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December 16, 2004

Ms. Loretta Daniel
Senior Long Range Planner
Town of Castle Rock
100 North Wilcox Street
Castle Rock, CO 80104

RE: Downtown Castle Rock Parking Analysis – Preliminary Results
FHU Reference No. 04-181

Dear Ms. Daniel:

This letter has been prepared to summarize parking data collected and analyses conducted for the Downtown Castle Rock Parking Analysis. Specifically, this letter provides information on the parking supply, the results of a parking duration study, existing and 2030 parking conditions and a recommendation for spaces needed to accommodate future demand. The study area includes 26 blocks and has been divided into four zones. It is depicted in Figure 1.

I. PARKING SUPPLY INVENTORY

Information in the Town of Castle Rock Downtown Parking Study prepared by Burlstone, Inc. was used to determine the existing parking supply for each block in the study area. Based on the inventory given in the Burlstone study there are approximately 2,526 parking spaces available in the study area. 624 (about 25 percent) of those spaces are located along curb faces, 268 (11 percent) are located in off-street public lots, and 1,634 (63 percent) are located in off-street private lots. Of the 624 curb spaces, 288 spaces are unrestricted while 336 spaces have a two-hour time limit.

II. PARKING OCCUPANCY AND DURATION SURVEY

A parking occupancy and duration study was conducted for curb spaces for the downtown core area defined by 6th and 3rd Streets and by Jerry and Perry Streets and for three off-street public parking lots. The off-street lots were the 70 space lot on Elbert Street between 3rd and 4th Streets, the 22-space lot located on Elbert Street between 4th and 5th Street and the 30-space lot located south of 4th Street adjacent to the fire station. The study was conducted on a Wednesday and Friday from 11:00 am to 5:00 pm. The purpose of this study was to determine 1) the level of occupancy and the parking duration of unrestricted and two-hour curb spaces in the downtown core area.

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Table 1 summarizes the results of the occupancy study for curb spaces in the study area. A total of 344 parking spaces were surveyed, with a weekday average ranging from a high of 200 spaces occupied (58 percent) between Noon and 1:00 pm to a low of 138 spaces occupied (40 percent) between 5:00 pm and 6:00 pm. Blocks 15 and 16 were on average over 80 percent occupied for most of the day while blocks 8, 9, 13 and 20 were generally less than 50 percent occupied through the day.

Table 1. On-Street Block Occupancy Total

Block Number	Number of Spaces	Day	Time Period							Percent Occupancy
			11:00 – Noon	Noon – 1:00	1:00 – 2:00	2:00 – 3:00	3:00 – 4:00	4:00 – 5:00	5:00 – 6:00	
8	48	Wed.	13	25	25	16	19	14	13	37%
		Fri.	16	19	13	9	11	15	12	28%
9	37	Wed.	25	18	16	17	12	7	3	38%
		Fri.	13	18	17	16	16	11	5	37%
12	52	Wed.	41	42	34	33	37	39	30	70%
		Fri.	49	40	36	39	45	40	42	80%
13	30	Wed.	17	20	15	10	11	13	11	46%
		Fri.	18	19	7	10	8	10	11	40%
15	25	Fri.	22	22	23	19	20	19	18	82%
16	20	Wed.	20	18	19	15	18	17	19	90%
		Fri.	19	20	19	19	20	20	18	96%
17	64	Wed.	30	38	28	28	32	31	26	48%
		Fri.	45	42	44	35	43	32	28	60%
19	16	Wed.	12	9	10	7	7	8	7	54%
		Fri.	12	12	7	12	11	9	5	60%
20	52	Wed.	20	20	17	23	17	18	14	35%
		Fri.	17	18	18	22	19	23	13	36%
Total Spaces	**344**	**Wed.**	**178**	**190**	**164**	**149**	**153**	**147**	**123**	**46%**
		Fri.	**211**	**210**	**184**	**181**	**193**	**179**	**152**	**54%**
Weekday Average			**195**	**200**	**174**	**165**	**173**	**163**	**138**	
Percent Occupancy			**57%**	**58%**	**51%**	**48%**	**50%**	**47%**	**40%**	

Table 2 summarizes the parking occupancy study for the off-street public parking lots. As shown, between 11:00 am and 4:00 pm both the 70-space and the 30-space parking lots are near capacity or in some cases exceeding the capacity of the lot. On the other hand, the Elbert Street lot between 4th and 5th Streets is mostly empty all day.

