

# 4<sup>th</sup> Avenue Business District Parking Study Update



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*Submitted to:*

**ParkWise  
Dept. of Transportation  
City of Tucson  
110 E. Pennington St., #150  
P.O. Box 27210  
Tucson, Arizona 85726-7210**

*Submitted by:*

**DESMAN Associates  
7900 East Union Avenue, Suite 925  
Denver, CO 80237**

**DESMAN**  
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## INTRODUCTION

DESMAN Associates (DESMAN) has been retained by the City of Tucson and the ParkWise Department to conduct a parking study in an area just north of downtown including the 4<sup>th</sup> Avenue Business District, the Warehouse Historic District, and the Iron Horse and West University neighborhoods. The 4<sup>th</sup> Avenue Business District, which represents the core area within the larger study area, is home to a countless number of locally-owned shops, restaurants and bars and is a popular destination for nearby University of Arizona students and others throughout the Tucson area for shopping, dining and entertainment. The Warehouse District is ripe for redevelopment given the architectural character of the buildings in the area and the large number of vacant and underutilized properties. The Iron Horse and West University neighborhoods, developed in the late 1800's and early 1900's, are the most walkable neighborhoods in the city and home to a mix of businesses, rental housing for University of Arizona students and single-family houses in a variety of styles for long-time Tucson residents. The study area, indicated in Figure 1 on the following page, contains approximately 33 blocks, which have been numbered for identification purposes.

The same area was studied by DESMAN in the fall of 2012 and, although there were parking "hot spots" in the study area where parking demand exceeded the "effective" parking supply, the previous study concluded there was adequate parking within the study area overall and the development of more parking was not warranted at the time. Although no additional parking was required, it was recommended that the City of Tucson take steps to more actively manage parking in the 4<sup>th</sup> Avenue Business District. Following are the near-term recommendations for the study area from the previous study:

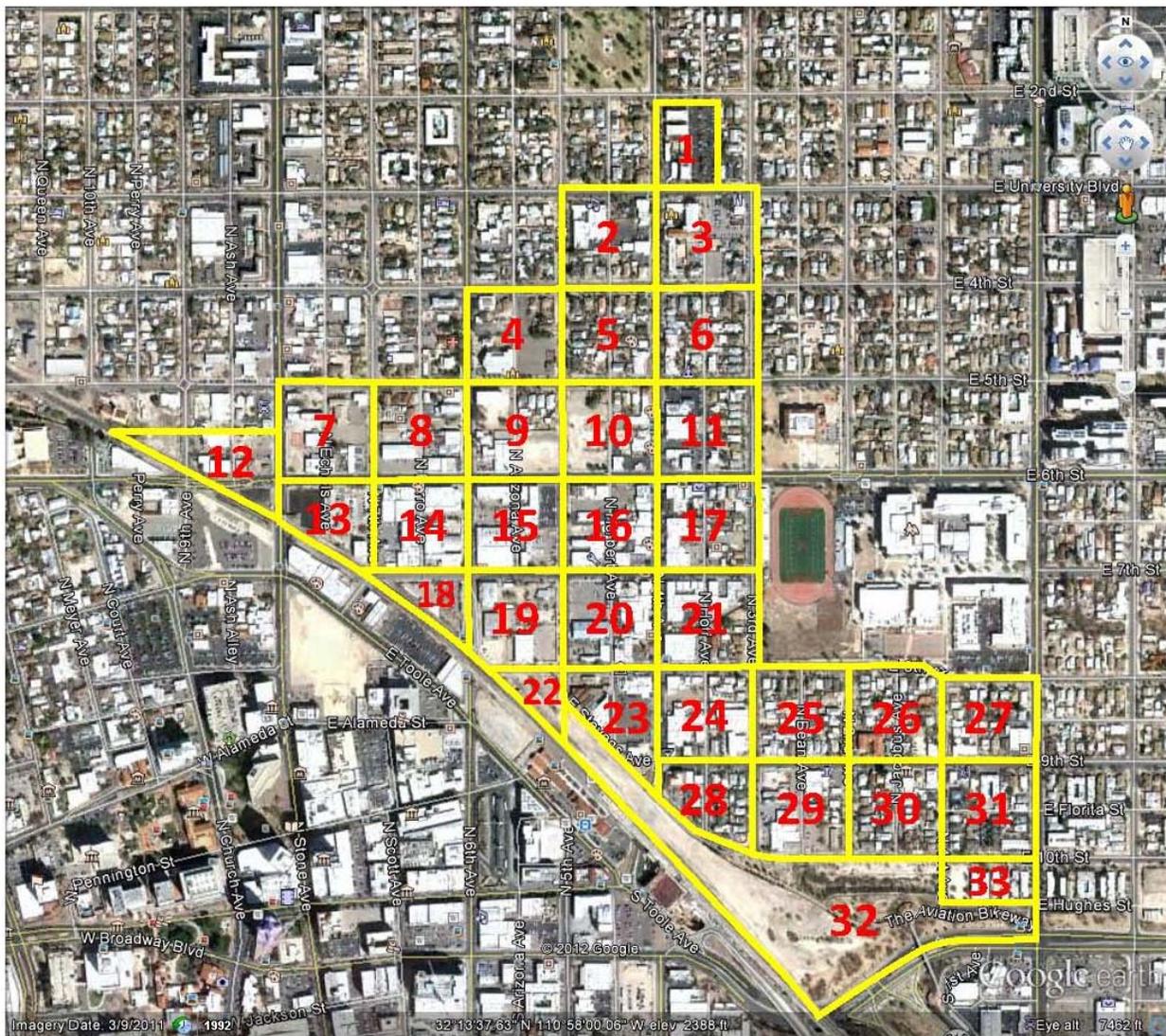
- Provide signage to direct parking patrons to public parking and to identify public parking lots
- Consider leasing private parking for public use when additional parking is required
- Improve parking lot lighting
- Reconsider the current policy of back-in diagonal on-street parking
- Institute on-street paid parking to encourage turnover of the most convenient parking spaces with parking meters

Refer to the previous report located in the Appendix for more detailed information on the above recommendations. Because parking activity was lower than expected, and may have been impacted by the construction of the Sun Link Modern Streetcar system on 4<sup>th</sup> Avenue, this study was commissioned by the City of Tucson to update the parking supply and demand analysis, recommend a program for on-street parking meters, provide a preliminary parking garage financial feasibility analysis, and identify and analyze alternative methods for financing parking facilities.

The modern streetcar, which will connect the 4<sup>th</sup> Avenue Business District with downtown Tucson to the south and the University of Arizona campus to the northeast, is expected to encourage private development within the study area. The streetcar system will be completed and fully operational later this year. In addition, Downtown Links is an improvement project that will provide multi-modal "links" between Barraza-Aviation Parkway and Interstate 10, including a new four-lane highway, sidewalks, bicycle lanes, and drainage system that will run through the study area on the arroyo just north of the

railroad tracks. Downtown Links will make the area more accessible by automobile and bring more people to the study area. The boundaries and shape of the study area have been influenced by the Downtown Links project. Much of the study area is also within the Downtown Infill Incentive District (IID), which is an optional overlay zone that offers incentives and removes barriers to encourage infill development and redevelopment.

**Figure 1.**  
**Parking Study Area**



**EXISTING PARKING CONDITIONS**

**Parking Supply**

Table 1 presents the current on-street parking inventory within the study area by block and type of parking. There are currently an estimated 1,396 on-street parking spaces within the study area.

**Table 1. On-Street Parking Inventory**

Block	Unrestricted	1 or 2 Hr. Limit	Residential Parking Permit Program			No Parking 10pm-6am	Loading	Accessible	Other*	Total
			24/7	8-5, M-F	Eve./Wknds.					
1	21								21	
2	34	7	17						58	
3	65	2							67	
4	20		19		11				50	
5	14		22		14		1		51	
6	14	9	16	28			1		68	
7	19								19	
8	30	10							40	
9		27	6						33	
10		30	4				1		35	
11	12	13		23			1	28	77	
12	27								27	
13	12								12	
14	19	19							38	
15	41	19							60	
16	12	21					2		35	
17	40	9	10				3	1	63	
18		8							8	
19		21							21	
20	4	36					3		43	
21	50	30					1		81	
22									0	
23		14					1		15	
24	22	10					3		35	
25	13		8	42					63	
26				51					51	
27	11			16					27	
28	38		10				1		49	
29	48								48	
30	37			23			2		62	
31	38			11					49	
32						65			65	
33	18					7			25	
<b>Total:</b>	<b>659</b>	<b>285</b>	<b>112</b>	<b>194</b>	<b>25</b>	<b>72</b>	<b>15</b>	<b>6</b>	<b>28</b>	<b>1,396</b>
<b>Percent:</b>	<b>47.2%</b>	<b>20.4%</b>	<b>8.0%</b>	<b>13.9%</b>	<b>1.8%</b>	<b>5.2%</b>	<b>1.1%</b>	<b>0.4%</b>	<b>2.0%</b>	<b>100.0%</b>

\* Other includes 10 reserved school spaces plus 18 bus loading spaces that are available after 4:00 PM on the east side of 3rd Avenue.

The largest category of on-street parking is unrestricted with 659 spaces, which represents 44% of the parking supply. There are a total of 331 Residential Parking Permit Program (PPP) spaces, which

represents approximately 20% of the parking supply. There are 285 time limited spaces (1 or 2 hour limit) within the study area, which represents approximately 20% of the parking supply. Most of the time restricted spaces are on 4<sup>th</sup> Avenue, 5<sup>th</sup> Avenue, 6<sup>th</sup> Avenue, 7<sup>th</sup> Street and 8<sup>th</sup> Street. There are an estimated 72 parking spaces where parking is prohibited from 10:00 PM to 6:00 AM on Stevens Avenue, 10<sup>th</sup> Street and 1<sup>st</sup> Avenue (Blocks 32 and 33). Loading, accessible and “other” spaces make up the remaining 4% of the on-street parking. There are no on-street parking meters within the study area.

Table 2 presents the current off-street parking within the study area by block. There are an estimated 2,715 off-street parking spaces within the study area. Included in the off-street inventory are mostly public and private commercial parking lots. The off-street inventory for this survey also includes a few residential facilities, including a 572-space parking garage for the District on 5th apartments located on Block 10. The parking supply has been estimated in the parking lots with no marked spaces. Refer to the Block Maps in the Appendix for the location of the off-street lots on each block, which have been assigned a letter designation for identification purposes.

**Table 2. Off-Street Parking Inventory**

Block	Lot Designations	Parking Spaces
1	A	139
2	A-G	85
3	A-E	136
4	A-D	188
6	A-E	28
7	A-E	116
8	A-J	105
9	A-C	115
10	A-E	621
11	A-E	97
12	A-E	112
13	A-B	156
14	A-F	63
15	A-D	104
16	A-H	107
17	A-G	51
18	A	34
20	A-D	110
21	A-G	73
23	A	120
24	A-F	43
26	A-B	32
27	A-D	20
29	A-B	44
30	A	8
31	A	8
Total:		2,715

Of the estimated 2,715 off-street parking spaces, only 245 spaces are public (9%) and the remaining 2,446 are private (91%). The public off-street parking is shown in Table 3 below. Parking within the study area is mostly free. There are two lots that charge for parking, including the Creative lot on Block 11 (\$3 before 6:00 PM and \$5 after 6:00 PM) and the O'Malley's lot on Block 20 (\$5 in the evening).

**Table 3.**  
**Public Off-Street Parking Inventory**

Block	Name & Block Map Designation	Spaces
3	Trinity Church (A, B & D)	112
16	Antigone (H)	15
20	O'Malley's and Hut (A & C)	118
Total:		245

**Effective Parking Supply**

A parking system operates at optimum efficiency at a level below its actual capacity. The occupancy at which peak efficiency is reached is generally considered to be 85% of the capacity by parking professionals. This cushion of spaces reduces the time to search for the last few available spaces and allows for the dynamics of vehicles moving in and out of parking stalls during peak periods. It also allows for variations in parking activity, the loss of parking due to the mis-parked vehicles, construction, reserved spaces, and other factors. As a result, the effective supply is used to determine the adequacy of the parking system rather than the actual supply.

**Parking Occupancy**

Parking occupancy counts were conducted within the study area on Friday and Saturday, April 19 and 20, 2013. Parked vehicles were counted every other hour from 12:00 PM to 12:00 AM on Friday and from 12:00 PM to 6:00 PM on Saturday.

*Friday, April 19, 2013*

On-street parking occupancy on Friday, April 19, 2013 is presented in Table 4. There were 758 vehicles parked in 1,396 on-street spaces at the peak hour of 12:00 PM, which represents an occupancy level of 54.3%. The on-street spaces were approximately 50% occupied at the peak hour of 10:00 PM during the previous survey of parking occupancy.

Located in the Appendix are tables showing the on-street parking occupancy by block face for every primary street, avenue and boulevard within the study area. A summary of peak hour parking occupancy by street is presented in Table 5. Peak hour parking occupancy ranged from a low of 25% on 10<sup>th</sup> Street to a high of 106% on 4<sup>th</sup> Avenue. Streets with 85% and above parking occupancy levels are highlighted in the table, which include the east side of 3<sup>rd</sup> Avenue, 4<sup>th</sup> Avenue and Stevens Avenue.

**Table 4. On-Street Parking Occupancy by Block, Friday, April 19, 2013**

Block	Spaces	Occupied Spaces						
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
1	21	15	19	14	11	9	9	10
2	58	37	37	33	35	33	19	15
3	67	48	48	29	37	39	28	29
4	50	12	8	5	7	14	22	24
5	51	20	20	24	24	27	31	24
6	68	35	31	26	41	39	41	49
7	19	14	16	14	0	0	0	0
8	40	14	12	17	4	4	4	5
9	33	11	10	15	7	7	8	17
10	35	29	26	27	28	28	30	31
11	77	38	31	26	40	56	52	64
12	27	19	20	15	3	2	2	2
13	12	10	10	3	0	0	0	0
14	38	27	20	19	10	8	10	10
15	60	46	41	31	11	8	13	21
16	35	28	25	17	28	27	26	33
17	63	51	46	30	53	52	51	57
18	8	7	5	3	7	2	1	0
19	21	5	2	2	4	9	8	11
20	43	25	20	21	30	37	37	42
21	81	68	54	42	62	63	59	70
22	0	0	0	0	0	0	0	0
23	15	4	6	2	7	9	11	14
24	35	30	28	20	32	27	29	34
25	63	24	16	17	27	26	27	29
26	51	14	12	5	11	11	13	16
27	27	13	11	8	10	12	14	11
28	49	23	27	26	27	27	27	31
29	48	27	17	15	25	15	15	25
30	62	27	18	24	21	22	26	32
31	49	25	15	20	23	28	31	32
32	65	6	7	5	6	6	5	8
33	25	6	5	3	9	6	8	6
<b>Total:</b>	1,396	<b>758</b>	663	558	640	653	657	752
<b>% Occupied:</b>		<b>54.3%</b>	47.5%	40.0%	45.8%	46.8%	47.1%	53.9%

**Table 5.**  
**Summary of Peak-Hour On-Street Parking Occupancy by Street**

Street Name	Spaces	Spaces Occupied	Percent Occupied	Peak Hour(s)
1st Avenue	50	17	34%	12:00 PM, 10:00 PM, 12:00 AM
2nd Avenue	47	23	49%	10:00 PM
3 rd Avenue (West Side)	115	55	48%	12:00 AM
3rd Avenue (East Side)	114	99	<b>87%</b>	12:00 AM
4th Avenue	143	152	<b>106%</b>	6:00 PM
5th Avenue	92	65	71%	12:00 AM
6th Avenue	54	32	59%	12:00 PM
7th Avenue	49	27	55%	12:00 PM
University Blvd.	25	15	60%	12:00 PM, 8:00 PM
Stevens Avenue	9	8	<b>89%</b>	2:00 PM, 12:00 AM
4th Street	63	25	40%	8:00 PM, 10:00 PM
5th Street	116	88	76%	12:00 AM
7th Street	95	70	74%	4:00 PM Saturday
8th Street	62	45	73%	12:00 AM
9th Street	102	69	68%	12:00 AM
10th Street	114	29	25%	12:00 AM
Hughs Street	6	3	50%	4:00 PM Saturday

*Peak hour occurred on Friday except as otherwise noted above.*

Off-street parking occupancy on Friday is presented in Table 6 on the following page. There were 1,214 vehicles parked in 2,715 off-street spaces at the peak hour of 12:00 PM, which represents an occupancy level of 44.7%. The off-street spaces were approximately 35% occupied at the peak hour of 12:00 PM during the previous survey of parking occupancy.

**Table 6.**  
**Off-Street Parking Occupancy by Block, Friday, April 19, 2013**

Block	Spaces	Occupied Spaces						
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
1	139	75	70	59	59	61	60	74
2	85	37	41	26	12	9	7	4
3	136	50	61	62	55	51	32	50
4	188	6	7	8	5	6	5	4
6	28	13	17	17	22	15	14	15
7	116	25	24	26	10	7	6	5
8	105	15	10	5	2	0	0	0
9	115	77	78	87	87	93	91	89
10	621	308	293	310	326	317	349	371
11	97	67	65	63	64	59	57	62
12	112	99	92	86	11	7	5	5
13	156	84	63	14	0	0	0	0
14	63	37	32	22	6	0	0	0
15	104	65	60	39	19	12	15	17
16	107	27	28	40	62	66	71	94
17	51	30	23	21	27	19	18	23
18	34	0	0	0	0	0	0	0
20	110	43	41	35	32	28	29	47
21	73	44	46	53	45	40	39	29
23	120	43	44	64	71	74	86	109
24	43	30	13	8	13	6	6	13
26	32	16	14	13	11	11	11	12
27	20	12	9	12	5	5	7	8
29	44	7	10	12	9	9	10	12
30	8	4	2	3	1	1	1	1
31	8	0	0	0	4	6	7	6
Total:	2,715	<b>1,214</b>	1,143	1,085	958	902	926	1,050
% Occupied:		<b>44.7%</b>	42.1%	40.0%	35.3%	33.2%	34.1%	38.7%

Table 7 presents parking occupancy on Friday for the public off-street parking lots. There were 297 vehicles parked in 715 spaces at the peak hour of 2:00 PM, which represents an occupancy level of 41.5%. The public off-street spaces were approximately 36% occupied at the peak hour of 2:00 PM during the previous survey of parking occupancy.

**Table 7.**  
**Public Off-Street Parking Occupancy, Friday, April 19, 2013**

Block	Name & Block Map Designation	Spaces	Occupied Spaces						
			12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
3	Trinity Church (A, B & D)	112	47	58	47	44	32	17	31
16	Antigone (H)	15	9	11	11	14	14	10	15
20	O'Malley's and Hut (A & C)	118	39	37	31	24	19	15	33
Total:		245	95	<b>106</b>	89	82	65	42	79
% Occupied:			38.8%	<b>43.3%</b>	36.3%	33.5%	26.5%	17.1%	32.2%

As presented in Table 8 below, the overall peak hour for parking on Friday was 12:00 PM when there were 1,972 vehicles parked in 4,111 spaces, which represents an occupancy level of 48%. The on- and off-street spaces were approximately 40% occupied at the peak hour of 12:00 PM during the previous occupancy survey.

