Parking Study Recommendations

Executive Summary

Sustainability, increase in traffic congestion, transportation preferences, and technology are factors fueling a parking paradigm shift around the world.[1] This paradigm shift, along with projections of growth in Sandy and all of Utah, suggests the need for a sustainable growth plan in Sandy City.

A recent 2016 APA Utah Seminar at the Salt Lake City Public Library demonstrated the unpredictability of parking demand and suggested that inflexible approaches to parking requirements cause an oversupply of parking. The oversupply of parking is not desirable because it results in inefficient land use, discourages compact and dense city centers, is aesthetically unappealing, and has negative health consequences. Sandy City could benefit from a flexible parking code as opposed to the current, formulaic code to solve the challenge of oversupplied parking. This document provides a detailed summary of several topics:

- The parking challenge Sandy City faces
- The effect of the challenge
- The cause of the challenge
- Reasons to consider tackling the challenge
- Recommendations to consider, improve upon, and implement in Sandy City
- A case application for The Cairns City Block area

Recommendations

The Cairns City Block area, a mixed-use zone around City Hall, requires alterations to "right-size"[a] the parking requirements for the area. As a result of the City Hall parking study, we found Sandy's City Hall block area able to offer more parking spaces to adjacent[b] uses during certain times. The current parking ordinance only allows for up to a 25% reduction in parking requirements for development when even larger reductions are likely justified on the City Hall Block. Research suggested several modern solutions to parking struggles and we include the following recommendations to decrease parking requirements for Sandy City:

1. Right-sizing Base Parking Requirements
2. Recognizing Differences in Office Type
3. Reductions for Walkability
4. Reductions for Shared Use
5. Maintaining Planning Commission Discretion

In hopes of preserving discretion yet allowing flexibility for mixed-use projects, we present these recommendations to provide useful changes that support Sandy City's vision for future development.

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[a] "Right-sizing" refers to managing parking requirements to make sure the City is not requiring developers to build too much parking while still providing enough parking to meet needs.
[b] Adjacent uses are uses that can share a parking area because the uses are very close to one another.

PARKING STUDY RECOMMENDATIONS

8/10/2016

Sandy City, Utah

This document addresses the possible solutions to ease parking and walkability challenges in Sandy City areas. This is a guiding document to be used for current area improvements and future developments. Research included within this document addresses potential revisions to Sandy's parking regulations and their applicability to The Cairns City Hall Block area.

Administration Department & Department of Community Development

Table of Contents

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A recent 2016 APA Utah Seminar at the Salt Lake City Public Library demonstrated the unpredictability of parking demand and suggested that inflexible approaches to parking requirements cause an oversupply of parking. The oversupply of parking is not desirable because it results in inefficient land use, discourages compact and dense city centers, is aesthetically unappealing, and has negative health consequences. Sandy City could benefit from a flexible parking code as opposed to the current, formulaic code to solve the challenge of oversupplied parking.

CHALLENGE

Sandy's goals include, "… managing the projected growth for the Area and help in attracting development [to] and improve the quality of life for its citizens." Oversupplied parking is a major obstacle impeding development because too much parking is an inefficient use of real estate. Surface parking lots are currently underutilized in many cases, in part because minimum parking requirements established by city ordinance are too high.

Developers generally tend to find the cost of parking structures compared to surface parking far too unattractive when required to comply with high minimum parking requirements. Excessive parking supply discourages people to from using alternatives to their car and parking is expensive. A structured parking space costs approximately $12,000 per stall to build (conservatively). A surface parking space costs only approximately $5,000 per stall. Surface parking, however, is not as great a solution when its negative effects are considered.

Envision Utah, a nonprofit organization dedicated to assisting in a more sustainable Utah, conducted a survey in 2015 and its results indicated that more than 82% of Utahns and 77% of Sandy Residents chose a vision for Utah' in which people live close to mixed-use centers with a variety of office, retail, recreation, and residential areas. The survey also identified that, "Utahns want to conveniently get around their communities without a car, to reduce traffic congestion, to live close to destinations, and to reduce the amount of farmland lost to development."[2] Even parking structures, if too plentiful, can prevent a leisurely walk through the downtown area.

EFFECT

According to a recent American Planning Association (APA) of Utah Seminar, even when citizens of a city do not *use* the parking available to them, citizens still bear the burden of paying for that parking. The parking challenge placed before Sandy City produces a high financial burden for the City, but this necessary cost is far greater than it should be. Several parking lots around Sandy's City Hall are underused. This issue begs the question of if we, as a city, are putting our land to its *best* use.

Sandy City Hall's West and East Parking Lots and the Justice Court's parking lot were the focus of a survey conducted for several weeks. At randomized hours of

the day, the occupied parking spots were observed, recorded, and compared to the number of current available parking stalls in each parking lot. City Hall's East parking lot was occupied at 88% at its highest parking demand throughout the survey. City Hall's West lot was occupied at a rate of 66% and the Justice Court was occupied at a rate of 62% at their highest parking demands. The occupancy rate would be lower if the parking were not currently being used by construction workers from the surrounding projects and while 100 parking stalls north of City Hall has been temporarily removed for construction.

Despite the apparent surplus of parking that currently exists at City Hall, the City's parking regulations call for almost 300 more parking stalls. Even after restoring 100 of the stalls lost north of City Hall, the Planning Commission would need to use its discretion and reduce the requirement for the Kaplan Project by 10% and the requirement for City owned buildings by over 15% in order for the available parking to be within regulations.

The City recently adopted a master plan for the area surrounding City Hall. After further evaluation, it became apparent that the current parking ordinance requires more parking than is needed to accommodate the suggested uses in the master plan. Under current regulations, the master plan could not be implemented without a parking structure on the east side of City Hall or a third level of parking on the west side. Appendix G is a detailed case study of the parking requirements under the current ordinance for the master plan compared to the parking requirements with the recommended revisions.

Does our city require unneeded parking at the expense of land that could be put to a more productive use? Instead of continuing to provide unused parking spaces to areas that do not need them, Sandy City is determined to identify and find solutions for the cause of this challenge.

CAUSE

Sandy City is generally considered a suburban city. Recent years have seen a trend in walkable, sustainable, and financially stable cities with decreased parking requirements across the US. Current traditional parking code, however, tends to be inflexible, ignoring change and development. Unfortunately, research suggests traditional parking requirements tend to ignore the impacts of oversupply of parking.[9]

IMPORTANCE

Envision Utah asserts that the population of Utah will nearly double by 2050, an increase of nearly 2.5 million people.[2] The buildable land supply in Salt Lake County is 35,000 acres, but Salt Lake County requires 130,000 more acres to grow, according to a study done by RCLCO. Sandy City will be fully built out by 2040, which will not allow for further growth if current development practices are maintained.[3] Sandy City strives to sustain the growth projected by Envision Utah through innovative solutions.

Generally speaking, between one third and one half of households in the US prefer walkable neighborhoods with a variety of land-uses within walking distance.[4] Walkability refers to the ease and desirability a pedestrian has to walk to destinations rather than drive, which accomplishes the City's goal to manage growth, differentiate value and lifestyle in The Cairns area, support traffic and infrastructure, and create an international destination and brand.

This study explores options to decrease parking requirements for several reasons including minimizing *excess* parking costs and fully utilizing land. We present our recommendations to accomplish our goals below.

RECOMMENDATIONS

Decreasing surface parking not only provides several financial and economic benefits, but also visually enhances a city. Congestion, traffic, and underutilized land are some other motives behind promoting the use of other transportation methods through decreased surface parking. Even so, Sandy City is dedicated to providing enough parking to meet peak parking demands and strives to optimize parking rather than fall below actual parking demand.

