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February 5, 2016

Lloyd E. Neal, P.E./PTOE  
Transportation Engineering Manager  
City of Plano  
1520 K Avenue, 2<sup>nd</sup> Floor, Suite 250  
Plano, Texas 75074

Re: Downtown Parking Study  
Walker Project # 25-1867.00

Dear Lloyd:

We are pleased to present our final report relating to the referenced project. The attached report contains our analysis, conclusions, and assumptions.

Sincerely,

WALKER PARKING CONSULTANTS

A handwritten signature in black ink that reads "John W. Dorsett". The signature is written in a cursive, flowing style.

John W. Dorsett, AICP, CPP  
Senior Vice President



Ahead of the Curve  
in creative parking solutions

DOWNTOWN PARKING STUDY  
FINAL REPORT

**CITY OF PLANO**  
PLANO, TEXAS

Prepared for:  
LLOYD NEAL

FEBRUARY 5, 2016



**WALKER**  
PARKING CONSULTANTS

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## **EXECUTIVE SUMMARY**

The City of Plano engaged the services of Walker Parking Consultants to evaluate the current parking supply, demand, and future parking needs in the downtown Plano area. The recommendations provided in this study foster balanced parking availability, increase safety, and provides the ability to accommodate future parking needs and improve the efficiency of the parking system. The study includes the review of applicable parking policies and recommends improvements that enhance the downtown patron experience and use of parking lots.

By observation of current traffic patterns and parking practices, review of parking policies and operational procedures, and estimating future parking needs, it was determined that 15<sup>th</sup> Street will likely remain the downtown patron's first choice for parking even with adequate perimeter parking being available within a reasonable walking distance. Parking availability on 15<sup>th</sup> Street, serving commercial, retail, and restaurant businesses, was found to be limited beginning late afternoon through the evening hours. During this time the parking lots a block away were found to be underused. The morning and afternoon field observations on 15<sup>th</sup> Street found on-street parking stalls being sometimes used for periods extending past authorized time limits, and in some cases vehicles being relocated to other nearby parking stalls.


Bicycle and pedestrian facilities were found to be adequate in the overall downtown core area. Bike racks are provided at the DART light rail platform, in the community park, and at several locations in the core area. At signalized intersections pedestrian crossing signals are provided and side-streets with significant pedestrian crossing activity are marked with pedestrian crosswalks. Area security lighting is provided on major roads, every 600 feet on minor roads, and within public parking lots. The addition of emphasis traffic safety signing, secure bike rack stations, and pavement markings are suggested to enhance the unique character and patron experience while visiting or working in downtown Plano.

The downtown area land development strategy; encourages the adaptive reuse of existing buildings by minimizing the required parking of repurposed buildings, utilizes the shared pool of parking across the entire downtown area to meet future parking needs, and encourages the use of on-street parking to reduce the need for parking lots. The redevelopment requirement that triggers the need for additional parking is based on the proposed additional floor space above that of the current building. This requirement applies regardless of repurposed building use. These strategies support the desired outcome of creating a compact transit-oriented development that reduces the dependency on motor vehicles, reduces vehicle speeds, and increases walking and biking mobility. These strategies and requirements continue to produce satisfactory outcomes and should remain.

STUDY AREA



Plano TX Base Map

- ① Lot Numbers
- Study Boundary
- NORTH  




## SUMMARY

Current PUBLIC Parking Supply: 1,445  
Current Weekday Peak PUBLIC Demand: 905 (63% Occupied at 1 pm)  
Current Weekday PUBLIC Adequacy: 377 (effective supply - demand)  
Current Weekend Peak PUBLIC Demand: 632 (44% Occupied at 8 pm)  
Current Weekend PUBLIC Adequacy: 650 (effective supply - demand)

Future PUBLIC Parking Supply: 1,545  
Future Weekday PUBLIC Demand: 1,423  
Future Weekday PUBLIC Adequacy: -32 (effective supply - demand)  
Future Weekend PUBLIC Demand: 1,023  
Future Weekend PUBLIC Adequacy: 368 (effective supply – demand)

## KEY RECOMMENDATIONS

In order to accomplish the objectives outlined in this plan, the following key recommendations are split into three time ranges: short-term (1 year), mid-term (1 – 3 years), and long-term (3 years or longer). These strategies are listed below.

### SHORT-TERM (1 YEAR)

- Include destination signage at all public parking lots and garages to mark the locations of parking upon arrival, and directional parking signage to mark where to go in order to find parking.
- Establish a 3-hour parking limit in the general downtown area.
- Allow unlimited parking time along J Avenue from 16<sup>th</sup> Street to 18<sup>th</sup> Street.
- Continue to allow unlimited parking in public lots in Blocks 3 and 4. Keep existing 4 hour limits in public lots on Block 18.
- Clearly mark parking restrictions and time limits on-street.
- Work with businesses downtown to educate employees on parking options available and time limits.
- Add to city website to aid in distribution of information, maps, and locations of parking facilities and restrictions.
- Work with merchants to develop a valet program in the core area (15<sup>th</sup> Street).
- Partner with DART to develop incentives such as discount tickets or validations for patrons during peak events downtown.
- Utilize shared parking in evaluating parking supply and demand.
- Encourage on-street parking to reduce the need for parking lots and reduce vehicular speed.
- The core downtown area should have limited parking and be reliant on perimeter parking lots to fulfill daily parking needs.
- Encourage resident and employee parking in garages and perimeter parking lots.
- Encourage the use of shared parking lots that have specific user needs that occur during different times of the day.

- Utilize the shared pool of parking across the entire downtown area to meet the parking needs for all.
- Accommodate the adaptive reuse of existing buildings by minimizing required parking. Large buildings should be garaged parked.
- Continue the current practice of providing non-restricted time parking in southern portion of the J Avenue/DART parking lot, and I Avenue to accommodate the daily parking needs of Downtown Plano DART Station patrons.
- Consider using advanced parking enforcement technologies for improved parking compliance.
- Prohibit heavy truck use on 15<sup>th</sup> Street between G Avenue and Municipal Avenue. Access by smaller local delivery trucks will continue to be permitted.
- Coordinate future downtown wayfinding sign system modifications with recommendations to be produced from a separate ongoing study on citywide wayfinding needs.
- Valet parking strategies should be permitted for evening, week-end, and special event parking demand.
- Foster increased deployment of bike racks, pedestrian walking facilities, and use of public transit.
- Install additional bike rack systems at key locations.
- Emphasize pedestrian crossing safety at 14<sup>th</sup> Street and J Avenue/DART light-rail crossing.
- Refresh the traffic pavement markings in the downtown area.
- Encourage creation of parking information on private business websites with links to the city webpage.
- Require one parking space for every 300 square feet of new building space. The requirement only applies for floor space created in excess of existing building floor area regardless of use.
- Expand the use of public parking through incentives, public-private partnerships, and acquiring additional property as a land banking parking strategy.

### *MID-TERM (1 – 3 YEARS)*

- Monitor parking conditions in and around the study area — especially near areas of planned and potential future developments to determine if an adequate parking supply exists.
- Begin outreach by educating local business owners and residents on which off-street parking lots to use in order to avoid future parking inadequacies.
- Work with private lot owners to establish shared parking to accommodate future public parking deficits.
- Continue placement of bike racks in downtown, work with DART on bike racks at the rail station near bike path.
- Install count-down pedestrian crossing systems at all downtown signalized intersections.
- Increase the conspicuity of the 15<sup>th</sup> Street mid-block crossing.
- Upgrade the reflectivity of downtown area traffic safety signs.





- Continue to install countdown pedestrian heads at traffic signal crossings.
- Consider creating shared privately-owned, publically-operated parking lots for public use.
- Provide incentives for patron use of DART transit services while visiting the downtown area.

*LONG-TERM (3 YEARS OR MORE)*

- Continue to review parking demand and update the city's parking management strategies as needed.
- Add to public parking supply as needed.
- Evaluate the installation of low level pedestrian lighting.

## **INTRODUCTION**

The City of Plano, a moderately sized city, is located just north of the City of Dallas. The downtown area is composed of mixed-use dwelling units, an intermediate light-rail station, and retail/commercial/restaurant businesses. The planned vision for the downtown area is to retain the eclectic appearance of the brick clad buildings, be flexible in accommodating redevelopment opportunities, and foster a safe pedestrian friendly environment. The principal strategy used in meeting this vision is to accommodate the adaptive reuse of existing buildings by minimizing required parking, utilize the shared pool of parking across the entire downtown area to meet future parking needs, encourage the use of on-street parking to reduce the need for parking lots and to reduce vehicular speeds, and to enhance pedestrian travel and bicycle use.

## **SUPPLY AND DEMAND ANALYSIS**

### **STUDY AREA**

The City identified an 18 block Study Area as the focus of this study. The Study Area is generally bounded by 18<sup>th</sup> Place to the north, M Avenue to the east, rail road tracks to the south, and F Avenue to the west. The figure on the following page depicts the Study Area.

Land availability in the study area is limited along the 15<sup>th</sup> Street corridor due to the dense nature of existing buildings. Some growth has occurred north, with most of the redevelopment occurring to the south, where current redevelopment opportunities exist.

Figure 1: Study Area



Plano TX Base Map

① Lot Numbers

----- Study Boundary

NORTH



Source: Google

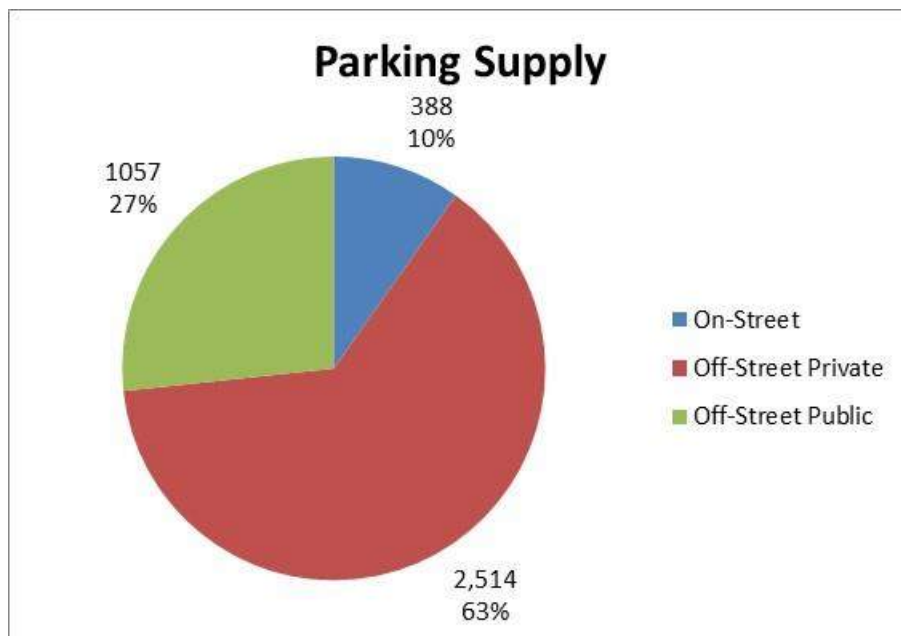
**PARKING SUPPLY**

The foundation of a parking supply and demand study is an inventory of the existing parking supply. Parking in the Study Area is available in several forms. On-street parking is offered at no charge. On-street parking was generally signed well and restrictions were clearly marked (4 hour limit). Off-street parking is available to the public in lots and garages, which are both publicly and privately owned facilities. Private parking is available for specific user groups in lots and is often restricted for use by the individual businesses.

The inventory is compared to the parking demand to quantify the existence of a parking surplus or deficit. A surplus exists when the supply exceeds the demand; a deficit exists when the supply is inadequate to meet the demand. We conducted this analysis on a block-by-block basis within the Study Area, segmenting the demand by block.

Based on the data collected, there are a total of 3,959± spaces in the Study Area. Following is a breakdown of these spaces: 388± are on-street and 3,571± are off-street. Of the off-street spaces, 1,057± are open to the public and 2,514± are private or restricted-use spaces. The table below summarizes the parking supply by block.

Figure 2: Distribution of Parking Supply by Type



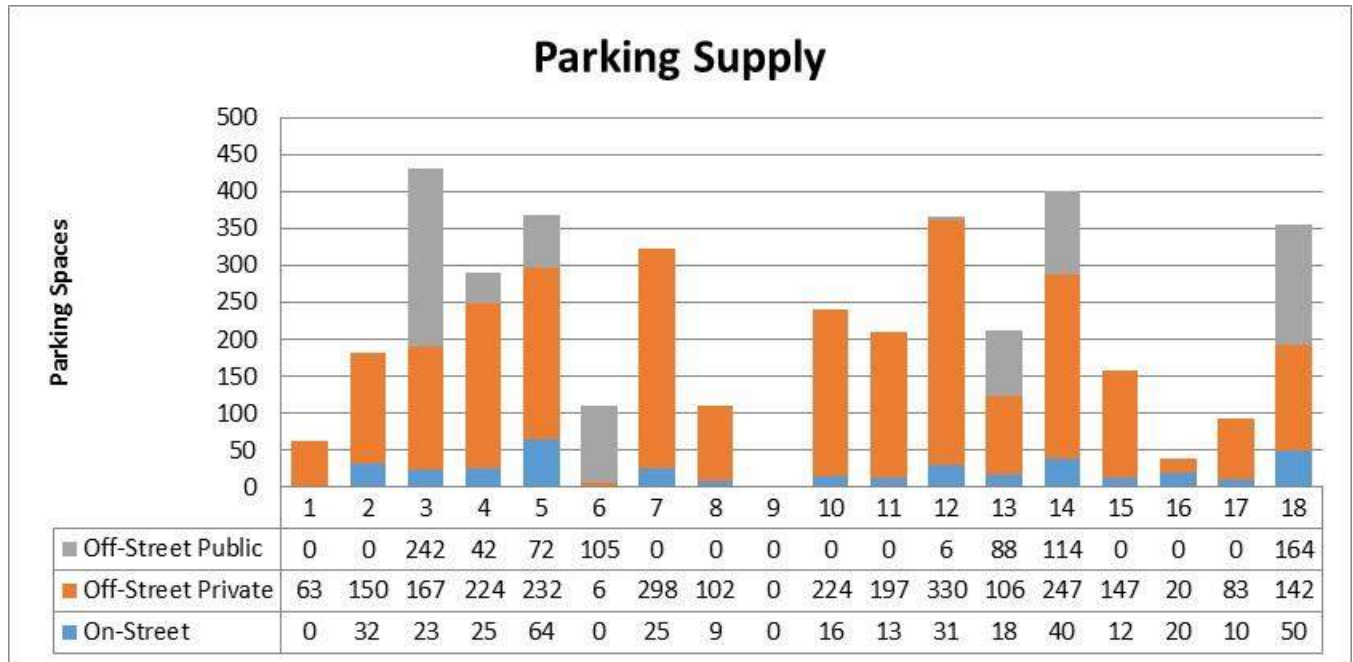
Source: Walker Parking Consultants

Table 1: Parking Supply Summary

Parking Supply				
Block #	Number of Parking Spaces			
	On-Street	Off-Street Private	Off-Street Public	Total Spaces
1	0	63	0	63
2	32	150	0	182
3	23	167	242	432
4	25	0	266	291
5	64	232	72	368
6	0	6	105	111
7	25	298	0	323
8	9	102	0	111
9	0	0	0	0
10	16	224	0	240
11	13	197	0	210
12	31	330	6	367
13	18	106	88	212
14	40	247	114	401
15	12	147	0	159
16	20	20	0	40
17	10	83	0	93
18	50	142	164	356
<b>Total</b>	<b>388</b>	<b>2,514</b>	<b>1,057</b>	<b>3,959</b>

Source: Walker Parking Consultants

Figure 3: Parking Supply by Block and Type



Source: Walker Parking Consultants



## EFFECTIVE PARKING SUPPLY

The inventory of parking within the Study Area is adjusted to allow for a cushion necessary for vehicles moving in and out of spaces and to reduce the time necessary to find the last few remaining spaces when the parking supply is nearly full. We derive the effective supply by deducting this cushion from the total parking capacity. The cushion allows for vacancies created by restricting parking spaces to certain users (reserved spaces), misparked vehicles, minor construction, and debris removal. A parking supply operates at peak efficiency when parking occupancy, including both daily visitors and employee parking patrons, is 85% to 95% of the supply. When occupancy exceeds this level, patrons may experience delays and frustration while searching for a space. Therefore, the parking supply may be perceived as inadequate even though there are some spaces available in the parking system.