**Table 8.**  
**Summary of Parking Occupancy, Friday, April 19, 2013**

Parking	Spaces	Occupied Spaces						
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
On-Street	1,396	758	663	558	640	653	657	752
Off-Street	2,715	1,214	1,143	1,085	958	902	926	1,050
Total:	4,111	<b>1,972</b>	1,806	1,643	1,598	1,555	1,583	1,802
% Occupied:		<b>48.0%</b>	43.9%	40.0%	38.9%	37.8%	38.5%	43.8%

Table 9 provides a summary of peak hour (12:00 PM) parking occupancy on Friday by block. The blocks with on-street, off-street and combined parking occupancy levels at or above 85% are highlighted in the table.

**Table 9.**  
**Summary of Parking Occupancy by Block, Friday, April 19, 2013 (12:00 PM)**

Block	On-Street Parking			Off-Street Parking			Total Parking		
	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied
1	21	15	71%	139	75	54%	160	90	56%
2	58	37	64%	85	37	44%	143	74	52%
3	67	48	72%	136	50	37%	203	98	48%
4	50	12	24%	188	6	3%	238	18	8%
5	51	20	39%				51	20	39%
6	68	35	51%	28	13	46%	96	48	50%
7	19	14	74%	116	25	22%	135	39	29%
8	40	14	35%	105	15	14%	145	29	20%
9	33	11	33%	115	77	67%	148	88	59%
10	35	29	83%	621	308	50%	656	337	51%
11	77	38	49%	97	67	69%	174	105	60%
12	27	19	70%	112	99	<b>88%</b>	139	118	<b>85%</b>
13	12	10	83%	156	84	54%	168	94	56%
14	38	27	71%	63	37	59%	101	64	63%
15	60	46	77%	104	65	63%	164	111	68%
16	35	28	80%	107	27	25%	142	55	39%
17	63	51	81%	51	30	59%	114	81	71%
18	8	7	<b>88%</b>	34	0	0%	42	7	17%
19	21	5	24%				21	5	24%
20	43	25	58%	110	43	39%	153	68	44%
21	81	68	84%	73	44	60%	154	112	73%
23	15	4	27%	120	43	36%	135	47	35%
24	35	30	<b>86%</b>	43	30	70%	78	60	77%
25	63	24	38%				63	24	38%
26	51	14	27%	32	16	50%	83	30	36%
27	27	13	48%	20	12	60%	47	25	53%
28	49	23	47%				49	23	47%
29	48	27	56%	44	7	16%	92	34	37%
30	62	27	44%	8	4	50%	70	31	44%
31	49	25	51%	8	0	0%	57	25	44%
32	65	6	9%				65	6	9%
33	25	6	24%				25	6	24%
<b>Total:</b>	<b>1,396</b>	<b>758</b>	<b>54%</b>	<b>2,715</b>	<b>1,214</b>	<b>45%</b>	<b>4,111</b>	<b>1,972</b>	<b>48%</b>

Saturday, April 20, 2013

On-street parking occupancy on Saturday, August 25, 2012 is presented in Table 10 below. There were 625 vehicles parked in 1,396 on-street spaces at the peak hour of 6:00 PM, which represents an occupancy level of 44.8%. The on-street spaces were approximately 39% occupied at the peak hour of 12:00 PM during the previous occupancy survey.

**Table 10.**  
**On-Street Parking Occupancy by Block, Saturday, April 20, 2013**

Block	Spaces	Occupied Spaces			
		12:00 PM	2:00 PM	4:00 PM	6:00 PM
1	21	12	9	11	9
2	58	33	28	42	22
3	67	24	34	28	23
4	50	8	7	11	7
5	51	20	20	22	24
6	68	32	36	36	37
7	19	0	0	0	0
8	40	7	6	5	3
9	33	9	10	12	7
10	35	22	25	26	25
11	77	28	35	42	40
12	27	3	3	4	2
13	12	0	0	0	0
14	38	14	12	14	6
15	60	34	35	26	27
16	35	27	29	31	30
17	63	30	37	45	56
18	8	3	3	7	3
19	21	7	9	7	9
20	43	27	36	34	41
21	81	33	42	57	65
22	0	0	0	0	0
23	15	6	5	4	11
24	35	17	21	19	28
25	63	21	23	26	21
26	51	8	11	10	10
27	27	11	12	10	11
28	49	20	24	24	33
29	48	13	14	11	20
30	62	16	19	23	21
31	49	24	14	23	27
32	65	1	1	1	1
33	25	9	9	9	6
<b>Total:</b>	1,396	519	569	620	<b>625</b>
<b>% Occupied:</b>		37.2%	40.8%	44.4%	<b>44.8%</b>

Off-street parking occupancy on Saturday is presented in Table 11. There were 882 vehicles parked in 2,715 off-street spaces at the peak hour of 12:00 PM, which represents an occupancy level of 32.5%. The off-street spaces were approximately 24% occupied at the peak hour of 12:00 PM during the previous occupancy survey.

**Table 11.**  
**Off-Street Parking Occupancy by Block, Saturday, April 20, 2013**

Block	Spaces	Occupied Spaces			
		12:00 PM	2:00 PM	4:00 PM	6:00 PM
1	139	59	59	56	64
2*	85	24	20	80	17
3	136	74	46	22	28
4	188	5	5	5	2
6	28	10	10	13	12
7	116	13	11	13	9
8	105	8	6	4	0
9	115	75	86	81	78
10	621	346	309	284	281
11	97	49	52	64	67
12	112	10	15	15	12
13	156	5	1	1	0
14	63	25	18	14	7
15	104	11	11	15	9
16	107	37	37	40	41
17	51	14	22	13	13
18	34	4	2	0	0
20	110	18	38	34	48
21	73	28	32	38	29
23	120	29	32	36	51
24	43	5	9	5	7
26	32	4	4	7	8
27	20	11	12	9	8
29	44	11	3	7	8
30	8	3	1	1	1
31	8	4	2	4	4
<b>Total:</b>	<b>2,715</b>	<b>882</b>	<b>843</b>	<b>861</b>	<b>804</b>
<b>% Occupied:</b>		<b>32.5%</b>	<b>31.0%</b>	<b>31.7%</b>	<b>29.6%</b>

\*Rogue Theater parking in Lot F.

Table 12 presents parking occupancy on Saturday for the public off-street parking lots. There were 93 vehicles parked in 245 spaces at the peak hour of 12:00 PM, which represents an occupancy level of 38%. The public off-street parking was approximately 36% occupied during the previous occupancy survey.

**Table 12.**  
**Public Off-Street Parking Occupancy, Saturday, April 20, 2013**

Block	Name & Block Map Designation	Spaces	Occupied Spaces			
			12:00 PM	2:00 PM	4:00 PM	6:00 PM
3	Trinity Church (A, B & D)	112	62	35	11	17
16	Antigone (H)	15	13	13	13	12
20	O'Malley's and Hut (A & C)	118	18	37	32	39
<b>Total:</b>		245	<b>93</b>	85	56	68
<b>% Occupied:</b>			<b>38.0%</b>	34.7%	22.9%	27.8%

As presented in Table 13, the overall peak hour for parking on Saturday was 4:00 PM when there were 1,481 vehicles parked in 4,111 spaces, which represents an occupancy level of 36.0%. The on- and off-street parking was 30% occupied at the peak hour of 12:00 PM during the previous occupancy survey.

**Table 13.**  
**Summary of Parking Occupancy, Saturday, April 20, 2013**

Parking	Spaces	Occupied Spaces			
		12:00 PM	2:00 PM	4:00 PM	6:00 PM
On-Street	1,396	519	569	620	625
Off-Street	2,715	882	843	861	804
<b>Total:</b>	4,111	1,401	1,412	<b>1,481</b>	1,429
<b>% Occupied:</b>		34.1%	34.3%	<b>36.0%</b>	34.8%

Table 14 provides a summary of peak hour (12:00 PM) parking occupancy on Saturday by block. The blocks with on-street, off-street and combined parking occupancy levels at or above 85% are highlighted in the table.

**Table 14.**  
**Summary of Parking Occupancy by Block, Saturday, April 20, 2013 (4:00 PM)**

Block	On-Street Parking			Off-Street Parking			Total Parking		
	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied
1	21	11	52%	139	56	40%	160	67	42%
2	58	42	72%	85	80	<b>94%</b>	143	122	<b>85%</b>
3	67	28	42%	136	22	16%	203	50	25%
4	50	11	22%	188	5	3%	238	16	7%
5	51	22	43%				51	22	43%
6	68	36	53%	28	13	46%	96	49	51%
7	19	0	0%	116	13	11%	135	13	10%
8	40	5	13%	105	4	4%	145	9	6%
9	33	12	36%	115	81	70%	148	93	63%
10	35	26	74%	621	284	46%	656	310	47%
11	77	42	55%	97	64	66%	174	106	61%
12	27	4	15%	112	15	13%	139	19	14%
13	12	0	0%	156	1	1%	168	1	1%
14	38	14	37%	63	14	22%	101	28	28%
15	60	26	43%	104	15	14%	164	41	25%
16	35	31	<b>89%</b>	107	40	37%	142	71	50%
17	63	45	71%	51	13	25%	114	58	51%
18	8	7	<b>88%</b>	34	0	0%	42	7	17%
19	21	7	33%				21	7	33%
20	43	34	79%	110	34	31%	153	68	44%
21	81	57	70%	73	38	52%	154	95	62%
23	15	4	27%	120	36	30%	135	40	30%
24	35	19	54%	43	5	12%	78	24	31%
25	63	26	41%				63	26	41%
26	51	10	20%	32	7	22%	83	17	20%
27	27	10	37%	20	9	45%	47	19	40%
28	49	24	49%				49	24	49%
29	48	11	23%	44	7	16%	92	18	20%
30	62	23	37%	8	1	13%	70	24	34%
31	49	23	47%	8	4	50%	57	27	47%
32	65	1	2%				65	1	2%
33	25	9	36%				25	9	36%
<b>Total:</b>	<b>1,396</b>	<b>620</b>	<b>44%</b>	<b>2,715</b>	<b>861</b>	<b>32%</b>	<b>4,111</b>	<b>1,481</b>	<b>36%</b>

Friday was a busier day for parking than Saturday and will be the focus of the remainder of the analysis of existing parking conditions. Parking occupancy on the peak day, although slightly higher than last time, was still very low for the study area overall. This is because it is a large and diverse area that is in the

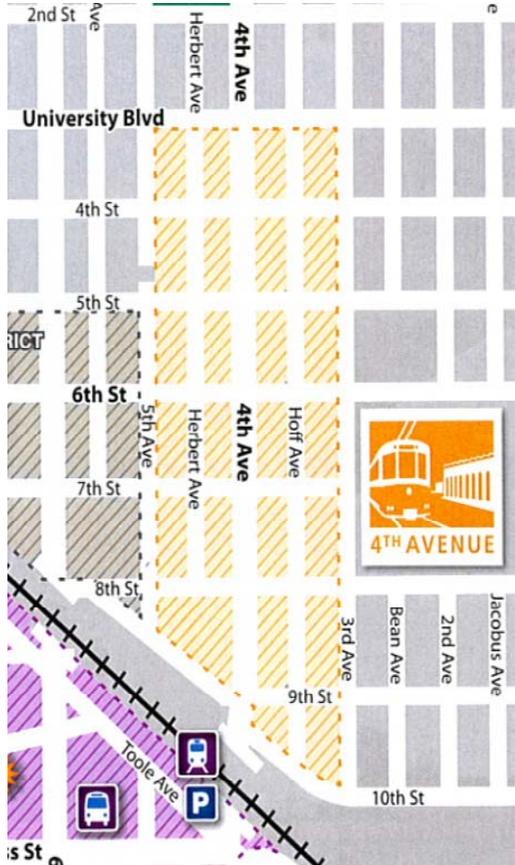
early stages of redeveloping. The commercial, residential and industrial areas of the study area do not exhibit peak parking activity at the same time of the day. For example, when the commercial area near 4<sup>th</sup> Avenue is the busiest in the late evening, the Warehouse District has minimal parking activity. When there is more parking activity in the Warehouse District on weekdays, the 4<sup>th</sup> Avenue Business District and the residential areas in the Iron Horse and West University neighborhoods are not very busy. There are also several vacant buildings in the Warehouse District.

*4<sup>th</sup> Avenue Business District*

The 4<sup>th</sup> Avenue Business District, pictured on the right, is bounded by University Boulevard on the north, 10<sup>th</sup> Street on the south, 3<sup>rd</sup> Avenue on the east and 5<sup>th</sup> Avenue on the west. It consists of 13 of 33 blocks within the study area and, as previously mentioned, represents the core area within the study area.

On-street parking occupancy in the 4<sup>th</sup> Avenue Business District on Friday, August 24, 2012 is presented in Table 15 on the following page. There were 369 vehicles parked in 529 on-street spaces at the peak hour of 8:00 PM, which represents an occupancy level of 69.8%. The on-street parking was approximately 70% occupied at the peak hour of 8:00 PM during the previous occupancy survey.

Off-street parking occupancy on Friday in the 4<sup>th</sup> Avenue Business District is presented in Table 16. There were 817 vehicles parked in 1,471 off-street spaces at the peak hour of 12:00 AM, which represents an occupancy level of 55.5%. The off-street parking was approximately 49% occupied at the peak hour of 10:00 PM during the previous occupancy survey.



**Table 15.**  
**On-Street Parking Occupancy by Block, Friday, April 19, 2013**  
**4th Avenue Business District**

Block	Spaces	Occupied Spaces						
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
2	58	37	37	33	35	33	19	15
3	55	40	40	24	33	33	23	25
5	51	20	20	24	24	27	31	24
6	55	31	28	22	36	34	36	41
10	35	29	26	27	28	28	30	31
11	49	29	22	22	29	35	33	36
16	35	28	25	17	28	27	26	33
17	35	24	24	20	25	29	23	29
18	8	7	5	3	7	2	1	0
19	21	5	2	2	4	9	8	11
20	43	25	20	21	30	37	37	42
21	47	37	32	29	37	34	32	39
24	35	30	28	20	32	27	29	34
28	49	23	27	26	27	27	27	31
<b>Total:</b>	<b>576</b>	<b>365</b>	<b>336</b>	<b>290</b>	<b>375</b>	<b>382</b>	<b>355</b>	<b>391</b>
<b>% Occupied:</b>		<b>63.4%</b>	<b>58.3%</b>	<b>50.3%</b>	<b>65.1%</b>	<b>66.3%</b>	<b>61.6%</b>	<b>67.9%</b>

**Table 16.**  
**Off-Street Parking Occupancy by Block, Friday, April 19, 2013**  
**4th Avenue Business District**

Block	Spaces	Occupied Spaces						
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
2	85	37	41	26	12	9	7	4
3	136	50	61	62	55	51	32	50
6	28	13	17	17	22	15	14	15
10	621	308	293	310	326	317	349	371
11	97	67	65	63	64	59	57	62
16	107	27	28	40	62	66	71	94
17	51	30	23	21	27	19	18	23
20	110	43	41	35	32	28	29	47
21	73	44	46	53	45	40	39	29
23	120	43	44	64	71	74	86	109
24	43	30	13	8	13	6	6	13
<b>Total:</b>	<b>1,471</b>	<b>692</b>	<b>672</b>	<b>699</b>	<b>729</b>	<b>684</b>	<b>708</b>	<b>817</b>
<b>% Occupied:</b>		<b>47.0%</b>	<b>45.7%</b>	<b>47.5%</b>	<b>49.6%</b>	<b>46.5%</b>	<b>48.1%</b>	<b>55.5%</b>

All of the public off-street parking lots shown previously in Tables 3 and 7 are located within the 4<sup>th</sup> Avenue Business District. There were 106 vehicles parked in 245 spaces at the peak hour of 12:00 PM, which represents an occupancy level of 43.3%. The public off-street parking was approximately 46% occupied at the peak hour of 2:00 PM during the previous occupancy survey.

As presented in Table 17, the overall peak hour for parking on Friday in the 4<sup>th</sup> Avenue Business District was 12:00 AM when there were 1,208 vehicles parked in 2,047 spaces, which represents an occupancy level of 59%. The on- and off-street parking was approximately 56% occupied at the peak hour of 10:00 PM during the previous occupancy survey.

**Table 17.**  
**Summary of Parking Occupancy, Friday, April 19, 2013**  
**4th Avenue Business District**

Parking	Spaces	Occupied Spaces						
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM	12:00 AM
On-Street	576	365	336	290	375	382	355	391
Off-Street	1,471	692	672	699	729	684	708	817
Total:	2,047	1,057	1,008	989	1,104	1,066	1,063	<b>1,208</b>
% Occupied:		51.6%	49.2%	48.3%	53.9%	52.1%	51.9%	<b>59.0%</b>

Table 18 provides a summary of peak hour (12:00 AM) parking occupancy in the 4<sup>th</sup> Avenue Business District on Friday by block. The blocks with on-street, off-street and combined parking occupancy levels at or above 85% are highlighted in the table.

**Table 18.**  
**Summary of Parking Occupancy by Block, Friday, April 19, 2013 (12:00 AM)**  
**4th Avenue Business District**

Block	On-Street Parking			Off-Street Parking			Total Parking		
	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied
2	58	15	26%	85	4	5%	143	19	13%
3	55	25	45%	136	50	37%	191	75	39%
5	51	24	47%				51	24	47%
6	55	41	75%	28	15	54%	83	56	67%
10	35	31	<b>89%</b>	621	371	60%	656	402	61%
11	49	36	73%	97	62	64%	146	98	67%
16	35	33	<b>94%</b>	107	94	<b>88%</b>	142	127	<b>89%</b>
17	35	29	83%	51	23	45%	86	52	60%
18	8	0	0%				8	0	0%
19	21	11	52%				21	11	52%
20	43	42	<b>98%</b>	110	47	43%	153	89	58%
21	47	39	83%	73	29	40%	120	68	57%
23				120	109	<b>91%</b>	120	109	<b>91%</b>
24	35	34	<b>97%</b>	43	13	30%	78	47	60%
28	49	31	63%				49	31	63%
Total:	576	391	68%	1,471	817	56%	2,047	1,208	59%

### **Summary of Existing Parking Conditions**

Although parking demand has increased compared with the previous surveys and there are currently parking “hot spots” in the study area where parking demand exceeds the effective parking supply, the results of the parking occupancy surveys indicate there is still adequate parking within the study area overall and the development of more parking is not warranted at this time. Although parking development is not recommended at this time, it is recommended that the city take steps to more actively manage parking in the 4<sup>th</sup> Avenue Business District, which will have the benefit of transitioning from the current “free” parking environment to an environment where people are used to the idea of paying for parking when they visit the area.

### **FUTURE PARKING CONDITIONS**

#### **Future Housing Projects**

There are several student housing projects under construction or planned within or nearby the study area that may have an impact on future parking availability. The City of Tucson code requirement for parking for dormitory type housing is 0.70 spaces per bed/resident. However, parking can automatically be reduced by up to 25% for projects located within the IID, which results in a parking ratio 0.525 spaces per bed/resident. The number of parking spaces required for on-campus resident students is typically below 0.50 parking spaces per resident student. The number of resident spaces required for off-campus housing is generally higher than for on-campus housing.

The District on 5<sup>th</sup>, located at 550 N. 5<sup>th</sup> Avenue on Blocks 9 and 10, has 756 beds in 206 two- and four-bedroom apartment units for University of Arizona students. Provided on site are 647 parking spaces in a surface lot (75 spaces) and multi-level parking structure (572 spaces), which equates to a parking supply ratio of 0.86 spaces per bed/resident. The peak parking demand ratio based on the occupancy counts is 0.54 spaces per bed/resident (411 of 647 spaces occupied). The parking demand ratio based on the effective parking supply (85% of the actual supply) is 0.75 spaces per bed/resident.

