhaps should have added 8 more feet of parking lane, parking both sides, with a total width of 56 feet. Instead, we in effect reduced the ROW by 8 feet to allow for parking but also thus allowed more units. If we were to redo the Cars in Central Park Plan, we would use the BkF ROW of 50 feet and add whatever width was necessary for head-in parking which would have reduced the unit count even more.

Head-in parking worked much better. We were able to meet the goal for the townhouses, but the condos and quads were still short of parking, with 314 spaces when 456 were needed.

For aesthetic reasons we ruled out wide parking lots, which would have had to be fairly long and 50 feet wide (15 feet for head-in parking both sides and two 10-foot travel lanes). They increased car-to-unit distance without saving pavement area.

The Cars Plan had 114 student housing apartments, 228 two-bedroom two bath condos and 229 three-bedroom units for a total of 571 units, short of City goals and well below the Walkways in Central Park Plan. Planning for cars reduced the units possible from 742 to 571, a 23 percent reduction.

The reduced number was unable to accommodate parking even after sifting to more parking in the ROW. The Walkways Plan had 135 spaces, only .18 of a space per unit, virtually no parking. The Cars Plan had .95 spaces per unit, a very low number compared to suburban development.

Walkways vs cars					<i>Hayward Area Planning Association</i>			
	Walkways Plan				Cars Plan			
Unit counts	Student housing	condos	Three Bdrm	Total	Student housing	condos	Three Bdrm	Total
city unit target	125	250	250	625	125	250	250	625
achieved count	147	300	295	742	114	228	229	571
Walkways advantage					33	72	66	171
Streets loss of units								23.0%
parking				135				542
parking spaces per unit				0.18				0.95

The Walkways Plan had much less ROW and parking area and lower cost than the Cars Plan. The walkways had 162,000 square feet of paving and the Cars Plan had 298,000, 84 percent more.

BkF estimated the cost of street and parking at \$10 per square foot, sidewalk and landscaping at \$12 per square foot, and concrete curb and gutter at \$30 per linear foot. The combined cost of parking and ROW in the Walkways Plan was \$2.97 million and in the Cars Plan, \$7.77 million, 162 percent more expensive. The main contributor to Cars Plan's higher cost was the price of curbs and gutters.

The building cost per unit remained constant for both Plans:

- student quads \$159 per square foot
- condos \$150 per square foot
- townhouses \$163 per square foot

The Walkways Plan with more buildings had a higher cost for all buildings at \$142 million than the Cars Plan at \$109 million. The higher unit count also generated higher gross revenue.

Assuming a 10 percent return, the Walkways Plan would generate \$14.5 million return on assets and the Cars Plan, \$11.7 million. Overall, the Walkways Plan would generate 19 percent more return on assets.

Walkways vs Cars in central Park financial analysis							
	Walkways Plan				Cars Plan		
Category	Units	Unit cost	Qty	Amount	Unit cost	Qty	\$ Amount
Right-of-way							
Walkways	SF	\$10	134,760	\$1,347,600			
Street					\$10	107,280	\$1,072,800
Concrete curb and gutter					\$30	47,680	\$1,430,400
Sidewalk					\$12	47,680	\$572,160
Landscaping					\$12	47,680	\$572,160
Total Row				\$1,347,600			\$3,647,520
Parking	SF	\$10	27,000	\$270,000	\$10	47,680	\$476,800
Total quantity			161,760	\$2,965,200		298,000	\$7,771,840
Percent increase Cars over Walkways						84%	162%

Buildings							
Student quads	SF	\$159	169,344	\$26,869,248	\$159	131,328	\$20,837,376
Condos	SF	\$163	288,000	\$46,944,000	\$163	218,880	\$35,677,440
Townhouses	SF	\$150	453,120	\$67,968,000	\$150	351,744	\$52,761,600
Total Building			910,464	\$141,781,248		701,952	\$109,276,416
Total Cost				\$144,746,448			\$117,048,256
Cost Per SF				\$195			\$167
Gross margin analysis assuming 10% return				\$14,474,645			\$11,704,826
Cars decrease in net revenue							19.1%
This analysis varies only the unit count and right of way. Walkways, busway, streets all use pervious paving. Unit cost per SF varies from \$175 to \$190.							

