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Memorandum

To:Waterfront District Specific Plan TeamFrom:Josh Lathan and Matthew GerkenDate:May 31, 2016Subject:Parking Study

INTRODUCTION

The City of Suisun City is planning for increased development through preparation of the Waterfront District Specific Plan (Specific Plan). The Specific Plan describes the City's long-term vision to increase housing, retail, and employment opportunities, and maximize the City's proximity to the Capital Corridor train depot, providing commuter access to employment centers in the Bay Area and Sacramento regions.

The planned housing, retail, and office growth in the Specific Plan Area will increase demand for parking options beyond the existing capacity. This parking study presents the results of a shared parking analysis that considers opportunities to reduce total parking requirements by leveraging the varying time-of-day parking demand periods of different land uses. The result is a more nuanced estimate of total parking needed to support the amount and location of development envisioned in the Specific Plan through consideration of the compact, walkable character of the parking study area, the City's access to regional transit options, and a reduction in household car dependence based on increased residential densities. The study finds that under full buildout of the Specific Plan, existing parking supply is insufficient to meet demand from future development, even when shared parking opportunities are taken into consideration, and concludes with long-term recommendations for developing the necessary parking supply over time as the Specific Plan's vision is implemented.

STUDY AREA AND SCOPE

The study considered parking supply and demand in three adjacent districts of the Specific Plan Area, as shown in Figure 1. The parking districts represent areas where infill development will be focused in implementing the Specific Plan, and an area that would be walkable and potentially supportive of shared parking opportunities, such as varying time-of-day demands from different land uses and captive trips (e.g., employees parked in the area who walk to retail and restaurants during breaks).



Figure 1 – Study Area and Parking Districts



This parking study focuses on the downtown commercial core of the City – the area where shared parking could make the most sense. We did not focus on the 30-acre property, assuming that this property would include surface parking to accommodate future demand on this site. We also did not focus on residential areas, assuming that parking is provided in garages, in driveways, and on the street in these areas.

LAND USE ASSUMPTIONS

Future parking demand was calculated based on land use locations and amounts described in the Specific Plan. For purposes of this analysis, land uses were organized into six categories:

- Retail
- Restaurant



- Office
- Hotel
- ▶ Theater
- Higher-Density Residential

Table 1 shows the total development assumptions (i.e., existing plus new development under the Specific Plan) used in the parking study. Land use values are expressed in the units used to calculate parking demand. Retail, restaurant, and office uses are described in total square feet of building space; the hotel land use is described in total rooms; the theater land use is provided in total seats; and, the higher-density residential use is shown in total dwelling units. It should be noted that the hotel land use assumes a second hotel will be developed equal in size to the existing Hampton Inn & Suites hotel in the parking study area.

Land Use	Units	District 1	District 2	District 3	Total
Retail	sq ft	95,800	190,800	72,900	359,400
Restaurant	sq ft	101,300	79,800	30,500	211,500
Office	sq ft	134,700	184,700	37,500	356,900
Hotel	rooms	204	0	0	204
Theater	seats	0	0	175	175
Higher-Density Residential	units	190	241	45	476

Table 1 – Land Use Assumptions

Note: sq ft = square feet

ESTIMATE OF PARKING DEMAND

This study followed the shared parking calculation guidance provided in the Urban Land Institute (ULI) *Shared Parking,* Second Edition report. Accordingly, a project's base parking demand is calculated first using parking demand rates specific to each land use. The base demand is then refined using seasonal and time-of-day demand variables to estimate total peak parking demand under a shared parking scenario. The following sections describe the parking demand factors used in this study, results of the base parking scenario, and shared parking opportunities resulting from varying time-of-day parking demand in the three parking districts.

Parking Demand Relationships

Parking demand is a function of land use type, size, and location. The Institute of Transportation Engineers (ITE) publishes parking demand estimates by land use type, which are often the starting point for parking demand analyses. However, the data collected and published in ITE's Parking Generation report most closely represents suburban conditions with more auto-dependent development patterns that do not reflect the future urbanized character of the parking study area described in the Specific Plan. Therefore, this analysis relied on the findings of other published studies and reports when selecting appropriate parking demand rates for the city.

