ALLIANT
ENGINEERING

DRAFT MEMORANDUM

DATE: July 20, 2017

TO: Jen Desrude, PE, Development Coordinator, City of Bloomington

FROM: Jordan Schwarze, PE, Alliant Engineering
Lia Klein, EIT, Alliant Engineering
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SUBJECT: **WhirlyBall Twin Cities Parking Study**

Alliant Engineering, Inc. has conducted a parking study in response to the WhirlyBall Twin Cities proposed development located at 2405 E Old Shakopee Road in Bloomington, MN. The proposed WhirlyBall facility is an addition to a planned hotel development on the same site in the South Loop District of Bloomington. Both facilities will share an onsite surface parking lot.

1. Introduction

The proposed 30,000 square foot WhirlyBall facility will consist of three WhirlyBall courts, a laser tag court, eight bowling lanes, a dining/bar area, five escape rooms, and meeting/office/storage spaces, while the planned hotel will have 182 guest rooms. The proposed site plan is illustrated in **Figure 1**, while **Table 1** summarizes the proposed land use characteristics. It should be noted that the proposed development site is currently vacant.

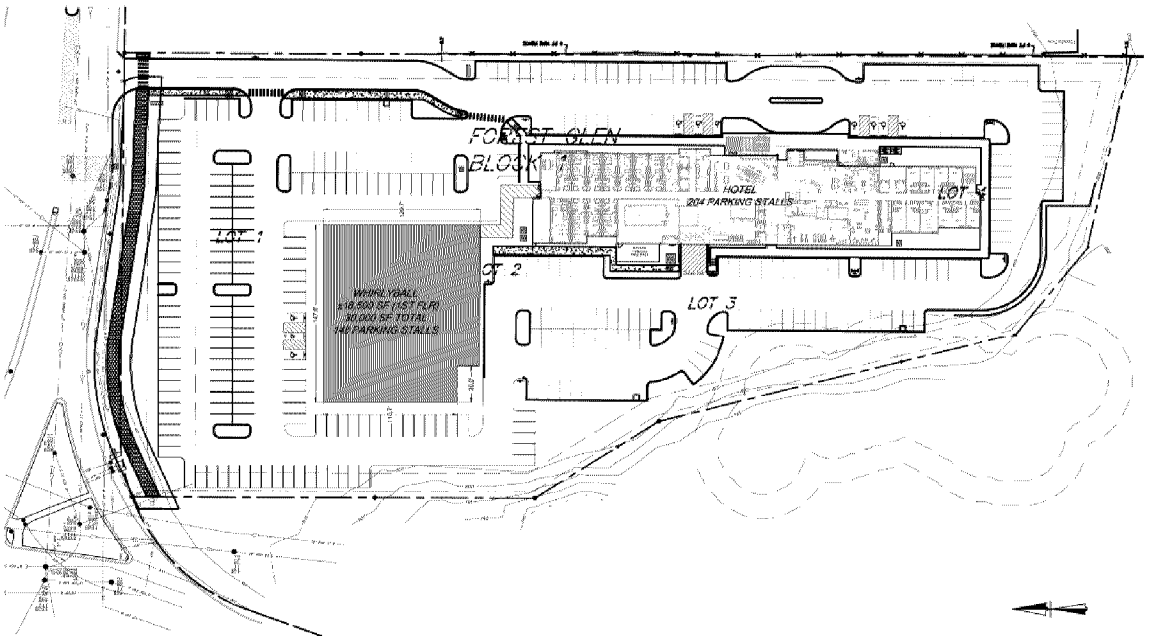
Table 1. Proposed Land Use Characteristics

Estimated Schedule	Land Use	Parking
Project Completion: 2018	• Construction of a 30,000 SF WhirlyBall facility • Construction of a 182 room hotel	• Construction of a 352 stall surface parking lot: o 148 stalls allocated to the WhirlyBall facility o 204 stalls allocated to the hotel

Proposed development parking consists of a 352 stall off-street surface parking lot, with 148 stalls allocated to WhirlyBall and 204 stalls allocated to the hotel. While this parking allocation is shown on the proposed site plan, no physical separation of parking stalls is anticipated.