The Mini-Parks Plan

The Mini-Parks Plan for Walkways and Cars had several parks dispersed to make more efficient use of the site than the Central Park Plan, and to make it easier for residents to reach parks. The mini-parks had same total area as the central park. The Walkways Plan had a Palisade building with studios and one-bedrooms, a busway, and a Community Center, which remained the same in the two Plans. The Bayview original Plan was revised to add student quads, swapping out other unit types and maintaining the City's target ratio among the unit types. The Plan had one-bedroom/one-bath condos and two-bedroom/two-bath condos, and three, four-and five-bedroom townhouses. As a result, this Plan had eight-unit types. The only things that changed between Walkways and Cars were the ROW and, as a result, the units.

Walkways in Mini-Parks Plan

The Mini-Parks Plan had walkways 20 feet wide and a parking lot for 100 spaces on one side of the site. We allocated the unit types along the streets using the City's target ratios for

unit types. In the Mini-Parks Walkways Plan, the walkways helped reduce walking distances. The length of the walkways was 6,303 feet. At 20 feet wide, there were 126,000 square feet of ROW area.

Cars in Mini-Parks Plan

The Mini-Parks with Cars Plan had 20-foot-wide streets with 8 feet for parking on both sides for a ROW 36 feet wide. We allocated the unit types along the streets using the City's target ratios for unit types. parking had 660 spaces based on parallel parking spots 19 feet long for 592 units. The condos and townhouses got one space per unit and the student housing got 1.5 spaces per quad.

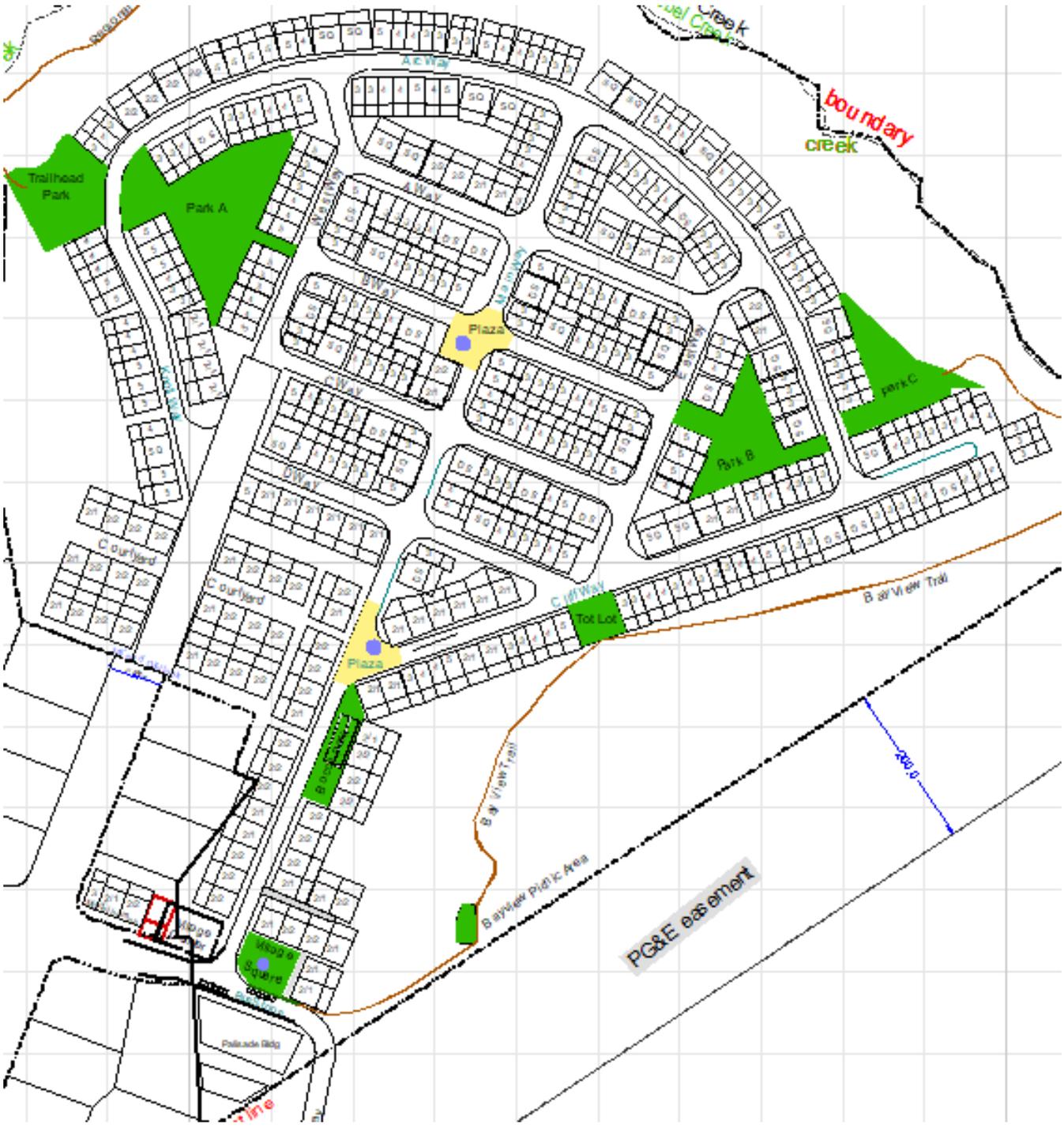
The Mini-Parks Cars Plan with only street parking had less parking than most smart growth, which typically has street parking and parking underneath. parking underneath with stacked parking (one car behind the other) can have a narrow floor Plan width. Side-by-side parking requires more width, e.g., 24 feet, often located in the back of the building and accessed from an alley. The width of two-car parking in back allows some limited ground floor living space in front. A second floor typically has living, dining, kitchen and laundry, and the top floor would have two or three bedrooms.

