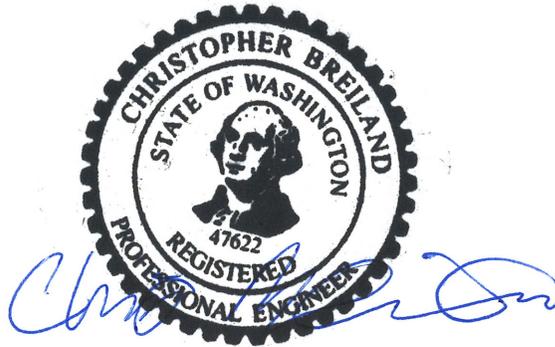


Transportation and Parking Analysis for the Redmond Downtown Park

Prepared for:
The City of Redmond



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SE15 - 0405

FEHR PEERS
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EXECUTIVE SUMMARY

DOWNTOWN PARK BACKGROUND

The Redmond Downtown Park is a vital part of creating a livable community in a regional growth center that is experiencing a notable expansion of urban density. The two-acre “Downtown Park” is essential to ensuring a high quality of life in Downtown and will be a significant destination and landmark for the entire city.

The park will provide a critical new public open and green space that will serve as a daily gathering place for the neighborhood and as an event and performance space for the entire community on special occasions. The master plan concept for the park is based on having areas suitable for accommodating both large events as well as smaller, more intimate gatherings.

As an urban park there are certain expectations about how it will function that are different than a typical suburban park. For example, with the large number of residential units nearby it is expected that many visitors on a typical day will simply walk to the park. With an existing transit center close by, and a light rail station planned about one block away, access by transit will be possible for many visitors. Finally, as parking needs and demands change, there is an expectation that there will be more creative parking arrangements between private land owners to allow shared parking, as well as arrangements by the City of Redmond and other event organizers to address parking needs during special events of certain sizes. The Downtown Park has been envisioned and designed as an urban public space and therefore has no dedicated off-street parking supply.

TRANSPORTATION AND PARKING ANALYSIS

Fehr & Peers prepared a transportation impact analysis for the proposed development of the Downtown Park in Redmond. Potential traffic, parking, and pedestrian/bicycle impacts were analyzed for three primary event scenarios envisioned for the park: (1) typical weekday use, (2) a weekday night market event, and (3) a weekend midday concert.

Table ES.1 summarizes the peak hour trip generation and parking demand results for all three event scenarios. As shown, the weekday night market and weekend concert scenarios generate a substantial number of vehicle trips and trips by other modes at their peak times. Though the weekday night market and weekend concert scenario have similar cumulative attendance estimates, traffic and parking demands

are the most intensive for the weekend concert scenario since the majority of attendees are on-site during the same time period. For the night market scenario, arrivals and departures would occur more steadily throughout the span of the event, making parking demand more evenly distributed compared to the concert scenario and less intensive at its absolute peak. The period of highest demand for the night market scenario occurs at 7 – 8 PM, well outside the 5 – 6 PM peak commute hour associated with heavy congestion throughout Redmond.

TABLE ES.1: PEAK HOUR TRIP GENERATION FOR ALL SCENARIOS

Scenario/Time Period	Peak Event Attendance	Cumulative Total Event Attendance	Total Person Trips	Vehicle Trips (2.2 persons/vehicle trip)	Person Trips by Other Modes (Ped, Bike, Transit)	Maximum Total Parking Needed by Event Attendees	
						Vehicle	Bike
Typical Weekday/5-6 PM	200	n/a ^a	480	190 : 95 arrivals and 95 departures	62 : 31 arrivals and 31 departures	95	7
Weekday Night Market/7-8 PM	964	3,000	1,839	727 : 376 arrivals and 351 departures	239 : 124 arrivals and 115 departures	352	27
Weekend Concert/End of Show	3,200 ^b	3,368	2,358	932 : all departures	306 : all departures	1,265 ^c	104 ^c

Notes:
a Cumulative total attendance not estimated.
b Maximum parking occupancy represents conditions 1 hour into the show, when the event is at peak attendance. The estimated total amount of parking occupied by concert attendees at the end of show is lower due to early departures.
c Peak attendance for concert would occur 1 hour into the show. Attendance levels at the end of the show would be somewhat lower due to early departures.