In the 2008 report *Suisun City Downtown Parking Study*, Wilbur Smith Associates (WSA) concluded that "the pedestrian nature of Main Street suggests lower demand rates than those that are used for



suburban development."¹ Based on their previous parking demand studies, WSA recommended weekday and weekend parking rates for retail, restaurant, and office uses in Suisun City that are more applicable to the city's existing development character (see Table 2). The WSA study also included parking rates for the existing theater in the parking study area.

The hotel parking rates in Table 2 were collected from ULI's *Shared Parking* report. The rates represent a business hotel, and include parking allocations for guests and employees. The ULI parking rates are based on ITE's *Parking Generation* publication and additional data collected specifically for the ULI report.

Table 2 – Parking	Demand Rates
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Land Use	Weekday Demand	Weekend Demand	Unit	
Retail ¹	2.88	4.03	space/1,000 sq ft	
Restaurant ¹	6.38	6.38	space/1,000 sq ft	
Office ¹	2.97	0.3	space/1,000 sq ft	
Hotel ²	1.25	1.08	space/room	
Theater ¹	0.25	0.25	space/seat	
Higher-Density Residential ³				
Parking District 1	1.14	1.14	space/unit	
Parking District 2	1.19	1.19	space/unit	
Parking District 3	1.04	1.04	space/unit	

Note: sq ft = square feet

¹ Wilbur Smith Associates, Suisun City Downtown Parking Study – Final Report

² Urban Land Institute, *Shared Parking*, Second Edition

³ AECOM 2016

Figure 2 on the following page illustrates the differences in non-residential weekday and weekend parking demands. As shown, retail parking demand increases on weekends, while office and hotel demand decreases. This study assumed that restaurant and theater demand were unchanged from weekday to weekend. The opposite demand periods for retail and office uses suggest that when located within the same parking district, some portion of office parking would be available on weekends for retail customers and vice-versa on weekdays.

¹ Wilbur Smith Associates. Suisun City Downtown Parking Study – Final Report, pg. 4. 2008.

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Figure 2 - Non-Residential Parking Demand

* Retail, Restaurant, and Office are space/1,000 sq ft; Hotel is spaces/room; Theater is spaces/seat

The higher-density residential parking rates shown in Table 2 were developed with consideration for the future density of residential areas. Based on research from John Holtzclaw, household vehicle ownership decreases as residential densities increase.² For purposes of this parking study, household vehicle ownership was used as a proxy for parking demand (i.e., as household vehicle ownership decreases, so too will demand for designated parking spaces). Holtzclaw describes the relationship of household vehicle ownership and density in the following equation:

Household vehicle ownership = $2.702 \times (\text{density})^{-0.25}$

Residential densities were calculated for the three parking districts and applied to the Holtzclaw equation.³ Residential densities were estimated to reach 54.67 units/acre in District 1, 45.86 units/acre in District 2, and 83.61 units/acre in District 3. Figure 3 illustrates the inverse relationship between residential parking demand and parking district density.

² John Holtzclaw. Using Residential Patterns and Transit to Decrease Auto Dependence and Costs. June 1994

³ In some cases, residential densities had to be estimated rather than directly reported because the properties anticipate mixed-use (both residential and non-residential) development. In these instances, the effective residential density was calculated by removing consideration of the non-residential portion of the development.





Figure 3 – Residential Parking Demand

Base Parking Demand

The base parking demand scenario represents parking demand before considering reductions associated with shared parking strategies. The land use assumptions from Table 1 were multiplied by the parking demand rates from Table 2 to calculate the total base parking demand values shown in Table 3. Restaurant uses are assumed to be the primary parking demand drivers in District 1; retail and office uses generate the highest demand in District 2; and, retail is the primary driver in District 3.

Land Use	District 1 (parking spaces)	District 2 (parking spaces)	District 3 (parking spaces)
Retail	276	549	210
Restaurant	646	509	194
Office	400	549	111
Hotel	255	-	-
Theater	-	-	44
Higher-Density Residential	217	286	47
Total	1,794	1,893	606

Table 3 – Base Parking Demand

Shared Parking Demand

Shared parking analyses must consider the seasonal and hourly demand variations of different land uses when evaluating opportunities for parking supply reductions. This study applied the base parking demand values from Table 3 to seasonal and time-of-day adjustment factors published in the ULI *Shared Parking* report to develop a refined parking demand scenario.