Unit count. The City target was 625 units. The Cars Plan fell short at 592 units, while the Walkways Plan approach achieved more than the target, 665 units. The Cars Plan had 11 percent fewer units than the walkways approach.

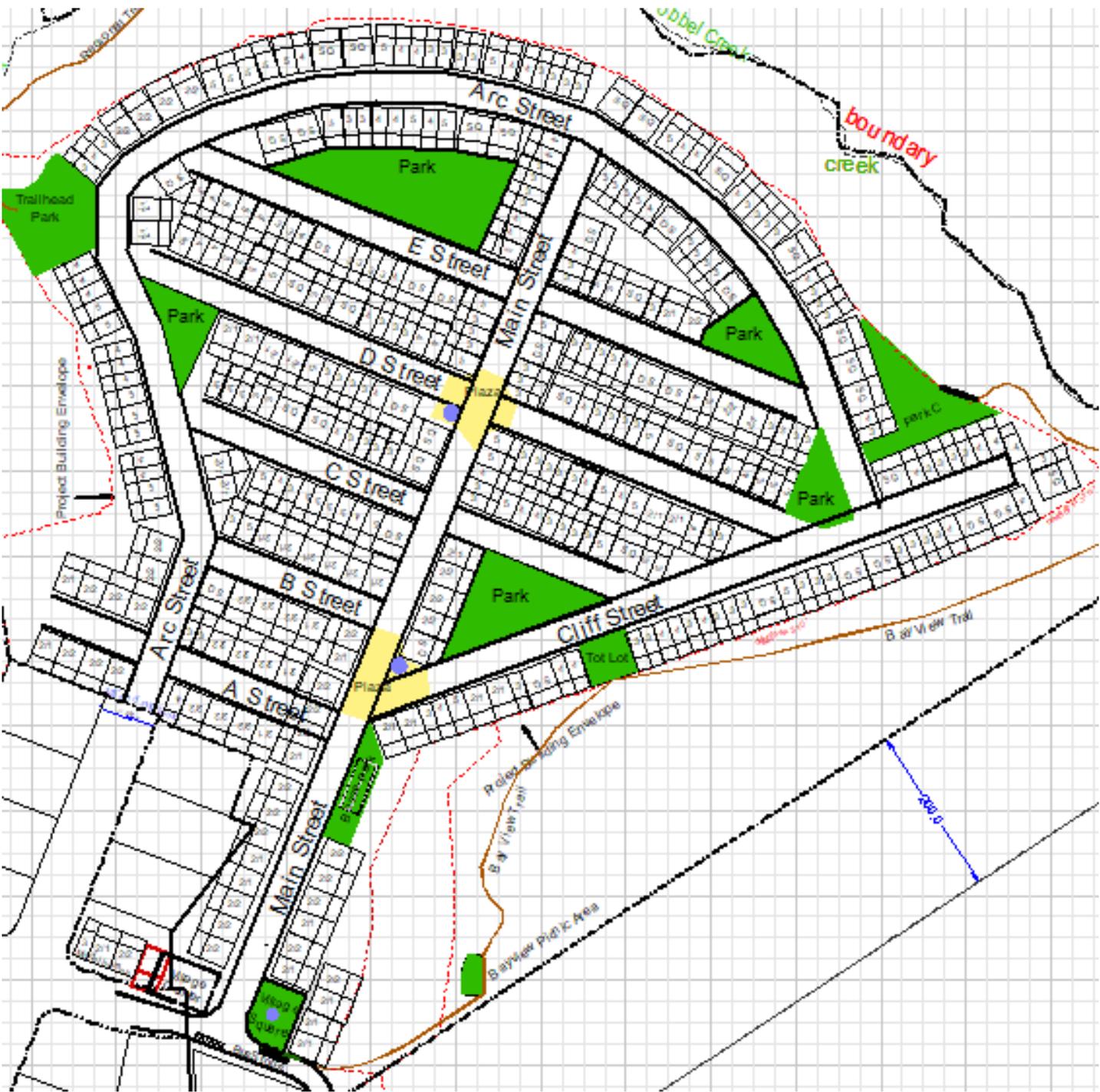
ROW length and area. ROW is usually 40 feet wide or more. The Mini-Parks Plan for Cars had only 36-foot-wide streets. We eliminated one east-west walkway/street and two north-south walkways/streets because they were not needed and we could use the space for units. The length of the streets in the Cars Plan was less, 6,272 feet, with area of 226,000 square feet. The wider ROW for cars more than offsets the shorter length, and resulted in a 79 percent increase in costs for cars, \$2.26 million compared to \$1.26 million for Walkways.