Based on the perceived parking demand, zoning code requirements, and parking availability, concerns have been raised for the proposed development. The objective of this parking study is to document the parking demand of similar existing land uses and to estimate the future total parking demand created by the proposed development.

Figure 1. Proposed Site Plan



1.1. Study Purpose

The purpose of this study is to evaluate the expected parking demand of the proposed development. To achieve this, the following goals have been established:

- Determine the City of Bloomington Zoning Code off-street parking requirement
- Estimate seasonal variations in parking generation
- Evaluate data collected in the field for WhirlyBall Twin Cities and an existing hotel in the South Loop District to develop estimated parking demand calculations based on guests and/or other measures/assumptions to be determined through the analysis
- Establish the recommended parking supply required for the proposed development
- Develop charts and exhibits highlighting the parking demand versus supply analysis, illustrating peak parking demands and seasonal variation in the parking demand

2. Data Collection

An existing WhirlyBall Twin Cities location in Maple Grove and the Fairfield Inn & Suites in the South Loop District of Bloomington were utilized to estimate the parking demand characteristics that can be expected at the proposed development. Field data was collected to observe parking patterns and vehicle occupancy. Additional court reservation and walk-in data was provided by WhirlyBall Twin Cities.

2.1. Field Study

Through conversations with WhirlyBall Twin Cities management and research into parking generation rates for hotel land uses in the *Institute of Transportation Engineers (ITE) Parking Generation Manual, 4th Edition*, Friday and Saturday evenings were presumed to represent peak parking demand for both proposed development land uses. Consequently, field data collection was completed on Friday, June 16, 2017 and Saturday, June 17, 2017 from 6:00 to 11:00 p.m. at both WhirlyBall Twin Cities in Maple Grove and the Fairfield Inn & Suites in Bloomington.

Within the observed parking lots, initial and final parking stall occupancy was recorded as well as a running tally of vehicles entering and exiting the parking lots. Additionally, initial and final person occupancy as well as a running tally of pedestrians (patrons and employees) entering and exiting were recorded at the existing WhirlyBall facility. Furthermore, shuttle vehicle volumes were collected at the Fairfield Inn & Suites. It should be noted that the existing WhirlyBall facility was observed to have a total of 120 parking stalls, while the Fairfield Inn & Suites was observed to have a total of 142 parking stalls.

2.2. Observed Parking Demand

Figure 2 and **Figure 3** summarize the results of the existing parking utilization field survey at the Fairfield Inn & Suites. Vehicles counted in the parking lot were shuttles or those belonging to hotel guests and employees. Only two shuttles were observed on each night of data collection. It should be noted that the Fairfield Inn & Suites offers a park and fly program in which vehicles belonging to Minneapolis – Saint Paul (MSP) International Airport travelers may be left within the onsite parking lot. These vehicles were parked in a specific location within the parking lot and marked with an in-vehicle permit. Minimal turnover in park and fly vehicles was observed during data collection. Therefore, park and fly vehicles were removed from the parking counts as most were assumed not to belong to active hotel guests.