Table 2. Off-Street Block Occupancy Total

Parking Lot Spaces and Location	Day	Time Period						
		11:00 – Noon	Noon – 1:00	1:00 – 2:00	2:00 – 3:00	3:00 – 4:00	4:00 – 5:00	5:00 – 6:00
70-space lot on Elbert	Wed.	61	64	68	69	72	71	63
	Fri.	77	78	63	63	46	21	6
22-space lot on Elbert	Wed.	0	2	1	1	1	0	0
	Fri.	0	1	0	0	0	0	0
30-space lot near Fire Station	Wed.	32	34	36	36	36	33	30
	Fri.	35	35	34	36	34	34	32

Table 3 summarizes the results of the duration study for both unrestricted and two-hour parking spaces. A total of 82 unrestricted parking spaces were surveyed, with the average parking duration in these spaces of approximately three hours on Wednesday and approximately three hours and twenty minutes on Friday. For the 262 two-hour parking spaces surveyed, the average parking duration was just under two-hours on both Wednesday and Friday. However, it should be noted that about ten percent of parked vehicles violated the two-hour time limit on both days, which is a fairly significant violation rate.

Table 3. Parking Duration Summary By Block

Block Number	Day	Unrestricted Parking Spaces			2-Hour Parking Spaces			
		Total Number of Spaces	Total Number of Vehicles	Average Duration	Total Number of Spaces	Total Number of Vehicles	Average Duration	Number of Violations
8	Wed.	30	31	2:52	18	25	2:22	6
	Fri.		30	2:24		20	1:41	2
9	Wed.	23	20	3:18	14	27	1:27	5
	Fri.		16	3:51		20	2:02	1
12	Wed.	0	0	N/A	52	173	1:48	11
	Fri.		0			210	1:39	14
13	Wed.	0	0	N/A	30	50	2:13	9
	Fri.		0			48	2:10	4
15	Fri.	0	0	N/A	19	60	2:59	20
16	Wed.	0	0	N/A	20	89	1:40	7
	Fri.		0			93	1:45	5
17	Wed.	0	0	N/A	64	151	1:34	7
	Fri.		0			174	1:47	11
19	Wed.	0	0	N/A	16	41	1:32	4
	Fri.		0			45	1:34	3
20	Wed.	29	19	2:44	23	39	2:49	8
	Fri.		12	4:12		49	2:09	7
Total Spaces	**Wed.**	**82**	**70**	**2:59**	**262**	**595**	**1:53**	**57**
	Fri.		**58**	**3:21**		**719**	**1:57**	**70**

III. ESTIMATED PARKING DEMAND

Estimating parking demand requires the development of a parking rate for each land use type in the downtown area. A parking rate relates a quantity of land use to a particular number of occupied parking spaces. For instance, an office building might generate demand for three parking spaces for 1,000 gross square feet of building space. The development of parking rates is a subjective process if detailed studies of existing land uses have not been completed. A portion of the subjectivity can be minimized by using a number of professional sources that have documented parking generation indices for various national and local studies.

To develop a parking generation model for downtown Castle Rock, a combination of 1) information from the Burlstone study; 2) parking occupancy data collected in the downtown core area; and 3) published parking generation rates were used to establish localized parking rates for existing land uses in for downtown Castle Rock.

A. Parking Rate Development

Generally, parking rates for the study area are based on the land use type and the gross square footage of the buildings on each block. Both long-term (employees and employers) and short-term (customer) needs are determined for each land use type. Long-term rates were determined from employee information provided in the Burlstone study and on occupancy data collected in the downtown core area. Short-term rates were based on national rates that were calibrated to local conditions based on observed occupancy.