The City is responsible for striking a balance between sufficient parking and productive land use. It should be noted that the following recommendations and potential policy changes should undergo a review at least every 5 years to ensure a custom fit for Sandy City and its vision.

We recommend several options to reduce parking requirements for specific areas. The following recommendations sum up several ways to reduce parking requirements for land-uses: right-sizing base parking requirements; high, medium, and low employee density differentiation; walkability assessment reductions; shared use reductions; and Planning Commission Discretion.

1. Right-Sizing Base Parking Requirements

When compared to other Utah cities with similar population density, Sandy's current minimum parking requirements are high. We recommend an overall reduction in the base minimum parking requirement as written in the parking ordinance where Sandy's minimum requirements exceed the average minimum parking requirements for similar cities. Refer to Appendix A for a copy of the current ordinance.

Rationale

When compared to similar Utah cities, Sandy City's parking requirements were high in certain categories. Table 1 highlights several land-use categories and lists each city's parking requirement for the particular land-use. Note that several cities establish zones in which parking requirements are altered.

Table 1: Sandy Compared to Cluster Cities[5]

	Single Family Dwelling	Apartments 1 bedroom	Apartments 2 bedroom	Apartments 3+ bedroom	Commercial Retail Sales and Services	Business Office Building	Sit-Down Restaurant
Average	2.08	1.91	2.16	2.27	3.85	3.94	10.53
Median	2.00	2.00	2.00	2.25	4.00	4.00	12.00
Sandy	**2.25**	**1.75**	**2.25**	**2.75**	**5.00**	**4.00**	**14.40**
Recommended	**2.00**	**1.75**	**2.00**	**2.25**	**4.00**	**Vary by Type**	**10.00**

Sandy's parking requirements as presented in Table 1 appear high when compared to the average of the population cluster. Sandy's parking requirements are in red if it exceeds the average parking requirement for a particular land-use category. Blue requirements indicate the average and median parking requirements. As a result of this comparison, we find it reasonable to reduce parking requirements for Single Family Dwellings, 2 Bedroom Apartments, 3+ Bedroom Apartments, Commercial Retail Sales and Services, Business Office Buildings, and Sit-Down Restaurants. Green requirements are the recommended minimum requirements for Sandy City.

Please refer to Appendix B for a full overview of Sandy City's parking requirements in comparison to other cities in Utah in the same cluster and an expanded version of Table 1. We recommend that Sandy's parking requirements be revised to be consistent with requirements of similar Utah cities.

2. Recognize Differences in Office Types

Not all office types are alike. For example, high-tech companies tend to house many more *employees* per square foot with shared work spaces and fewer private offices. It is not uncommon for some high-tech companies or call centers to allocate less than 200 square feet per employee. On the other hand, City Hall is an example of a low *employee* density office space with large atriums, private offices, and large common areas. It has approximately 380 square feet per employee. Low, medium, and high employee density offices should have parking requirements that reflect employee parking demand.

Background

As office space trends shift to more space efficient offices, Sandy City's parking code would benefit from differentiating between high, medium low *employee* density office spaces to accommodate change.

Stringent and high minimum parking requirements are also not a one-size-fits-all formula. High minimum parking requirements tend to make land use less dense and encourage driving, thus causing a higher demand for parking spaces.[6] Instead, low density land uses should have different parking requirements than high density areas because the areas are inherently different and house fewer *employees* per square foot. Visitors, employees working outside of the office, absenteeism, and staff vacancies should be considered.

Not only could developers save money by building less parking for lower *employee* density offices, altering the code would allow higher *employee* density office buildings to better fit the office's needs to give these offices even higher minimum requirements than previously given to all office buildings. We recommend differentiating between high, medium, and low *employee* density office buildings to mirror actual parking potential of office buildings with different *employee* densities as illustrated in Appendix D.

3. Reductions for Walkability

According to WalkScore.com®, a third party observer of walkability around the United States, current conditions in most areas in Sandy City warrant walkability improvement. Increasing walkability in future development is also a crucial component of Sandy City's plan. We suggest the use of a walkability assessment tool to analyze the feasibility of decreasing parking ratios as a result of proximity to transit modes and walkability components.

Background

The more people walk, the less parking is needed. Residents in walkable areas tend to have fewer cars. Restaurants and retail patrons are more likely to have arrived on foot. The City of Alexandria, Virginia inspired an expansion of their tool for use in gauging walkability.[7] Respondents of a survey conducted in a journal article *Comparing the Walking Behavior between Urban and Rural Residents* felt comfortable walking 5 to 10 minutes or .25 to .50 miles to reach a variety of neighborhood destinations rather than driving.[8] We used this assumption that people will likely walk up to .50 miles to and from various locations to construct an expanded version of the City of Alexandria's walkability tool. Please refer to appendix E for the full explanation of how this tool functions and how it can be used by staff to calculate further reductions to base requirements.

Proposed Ordinance Addition

We propose the addition of the following language to grant the ability to use the Walkability Assessment Tool for parking reductions:

> "City staff is hereby authorized to use a walkability assessment tool or walkability study provided by a developer to guide further parking reductions."

4. Reductions for Shared Use

Staff would be able to calculate reductions for shared use using one of several tools to determine parking requirements for specific mixed-use complementary and walkable developments. We recommend using the Peak Time Comparison tool to conduct a parking study and determine just how "complementary" or how well parking can be shared at opposing times of the day for different land uses.

Background

Research suggests several factors to consider when assessing actual parking need: building size, building capacity, popularity of the establishment, geographic features (e.g., transit proximity, walkability, and land use density), demographics, income, parking management practices, and the ability to consider demand at certain times of the day.[9]

For example, a restaurant might have a large peak demand in the evening, while an adjacent office building might have a peak demand during the morning and afternoon. Parking spaces will go unused for the office building in the evenings. Likewise, parking spaces will go unused at the restaurant during the mornings and afternoons. Together, this hypothetical restaurant and office make a great shared-use location. The proposed Peak Time Comparison tool aims to assist in determining the appropriate reduction for shared use.

Proposed Ordinance Addition

We propose the addition of the following language to grant the ability to use the Peak Time Comparison Tool for parking reductions:

> "City staff is hereby authorized to use a Peak Time Comparison Tool or peak time study provided by a developer to guide further parking reductions."

To capture an area's potential of full utilization, we provide guidelines to use the Peak Time Comparison tool to calculate and also project parking demand in a specific area between several land-uses. Please refer to Appendix F for a full explanation of how this tool functions.

5. Planning Commission Discretion

We recommend that the Planning Commission should maintain discretion for parking. Although it is recommended that staff is authorized to use the Walkability Assessment and Peak Time Comparison Tools to allow for parking reductions, we recommend that the Planning Commission maintain discretion up to a 15% reduction beyond that which the staff is authorized to do.

CONCLUSIONS

Sandy City will continue to grow and develop. Current parking requirements result in parking competing with other productive land uses. More parking promotes more driving, which allows The Cairns area specifically to become less compact, less walkable, and ignores potentially profitable land used for a sea of unused parking. Offices are also not all created equal. Offices with large atriums and private offices should surely require less parking than compact offices with relatively more employees.

The Planning Commission and staff should be granted the opportunity to have quantitative and qualitative tools to aid their discretion-based decisions regarding project parking requirements. The walkability assessment tool provides a researched basis for staff to gauge decreased parking needs for walkable land-uses. The Peak Time Comparison Tool allows staff to base projections on peak and low parking demands and measure containable and feasible spillover. Both tools give way to a reduction in parking requirements based on walkability of a particular place and also cross-utilization of parking spaces. By adopting the changes suggested in this document, we foresee a more open path to truly becoming a place "Where Mountain Meets Urban."