As a result, the effective supply is used in analyzing the adequacy of the parking system rather than the total supply or inventory of spaces. Following are some factors that affect the efficiency of the parking system:

- Capacity – Large, scattered surface lots operate less efficiently than a more compact facility, such as a parking structure, which offers consolidated parking in which traffic generally passes more available parking spaces in a more compact area. Moreover, it is more difficult to find the available spaces in a widespread parking area than a centralized parking facility.
- Type of Users – Monthly or regular parking patrons can find the available spaces more efficiently than infrequent visitors because they are familiar with the layout of the parking facility and typically know where the spaces will be available when they are parking.
- On-street vs. Off-street – On-street parking spaces are less efficient than off-street spaces due to the time it takes patrons to find the last few vacant spaces. In addition, patrons are typically limited to one side of the street at a time and often must parallel park in traffic to use the space.

The size of the cushion is dependent on the type of user and facility. On-street parking is adjusted by an 85% effective supply factor (ESF), because of the relative difficulty of finding an open space while negotiating traffic. Public off-street parking is adjusted by a 90% ESF to account for user unfamiliarity and the challenges of safely navigating the area while searching for a space. Private off-street parking is adjusted by a 95% ESF because employees or repeat users are familiar with the area and generally park in the same location each day. The Study Area contains a total of 3,959± spaces before any adjustments are made to account for an effective supply. After the effective supply factor is applied to the overall supply numbers, the Study Area's effective supply is 3,673± spaces, as shown in the following tables.

Table 2: Effective Supply Summary

Effective Supply Calculations				
Parking	Actual Supply	Effective Supply Factor	Effective Supply	Operating Cushion
On-Street	388	0.85	330	58
Public Off-Street	1057	0.90	952	105
Private Off-Street	2,514	0.95	2,391	123
<b>Total</b>	<b>3,959</b>	<b>93%</b>	<b>3,673</b>	<b>286</b>

Source: Walker Parking Consultants

Table 3: Effective Supply by Block

Block #	Effective Parking Supply									Total Effective Supply
	On-Street Parking			Off-Street Public Parking			Off-Street Private Parking			
	Supply	Effective Supply Factor	Effective Supply	Supply	Effective Supply Factor	Effective Supply	Supply	Effective Supply Factor	Effective Supply	
1	0	0.85	0	0	0.90	0	63	0.95	60	60
2	32	0.85	27	0	0.90	0	150	0.95	143	170
3	23	0.85	20	242	0.90	218	167	0.95	159	397
4	25	0.85	21	266	0.90	239	0	0.95	0	260
5	64	0.85	54	72	0.90	65	232	0.95	220	339
6	0	0.85	0	105	0.90	95	6	0.95	6	101
7	25	0.85	21	0	0.90	0	298	0.95	283	304
8	9	0.85	8	0	0.90	0	102	0.95	97	105
9	0	0.85	0	0	0.90	0	0	0.95	0	0
10	16	0.85	14	0	0.90	0	224	0.95	213	227
11	13	0.85	11	0	0.90	0	197	0.95	187	198
12	31	0.85	26	6	0.90	5	330	0.95	314	345
13	18	0.85	15	88	0.90	79	106	0.95	101	195
14	40	0.85	34	114	0.90	103	247	0.95	235	372
15	12	0.85	10	0	0.90	0	147	0.95	140	150
16	20	0.85	17	0	0.90	0	20	0.95	19	36
17	10	0.85	9	0	0.90	0	83	0.95	79	88
18	50	0.85	43	164	0.90	148	142	0.95	135	326
<b>Totals</b>	<b>388</b>	<b>0.85</b>	<b>330</b>	<b>1057</b>	<b>0.90</b>	<b>952</b>	<b>2,514</b>	<b>0.95</b>	<b>2,391</b>	<b>3,673</b>

Source: Walker Parking Consultants

**PARKING OCCUPANCY - WEEKDAY**

To determine the parking patterns of patrons in the Study Area, the usage of the majority of parking facilities located in the Study Area was evaluated on a weekday and weekend. An understanding of these parking patterns helps define both patron types and parking locations. Occupancy counts for a typical weekday were taken for on- and off-street parking spaces on Thursday, May 21, 2015. Counts were taken at 10:00 a.m., 1:00 p.m., 5:00 p.m., and 8:00 p.m.

The following table summarizes the observed occupancy rates for on-street and off-street parking.

**Table 4: Weekday Parking Occupancy Summary**

Weekday Occupancy Summary									
Type	Supply	10:00 AM	Percentage	1:00 PM	Percentage	5:00 PM	Percentage	8:00 PM	Percentage
On-Street	388	229	47%	248	51%	168	36%	97	22%
Private Off-Street	2,514	1,054	42%	1,122	45%	842	33%	559	22%
Public Off-Street	1,057	579	55%	657	62%	421	40%	217	21%
<b>Total</b>	<b>3,959</b>	<b>1,862</b>	<b>47%</b>	<b>2,027</b>	<b>51%</b>	<b>1,431</b>	<b>36%</b>	<b>873</b>	<b>22%</b>

Source: Walker Parking Consultants

Occupancy rates as a whole do not indicate a shortage of parking. Peak parking demand was observed around 1:00 p.m. with approximately 2,027 occupied spaces, or 51% of the overall supply. Public off-street spaces were occupied at a slightly higher percentage than the other land uses. The following tables illustrate the observed occupancy for on-street, public off-street and private off-street parking by block.

**Table 5: Weekday Parking Occupancy Summary – On-Street**

On-Street Weekday Occupancy									
Block #	Supply	10:00 AM	Percentage	1:00 PM	Percentage	5:00 PM	Percentage	8:00 PM	Percentage
1	0	0	0%	0	0%	0	0%	0	0%
2	32	23	72%	25	78%	11	34%	2	6%
3	23	4	17%	1	4%	1	4%	1	4%
4	25	22	88%	23	92%	9	36%	0	0%
5	64	62	97%	62	97%	56	88%	30	47%
6	0	0	0%	0	0%	0	0%	0	0%
7	25	19	76%	18	72%	7	28%	2	8%
8	9	6	67%	7	78%	8	89%	4	44%
9	0	0	0%	0	0%	0	0%	0	0%
10	16	4	25%	3	19%	3	19%	0	0%
11	13	8	62%	9	69%	4	31%	1	8%
12	31	6	19%	11	35%	6	19%	1	3%
13	18	17	94%	17	94%	19	106%	9	50%
14	40	17	43%	24	60%	20	50%	25	63%
15	12	0	0%	1	8%	0	0%	0	0%
16	20	5	25%	7	35%	5	25%	2	10%
17	10	3	30%	2	20%	2	20%	2	20%
18	50	33	66%	38	76%	17	34%	18	36%
<b>Totals</b>	<b>388</b>	<b>229</b>	<b>59%</b>	<b>248</b>	<b>64%</b>	<b>168</b>	<b>43%</b>	<b>97</b>	<b>25%</b>

Source: Walker Parking Consultants

Generally, on-street parking occupancy during the peak hour ranges from 0% to 97%.

**Table 6: Weekday Parking Occupancy Summary – Public Off-Street**

Public Off-Street Weekday Occupancy									
Block #	Supply	10:00 AM	Percentage	1:00 PM	Percentage	5:00 PM	Percentage	8:00 PM	Percentage
1	0	0	0%	0	0%	0	0%	0	0%
2	0	0	0%	0	0%	0	0%	0	0%
3	242	85	35%	68	28%	49	20%	11	5%
4	266	254	95%	235	88%	85	32%	10	4%
5	72	45	63%	48	67%	41	57%	40	56%
6	105	29	28%	46	44%	41	39%	10	10%
7	0	0	0%	0	0%	0	0%	0	0%
8	0	0	0%	0	0%	0	0%	0	0%
9	0	0	0%	0	0%	0	0%	0	0%
10	0	0	0%	0	0%	0	0%	0	0%
11	0	0	0%	0	0%	0	0%	0	0%
12	6	4	67%	4	67%	3	50%	0	0%
13	88	20	23%	68	77%	42	48%	65	74%
14	114	56	49%	66	58%	83	73%	45	39%
15	0	0	0%	0	0%	0	0%	0	0%
16	0	0	0%	0	0%	0	0%	0	0%
17	0	0	0%	0	0%	0	0%	0	0%
18	164	86	52%	122	74%	77	47%	36	22%
<b>Totals</b>	<b>1,057</b>	<b>579</b>	<b>55%</b>	<b>657</b>	<b>62%</b>	<b>421</b>	<b>40%</b>	<b>217</b>	<b>21%</b>

Source: Walker Parking Consultants

During the peak hour, a little more than half of the available public parking supply is occupied. The peak occupancy for public off-street actually occurred at the 1:00 p.m. count.

Some public spaces on Blocks 3, 4, and 18 are utilized by the city to store fleet vehicles. The extent of the usage is minimal and does not create parking deficits for the general public.

Note: All observations are prior to the closure of the Plano Athletic and Recreational Department and the opening of Junction 15.

At 1:00 p.m., approximately 45% of the private off-street parking supply was occupied. The parking occupancy on some blocks was observed at more than 90%, although most blocks saw occupancy levels at a much less rate.

**Table 7: Weekday Parking Occupancy Summary - Private Off-Street**

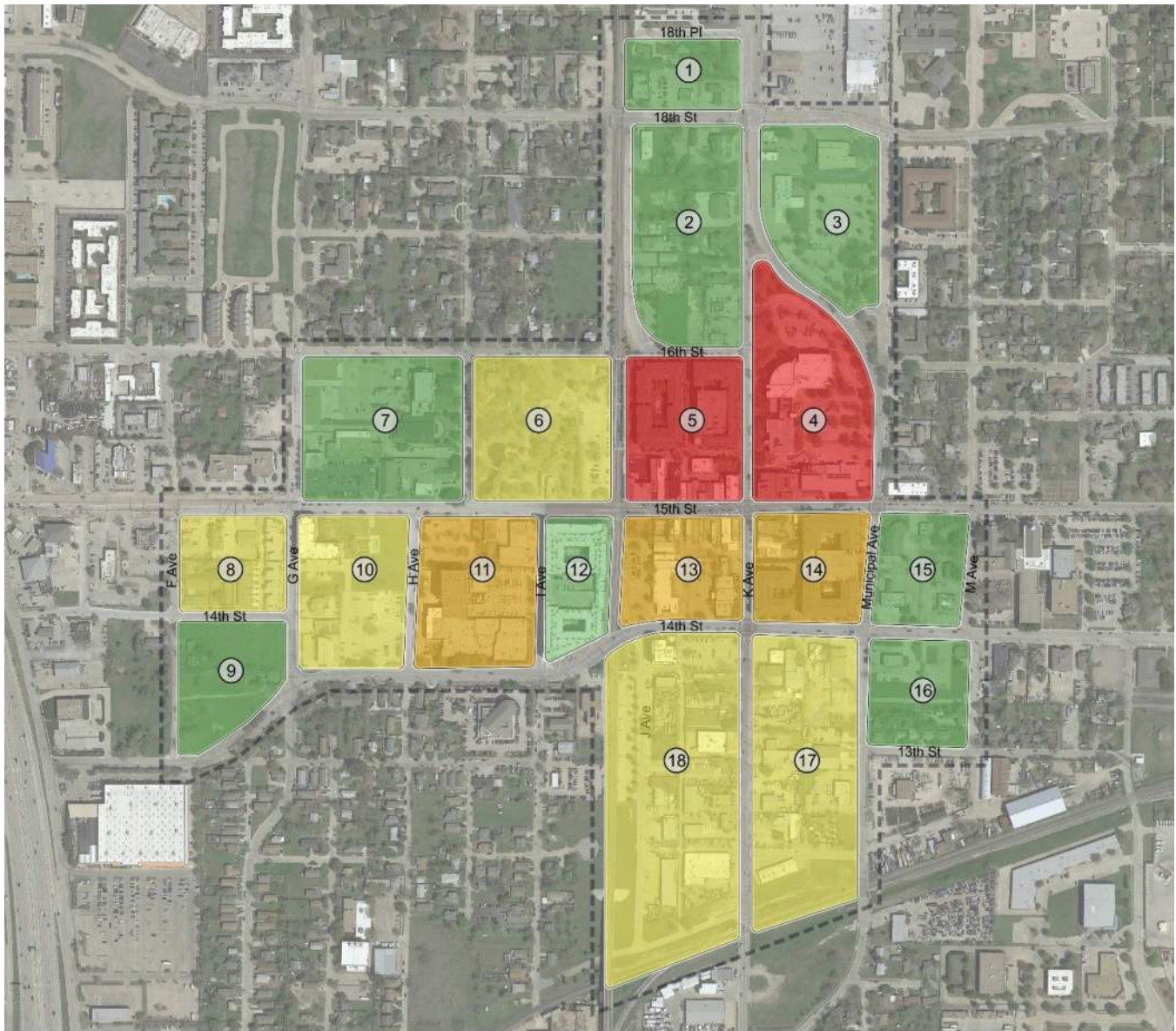
Private Off-Street Weekday Occupancy									
Block #	Supply	10:00 AM	Percentage	1:00 PM	Percentage	5:00 PM	Percentage	8:00 PM	Percentage
1	63	7	11%	6	10%	3	5%	2	3%
2	150	52	35%	52	35%	17	11%	3	2%
3	167	42	25%	34	20%	15	9%	8	5%
4	0	0	0%	0	0%	0	0%	0	0%
5	232	196	84%	196	84%	193	83%	200	86%
6	6	4	67%	5	83%	1	17%	0	0%
7	298	80	27%	99	33%	27	9%	9	3%
8	102	22	22%	47	46%	30	29%	15	15%
9	0	0	0%	0	0%	0	0%	0	0%
10	224	126	56%	132	59%	83	37%	20	9%
11	197	125	63%	144	73%	96	49%	50	25%
12	330	0	0%	0	0%	0	0%	0	0%
13	106	78	74%	82	77%	68	64%	10	9%
14	247	214	87%	215	87%	212	86%	230	93%
15	147	25	17%	33	22%	13	9%	0	0%
16	20	8	0%	5	0%	7	0%	0	0%
17	83	36	43%	42	51%	33	40%	2	2%
18	142	39	27%	30	21%	44	31%	10	7%
Totals	2,514	1,054	42%	1,122	45%	842	33%	559	22%

Note: The parking structure on Block 12 was under construction during our survey, and as such, no occupancy was recorded.