Figure 2. Fairfield Inn & Suites Bloomington – Friday Parking Demand

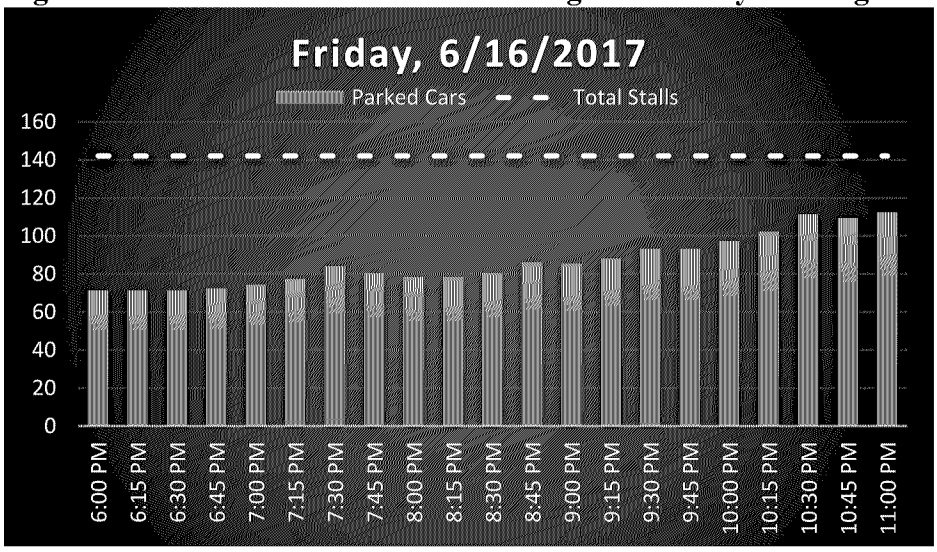


Figure 3. Fairfield Inn & Suites Bloomington – Saturday Parking Demand

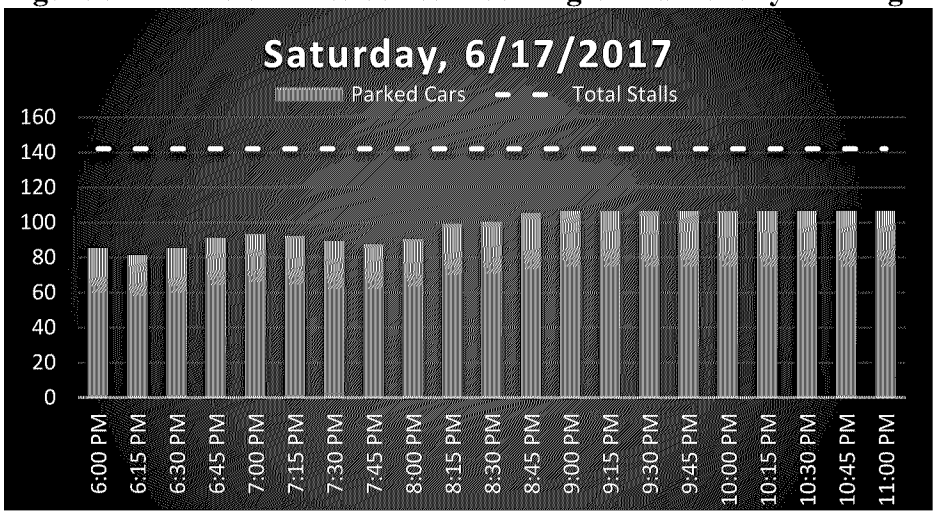


Figure 4 and **Figure 5** summarize the results of the existing parking utilization and pedestrian volume field survey at WhirlyBall Twin Cities in Maple Grove.