APPENDIX A: CURRENT PARKING ORDINANCE

"B. Table of Parking Requirements by Land Use Category. The following minimum parking is required: (Ord 10-26, Amended 7-30-2010)

Table 15A-24-09(B) – Parking Requirements by Land Use Category	
Residential Land Use Categories	Space Requirements
Dwelling, Single Family	2 spaces per dwelling unit (within an enclosed garage)
Dwelling, Duplex	2 spaces per dwelling unit
Dwelling, Multiple Unit (…)	2 spaces per dwelling unit
Dwelling, Multiple-Unit ([Apts.])	
- one bedroom unit	1.5 spaces per unit
- two bedroom unit	2.0 spaces per unit
- three or more bedroom unit	2.5 spaces per unit
- guest parking	0.25 spaces per unit (NOTE:…)
Assisted Living Center, [etc.] (…)	0.5 spaces per bed, plus 10% for support staff/physicians, plus a bus only parking stall to meet the dimensions of a handicap parking stall.
Senior or Elderly Housing	1 space per unit (…)

Retail Commercial Land Use Categories	Space Requirements
Automotive Repair (service bays are not included in the required number of required parking spaces)	5 spaces per 1,000 square feet Exceptions: (…)
Commercial Retail Sales and Services **	
Heavy Commercial	
Commercial Center, Community	
Commercial Center, Convenience	
Commercial Center, Neighborhood	
Commercial Center, Regional	
Liquor Sales	
Commercial Services, Offices Land Use Categories	Space Requirements
Bar, Tavern, Club	3.5 spaces per 1,000 square feet
Business or Financial Services	4.0 spaces per 1,000 square feet
Dance Hall, Discotheque	3.5 spaces per 1,000 square feet
Day Care, Group	1 space for each instructor (plus drop-off space)
Veterinary Office	4 spaces for each practitioner
Medical and Health Care	5 spaces per 1,000 square feet OR 4 spaces for each practitioner plus 1 space per employee (including practitioner) at highest shift, whichever is greater. (…)
Motel, Hotel	1 space per rental unit; 1 space for each 200 square feet of assembly, conference space, banquet, sit-down restaurant facility, and office space.
Restaurants Land Use Categories	Space Requirements
Restaurant – Sit down	1 space per 3 seats (including outdoor seating) plus 0.5 space per number of employees on the largest shift (minimum of 5 employee spaces)
Restaurant – Drive-in/Drive-thru (…)	1 space per 100 square feet of floor area. (…)

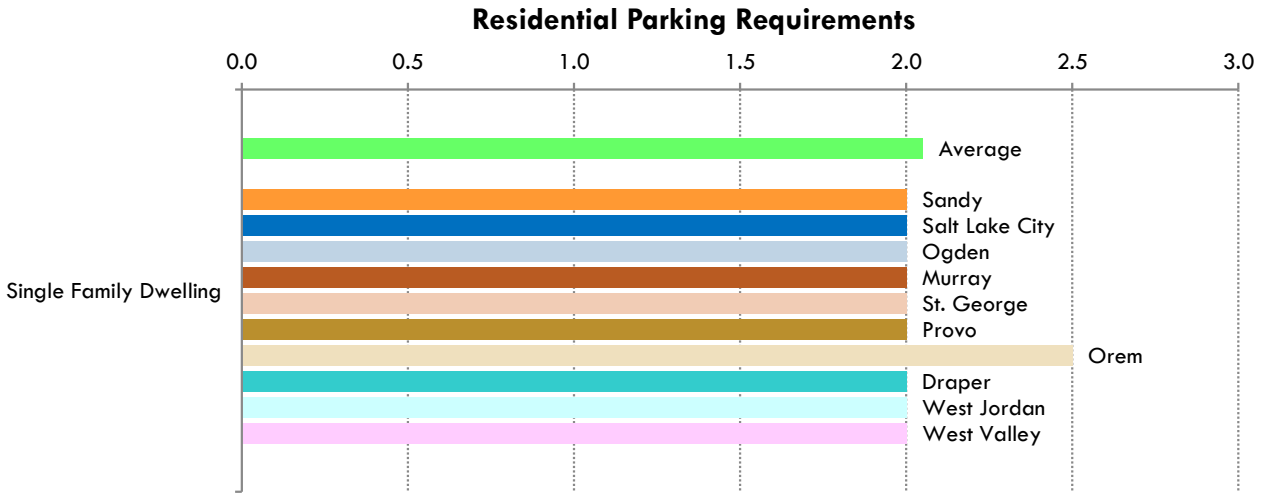
(**Recreation, Indoor; Special Review; Public Uses; and Industry** Land Use Categories omitted)"

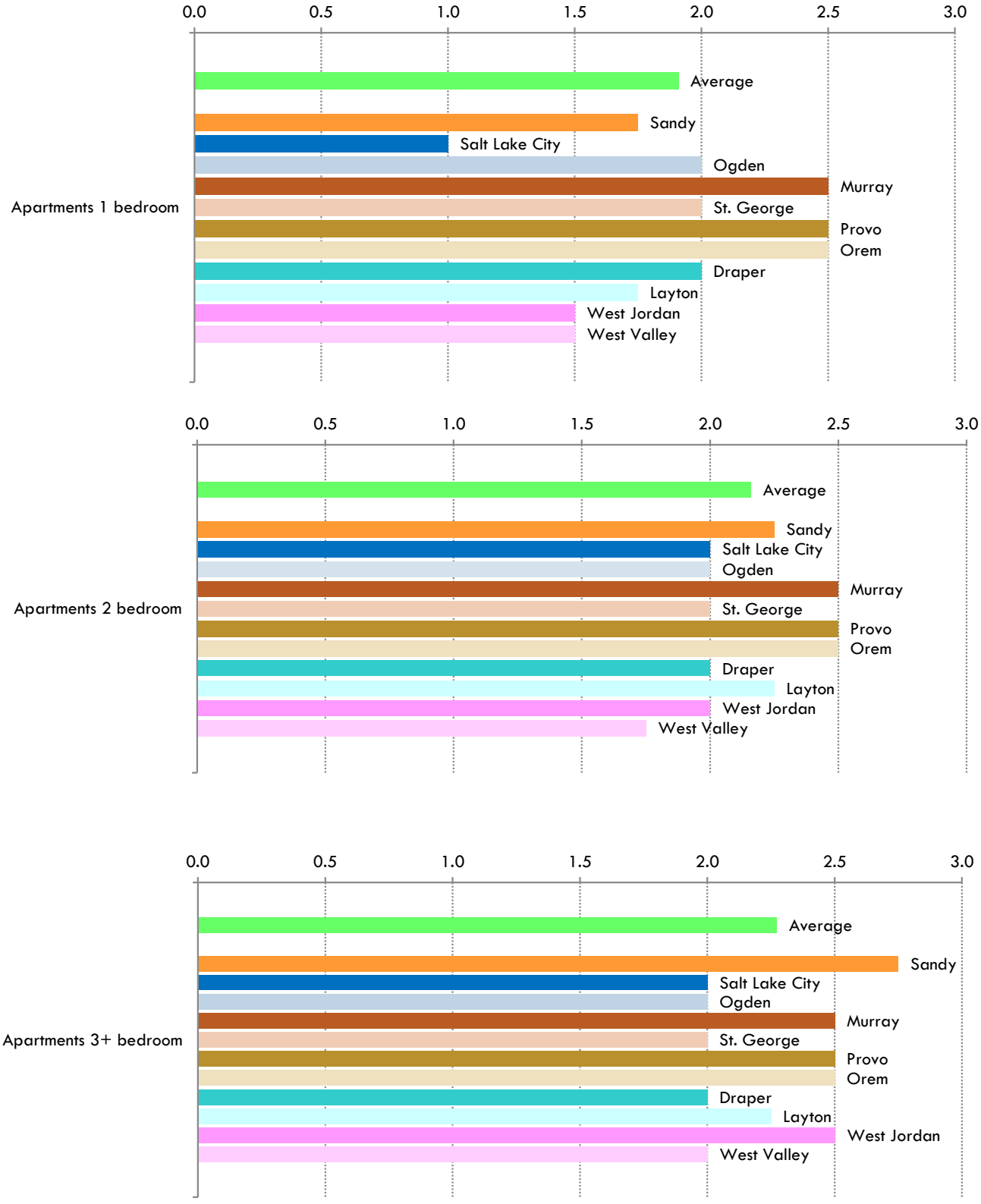
APPENDIX B: UTAH CITY PARKING SURVEY GRAPHS