Housing developments on the Railroad site atop the new Centro garage and on the old Greyhound site, both located just outside the southern border of the study area, will have 456 beds in 199 apartment units. The housing projects will be provided 184 reserved parking spaces in the Centro Garage and another 158 reserved parking spaces in the Pennington Garage and Toole Avenue lot downtown. The 342 spaces represent a parking ratio of 0.75 spaces per bed, which is the minimum the lender would accept for the residential developments. Any remaining parking required for the developments is expected to be accommodated in other downtown parking facilities, if required.

The Junction at Iron Horse, located at 504 E. 9<sup>th</sup> Street, will soon be under construction on Block 29. There will be 232 beds and 135 on-site parking spaces when completed, which represents a parking ratio of 0.57 spaces per bed. The developer has submitted a request for a reduction in required parking based on parking reduction strategies such as car sharing, the use of on-street spaces adjacent to the development, management and staff parking in a nearby garage, free transit passes, and more bicycle

parking. Nonetheless, there could still be overflow parking into the neighborhood from this development in the range of 40+ spaces during peak periods.

A 14-story student housing development is currently under construction at 1020 N. Tyndall near the Main Gate of the University of Arizona. Provided will be 562 beds and only 90 on-site parking spaces, which represents a parking ratio of 0.16 spaces per bed. Despite being very close to the University of Arizona campus, this development is not expected to have sufficient on-site parking. That being said, given the distance of the project from the study area and the vast university parking supply located nearby, this student housing project is not expected to have an impact on study area parking.

There has been serious developer interest in a student housing project similar to the District on 5<sup>th</sup> apartment complex on Block 19. There is no more specific information available about this proposed project at this time. All of the existing buildings on Block 19 are currently vacant and there is no off-street parking presently provided on the block.

### **Other Development**

Tap & Bottle, a craft beer and wine store and tasting room, recently opened at 403 N. 6<sup>th</sup> Avenue on Block 14. They are one of three tenants at the Old Market Inn, including a coffee roasting business and a tile shop, both of which recently opened. The City of Tucson code requirement for parking for Alcoholic Beverage Service is 1 space per 50 square feet, which translates into 52 parking spaces for the approximately 2,600 square foot space. As previously mentioned, parking can automatically be reduced by up to 25% for projects located within the IID, which results in a revised parking requirement of 39 spaces. The owner/developer has been approved for a Modification of Development Regulations (MDR) and is not providing any parking because of the proximity of the store to the Pennington Garage, which is approximately two blocks away. The Tap & Bottle parking demand could still fill nearby on-street parking during peak periods, as it is thought that Tap & Bottle patrons will search for available nearby on-street spaces prior to parking in the Pennington Garage.

There will be a new restaurant called Hudson opening at 201 N. 4<sup>th</sup> Avenue on Block 23. The required parking for a 6,150square foot restaurant within the IID is 0.75 spaces per 100 GFA, which results in the need for 46 parking spaces. They have satisfied their parking requirement by signing an agreement to spend \$830 per month on parking validations for customer use at the Centro Garage, which is located approximately 600 feet from the proposed restaurant.

There is also a new 739 square foot café going into the first floor of the Hotel Coronado at the southeast corner of 4<sup>th</sup> Avenue and 9<sup>th</sup> Street on Block 28. They are satisfying their parking requirement with validations for customer use at the Centro Garage, which is about two blocks away, and through the conversion of parallel on-street parking to angled parking, which will result in the net gain of three or four on-street spaces.

There is also a brew pub planned for the northeast corner of 5<sup>th</sup> Avenue and 7<sup>th</sup> Street (Block 16). No more information is available for this development project at this time.

## Loss of Parking

Downtown Links will contribute to the loss of parking within the study area. It appears as though the transportation project will displace an estimated 236 on- and off-street parking spaces in the southwest portion of the study area on Blocks 7, 8, 12, 13, 14 and 18. Parking on Blocks 19, 22 and 32 was displaced due to construction activities related to the modern streetcar and Downtown Links prior to the start of the parking study and conducting parking occupancy surveys.

## Summary of Future Parking Conditions and Recommendations

Future development coupled with the loss of parking may result in parking deficits on several blocks in the southern portion of the study area. With that being said, current and projected levels of parking demand do not support the development of a parking structure in the area in the immediate future. As mentioned in the previous parking study, consideration should be given to more effectively direct 4<sup>th</sup> Avenue Business District customers, visitors and employees to available off-street public parking. Signage is required to both direct parking patrons to public parking and to clearly identify the parking as available to the general public. If the existing public lots do not represent viable parking for the general public because of location or for other reasons, consideration should be given to leasing existing underutilized private parking for public use. The parking occupancy surveys indicate there are private parking lots near 4<sup>th</sup> Avenue that are significantly underutilized during peak periods. The key to the success of leasing private parking for public use is providing convenient parking close to primary destinations and, as mentioned above, signage to effectively direct patrons to clearly identified public parking lots. Although additional parking is not required presently, it is only a matter of time before it will be required, and it is reasonable to start planning for this sooner rather than later.



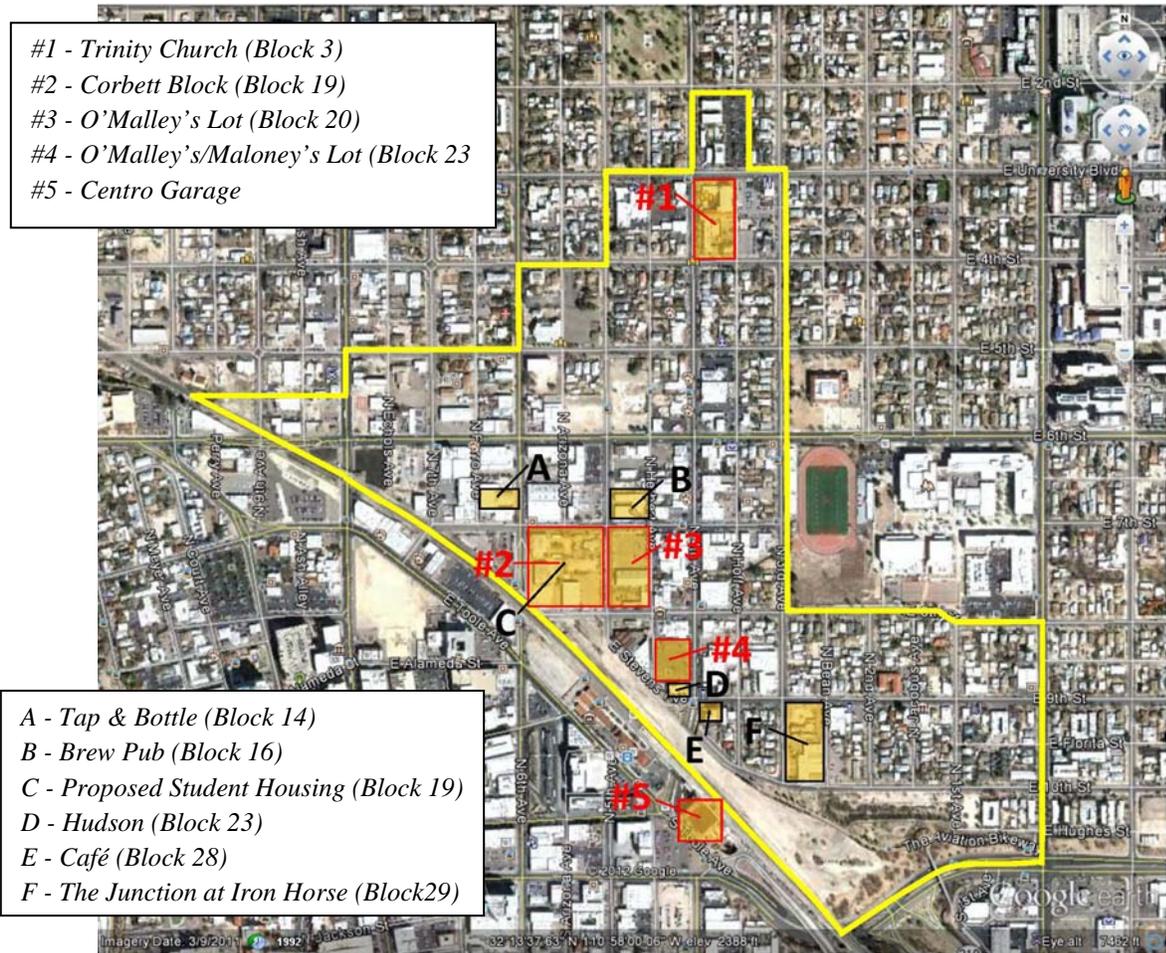
## Parking Development Sites

Large and rectangular shaped sites are ideal for parking structures. Although flat sites are generally more economical to develop, sloped sites can provide opportunities such as access on different levels or no ramping between levels. Double-loaded parking bays generally range in width between 54 and 60 feet, depending upon the angle of the parking. The overall width of a parking structure is determined upon the multiples of the chosen bay widths. Longer sites provide the opportunity to park along the end bays, which provides more parking spaces, improves the layout efficiency, and lowers the cost per space. Longer sites also allow for more moderate ramp slopes for improved user comfort. Generally, parking bays are oriented parallel to the longer dimension of the site and preferably in the predominate direction of pedestrian travel. Tolerable walking distances from parking to a primary destination vary by user group, but range from 200 to 300 feet for shoppers to up to 1,200 feet for employees. The evaluation criteria used to evaluate sites for structured parking include the following:

- Parking Needs
- User Groups Served
- Site Ownership and Acquisition Cost
- Distance to Primary Destinations
- Size, Current Use and Topography of the Site

- Parking Efficiency and Spaces Replaced
- Site Access and the Intermixing of Vehicles and Pedestrians
- Visual Impact/Architectural Compatibility/Historic Integrity
- Shared-Use and Mixed-Use Possibilities

ParkWise is considering investing in structured parking as a component of mixed-use development at a site on 4<sup>th</sup> Avenue and north of 6<sup>th</sup> Street. A private developer has proposed a mixed-use development at the Trinity Church site at 4<sup>th</sup> Avenue and University Boulevard on Block 3. The city and ParkWise have had discussions with the developer about the possibility of adding a level of public parking (approximately 100 spaces) to the proposed parking structure below a residential development. There are three other sites in the area west of 4<sup>th</sup> Avenue and south of 7<sup>th</sup> Street that merit consideration for a parking structure based on their location, availability of sufficient land area to accommodate an efficient parking garage, and the lack of historic buildings on the sites. The additional sites to be considered include the O’Malley’s parking lot on Block 20, the shared O’Malley’s/Maloney’s parking lot on Block 23 and the Corbett site on Block 19. These sites are highlighted and numbered 1 to 4 on the map below. Also shown on the map is the Centro Garage (#5), which is just outside of the study area, and the future housing and commercial development projects discussed (A-F).



Parking structure sites on 4<sup>th</sup> Avenue would be conducive to a mixed-use project with ground floor commercial space. A site off of 4<sup>th</sup> Avenue may favor a mixed-use project with housing above the parking, similar to the Centro Garage. A site south of 6<sup>th</sup> Street is generally favored to a site north of 6<sup>th</sup> Street as the on- and off-street parking in the 4<sup>th</sup> Avenue Business District is generally busier south of 6<sup>th</sup> Street, particularly in the evening, and the planned and proposed development projects are all south of 6<sup>th</sup> Street. There are also several vacant or underutilized properties that represent opportunities for redevelopment west of 4<sup>th</sup> Avenue and south of 6<sup>th</sup> Street, and the Warehouse District is ripe for redevelopment given the architectural character of the buildings. Following are the primary advantages and disadvantages of the sites identified for structured parking:

**Trinity Church (Site #1)**

*Advantages:*

- Site is located on 4<sup>th</sup> Avenue
- Site’s location near a streetcar stop will encourage “park once” and ride trips
- Displacement of minimal existing surface parking
- Developer interest in the site and shared-use possibilities
- Mixed-use potential
- No nearby parking structures
- There is a lack of other buildable sites in the area due to historic building designations
- Facility would quickly intercept vehicles entering the study area from the north
- Site would be accessible for parking during street fairs.

*Disadvantages:*

- Site is north of 6<sup>th</sup> Street and not near future development
- Less central location than other sites within the study area
- Historic buildings on the site
- Site may not be accessible for parking during street fairs

**Corbett Block (Site #2)**

*Advantages:*

- Displaces no existing surface parking spaces
- Site is south of 6<sup>th</sup> Street and near future development
- No historic buildings on the site
- Developer interest in the site and shared-use possibilities
- Mixed-use potential
- Closest site to the parking displaced by Downtown Links
- Direct connectivity to Downtown Links
- Site would be accessible for parking during street fairs

*Disadvantages:*

- The acquisition of private property
- Site is the farthest away from 4<sup>th</sup> Avenue
- Site is fairly close to existing downtown parking structures

**O'Malley's Lot (Site #3)**

*Advantages:*

- Site is south of 6<sup>th</sup> Street and near future development
- Site is a current pay parking lot in the evening
- No historic buildings on the site
- Shared-use and mixed-use potential
- Site is closer to 4<sup>th</sup> Avenue than the Corbett site
- Site would be accessible for parking during street fairs

*Disadvantages:*

- The acquisition of private property
- Displacement of a large number of existing surface parking spaces
- Site is not on 4<sup>th</sup> Avenue
- Site is fairly close to existing downtown parking structures

**O'Malley's/Maloney's Shared Lot (Site #4)**

*Advantages:*

- Site is located on 4<sup>th</sup> Avenue
- Site's location near a streetcar stop will encourage "park once" and ride trips
- Site is south of 6<sup>th</sup> Street and near future development
- No historic buildings on the site
- Shared-use and mixed-use potential
- Facility would quickly intercept vehicles entering the study area from the south and east
- Site would be accessible for parking during street fairs

*Disadvantages:*

- The acquisition of private property
- Displacement of a large number of existing surface parking spaces
- Visual impact of a parking garage on nearby businesses
- The smallest site of the four considered
- Site is the closest to existing downtown parking structures

All of the sites identified are good sites for structured parking and none should be eliminated from consideration. However, as previously mentioned, the sites south of 6<sup>th</sup> Street (Site #'s 2, 3 and 4) are generally favored over the site north of 6<sup>th</sup> Street (Site #1) because the existing parking is busier south of 6<sup>th</sup> Street, all of the future development is south of 6<sup>th</sup> Street, and there are more development and redevelopment opportunities south of 6<sup>th</sup> Street. The favored site south of 6<sup>th</sup> Street is the O'Malley's/Maloney's parking lot on Block 23 (Site #4) because it is located on 4<sup>th</sup> Avenue and likely has the best revenue potential of all of the sites under consideration. A parking garage at this location would quickly intercept vehicles entering the 4<sup>th</sup> Avenue area from the south and east and, in conjunction with the modern streetcar, encourage visitors and customers to "park once" and ride the modern streetcar between downtown, 4<sup>th</sup> Avenue and University of Arizona destinations.

Envisioned at this location is a two-bay, single threaded helix garage with ground floor retail and possibly second floor office space fronting 4<sup>th</sup> Avenue, similar to the 15<sup>th</sup> and Pearl Garage in Boulder, CO, pictured below. A two-bay wide footprint on the site will provide approximately 85 spaces per level. Vehicle ingress/egress could be to/from both 4<sup>th</sup> Avenue and 8<sup>th</sup> Street.



It is acknowledged that the City of Tucson and other stakeholders may view the advantages and disadvantages of the alternative sites differently than DESMAN and may ultimately favor another site. Even if all are in agreement on the best site for structured parking, the city may end up with another location because the opportunity to acquire the real estate or undertake a public-private partnership may be present at another site and not available at a preferred location.

## ON-STREET PARKING METERS AND PARKLETS

In order for a parking structure to be considered in the 4<sup>th</sup> Avenue area, paid on-street parking must first be introduced so parking patrons become accustomed to paying for parking. DESMAN believes that the best meters for the area are the “smart” single-space meters, pictured on the right. These meters are solar powered, have rechargeable battery packs, and are wirelessly networked to a remote web-based management system. The system allows remote diagnostics and configuration of the meters. They accept coins, tokens, credit cards, debit cards and smart cards. It is also possible to pay by cell phone. These meters can also come with a wireless sensor to reset the meters to “0” when a vehicle vacates a parking space. Advantages of the smart single-space meters include:



- Multiple payment options including coins, credit cards and smart cards.
- Offer the same fundamental rules and usage habits of the existing downtown and UA meters.
- Offer option of future conversion to market-based pricing (higher rates at higher use times).
- More user-friendly and better understood by users than multi-space meters.
- More convenient to use than multi-space meters as they are located next to the parking space.
- No space numbering required.
- Meter placement can delineate on-street parking spaces.
- No additional signage required advising users to pay at the parking station and either key in their parking space number or place a receipt on their dashboard.
- Meter malfunctions are wirelessly communicated to the maintenance shop so repair efforts can be handled as needed rather than on a routine basis.
- If a meter fails, only a single space is affected.
- No paper jams or increased costs for consumables.

On the following page is a parking meter map showing the recommended locations for parking meters on and near 4<sup>th</sup> Avenue. There are an estimated 467 on-street parking spaces recommended for parking meters, of which 206 are currently unrestricted (44%), 245 have one- or two-hour limits (52%), 10 are loading spaces (2%) and 6 are handicap spaces (1%). The locations of the 467 on-street spaces mentioned above are identified by street in Table 19 on the following page. Also refer to the Parking Meter Tabulation in the Appendix for more detail on the spaces recommended for the installation of parking meters by block.



**Estimated Revenues and Expenses**

It is recommended that the majority of the parking meters have a two-hour limit and all the meters be enforced from 11:00 AM to 12:00 AM Monday through Saturday. A limited number of one-hour meters could be placed in higher turnover areas and some three-hour meters placed in lower turnover areas. The recommended meter rate is \$1.00 per hour. The parking meters are estimated to generate first year revenue of \$317,100, which equates to annual revenue of approximately \$679 per meter for 467 meters. The estimated meter revenue is based on the following assumptions and calculated as follows:

Number of Meters:	467
Average Occupancy (1):	60%
Average Daily Turnover (2):	3.0
Number of Days (3):	302
Average Length of Stay and Parking Fee (4):	Approximately 1.1 hours (\$1.25 fee)

- 467 meters x 60% average occupancy = 280 x 3.0 average turnover = 840 x 302 days = 253,680 x \$1.25 average fee = \$317,100; \$317,100 ÷ 467 meters = \$679.01 per meter.

Notes:

- (1) The average parking occupancy on Friday, Friday night and Saturday for the 467 on-street spaces where meters are recommended was approximately 72%.
- (2) The spaces included in the parking duration and turnover survey during the previous study turned over 4.23 times over an eight-hour period.
- (3) Six days per week x 52 weeks = 312 days - 10 holidays = 302 days.
- (4) The average length of stay during the parking duration and turnover survey was approximately 1.1 hours. The \$1.25 average fee represents an overpayment of approximately 15%.

The 1,240 functioning downtown and Main Gate parking meters generated \$703,160 in revenue in FY 2013 (meter hooding is included in this figure), which equates to \$567.06 per meter. The 4<sup>th</sup> Avenue meters could very realistically generate two times more revenue than the downtown meters given the increased hours of enforcement and a 100% higher hourly rate.