Source: Walker Parking Consultants



Figure 4: Total Current Weekday Adequacy



**Plano TX Parking Occupancy - Current Weekday**

① Lot Numbers

--- Study Boundary



**Occupancy Percentage**

00% - 49%    50% - 69%    70% - 84%    85% - 100%

Source: Walker Parking Consultants

**PARKING OCCUPANCY - WEEKEND**

Using the same methodology as stated in the weekday section, Walker collected weekend occupancy counts on Saturday, August 8, 2015. Counts were taken at 10:00 a.m., 1:00 p.m., 6:00 p.m., 8:00 p.m., and 10:00 p.m.

The following table summarizes the observed occupancy rates for on-street and off-street parking.

**Table 8: Weekend Parking Occupancy Summary**

Weekend Occupancy Summary											
Type	Supply	10:00 AM	Percentage	1:00 PM	Percentage	6:00 PM	Percentage	8:00 PM	Percentage	10:00 PM	Percentage
On-Street	388	125	32%	142	37%	145	37%	163	42%	36	9%
Private Off-Street	2,514	721	29%	751	30%	648	26%	660	26%	607	24%
Public Off-Street	1,057	237	22%	288	27%	424	40%	469	44%	304	29%
<b>Total</b>	<b>3,959</b>	<b>1,083</b>	<b>27%</b>	<b>1,181</b>	<b>30%</b>	<b>1,217</b>	<b>31%</b>	<b>1,292</b>	<b>33%</b>	<b>947</b>	<b>24%</b>

Source: Walker Parking Consultants

Peak parking demand was observed around 8:00 p.m. with approximately 1,292 occupied spaces, or 33% of the overall supply. Private off-street spaces were occupied at a slightly lower percentage than the other land uses. The tables below illustrate the observed occupancy for on-street, public off-street and private off-street parking during the weekend count by block.

**Table 9: Weekend Parking Occupancy Summary – On-Street**

On-Street Weekend Occupancy											
Block #	Supply	10:00 AM	Percentage	1:00 PM	Percentage	6:00 PM	Percentage	8:00 PM	Percentage	10:00 PM	Percentage
1	0	0	0%	0	0%	0	0%	0	0%	0	0%
2	32	0	0%	0	0%	0	0%	0	0%	0	0%
3	23	1	4%	0	0%	1	4%	0	0%	0	0%
4	25	6	24%	6	24%	8	32%	5	20%	0	0%
5	64	51	80%	60	94%	61	95%	64	100%	14	22%
6	0	0	0%	0	0%	0	0%	0	0%	0	0%
7	25	2	8%	5	20%	1	4%	8	32%	0	0%
8	9	5	56%	2	22%	6	67%	7	78%	4	44%
9	0	0	0%	0	0%	0	0%	0	0%	0	0%
10	16	1	6%	1	6%	1	6%	1	6%	0	0%
11	13	2	15%	3	23%	0	0%	0	0%	0	0%
12	31	2	6%	4	13%	3	10%	4	13%	1	3%
13	18	18	100%	18	100%	18	100%	19	106%	11	61%
14	40	15	38%	23	58%	24	60%	21	53%	2	5%
15	12	0	0%	0	0%	0	0%	0	0%	0	0%
16	20	5	25%	5	25%	3	15%	4	20%	0	0%
17	10	3	30%	3	30%	3	30%	3	30%	0	0%
18	50	14	28%	12	24%	16	32%	27	54%	4	8%
<b>Totals</b>	<b>388</b>	<b>125</b>	<b>32%</b>	<b>142</b>	<b>37%</b>	<b>145</b>	<b>37%</b>	<b>163</b>	<b>42%</b>	<b>36</b>	<b>9%</b>

Source: Walker Parking Consultants

Generally, on-street parking occupancy during the peak hour ranges from 0% to 106%. As seen in the table above, the on-street occupancy during the weekend survey day exceeded supply in a few blocks, yet was below 50% on others.

**Table 10: Weekend Parking Occupancy Summary – Public Off-Street**

Public Off-Street Weekend Occupancy											
Block #	Supply	10:00 AM	Percentage	1:00 PM	Percentage	6:00 PM	Percentage	8:00 PM	Percentage	10:00 PM	Percentage
1	0	0	0%	0	0%	0	0%	0	0%	0	0%
2	0	0	0%	0	0%	0	0%	0	0%	0	0%
3	242	40	17%	31	13%	34	14%	34	14%	15	6%
4	266	27	10%	21	8%	30	11%	24	9%	9	3%
5	72	34	47%	35	49%	64	89%	60	83%	55	76%
6	105	16	15%	32	30%	40	38%	40	38%	38	36%
7	0	0	0%	0	0%	0	0%	0	0%	0	0%
8	0	0	0%	0	0%	0	0%	0	0%	0	0%
9	0	0	0%	0	0%	0	0%	0	0%	0	0%
10	0	0	0%	0	0%	0	0%	0	0%	0	0%
11	0	0	0%	0	0%	0	0%	0	0%	0	0%
12	6	2	33%	2	33%	2	33%	1	0%	1	0%
13	88	20	23%	25	28%	64	73%	101	115%	49	56%
14	114	84	74%	111	97%	85	75%	89	78%	66	58%
15	0	0	0%	0	0%	0	0%	0	0%	0	0%
16	0	0	0%	0	0%	0	0%	0	0%	0	0%
17	0	0	0%	0	0%	0	0%	0	0%	0	0%
18	164	14	9%	31	19%	105	64%	120	73%	71	43%
<b>Totals</b>	<b>1,057</b>	<b>237</b>	<b>22%</b>	<b>288</b>	<b>27%</b>	<b>424</b>	<b>40%</b>	<b>469</b>	<b>44%</b>	<b>304</b>	<b>29%</b>

Source: Walker Parking Consultants

During the peak hour, approximately 44% of the available public parking supply is occupied. Additionally, the occupancy rate at these lots varied greatly, with some blocks experiencing 14% occupancy rates while other blocks (like Block 13) were over 100% full.

At 1:00 p.m., approximately one third of the private off-street parking supply was occupied. The parking occupancy on most blocks was observed at less than 25%. Block 5 had an 86% occupancy recorded at 1:00 p.m.

**Table 11: Weekend Parking Occupancy Summary - Private Off-Street**

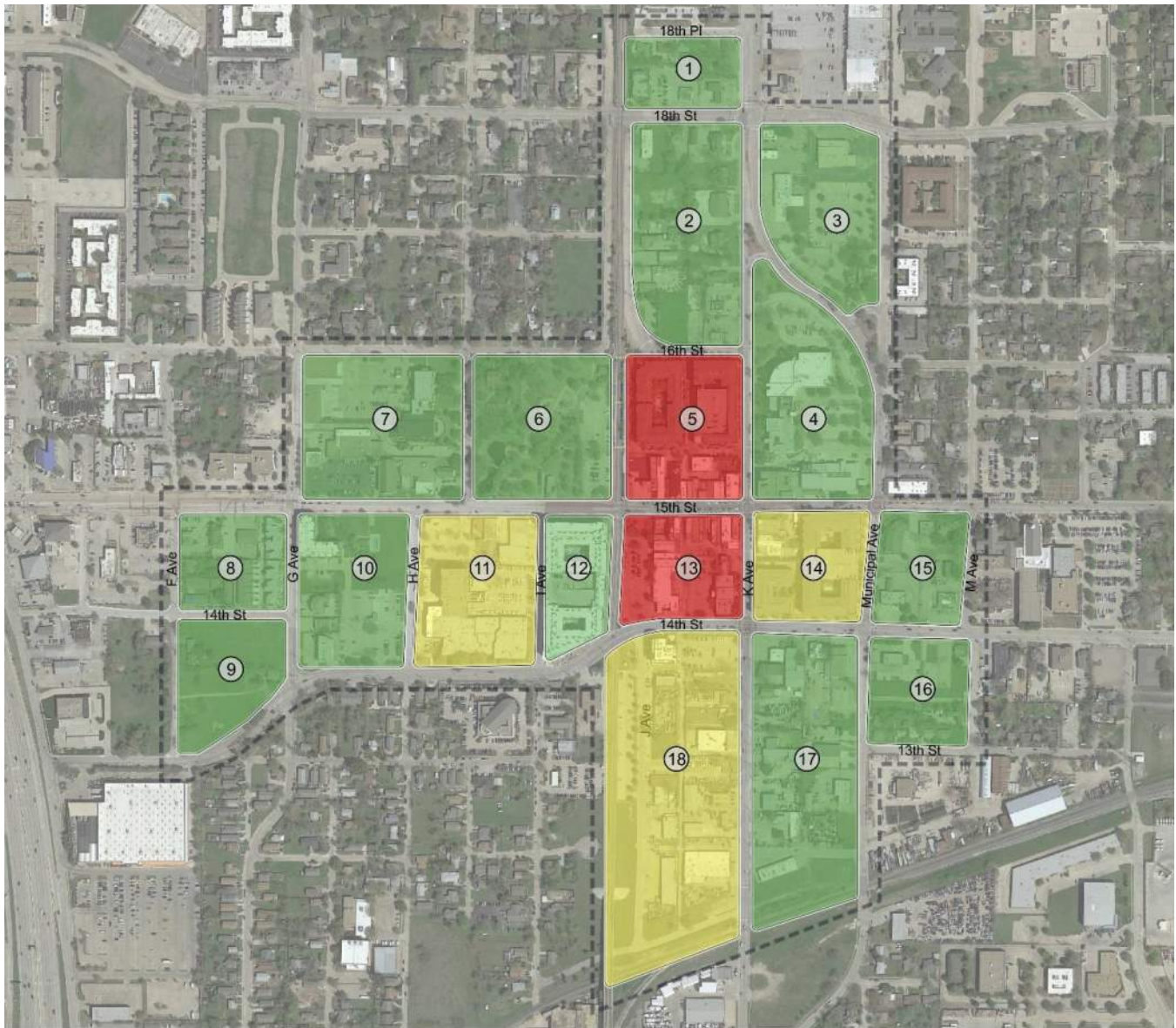
Private Off-Street Weekend Occupancy											
Block #	Supply	10:00 AM	Percentage	1:00 PM	Percentage	6:00 PM	Percentage	8:00 PM	Percentage	10:00 PM	Percentage
1	63	13	21%	18	29%	1	2%	1	2%	0	0%
2	150	14	9%	32	21%	14	9%	11	7%	2	1%
3	167	18	11%	14	8%	9	5%	9	5%	0	0%
4	0	0	0%	0	0%	0	0%	0	0%	0	0%
5	232	190	82%	199	86%	200	86%	210	91%	220	95%
6	6	5	83%	0	0%	1	17%	0	0%	0	0%
7	298	10	3%	46	15%	1	0%	0	0%	0	0%
8	102	23	23%	8	8%	13	13%	12	12%	8	8%
9	0	0	0%	0	0%	0	0%	0	0%	0	0%
10	224	37	17%	39	17%	33	15%	29	13%	25	11%
11	197	81	41%	107	54%	75	38%	72	37%	70	36%
12	330	0	0%	0	0%	0	0%	0	0%	0	0%
13	106	42	40%	70	66%	78	74%	80	75%	51	48%
14	247	189	77%	144	58%	175	71%	202	82%	220	89%
15	147	51	35%	12	8%	8	5%	6	4%	5	3%
16	20	4	0%	3	0%	0	0%	0	0%	0	0%
17	83	14	17%	17	20%	15	18%	21	25%	2	2%
18	142	30	21%	42	30%	25	18%	7	5%	4	3%
<b>Totals</b>	<b>2,514</b>	<b>721</b>	<b>29%</b>	<b>751</b>	<b>30%</b>	<b>648</b>	<b>26%</b>	<b>660</b>	<b>26%</b>	<b>607</b>	<b>24%</b>

Source: Walker Parking Consultants

Weekend parking occupancy rates are less than that of weekdays. This may be due to the large presence of office related uses in the core downtown (government uses).



Figure 5: Total Current Weekend Adequacy



**Plano TX Parking Occupancy - Current Weekend**

① Lot Numbers

----- Study Boundary



**Occupancy Percentage**

00% - 49%    50% - 69%    70% - 84%    85% - 100%

Source: Walker Parking Consultants

## LICENSE PLATE INVENTORY

Walker conducted a site survey and analysis of the on-street parking conditions on a couple of key streets in the downtown area. The survey portion of the inventory required that visual inspections of all spaces be made every hour, during which time the last three characters of the license plate on the occupying vehicle (if present) were recorded on a data collection form. The survey began at 8:00 a.m. and continued throughout the day until 3:00 p.m.

Note: Plano does not use parking meter technology at this time.

Analysis of the data required input of the collected license plate characters into a spreadsheet that examined the turnover characteristics on a block face at a time.

The figure below identifies the three block faces that were surveyed for this effort, which included K Avenue from 16<sup>th</sup> Street to 15<sup>th</sup> Street and both sides of 15<sup>th</sup> Street from K Avenue to the DART Rail Line.




Figure 6: License Plate Inventory Map



Plano TX LPI Study

① Lot Numbers       LPI Street Observation

 Study Boundary



Source: Walker Parking Consultants

The following table shows that the peak parking occupancy occurred during the 12:00 p.m. hour with 53 out of 55 spaces being occupied, which represents a 96% occupancy rate.