Below are the survey data graphs for cities in Sandy's cluster of cities. Note that the parking requirements included below are one of many minimum requirements for several cities and do not represent finite, inflexible requirements for entire cities.

Table 1: Sandy Compared to Cluster Cities[5]

	Single Family Dwelling	Apart-ments 1 bedroom	Apart-ments 2 bedroom	Apart-ments 3+ bedroom	Commercial Retail Sales and Services	Business Office Building	Sit-Down Restau-rant
Average	2.05	1.91	2.16	2.27	3.85	3.94	10.53
Median	2.00	2.00	2.00	2.25	4.00	4.00	12.00
Sandy	**2.00**	**1.75**	**2.25**	**2.75**	**5.00**	**4.00**	**14.40**
Recommended	**2.00**	**1.75**	**2.00**	**2.25**	**4.00**	**Vary by Type**	**10.00**
Salt Lake City	2.00	1.00	2.00	2.00	2.00	2.00	2.00
Ogden	2.00	2.00	2.00	2.00	3.33	3.33	10.00
Murray	2.00	2.50	2.50	2.50	5.00	4.00	12.00
St. George	2.00	2.00	2.00	2.00	4.00	4.00	10.00
Provo	2.00	2.50	2.50	2.50	5.00	4.00	12.00
Orem	2.50	2.50	2.50	2.50	4.00	4.00	12.00
Draper	2.00	2.00	2.00	2.00	2.50	4.00	8.00
Layton	-	1.75	2.25	2.25	5.00	5.00	12.00
West Jordan	2.00	1.50	2.00	2.50	2.50	5.00	9.00
West Valley	2.00	1.50	1.75	2.00	4.00	4.00	14.40

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Apartments 2 bedroom
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St. George
Provo
Orem
Draper
Layton
West Jordan
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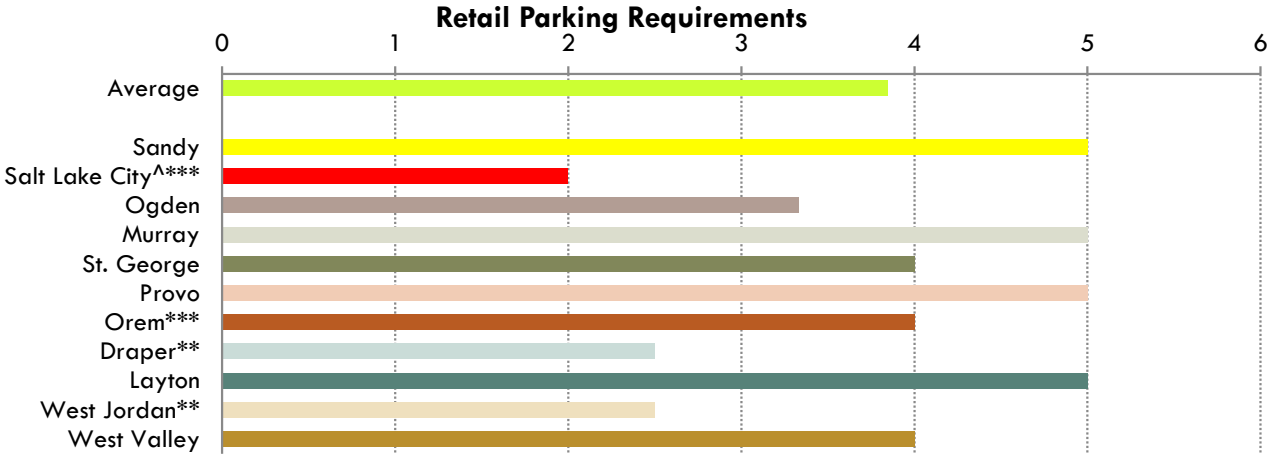
Retail Parking Requirements
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Ogden
Murray
St. George
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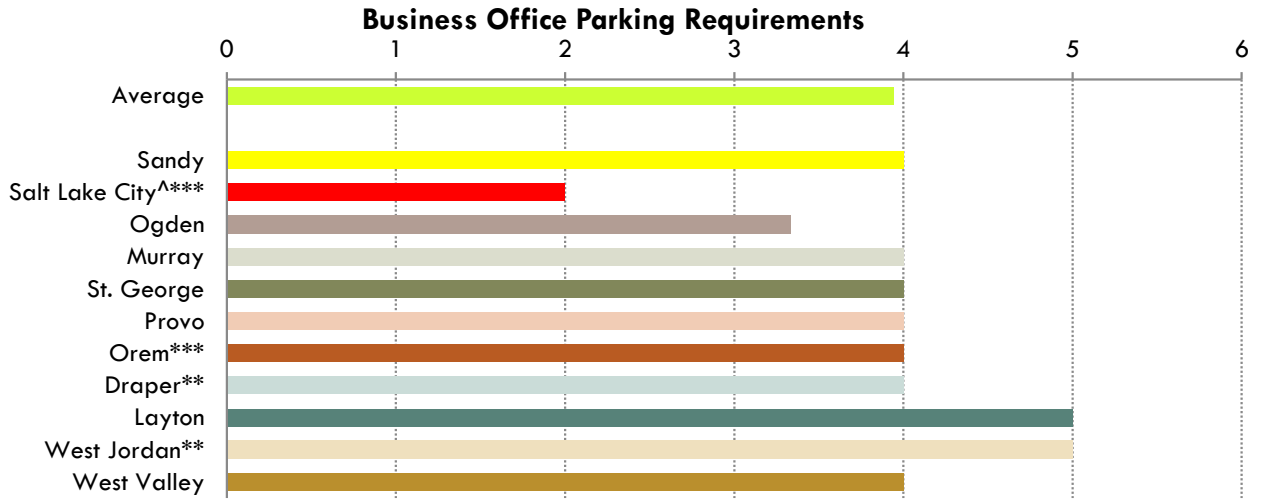
Orem***
Draper**
Layton
West Jordan**
West Valley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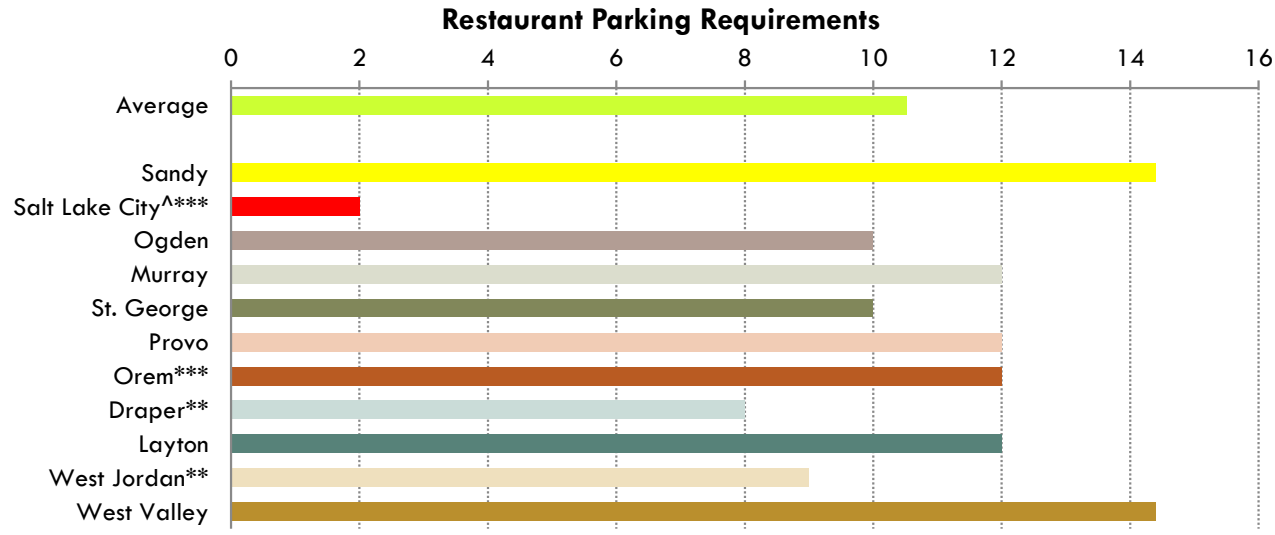
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Murray
St. George
Provo
Orem***
Draper**
Layton
West Jordan**
West Valley