The City of Tucson has estimated first year parking meter citation revenue for the 4<sup>th</sup> Avenue area. Meter expiration and time limit citation revenue is estimated to total \$113,102. Adding the estimated 4<sup>th</sup> Avenue meter citation revenue of \$113,102 to the estimated 4<sup>th</sup> Avenue meter revenue of \$317,100, results in total revenue of \$430,202.

On the following page are the estimated expenses for the 4<sup>th</sup> Avenue parking meters. The expenses anticipate that there are three full-time personnel, including one collection and maintenance person and two enforcement officers, three vehicles to be maintained, 467 single-space “smart” meters, and ParkWise administration of the parking meter program. The expenses do not include debt service or lease payments for the new parking meters.

1. Personnel (1)	\$126,000
2. Repair/Maintenance (2)	\$ 7,560
3. Management, Data, Transaction Fees (3)	\$ 39,695
4. Administration	\$ 10,080
5. Misc. (4)	<u>\$ 9,165</u>
Total:	\$192,500

Notes:

- (1) Includes payroll and benefits.
- (2) Repair and maintenance of three vehicles and 467 meters.
- (3) \$85 per meter for 467 meters.
- (4) Approximately 5% of 1-4 above.

Given an estimated \$430,202 in revenue and \$192,500 in expenses, the parking meters will generate an estimated \$237,702 in net revenue.

Merchants in the 4<sup>th</sup> Avenue area have expressed concern for employee parking with the addition of on-street parking meters. The meters should be coupled with discounted off-street employee parking at more remote locations that are currently underutilized to alleviate these concerns.

**Parklets**

Parklets are intended to provide outdoor space for public enjoyment where existing sidewalks are too narrow to accommodate such use. Parklets are typically the size of a few parking spaces and should be designed for quick and easy removal for emergencies or for other reasons such as street maintenance and snow removal. The photograph below shows a parklet in San Francisco, where they originated in 2010.



There have recently been several requests to remove on-street parking spaces in the downtown and 4th Avenue areas. Parklets are currently defined by the City of Tucson as public spaces that may be sponsored by adjacent businesses, but are not an extension of the business. So under the city's definition of parklets they can be used by anyone but food and drinks cannot be served. The city is currently looking at three categories for the temporary or permanent removal of on-street parking spaces:

1. Permanent Removal for Private Use. For these parklets the city would like to levy a substantial fee based on the replacement value of a parking space.
2. Temporary Removal for Private Use. This represents an alternative that would be offered to businesses interested in expanding their space, but are unable to pay the replacement value for the permanent removal of parking. The city would charge an annual fee for the temporary removal of on-street parking to make up for lost parking revenue and for the replacement value of a parking space. These parklets would be renewed yearly, most likely through the city's Real Estate office's Temporary Revocable Easement process.
3. Temporary Removal for Public Use. This represents the city's current definition of parklets. The city would charge an annual fee for the temporary removal of the on-street parking similar to the description above.

Given the economic value of on-street parking spaces, the City of Tucson should definitely start charging a fee for the temporary and permanent removal of on-street parking spaces. It is recommended to charge a flat rate based on the replacement value of a structured parking space. This fee would be analogous to the in-lieu fees previously discussed. The funds received would be set aside for the construction of a garage in the future. Alternatively, an annual fee could be charged for the removal of on-street parking for parklets that could be easily installed and removed. A part of this program would be an annual review of their continuance through the Temporary Revocable Easement process. The annual fee could be based on the replacement value of the parking amortized over several years at the prevailing interest rate. For example, the annual payment for a \$16,000 parking space at 3% interest amortized over 20 years is \$1,075, which equates to a cost of \$6.11 per square foot for a typical 8' x 22' parallel parking space.

The Fourth Avenue Merchants Association (FAMA), while not entirely against the concept of Temporary Revocable Easements, has expressed the following concerns with parklets:

- The loss of on-street parking spaces and revenues
- Parklets that benefit individual businesses at the expense of neighboring businesses
- Determining the fair market value of the sidewalk area
- Pedestrian congestion
- Vehicle and bicycle safety issues
- Parklets policies and approval process
- The cost to remove a parklet for unsustainable sponsoring businesses

**PARKING STRUCTURE FINANCIAL FEASIBILITY ANALYSES**

The following financial feasibility analyses for structured parking at the four sites are partially based on current garage revenues and expenses for five existing ParkWise garages, including the Pennington, City-State, Library, Centro and Depot Plaza garages. Operating and maintenance expenses for the city’s five garages range between \$123 and \$473 per parking space per year, with an average of \$293 per parking space. The average is very comparable to the annual operating and maintenance and maintenance expenses for the Pennington garage, which is \$291 per space per year. For this analysis \$300 per space per year (\$30,000 annually) is used to estimate the first-year operating and maintenance expenses for a proposed parking garage. Parking garage revenues for the five existing garages range from \$178 to \$467 per space per year, with an average of \$294. The Pennington garage generates the most revenue because of its downtown location and versatility with a combination of monthly, daily, evening and weekend users. A 4<sup>th</sup> Avenue garage would also be expected to attract a variety of users on weekdays, in the evening and on weekends.

**Trinity Church (Site #1)**

Two scenarios will be analyzed for the Trinity Church site, one with 100 public parking spaces below a residential building and the other with 300 spaces below a residential building with a combination of tenant (140 spaces for 140 units at a 1:1 ratio) and public (160 spaces) parking. The second scenario is being proposed by a developer and all of the parking (300 spaces) would be under the control of ParkWise.

As indicated in Table 20 on the following page, 100 structured parking spaces at the Trinity Church site (Site #1) are estimated to represent a construction cost of \$1.6 million (\$16,000 per space for parking below a residential building). Adding \$320,000 in financing and development costs results in a total project cost \$1.92 million. Anticipating financing can be obtained at 3% interest and amortized over 20 years, annual debt service is \$129,054.

The estimated first-year operating and maintenance expenses for the proposed parking garage are \$30,000 (\$300 per space per year). First-year revenue for the proposed garage at is estimated at \$510 per parking space (\$51,000 annually). The revenue estimate anticipates 100 public spaces that are on average 20% occupied with monthly parkers at a rate of \$50.00 per month and 50% occupied with customers and visitors three nights per week at a flat rate of \$5.00 with no turnover. Average annual increases in revenue vary based on an evolving mix of users. Monthly garage patrons are anticipated to increase from 20 the first year (20% of 100 spaces) to 50 by Year 10 (50% of 100 spaces). Transient patrons are anticipated to increase from 50 the first year (50% of 100 spaces) to 85 by Year 10 (85% of 100 spaces). Parking rates are anticipated to increase 7.5% in Years 4 and 8.

There will be an estimated \$21,000 in net income the first year (parking income less O&M expenses) to cover debt service. With a debt service payment of \$129054, the proposed garage is projected to lose \$108,054 the first year and have a debt service coverage ratio of only 0.16, which is below the debt service coverage ratio of the Pennington garage last fiscal year of 0.25. Given a 3% average annual increase in expenses and the increases in revenue discussed above, the parking garage by Year 10 is

expected to produce a net loss of \$54,533. Cumulative losses over the ten-year period are approximately \$820,000.

Number of Parking Spaces	100									
Estimated Cost per Space (1)	\$ 16,000									
Construction Cost (2)	\$ 1,600,000									
Financing & Development Costs (3)	\$ 320,000									
Total Project Cost	\$ 1,920,000									
Annual Debt Service (4)	\$ 129,054									
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>
Parking Income (5)	\$ 51,000	\$ 56,262	\$ 61,524	\$ 71,795	\$ 77,451	\$ 83,108	\$ 88,764	\$ 101,502	\$ 107,583	\$ 113,664
Operating & Maintenance Expenses (6)	\$ 30,000	\$ 30,900	\$ 31,827	\$ 32,782	\$ 33,765	\$ 34,778	\$ 35,822	\$ 36,896	\$ 38,003	\$ 39,143
Net Income	\$ 21,000	\$ 25,362	\$ 29,697	\$ 39,013	\$ 43,686	\$ 48,330	\$ 52,943	\$ 64,606	\$ 69,580	\$ 74,521
Debt Service	\$ 129,054	\$ 129,054	\$ 129,054	\$ 129,054	\$ 129,054	\$ 129,054	\$ 129,054	\$ 129,054	\$ 129,054	\$ 129,054
Total Net Income	\$ (108,054)	\$ (103,692)	\$ (99,357)	\$ (90,041)	\$ (85,368)	\$ (80,725)	\$ (76,111)	\$ (64,448)	\$ (59,474)	\$ (54,533)
Debt Service Coverage Ratio	0.16	0.20	0.23	0.30	0.34	0.37	0.41	0.50	0.54	0.58

(1) The cost per space reflects a less efficient parking layout due to the column spacing to support housing above the parking.

(2) Does not include land acquisition cost.

(3) 20% of the construction cost.

(4) Principal balance of \$1,920,000 at 3% interest rate over a 20 year term.

(5) \$510 per parking space for the first year; average annual increase varies based on the evolving mix of users.

(6) \$300 per parking space for the first year; 3% average annual increase.

As indicated in Table 21 on the following page, 300 structured parking spaces at the Trinity Church site (Site #1) are estimated to represent a construction cost of \$4.8 million (\$16,000 per space for parking below a residential building). Adding \$960,000 in financing and development costs results in a total project cost \$5.76 million. Anticipating financing can be obtained at 3% interest and amortized over 20 years, annual debt service is \$387,162.

The estimated first-year operating and maintenance expenses for the proposed parking garage are \$90,000 (\$300 per space per year). Revenue projections anticipate that there are 140 parking spaces for residential tenants and 160 spaces for the general public. First-year revenue for the proposed garage is estimated at \$620 per parking space (\$186,000 annually). The revenue estimate anticipates 140 residential spaces at a rate of \$50 per month and the 160 public spaces are on average 20% occupied with monthly parkers at a rate of \$50.00 per month and 50% occupied with customers and visitors three nights per week at a flat rate of \$5.00 with no turnover. Average annual increases in revenue vary based on an evolving mix of users. Monthly garage patrons are anticipated to increase from 32 the first year (20% of 160 spaces) to 80 by Year 10 (50% of 160 spaces). Transient patrons are anticipated to increase from 80 the first year (50% of 160 spaces) to 136 by Year 10 (85% of 160 spaces). Parking rates are anticipated to increase 7.5% in Years 4 and 8.

There will be an estimated \$96,000 in net income the first year (parking income less O&M expenses) to cover debt service. With a debt service payment of \$387,162, the proposed garage is projected to lose \$291,162 the first year and have a debt service coverage ratio of only 0.25, which is equal to the debt service coverage ratio of the Pennington garage last fiscal year of 0.25. Given a 3% average annual increase in expenses and the increases in revenue discussed above, the parking garage by Year 10 is

expected to produce a net loss of \$90,053. Cumulative losses over the ten-year period are approximately \$1.9 million.

**Table 21.**  
**Trinity Church Site (# 1) Garage Pro Forma Statement of Revenues and Expenses, Years 1-10**

Number of Parking Spaces	300									
Estimated Cost per Space (1)	\$ 16,000									
Construction Cost (2)	\$4,800,000									
Financing & Development Costs (3)	\$ 960,000									
Total Project Cost	\$5,760,000									
Annual Debt Service (4)	\$ 387,162									
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>
Parking Income (5)	\$ 186,000	\$ 205,190	\$ 224,381	\$ 261,839	\$ 282,469	\$ 303,099	\$ 323,729	\$ 370,185	\$ 392,362	\$ 414,539
Operating & Maintenance Expenses (6)	\$ 90,000	\$ 92,700	\$ 95,481	\$ 98,345	\$ 101,296	\$ 104,335	\$ 107,465	\$ 110,689	\$ 114,009	\$ 117,430
Net Income	\$ 96,000	\$ 112,490	\$ 128,900	\$ 163,494	\$ 181,173	\$ 198,764	\$ 216,264	\$ 259,497	\$ 278,353	\$ 297,110
Debt Service	\$ 387,162	\$ 387,162	\$ 387,162	\$ 387,162	\$ 387,162	\$ 387,162	\$ 387,162	\$ 387,162	\$ 387,162	\$ 387,162
Total Net Income	\$ (291,162)	\$ (274,672)	\$ (258,263)	\$ (223,669)	\$ (205,989)	\$ (188,398)	\$ (170,899)	\$ (127,666)	\$ (108,810)	\$ (90,053)
Debt Service Coverage Ratio	0.25	0.29	0.33	0.42	0.47	0.51	0.56	0.67	0.72	0.77

(1) The cost per space reflects a less efficient parking layout due to the column spacing to support housing above the parking.

(2) Does not include land acquisition cost.

(3) 20% of the construction cost.

(4) Principal balance of \$4,800,000 at 3% interest rate over a 20 year term.

(5) \$620 per parking space for the first year; average annual increase varies based on the evolving mix of users.

(6) \$300 per parking space for the first year; 3% average annual increase.

### Corbett Block and O'Malley's Lot (Site #'s 2 & 3)

Following are the financial feasibility analyses for the proposed Corbett Block and O'Malley's lot garages (Site #'s 2 and 3). One analysis assumes a free-standing garage at a cost of \$14,000 per parking space and the other \$16,000 per space for parking below a residential building. As indicated in Table 22 on the following page, 200 spaces in a free-standing parking structure are estimated to represent a construction cost of \$2.8 million. Adding \$560,000 in financing and development costs results in a total project cost \$3.36 million. Anticipating financing can be obtained at 3% interest and amortized over 20 years, annual debt service is \$225,845.

The estimated first-year operating and maintenance expenses for the proposed parking garage are \$60,000 (\$300 per space per year). First-year revenue for the proposed garage is estimated at \$579 per parking space (\$115,800 annually). The revenue estimate anticipates the garage is on average 25% occupied with monthly parkers at a rate of \$50.00 per month and 55% occupied with customers and visitors three nights per week at a flat rate of \$5.00 with no turnover.

Average annual increases in revenue vary based on an evolving mix of users. Monthly garage patrons are anticipated to increase from 50 the first year (25% of 200 spaces) to 100 by Year 10 (50% of 200 spaces). Transient patrons are anticipated to increase from 110 the first year (55% of 200 spaces) to 190 by Year 10 (95% of 200 spaces). Parking rates are anticipated to increase 7.5% in Years 4 and 8.

There will be an estimated \$55,800 in net income the first year to cover debt service. With a debt service payment of \$225,845, the proposed garage is projected to lose \$170,045 the first year and have a debt service coverage ratio of 0.25. Given a 3% average annual increase in expenses and the increases in revenue discussed on the previous page, the parking garage by Year 10 is expected to produce a net loss of \$61,580. Cumulative losses over the ten year period are approximately \$1.2 million.

**Table 22.**  
**Site #'s 2 & 3 Garage Pro Forma Statement of Revenues and Expenses at \$14,000/Space, Years 1-10**

Number of Parking Spaces	200									
Estimated Cost per Space (1)	\$ 14,000									
Construction Cost (2)	\$2,800,000									
Financing & Development Costs (3)	\$ 560,000									
Total Project Cost	\$3,360,000									
Annual Debt Service (4)	\$ 225,845									
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>
Parking Income (5)	\$ 115,800	\$ 126,254	\$ 136,708	\$ 158,200	\$ 169,438	\$ 180,676	\$ 191,914	\$ 218,389	\$ 230,470	\$ 242,551
Operating & Maintenance Expenses (6)	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 69,556	\$ 71,643	\$ 73,792	\$ 76,006	\$ 78,286
Net Income	\$ 55,800	\$ 64,454	\$ 73,054	\$ 92,636	\$ 101,907	\$ 111,120	\$ 120,271	\$ 144,597	\$ 154,464	\$ 164,265
Debt Service	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845
Total Net Income	\$ (170,045)	\$ (161,391)	\$ (152,790)	\$ (133,209)	\$ (123,937)	\$ (114,725)	\$ (105,574)	\$ (81,248)	\$ (71,381)	\$ (61,580)
Debt Service Coverage Ratio	0.25	0.29	0.32	0.41	0.45	0.49	0.53	0.64	0.68	0.73

(1) Estimated \$14,000 per space for a free-standing parking garage.

(2) Does not include land acquisition cost.

(3) 20% of the construction cost.

(4) Principal balance of \$3,360,000 at 3% interest rate over a 20 year term.

(5) \$579 per parking space for the first year; average annual increase varies based on the evolving mix of users.

(6) \$300 per parking space for the first year; 3% average annual increase.

As indicated in Table 23 on the following page, the 200 parking spaces below a residential building are estimated to represent a construction cost of \$3.2 million. Adding \$640,000 in financing and development costs results in a total project cost \$3.84 million. Anticipating financing can be obtained at 3% interest and amortized over 20 years, annual debt service is \$258,108.

Given the same assumptions listed above for the free-standing garage, there will be an estimated \$55,800 in net income the first year to cover debt service. With a debt service payment of \$258,108, the proposed garage is projected to lose \$202,308 the first year and have a debt service coverage ratio of 0.22. Given a 3% average annual increase in expenses and the increases in revenue previously discussed, the parking garage by Year 10 is expected to produce a net loss of \$93,843. Cumulative losses over the ten year period are approximately \$1.5 million.

**Table 23.**  
**Site #'s 2 & 3 Garage Pro Forma Statement of Revenues and Expenses at \$16,000/Space, Years 1-10**

Number of Parking Spaces	200									
Estimated Cost per Space (1)	\$ 16,000									
Construction Cost (2)	\$3,200,000									
Financing & Development Costs (3)	\$ 640,000									
Total Project Cost	\$3,840,000									
Annual Debt Service (4)	\$ 258,108									
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>
Parking Income (5)	\$ 115,800	\$ 126,254	\$ 136,708	\$ 158,200	\$ 169,438	\$ 180,676	\$ 191,914	\$ 218,389	\$ 230,470	\$ 242,551
Operating & Maintenance Expenses (6)	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 69,556	\$ 71,643	\$ 73,792	\$ 76,006	\$ 78,286
Net Income	\$ 55,800	\$ 64,454	\$ 73,054	\$ 92,636	\$ 101,907	\$ 111,120	\$ 120,271	\$ 144,597	\$ 154,464	\$ 164,265
Debt Service	\$ 258,108	\$ 258,108	\$ 258,108	\$ 258,108	\$ 258,108	\$ 258,108	\$ 258,108	\$ 258,108	\$ 258,108	\$ 258,108
Total Net Income	\$ (202,308)	\$ (193,654)	\$ (185,054)	\$ (165,472)	\$ (156,201)	\$ (146,989)	\$ (137,837)	\$ (113,512)	\$ (103,644)	\$ (93,843)
<b>Debt Service Coverage Ratio</b>	<b>0.22</b>	<b>0.25</b>	<b>0.28</b>	<b>0.36</b>	<b>0.39</b>	<b>0.43</b>	<b>0.47</b>	<b>0.56</b>	<b>0.60</b>	<b>0.64</b>

(1) The cost per space reflects a less efficient parking layout due to the column spacing to support housing above the parking.

(2) Does not include land acquisition cost.

(3) 20% of the construction cost.

(4) Principal balance of \$3,840,000 at 3% interest rate over a 20 year term.

(5) \$579 per parking space for the first year; average annual increase varies based on the evolving mix of users.

(6) \$300 per parking space for the first year; 3% average annual increase.