Figure 4. WhirlyBall TC Maple Grove – Friday Parking/Pedestrian Demand

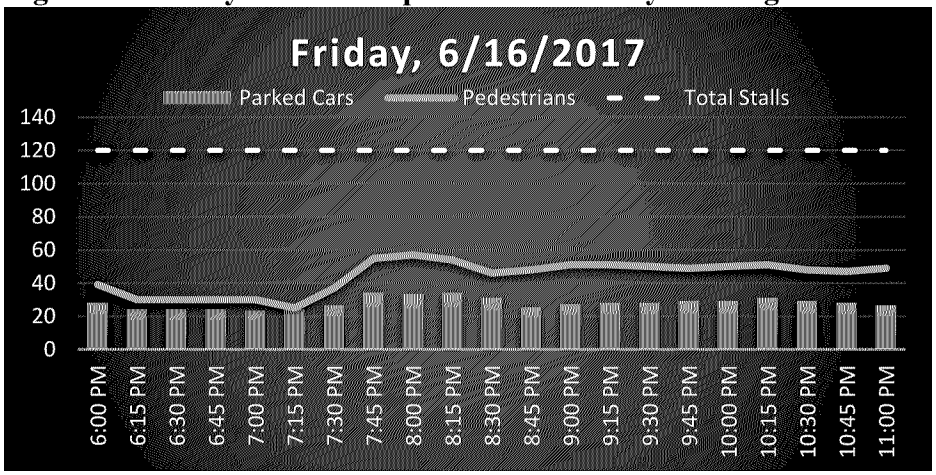


Figure 5. WhirlyBall TC Maple Grove – Saturday Parking/Pedestrian Demand

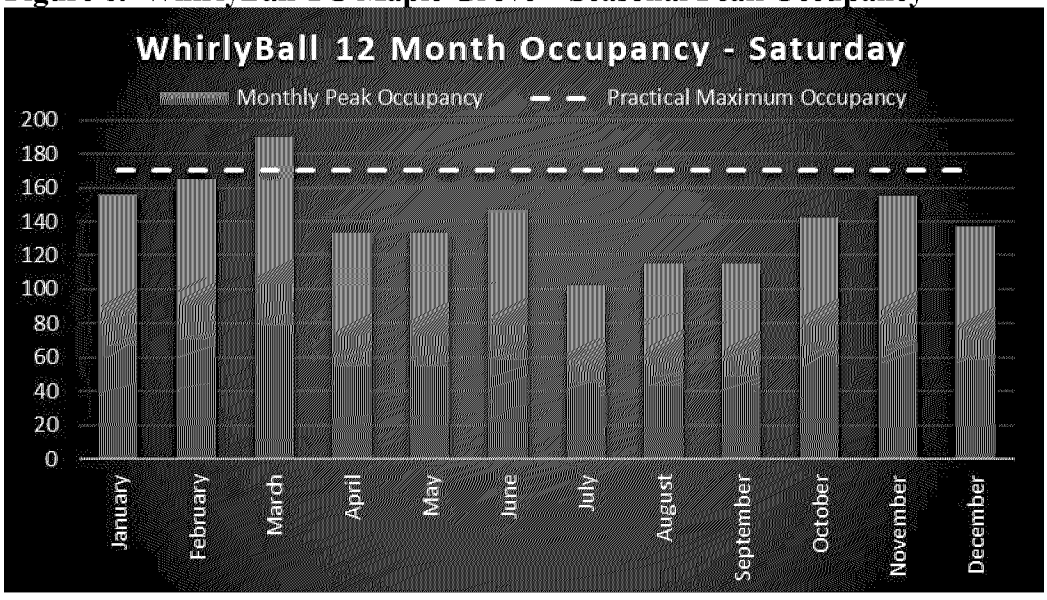
The maximum observed parking demand at the Fairfield Inn & Suites was 112 vehicles (79% lot occupancy) on Friday, June 16, 2017. Based on information provided by the Fairfield Inn & Suites, 124 of 129 rooms were occupied on Friday, June 16, 2017 while 127 of 129 rooms were occupied on Saturday, June 17, 2017. Consequently, the maximum observed parking demand ratio was 0.9 vehicles per occupied room.

At WhirlyBall Twin Cities, the maximum observed parking demand was 58 vehicles (48% lot occupancy). The maximum people occupancy inside WhirlyBall Twin Cities was observed to be 123 pedestrians, which corresponded with the maximum observed parking demand. At peak occupancy, the observed parking demand ratio was approximately 0.5 vehicles per person. It should be noted that WhirlyBall Twin Cities is open from 11:00 a.m. to 2:00 a.m. on Fridays and Saturdays. Court reservations run in one-hour increments with the last reservation beginning at 11:00 p.m. Consequently, vehicle and pedestrian volumes likely peaked at 11:00 p.m. on Saturday, June 17, 2017 despite the appearance of still rising volumes. Therefore, parking demand at the proposed development would be expected to peak around 11:00 p.m. as well.