APPENDIX C: PROPOSED PARKING ORDINANCE

"B. Table of Parking Requirements by Land Use Category. The following minimum parking is required: (Ord 10-26, Amended 7-30-2010)

Table 15A-24-09(B) – Parking Requirements by Land Use Category	
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Dwelling, Multiple Unit (…)	2 spaces per dwelling unit
Dwelling, Multiple-Unit ([Apts.])	
- one bedroom unit	1.75 spaces per unit guest parking included
- two bedroom unit	~~2.0 spaces per unit~~ 2 spaces per dwelling guest parking included
- three or more bedroom unit	~~2.5 spaces per unit~~ 2.25 spaces per dwelling guest parking included
~~- guest parking~~	~~0.25 spaces per unit~~ (NOTE:…)
Assisted Living Center, [etc.] (…)	0.5 spaces per bed, plus 10% for support staff/physicians, plus a bus only parking stall to meet the dimensions of a handicap parking stall.
Senior or Elderly Housing	1 space per unit (…)
Retail Commercial Land Use Categories	Space Requirements
Automotive Repair (…)	~~5 spaces per 1,000 square feet~~ 4 spaces per 1,000 square feet Exceptions: (…)
Commercial Retail Sales and Services **	
Heavy Commercial	
Commercial Center, Community	
Commercial Center, Convenience	
Commercial Center, Neighborhood	
Commercial Center, Regional	
Liquor Sales	
Commercial Services, Offices Land Use Categories	Space Requirements
Bar, Tavern, Club	3.5 spaces per 1,000 square feet
~~Business or Financial Services~~	~~4.0 spaces per 1,000 square feet~~
Dance Hall, Discotheque	3.5 spaces per 1,000 square feet
Day Care, Group	1 space for each instructor (plus drop-off space)
Veterinary Office	4 spaces for each practitioner
Medical and Health Care	5 spaces per 1,000 square feet OR 4 spaces for each practitioner plus 1 space per employee (including practitioner) at highest shift, whichever is greater. (…)
Motel, Hotel	1 space per rental unit; 1 space for each 200 square feet of assembly, conference space, banquet, sit-down restaurant facility, and office space.
Business or Financial Services	(See Appendix D)
Restaurants Land Use Categories	Space Requirements
Restaurant – Sit down	~~1 space per 3 seats (including outdoor seating) plus 0.5 space per number of employees on the largest shift (minimum of 5 employee spaces)~~ 10 spaces per 1,000 square feet.
Restaurant – Drive-in/Drive-thru (…)	1 space per 100 square feet of floor area(…).

(**Recreation, Indoor; Special Review; Public Uses; and Industry** Land Use Categories omitted)"

APPENDIX D: RECOGNIZING OFFICE TYPES

We propose a differentiation between low, medium, and high employee density offices. Table 2 below is an example of what that change would look like.

Table 2: Example of Parking Ordinance Based on Office Type

Offices Land Use	Office Type		
Business or Financial Services Offices	**Low Employee Density** (350 sq. ft. or greater per employee)	**Medium Employee Density** (200-350 sq. ft. per employee)	**High Employee Density** (Less than 200 sq. ft. per employee)
	3.0 spaces per 1,000 square ft.	4.0 spaces per 1,000 square ft.	5.0 spaces per 1,000 square ft.

APPENDIX E: WALKABILITY ASSESSMENT TOOL EXPLAINED

Walkability Assessment Tool Guidelines

ASSUMPTIONS

This tool is based on assumptions that pedestrians are equally likely to walk to *and* from different land uses. For example, if a grocery store receives a "Very Walkable" score based on the assessment tool, it is assumed that this particular grocery store has significantly more walking patrons than a store categorized as "Slightly Walkable." We also assumed a decrease in points as the distance from the land use in question increased.

INPUTS

1. Staff members choose the "Type" of land use.
2. Staff members input data into the spreadsheet tool. Radii of distance around the comparison or destination location should be obtained to use for this particular tool. Grayed areas are not used in the analysis.
3. The spreadsheet automatically calculates the total number of points and the points do not exceed the maximum allowed per category.
4. Staff members are to simply check the appropriate boxes based on distance for every land-use in the area up to the amount of boxes that are available per category.

PROCESS

The Walkability Assessment tool uses a point system with checked boxes to indicate how walkable an area is likely to be. The underlying idea is that a place is walkable if various different land uses are close to one another to encourage pedestrians to walk to and from the location under analysis. Figure 1 demonstrates the piece of the tool in spreadsheet format.

Figure 1: Excerpt from Walkability Assessment Tool

Walkability Assessment Tool					
Food and Retail	(Name)				
Category	**Max. Points**	**Land-Use**	**0-.10 mi.**	**.10-.25 mi.**	**.25-.50 mi.**
Food and Retail	15	Supermarket or grocery with produce section (min. 5,000 gross square footage)	☐ 15	☐ 10	☐ 5
Community-Serving Retail	20	Convenience Store	☐ 7	☐ 5	☐ 3
		Farmers Market (min. 9 months per year)	☐ 5	☐ 3	-
		Hardware Store	☐ 5	☐ 3	-
		Pharmacy	☐ 10	☐ 7	☐ 5
		Other Retail	☐ 3	-	-

RESULTS

The results of this tool simulate how walkable a particular location is relative to the proximity of other locations around it. The location accumulates points used to

support a possible reduction in parking ratio requirement. Ratio reductions are put in ranges, which are colored to indicate a 5% reduction, 7% reduction, and 10% reduction. Figure 2 indicates the reduction in parking ratio that correlates to points accrued from the analysis.