Seasonal Demand Adjustment

Land uses experience high and low parking demand in different seasons. For example, shopping centers experience peak parking demand in December, with their lowest demand in January and February, while business hotels see peak demand in early summer and relatively lower demand in late December. Seasonal parking factors were applied to the base parking scenario to identify peak parking months in the study area.



In each of the three districts, December was identified as the peak parking demand month. However, developing a comprehensive parking strategy based on a two-week peak period driven by retail demand could inhibit the overall vision of the Specific Plan. Over parking to accommodate a relatively short period of high demand is an expensive strategy. It would also result in parking lots sitting vacant for much of the year, which detracts from the active atmosphere envisioned in the Specific Plan and does not provide any revenue to the City. Therefore, this study selected the second highest peak parking month for each district for further analysis of shared parking opportunities. However, peak holiday parking strategies are discussed later in the parking solutions section. Based on the varying mix of land uses in each district, the months selected for further analysis were also different.

Excluding the previously mentioned December demand period, District 1 has peak demand in June, District 2 in November, and District 3 in August. There was also variation within each district when considering peaks on weekdays and weekends. However, as previously mentioned, the total parking demand in each district was highest during weekdays, so this study focused on weekday demand. Table 4 shows the base scenario parking demand and seasonally adjusted parking demand for each district. Seasonal adjustments result in demand reductions of approximately 7%, 10%, and 16% for Districts 1, 2, and 3, respectively.

	District 1		Dist	rict 2	District 3	
Land Use	Base Scenario	June	Base Scenario	November	Base Scenario	August
Retail	276	185	549	396	210	145
Restaurant	646	614	509	473	194	192
Office	400	400	549	549	111	106
Hotel	255	255	-	-	-	-
Theater	-	-	-	-	44	18
Higher-Density Residential	217	217	286	286	47	47
Total	1,794	1,671	1,893	1,704	606	508

Table 4 – Seasonally Adjusted Parking Demand

Time-of-Day Demand Adjustment

Land uses also require parking at different times of the day, and it is the differences in these peak demand periods that allow parking supply to be shared among various uses within a parking district. Figure 4 illustrates the parking demand curves for the six land uses analyzed in this study. As shown, hotel and residential uses achieve peak demand from night time to early morning when residents are at home or in their hotel rooms. Then, parking demand for these uses declines as people drive their cars to work, school, and other daily tasks. The opposite is shown for the non-residential uses where parking demand increases from morning through early evening. Office demand peaks while employees are at work; restaurant demand peaks during lunch and dinner meal times; retail demand is high from midday to evening when stores are open; and, theater demand increases throughout the afternoon, peaking with the late evening movie show times.





Figure 4 – Parking Demand by Land Use by Time of Day

The time-of-day demand curves were applied to the seasonally-adjusted parking demand values from Table 4 to develop hourly parking demand estimates. Figures 5, 6, and 7 illustrate the weekday parking demand forecasts for each district, showing hourly demand from each land use. In all three instances, the 12:00 PM hour was identified as the peak daily parking demand period.



Figure 5 – District 1 Weekday Parking Demand





Figure 6 – District 2 Weekday Parking Demand





Table 5 compares each parking district's peak daily demand to its base scenario and seasonally adjusted scenario. Time-of-day adjustments result in demand reductions below the base scenario of approximately 20%, 20%, and 25% for Districts 1, 2, and 3, respectively.⁴

⁴ Base scenario is abbreviated as "base," seasonally adjusted is abbreviated as "season," and time-of-day adjusted is abbreviated as "time" for formatting of Table 5.