Costs. We made estimates of the cost of buildings and ROW, leaving out other costs because they did not differ much between the two Plans. For ROW, we assumed the same \$10 cost per square foot for pervious paving, with the difference in cost due to different lengths and widths. Since the units were identical except for their number, the difference reflected the greater number of units for the walkways. Building cost per square foot varied by unit type from \$160 to \$190. The Cars Plan decreased the gross margin by 11 percent.

Mini-Parks Plan for Walkways



Mini-Parks Plan for Cars



Mini-Parks, Walkways vs Cars				Hayward Area Planning Association			
Unit counts v Unit types ->	Two Bdrm One Bath	Two Bdrm Two Bath	Three Bdrm	Four Bdrm	Five Bdrm	Student housing	Total
City Planning targets	250 condos		250 townhouses			500 beds	
Applied to floor Plans	121	129	138	66	46	125	625
achieved unit counts							
Walkways units	129	135	149	70	47	135	665
Cars units	114	126	129	61	42	120	592
Increase with Walkways	15	9	20	9	5	15	73
Percent decrease with Cars							11%

Walkways Financial analysis					
Cost estimates	ROW	Buildings	Total	Cost Per SF	Gross margin
Walkways	\$ 1,260,600	\$ 151,712,256	\$ 152,972,856	\$ 180	\$ 15,297,286
Parking	\$ 2,257,920	\$ 134,617,440	\$ 136,875,360	\$ 182	\$ 13,687,536
Decrease in gross margin with Cars					11%
Gross margin assumes 10% return on total cost					

Parking underneath estimate

Parking underneath compared the Mini-Parks Walkways Plan to the Mini-Parks Car Plan with wider buildings due to parking underneath. We looked first at wider buildings and then at wider ROW.

The average parking garage area for two cars is 26 by 26 feet, but they can be as small as 20 by 20. We assumed an area 24 feet square. For three-story townhouses, the area for parking underneath was added to the total living area and divided by three to get the ground floor area. Since the buildings were all 32 feet deep, the width of the new building was the ground floor area divided by 32 feet. This also worked for the four-bed and five-bed townhouses.

The three-bed townhouse had a problem. Adding parking of 576 square feet (24x24) created a total unit area of 2,112 square feet. Dividing by three for the ground floor area yielded 704 square feet, and then dividing by 32 feet for the depth of the building yielded a width of 22 feet when we were aiming for 24 feet, but still room for two spaces 11 feet wide. So, we made depth a little deeper, 26 feet, just.