Figure 2: Final Results Point Index

0%	5%	7%	10%
0-50	**51-70**	**71-90**	**91+**
Not Walkable	Slightly Walkable	Very Walkable	Extremely Walkable

The Walkability Assessment tool provides staff with a numerical and measurable foundation for staff to base parking reduction decisions. The likelihood that staff will give a location the same score in this audit is very likely because the criteria for walkability are fairly objective. The final result in located in the green cell and indicates the feasible percentage decrease based on the number of points accumulated by using the tool.

This eligible reduction is based on how many people would walk to the destination taking into account walking behavior and distance. To determine which reduction applies, simply locate the total number of points accumulated ("Total Points") and match the total points into its appropriate range between minimum and maximum points. The percentages indicate the feasible decrease in parking requirements for the location.

APPENDIX F: PEAK COMPARISON TOOL EXPLAINED

To illustrate the Peak Comparison Tool's effectiveness, Figure 3a highlights the parking demand necessary if an area were built to support maximum peak parking demands for each individual land use. For example, Hale Center Theatre would require 300 parking stalls at its peak demand. On top of that 300 stalls, a Restaurant would require an additional 300 parking stalls for its peak demand. City Hall would require another 300 stalls for its peak demand when the demand for each land use is considered individually. The three uses together would require 900 parking spaces. Figure 3b assumes that the three uses share parking and the demand be evaluated together.

Figure 3a: Individual Parking Demand

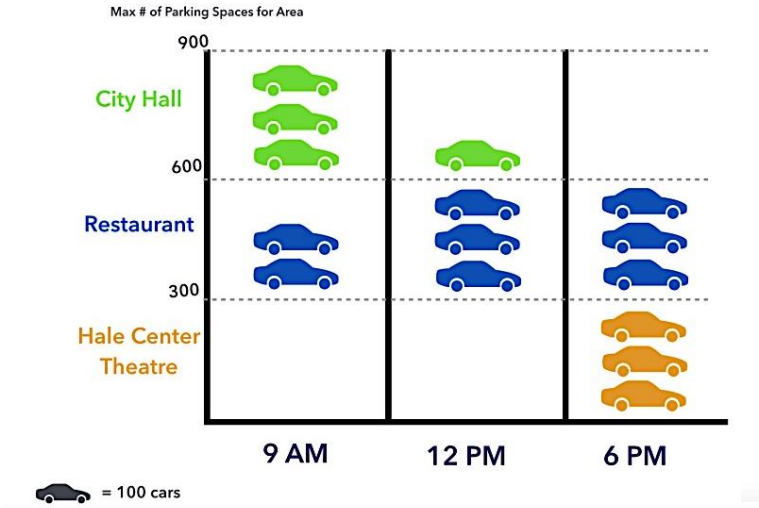


Figure 3b: Shift

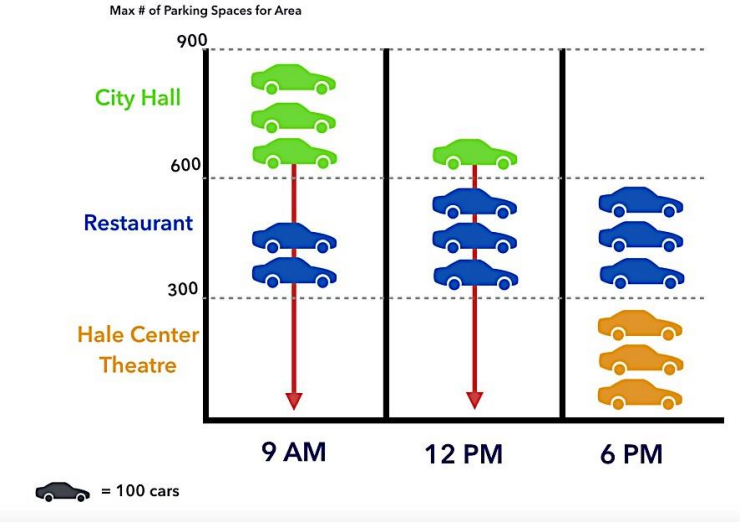
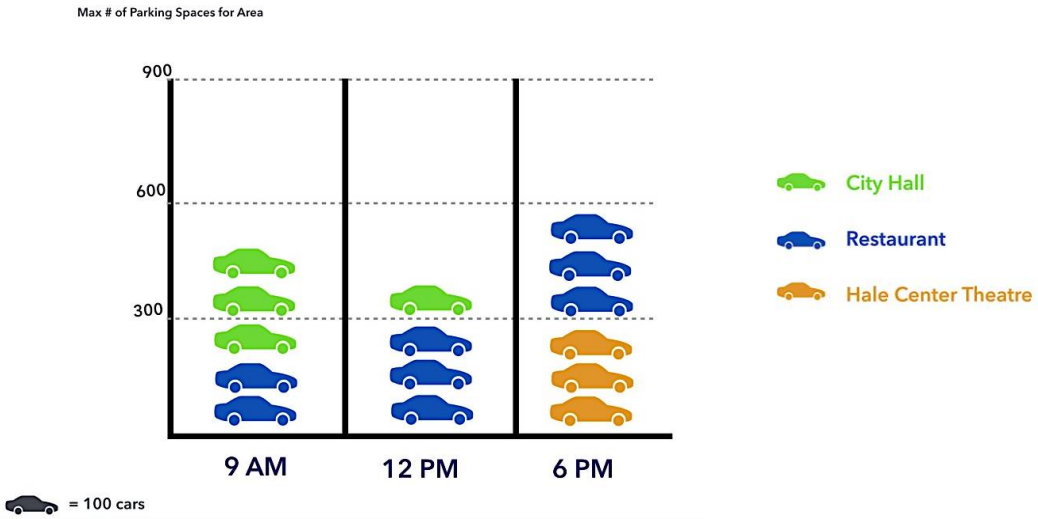


Figure 4 represents the demand curve for parking when all three land uses are considered together. The total parking demand is never more than 600 parking stalls. Parking requirements could be further decreased with walkability reductions.

Figure 4: Combined Actual Parking Demand



Peak Time Comparison Tool Guidelines

ASSUMPTIONS

We assume that Sandy City has historically established *minimum* parking requirements equal to the maximum projected peak parking demand for each particular land use. We then use Google® "Popular Times" to estimate the demand for each hour of the day. We further assume that projected parking demand follows the average peak and low parking demand on an hourly basis. We assumed that the peak parking demand for each land use was always the highest demand of the year or at least close to that high peak.

INPUTS

1. Staff members are to enter the maximum parking demands (number of parking stalls occupied) for particular hours in the day, on a particular day, and on a particular week for 2-10 land-uses. Staff should input the *maximum* parking demand, not an average parking demand into purple cells for each hour of each day of the week.
2. If projections of parking demands are required, staff members may refer to Google® "Popular Times" to gauge parking demand and place the minimum requirement for that land use as the maximum or peak shown on Google® "Popular Times."

PROCESS

The cells in this document combine the total possible parking stalls available between two land uses and determine if the areas are under or over parked. For example, the Comparison's available parking and A's available parking are added together forming a total. That total is the ceiling parking limit between the two land-uses. Each land-use is compared to the Comparison land-use. The areas are analyzed on an hourly basis based on several lenient assumptions regarding the number of parking stalls that will be used. This same principle applies to a weekly and monthly/seasonal level. In addition, the entire area or zone is analyzed as a whole accounting for parking spillover.