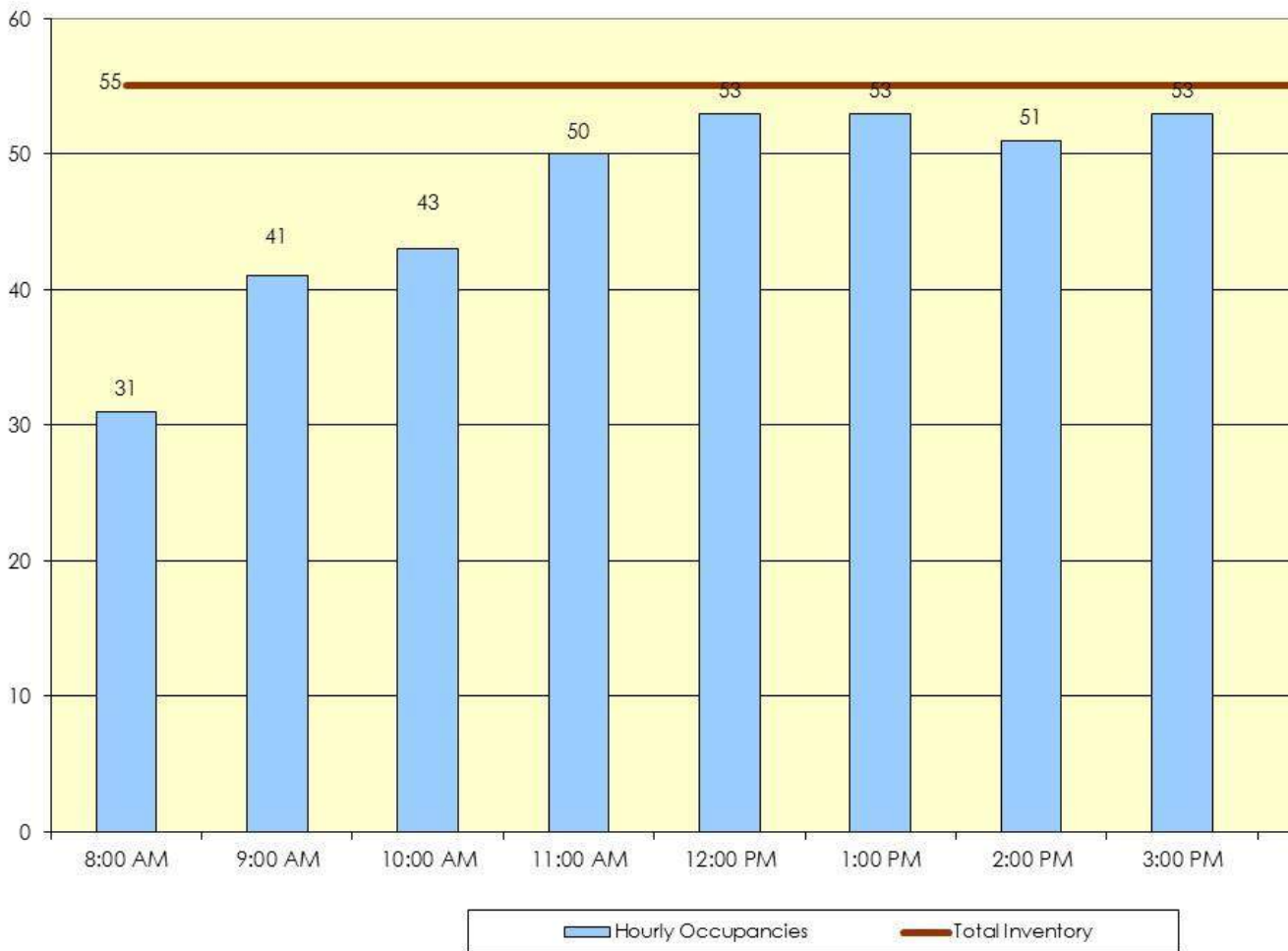
**Table 12: LPI Occupancy Summary**

LPI Occupancy Results						Hourly Occupancies								Peak Hour
Area	Street:	Side:	From:	To:	Total Inventory	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	12:00 PM
1	K Avenue	E	16th Street	15th Street	16	16	15	15	15	14	14	16	15	14
2	15th Street	N	K Avenue	RXR	21	9	14	18	17	21	21	17	21	21
3	15th Street	S	RXR	K Avenue	18	6	12	10	18	18	18	18	17	18
<b>Total Occupancies</b>					55	31	41	43	50	53	53	51	53	53
<b>Percent Occupied</b>						56%	75%	78%	91%	96%	96%	93%	96%	96%

Source: Walker Parking Consultants

Figure 7: LPI Hourly Occupancy

**Chart 1: Summary of Hourly Occupancies (all areas)**

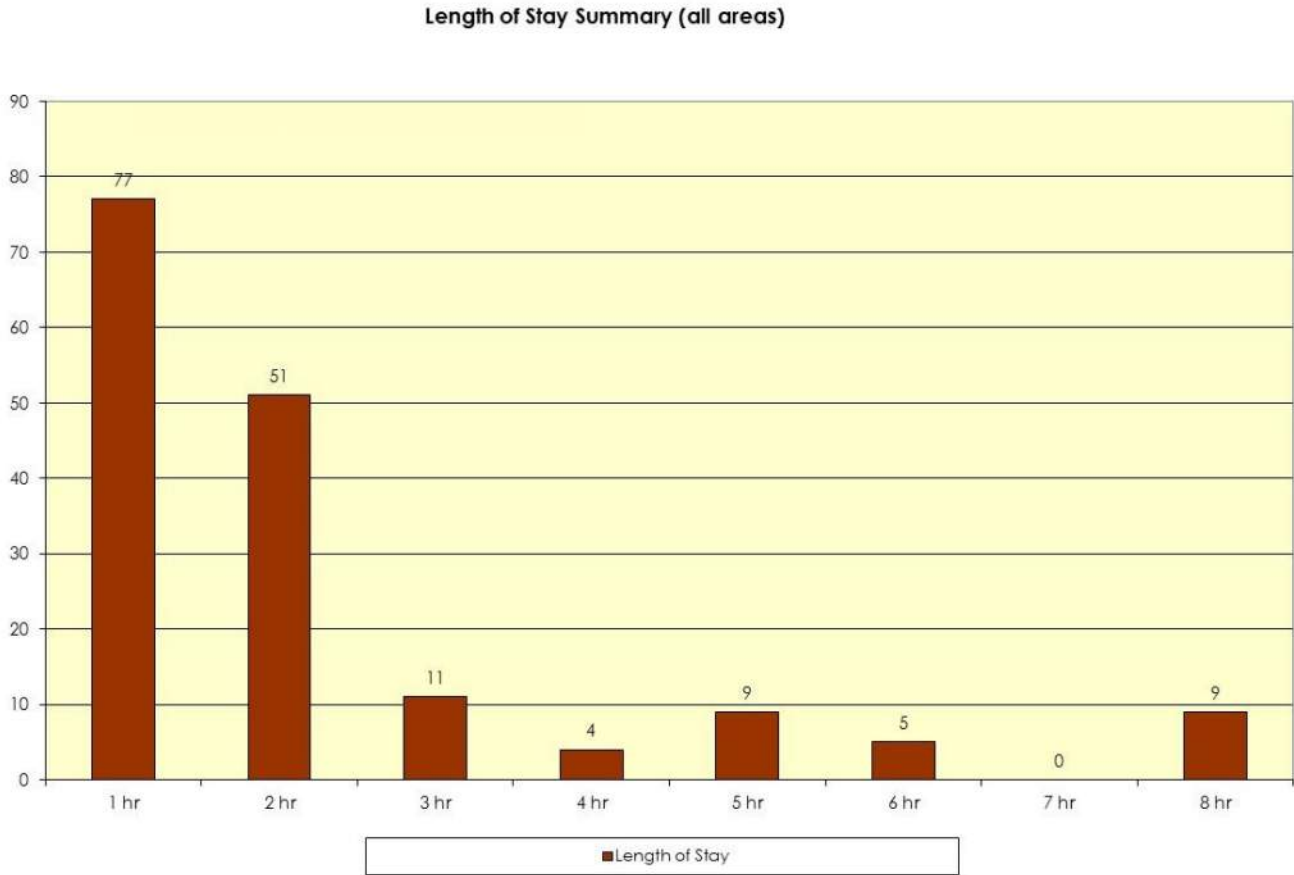


Source: Walker Parking Consultants

The figure below shows that most vehicles that were observed as parked on-street were parked for two hours or less in the downtown area. This suggests that the majority of on-street spaces are used by short-term parkers, which is appropriate. This is not to say that specific streets within the study did not experience poor turnover. The high turnover at the majority of on-street spaces suggests that the public is, for the most part, obeying the posted time limits.

The posted time limit downtown is 4 hours. The average length of stay is 2.4 hours. However, our data shows approximately 23 vehicles that overstayed the 4 hour limit.

Figure 8: Length of Stay Summary



Source: Walker Parking Consultants

Table 13: Average Length of Stay

Area	Street:	Side:	From:	To:	Total Inventory	Length of Stay								Average
						1 hr	2 hr	3 hr	4 hr	5 hr	6 hr	7 hr	8 hr	
1	K Avenue	E	16th Street	15th Street	16	8	12	4	3	2	1	0	6	3.3
2	15th Street	N	K Avenue	RXR	21	33	17	2	0	5	4	0	2	2.2
3	15th Street	S	RXR	K Avenue	18	36	22	5	1	2	0	0	1	1.7
<b>Totals</b>					<b>55</b>	<b>77</b>	<b>51</b>	<b>11</b>	<b>4</b>	<b>9</b>	<b>5</b>	<b>0</b>	<b>9</b>	<b>2.4</b>

Source: Walker Parking Consultants

Additional tables detailing the occupancy on a per space basis may be found in the Appendix. Walker recommends the city consider a three hour parking limit, which will capture most of the parking patrons surveyed.

## **STAKEHOLDER INPUT**

Stakeholder interviews were held with a sample of individuals and leaders in the downtown that are directly impacted by parking policies and decisions. Information was obtained from stakeholders through a group discussion. The following summary highlights common subjects and reflects key comments obtained from the stakeholders.

- Need more parking enforcement
- Signage needed to discourage through truck traffic
- Are parking requirements in the Zoning Ordinance adequate?
- The study should cover parking occupancy on a Saturday
- Parking is a concern in the core of downtown
- People are parking on-street for long periods of time
- The 4 hour time limit is too long
- Comparisons should use a common business related unit measure
- Expand the coverage area
- Special event parking needs addressed

## **FUTURE CONDITIONS**

There are basically two different methods for projecting future parking volumes. One method involves the use of historical and projected growth rates. The other method involves the collection of information regarding the proposed development that is likely to occur in terms of land use and square footage changes. This information regarding future developments allows the projecting of vehicular volumes and parking demands for these new uses. However, as the planning horizon goes further and further into the future, the ability to predict these changes becomes more and more difficult and less accurate. In the case of Plano, we will utilize a blended methodology.

## **PROJECTED PARKING DEMAND**

Parking demand refers to the amount of parking that is estimated to be used at a particular time, place, and price. It is affected by vehicle ownership, trip rates, mode split, length of stay, geographic location, type of trip (work, shopping, special event), the quality of public transportation and factors such as fuel and parking costs. The methodology employed by Walker to project future demand combines the baseline demand, which is equal to the observed weekday occupancy level, and any incremental change or growth in demand resulting from new land uses entering the Study Area. The baseline and incremental increase in demand are added together and then compared to the effective parking supply to determine the overall parking adequacy.

There are several potential new downtown development opportunities that may directly impact parking in downtown Plano. Walker used land use data provided by the City to project possible future parking demand for the Study Area. It is assumed that all known development projects will be operational by 2025.

The list of proposed developments may not represent all real estate projects or business expansions being considered in the Study Area, but does represent a collection of the most significant projects being considered at this time. For the purpose of this study, the following projects are reflected in the calculation of future parking demand. The projects are organized by block.

Although few specific development opportunities are identified in the areas south of 14<sup>th</sup> Street, it is recognized by city planning officials that this area will most likely be transformed by repurposing the existing buildings into more intense uses, resulting in an increased parking demand. Uses could be restaurants, bars, wineries, and artist studios, just to name a few. For this analysis, Walker assumed a general growth in parking demand of 30% over the next 10 years (a moderate 3% per year).



[Table 14: New Development Assumptions](#)

<b>Block</b>	<b>Land Use</b>	<b>Size</b>	<b>Unit</b>
10	Mixed Use	50,000 Square Feet	
3	Apartments	400 Units	
	Retail	5,000 Square Feet	
	Casual/Fine Dining	5,000 Square Feet	
13	Apartments	190 Units	
	Retail	6,000 Square Feet	
	Casual/Fine Dining	6,000 Square Feet	
18	Retail	30,000 Square Feet	
	Restaurant	10,000 Square Feet	

Source: City of Plano

There are two primary variables applied to the calculation of peak accumulation for new developments: 1) the total gross floor area (GFA), number of hotel rooms, seating capacity, etc. for each type of proposed land use (i.e. office, retail, restaurant, etc.) and 2) the appropriate parking demand ratio. The following section provides a discussion on the use of shared parking methodology when calculating the appropriate demand ratio to use for each type of land use in this analysis.

### SHARED PARKING DEMAND

Shared parking is defined as parking spaces that can be used to serve two or more individual land uses without conflict or encroachment. One of the fundamental principles of downtown planning from the earliest days of the automobile has always been to share parking resources rather than to have each use or building have its own parking. The resurgence of many central cities resulting from the addition of vibrant residential, retail, restaurant, and entertainment developments continues to rely heavily on shared parking for economic viability. In addition, mixed-use projects in many different settings have benefited from shared parking. There are numerous benefits of shared parking to a community at large, not the least of which is the environmental benefit of significantly reducing the square feet of parking provided to serve commercial development.

The interplay of land uses in a mixed-use environment produces a reduction in overall parking demand. For example, a substantial percentage of patrons at one business (restaurant) may be employees of another downtown business (office). This is referred to as the “effects of the captive market.” These patrons are already parking and contribute only once to the number of peak hour parkers. In other words, the parking demand ratio for individual land uses should

be factored downward in proportion to the captive market support received from neighboring land uses.

Adjustments are also made to account for the number of patrons who arrive at the subject property by means other than personal vehicle. Based on data collected by the U.S. Census Bureau, Walker applied a drive ratio, or modal split factor, to each land use. Per current census data, approximately 88%<sup>1</sup> of employees arrive via personal vehicle in Plano, depending on proximity to public transit and their type of occupation. The remaining 12% utilize another means of transportation such as mass transit, bicycle, or walking, or worked from home.

Walker did not delineate between customer and employee demand when preparing our projections. Additionally, although census data represents a blended drive ratio for all employees, professional and commercial employees exhibit slightly different driving habits. For this reason, Walker adjusted the drive ratio for each land use to account for site specific conditions.

The base parking demand ratio for each land use is adjusted to represent the project ratio. Project ratios are calculated by multiplying the base ratio by the drive ratio (modal split), non-captive ratio (one minus the percent captive) and an hourly adjustment.

**Table 15: Future Development Parking Demand**

Block	Land Use	Size	Unit	Base Ratio Per 1,000 SF or per Unit	Gross Parking Demand	Time of Day Adj	Drive Ratio	Future Parking Demand
10	Mixed-Use	50,000	Square Feet	3.33	167	50%	100%	83
3	Apartments	400	Units	1.25	500	90%	100%	450
	Retail	5,000	Square Feet	3.33	17	100%	100%	17
	Casual/Fine Dining	5,000	Square Feet	3.33	17	100%	100%	17
13	Apartments	190	Units	1.25	238	90%	100%	214
	Retail	6,000	Square Feet	3.33	20	100%	100%	20
	Casual/Fine Dining	6,000	Square Feet	3.33	20	100%	100%	20
18	Retail	30,000	Square Feet	3.33	100	100%	100%	100
	Restaurant	10,000	Square Feet	3.33	33	100%	100%	33

Note: Plano Planning Department recommended base parking ratios  
Walker assumed peak demand occurred around 1:00 p.m.  
The US Census data indicated an 88% drive ratio for employees in Plano. Walker adjusted the census data to a conservative 100% drive ratio.  
Regardless of use, no fee is incurred unless you exceed existing floor space.

Source: City of Plano

<sup>1</sup> Walker used the 2009-2013 ACS survey to determine modal split.

**FUTURE PARKING SUPPLY**

The data regarding the number of spaces gained as a result of future development was provided by the city. No change in the number of on-street parking spaces is assumed. Future parking is projected to have a net gain of 844 spaces.

**Table 16: Changes in Future Parking Supply**

Block #	Current Supply			Change in Supply (Public)		Change in Supply (Private)		Total Future Supply
	Total Spaces	Public	Private	Reduction	Addition	Reduction	Addition	
1	63	0	63					63
2	182	32	150					182
3	432	265	167	220	220	304	594	722
4	291	291	0					291
5	368	136	232					368
6	111	105	6					111
7	323	25	298					323
8	111	9	102					111
9	0	0	0					0
10	240	16	224			0	200	440
11	210	13	197					210
12	367	37	330					367
13	212	106	106	70	120	6	243	499
14	401	154	247					401
15	159	12	147					159
16	40	20	20					40
17	93	10	83					93
18	356	214	142	0	50	50	67	423
<b>Total</b>	<b>3,959</b>	<b>1,445</b>	<b>2,514</b>	<b>290</b>	<b>390</b>	<b>360</b>	<b>1,104</b>	<b>4,803</b>

Sources: City of Plano, Walker Parking Consultants

**FUTURE WEEKDAY CONDITIONS**

Walker projected parking demand within the downtown Study Area for the 2025 planning horizon. The 2025 projections assume all proposed development projects are operational and have begun to generate parking demand. Additionally, we assumed the remaining public parking demand in Study Area would grow a 3% compounded annually. The following section details demand for PUBLIC spaces only (on- and off-street). Private parking space analysis can be found in the Appendix.