2.3. Seasonal Data and Patterns

In addition to collected field data, WhirlyBall Twin Cities provided information on group reservations and individual walk-in sales. The data included all Fridays and Saturdays from June 2016 to June 2017, which provided a seasonal distribution of customer visits. WhirlyBall people occupancy was calculated by combining the group and individual sales for each hour and assuming the average patron stayed for approximately 2-3 hours after arriving. The provided data indicated that WhirlyBall occupancy consistently peaks on Saturday nights. **Figure 6** presents estimated peak occupancy patterns for Saturdays throughout the year. It should be noted that the practical maximum occupancy of the existing WhirlyBall facility is estimated to be 170 people, considering WhirlyBall is the primary attraction and only a certain number of people are able to play at any given time.

Figure 6. WhirlyBall TC Maple Grove – Seasonal Peak Occupancy



3. Parking Demand Analysis

The parking demand expected for the proposed development was estimated based on three methodologies – the City of Bloomington Zoning Code, the ITE Parking Generation Manual, and a parking model developed based on historical data and field observations.

3.1. Method 1 – City Code Parking Requirements

The City of Bloomington Zoning Code regulates the minimum off-street parking supply based on land uses. Relevant land uses for this proposed development include Hotel and Place of Assembly. City Code parking requirements were provided by City staff and proposed land use types were provided by WhirlyBall Twin Cities, as shown in **Table 2**. In cases where the City Code did not specify a unique land use, the requirement for "Arena; Dance Hall; Library; Mortuary; Museum; Place of Assembly; Stadium; or Theater, Indoor or Outdoor" was used. For the proposed bowling lanes, the ITE Parking Generation average peak parking rate was used due to the unique characteristics of the land use, which did not fit the general criteria in the City Code.

Table 2. Bloomington City Code Parking Requirements

Parking Use	Space (SF)	Occupancy /Units	Rate	Required Spaces
WhirlyBall Courts	9,750	30	1 space/3 seats	10
Laser Tag	2,500	30	1 space/3 seats	10
Escape Rooms	2,500	50	1 space/3 seats	17
Bowling Lanes	5,000	8	5.02 spaces/1 lane [1]	41
Meeting Space	2,500	167	1 space/3 seats	56
Dining	2,500	120	1 space/2.5 seats	48
Office	600	--	1 space/ 285 SF	3
Storage	500	--	1 space/ 1000 SF	1
WhirlyBall Total				**186**
Hotel	96900	182	1.1 space/ 1 room	201
Hotel Total				**201**
Total Parking Requirement				**387**

1. ITE Parking Generation Method

A total of 387 parking stalls (186 for the WhirlyBall facility and 201 for the planned hotel) is required by the City Code. This number is higher than the proposed parking supply of 352 stalls planned for the development, which emphasizes the need for empirical parking data collection and analysis in support of the proposed parking supply. A summary of the proposed parking supply is shown in **Table 3**.

Table 3. Hotel and WhirlyBall TC Proposed Parking Supply

Parking Use	SF	Proposed Parking Spaces
Hotel	96,900	204
WhirlyBall Twin Cities	30,000	148
Total		**352**

3.2. Method 2 – ITE Parking Generation Manual

In addition to the parking supply requirement calculated based on City Code, the ITE Parking Generation Manual was also used to assess the estimated parking demand for the planned hotel development. The ITE Manual provides peak parking generation rates based on studies of various land uses. Given the uniqueness of the proposed WhirlyBall facility, there is no applicable land use type presented in the ITE Manual. Therefore, **Table 4** documents the ITE estimated peak parking demand for only the proposed hotel land use.

Table 4. ITE Parking Generation Analysis Results

Land Use	Size (SF)	Units	Average Peak Parking Rate	Estimated Peak Parking Demand
Hotel	96,900	182	1.3 vehicles/ 1 room	237 vehicles

It should be noted that the proximity of a development to public transit and other modes of transportation can affect the need for parking. In the case of the planned hotel, shuttles provided by the hotel as well as the nearby light rail transit (LRT) station at the Mall of America providing a public transit option to MSP International Airport could reduce the need for parking stalls. The ITE Manual estimated peak parking demand of 237 vehicles exceeds the proposed hotel parking supply, though this estimate is likely conservative for the reasons noted above.