RESULTS

The "Results-entire area" tab indicates how complementary the entire area is as a unit. Hourly results demonstrate average parking demand for an average week per hour—the most specific results. "Entire area" results are useful to determine if changes in particular parking requirements would allow for adequate spillover into surrounding parking lots and to gauge cross-utilization of parking between land-uses to decrease surface and structured parking costs. Figure 4 provides more detail regarding how many parking spots are open on an hourly basis in that entire area. The table demonstrates the minimum surplus *or* maximum deficit to enable a staff member to quantitatively know the parking demand for the entire area under analysis. The "Feasible Parking Decrease" is the percentage of parking that could be eliminated to sustain the hourly parking dynamics in the entire area.

The stacked line graph beside the table in Figure 5 visually shows the maximum parking demand between all available parking lots in the entire area. The graph demonstrates how complementary the uses in this area are and accounts for parking demand spillover throughout the available parking supply. For example, if a patron wanted to park in land use "A," but could not find a parking spot immediately near "A," this patron would be able to park at land use "B"'s parking without difficulty, thus accounting for spillover.

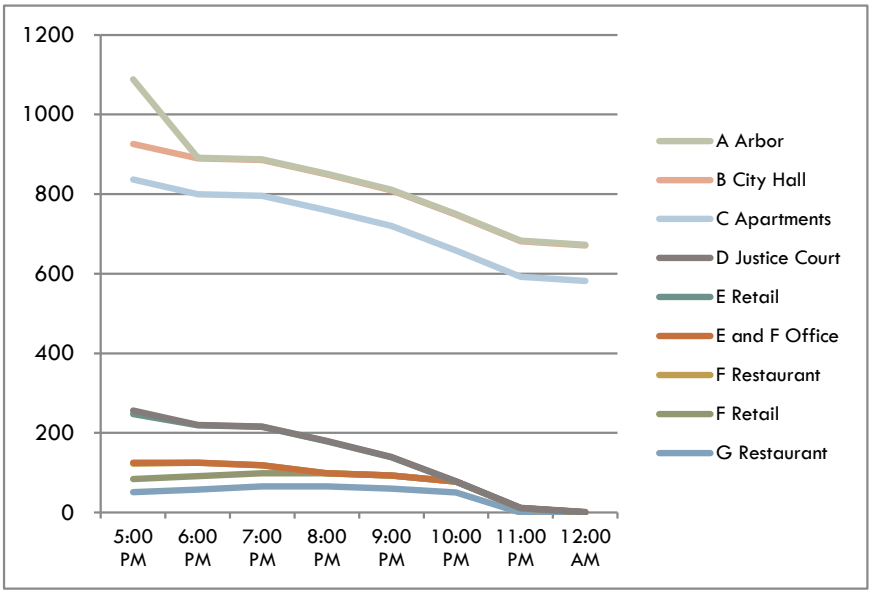
Figure 5: Excerpt from Hourly Entire Area Results

Peak Time Comparison

Parking Stalls Available for Use	
5:00 PM	55
6:00 PM	638
7:00 PM	678
8:00 PM	714
9:00 PM	754
10:00 PM	810
11:00 PM	878
12:00 AM	914
Surplus/Deficit	**55**

Feasible Parking Decrease	**15.2%**

Peak Parking Demand in Entire Area



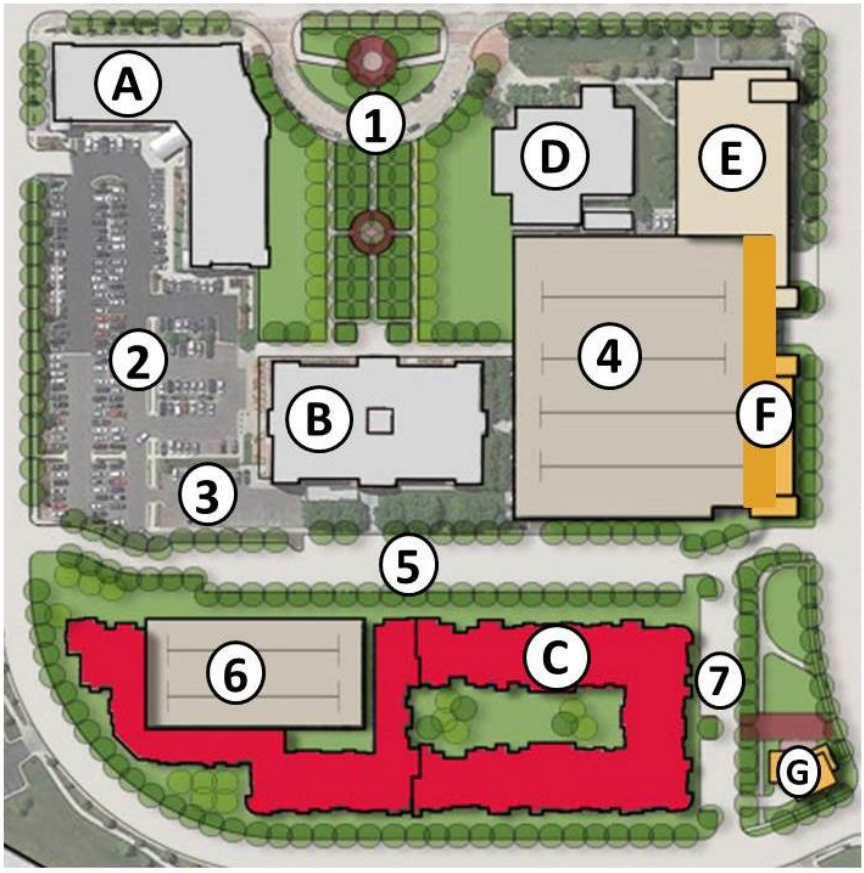
APPENDIX G: CITY HALL BLOCK PARKING ANALYSIS WITH APPLIED RECOMMENDATIONS

The Cairns area spans from 9000 South to 10600 South. This area carries a slogan: Where Mountain Meets Urban. To stay true to the vision, Sandy City will likely have to alter its parking requirements in The Cairns area.

Suggestions for The Cairns City Hall Block

The Cairns City Hall Block Master Plan is displayed in Figure 6. Each letter represents a particular land use and each number represents parking locations.

Figure 6: City Hall Block Parking Lot and Building Map



We suggest the application of the tools and guidelines described earlier in this document to The Cairns City Hall Block area. Specifically, Table 3 compares the parking requirements under the current ordinance to that which would be required with the revisions recommended in this study.

Base Requirement Reductions

After analysis, we recommend base parking reductions apply to The Cairns City Hall Block. We assert that the parking requirement for City Hall (B), the Justice Court (D), and the Arbor Building (A) should decrease to 3 per 1,000 square feet

because they each meet the definition of a low density office. The Kaplan Apartments (C) should use only the structured parking provided (6 in Figure 6). Both E and F Retail should be allowed a lower parking requirement of 4 per 1000 square feet based on the comparisons with other Utah cities. Restaurants in F and G should be allowed 10 parking stalls per 1000 square feet also based on Utah city comparisons.

Revising the base parking requirement to be more consistent with similar Utah cities reduces the requirement for the City Hall Block from 2,048 to 1,823; a reduction of 225 parking stalls. Without this reduction, the City would need to add a second level of parking to lot 2 on the east side of City Hall before it could consider uses E, F, and G on Monroe Street.

Walkability Reductions

Offices, restaurants, and retail in The Cairns City Hall Block all received a score between 51 and 70 as "Slightly Walkable" locations, which warrants a 5% reduction for walkability.

Shared Use Reductions

We further support an overall reduction of 15.2% of the parking spaces allocated to each land-use because peak parking demands would still be adequately satisfied should the entire area have 15.2% less parking stalls available. The proposed parking structure in area 4 in Figure 6 will provide parking to meet the demand of this mixed-use area.