**PUBLIC PARKING OCCUPANCY**

Walker is projecting an overall occupancy rate of 92% during weekday conditions by 2025, assuming new parking is built with the planned developments. When parking occupancies reach 85% or greater, finding available parking can be difficult. Most of the blocks within our Study Area are expected to experience parking rates above 85%. Due to the nature of assigning demand on a block by block basis, there are instances where demand exceeds

supply on a given block. It is recognized that excess parking demand on one block will be absorbed by surplus supply on adjacent blocks. The overall total peak parking demand for the future is projected to result in a small total parking surplus of approximately 22 spaces.

Table 17: 2025 Total Peak PUBLIC Parking Occupancy – Weekday

Block #	Current			10-Year Projection		
	Public Supply	1:00 p.m.	Percentage	Future Public Supply	Demand	Percentage
1	0	0	0%	0	0	0%
2	32	25	14%	32	34	105%
3	265	69	16%	265	126	48%
4	291	258	89%	291	347	119%
5	136	110	30%	136	148	109%
6	105	46	41%	105	62	59%
7	25	18	6%	25	24	97%
8	9	7	6%	9	9	105%
9	0	0	0%	0	0	0%
10	16	3	1%	16	4	25%
11	13	9	4%	13	12	93%
12	37	15	4%	37	20	54%
13	106	85	40%	156	154	99%
14	154	90	22%	154	121	79%
15	12	1	1%	12	1	11%
16	20	7	18%	20	9	47%
17	10	2	2%	10	3	27%
18	214	160	45%	264	348	132%
<b>Totals</b>	<b>1,445</b>	<b>905</b>	<b>63%</b>	<b>1,545</b>	<b>1,423</b>	<b>92%</b>

Source: Walker Parking Consultants

Parking demand for weekend is expected to increase over the next ten years. By 2025, a 66% occupancy rate is projected. Due to the nature of assigning demand on a block by block basis, there are instances where demand exceeds supply on a given block. It is recognized that excess parking demand on one block will be absorbed by surplus supply on adjacent blocks. The overall total peak parking demand for the future is projected to result in a total parking surplus of approximately 422 spaces.

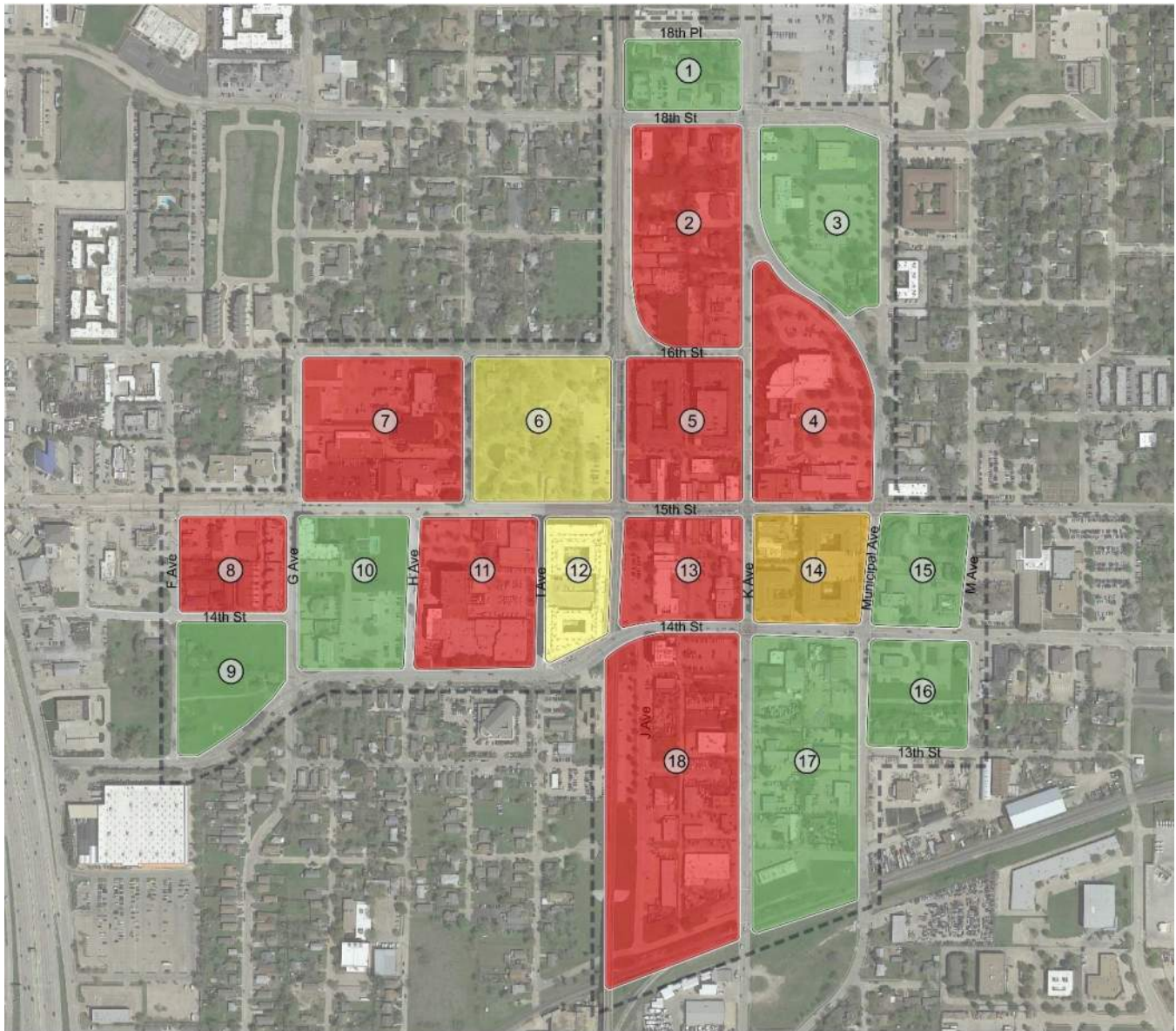
**Table 18: 2025 Total Peak PUBLIC Parking Occupancy – Weekend**

Block #	Current			10-Year Projection		
	Supply	8:00 p.m.	Percentage	Future Supply	Demand	Percentage
1	0	0	0%	0	0	0%
2	32	0	0%	32	0	0%
3	265	34	8%	265	79	30%
4	291	29	10%	291	39	13%
5	136	124	34%	136	167	123%
6	105	40	36%	105	54	51%
7	25	8	2%	25	11	43%
8	9	7	6%	9	9	105%
9	0	0	0%	0	0	0%
10	16	1	0%	16	1	8%
11	13	0	0%	13	0	0%
12	37	5	1%	37	7	18%
13	106	120	57%	156	201	129%
14	154	110	27%	154	148	96%
15	12	0	0%	12	0	0%
16	20	4	10%	20	5	27%
17	10	3	3%	10	4	40%
18	214	147	41%	264	297	113%
<b>Totals</b>	<b>1,445</b>	<b>632</b>	<b>44%</b>	<b>1,545</b>	<b>1,023</b>	<b>66%</b>

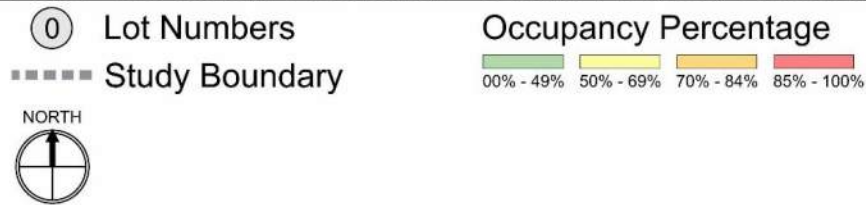
Source: Walker Parking Consultants



Figure 9: Future Weekday PUBLIC Parking Adequacy



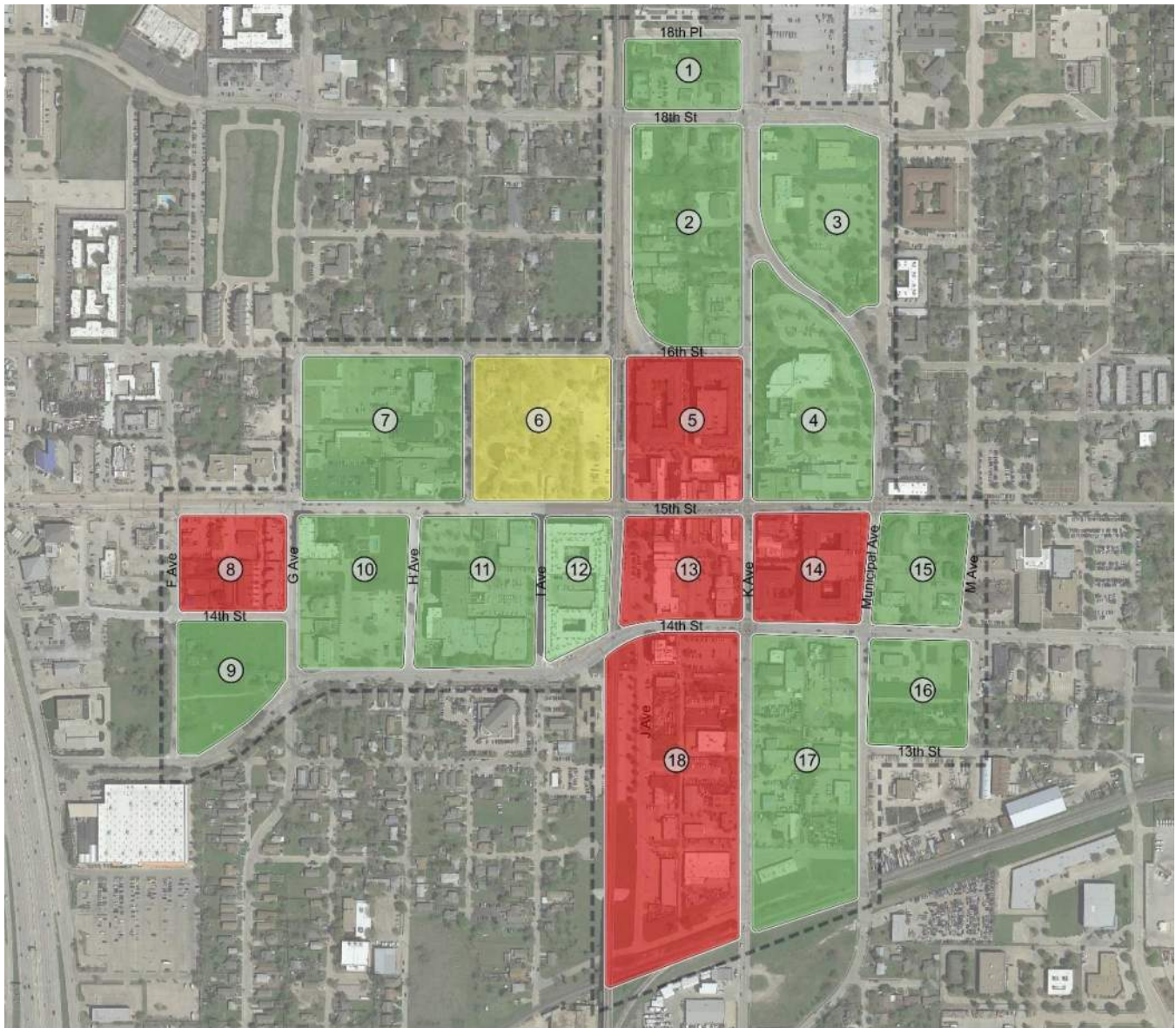
Plano TX Parking Occupancy - Future (10 year) Weekday



Source: Walker Parking Consultants



Figure 10: Future Weekend PUBLIC Parking Adequacy



Plano TX Parking Occupancy - Future (10 year) Weekend

0 Lot Numbers  
 Study Boundary  
 00% - 49%  
 50% - 69%  
 70% - 84%  
 85% - 100%

NORTH

Source: Walker Parking Consultants

**PARKING ADEQUACY**

As discussed earlier, parking adequacy is the ability of the parking supply to accommodate the parking demand. In order to determine the 2025 adequacy, Walker compared the projected public parking demand to the future public effective parking supply. As shown in the following table, an overall parking deficit of 32 spaces is projected, even with surplus supply on adjacent blocks. To satisfy the increase in demand, additional public parking supply is needed.

**Table 19: 2025 PUBLIC Parking Adequacy - Weekday**

Block #	Effective Supply	10 Year Peak Demand	Adequacy
1	0	0	0
2	29	34	(5)
3	239	126	112
4	262	347	(85)
5	122	148	(25)
6	95	62	33
7	23	24	(2)
8	8	9	(1)
9	0	0	0
10	14	4	10
11	12	12	(0)
12	33	20	13
13	140	154	(14)
14	139	121	18
15	11	1	9
16	18	9	9
17	9	3	6
18	238	348	(111)
<b>Totals</b>	<b>1,391</b>	<b>1,423</b>	<b>(32)</b>

Source: Walker Parking Consultants

Table 20: 2025 PUBLIC Parking Adequacy – Weekend

Block #	Effective Supply	10 Year Peak Demand	Adequacy
1	0	0	0
2	29	0	29
3	239	79	160
4	262	39	223
5	122	167	(44)
6	95	54	41
7	23	11	12
8	8	9	(1)
9	0	0	0
10	14	1	13
11	12	0	12
12	33	7	27
13	140	201	(61)
14	139	148	(9)
15	11	0	11
16	18	5	13
17	9	4	5
18	238	297	(60)
Totals	1,391	1,023	368

Source: Walker Parking Consultants

Weekend demand is projected to increase due to overall growth and new developments. Most blocks have an adequate parking supply. Exceptions are Blocks 5, 8, 13, 14, and 18. All core blocks are reliant on the adjacent blocks to meet the parking demand requirements. Overall demand does not surpass supply.

**SPECIAL EVENT DEMAND**

In addition to the demand from existing and proposed developments, downtown occasionally hosts special events. The City has identified at least five events with attendance figures (two more were listed, but without attendance). The following table details the events, expected drive ratio and occupancy per car, to give an estimate of the total parking demand per event. Demand is projected to be between 100-200 cars. This additional demand can be accommodated by excess supply in some lots within the downtown core, or by utilizing remote lots, church lots, and DART lots. The DART lot located at Parker Road has an inventory of approximately 1,700 spaces.

Merchants could choose to give a "special discount" to valid pass holders who utilize DART during events. DART could offer covered parking and shuttle service as a convenience to users. In addition, tying the existing bike path system with DART by offering bike stalls will strengthen the existing bike path connection at the rail station.

**Table 21: Special Event Demand**

Event	Event Days	Total Expected Attendance	Drive Ratio	Non-Captive Ratio	Average Occupancy Per Car	Total Cars Per Event
MLK - Unity Walk	1	300	0.98	1.0	2.5	118
Night Out on 15th	1	250	0.98	1.0	2.5	98
Chalk-It Up	1	400	0.98	1.0	2.5	157
Block Party 2015	1	400	0.98	1.0	2	196
Stein Fest	1	400	0.98	1.0	2	196

Source: City of Plano / Walker Parking Consultants

During peak parking demand periods, especially during these events, it may be necessary to erect temporary signage that would direct parking patrons to the perimeter parking areas of downtown. Even message boards placed near the outskirts of the downtown could provide information on available parking areas. It may be necessary to have directional signage placed at all intersections.