B. Methodology

The first step in developing a parking generation model was to obtain detailed information on all business types and gross square footage within the study area. The Burlstone study and the Castle Rock Downtown Business database were used to identify business types and square footage for each block.

The employment and customer information provided in the Burlstone study was then used to generate long and short-term parking rates for the various land uses in the study area. The employment and customer information was based on trip generation rates published in Trip Generation (Institute of Transportation Engineers (ITE), Sixth Edition) and on employee and customer estimates obtained from the Chamber of Commerce. Average long-term parking rates were developed for each land use by determining the typical number of employees working during the day per 1,000 SF for that land use. Similarly, the short-term parking rates for each land use were developed by determining the typical number of customers during the day per 1,000 SF.

For example, the typical number of employees per 1,000 SF of retail space was 0.80 employees/KSF. This was based on 34 retail establishments in the study area, whose services ranged from flowers, to musical instrument sales, to toy sales. In each case, the number of employees working during the day was divided by the square footage of the establishment, producing 34 different employee/KSF rates. Then, the average of these 34 rates was determined, with the result taken as the average long-term parking rate for retail space. A similar procedure was applied to determine short-term parking rates.

After the initial set of parking rates had been developed and applied to land uses in the study area, the resulting parking demand was compared to the observed parking demand for the blocks surveyed in the downtown core area. Long-term parking rates for Douglas County and Castle Rock government uses were adjusted to match observed demand in the vicinity of these uses. In addition, short-term rates for all land uses were adjusted until the estimated demand for the downtown core area was similar to the observed demand.

C. *Local Indices vs. ITE/National Parking Generation*

A comparison was then made between the Castle Rock parking rates, rates published in the *ITE Parking Generation Manual, 3rd Edition*, rates published by the Eno foundation, a composite rate of several other national indices, and rates developed for similar parking studies conducted for the City of Tacoma, Washington and the Town of Longmont, Colorado. Table 4 presents the results.

Table 4. Comparison of Longmont Rates and Other Published Parking Rates

Land Use	Castle Rock			ITE Rates	Eno Rates	National Rates	Longmont Rates	Tacoma Rates
	Short-term	Long-term	Total Rates					
Auto Repair	1.31	1.15	2.46	1.55			1.07	
Bank	1.15	4.02	5.17	4.23	5.50	4.68	1.90	4.68
County Government	1.35	2.79	4.14	3.84			5.74	
Church	0.51	0.24	0.75			2.00	0.40	3.22
City Government	1.05	1.90	2.95	3.84			4.06	
Convenience Store	1.66	2.95	4.61	1.41			1.72	1.75
Newspaper	0.79	0.89	1.68				3.95	
Industrial Sales	0.04	2.21	2.25	1.55	1.00	1.72	2.23	1.14
Library	1.81	2.03	3.84				2.03	
Print Shop	1.01	0.87	1.88				2.29	
Professional Office	1.42	1.84	3.26	4.11	3.00	4.09	1.60	1.97
Retail Sales	1.02	0.80	1.82		4.50	2.40	1.13	2.12
Sit-Down Restaurant	2.07	1.79	3.86	9.08	11.20	10.69	2.05	1.98
Tavern/Bar	1.54	1.29	2.83				1.78	

As Table 4 indicates, the largest discrepancy between Castle Rock rates and other nationally published rates occurs with sit-down restaurants. This is likely due to the national rates being based on the lunch or dinner hour demand, while the Castle Rock and other city rates are based on demand in the middle of the afternoon. Note however that the sit down restaurant rate for Castle Rock is similar to the rate for both Longmont and Tacoma; the rates for those cities were also calculated for mid-day demand. Castle Rock rates are similar to Longmont rates for industrial sales, print shop and retail sales, as well, and are similar to national rates for county and city government and professional office.

D. *Results*

The rates in Table 4 were used to generate parking demand for existing conditions as well as future conditions in 2030.