Land Lise	District 1		District 2			District 3			
	Base	Season	Time	Base	Season	Time	Base	Season	Time
Retail	276	185	176	549	396	376	210	145	138
Restaurant	646	614	614	509	473	473	194	192	192
Office	400	400	360	549	549	494	111	106	95
Hotel	255	255	163	-	-	-	-	-	-
Theater	-	-	-	-	-	-	44	18	4
Higher- Density Residential	217	217	128	286	286	170	47	47	27
Total	1,794	1,671	1,441	1,893	1,704	1,513	606	508	456

Table 5 – Time-of-Day Adjusted Parking Demand

SHARED PARKING DEMAND AND SUPPLY

The refined parking demand scenario from Table 5 (i.e., time-of-day demand) was compared against the existing parking supply within each district. Parking supply values were manually counted using Google Earth images of the parking study area. This review counted striped parking spaces in all surface parking lots and striped on-street parking spaces within the districts, and estimated the number of unstriped, on-street parking spaces between curb cuts, garage doors, and other parking obstacles. We also estimated the number of existing off-street parking spaces in the residential areas of Districts 2 and 3. In addition, the vacant parcels on Main Street at the intersections of Sacramento Street and California Street are marked as temporary parking lots, and were included in the parking supply count. This parking supply review conservatively excluded estimates for on-street parking in residential areas adjacent to the parking districts because shared use of limited parking spaces may be infeasible. Figure 8 illustrates the parking supply and weekday and weekend demands. Assuming the Waterfront District Specific Plan is fully built out without providing any additional parking, future parking demand would exceed existing supply in each district, with a total parking deficit of approximately 1,696 spaces. Individually, with full buildout assuming no additional supply, District 1 is estimated to have a deficit of 671 parking spaces, District 2 has 994, and District 3 has 90. The following section conceptually describes options to address the projected parking shortage.



Figure 8 – Projected Parking Demand



Potential Parking Solutions

The challenge of providing sufficient parking within the study area can be amortized over a timeline equal to that of Specific Plan implementation. That is, if development related to the Specific Plan occurs rapidly, then parking solutions will also need to be provided quickly. If development is slow to occur, then the existing parking supply could be sufficient for a longer period of time. While the speed of implementation is unknowable, several parking opportunities exist for further consideration. Undeveloped and underutilized parcels could provide additional surface parking options over the nearterm. The City could establish a financing district and collect fees or in-lieu fees over time to use for future development of parking structure/s. Holiday peak demand could be resolved with additional temporary lots, a parking lot shuttle for visitors, or other temporary strategies. Future density and intensity increases could also result in further reductions of parking demand beyond those reductions already estimated in this study. Each of these options is described further in the following sections.

Increase Surface Parking Options

Much of the future parking demand presented in this study is dependent upon reuse of underutilized properties adjacent to the Union Pacific railroad tracks. The City could examine opportunities to add linear parking that fronts onto the railroad tracks. Properties directly adjacent to the railroad tracks may not be as attractive for development, but could help to meet future parking demand, without sacrificing land that could otherwise be developed with a use that would add vibrancy and/or generate revenue in the Specific Plan Area.

Using the linear parking lot on Main Street between Driftwood Drive and Solano Street as a guide, a double-loaded parking lot can accommodate approximately 185 parking spaces in 1,050 linear feet of roadway, including ample landscaping. There is approximately 1,300 linear feet in Districts 1 and 2 adjacent to the railroad tracks between the Suisun City Station drop off zone on Spring Street to Sacramento Street. Linear parking along this area could provide 230-250 parking spaces in an area poorly suited for more active types of development, such as residential or office uses. Additionally, two underutilized parcels between Benton Court and Sacramento Street (to the east of Railroad Avenue) are irregularly shaped and directly adjacent to the railroad tracks. Part or all of these parcels may be appropriate for additional parking with capacity for approximately 30 spaces.

In addition to redevelopment of existing uses, vacant parcels in the study area could also accommodate surface parking lots. These vacant parcels are candidates for development as the Specific Plan is implemented, but can provide relatively inexpensive parking capacity in the interim. Table 6 identifies six vacant parcels within and adjacent to the study area with surface parking potential, and provides estimates of their total capacity. The estimates are based on the parcels' size and shape and the design of other surface parking lots in Suisun City, and are intended for informational purposes only. Figure 9 illustrates the location of the surface parking opportunity areas.