## ALTERNATIVES ANALYSIS

Future parking demand projections in the Study Area indicate that public parking will likely be inadequate. However, the projected deficits do not necessarily indicate the need to build structured parking (unless individual private projects can contribute to the demand/construction). The following section of the report provides recommendations to improve the existing and future parking supply's adequacy and perceived adequacy.

## GENERAL OBSERVATIONS

There are 3,959± total spaces in the Study Area. Of these, 2,514± have user restrictions posted, limiting usage of the lot to a particular business. The remaining 1,445± spaces of on- and off-street public spaces are available to the general public for parking. Regulating, organizing, and improving the parking supply requires a collective effort of the property/business owners and the city.

## PARKING LOT ANALYSIS

Most of the lots are private, as the use of the lots is restricted to the patrons and/or employees of the business that own the lot. Parking areas are better served when located off the main corridor streets.

If shared parking becomes a viable option for the city, issues over liability, maintenance, operation, and revenue collection will need to be addressed with the individual lot owners. This coordination of parking operations would most likely be best handled by the city. Third-party parking operators could be utilized to assist in the operation.

Some of the private lots south of 14<sup>th</sup> Street are in need of resurfacing and/or restriping.

## POTENTIAL PARKING STRUCTURE SITES

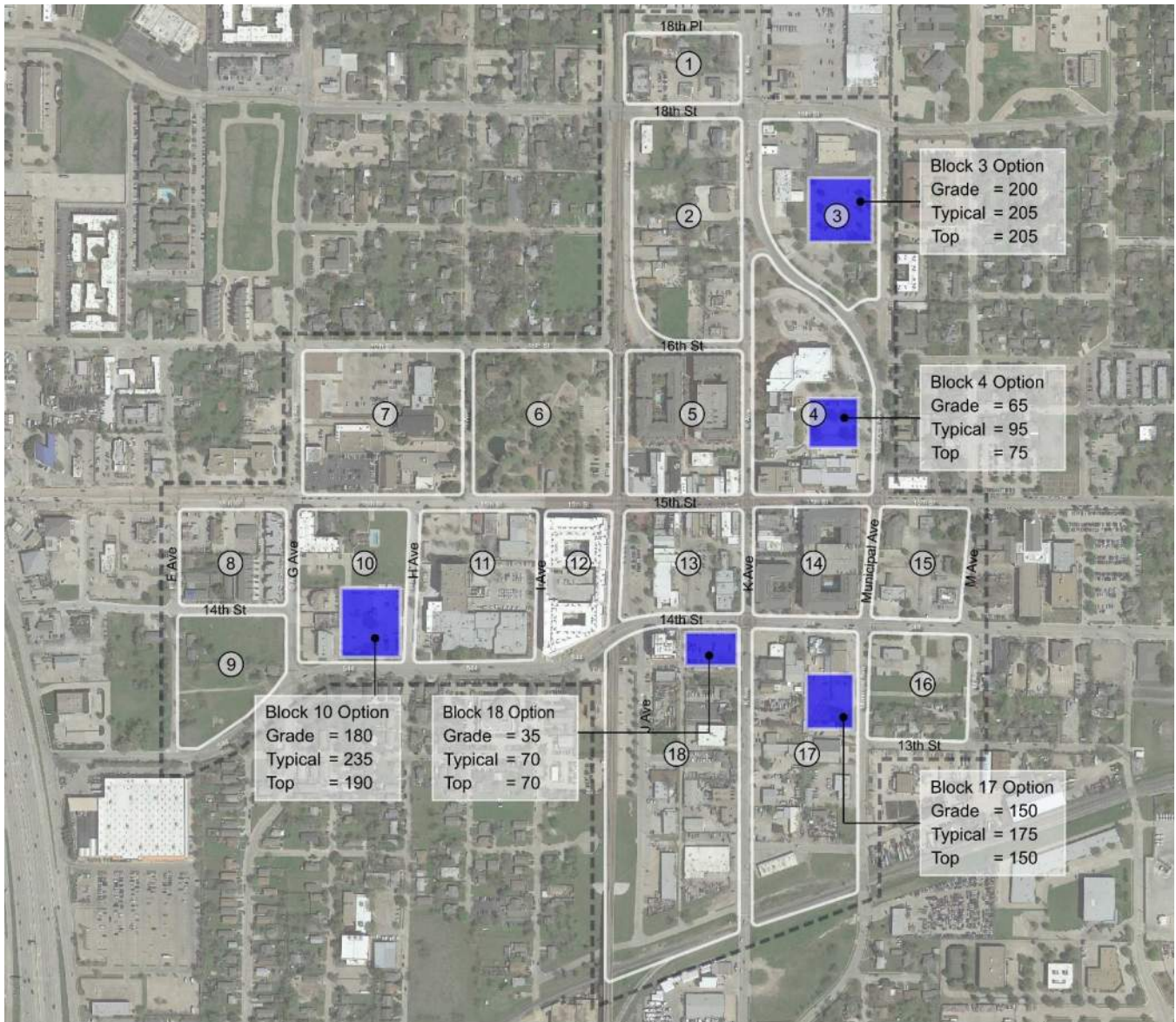
The Study Area was evaluated to determine the optimum locations for a parking structure based on independent Walker evaluation, conversations with staff, *and* the future parking deficits. As the city grows and parking demand increases, it is important to plan the parking to grow with the expansion, in order to continue to meet the growing parking demands.

Several sites were evaluated to determine the ability of the site to accommodate a parking structure. The following figure details the approximate footprint of seven sites. Each option gives the grade, typical floor, and top floor parking count. The exact size would depend on how many levels the city would choose to build.

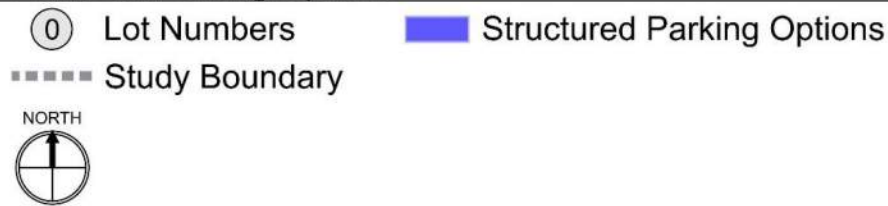
The following blocks were best suited for evaluation: Blocks 3, 4, 10, 17, and 18. This was determined by opinion of the Walker design team, taking into consideration such as efficient parking layouts and available space on blocks, etc. In conjunction with redevelopment, additional locations may be appropriate and will be determined on a block-by-block basis.



Figure 11: Additional Parking Structure Options



Plano TX Parking Options



Source: Walker Parking Consultants



*BLOCK 3*

**Current Land Use:** Public surface parking.

**Design Capacity:**

- Grade: 200 spaces
- Typical Floor: 205 spaces
- Top Floor: 205

*BLOCK 4*

**Current Land Use:** Public surface parking.

**Design Capacity:**

- Grade: 65 spaces (area fits within existing boundary of parking lot)
- Typical Floor: 95 spaces
- Top Floor: 75

*BLOCK 10*

**Current Land Use:** Public surface parking.

**Design Capacity:**

- Grade: 180 spaces
- Typical Floor: 235 spaces
- Top Floor: 190

*BLOCK 17*

**Current Land Use:** Private surface parking.

**Design Capacity:**

- Grade: 150 spaces
- Typical Floor: 175 spaces
- Top Floor: 150

## *BLOCK 18*

**Current Land Use:** Public surface parking.

### **Design Capacity:**

- Grade: 35 spaces
- Typical Floor: 70 spaces
- Top Floor: 70

The estimated costs per space range \$15,000 to \$20,000, depending on façade treatments, soils, etc. (not including land acquisition, demo, and other costs).

## **RESTRIPING**

Typically the quickest and least expensive way to increase parking supply is by maximizing the existing space through restriping. Costs of a parking structure can run anywhere from \$15,000 to \$20,000 per space and upwards. Surface parking lot construction costs typically range from \$2,000 to \$3,500 per space. By comparison, simple line restriping costs for an asphalt parking lot range from \$21 to \$35 per space depending on several variables including the number of coats of sealer used. Therefore, restriping a parking facility to increase capacity represents a substantial savings over building new parking facilities.

The limited sizes and shapes of most of the parking lots in the study area limit the ability to effectively gain substantial quantities of parking supply by restriping. Most of the larger lots were found to have efficient parking space layouts, and no substantial gains in supply were noted.

## **WAYFINDING / SIGNAGE**

We recommend continued implementation of a comprehensive signage program to maximize visitor awareness to public parking locations. The signage improvements should be prepared in conjunction with any enhancements to the parking resources, in addition to any streetscape improvements along the corridor roadways. As is true with any good communications medium, signs should be brief, precise and appropriate, such as "Public Parking" or "Three Hour Parking." Further, the signage should guide the driver from the main thoroughfares into the parking lots.

At present, there are some wayfinding signs directing patrons to the public garages, but increased signage, particularly along thoroughfares such as 15<sup>th</sup> Street are needed to direct patrons to the public parking lots and garages. The blue background with the white P symbol with an arrow is recommended at the key intersections (15<sup>th</sup> and K, 15<sup>th</sup> and DART rail line, 15<sup>th</sup> and Municipal Ave.). The city is currently embarking on a comprehensive wayfinding program.

The city recently completed a signage package with the goal of simplifying the content of signs, and making them more uniform. Walker encourages the continuation of this program. Walker recommends replacement of the "green colored" parking signs near the public parking lots (as

shown on the following figure) with the standard blue P sign type. Also branding of the blue P on the city website detailing public parking areas is encouraged.

Many business owners have private parking signs posted on the sides of buildings, sign posts, and fences, which vary in content and visual appearance.

Examples of some of the signage is found in the following figure.

Figure 12: Signage in Study Area



Source: Walker Parking Consultants

Each parking area has its own set of wayfinding/signage requirements. These requirements present specific questions concerning the needs and concerns of the users to be answered during the design of the signs, including:

- What are the points at which information is needed?
- What information is needed?
- How should this information be presented?
- Will there be a high percentage of first-time visitors to the district, or is the parking supply used by the same people every day?
- Are there special sign requirements for accessible parking or bilingual patrons?



- Are there choices in traffic patterns that must be presented to drivers such as directions to parking near the entrance to an anchor tenant or exits to different streets?

It is also important that general rules for sign design and placement be followed when planning the streetscape improvements.

- All signage should have a general organizing principle consistently evident in the system.
- Direction signage for both pedestrians and vehicles must be continuous (i.e., repeated at each point of choice) until the destination is reached. Very minimal signage exists at the point of parking that directs patrons back to the merchants.
- Signs should be placed in consistent and therefore predictable locations.

### SHARING SMALL PRIVATE LOTS

One option that may be considered in the area is sharing the smaller restricted private lots. In essence, all of the private lots would be used as public parking areas, allowing patrons to park in the lesser used lots. The lots would still be owned by the individual property owners; however the operation of the lots would be regulated by the City. This option would greatly improve parking conditions during the previously identified peak parking demand period and evening off-peak times.

Issues concerning liability insurance, maintenance and operation need to be addressed with the individual lot owners and the City. Possible solutions to resolving the issues are:

- Form a partnership between the business and the City to share the lot.
- Assemble the properties and have the City operate the lot.
- Provide liability coverage by the City, listing each individual property owner as an additional insured.
- Sign the lot indicating it is operated and managed by the City or partnership.
- Maintain the parking lot – utilities, monitoring, and trash control - with City funds.
- Work closely with owners to determine which lots are feasible.
- Some lots may not be structurally adequate.

### WALKING DISTANCE

**Pedestrian Safety:** This criterion involves two factors: the ability of vehicles to move to and from the area without pedestrian/vehicle conflict and, the ease of use by pedestrians with consideration of the walking path and distances to/from the facility.

Walking distance varies based on the patron user group as well as the environment of the surrounding area in which the patron must walk. To aid in estimating the appropriate walking distance, a Level of Service (LOS) rating system is used for evaluating appropriate walking distances based on specific criteria. Several factors impact the walking distance that a typical person will consider reasonable. These include climate, perceived security, lighting, and whether it is through a surface lot or inside a parking structure. LOS "A" is considered the best

or ideal, LOS "B" is good, LOS "C" is average and LOS "D" is below average but minimally acceptable. A breakdown of the LOS conditions is provided in the following table.

**Table 22: Level of Service**

Level of Service Conditions	A	B	C	D
Climate Controlled	1,000 ft.	2,400 ft.	3,800 ft.	5,200 ft.
Outdoor/Covered	500	1,000	1,500	2,000
Outdoor/Uncovered	400	800	1,200	1,600
Through Surface Lot	350	700	1,050	1,400
Inside Parking Facility	300	600	900	1,200

Source: "How Far Should Parkers Have to Walk?", by Mary S. Smith & Thomas A. Butcher  
Parking May 2008

Walker Parking Consultants

We recommend striving to provide adequate parking to specific user groups using the following LOS guidelines.

**Visitors:** Because visitors are most likely unfamiliar with the area and/or are short-term parkers, we recommend providing walking distance LOS "A" to all visitors.

**Employees:** We recommend striving to provide LOS "C" and/or "D" to employees which park for longer periods and may not require the use of their vehicles throughout the day.

Walker measured the walking distances from a few public parking lots in the study area to gain an appreciation of scale. The following figures detail the distances.



Figure 13: Walking Distances from Center of Downtown



**Plano TX Walking Distance**

① Lot Numbers      - - - - - Walking Radius

- - - - - Study Boundary

NORTH





## ZONING CODE REVIEW

Walker reviewed sections of the Plano Zoning Ordinance that govern parking (Article 16). Walker was asked to provide comments and suggestions to better serve economic development and protect property owner rights while minimizing waste and promoting sustainability. The Zoning Ordinance ("Code") is used by the Planning Department to ensure sufficient parking is provided for new and redeveloped properties in Plano.

## RECOMMENDED ZONING PARKING CODE CHANGES/CONSIDERATIONS

The zoning provisions used by Plano are fairly comprehensive and thorough. As a point of discussion and consideration, we introduce the following issues and strategies that Plano may consider in order to further enhance the current code.

- **Restaurant:** 1 space for every 100 feet (recommend splitting this into three categories: Fine/Casual 20/1,000; Family 10/1,000; and Fast Food 15/1,000).
- Section 16.900 **Joint Parking Facilities:** this provision recognizes the benefits of shared parking for parking reductions. Walker recommends the city adopt provisions for shared parking. Reference to a professional parking study or the Urban Land Institute standard is recommended.
- **Dimensions: Figure 16-3.** On the one-way 70° option, Walker recommends the following dimensions: 19', 18'6", 19' instead of the 19'6", 20', 19'6" to allow for a more efficient layout.

## TRANSIT ORIENTED DEVELOPMENT (TOD)

The primary purpose of the Transit-Oriented Development (TOD) is to encourage an appropriate mixture and density of activity around transit stations, to increase ridership along the DART Light Rail Corridor, and promote alternative modes of transportation to the automobile. The secondary purpose of TOD is to decrease auto-dependency and mitigate the effects of congestion and pollution. These regulations achieve this type of development by providing a pedestrian, bicycle, and transit supportive development integrating auto uses with a complementary mix of land uses, where streets have a high level of connectivity and the blocks are small, all within a comfortable walking and bicycling distance from light rail stations.