#### **O'Malley's/Maloney's Shared Lot (Site #4)**

As indicated in Table 24 on the following page, 200 spaces in a free-standing structure at the O'Malley's/Maloney's shared lot site are estimated to represent a construction cost of \$2.8 million. Adding \$560,000 in financing and development costs results in a total project cost \$3.36 million. Anticipating financing can be obtained at 3% interest and amortized over 20 years, annual debt service is \$225,845.

The estimated first-year operating and maintenance expenses for the proposed parking garage are \$60,000 (\$300 per space per year). First-year revenue for the proposed garage is estimated at \$687 per parking space (\$137,400 annually). The revenue estimate anticipates the garage is on average 30% occupied with monthly parkers at a rate of \$50.00 per month and 65% occupied with customers and visitors three nights per week at a flat rate of \$5.00 with no turnover.

Average annual increases in revenue vary based on an evolving mix of users. Monthly garage patrons are anticipated to increase from 60 the first year (30% of 200 spaces) to 120 by Year 10 (60% of 200 spaces). Transient patrons are anticipated to increase from 130 the first year (65% of 200 spaces) to 220 by Year 10 (100% of 200 spaces x turnover of 1.1). Parking rates are anticipated to increase 7.5% in Years 4 and 8.

There will be an estimated \$77,400 in net income the first year to cover debt service. With a debt service payment of \$225,845, the proposed garage is projected to lose \$148,445 the first year and have a debt service coverage ratio of 0.34. Given a 3% average annual increase in expenses and the increases in

revenue discussed above, the parking garage by Year 10 is expected to produce a net loss of only \$19,993. Cumulative losses over the ten year period are approximately \$865,000.

**Table 24.**  
**Site #4 Garage Pro Forma Statement of Revenues and Expenses, Years 1-10**

Number of Parking Spaces	200									
Estimated Cost per Space (1)	\$ 14,000									
Construction Cost (2)	\$2,800,000									
Financing & Development Costs (3)	\$ 560,000									
Total Project Cost	\$3,360,000									
Annual Debt Service (4)	\$ 225,845									
	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>Year 4</u>	<u>Year 5</u>	<u>Year 6</u>	<u>Year 7</u>	<u>Year 8</u>	<u>Year 9</u>	<u>Year 10</u>
Parking Income (5)	\$ 137,400	\$ 149,453	\$ 161,505	\$ 186,575	\$ 199,531	\$ 212,488	\$ 225,444	\$ 256,281	\$ 270,209	\$ 284,138
Operating & Maintenance Expenses (6)	\$ 60,000	\$ 61,800	\$ 63,654	\$ 65,564	\$ 67,531	\$ 69,556	\$ 71,643	\$ 73,792	\$ 76,006	\$ 78,286
Net Income	\$ 77,400	\$ 87,653	\$ 97,851	\$ 121,011	\$ 132,001	\$ 142,931	\$ 153,801	\$ 182,489	\$ 194,203	\$ 205,851
Debt Service	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845	\$ 225,845
Total Net Income	\$ (148,445)	\$ (138,192)	\$ (127,994)	\$ (104,834)	\$ (93,844)	\$ (82,913)	\$ (72,043)	\$ (43,356)	\$ (31,642)	\$ (19,993)
Debt Service Coverage Ratio	0.34	0.39	0.43	0.54	0.58	0.63	0.68	0.81	0.86	0.91

(1) Estimated \$14,000 per space for a free-standing parking garage.

(2) Does not include land acquisition cost.

(3) 20% of the construction cost.

(4) Principal balance of \$3,360,000 at 3% interest rate over a 20 year term.

(5) \$687 per parking space for the first year; average annual increase varies based on the evolving mix of users.

(6) \$300 per parking space for the first year; 3% average annual increase.

A parking garage in the 4<sup>th</sup> Avenue area will need to be heavily subsidized to become a reality. Following is an analysis of sources for additional funds for the development of a parking garage.

## FINANCING APPROACHES

Although parking garages can make important contributions to the success of an area by spurring economic development, most parking garages are not self supporting. That is to say, operating revenues generally fall well short of covering both operating expenses and debt service. Because of this, most parking garages require a subsidy of some sort, which most commonly includes revenues from other parking facilities and operations, bonds, taxes, grants, and tax revenue growth.

There are numerous methods of public sector involvement in the financing of parking facilities. In addition to the more traditional methods of selling general obligation or parking revenue bonds, other methods that will be discussed in this section of the study include Certificates of Participation, Tax-Increment Financing, Parking Benefit and Business Improvement Districts, fees-in-lieu of parking, Parklets, federal grants, developer incentives, and public-private partnerships.

### General Obligation Bonds

Municipalities traditionally relied on General Obligation (GO) bonds to finance most public infrastructure improvements, including parking. The primary advantage of financing a parking structure through GO

bonds is that a low interest rate can be obtained because the full faith and credit of the municipality will be pledged toward retirement of the bonds. Because the basis of a city's credit is its taxing powers, constitutional and statutory laws usually limit the amounts that local governments may borrow using general obligation bonds. The borrowing limits are usually expressed in terms of a specific percentage of the assessed value of the community's taxable property.

Parking facilities are one of many reasons to issue bonds and other purposes often take priority over parking when issuing bonds. Advocates of parking, however, would stress that the tax base of the area is being strengthened by the development of a needed parking facility. The potential for future growth is therefore increased because businesses must be provided an adequate parking supply.

### **Revenue Bonds**

With the advent of parking authorities, revenue bonds became the most common method of financing parking projects. Revenue Bonds are most often secured by a pledge of net revenues generated by an entire parking system, which can include parking meter and fine revenue, other parking garage and lot revenue, ground leases, air rights and rent from mixed-use space in garages (ground-floor retail, residential units above the parking, etc.). Because the parking system is the sole of repayment, there is no pledge of ad valorem taxes. Investors view revenue bonds as an inherently risky investment, but pledging system revenues rather than revenues from a single parking facility decreases this risk. For this reason and because multi-level parking facilities are expensive, most parking revenue bonds are "system" rather than "stand-alone facility" bonds. Issuers sometimes further diversify and stabilize the revenue stream by pledging an unrelated revenue source such as tax increment revenues, special assessments, or taxes.

It is understood that ParkWise is a self-supporting program that operates from parking revenues, including off-street garage and lot revenue, on-street meter revenue, on-street resident and visitor parking permits, parking validations and parking citations. Any surplus funds are reinvested into the downtown area.

### **Certificates of Participation**

This is one of only a few tax-exempt financing routes that lend itself to a public-private partnership. COP financing can be used to provide funds for the construction of parking facilities. Briefly, a development company (the lessor) would build a facility, financed through the distribution of COP by a bank trustee, and the municipality leases the facility back from the developer. Payments, raised through user fees, are made to the lessor by the lessee. The certificate generally entitles the holder to receive a share, or participation, in the lease payments from the project. The lease payments are passed through the lessor to the certificate holders. The lessee would assume all costs in connection with operations and maintenance. To be eligible for tax-exempt status, the final owner of the facility must be the municipality and the garage must be for public use. The primary advantage of this program is that the government entity can raise funds in most cases outside the legal definition of debt. This can be achieved if the lease rental payment is subject to annual appropriation by the governing body. Because of this, this type of financing is used where governments are constrained by limitations regarding the issuance of debt or limitations on bonding capacity.

**Tax-Increment Financing**

In the most simplistic terms, Tax Incremental Financing (TIF) can be described as created residual property tax. The current tax base and associated revenue stream for the TIF District, which is usually a redeveloping area, is be frozen at its present level, with the assumption that tax revenues are sufficient to meet the cost of publicly supported systems. Under the assumption that new development will take place after the freeze, all new or incremental tax revenues are designated to a special TIF account. The proceeds of this process are then utilized to provide needed infrastructure to support or encourage the new development, including parking structures. TIF funds can be used as they are generated or the city can issue bonds backed by the future revenues from the increment collected in the district. This may be a desirable financing mechanism in the 4<sup>th</sup> Avenue/Warehouse District given the development potential of the area.

It is believed that the only existing TIF district in the State of Arizona is the one the City of Tucson created in 1999 to redevelop the downtown and west side areas, known as Rio Nuevo. A portion of the study area is included in TIF district boundaries, including Blocks 13, 14 and 18. Development funded and built with Rio Nuevo TIF includes environmental remediation and infrastructure on the West Side, and the renovation of the Fox Theatre and Rialto Theatre on Congress Street. The State of Arizona revised the enabling legislation for Rio Nuevo in 2010, mandated a focus on convention and hotel facilities, and seated a new Board of Directors, appointed by the Governor, Senate President, and House Speaker. Tucson's TIF collects incremental sales tax revenue rather than property tax revenue, and barring further legislative adjustments, will do so until 2025. Once Rio Nuevo has given a Notice to Proceed to a hotel project in Downtown, it is free to invest in projects other than the convention center or hotel. However, the small area on the north side of the railroad tracks that is part of the TIF district does not have enough real estate or the right location to build more parking. The current political climate, given Rio Nuevo's history and public perception, is such that altering the boundaries of the existing district or creating a new TIF district would be nearly impossible in the foreseeable future."

**Parking Benefit District**

A Parking Benefit District is a program where the city agrees to return all or percentage of net parking revenue, often generated by parking meters, back to the area where the revenue is generated for capital improvements (such as a parking structure) and beautification projects. Fourth Avenue merchants and other key stakeholders may better support parking meters if they know that the revenue generated by the meters will be reinvested in the community. Two examples of successful Parking Benefit Districts include Boulder, CO and Old Pasadena, CA. In Boulder parking revenues are used to encourage the use of alternative travel modes. Parking revenue in Pasadena is used for streetscape improvements and maintenance.

**Business Improvement District**

Business Improvement Districts (BID's) levy a special assessment on commercial properties to fund improvements within the district, which often includes parking facilities. These districts have been established in many municipalities across the country. Although BID's often address a number of issues other than parking (advertising, streetscape improvements, security, maintenance, etc.), a "benefit" zone

would be established for a central parking facility based upon acceptable walking distances. Properties within the business area of the proposed parking facility would be assessed in accordance with the benefits they derive from the parking. Several formulas exist for the determination of the rate of payment or subsidy for the parking improvement, including walking distance, assessed value, building size, street frontage, etc. Disadvantages of BID's include objector property owners that can significantly slow the process and perceptions that certain properties are benefiting more from the parking than others. If bonds are issued payable from specials assessments, they are usually general obligations of the government entity.

Business Improvement Districts are enabled in the state by Arizona Revised Statutes, Section 48-575 and are referred to as Enhanced Municipal Services Improvement Districts. The City of Tucson has a current BID in the downtown area, which is managed by the Downtown Tucson Partnership. The northern boundary of the BID stops at the railroad tracks just south of the 4<sup>th</sup> Avenue study area. The Fourth Avenue Merchants Association provides BID-style services to its business district with funds derived from its two annual street fairs and membership fees. The area west of 5th Avenue and north of the railroad tracks does not receive enhanced maintenance or security services due to its being outside of both the BID and FAMA boundaries. The City of Tucson might consider approaching area property owners about the possibility of setting up a BID, or Enhanced Services District, in the greater 4th Avenue/Warehouse District area.

### **Fees-In-Lieu of Parking**

This technique is not an inducement to development but rather a method to provide parking in growth areas within cities. A few cities have provisions in their zoning ordinances requiring payments in lieu of parking in business districts. This program allows them to finance and build centrally located parking facilities. The developer of a building, instead of providing all the on-site parking required, is allowed to make a payment in lieu of parking that is put into a pool to fund nearby facilities that are available to customers and employees of the contributing businesses.

In-lieu programs can reduce the cost of development, encourage shared parking, improve urban design, support historic preservation and allow development of sites that cannot physically accommodate the required parking. On the other hand, it could prove difficult to convince developers (businesses) that the parking will be provided in a timely manner. Also, participating businesses have concerns about the convenience of the parking; that is, will the central location be close enough to their businesses to conveniently service them.

Cities use two basic approaches to set their in-lieu fees. The first is to calculate the appropriate fee per space on a case-by-case basis for each project. The second is to have a uniform fee per space for all projects. Uniform fees are easier for the city to administer and for developers to use. Developers can easily incorporate the fee into a financial analysis and decide whether to provide the required parking or pay the fee. Many in-lieu fees do not cover the full cost of providing a structured parking space. Cities aim to set their fees high enough to pay for public parking, yet low enough to attract development. A reasonable formula is the replacement cost per space less the net revenue per space. Most cities have no explicit policy regarding how often to revise their fees and fees in some cities have not changed for many

years. A few cities automatically link their fees to an index of construction costs, such as the ENR Construction Cost Index, a measure of cost inflation in the construction industry.

This program has been most successful in communities where there is an active public construction program dedicated to the provision of needed public facilities. Because of the very nature of the program, it would be most successful where there is a rapid rate of development proposed in a concentrated area.

### **Federal Grants**

The U.S. Department of Transportation offers two grants that are available to parking projects only with a transit component, such as a transit station for buses or light rail. In other words, consideration for federal funding will only be given to projects that can prove they are establishing or improving mass transit service. To qualify for funding the multi-modal transportation and parking project would require a joint application from the city, state and local transit service. The application process is very lengthy and requires proof of the project in a coordinated regional transportation plan, an environment impact statement, approval of the project by the Federal Transit Administration and the Federal Highway Administration, and several other requirements. The federal government will provide grants for up to 80% of the total cost of the project.

### **Developer Incentives**

There are many financial incentives that can be offered to a developer in an effort to promote the expansion of parking in the 4<sup>th</sup> Avenue/Warehouse area. Multiple parcels of land often need to be assembled in order to develop parking facilities. Private developers are often unsuccessful in acquiring the parcels needed for larger and/or mixed-use parking facilities. The city can use its powers of eminent domain to acquire land for public use. The city could also explore land exchanges between the public and private sectors. Land owned by the city could also be passed on to a private developer at a reduced cost in order to encourage development. Cities are also developing parking in air rights above or below freeways, city streets and public parks, which eliminate or reduce land costs.

At the local level, tax abatement can take the form of reduced property or sales taxes. The approaches used by municipalities vary widely and can include a partial, variable or a complete abatement. Tax abatement can also take the form of a stabilization arrangement if taxes have been rising rapidly, as they have been in other major cities in the United States. In general, tax abatement alone is not a major inducement to development.

### **Public-Private Partnerships**

The Centro Garage represents a very good example of a city developing parking as a base upon which a building is later constructed. The City of Tucson built the garage, sold the ground-floor commercial space, and sold the air rights above the parking to a developer for student apartments. This type of development lends itself to public-private ventures, where the public sector usually develops the parking and a private developer retains the air rights for future development. If the land upon which parking is developed is publicly owned, the air rights can be sold for future development. Common today are the development of mixed-use, shared-use and air rights parking projects so that financial shortfalls can be

minimized. For instance, viable grade-level commercial space commands a higher rent per square foot than does parking.

**Design-Build-Operate-Manage (DBOM)**

This represents an example of a public-private partnership that has been used sparingly nationwide. The city would issue bonds to cover the cost of constructing a new parking structure. Due to the structure of the agreement, the bonds would be guaranteed by a private entity that is used to design, build, operate and manage the facility through a lease from the city. The lease payments would cover the city’s debt service and the facility revenues, in theory, would cover the lease payments. Any excess revenues would be shared between the city and the private DBOM entity. If the lease payments and revenue sharing is insufficient to cover debt service, the private entity would be responsible for making up the difference. Simply, because of the poor economics of structured parking this does not represent a viable financing method for the vast majority of parking structures in the United States. The few parking structures that generate enough revenue to support this type of public-private partnership are located at major airports.

**Long-term Lease Agreements (Privatization)**

The City of Tucson could finance new mixed-use parking projects and improvements by leasing to a private entity existing parking assets. These transactions involve the transfer of operational and maintenance responsibilities for parking assets to a private entity for a defined period of time (usually 20-75 years), including both the revenues and expenses generated by the assets, in exchange for an up-front lump sum payment, annual payments or a combination of both, to the public entity which retains ownership of the parking assets. The allure of these types of transactions comes from the potential to generate a significant sum of cash up-front, or a steady stream of cash, while removing from the public entity the risk and expenses involved with operating the parking assets. While leasing public parking assets are a relatively new phenomenon in the United States, similar transactions involving public infrastructure assets (i.e. utilities, toll roads, etc.) have occurred in Europe for decades. The first lease agreement in the United States was in 2006 when the City of Chicago and the Chicago Park District awarded a group of private investors, headed by Morgan Stanley, a 99-year concession lease of four underground parking garages in the vicinity of Millennium Park. In exchange for the cash flow associated with the more than 9,000 parking spaces in these facilities for the subsequent 99 years, the city received an up-front payment of approximately \$563 million. The Ohio State University recently entered into a long-term concession lease of their parking assets, totaling 36,000 spaces, for a winning bid of \$483 million.

**Conclusion**

Parking is an essential service that is not always provided by the private sector, generally because it is not financially feasible. The public sector has access to financing methods and rates that are more conducive to the development of parking. The provision of parking by the public sector has no doubt contributed to economic development in Tucson in recent years; and it is equally clear that economic conditions in the 4<sup>th</sup> Avenue Business District will continue to improve with ongoing assistance from the public sector.

**FINANCIAL REPORT LIABILITY LIMITING LANGUAGE**

The revenue and expense projections in this report do not represent comprehensive financial feasibility studies and are not intended to be part of a bond issue. The information used to complete these analyses is based on assumptions reviewed by the City of Tucson and have been deemed to provide a reasonable basis for the projections contained in these analyses. Actual results may vary from the assumptions contained in these analyses, and the variations may be material.