Table 6 – Vacant Parcels

ID #	Location	District	Potential Parking Spaces
1	Main Street – north of Driftwood Drive	1	30
2	Civic Center Boulevard – between Lotz Way and Driftwood Drive	1	126 ¹
3	Travis Court – southern end	2	120
4	Main Street – north of Suisun Street	2	78
5	Driftwood Drive – west of Civic Center Boulevard	2	32
6	Kellogg Street – south of Morgan Street	3	16
	Total		402

¹ Potential site for second hotel; assumed to be equal in size to existing Hampton Inn & Suites with same parking supply



Figure 9 – Surface Parking Opportunity Areas



Financing Future Structured Parking

The amount of new development envisioned in the Specific Plan suggests a need for structured parking options in the long-term. This assumption is further supported by the parking supply and demand illustration in Figure 8, which shows a significant deficit between future demand and existing supply. However, developing structured parking is expensive, and can be especially problematic in a small downtown environment like Suisun City where many small users contribute to a cumulatively large parking demand. It may be an option for some large future development projects to provide their own structured parking options within the planning area. For example, a new hotel, multi-story office, or residential project may be able to finance structured parking with designated spaces for project tenants and possible excess supply for public parking users. However, for the majority of future projects in the study area, independent construction of structured parking will not be an option. The City could establish some type of benefit district and collect fees with new development to fund the future construction of centralized structured parking.

Based on 2013 construction costs estimates from RS Means, a five-story parking structure would cost approximately \$73/sq. ft. in Vallejo and \$71/sq. ft. in Sacramento (the closest cities for which cost estimates were available). Given the height restrictions described in the Specific Plan, a parking structure of five to six stories would be allowed in the study area.

WSA previously identified several opportunity sites for potential future parking structures, including the One Harbor Center parking lot, the Caltrans park-and-ride lot opposite Suisun City Station, the vacant parcel south of Travis Court (#3 on Figure 9), the waterfront parking lot along Main Street, and the Kellogg Street parking lot south of Bab's Delta Diner. WSA concluded that the waterfront and Kellogg Street parking lots were poor candidates for parking structures as they would both block open views of the water; we agree with this assessment.

We also agree that a structured parking lot somewhere in District 1 near the Suisun City Station would be a good option, either on the current park-and-ride lot or the One Harbor Center lot. Based on sample parking structure designs provided in *Time-Saver Standards for Building Types*, Fourth Edition, a five-story structure with a building footprint of 120'x240' would accommodate 374 parking spaces. When overlaid on top of the existing park-and-ride lot, this would replace 138 parking spaces (or approximately 50% of the current spaces), for a net gain of 236 spaces. The property has sufficient space for a larger parking structure, if desired. This hypothetical structure would total 144,000 sq. ft. with a total construction cost of approximately \$10.5 million, or \$28,000 per parking space. It should be noted that a more efficient parking structure design than the template layout used in this analysis could result in lower per space construction costs and/or a greater number of parking spaces.

Vacant parcels #3 and 4 from Figure 9 were similarly analyzed as opportunities for parking structures. Both are centrally located relative to the parking study area and are adjacent to underutilized industrial properties designated for more active future uses. Starting from a template parking garage design, we developed a hypothetical five-story parking structure for parcel #3 that is 122'x187' and accommodates approximately 400 parking spaces. Using the same RS Means construction estimates, this garage would cost \$8.3 million or \$20,600 per space. WSA noted that this property is understood to have hazmat problems, would could result in higher construction costs.

Parcel #4 is smaller and more constrained than either the park-and-ride lot or parcel #3, and a more detailed design analysis of the site may conclude that a parking structure is infeasible. However, based on the same design template applied to parcel #3, this site could potentially accommodate a five-story structure covering an area of 122'x177' with 384 parking spaces. This example would cost \$7.9 million



to construct, or \$20,500 per space. We assume that only one parking structure would be constructed in District 2. Figure 10 shows the location of the four structured parking opportunity sites and the remaining surface parking opportunity areas.



Figure 10 – Surface and Structured Parking Opportunities

Decreased Demand from Mode Shift

It is likely that as the study area develops according to the Specific Plan vision, the urbanizing character of the area will result in changes to resident and visitor modes of travel. Though not specifically a shared parking strategy, this future mode shift will have implications for total parking demand. For example, while the restaurant parking demand value used in this study was tailored to the character of Downtown Suisun City, it does not reflect parking demand associated with the future character of the area after Specific Plan implementation. The substantial increase in office and retail workers in the area will likely lead to increased patronage of restaurants in the study area, and a portion of those visits will be made by foot, resulting in lower restaurant parking demand. The ULI Shared Parking analysis assumes that in a suburban office environment, 10% of employees will leave the office to eat lunch off-



site. Within a restaurant-rich and walkable environment, the number of office employees taking their lunch breaks off-site is potentially higher, and if office and retail employees walk to lunch breaks at restaurants in the study area, then restaurant parking demand could be reduced by an equal number of parking spaces. This study considered a range from 10-20% of employees walking to local lunch options, which equates to parking reductions of approximately 215-430 parking spaces across the study area. This calculation may be conservative in that it only considers the potential increase in restaurant patronage from future office and retail employees. The resident population within the Specific Plan Area is also expected to increase, providing another source of restaurant customers within walking or biking distance.