Year 2030 parking demand estimates were estimated based on the following changes to the existing conditions parking demand model.

- Short-term parking rates, which represent the customer demand, were increased by an annual rate of three percent per year.

- Long-term rates, which represent employee demand, were increased by 0.1 percent per year to account for some growth in employees.
- Vacant properties were assumed occupied with the currently allowed land use.
- A new 20,000 square foot retail/office building was included at 319 Perry Street.

Table 5 shows the existing parking supply, the existing and 2030 estimated parking demand and the existing and 2030 surplus/deficit on a block-by-block basis. Figures 2 and 3, respectively, illustrate existing and 2030 parking deficits for blocks in the downtown area. For existing conditions, the downtown as a whole experience a surplus of 891 parking spaces, but by 2030 the downtown area is estimated to have on overall parking deficit, with most of this deficit located in Zone 3. Blocks 12 and 17 in that zone are projected to have parking deficits of 139 and 288 spaces, respectively.

Table 5. Existing and 2030 Parking Demand

Block	Supply	Existing Conditions		2030 Conditions	
		Demand	Surplus / Deficit	Demand	Surplus / Deficit
1	55	10	45	17	38
2	27	22	5	34	(7)
Zone 1	**82**	**32**	**50**	**52**	**31**
3	107	30	77	48	59
4	209	134	75	212	(3)
5	47	12	35	19	28
6	145	111	34	156	(11)
7	26	0	26	0	26
8	121	70	51	100	21
9	61	31	30	44	17
10	15	3	12	4	11
Zone 2	**731**	**390**	**341**	**583**	**148**
11	61	23	38	36	25
12	129	160	(31)	268	(139)
13	126	58	68	83	43
14	52	4	48	6	46
15	12	79	42	115	6
16	118	126	(8)	176	(58)
17	72	131	(59)	360	(288)
18	97	71	26	110	(13)
19	338	253	85	367	(29)
Zone 3	**1,114**	**907**	**207**	**1,523**	**(409)**
20	88	46	42	83	5
21	22	22	0	36	(14)
22	72	50	22	84	(12)
23	120	61	59	87	33
24	104	40	64	57	47
25	36	59	(23)	92	(56)
26	147	18	129	30	117
Zone 4	**589**	**296**	**293**	**469**	**120**
Total	**2,516**	**1,625**	**891**	**2,626**	**(110)**

The parking surplus/deficit estimates shown in Table 5 are for the entire downtown study area. Table 6 breaks out the parking surplus/deficit estimates by businesses with and without private parking. As shown, while the overall parking deficit forecast for the downtown area is 110 spaces, businesses with private parking are forecast to have a parking surplus of 250 spaces, while businesses without private parking are forecast to have an overall parking deficit of 360 spaces. Zone 3 is forecast to have the largest deficit, at 411 spaces. This suggests that approximately 400 additional parking spaces in Zone 3 are needed to accommodate the future parking demand of business without private parking lots.

Table 6. Future Parking Needs

Area	Overall Surplus / Deficit		
	Businesses With Private Parking	Businesses Without Private Parking	Overall
Zone 1	20	10	30
Zone 2	153	(5)	148
Zone 3	2	(411)	(409)
Zone 4	74	46	120
Downtown	250	(360)	(110)

Interim year analyses of parking surplus/deficits were also conducted. Table 7 shows the interim projected parking deficit for businesses without private parking in Zone 3.

Table 7. Interim Year Parking Deficits for Businesses without Private Parking in Zone 3

Year	Projected Deficit
2010	163 spaces
2015	211 spaces
2020	269 spaces
2025	338 spaces
2030	411 spaces

E. Recommendation

As noted above, businesses without private parking in Zone 3 are forecast to generate a demand for approximately 400 additional spaces by the year 2030. When planning for a parking structure it is recommended that the structure be sized to accommodate an additional 10 percent of the forecast demand to account for variability in parking from day to day and season to season. Therefore, it is recommended that a 450-space structure be constructed in the vicinity of Zone 3 in the downtown area.