Getting two spaces per two-bedroom condo was not possible, because the design had identical floor Plans three stories high. We did not solve this problem but made a hypothetical estimate for one car per condo and with a width of 36 feet for three.

The analysis was based on calculations of building widths and ROW distances, so no revision of the Plan was needed. parking underneath decreased the number of units possible on the same ROW. The decrease in units was calculated based on the increased width of buildings with parking and the length of the available ROW.

Parking Underneath Analysis				Hayward Area Planning Association			
Decrease in units	Width with no parking	# of units	Total width	Width with parking	Resulting # of units	Garage area/unit	Garage as % of unit
2 bed 1 bath condos	28	156	4,368	37	118	288	24%
2 bed 2 bath condos	30	180	5,400	39	138	288	23%
3 bed townhouses	16	185	2,960	22	135	576	27%
4 bed townhouses	18	88	1,584	24	66	576	25%
5 bed townhouses	22	61	1,342	28	48	576	21%
Units/ decrease in units		670			505	-25%	

The number of units possible was reduced from 670 to 505, a reduction of 33 percent. The garage as a percent of the unit area ranged from 21 percent to 27 percent.

Parking underneath increased building costs. The Craftsman Book Company site, Building-Cost.net, based on its 2019 National Building Cost Manual, was used to estimate building costs for the three-bedroom townhouse. We generally assumed a standard home with class 4 quality for both living space and living plus garage estimates (<http://wsip-184-185-152-244.sd.sd.cox.net/CornersType.asp>). The site calculates building costs based on number of foundation corners, area, area of third floor, location, area of garage and 32 items of cost (excavation, etc.). Building-Cost.net indicated that garage space cost more than living space.

The building cost for a three-bedroom townhouse with no parking was \$199,000. The cost for the townhouse with garage area treated as living area was \$256,000, an increase of 29 percent. The cost with the garage area treated as garage was \$282,000, an increase of 42 percent.

Parking Underneath Financial Analysis				
Three-bedroom townhouse	Floors	Width	Depth	Area
With 576 sq. ft. of parking	3	22	32	2,112
With no parking underneath	3	16	32	1,536
Building cost increases	total cost	cost increase	cost/sq. ft.	cost increase
With parking cost as parking	\$282,003	42%	\$184	42%
With parking at cost of living space	\$255,584	29%	\$166	29%
With no parking	\$198,867		\$129	

Wider streets and parking underneath

Wider streets plus parking underneath reduced the number of units to 446, 33 percent fewer than with walkways and no parking underneath.

Similarly, the **lot cost** per lot went up with fewer units. The decrease in units caused by parking underneath meant that the cost per lot increased. The City agreed to pay Caltrans

\$18,180,000 for the quarry if it exercised its option. With 665 units, the cost per lot would be \$27,338; with 446, cost per lot would be \$40,762, or 49 percent more.

The price of a three-bedroom townhouse went from \$460,800 to \$653,437, an increase of 42 percent. For five-bed townhouses, parking and wider streets increased the cost by 34 percent. Four-bed townhouses could be expected to increase by 39 percent more expensive and two-bed condos to increase by about 44 percent.

Given the uncertainty of cost estimates, the relationships among the estimates is more important than the exact amounts.

Housing affordability

All seven for-sale unit types in Bayview Village, on which the Mini-Parks for Walkways Plan is based, are affordable for moderate income households. Moderate income is 80 to 120 percent of median income. The studio, one-bedroom, two-bedroom/one bath, two-bedroom/two bath, three-bedroom, and four-bedroom townhouses are also even affordable to low income.

Housing affordability income levels are defined by HUD for Alameda County for five income levels and eight household sizes:

Section 6932. 2019 Income Limits

County	Income Category	Number of Persons in Household							
		1	2	3	4	5	6	7	8
Last page instructs how to use income limits to determine applicant eligibility and calculate affordable housing cost and rent									

Alameda County Area Median Income: \$111,700	Extremely Low	26050	29750	33450	37150	40150	43100	46100	49050
	Very Low Income	43400	49600	55800	61950	66950	71900	76850	81800
	Low Income	69000	78850	88700	98550	106450	114350	122250	130100
	Median Income	78200	89350	100550	111700	120650	129550	138500	147450
	Moderate Income	93850	107250	120650	134050	144750	155500	166200	176950

Housing expense includes mortgage, HOA fees, taxes, and insurance. The spreadsheet data below is based on several other pro formas that estimate housing prices and mortgage costs assuming 10 percent down. The HUD spending limit is 35 percent of income.