The specific objectives of the TOD are:

- Encourage people to walk, ride a bicycle, or use transit;
- Encourage outdoor pedestrian activities within public rights-of-way;
- Allow for a mix of uses designed to attract pedestrians;
- Achieve a compact pattern of development more conducive to walking and bicycling;
- Provide a high level of amenities that create a comfortable environment for pedestrians, bicyclists, and other users;
- Maintain an adequate level of parking and access for automobiles and integrate this use safely with pedestrians, bicyclists, and other users;

- Provide sufficient density of employees, residents, and recreational users to support transit; and generate a relatively high percentage of trips serviceable by transit.

## VALET PARKING

Valet parking can be an excellent value added service to visitors to the downtown area. Parking patrons dealing with inclement weather, running late, or having trouble finding a close space, in which to park may welcome the front door drop-off service. Valet check-in should include a vehicle check for previous damage and the issuance of a parking claim ticket. In addition, questions regarding the anticipated length of stay of the visitor would be helpful when the service is not directly associated with a specific restaurant or business. When done correctly, valet services can create a more favorable image for the visitor. It also provides a “front door” welcome to downtown Plano. This creates an opportunity to personally welcome each visitor.



Through valet parking, spaces are maximized. This includes being able to use undesirable parking areas, creating additional parking supply by stacking vehicles, or opening up previously unused private parking locations via agreements between the valet service provider and the parking lot owner. Spaces may also be lined at a more narrow width than the public uses since valet drivers are skilled drivers who are able to routinely navigate narrow spaces. Valet operations set up in the downtown area can easily park cars in the public parking lots near the municipal building. The short distance will allow for quick vehicle retrieval times.

## VALET RECOMMENDATIONS

- Valet drop off points should be shared or grouped along 15<sup>th</sup> street. (individual valet stations for each business is discouraged).
- The Historic Downtown Plano Association or Public Improvement District could operate the valet service.
- Restaurants or stores could offer discounts or vouchers to help offset the costs of valet.
- Valet vehicles could be stored in nearby areas such as McCall Plaza, east of K Avenue, the municipal building lot, or the north end of Haggard Park.

## BICYCLE RACKS

An alternative to expanding the bus schedule or shared vehicle services is using bicycles. By providing bicycle racks either on-street or at employment centers, employers can encourage individuals who live in close proximity to their places of work to bike or walk.

A bicycle rack is a fixed structure, usually anchored to the ground or nearby building, to which a bicycle can be attached in order to prevent theft. Bike racks serve to encourage citizens to use bicycles and has the potential to significantly reduce traffic, air pollution, and parking

demand within a City. Adding bicycle parking increases overall parking capacity at a relatively small cost. Additionally, businesses gain a competitive advantage by attracting and retaining health conscious employees and customers. Installing and utilizing bike racks not only makes riding a bicycle more convenient, it can eliminate the clutter, pedestrian hazard, and tree damage associated with unplanned bike parking as well.

A well-built bike rack should:

- Support the bicycle upright by its frame in two places
- Prevent the wheel from bending and the bicycle from tipping over
- Enable the frame and at least one wheel to be secured
- Support bicycles without a diamond-shaped frame with a horizontal top tube
- Allow front-in parking: a U-lock should be able to lock the front wheel and the down tube of an upright bicycle
- Allow back-in parking: a U-lock should be able to lock the rear wheel and seat tube of the bicycle



The ideal situation for those cyclists who desire long-term parking (3+ hours) is to allow bicycles to be brought and stored inside the workplaces. When this is not feasible, other solutions include:

- High security rack: the frame and wheels are secured with moving parts by a single lock
- Bicycle lid or rocker: a hard plastic shell, which securely encases the bike
- Bicycle "cage": fenced outdoor area, requiring an access key or combination lock
- Bicycle locker: an enclosed container of sorts, usually rented to a cyclist that offers a high level of security and weather protection

Cities where a successful Bike Rack program exist:

- <http://www.arlington-tx.gov/cdp/transportation/bikeped/plan/#maps>
- <http://fortworthtexas.gov/bikeFW/>
- <http://www.cityofdenton.com/departments-services/utility-and-cip-engineering/current-projects/pedestrian-bicycle-accommodation>
- <https://www.houstonbikeways.org/>
- [Madison, Wisconsin](#)
- [Chicago, Illinois](#)
- [Portland, Oregon](#)
- [Santa Cruz, California](#)
- [Bloomington, Indiana](#)

## ENFORCEMENT

Walker recommends that the City use an electronic citation issuance and parking enforcement management system that allows electronic tire chalking and maintains electronic records of enforcement activity. Systems are available that provide the enforcement officer with information on a “live” or “real-time” basis while in the field via cellular technology, but most require that base data information be downloaded to the handheld units from a local or remote application server before departure, and are not networked again until docked at the end of the shift. Citation and configuration data is then transferred to the base application server to be ready for the following business day.



In the past few years, many systems have begun offering “apps” for parking enforcement that can be used with selective cellular phones and tablets. The “apps” are downloaded, accessed, and used in very similar ways to most other smart phone apps. This type of system can be a great option for small to medium sized operations as it can significantly reduce the upfront costs. The traditional electronic handheld ticket-writer can be quite expensive when compared to the cost of a standard smart phone. Most of these applications, both the enforcement software as well as the back-end management system, are stored remotely and accessed through standard web-browsers thereby significantly reducing the up-front hardware costs for new computers and equipment.



Parking management systems are typically networked to a service provider’s central server computer, which can often be networked to exchange information with the local DMV directory license lookup services. These services supply addresses, facilitating follow-up letters, collection efforts, etc. Some service providers can also perform all of the processing between the citation and the money collection, offloading the related overhead, for small fees passed on to the payer or for portions of the ultimate collection amounts.



The most significant advantages over the old handwritten systems are

1. Information is automatically downloaded directly to the system avoiding data entry errors and transcription errors from sometimes-illegible handwritten citations,
2. Most systems are programmed or modified specifically for the client, and
3. Options such as scofflaw programs are included with a permit database, so no citations will be written on permitted vehicles. Handhelds can record occupancy data with special time intervals so the handheld keeps track of warning time (like chalk marks on tires). Some systems also use bar code reading of licenses or permits.

During Walker's license plate inventory collections and turnover analysis, there were approximately 51± vehicles per day parked in violation of a posted (or assumed) 4-hour time limit. Extrapolated out with significantly improved enforcement coverage could potentially result in over 13,260 violations annually. Improved enforcement efficiencies through technology could reduce the total number of infractions, and ultimately provide a better, more consistent parking system to the city businesses and patrons.

## MARKETING AND WEBSITE

It is also recommended that the city, in coordination with any downtown business/merchants association(s), consider developing a formalized parking management plan that clearly communicates locations for employee, resident, and visitor parking. Many of the localized parking challenges can be addressed through improved management and marketing of the existing resources.

The Public Relations and Communications program should:

- Include a comprehensive "Downtown Parking" city website. This website can share data and links with the current city website in order to reduce duplication and overall cost and effort.
- Respond to questions and requests from the general public for locations of parking facilities, pricing, and availability.
- Maintain the integrity of downtown parking promotional materials and provide parking maps, business development packets, and fact sheets.
- Provide day-to-day media relations and generate press releases as needed.
- Provide public relations assistance to other downtown events as needed.

This information should be distributed through:

1. A more comprehensive "Downtown Parking" city website.
2. A quarterly newsletter for the downtown parking community with news of economic developments in parking, development and construction projects, upcoming events, and profiles of newsmakers.
3. Newspaper items or articles and media releases.
4. Brochures and maps both distributed and posted.
5. Direct mailings/email when appropriate.
6. Meetings and presentations about downtown parking to city business and civic groups upon request.

Local businesses are often willing to provide parking information and links to additional parking resources from their website's home page. This can be very helpful in catering specific location data to their customers, while also providing a free portal to market parking services to potential patrons. If patrons are armed with parking availability and location information prior to arriving at their destination, their overall downtown experience will be greatly improved.

Examples of Municipal Parking web pages:





- <http://fortworthtexas.gov/parking/>
- <http://www.arlington-tx.gov/cdp/transportation/special-event-parking/>
- <http://dallascityhall.com/departments/courtdetentionservices/Pages/Pay-Your-Ticket.aspx>
- <http://www.downtownsouthbend.com/parking-and-maps>
- <http://downtownlincoln.org/get-there/car.html>
- <http://www.pittsburghparking.com/>
- <http://www.miamiparking.com/en/home.aspx>
- <https://springfieldparkingauthority.com/>
- <http://archive.baltimoreCity.gov/Government/QuasiAgencies/ParkingAuthority.aspx>
- <http://www.downtownkalamazoo.org/>
- [http://bloomington.in.gov/sections/viewSection.php?section\\_id=132](http://bloomington.in.gov/sections/viewSection.php?section_id=132)
- <http://www.traverseCitymi.gov/publicparking.asp>
- <https://cantonohio.gov/engineering/?pg=112>

## KEY RECOMMENDATIONS

To accomplish the objectives outlined in this plan, the following key recommendations split into three time ranges: short-term (1 year), mid-term (1 – 3 years), and long-term (3 years or longer). These strategies are listed below.

### SHORT-TERM (1 YEAR)

- Include destination signage at all public parking lots and garages to mark the locations of parking upon arrival, and directional parking signage to mark where to go in order to find parking.
- Establish a 3-hour parking limit in the general downtown area.
- Allow unlimited parking time limit along J Ave. from 16<sup>th</sup> St. to 18<sup>th</sup> St.
- Continue to allow unlimited parking in public lots in Blocks 3 and 4. Keep existing 4 hour limits in public lots on Block 18.
- Clearly mark parking restrictions and time limits on-street.
- Work with businesses downtown to educate employees on parking options available and time limits.
- Add to City website to aid in distribution of information, maps and locations of parking facilities and restrictions.
- Work with merchants to develop a valet program in the core area (15<sup>th</sup> Street).
- Partner with DART to develop incentives such as discount tickets or validations for patrons during peak events downtown.
- Utilize shared parking in evaluating parking supply and demand.



- Encourage on-street parking to reduce the need for parking lots and reduce vehicular speed.
- The core downtown area should have limited parking and be reliant on perimeter parking lots to fulfill daily parking needs.
- Encourage resident and employee parking in garages and perimeter parking lots.
- Encourage the use of shared parking lots that have specific user needs that occur during different times of the day.
- Utilize the shared pool of parking across the entire downtown area to meet the parking needs for all.
- Accommodate the adaptive reuse of existing buildings by minimizing required parking. Large buildings should be garage parked.
- Continue the current practice of providing non-restricted time parking in the southern portion of the J Avenue/DART parking lot and I Avenue to accommodate the daily parking needs of Downtown Plano DART Station patrons.
- Consider using advanced parking enforcement technologies for improved parking compliance.
- Prohibit heavy truck use on 15<sup>th</sup> Street between G Avenue and Municipal Avenue. Access by smaller local delivery trucks will continue to be permitted.
- Coordinate future downtown wayfinding sign system modifications with recommendations to be produced from a separate ongoing study on citywide way finding needs.
- Valet parking strategies should be permitted for evening, week-end, and special event parking demand.
- Foster increased deployment of bike racks, pedestrian walking facilities, and use of public transit.
- Install additional bike rack systems at key locations.
- Emphasize pedestrian crossing safety at 14<sup>th</sup> Street and J Avenue/DART light-rail crossing.
- Refresh the traffic pavement markings in the downtown area.
- Encourage creation of parking information on private business websites with links to the city webpage.
- Require one parking space for every 300 square feet of new building space. The requirement only applies for floor space created in excess of existing building floor area regardless of use.
- Expand the use of public parking through incentives, public-private partnerships, and acquiring additional property as a land banking parking strategy.

#### *MID-TERM (1 – 3 YEARS)*

- Monitor parking conditions in and around the study area — especially near areas of planned and potential future developments to determine if an adequate parking supply exists.
- Begin outreach by educating local business owners and residents on which off-street parking lots to use in order to avoid future parking inadequacies.



- Work with private lot owners to establish shared parking.
- Continue placement of bike racks in downtown and work with DART on bike racks at the rail station near the bike path.
- Install count-down pedestrian crossing systems at all downtown signalized intersections
- Increase the conspicuity of the 15<sup>th</sup> Street mid-block crossing.
- Upgrade the reflectivity of downtown area traffic safety signs.
- Continue to install countdown pedestrian heads at traffic signal crossings.
- Consider creating shared privately-owned publically-operated parking lots for public use.
- Provide incentives for patron use of DART transit services while visiting the downtown area.

*LONG-TERM (3 YEARS OR MORE)*

- Continue to review parking demand and update the city's parking management strategies as needed.
- Add to public parking supply, as needed.
- Evaluate the installation of low level pedestrian lighting.

## OVERVIEW OF PARKING ECONOMICS

This section provides a general overview of basic parking economics that must be considered when planning for a new parking structure. A brief discussion is provided on capital costs, operating expenses, breakeven pricing, structural repair budget, and minimum parking dimensions.

### CAPITAL COSTS

Walker understands that future parking improvements may be developed as a stand-alone parking garage or incorporated with the design of a future mixed-use building. The type of development will have a dramatic impact on the overall efficiency and cost per space for construction. There are many factors that will impact the construction cost of a parking garage, ranging from site selection, program requirements, existing utilities and topography, below grade garage levels, and aesthetics for the exterior of the garage. A general guideline for determining the conceptual estimate of probable construction cost for a parking ramp is to apply a cost per space figure to the target capacity. A reasonable range for an above-grade, 200-300 space parking facility with no integrated uses and is on flat ground and minimal architectural treatments is approximately \$17,000 to \$20,000 per space. The larger the structure, the more economies of scale can be achieved reducing the overall cost per space.

In most cases, the major cost for a parking garage is the structure. The type of structure selected typically depends upon the owner's requirements for long-term durability, integration of other uses in the structure such as hotel or retail, site constraints, and availability of material. The type of foundations required to support the garage can also provide a large impact in construction cost.

A cast-in-place (CIP) superstructure is a more durable product than a precast (PC) superstructure. Water is the major culprit to any structure. The CIP superstructure has less joints to keep maintained. Based upon the current market in north Texas, the costs for a CIP and PC superstructure are much closer on a price per square feet. We are currently seeing many projects going with CIP because PC is not as readily available. The precast plants are busy right now, and the small cost deltas are pushing the construction selection process towards CIP.

A parking facility that is built into a project, as either the upper or lower floors of that development compared to a stand-alone parking facility, requires that the garage use short-span construction. Short-span construction uses an increased number of columns to support the weight of the structural elements above it. In short-span construction, the column grid is roughly 30 feet on center. The efficiencies of short-span construction are less than long-span construction because of the column projections that interfere with the parking layout. A typical short-span construction garage has design efficiency in the range of 400-450 square feet per space, depending upon the geometrics of the footprint. This type of garage will be at the higher end of the cost spectrum, possibly exceeding \$23,000 per space.

If the ramp is a stand-alone structure, utilizing long-span construction, the columns can be located at the front of the parking stalls so that there are no column projections. The efficiency of the garage can be increased to an approximate range of 315 to 350 square feet per space,

depending upon the geometrics of the footprint. The increase in efficiency is due to the ability to increase the number of parking spaces inside the same footprint. The approximate construction cost mentioned in the beginning paragraph is based upon this type of superstructure.