# **APPENDIX**

# 4<sup>th</sup> Avenue Business District Parking Study



September 21, 2012

*Submitted to:*

**ParkWise**  
**Dept. of Transportation**  
**City of Tucson**  
**110 E. Pennington St., #150**  
**P.O. Box 27210**  
**Tucson, Arizona 85726-7210**



*Submitted by:*

**DESMAN Associates**  
**7900 East Union Avenue, Suite 925**  
**Denver, CO 80237**

**DESMAN**  
A S S O C I A T E S

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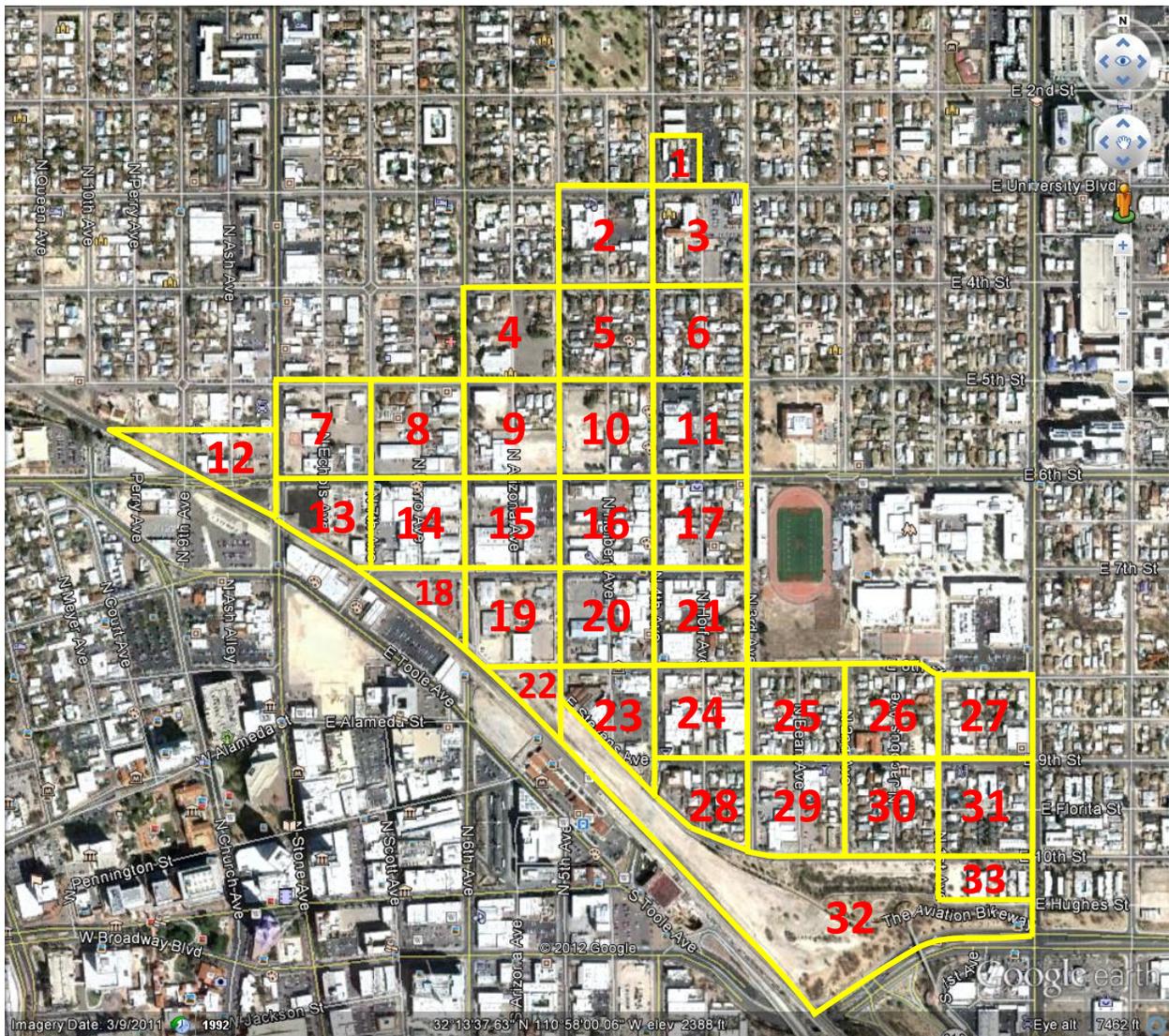
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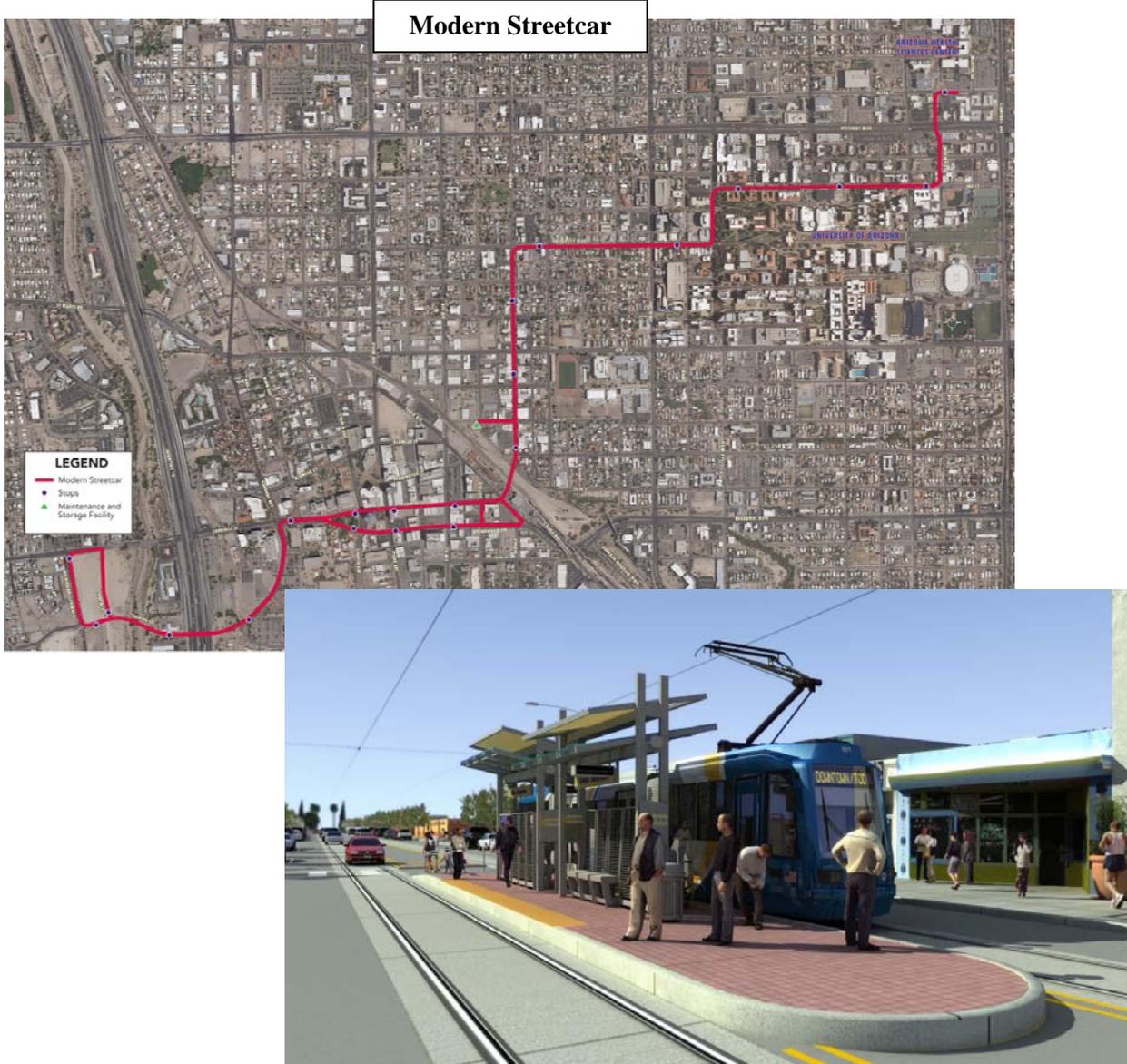
**INTRODUCTION**

DESMAN Associates (DESMAN) has been retained by the City of Tucson and the ParkWise Department to conduct a parking supply and demand study and review parking operations in an area immediately north of downtown Tucson, which includes the 4<sup>th</sup> Avenue Business District, the Warehouse Historic District, and the Iron Horse and West University neighborhoods. The study area, indicated in Figure 1 below, contains approximately 33 blocks, which have been numbered for identification purposes. Much of the study area is within the Downtown Infill Incentive District (IID), which is an optional overlay zone that offers incentives and removes barriers to encourage infill development and redevelopment.

**Figure 1.**  
**Parking Study Area**

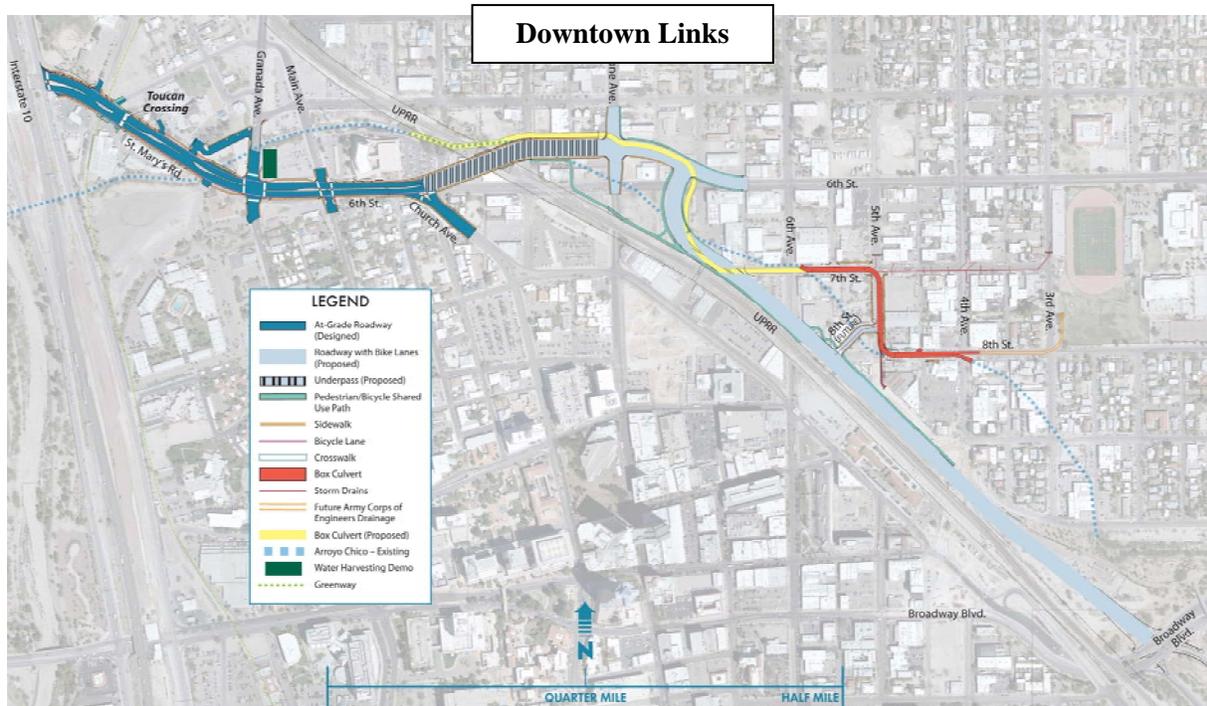


There are two major transportation projects currently underway that are expected to encourage private development within the study area. The Sun Link Modern Streetcar system is currently under construction on 4<sup>th</sup> Avenue. The four-mile streetcar line will connect the 4<sup>th</sup> Avenue Business District with downtown Tucson to the south and the University of Arizona campus to the northeast. There will be three stops on 4<sup>th</sup> Avenue and a stop on University Boulevard between 3<sup>rd</sup> and 4<sup>th</sup> Avenues. There is a streetcar maintenance and storage facility currently under construction that has removed overflow parking that was previously used by 4<sup>th</sup> Avenue area customers. The streetcar system is expected to be completed and fully operational in late 2013. Refer to the images below.



Downtown Links is an improvement project that will provide multi-modal “links” between Barraza-Aviation Parkway and Interstate 10, including a new four-lane highway, sidewalks, bicycle lanes, and drainage system that will run through the study area on the arroyo just north of the railroad tracks. The

boundaries and shape of the study area have been influenced by the Downtown Links project. Refer to the image below.



This study represents the first phase of a possibly larger study assessing the feasibility of parking improvements within the study area. Following is our scope of services for the first phase of the parking study.

**SCOPE OF SERVICES**

*Task 1.1 - Review Existing Data*

Review pertinent parking and traffic studies, master plans, statistical data, zoning, development plans, base maps, etc. provided by the city. Additional information needed to complete the study will be discussed following this review.

*Task 1.2 - Initial Meeting*

Meet with city officials to clarify study objectives, confirm the study area, define parking analysis zones, and to discuss the work plan and study schedule. We will also walk/drive the study area in order to develop a first-hand understanding of the parking and traffic systems.

*Task 1.3 - Verification of Parking and Review of Policies*

Verify and breakdown the current on-street and off-street parking supply within the study area by type, allocation, restrictions and rates. The parking supply included in the study will be all of the on-street

parking and the public and private commercial off-street parking. Parking polices will be reviewed to determine if they restrict the maximum usage of the parking supply.

*Task 1.4 - Parking Surveys and Existing Parking Conditions*

Prepare and coordinate parking occupancy surveys to be completed on a weekday, weekend day and a Friday or Saturday evening for the parking identified in Task 1.3 after the fall term starts at the University of Arizona. The data on parking occupancy will be compared to the *effective* parking supply. This analysis of existing conditions will provide the base from which future parking conditions can be determined.

Determine parking duration and turnover for select on-street and/or off-street spaces in a busy area within the study area (maximum four blocks). We will direct the performance of a license plate survey of parked vehicles on an hourly basis. From the data, we will determine the following:

1. The number of vehicles parking.
2. The average parking duration.
3. The average turnover of each space during the survey period.
4. The number of short-term parkers versus long-term parkers.

*Task 1.5 - Future Parking Conditions*

Parking demand ratios will be used to determine the demand for parking associated with new, planned, and proposed projects and any other changes within the study area. The future demand for parking will be compared to the adjusted supply, parking surpluses and deficiencies calculated, and the best general locations for parking expansion determined.

*Task 1.6 - Review of Parking Operations*

Review existing on-street and off-street parking operations in the area and recommend new and revised parking policies, procedures, regulations and technologies to improve overall parking operations.

*Task 1.7 - Draft Phase 1 Report*

Prepare a draft report detailing existing and future parking conditions and the assessment of parking operations for review and comment by city officials. A phone meeting will then be held to discuss findings and recommendations in the report.

*Task 1.8 - Final Phase 1 Report*

A final report will be prepared and all comments discussed in the review meeting will be incorporated into the final report. One electronic copy of the report will be issued to the city.

**EXISTING PARKING CONDITIONS**

**Parking Supply**

Table 1 presents the current on-street parking inventory within the study area by block and type of parking. There are currently an estimated 1,303 on-street parking spaces within the study area.

**Table 1. On-Street Parking Inventory**

Block	Unrestricted	1 or 2 Hr. Limit	Residential Parking Permit Program			No Parking 10pm-6am	Loading	Accessible	Total
			24/7	8-5, M-F	Eve./Wknds.				
1	13								13
2	34	7	17						58
3	53	2							55
4	20		19		11				50
5	16		22		14		1	1	54
6	13	16	16	15			1		61
7	19								19
8	30	10							40
9		27	6						33
10		29	4					1	34
11	12	11		23				1	47
12	27								27
13	12								12
14	19	19							38
15	41	19							60
16	12	26						2	40
17	12	16	10				4	1	43
18		8							8
19		21							21
20	4	38					3		45
21	16	30						1	47
22									0
23		20					1		21
24	22	13					3		38
25	13		8	42					63
26				51					51
27	11			16					27
28	38		10				1		49
29	48								48
30	37			23			2		62
31	38			11					49
32						65			65
33	18					7			25
<b>Total:</b>	<b>578</b>	<b>312</b>	<b>112</b>	<b>181</b>	<b>25</b>	<b>72</b>	<b>16</b>	<b>7</b>	<b>1,303</b>
<b>Percent:</b>	<b>44.4%</b>	<b>23.9%</b>	<b>8.6%</b>	<b>13.9%</b>	<b>1.9%</b>	<b>5.5%</b>	<b>1.2%</b>	<b>0.5%</b>	<b>100.0%</b>

The largest category of on-street parking is unrestricted with 578 spaces, which represents 44% of the parking supply. There are a total of 318 Residential Parking Permit Program (PPP) spaces, which represents approximately 24% of the parking supply. The Residential PPP restricts non-residential

parking either 24/7, on weekdays, or in the evenings and on weekends. Approximately 900 residential parking permits have been issued within the study area. There are 312 time limited spaces (1 or 2 hour limit) within the study area, which represents approximately 24% of the parking supply. Most of the time restricted spaces are on 4<sup>th</sup> Avenue, 5<sup>th</sup> Avenue, 6<sup>th</sup> Avenue, 7<sup>th</sup> Street and 8<sup>th</sup> Street. There are an estimated 72 parking spaces where parking is prohibited from 10:00 PM to 6:00 AM on Stevens Avenue, 10<sup>th</sup> Street and 1<sup>st</sup> Avenue (Blocks 32 and 33). Loading and accessible spaces make up the remaining 2% of the on-street parking. There are no on-street parking meters within the study area. Because none of the parallel spaces are marked, DESMAN estimated the number of spaces based on the curb length available for parking divided by the typical length of a parallel parking space.

Table 2 presents the current off-street parking within the study area by block. There are an estimated 1,846 off-street parking spaces within the study area. Included in the off-street inventory are the public and private commercial parking lots. No residential parking is included in the off-street inventory. The parking supply has been estimated in the parking lots with no marked spaces. Refer to the Block Maps in the Appendix for the location of the off-street lots on each block, which have been assigned a letter designation for identification purposes.

**Table 2.**  
**Off-Street Commercial Parking Inventory**

Block	Lot Designations	Parking Spaces
2	A-G	85
3	A-E	132
4	A-D	188
6	A-E	28
7	A-E	116
8	A-H	83
9	A-B	40
10	A-D	49
11	A-E	97
12	A-E	92
13	A-B	156
14	A-F	63
15	A-D	104
16	A-H	107
17	A-G	51
18	A	34
20	A-D	110
21	A-G	73
23	A	120
24	A-E	38
27	A-D	20
29	A-B	44
30	A	8
31	A	8
Total:		1,846

Of the estimated 1,846 off-street parking spaces, 711 spaces are identified on the city’s website as public (39%) and 1,135 are private (61%). The public off-street parking is shown in Table 3 below. Parking within the study area is mostly free. There are two lots that charge for parking, including the Creative lot on Block 11 (\$3 before 6:00 PM and \$5 after 6:00 PM) and the O’Malley’s lot on Block 20 (\$5 in the evening).

**Table 3. Public Off-Street Parking Inventory**

Block	Name & Block Map Designation	Spaces
2	Robinowitz (F)	46
3	Trinity Church (A, B & D)	108
4	FAMA (A & C)	79
10	DQ and Delectables (A & D)	24
11	Sky Bar, Creative and Athens (A, C & E)	79
13	City & Benjamin (A & B)	156
14	Firestone and DeWitt (B & D)	34
15	Santa Theresa (A)	8
16	Plush and Antigone (A & H)	39
17	Co-Op (D)	7
20	O'Malley's and Hut (A & C)	118
21	Goodwill (G)	13
Total:		711

Other nearby public parking resources includes three City of Tucson parking garages located downtown. The new 378-space Centro Garage, located at 345 E. Congress Street, is closest to the study area and pedestrians can walk to the study area at the 4<sup>th</sup> Avenue underpass. The two other garages are the 749-space Pennington Street Garage and the 287-space Depot Plaza Garage. The weekend and evening flat rate at the Centro and Depot Plaza garages is \$5.00. The weekend and evening flat rate at the Pennington Street garage is \$3.00.

There are two University of Arizona garages that offer free weekend parking. The Main Gate Garage, located at Euclid Avenue and 1<sup>st</sup> Street, has 1,100 spaces. The Tyndall Garage, located at Tyndall Avenue at 4<sup>th</sup> Street, has 1,700 spaces.

Refer to Figure 2 on the following page for the location of the above mentioned garages in relation to the study area. The modern street car will have stops at or near (within one block) all of the nearby parking garages. Customers/visitors may be encouraged to “park once” in a facility and ride between several downtown, 4<sup>th</sup> Avenue Business District and University of Arizona destinations. This will essentially increase the available parking supply serving the study area. Park once trips can also be encouraged by improving the quality of the walking environment between destinations. The study area walking environment will improve over time as the area redevelops.



allows for the dynamics of vehicles moving in and out of parking stalls during peak periods. It also allows for variations in parking activity, the loss of parking due to the mis-parked vehicles, construction, reserved spaces, and other factors. As a result, the effective supply is used to determine the adequacy of the parking system rather than the actual supply.