We hope this information is helpful in the planning for future parking in the downtown Castle Rock area. If you have any questions, please feel free to call.

Sincerely,

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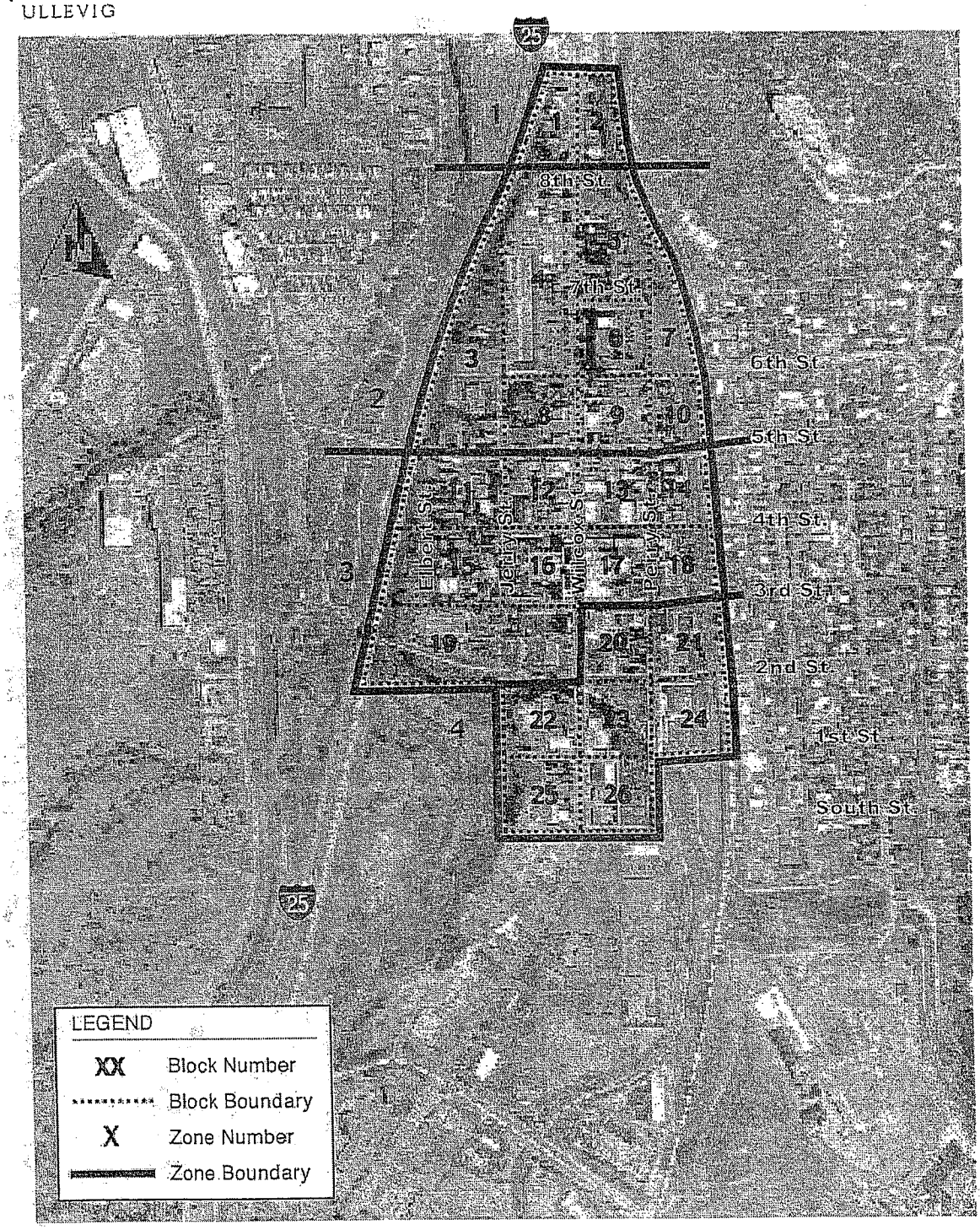