3.3. Method 3 - Parking Model

To create a more appropriate estimate of future parking demand at the proposed development, data collected from existing sites with similar characteristics should be used. With the field data and seasonal data previously documented, a parking model can be created to estimate the future needs of the WhirlyBall Twin Cities/planned hotel site.

3.3.1. Seasonal Parking Demand

To comprehend seasonal parking demand patterns, information provided by WhirlyBall Twin Cities was used to develop parking adjustment factors for each month. These seasonal adjustment factors were calculated by comparing the estimated monthly peak people occupancy (based on June 2016 to June 2017 WhirlyBall group and individual sales data) to the practical maximum occupancy of 170 people for the existing WhirlyBall facility. **Figure 7** illustrates the calculated WhirlyBall seasonal parking adjustment factors. It should be noted that peak seasonal demand at the proposed WhirlyBall Twin Cities facility is expected to occur from January to March.

Figure 7. WhirlyBall TC Maple Grove – Seasonal Parking Adjustment Factors

Similarly, seasonal parking adjustment factors were developed for the planned hotel. These seasonal adjustment factors were calculated by scaling average monthly hotel occupancy rates presented in the ITE Parking Generation Manual by actual observed occupancy at the Fairfield Inn & Suites location surveyed in June 2017. **Figure 8** illustrates the calculated hotel seasonal parking adjustment factors. It should be noted that peak seasonal demand at the planned hotel is expected to occur from June to August.

Figure 8. Hotel – Seasonal Parking Adjustment Factors

3.3.2. Forecast Parking Demand

The forecast parking demand for the proposed development was based on field observations, customer data provided by WhirlyBall Twin Cities, and ITE Parking Generation Manual data. The proposed land uses were divided into four different parking models. The WhirlyBall/laser tag and escape room parking forecast models are based on the previously documented seasonal factors as well as the vehicle and people occupancy observed at the existing WhirlyBall site. The bowling parking forecast model is based on occupancy rates provided in the ITE Parking Generation Manual as well as the previously documented seasonal factors. The hotel parking forecast model is based on the previously documented seasonal factors as well as the vehicle and people occupancy observed at the Fairfield Inn & Suites data collection site. The four individual models as well as the total for the development can be found in **Table 5**. It should be noted that the practical maximum occupancy was increased to 180 people for WhirlyBall/laser tag model due to the inclusion of a third WhirlyBall court at the proposed Bloomington facility.

To model a hypothetical scenario in which both proposed facilities are at full capacity, the maximum parking demand model shown in **Table 6** was created.

Figure 9 illustrates the estimated seasonal parking demand for the entire proposed development, while **Figure 10** illustrates the estimated seasonal parking demand for the WhirlyBall facility alone.