Units	Gross sq. ft	Price/unit	Price/sq. ft	# units	HOA fees/month	Taxes	Insurance	All 3
Studio	480	\$ 157,200	\$ 328	6	\$238	\$212	\$47	\$ 497
One bedroom	576	\$ 187,200	\$ 325	26	\$241	\$254	\$49	\$ 545
Two-bedroom one bath	896	\$ 283,733	\$ 317	156	\$186	\$391	\$52	\$ 629
Two-bedroom two bath	960	\$ 302,400	\$ 315	180	\$187	\$417	\$55	\$ 659
Three-bedroom	1,536	\$ 460,800	\$ 300	185	\$217	\$641	\$57	\$ 915
Four-bedroom	1,728	\$ 509,760	\$ 295	88	\$226	\$710	\$60	\$ 997
Five-bedroom	2,112	\$ 601,920	\$ 285	61	\$242	\$840	\$64	\$1,146

Bayview Village and HUD limits								
Loan terms:	10% down	interest rate:	3.5%	term:	30	years	HUD/City limit	
unit type	down	principal	mortgage/ month	all 3	housing/ month	H'd size	Moderate income	Low income
studio	\$ 15,720	\$ 141,480	\$ 635	\$ 497	\$ 1,132	1	\$ 2,737	\$ 2,013
One-bedroom	\$ 18,720	\$ 168,480	\$ 757	\$ 545	\$ 1,301	2	\$ 3,128	\$ 2,300
Two-bdrm/ one-bath	\$ 28,373	\$ 255,360	\$ 1,147	\$ 629	\$ 1,775	3	\$ 3,519	\$ 2,587
Two-bdrm two-bath	\$ 30,240	\$ 272,160	\$ 1,222	\$ 659	\$ 1,881	3	\$ 3,519	\$ 2,587
Three-bdrm	\$ 46,080	\$ 414,720	\$ 1,862	\$ 915	\$ 2,777	4	\$ 3,910	\$ 2,874
Four-bedroom	\$ 50,976	\$ 458,784	\$ 2,060	\$ 997	\$ 3,057	5	\$ 4,222	\$ 3,105
Five-bedroom	\$ 60,192	\$ 541,728	\$ 2,433	\$1,146	\$ 3,579	6	\$ 4,535	\$ 3,335
						7	\$ 4,848	\$ 3,566
						8	\$ 5,161	\$ 3,795

Parking and Housing Affordability, 1999- 2018

Jia and Wachs. Wenyu Jia and Martin Wachs. 1999. "Parking Requirements and Housing Affordability: Case Study of San Francisco." *Transportation Research Record: Journal of the Transportation Research Board*. <https://doi.org/10.3141/1685-20>. In a case study of six neighborhoods in the city of San Francisco, the influence on housing affordability of code-required parking was studied. The analysis revealed that single-family houses and condominiums were more than 10 percent more costly if they included off-street parking than if they did not. Based on the selling prices and the distribution of incomes of San Francisco residents, it was estimated that tens of thousands of additional households could qualify for home mortgages for units without off-street parking if those units could be provided legally under zoning and subdivision ordinances.

Lehe. Lewis Lehe. 2018. "Minimum parking requirements and housing affordability." *Journal of Transport and Land Use* 11:1 pp. 1309–1321. <http://jtlu.org>. A growing consensus argues that minimum parking requirements (MPRs) make housing more expensive. This paper examines two claims from this discussion: (1) that MPRs discourage the construction of small units; (2) that the costs of building required parking are "passed on" to buyers and renters in the form of higher prices and rents. We propose that MPRs discourage small units because they eliminate the most profitable floorspace/parking bundle to supply to relatively lower-income households. We propose that parking costs may be passed on by reducing the supply of housing on offer at a given price.

The supporting spreadsheets are available from Sherman Lewis at sherman@csuhayward.us.

Leilani Menyweather is a 2019 graduate from CSUEB Hayward with a major in real estate finance and worked as an intern with the Hayward Area Planning Association.