Planning Commission Reductions

The Planning Commission maintains the ability to allow for a 15% reduction on top of the recommended reductions above.

Ultimately, the construction of a parking structure atop of Parking lot 4 would be sufficient to support the construction of areas E, F, and G in Figure 7, thus allowing a transformation into a dense downtown, walkable area.

Table 3 illustrates the parking requirements and allowed reductions under the current parking ordinance compared to the recommended parking ordinance and the proposed flexible allowed reductions in The Cairns City Hall Block. The current ordinance allows reductions based on Planning Commission discretion. If the Planning Commission were to grant full 25% reductions for land uses A-G, The Cairns City Hall Block would need 63 more stalls and would not have land on which to build those stalls. The recommended ordinance takes into consideration other possible allowed reductions such as walkability, and shared use to yield a surplus of 7 stalls. The recommended ordinance allows a 5% reduction for walkability and a 15.2% reduction for shared use. Furthermore, the Planning Commission could lower the minimum even more using their discretion if warranted.

Table 3: The Cairns City Hall Block Calculations

	A	B	C	D	E	F	G				
Current Ordinance	Arbor	City Hall	Kaplan	Justice Court	Retail, Office	Restaurant, Retail, Office	Restaurant	Reductions	Total	Available	Surplus/ (Deficit)
Strict Reading of Base Ordinance	266	348	648	136	325	257	68		2,048	1,502	(546)
Allowed Reductions											
Planning Commission Discretion	(38)	(87)	(68)	(34)	(81)	(64)	(17)	25.0%	(390)		
Totals	228	261	580	102	244	193	51		1,659	1,502	**(157)**

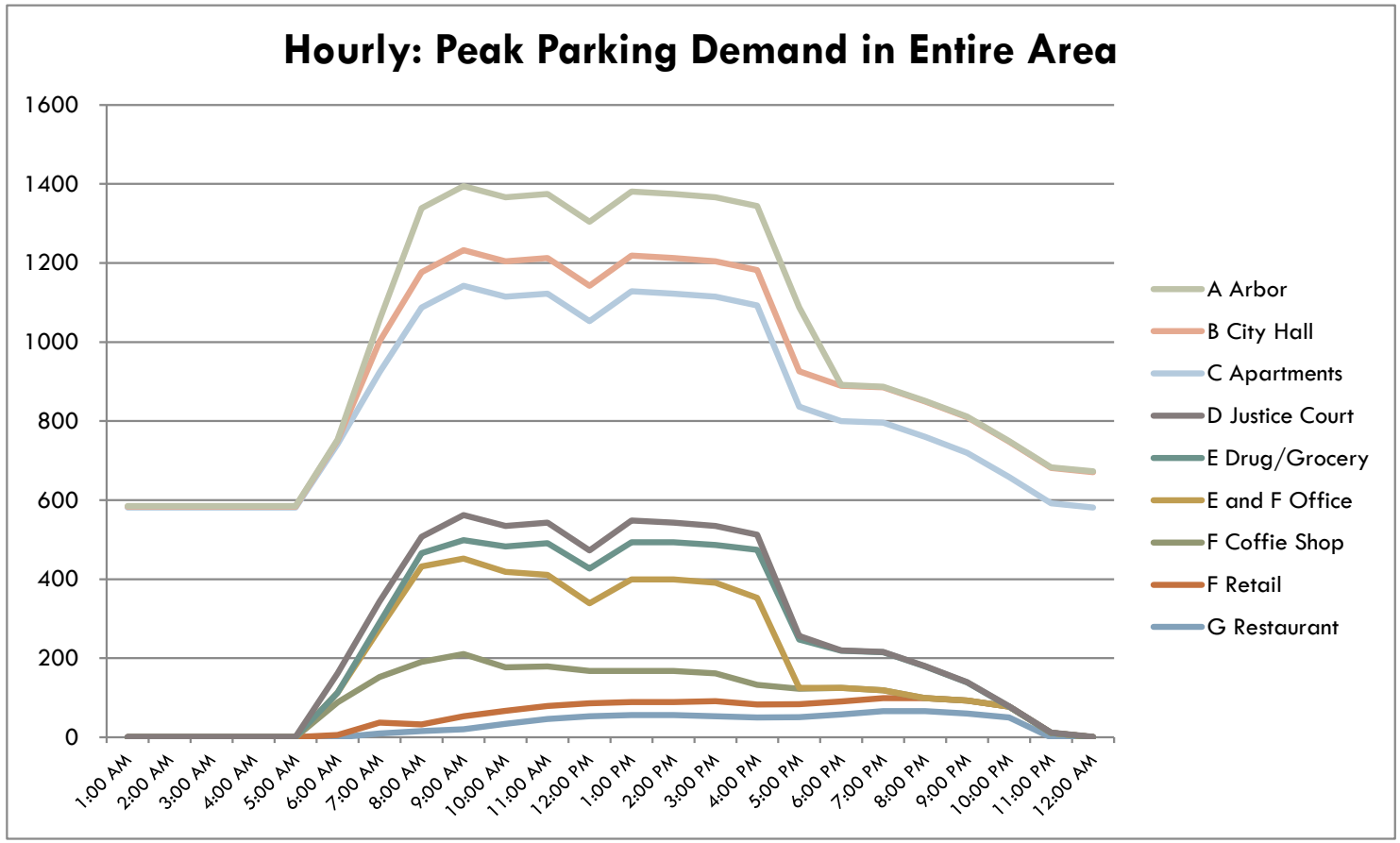
	A	B	C	D	E	F	G				
Recommended Ordinance	Arbor	City Hall	Kaplan	Justice Court	Retail, Office	Restaurant, Retail, Office	Restaurant	Reductions	Total	Available	Surplus/ (Deficit)
Strict Reading of Base Ordinance with Office Type	200	261	613	102	300	198	47		1,823	1,502	(219)
Allowed Reductions											
Walkability	(10)	(13)	0	(5)	(15)	(10)	(2)	5.0%	(55)		
Shared Use	0	(40)	(33)	(16)	(46)	(30)	(7)	15.2%	(138)		
Planning Commission Discretion	0	0	0	0	0	0	0	15.0%	(0)		
Totals	190	208	580	81	239	158	38		1,495	1,502	**7**

Table 4 illustrates an example of results for The Cairns City Hall Block, peak demand for each land use, and the actual usage of parking stalls in this particular area.

Table 4: Peak Time Comparison: Hourly[c]

Final Results: Entire Area	
Entire Area	
1:00 AM	1103
2:00 AM	1103
3:00 AM	1103
4:00 AM	1103
5:00 AM	1103
6:00 AM	935
7:00 AM	632
8:00 AM	349
9:00 AM	257
10:00 AM	282
11:00 AM	285
12:00 PM	369
1:00 PM	283
2:00 PM	281
3:00 PM	279
4:00 PM	351
5:00 PM	631
6:00 PM	828
7:00 PM	832
8:00 PM	868
9:00 PM	908
10:00 PM	969
11:00 PM	1075
12:00 AM	1103
Surplus/Deficit	**257**

Feasible Parking Decrease or Feasible Building Increase	**15.2%**



[c] For the purposes of this application, we assumed Retail on lot E was a CVS Pharmacy, the Restaurant on F was a Starbucks, Retail 2 was left general, and the G Restaurant was a Gourmandise.

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[9] Engel-Yan, J., & Passmore, D. (2010). Assessing alternative approaches to setting parking requirements. *Institute of Transportation Engineers.ITE Journal, 80*(12), 30-34. Retrieved from: http://search.proquest.com/docview/822547466?accountid=4488.