Figure 1
Study Area

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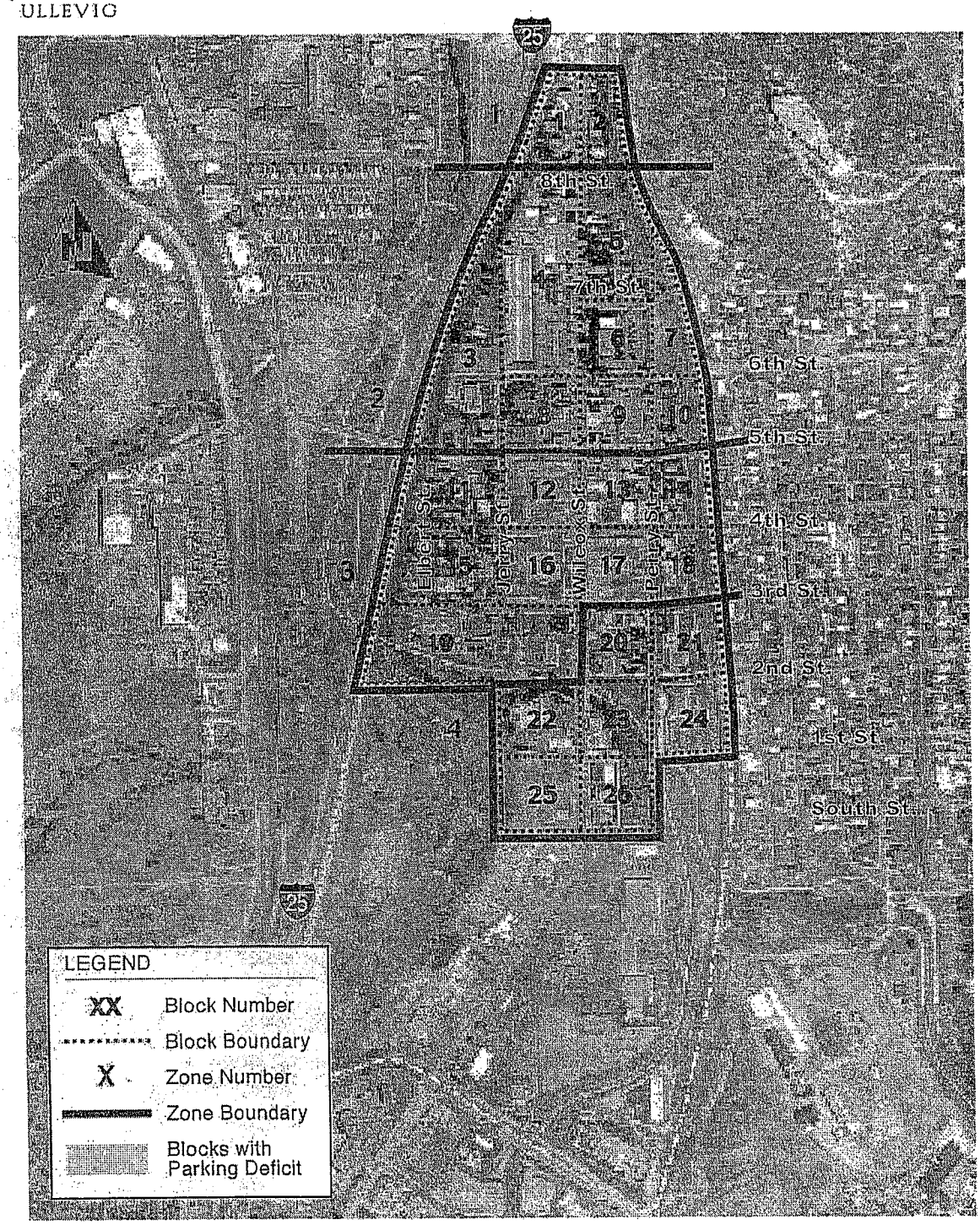