Additionally, future improvements to local transit options and biking infrastructure, implementation of regional travel demand management programs, and broader adoption of on-demand transportation solutions (e.g., Zip Car, Lyft, Uber) will also influence parking demand in the study area. The greater the shift away from single occupancy vehicle use, the less demand there will be for local parking. As the built environment in the study area evolves over time, the City can monitor gradual changes in parking demand and respond accordingly.

Holiday Peak Demand Strategies

As previously noted, the estimated highest seasonal demand would occur during the holiday period in December. The difference between the December peak demand and the non-holiday peak demand analyzed in this study is approximately 330 parking spaces. The peak holiday demand estimate is based on seasonal parking demand factors associated with a suburban shopping mall. While the study area in Suisun City may also experience increased demand during the holidays, it could be less significant than 330 additional parking spaces. An important determinant in holiday parking demand will be the type of retail options available in the study area, which is unknown at this time. Retail uses associated with daily goods and services, such as salons, tailors, and pet groomers, may not experience the same type of holiday increase as would clothing retailers, electronics stores, or other businesses selling gift-related items.

A potential holiday parking shortage would also manifest slowly over time, allowing the City to monitor the situation annually and prepare temporary solutions in advance. Should holiday parking supply become a critical issue that limits the success of local businesses, the City could facilitate use of temporary parking lots and/or a Downtown Waterfront shuttle to access parking options beyond walking distance of the commercial area. The two currently vacant properties west of Civic Center Boulevard at the intersection of Driftwood Drive (to the north and south) could accommodate temporary surface parking within easy walking distance to Main Street, assuming these parcels have not already been developed. Several other options exist for temporary parking outside of the commercial area, which could be accessed with a shuttle service and pick up/drop off locations within the study area. The Crystal Middle School parking lot has approximately 100 spaces, and could potentially be used on weekends during peak holiday times if it would not conflict with school events. Similarly, the large parking lot at the southern end of Kellogg Street could potentially be used during the holidays, assuming that marina parking demand is relatively low in December. Finally, the large currently undeveloped property north of Cordelia Street could also host overflow parking.

Summary Result of Additional Parking Options

Table 7 summarizes the parking demand, existing supply, and future supply options within the study area. As shown, sufficient opportunities exist to accommodate nearly all of the future parking demand in Districts 1 and 3. A larger parking structure in District 1 could address any remaining deficit there. A greater than estimated mode shift, resulting in lower future parking demand, could also help address



remaining deficits in Districts 1 and 3. District 2 shows a parking opportunity deficit of approximately 100 spaces, or 7% of total future demand. As previously mentioned, redevelopment of underutilized industrial sites are the primary parking demand driver in this district. This analysis did not attempt to estimate total parking supply that may be provided on-site as future redevelopment occurs. A parking structure in this district could also be designed to accommodate more spaces than estimated herein. The parking district boundaries are also non-physical barriers; parking demand from District 2 may use parking supply located in the other districts. And, as with the other districts, future mode shift could have a greater impact on future parking demand than currently estimated.

	District 1	District 2	District 3	Total
Peak Demand	1,441	1,513	456	3,410
Total Potential Supply	1,429	1,408	445	3,285
Existing Parking	770	519	366	1,655
UPRR Surface Parking	83	198	-	250
Vacant Lot Surface Parking	156	230	16	402
Parking Structures ¹	236	284	-	520
Mode Shift Reductions ²	185	177	63	426
Parking Deficit	12	105	11	128
% of Peak Demand	1%	7%	2%	4%

Table 7 – Future Parking Supply and Demand Summary

¹ Net additional parking spaces from surface parking estimates

² Assumes 20% participation from estimate range