## OPERATING COSTS

Expenses can vary dramatically since these depend on a number of independent variables. Traditional expenses can include costs associated with labor, utilities, daily maintenance, supplies, management and accounting, and insurance. Key factors in determining operating costs include the proposed hours of operations, type of parking access and revenue controls, and the application of active or passive security measures.

The operating expenses for a parking facility are typically presented on a cost per space basis. Walker's research indicates actual operating expenses that range from \$400 to over \$600 per space annually. The operating costs are lower at facilities that do not maintain revenue and access controls and have limited hours of operation. Conversely, operating costs are higher at facilities that are staffed; monitor access to the property with revenue and access controls, and operate 24 hours 7 days a week. All facilities require some degree of daily janitorial service that includes trash removal, sweeping, and minor repairs and maintenance such as lighting replacement.

## STRUCTURAL REPAIR BUDGET

In addition to operating expenses, Walker highly recommends that funds be set-aside in a sinking fund, on a regular basis, to cover structural maintenance costs at a minimum of \$75 per structured space annually. Once a sinking fund is established, contributions to this fund accumulate over time and are available to cover structural maintenance and structural repairs. Even the best designed and constructed parking facility requires structural maintenance. For example, expansion joints need to be replaced and concrete invariably deteriorates over time and needs to be repaired to ensure safety and to prevent further damage.

The structural maintenance cost typically represents the largest portion of the total maintenance budget. Property owners tend to grossly underestimate the structural maintenance cost and do not budget adequately for timely corrective actions that must be performed to cost effectively extend the service life of the structure. The cost of structural maintenance is relatively small considering the potential waste of the improvements associated with the failure to perform proper maintenance on a timely basis.

Periodic structural maintenance includes items such as patching concrete spalls and delaminations in floor slabs, beams, columns, walls, etc. In many instances there are maintenance costs associated with the topping membranes, the routing and sealing of joints and cracks, and the expansion joint repairs. The cost of these repairs can vary significantly from one structure to another. The factors that will impact the maintenance cost include, but are not limited to the value the owner places on the maintenance of the facility, the local climate, and the age of the structure.





A review by a restoration specialist is usually necessary to identify the preventive maintenance needs of a facility. In addition to the annual or other periodic inspections, material testing and examinations may also be necessary to determine and recommend maintenance measures. One example of this is the chloride monitoring testing that is necessary to monitor the effectiveness of sealer and coatings. The chloride testing also helps to determine the frequency and extent of sealer reapplications. The results of the periodic inspections may also indicate the need for other material examinations and laboratory testing.

# APPENDIX

## SCOPE OF SERVICES

### TASK I - SUPPLY/DEMAND STUDY

1. Meet with the City of Plano representatives to finalize project parameters, review project background and obtain previous reports, area maps, and other background information.
2. Obtain and review land use data within the Study Area (up to 40 blocks), provided in terms of square footage by land-use type (i.e. retail, restaurant, hotel, office, etc.)
3. Conduct parking inventories of all on- and off-street parking within the Study Area. Inventories will include space counts, rates, and restrictions.
4. Conduct parking occupancy counts of all parking in the Study Area on a weekday. Weekend and evening counts were added as well.
5. Conduct up to three separate stakeholder sessions. Several meetings may take place in a stakeholder session.
6. Create a parking demand model using Walker Parking Consultant's shared parking model to project typical parking demand throughout a weekday.
7. Calibrate the demand model to reflect observed conditions, thus calculating parking demand ratios for the land uses present.
8. Determine the surplus or shortfall within the area under current conditions, and create tabular and graphic illustrations of the parking system adequacy.
9. Obtain build-out plans from the City of Plano representatives and adjust the demand model to show future parking demand generated by approved and/or proposed developments in the area.

### TASK II - ALTERNATIVES ANALYSIS

1. Review inventory, utilization, and turnover data collected in Task I.
2. If data suggests deficits of usage, recommend management and policy changes that could reduce congestion in affected areas.
3. Review existing vehicular and pedestrian access and circulation patterns for their relationship to existing and proposed parking facilities/lots.
4. Determine whether the number of spaces could be increased through restriping and efficiency improvements in existing facilities/lots.
5. Determine whether any existing facilities/lots can be expanded to meet area parking needs.
6. Identify potential locations for new parking facilities (surface and/or structured). External variables that will be considered are desirable density, phasing of construction, and incorporation of other uses (such as retail) in any proposed facility.
7. Determine an order of magnitude project cost including estimated operational expenses to enable a comparison of the costs of each alternative on an "apples to apples" basis.
8. Evaluate the various alternatives on the basis of qualitative criteria to be mutually agreed upon with the City of Plano. A weighted matrix will be used to achieve more objectivity and to rank the alternatives.

9. Meet with the client via teleconference to discuss the conceptual designs and present the matrix analysis to agree upon weighting and other considerations.
10. Develop a recommended plan for improvements, including phasing of components corresponding to projected needs.

### TASK III - REVIEW OF PARKING POLICIES AND PRACTICES

1. Identify for the City of Plano's consideration, other customer-service enhancements that do not exist in the City of Plano. Obtain and review city parking policies, practices, and ordinances relating to parking.
2. Identify and gather parking policies, practices, and the parking element of zoning ordinances of up to six other cities for purposes of benchmarking.
3. If the city has a parking division, review the City of Plano's organizational structure and the staffing associated with its parking assets (if applicable). Recommend changes.
4. Review and comment on parking rates, time restrictions or lack thereof, and enforcement hours.
5. Review existing parking equipment and recommend upgrades where necessary.
6. Draft a policy statement regarding the relationship between on- and off-street parking.
7. Recommend modifications to the parking element of the city's Zoning Ordinance that align with its comprehensive plan and parking plan.
8. Review and comment on existing parking signage and identify opportunities for improvement.
9. Identify for the City of Plano's consideration, other customer-service enhancements that do not exist in the City of Plano.

### TASK IV - FINANCIAL PLAN

1. Meet with the City of Plano representatives to determine study objectives, boundaries, procedures, and project schedule.
2. Using Walker's database of operating expenses (collected periodically from more than 200 parking facilities), project annual operating expenses for a five year period, including but not limited to:
  - a. direct labor (cashiering, supervision, accounting, maintenance, and security) and fringe benefits;
  - b. utilities;
  - c. supplies;
  - d. daily maintenance (contracts and equipment); and
  - e. structural maintenance (a sinking fund for periodic major expenses).
3. Using our past experience, project construction costs, contingency costs, consulting fees, financing costs, Walker will project the initial cost of additional parking. The City of Plano will be asked to assist in providing interest rate and term of loan inputs.
4. Calculate the average annual debt service for the City of Plano system.
5. Research comparable market parking rates and recommend a rate structure for all the City of Plano-owned parking.
6. Based on the findings of Task I and the recommended rate structure, project the annual net operating income for parking considering a 10 and 20 year period.

## TASK V - PEDESTRIAN SAFETY

1. Meet with the City of Plano to develop an understanding of the current pedestrian circulation patterns and any possible modifications.
2. Identify alternatives regarding access, signage, protective barriers, and striping that would improve pedestrian safety.
3. Review alternatives with the City of Plano.
4. Modify the alternatives based on the comments received, as necessary.

## DEFINITION OF TERMS

Several terms or jargon are used in this report that have unique meanings when used in the parking industry. To help clarify these terms and enhance understanding by the reader, the following definitions are presented.

- **Adequacy** - The difference between the effective parking supply and parking space demand.
- **Design Day** - The day that represents the level of parking demand that the parking system is designed to accommodate. In most of the thousands of parking studies that we have conducted, this level of activity is typically equal to the 85<sup>th</sup> to 95<sup>th</sup> percentile of absolute peak activity. Although we will occasionally design to a higher-than-typical design standard, such as one exceeded less than one day per month or even the absolute peak level of demand, we do not typically design to these extreme conditions because the result is an abundance of spaces that remain unused most of the time.
- **Effective Supply** - The total supply of parking spaces, adjusted to reflect the cushion needed to provide for vehicles moving in and out of spaces, spaces unavailable due to maintenance, and to reduce the time necessary for parking patrons to find the last few available spaces. The effective supply varies as to the user group and type of parking, but typically the effective supply is 85 percent to 95 percent of the total number of spaces. The adjustment factor is known as the Effective Supply Factor.
- **Inventory** - The total number of marked parking spaces within the Study Area.
- **Parking Generation** - The peak accumulation of parked vehicles generated by the land uses present under any given set of conditions.
- **Patron or User** - Any individual parking in a study area.
- **Peak Hour** - The peak hour represents the busiest hour of the day for parking demand.
- **Survey Day** - The day that occupancy counts within a study area are recorded. This day should represent a typical busy day.

HOURLY LICENSE PLATE DATA

Table 23: K Avenue Occupied Spaces by Hour

Street:	Side:	From:	To:	Meter/ Space #	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM
K Avenue	E	16th Street	15th Street	1	994	x	x	x	-	-	011	x
K Avenue	E	16th Street	15th Street	2	130	x	653	-	-	-	8AF	x
K Avenue	E	16th Street	15th Street	3	787	x	x	x	x	240	994	x
K Avenue	E	16th Street	15th Street	4	273	x	x	x	x	x	x	x
K Avenue	E	16th Street	15th Street	5	936	x	x	x	x	x	x	x
K Avenue	E	16th Street	15th Street	6	731	x	x	x	x	x	x	x
K Avenue	E	16th Street	15th Street	7	769	x	x	x	226	769	x	x
K Avenue	E	16th Street	15th Street	8	KC8	x	x	x	x	x	x	x
K Avenue	E	16th Street	15th Street	9	322	x	x	x	x	144	536	x
K Avenue	E	16th Street	15th Street	10	467	x	x	x	x	x	x	x
K Avenue	E	16th Street	15th Street	11	197	x	x	x	x	x	x	x
K Avenue	E	16th Street	15th Street	12	645	x	x	826	731	x	818	x
K Avenue	E	16th Street	15th Street	13	470	x	648	292	x	ZW9	x	x
K Avenue	E	16th Street	15th Street	14	602	x	x	x	370	x	785	-
K Avenue	E	16th Street	15th Street	15	091	-	704	x	x	x	x	x
K Avenue	E	16th Street	15th Street	16	598	x	-	654	x	857	x	x
				Occupied Space			Empty Space					

Source: Walker Parking Consultants





**Table 25: 15<sup>th</sup> Street (South Side) Occupied Spaces per Hour**

Street:	Side:	From:	To:	Meter/ Space #	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM
15th Street	S	RXR	K Avenue	1	-	-	-	M9P	x	x	196	x
15th Street	S	RXR	K Avenue	2	-	-	-	837	x	625	809	100
15th Street	S	RXR	K Avenue	3	-	-	-	604	x	203	662	x
15th Street	S	RXR	K Avenue	4	-	809	075	x	767	695	481	x
15th Street	S	RXR	K Avenue	5	-	571	-	606	675	x	025	233
15th Street	S	RXR	K Avenue	6	175	x	329	415	771	x	539	356
15th Street	S	RXR	K Avenue	7	-	068	x	x	YMH	616	514	x
15th Street	S	RXR	K Avenue	8	996	x	-	268	x	990	MG7	443
15th Street	S	RXR	K Avenue	9	867	x	x	x	x	867	x	x
15th Street	S	RXR	K Avenue	10	641	x	-	228	x	092	x	-
15th Street	S	RXR	K Avenue	11	748	x	x	x	x	x	x	x
15th Street	S	RXR	K Avenue	12	124	924	715	x	062	788	x	x
15th Street	S	RXR	K Avenue	13	-	-	-	910	x	201	466	x
15th Street	S	RXR	K Avenue	14	-	-	892	x	x	x	303	847
15th Street	S	RXR	K Avenue	15	-	707	x	877	560	x	640	x
15th Street	S	RXR	K Avenue	16	-	669	-	958	x	x	x	x
15th Street	S	RXR	K Avenue	17	-	100	x	369	298	999	530	125
15th Street	S	RXR	K Avenue	18	-	-	887	x	x	818	349	390
				Occupied Space			Empty Space					

Source: Walker Parking Consultants

PRIVATE PARKING SUPPLY/OCCUPANCY/ADEQUACY

Table 26: 2025 Total Peak Private Parking Adequacy Weekday

Block #	Current			10-Year Projection		
	Private Supply	1:00 p.m.	Percentage	Future Private Supply	Demand	Percentage
1	63	6	10%	63	8	13%
2	150	52	29%	150	70	47%
3	167	34	8%	457	496	108%
4	0	0	0%	0	0	0%
5	232	196	53%	232	263	114%
6	6	5	5%	6	7	112%
7	298	99	31%	298	133	45%
8	102	47	42%	102	63	62%
9	0	0	0%	0	0	0%
10	224	132	55%	424	261	61%
11	197	144	69%	197	194	98%
12	330	310	84%	330	417	126%
13	106	82	39%	343	324	94%
14	247	215	54%	247	289	117%
15	147	33	21%	147	44	30%
16	20	5	13%	20	7	34%
17	83	42	45%	83	56	68%
18	142	30	8%	159	40	25%
<b>Totals</b>	<b>2,514</b>	<b>1,432</b>	<b>57%</b>	<b>3,258</b>	<b>2,671</b>	<b>82%</b>

Table 27: 2025 Private Parking Adequacy Weekday

Block #	Private Effective Supply	10 Year Peak Demand	Adequacy
1	60	8	52
2	143	70	73
3	434	496	(62)
4	0	0	0
5	220	263	(43)
6	6	7	(1)
7	283	133	150
8	97	63	34
9	0	0	0
10	403	261	142
11	187	194	(6)
12	314	417	(103)
13	326	324	2
14	235	289	(54)
15	140	44	95
16	19	7	12
17	79	56	22
18	151	40	111
<b>Totals</b>	<b>3,095</b>	<b>2,671</b>	<b>424</b>

Table 28: 2025 Total Peak Private Parking Adequacy Weekend

Block #	Current			10-Year Projection		
	Private Supply	8:00 p.m.	Percentage	Future Private	Demand	Percentage
1	63	1	2%	63	1	0%
2	150	11	6%	150	15	10%
3	167	9	2%	457	462	101%
4	0	0	0%	0	0	0%
5	232	210	57%	232	282	122%
6	6	0	0%	6	0	0%
7	298	0	0%	298	0	0%
8	102	12	11%	102	16	16%
9	0	0	0%	0	0	0%
10	224	29	12%	424	122	29%
11	197	72	34%	197	97	49%
12	330	310	84%	330	417	126%
13	106	80	38%	343	321	94%
14	247	202	50%	247	271	110%
15	147	6	4%	147	8	5%
16	20	0	0%	20	0	0%
17	83	21	23%	83	28	34%
18	142	7	2%	159	9	6%
<b>Totals</b>	<b>2,514</b>	<b>970</b>	<b>39%</b>	<b>3,258</b>	<b>2,051</b>	<b>63%</b>



Table 29: 2025 Private Parking Adequacy Weekend

Block #	Effective Supply	10 Year Peak Demand	Adequacy
1	60	1	59
2	143	15	128
3	434	462	(28)
4	0	0	0
5	220	282	(62)
6	6	0	6
7	283	0	283
8	97	16	81
9	0	0	0
10	403	122	281
11	187	97	90
12	314	417	(103)
13	326	321	5
14	235	271	(37)
15	140	8	132
16	19	0	19
17	79	28	51
18	151	9	142
Totals	3,095	2,051	1,045



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