Figure 2

Blocks Showing a Parking Deficit

Existing Conditions

North

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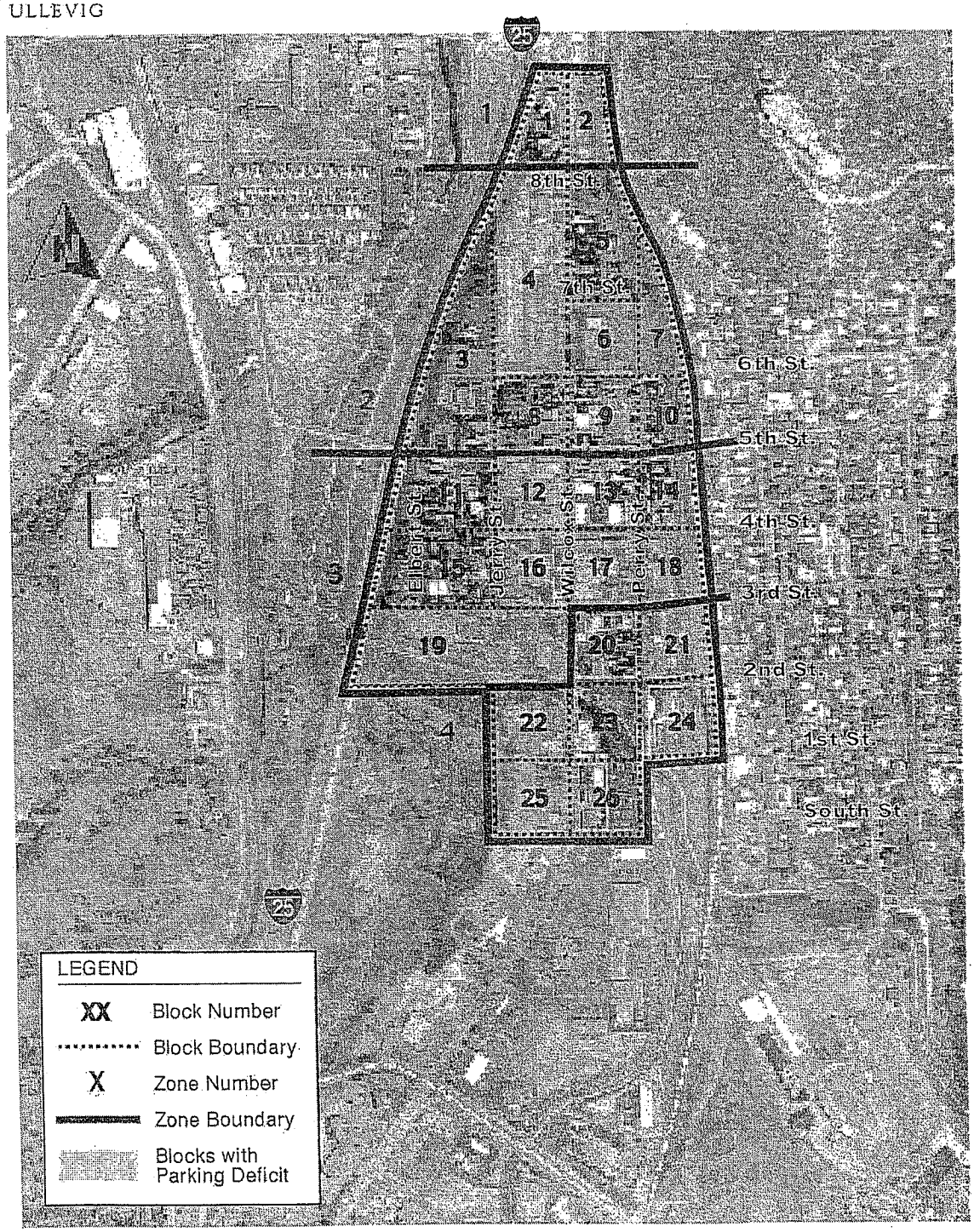

Figure 3

Blocks Showing a Parking Deficit

Future Conditions (2030)

North