Figure 9. Proposed Development Monthly Parking Demand

Table 5. Proposed Development Parking – Seasonal Forecast Demand Model

Proposed Parking Model (Saturday) Parking Requirement																			
Day	WhirlyBall/Laser Tag				Bowling (ITE)[3]				Escape Room (Client)					Hotel				Proposed Total Parking Demand[4]	WhirlyBall Twin Cities Only (WhirlyBall/Laser Tag, Bowling, and Escape Room)
	Practical Max Occupany	Montly Factor	Peak Period Parking Demand (People per Vehicle 2:1) [1]	Parking Demand	Montly Factor	Lanes	Peak Period Parking Demand (Vehicles per Lane)	Parking Demand	Montly Factor	Occupany per room	Rooms	Peak Period Parking Demand (People per Vehicle 2:1)	Parking Demand	Occupany ITE + Field Observations [5]	Rooms	Peak Period Parking Demand (Vehicles per occupied room) [2]	Parking Demand		
January	180	0.9	0.50	81	0.9	8	5.02	36	0.9	10	5	0.50	23	0.71	182	0.90	116	256	140
February	180	1.0	0.50	90	1.0	8	5.02	40	1.0	10	5	0.50	25	0.85	182	0.90	139	294	155
March	180	1.1	0.50	99	1.1	8	5.02	44	1.1	10	5	0.50	28	0.92	182	0.90	151	322	171
April	180	0.8	0.50	72	0.8	8	5.02	32	0.8	10	5	0.50	20	0.91	182	0.90	149	273	124
May	180	0.8	0.50	72	0.8	8	5.02	32	0.8	10	5	0.50	20	0.94	182	0.90	154	278	124
June	180	0.9	0.50	81	0.9	8	5.02	36	0.9	10	5	0.50	23	1.00	182	0.90	164	304	140
July	180	0.6	0.50	54	0.6	8	5.02	24	0.6	10	5	0.50	15	1.00	182	0.90	164	257	93
August	180	0.7	0.50	63	0.7	8	5.02	28	0.7	10	5	0.50	18	0.99	182	0.90	162	271	109
September	180	0.7	0.50	63	0.7	8	5.02	28	0.7	10	5	0.50	18	0.94	182	0.90	154	263	109
October	180	0.8	0.50	72	0.8	8	5.02	32	0.8	10	5	0.50	20	0.94	182	0.90	154	278	124
November	180	0.9	0.50	81	0.9	8	5.02	36	0.9	10	5	0.50	23	0.82	182	0.90	134	274	140
December	180	0.8	0.50	72	0.8	8	5.02	32	0.8	10	5	0.50	20	0.67	182	0.90	110	234	124

1. Based on pedestrian and vehicle volumes collected in the field study
2. Based on vehicle volumes and occupied hotel room data collected in the field study. ITE provides a value of 1.2 and the City of Bloomington Ordinance Code provides a value of 1.1.
3. ITE Parking Generation Manual Code 437
4. Parking demand does not account for shared use between land uses, resulting in a higher/conservative value
5. ITE Parking Generation Manual Hotel occupancy was scaled to reflect the June 2017 occupancy on the date of field collection.

Table 6. Proposed Development Parking – Hypothetical Maximum Demand Model

Mamixum Parking - Proposed (Saturday) Parking Requirement																			
Day	WhirlyBall/Laser Tag				Bowling (ITE)				Escape Room (Client)					Hotel				Proposed Total Parking Demand	WhirlyBall Twin Cities Only (WhirlyBall/Laser Tag, Bowling, and Escape Room)
	Practical Max Occupany	Montly Factor	Peak Period Parking Demand (People per Vehicle 2:1) [1]	Parking Demand	Montly Factor	Lanes	Peak Period Parking Demand (Vehicles per Lane)	Parking Demand	Montly Factor	Occupany per room	Rooms	Peak Period Parking Demand (People per Vehicle 2:1)	Parking Demand	Occupany (%)	Rooms	Peak Period Parking Demand (Vehicles per occupied room) [2]	Parking Demand		
Monthly (Max)	180	1.1	0.50	99	1.1	8	5.02	44	1.1	10	5	0.50	28	100%	182	0.90	164	335	171

1. Based on pedestrian and vehicle volumes collected in the field study
2. Based on vehicle volumes and occupied hotel room data collected in the field study. ITE provides a value of 1.2 and the City of Bloomington Ordinance Code provides a value of 1.1.

Figure 10. Proposed WhirlyBall TC Monthly Parking Demand

Results of the forecast parking demand model indicate the proposed development is expected to generate a peak parking demand of 322 vehicles. The WhirlyBall facility solely is expected to generate a peak parking demand of 171 vehicles. Although WhirlyBall peak parking demand may exceed the 148 stalls allocated, the overall onsite parking supply of 352 stalls is expected to be adequate. A hypothetical maximum parking demand of 335 vehicles is also expected to be adequately accommodated onsite in the proposed 352 stall parking lot. It should be noted that the forecast parking demand model likely produces a conservatively high peak parking demand, as no multi-use reduction was applied for people using both the proposed hotel and WhirlyBall land uses.