**Parking Occupancy**

Parking occupancy counts were conducted within the study area on Friday and Saturday, August 24 and 25, 2012. Parked vehicles were counted every other hour from 12:00 PM to 10:00 PM on Friday and from 10:00 AM to 4:00 PM on Saturday. There were 141 on- and off-street parking spaces closed during the surveys, including parking on 4<sup>th</sup> Avenue near University Blvd. and between 6<sup>th</sup> and 9<sup>th</sup> Streets.

*Friday, August 24, 2012*

On-street parking occupancy on Friday, August 24, 2012 is presented below in Table 4. There were 604 vehicles parked in 1,206 on-street spaces at the peak hour of 10:00 PM, which represents an occupancy level of 50.1%. There were 97 on-street spaces closed during the surveys of parking occupancy.

**Table 4. On-Street Parking Occupancy by Block, Friday, August 24, 2012**

Block	Spaces	Occupied Spaces					
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM
1	8	8	9	7	3	7	6
2	51	36	33	29	28	38	28
3	46	39	32	23	21	38	27
4	50	10	7	8	12	21	26
5	54	16	21	22	26	30	28
6	61	20	24	19	27	30	29
7	19	9	9	8	0	0	0
8	40	11	12	9	4	3	2
9	33	7	10	9	7	7	10
10	34	19	23	17	24	28	32
11	47	24	22	24	30	33	37
12	27	17	19	10	1	0	0
13	12	12	12	5	9	2	0
14	38	26	20	16	15	4	2
15	60	34	39	29	17	14	30
16	26	17	16	13	13	23	26
17	26	15	15	15	15	27	21
18	8	5	2	4	7	2	1
19	21	10	6	6	7	10	13
20	36	16	18	17	17	21	23
21	32	30	22	22	19	31	26
24	38	21	13	16	18	27	26
25	63	17	13	13	23	48	36
26	51	23	19	16	12	27	28
27	27	11	8	7	5	5	5
28	49	28	24	23	29	31	41
29	48	28	15	12	24	28	27
30	62	21	16	17	11	14	19
31	49	25	22	21	21	24	33
32	65	5	2	3	6	7	13
33	25	5	2	6	4	8	9
<b>Total:</b>	<b>1,206</b>	<b>565</b>	<b>505</b>	<b>446</b>	<b>455</b>	<b>588</b>	<b>604</b>
<b>% Occupied:</b>		<b>46.8%</b>	<b>41.9%</b>	<b>37.0%</b>	<b>37.7%</b>	<b>48.8%</b>	<b>50.1%</b>

Off-street parking occupancy on Friday is presented below in Table 5. There were 631 vehicles parked in 1,802 off-street spaces at the peak hour of 12:00 PM, which represents an occupancy level of 35%. There were 44 off-street spaces closed during the surveys of parking occupancy.

**Table 5. Off-Street Parking Occupancy by Block, Friday, August 24, 2012**

Block	Spaces	Occupied Spaces					
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM
2	85	47	55	47	31	35	27
3	132	36	43	33	22	25	31
4	188	11	9	8	16	16	9
6	28	19	15	17	23	17	14
7	116	17	12	14	8	6	7
8	54	5	11	2	0	1	0
9	40	16	9	7	20	10	28
10	49	14	22	23	22	35	34
11	97	59	69	68	75	73	51
12	92	44	46	31	6	4	3
13	156	38	26	18	0	0	0
14	63	34	32	26	14	3	4
15	104	51	64	35	6	1	1
16	92	28	25	20	33	60	78
17	51	20	12	12	12	28	22
18	34	31	31	28	6	1	1
20	110	44	42	39	35	29	40
21	73	52	51	59	45	39	39
23	120	22	21	31	33	37	83
24	38	14	8	6	6	6	5
27	20	9	10	9	3	3	4
29	44	12	5	8	15	15	11
30	8	4	4	2	0	1	1
31	8	4	3	3	3	3	3
Total:	1,802	<b>631</b>	625	546	434	448	496
% Occupied:		<b>35.0%</b>	34.7%	30.3%	24.1%	24.9%	27.5%

As presented in Table 6, the overall peak hour for parking on Friday was 12:00 PM when there were 1,196 vehicles parked in 3,008 spaces, which represents an occupancy level of 39.8%.

**Table 6. Summary of Parking Occupancy, Friday, August 24, 2012**

Parking	Spaces	Occupied Spaces					
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM
On-Street	1,206	565	505	446	455	588	604
Off-Street	1,802	631	625	546	434	448	496
Total:	3,008	<b>1,196</b>	1,130	992	889	1,036	1,100
% Occupied:		<b>39.8%</b>	37.6%	33.0%	29.6%	34.4%	36.6%

Table 7 provides a summary of peak hour (12:00 PM) parking occupancy on Friday by block. The blocks with on-street, off-street and combined parking occupancy levels at or above 85% are highlighted in the table.

**Table 7. Summary of Parking Occupancy by Block, Friday, August 24, 2012 (12:00 PM)**

Block	On-Street Parking			Off-Street Parking			Total Parking		
	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied
1	8	8	100%				8	8	100%
2	51	36	71%	85	47	55%	136	83	61%
3	46	39	85%	132	36	27%	178	75	42%
4	50	10	20%	188	11	6%	238	21	9%
5	54	16	30%				54	16	30%
6	61	20	33%	28	19	68%	89	39	44%
7	19	9	47%	116	17	15%	135	26	19%
8	40	11	28%	54	5	9%	94	16	17%
9	33	7	21%	40	16	40%	73	23	32%
10	34	19	56%	49	14	29%	83	33	40%
11	47	24	51%	97	59	61%	144	83	58%
12	27	17	63%	92	44	48%	119	61	51%
13	12	12	100%	156	38	24%	168	50	30%
14	38	26	68%	63	34	54%	101	60	59%
15	60	34	57%	104	51	49%	164	85	52%
16	26	17	65%	92	28	30%	118	45	38%
17	26	15	58%	51	20	39%	77	35	45%
18	8	5	63%	34	31	91%	42	36	86%
19	21	10	48%				21	10	48%
20	36	16	44%	110	44	40%	146	60	41%
21	32	30	94%	73	52	71%	105	82	78%
23				120	22	18%	120	22	18%
24	38	21	55%	38	14	37%	76	35	46%
25	63	17	27%				63	17	27%
26	51	23	45%				51	23	45%
27	27	11	41%	20	9	45%	47	20	43%
28	49	28	57%				49	28	57%
29	48	28	58%	44	12	27%	92	40	43%
30	62	21	34%	8	4	50%	70	25	36%
31	49	25	51%	8	4	50%	57	29	51%
32	65	5	8%				65	5	8%
33	25	5	20%				25	5	20%
Total:	1,206	565	47%	1,802	631	35%	3,008	1,196	40%

Table 8 presents parking occupancy on Friday for the public off-street parking lots. There were 250 vehicles parked in 696 spaces at the peak hour of 2:00 PM, which represents an occupancy level of 35.9%.

**Table 8. Public Off-Street Parking Occupancy, Friday, August 24, 2012**

Block	Name & Block Map Designation	Spaces	Occupied Spaces					
			12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM
2	Robinowitz (F)	46	25	32	22	14	5	3
3	Trinity Church (A, B & D)	108	27	35	26	16	15	19
4	FAMA (A & C)	79	8	7	6	7	7	7
10	DQ and Delectables (A & D)	24	4	8	9	8	18	16
11	Sky Bar, Creative and Athens (A, C & E)	79	54	64	61	71	70	51
13	City & Benjamin (A & B)	156	38	26	18	8	8	8
14	Firestone and DeWitt (B & D)	34	24	20	20	7	2	3
15	Santa Theresa (A)	8	4	5	4	0	0	0
16	Plush and Antigone (A & H)	24	5	7	4	14	22	24
17	Co-Op (D)	7	0	0	0	0	0	0
20	O'Malley's and Hut (A & C)	118	41	38	36	31	27	36
21	Goodwill (G)	13	12	8	8	5	7	7
Total:		696	242	<b>250</b>	214	181	181	174
% Occupied:			34.8%	<b>35.9%</b>	30.7%	26.0%	26.0%	25.0%

*Note: The Antigone lot was closed due to construction.*

A Midnight occupancy count was not conducted because it was thought that that parking activity would decrease overall after 10:00 PM based on our previous experience and the mix of land uses in the study area (retail/service, restaurant, bar, office, residential, industrial/warehouse, etc.). *Shared Parking* by the Urban Land Institute shows parking demand for shopping, dining and residential guests declining after 10:00 PM in mixed-use developments.

*Saturday, August 25, 2012*

On-street parking occupancy on Saturday, August 25, 2012 is presented in Table 9 on the following page. There were 472 vehicles parked in 1,206 on-street spaces at the peak hour of 12:00 PM, which represents an occupancy level of 39.1%.

Off-street parking occupancy on Saturday is presented in Table 10 (page 14). There were 429 vehicles parked in 1,802 off-street spaces at the peak hour of 12:00 PM, which represents an occupancy level of 23.8%.

**Table 9.**  
**On-Street Parking Occupancy by Block**  
**Saturday, August 25, 2012**

Block	Spaces	Occupied Spaces			
		10:00 AM	12:00 PM	2:00 PM	4:00 PM
1	8	5	7	5	6
2	51	30	30	27	25
3	46	15	15	18	15
4	50	14	12	15	21
5	54	26	26	23	26
6	61	20	24	21	22
7	19	0	0	0	0
8	40	0	2	4	2
9	33	8	6	10	8
10	34	22	31	24	25
11	47	18	27	25	29
12	27	0	2	2	2
13	12	3	4	2	2
14	38	14	17	15	5
15	60	26	34	28	25
16	26	12	16	14	14
17	26	9	18	16	17
18	8	1	1	1	1
19	21	9	6	8	4
20	36	9	16	15	15
21	32	8	26	22	23
24	38	11	18	15	19
25	63	21	28	19	23
26	51	13	10	11	7
27	27	8	11	9	9
28	49	22	21	23	19
29	48	9	8	8	8
30	62	23	19	15	20
31	49	30	31	31	29
32	65	2	2	2	0
33	25	8	4	5	4
Total:	1,206	396	<b>472</b>	433	425
% Occupied:		32.8%	<b>39.1%</b>	35.9%	35.2%

**Table 10.**  
**Off-Street Parking Occupancy by Block**  
**Saturday, August 25, 2012**

Block	Spaces	Occupied Spaces			
		10:00 AM	12:00 PM	2:00 PM	4:00 PM
2	85	16	19	20	17
3	132	21	22	23	22
4	188	11	10	9	9
6	28	12	15	13	13
7	116	17	13	12	10
8	54	1	3	1	0
9	40	9	9	27	27
10	49	13	30	17	15
11	97	56	60	63	48
12	92	4	10	11	10
13	156	22	19	1	1
14	63	13	17	12	12
15	104	8	5	5	0
16	92	22	27	23	25
17	51	27	31	23	19
18	34	1	1	3	3
20	110	24	37	35	36
21	73	23	48	54	40
23	120	14	22	16	13
24	38	2	7	9	11
27	20	9	10	6	6
29	44	9	10	6	7
30	8	1	1	1	3
31	8	3	3	3	3
Total:	1,802	338	<b>429</b>	393	350
% Occupied:		18.8%	<b>23.8%</b>	21.8%	19.4%

As presented in Table 11, the overall peak hour for parking on Saturday was 12:00 PM when there were 901 vehicles parked in 3,008 spaces, which represents an occupancy level of 30.0%.

**Table 11.**  
**Summary of Parking Occupancy, Saturday, August 25, 2012**

Parking	Spaces	Occupied Spaces			
		10:00 AM	12:00 PM	2:00 PM	4:00 PM
On-Street	1,206	396	472	433	425
Off-Street	1,802	338	429	393	350
Total:	3,008	734	<b>901</b>	826	775
% Occupied:		24.4%	<b>30.0%</b>	27.5%	25.8%

Table 12 provides a summary of peak hour (12:00 PM) parking occupancy on Saturday by block. The blocks with on-street, off-street and combined parking occupancy levels at or above 85% are highlighted in the table.

**Table 12. Summary of Parking Occupancy by Block, Saturday, August 25, 2012 (12:00 PM)**

Block	On-Street Parking			Off-Street Parking			Total Parking		
	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied
1	8	7	<b>88%</b>				8	7	<b>88%</b>
2	51	30	59%	85	19	22%	136	49	36%
3	46	15	33%	132	22	17%	178	37	21%
4	50	12	24%	188	10	5%	238	22	9%
5	54	26	48%				54	26	48%
6	61	24	39%	28	15	54%	89	39	44%
7	19	0	0%	116	13	11%	135	13	10%
8	40	2	5%	54	3	6%	94	5	5%
9	33	6	18%	40	9	23%	73	15	21%
10	34	31	<b>91%</b>	49	30	61%	83	61	73%
11	47	27	57%	97	60	62%	144	87	60%
12	27	2	7%	92	10	11%	119	12	10%
13	12	4	33%	156	19	12%	168	23	14%
14	38	17	45%	63	17	27%	101	34	34%
15	60	34	57%	104	5	5%	164	39	24%
16	26	16	62%	92	27	29%	118	43	36%
17	26	18	69%	51	31	61%	77	49	64%
18	8	1	13%	34	1	3%	42	2	5%
19	21	6	29%				21	6	29%
20	36	16	44%	110	37	34%	146	53	36%
21	32	26	81%	73	48	66%	105	74	70%
23				120	22	18%	120	22	18%
24	38	18	47%	38	7	18%	76	25	33%
25	63	28	44%				63	28	44%
26	51	10	20%				51	10	20%
27	27	11	41%	20	10	50%	47	21	45%
28	49	21	43%				49	21	43%
29	48	8	17%	44	10	23%	92	18	20%
30	62	19	31%	8	1	13%	70	20	29%
31	49	31	63%	8	3	38%	57	34	60%
32	65	2	3%				65	2	3%
33	25	4	16%				25	4	16%
<b>Total:</b>	<b>1,206</b>	<b>472</b>	<b>39%</b>	<b>1,802</b>	<b>429</b>	<b>24%</b>	<b>3,008</b>	<b>901</b>	<b>30%</b>



**Table 13.**  
**On-Street Parking Occupancy by Block, Friday, August 24, 2012**  
**4th Avenue Business District**

Block	Spaces	Occupied Spaces					
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM
2	51	36	33	29	28	38	28
3	46	39	32	23	21	38	27
5	54	16	21	22	26	30	28
6	61	20	24	19	27	30	29
10	34	19	23	17	24	28	32
11	47	24	22	24	30	33	37
16	26	17	16	13	13	23	26
17	26	15	15	15	15	27	21
18	8	5	2	4	7	2	1
19	21	10	6	6	7	10	13
20	36	16	18	17	17	21	23
21	32	30	22	22	19	31	26
24	38	21	13	16	18	27	26
28	49	28	24	23	29	31	41
<b>Total:</b>	<b>529</b>	<b>296</b>	<b>271</b>	<b>250</b>	<b>281</b>	<b>369</b>	<b>358</b>
<b>% Occupied:</b>		<b>56.0%</b>	<b>51.2%</b>	<b>47.3%</b>	<b>53.1%</b>	<b>69.8%</b>	<b>67.7%</b>

There are an estimated 131 Residential PPP spaces within the 4<sup>th</sup> Avenue Business District that are restricted and not available to the general public. Of the 160 on-street spaces available at the peak hour, 80± spaces were Residential PPP spaces. If these 80 unoccupied on-street spaces are removed from the parking inventory, the on-street parking occupancy level in the business district increases to 82%.

Off-street parking occupancy on Friday in the 4<sup>th</sup> Avenue Business District is presented in Table 14. There were 424 vehicles parked in 875 off-street spaces at the peak hour of 10:00 PM, which represents an occupancy level of 48.5%.

**Table 14.**  
**Off-Street Parking Occupancy by Block, Friday, August 24, 2012**  
**4th Avenue Business District**

Block	Spaces	Occupied Spaces					
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM
2	85	47	55	47	31	35	27
3	132	36	43	33	22	25	31
6	28	19	15	17	23	17	14
10	49	14	22	23	22	35	34
11	97	59	69	68	75	73	51
16	92	28	25	20	33	60	78
17	51	20	12	12	12	28	22
20	110	44	42	39	35	29	40
21	73	52	51	59	45	39	39
23	120	22	21	31	33	37	83
24	38	14	8	6	6	6	5
<b>Total:</b>	<b>875</b>	<b>355</b>	<b>363</b>	<b>355</b>	<b>337</b>	<b>384</b>	<b>424</b>
<b>% Occupied:</b>		<b>40.6%</b>	<b>41.5%</b>	<b>40.6%</b>	<b>38.5%</b>	<b>43.9%</b>	<b>48.5%</b>

As presented in Table 15, the overall peak hour for parking on Friday in the 4<sup>th</sup> Avenue Business District was 10:00 PM when there were 782 vehicles parked in 1,404 spaces, which represents an occupancy level of 55.7%.

**Table 15.**  
**Summary of Parking Occupancy, Friday, August 24, 2012**  
**4th Avenue Business District**

Parking	Spaces	Occupied Spaces					
		12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM
On-Street	529	296	271	250	281	369	358
Off-Street	875	355	363	355	337	384	424
Total:	1,404	651	634	605	618	753	<b>782</b>
% Occupied:		46.4%	45.2%	43.1%	44.0%	53.6%	<b>55.7%</b>

Table 16 provides a summary of peak hour (10:00 PM) parking occupancy in the 4<sup>th</sup> Avenue Business District on Friday by block. The blocks with on-street, off-street and combined parking occupancy levels at or above 85% are highlighted in the table.

**Table 16.**  
**Summary of Parking Occupancy by Block, Friday, August 24, 2012 (10:00 PM)**  
**4th Avenue Business District**

Block	On-Street Parking			Off-Street Parking			Total Parking		
	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied	Spaces	Spaces Occupied	Percent Occupied
2	51	28	55%	85	27	32%	136	55	40%
3	46	27	59%	132	31	23%	178	58	33%
5	54	28	52%				54	28	52%
6	61	29	48%	28	14	50%	89	43	48%
10	34	32	<b>94%</b>	49	34	69%	83	66	80%
11	47	37	79%	97	51	53%	144	88	61%
16	26	26	<b>100%</b>	92	78	<b>85%</b>	118	104	<b>88%</b>
17	26	21	81%	51	22	43%	77	43	56%
18	8	1	13%				8	1	13%
19	21	13	62%				21	13	62%
20	36	23	64%	110	40	36%	146	63	43%
21	32	26	81%	73	39	53%	105	65	62%
23				120	83	69%	120	83	69%
24	38	26	68%	38	5	13%	76	31	41%
28	49	41	84%				49	41	84%
Total:	529	358	68%	875	424	48%	1,404	782	56%

Table 17 presents parking occupancy on Friday for the public off-street parking lots in the 4<sup>th</sup> Avenue Business District. There were 192 vehicles parked in 419 spaces at the peak hour of 2:00 PM, which represents an occupancy level of 45.8%.