3.4. Parking Demand Comparison

Table 7 compares estimated parking supply requirements based on City Code, the ITE Parking Generation Manual, and the developed parking demand models. The parking demand models adopted by this study take into account the airport shuttle/transit oriented nature of South Loop District hotels as well as seasonal variations in peak parking demand for each potential land use. The result is a more site specific estimated peak parking demand compared to that obtained via theoretical methods.

Table 7. Parking Requirements based on City Code, ITE and Model Methods

Development	City Code	ITE	Parking Model Maximum Demand [1]	Hypothetical Maximum Demand [2]	Proposed Parking Supply
Hotel	201	237	151	164	204
WhirlyBall Twin Cities	186	--	171	171	148
Total	387	--	322	335	352

1. Based on the highest monthly parking demand in the parking demand model
2. Based on the hypothetical scenario in which all proposed facilities are at full capacity

The proposed off-street parking supply of 352 stalls is expected to be sufficient. At the modeled peak parking demand of 322 vehicles, a 30 stall (9%) surplus is anticipated. It is generally advisable to provide at least a 5% surplus of stalls to avoid unnecessary site circulation and the perception of inadequate parking.

While a parking surplus is anticipated, potential park and fly use of the proposed parking lot would require further study after facility opening. Potential park and fly use of the onsite parking lot should only be considered after documentation of a sustained parking surplus greater than 10% during peak demand periods. It should be noted that park and fly use of the proposed parking lot would require a conditional use permit.

3.5. Future Land Use

Given the proposed multi-use nature of the study property, a limited number of potential future alternative uses could be envisioned for the proposed WhirlyBall and/or hotel structures. It should be noted that any potential future redevelopment of the proposed structures or property as a whole would necessitate further study.

4. Conclusions

Based on this parking study, the following conclusions have been made:

- The proposed development site plan has a total of 352 off-street surface lot parking stalls.
- The City of Bloomington Zoning Code off-street parking requirement is estimated to be 387 stalls.
- Peak parking demand for the proposed development is expected to occur around 11:00 p.m. on Friday and Saturday nights.
  - However, the seasonal peak parking demand for WhirlyBall Twin Cities is expected to occur from January to March, while the seasonal peak parking demand for the planned hotel is expected to occur from June to August.
- The forecast parking demand model was based on field observations at an existing WhirlyBall Twin Cities location in Maple Grove and the Fairfield Inn & Suites in the South Loop District of Bloomington as well as customer data provided by WhirlyBall Twin Cities and ITE Parking Generation Manual data. The estimated peak parking demand is 322 vehicles.
  - At this parking demand, a surplus of 30 stalls (9%) is anticipated
  - The forecast parking demand model likely produces a conservatively high peak parking demand, as no multi-use reduction was applied for people using both the proposed hotel and WhirlyBall land uses.
- Any potential future redevelopment of the proposed structures or property as a whole would necessitate further study.

Recommendations

- WhirlyBall/hotel ownership should enter into a joint parking agreement.
  - Although a number of parking stalls could be specifically designated for exclusive WhirlyBall or hotel use, minimizing specific parking stall designations is recommended to consistently accommodate the combined total parking demand of the WhirlyBall and planned hotel land uses.
- The planned hotel should consider providing shuttle services for guests to/from MSP International Airport.
- Potential park and fly use of the onsite parking lot should only be considered after documentation of a sustained parking surplus greater than 10% during peak demand periods.
  - Park and fly use of the proposed parking lot would require a conditional use permit.
- Design pedestrian accommodations to link with existing sidewalks and pedestrian ramps at the 24th Avenue/Killebrew Drive/Old Shakopee Road intersection to provide a proper connection to the Mall of America and its LRT station.