**Table 17.**  
**Public Off-Street Parking Occupancy, Friday, August 24, 2012**  
**4th Avenue Business District**

Block	Name & Block Map Designation	Spaces	Occupied Spaces					
			12:00 PM	2:00 PM	4:00 PM	6:00 PM	8:00 PM	10:00 PM
2	Robinowitz (F)	46	25	32	22	14	5	3
3	Trinity Church (A, B & D)	108	27	35	26	16	15	19
10	DQ and Delectables (A & D)	24	4	8	9	8	18	16
11	Sky Bar, Creative and Athens (A, C & E)	79	54	64	61	71	70	51
16	Plush and Antigone (A & H)	24	5	7	4	14	22	24
17	Co-Op (D)	7	0	0	0	0	0	0
20	O'Malley's and Hut (A & C)	118	41	38	36	31	27	36
21	Goodwill (G)	13	12	8	8	5	7	7
Total:		419	168	<b>192</b>	166	159	164	156
% Occupied:			40.1%	<b>45.8%</b>	39.6%	37.9%	39.1%	37.2%

Table 18 indicates current parking adequacy by block in the 4<sup>th</sup> Avenue Business District. The effective parking supply of 1,194 spaces, which is 85% of the actual parking capacity, exceeds the peak-hour parking demand currently by 412 spaces. Only one of the fifteen blocks has a parking deficit. Block 16 has a parking deficit of four spaces because 29 on- and off-street spaces were closed on the survey day. Most of these spaces will be added back to the inventory after the construction is completed. The remaining blocks in the 4<sup>th</sup> Avenue Business District have parking surpluses ranging from one space (Block 28) to 93 spaces (Block 3).

**Table 18.**  
**Current Parking Adequacy by Block**  
**4th Avenue Business District**

Block	Parking Supply	Effective Supply	Parking Demand	Surplus/Deficit
2	136	116	55	61
3	178	151	58	93
5	54	46	28	18
6	89	76	43	33
10	83	71	66	5
11	144	122	88	34
16	118	100	104	-4
17	77	65	43	22
18	8	7	1	6
19	21	18	13	5
20	146	124	63	61
21	105	89	65	24
23	120	102	83	19
24	76	65	31	34
28	49	42	41	1
Total:	1,404	1,194	782	412

**Parking Duration and Turnover**

A limited number of 2-hour on-street parking spaces on 7<sup>th</sup> Street between 3<sup>rd</sup> Avenue and 5<sup>th</sup> Avenue were surveyed with respect to parking duration and turnover. Partial license plate numbers were recorded each hour in each occupied space. These parking spaces were chosen for the parking duration and turnover survey because they are time restricted, marked and well utilized on-street spaces. The results of the survey are summarized in Table 19 on the following page.

**Table 19.**  
**Summary of Parking Duration and Turnover**

Length of Stay (hours)	Number of Parkers	Percent of Total
0-1	124	68%
1-2	39	21%
2-3	7	4%
3-4	3	2%
4-5	2	1%
5-6	3	2%
6-7	1	1%
7-8	3	2%
<b>Total:</b>	<b>182</b>	<b>100%</b>
<b>Total Duration (hours):</b>		<b>203</b>
<b>Average Duration (hours):</b>		<b>1.12</b>
<b>Average Turnover:</b>		<b>4.23</b>

The parking spaces surveyed turned over 4.23 times and the average duration of stay was 1.12 hours (1 hour and 7 minutes). Most non-work trips to a commercial area average less than two hours and approximately 89% of the parkers on 7<sup>th</sup> Street stayed for two hours or less. This indicates the time restricted spaces are primarily being used by short-term users. However, approximately 11% of the parkers stayed for more than two hours and those staying for 4+ hours are likely employees that should be parking elsewhere. In short, it is important in a commercial area for the most convenient parking to turnover frequently. Turnover effectively increases the parking capacity, benefiting local merchants and others whose businesses are dependent upon those who park for short periods of time.

**Summary of Existing Parking Conditions**

Although there are currently parking “hot spots” in the study area where parking demand exceeds the effective parking supply, the results of the parking occupancy surveys indicate there is adequate parking within the study area overall and the development of more parking is not warranted at this time. With that being said, parking occupancy was lower than expected and may have been impacted by construction in the area. In other words, it is not known if construction discouraged people from patronizing the area or if they just parked on another street or in an off-street lot instead of on 4<sup>th</sup> Avenue.

Although a parking structure is not recommended at this time, it is recommended that the city take steps to more actively manage parking in the 4<sup>th</sup> Avenue Business District, which will have the benefit of transitioning from the current “free” parking environment to an environment where people are used to the idea of paying for parking when they visit the area. Following are the near-term recommendations for the study area.

**Near-Term Recommendations**

*Signage & Wayfinding*

Given the very low use of public off-street parking, consideration should be given to more effectively direct 4<sup>th</sup> Avenue Business District customers and visitors to available off-street public parking. Signage is required to both direct parking patrons to public parking and to clearly identify the parking as available to the general public.



*Leasing Private Parking for Public Use*

If the existing “public” lots do not represent viable parking for the general public because of location or other factors, consideration should be given to leasing existing underutilized private parking for public use. The parking occupancy surveys indicate there are private parking lots near 4<sup>th</sup> Avenue that are significantly underutilized during peak periods. The key to the success of leasing private parking for public use is providing convenient parking close to primary destinations and, as mentioned above, signage to effectively direct patrons to clearly identified public parking lots.

*Parking Lot Lighting*

Many of the parking lots within the study area are very dark at night and are not an inviting place to park for safety and security reasons. Lighting that enables users to see and to be seen is one of the most important security features of a parking facility. Lighting levels should be meeting minimum standards set by the Illuminating Engineering Society of North America (IESNA). The IESNA Roadway Lighting Committee has set standards for the lighting of both surface parking lots and parking structures, and is considered the authority for setting lighting standards in the United States. They recommend a minimum horizontal illuminance (measured at the surface) of 0.5 footcandles (fc) for enhanced security, with a maximum to minimum uniformity ratio of 15:1. Average horizontal fc should be in the range of 2.5 to 3.0. LED, fluorescent and induction are the most energy efficient light sources and are rapidly replacing older lighting in parking facilities such as high-pressure sodium and metal halide. These light sources of choice will reduce maintenance and energy costs and reduce the environmental footprint of the parking lots in the study area.

*Back-In Diagonal On-Street Parking*

Many of the diagonal on-street parking spaces in the study area have been converted to back-in/pull-out spaces. Consideration should be given to changing these spaces back to front-in/back-out spaces for, in our opinion, more efficient and safer vehicular and pedestrian traffic conditions. Front-in/back-out parking is recommended by many transportation engineers as the preferred method of on-street diagonal

parking for a number of reasons. A vacant space is visible from a greater distance for front-in parkers, which allows more time to signal and slow down. It is also not necessary to put the vehicle in reverse to enter a vacant parking space, avoiding traffic delays. The front overhang of a vehicle is typically shorter than the back overhang, which does not intrude into the pedestrian right-of-way, cause vehicle emissions to be funneled at sidewalk users, or result in curb-line damage. Front-in diagonal spaces are easy to enter because of unimpaired vision and mis-parked vehicles are a rarity.

Back-in/pull-out spaces are not visible from a very long distance and the reversing parking movement can cause the stacking of vehicles and traffic delays, similar to a parallel space. Vehicles traveling in the opposite direction are also tempted to cross the center line to pull into a back-in space on the other side of the street, and when backing out to depart the space they are faced in the opposite direction of traffic flow. The longer rear overhang of a vehicle can intrude into the pedestrian right-of-way and cause vehicle emissions to be funneled directly at sidewalk users. The impairment of vision associated with backing often results in mis-parked vehicles, can cause curb-line damage, and increase the probability pedestrian-vehicle conflict when parking and possible injury. It also evident that the angle of the parking has been changed where the spaces have been converted to back-in/pull-out and the on-street parking capacity slightly decreased. While back-in/pull-out parking no doubt allows for an easier and safer egress, is safer for bicyclist, and allows for safer trunk loading/unloading, the disadvantages associated with this form of parking outweigh the benefits, in our opinion. Refer to the photographs below for illustrations of the discussion of front-in versus back-in parking above.



Front-in parking in a back-in space.

Rear vehicle overhang and possible vehicle damage.





Misaligned vehicle in a back-in space.

### *On-Street Paid Parking*

On-street paid parking should be considered in the 4<sup>th</sup> Avenue Business District once construction on the streetcar system has been completed. Parking meters, either single-space meters or multi-space meters, should be considered on 4<sup>th</sup> Avenue from University Boulevard to 9<sup>th</sup> Street, on University Boulevard between 3<sup>rd</sup> and 5<sup>th</sup> Avenues, and on 4<sup>th</sup> Street to 9<sup>th</sup> Street between 3<sup>rd</sup> and 5<sup>th</sup> Avenues. The metered spaces in front of residential properties could be a combination of metered and Residential PPP spaces.

The primary reason to institute on-street paid parking is to encourage turnover of the most convenient parking spaces. Turnover is critical to most urban businesses because parking supply is limited. If long-term parkers, such as employees or residents, use a parking space in front of a store or restaurant, fewer short-term customers will have the opportunity to use that space. The reason turnover is so important to the health of businesses is the economic value represented by multiple customers using the same parking space. Bob Gibbs, of the Gibbs Planning Group, has estimated that a parking space in front of a retail establishment can be worth up to \$300,000 in annual retail sales. The lack of convenient on-street parking can contribute to an urban area not being able to compete with the surrounding suburban shopping centers. Lower retail sales, fewer retailers, and weaker property lease rates are a function, in part, of the parking issue.

Parking meters will also generate revenue to offset parking expenses and to pay for other improvements in the area, such as a future parking structure. Parking meters would represent the first step in implementing paid parking in the area and setting the course for a possible parking structure in the future. Following is a discussion of on-street parking meters, including a comparison of “smart” single-space and multi-space meters.

### **On-Street Parking Meters**

Following are some basic advantages and disadvantages of parking meters compared to time limited parking and enforcement:

Parking Meter Advantages:

- Provide an accurate time check on parking and simplify the detection of overtime parking.
- Reduce the personnel required for parking enforcement.
- Discourage all-day parkers in short-term spaces.
- Increase turnover and make more parking available for the intended users.
- Produce revenue and aid in the financing of parking and other improvements.
- Meters visually delineate on-street spaces.

Parking Meter Disadvantages:

- Meters can arouse resentment if used where they are not warranted.
- If not properly enforced, users learn that they can park overtime (plug the meters) without receiving a parking citation.
- Once meters are installed there can be reluctance to remove them to aid traffic flow because of the production of revenue.
- If parking is prohibited during rush hour where meters are installed, the presence of the meters can confuse motorists and make enforcement more difficult.
- Possible streetscape clutter with single-space meters.

The City of Tucson, ParkWise, 4<sup>th</sup> Avenue businesses and FAMA should consider both “smart” single-space meters and multi-space meters.

**“Smart’ Single-Space Meters**

The latest single-space meters are solar powered, have rechargeable battery packs, and are wirelessly networked to a remote web-based management system. The system allows remote diagnostics and configuration of the meters. They accept coins, tokens, credit cards, debit cards and smart cards. It is also possible to pay by cell phone. These meters can also come with a wireless sensor to reset the meters to “0” when a vehicle vacates a parking space.

Advantages of the smart single-space meters include:

- Multiple payment options including coins, credit cards and smart cards.
- Offer the same fundamental rules and usage habits of the existing downtown meters.
- More user-friendly and better understood by users than multi-space meters.
- More convenient to use than multi-space meters as they are located next to the parking space.
- No space numbering required.
- Meter placement delineates on-street parking spaces.
- No additional signage required advising users to pay at the parking station and either key in their parking space number or place a receipt on their dashboard.
- Meter malfunctions are wirelessly communicated to the maintenance shop so repair efforts can be handled as needed rather than on a routine basis.
- If a meter fails, only a single space is affected.
- No paper jams or increased costs for consumables.

- Parking enforcement can be done in a vehicle and it is also made easier with more highly visible expiration indicators.
- Audit control and real-time reporting and alarming.
- Represents a lower cost per space on blocks with fewer parking spaces than multi-space meters.

Disadvantages of the smart single-space meters include:

- More maintenance and collection costs compared to multi-space meters.
- More streetscape clutter than with multi-space meters.
- There are currently few suppliers of these meters.
- Credit card user will not be provided with a receipt.
- Wireless communication and credit card processing fees to be incurred.
- Wireless communication service interruptions could delay credit card processing.

### **Multi-Space Meters**

Multi-space meters are similar to standard parking meters but provide single-point control for a larger number of spaces. They can be configured to be either Pay-by-Space or Pay-and-Display. With pay-by-space, patrons note the parking space number, proceed to the multi-space meter, insert the appropriate fee and key the parking space number into the machine. With pay-and-display, patrons proceed to the meter, insert the appropriate fee and are issued a parking ticket to display on their dashboard. Although pay-by-space requires numbering the spaces, it is more convenient for users and easier to enforce. One or two meters are required for each block face where metered parking is provided, depending upon the length of the block.

The advantages of multi-space meters include:

- Multiple payment options including coins, bills, smartcards and credit cards.
- A high level of security for owners/operators.
- Reduced maintenance and collection costs compared to conventional parking meters.
- Audit control and real-time reporting and alarming.
- Less streetscape clutter than with single-space meters.

The principal disadvantages of multiple-space meters include:

- Confusion among users who are unfamiliar with this form of revenue control.
- Signage is required to provide patrons with the information needed to locate and use multi-space meters.
- All of the parking spaces must be numbered with pay-by-space.
- Increased walking distance between parking spaces and meter.
- Pay-and display requires users to walk from the meter back to their vehicles to display a receipt.
- High cost per space on blocks with fewer parking spaces.
- Two meters required on longer blocks, increasing the cost per space.
- Wireless communication and credit card processing fees to be incurred.
- Wireless communication service interruptions could delay credit card processing.

## Parking Meter Case Studies

### *City of Denver, Colorado*

Approximately 4,500 “smart” single-space meters were installed in downtown Denver in May 2010. The 4,500 solar-powered meters were installed after the successful completion of a pilot program where 126 meters were installed on ten blocks. Approximately 15% of the old electronic meters, which accept pre-paid cash keys, have remained in areas where metered parking is being re-evaluated. The new meters have also been installed in the Cherry Creek North (CCN) neighborhood, an upscale shopping district near downtown. The new meters replaced 77 Parkeon Stelio pay-and-display units. The shopping area did not have paid parking prior to the installation of the multi-space meters in 2004. The cost of on-street parking in the city of Denver is \$1.00 an hour.



The new meters have two hour limits and payment options include credit cards, smart cards (preloaded debit cards that can be purchased from the city), and coins. The single-space meters fit into existing poles and housings and can be replaced in seconds. It is simply a matter of removing the original top and mechanism and replacing it with the new one.

Visitors to downtown Denver welcomed the new more user-friendly meters and meter revenues have increased as more people are paying for curbside parking with the credit card option. The meter manufacturer reports 20% to 30% increases in revenues with the new meters. Although meter revenues are up in Denver because more people are paying for parking, fines for overtime parking are down. Parking enforcement officers are issuing 20% fewer citations. Although Denver officials expected the decline in fine revenue, they wanted to promote customer service and ease of use instead of writing more tickets. Other cities around the county are concentrating on pleasing rather than penalizing people who park, which represents a growing trend in downtown parking over the past several years. Denver is now testing the sensors to reset the meters when vehicles vacate parking spaces.

Contact: Dominic N. Vaiana  
Public Works Department  
City and County of Denver  
(720) 865-2523

### *City of Los Angeles, CA*

The City of Los Angeles recently completed the installation of 10,000 smart meters after a pilot program where 500 meters were installed and tested. Revenues increased by nearly 40% where the meters were installed during the pilot project, and the city estimated that the new meters would generate an additional \$1.0 to 1.5 million in net revenue annually. The city wanted the new meters in order to provide more convenient and reliable service to the Los Angeles residents and visitors parking on city streets. The City of Los Angeles now has the most solar powered individual space parking meters in the country. Parking meter rates in the city range between \$1.00 and \$4.00 per hour, depending upon location and parking

demand. According to a recent report presented to the LA City Council, the city’s new 10,000 smart meters have resulted in the following:

- A 50% increase in revenue.
- A 75% reduction in contested meter citations.
- A 55% reduction in complaints to the city’s “Meter Hotline.”
- 99% up-time and operating rate.

The city is crediting much of the increase in revenue to the 99% up-time rate and the rule that if the meters are not accepting coins, then a credit card must be used or the motorist must move to a different space.

Contact: Daniel Mitchell  
City of Los Angeles  
(213) 216-6266

*City of Missoula, MT*

The City of Missoula recently installed 40 smart meters as part of a three-month pilot program to replace decades-old meters for which parts are no longer available. To gauge how well people like the meters, parking officers periodically stopped downtown parkers and asked them to take a five-question survey. The meters got mixed reviews from survey respondents. The new meters got high marks for the flexibility to use credit cards and for solar power. They received lower marks for occasional coin jams and credit card transaction fees.

The City of Missoula recently completed the pilot program with the meters and provided DESMAN with an analysis of their trial. Coin transactions and revenue greatly exceeded credit card transactions and revenue by approximately 94% to 6%. The average coin transaction was \$0.36 and the average credit card transaction was \$0.34. The monthly meter fees, including an additional bank fee of \$0.06 per credit card transaction, averaged \$269.22, which represents an average monthly fee of \$6.73 per meter for 40 meters. The average fee per meter transaction was under \$0.07, which is a very low figure because of the large number of coin transactions compared to credit card transactions. The average fee per credit card transaction was \$0.25. Total meter fees were 3.3 times more than credit card revenue over the three-month period.

Contact: Anne Guest, Director  
Missoula Parking Commission  
(406) 552-6250

*City of Austin, TX*

The City of Austin, TX recently replaced 3,800 aging single-space meters with 750 solar-powered Parkeon Strada multi-space meters. The old meters had been in service for over thirteen years and more than 18,000 meter failures were predicted for the year prior to the installation of the new meters, which

was increasing city labor costs, forfeiting significant dollars in revenue to the city, and inconveniencing motorists. The pay-and-display units, which are manufactured in the United States, accept credit cards, debit cards and coins. The primary customer benefits of the new meters are payment flexibility, the use of remaining time at another location, and increased parking time from two hours to three hours at most locations. City benefits include solar powered units with batteries lasting three years, more efficient maintenance and collections, fewer broken meters, and increased parking revenue. The city completed the bulk of the meter replacement in August 2009.



In August 2010 the city completed the installation of 500 solar powered single space smart meters as the final step in the technology upgrade. The city installed the more cost-effective single space meters where there were only a few metered spaces on a block face.

Contact: Leah Fillion  
Austin Transportation Department  
(512) 974-7923

*City of Boulder, CO*

The City of Boulder replaced 1,270 single-space meters with 140 solar-powered Cale MP 104 compact pay-and-display units. The new meters accept coins, credit cards, pre-paid cards and tokens. The city also increased on-street parking rates from \$1.00 an hour to \$1.25 and increased enforcement hours from 9:00 AM to 7:00 PM Monday-Friday when the new meters were installed. There were several reasons why the city replaced the old electronic meters with the new multi-space meters. The old meters were aging and breaking down more frequently. The new pay stations are more reliable, provide the city with immediate on-line information and better revenue controls, free up space on the sidewalks (some of the old meter posts were converted to bike racks), and provide customers with benefits including multiple payment options, a five-minute grace period, and the ability to use remaining time on a previously purchased ticket at another on-street location for no additional charge. Credit cards account for more than half of the transactions at the new meters.



The city placed one or two pay stations on each block face depending upon the length of the block. For convenience, the old meters remained at accessible spaces. Time limits at the pay stations range from two to four hours, with most having three hour limits. The city stationed parking ambassadors throughout the downtown area to help new users operate the pay-and-display stations. While meter revenues are up, the number of tickets written has declined since the meters were installed, which was expected. The primary reason they installed the new meters was to improve customer service. The City of Boulder has had parking meters downtown since 1949.