The expected parking demand and available supply for the three Downtown Park scenarios are summarized in **Table ES.2**. The total supply of on-street parking within 5 and 10 minute walking distances from the park are shown in **Figure ES.1**. The 10 minute walking distance generally encompasses all on-street parking in Downtown and Redmond Town Center. In addition to on-street supplies, the Redmond Municipal Campus maintains a total of 608 parking stalls in one structure and multiple surface lots¹. This supply is currently reserved at all times for Municipal Campus visitors, but the City could potentially extend parking privileges to the general public for major events at the Downtown Park. The parking availability data shown in **Table ES.2** was calculated using the supply data combined with utilization information from the *Redmond Parking Strategies Study* (2014) and September 2015 observations of Redmond Downtown parking occupancy, both prepared by Rick Williams Consulting. The excess or deficit of available parking is also shown for each Downtown Park scenario.

¹ Parking supply total exclude spaces in lots reserved for visitors to the King County District Court and the Redmond Regional Library.

TABLE ES.2: PARKING DEMAND AND AVAILABILITY BY SCENARIO

Scenario/Time Period	Maximum Stalls Needed for Attendees (Demand) ^a	Within 5 Minute Walking Distance	Within 10 Minute Walking Distance ^b	
		On-Street and Connector Lot Stalls Available ^c (Excess/Deficit Based on Attendee Need)	On-Street and Connector Lot Stalls Available ^c (Excess/Deficit Based on Attendee Need)	Municipal Campus, On-Street, and Connector Lot Stalls Available ^c (Excess/Deficit Based on Attendee Need)
Typical Weekday (6-7 PM)	110	343 (+233)	583 (+473)	1,024 (+914)
Weekday Night Market (6-7 PM) ^d	405	343 (-62) ^f	583 (+178) ^f	1,024 (+619) ^f
Weekday Night Market (7-8 PM) ^e	405	354 (-51) ^f	608 (+203) ^f	1,093 (+688) ^f
Weekend Concert (1 hour into show)	1,455	135 (-1,320) ^f	228 (-1,227) ^f	728 (-727) ^f

Notes:
a Totals are 15% higher than the "Maximum Total Parking in Use by Event Attendees" reported in Table ES.1 to account for potential unevenness in the number of arrivals and departures (uneven parking turnover) through the course of the hour. This adjusted total provides a more conservative estimate of parking supply needs.
b Parking supply and availability within 10 minutes of the park includes the on-street stalls available within 5 minutes.
c Based on supply and observed occupancy at the time listed (i.e., Availability = Supply – Observed Occupancy)
d Peak hour for background parking demand.
e Peak hour for event parking demand.
f If event program includes street closures on 161st Avenue NE and/or Cleveland Street, available parking supply could be reduced by up to 24 on-street spaces.

The results in **Table ES.2** indicate the following conclusions:

- There is adequate parking supply for the typical weekday scenario within 5 minutes of the park
- There is adequate parking supply within 10 minutes for the weekday night market scenario. However, given that parking demand exceeds supplies within 5 minutes by 62 parking stalls during the 6 to 7 PM event period, there may be the potential for spillover into adjacent private off-street lots and garages. It is recommended that as the night market event grows, the City provide guidance to night market visitors about the availability of on-street and paid off-street parking options (in addition to encouraging walking, biking and transit). Adjacent parking lot owners may need to manage parking at their properties to discourage night market parking if they perceive this to be a problem. However, the City cannot manage parking on private properties.
- Because the weekend concert scenario parking demands would exceed available supplies by 727 stalls, additional dedicated off-street supplies will be needed to accommodate attendees. Additional parking mitigations are presented in **Table ES.3**.

Using the results of the multimodal trip generation and parking supply/demand analyses, transportation impacts were identified for three categories – traffic, pedestrian/bicycle, and parking. **Table ES.3** summarizes the identified impacts, measures that could mitigate the impacts to less-than-significant

levels, and recommendations for additional studies that would refine and finalize the specific mitigation measures.

TABLE ES.3: TRANSPORTATION IMPACTS AND MITIGATIONS SUMMARY

Impact Type	Event Scenario	Impacts	Mitigations <i>For Downtown Park events, organizer should develop an event management plan that includes parking agreements, defines a traffic control plan, and details the implementation of all mitigations listed below.</i>
Traffic	Typical Weekday	Low	Not required
	Weekday Night Market	Low	If pursuing a street closure permit, address access and circulation revisions as part of the traffic control plan.
	Weekend Concert	Traffic congestion during peak periods of attendee ingress/egress.	<ul style="list-style-type: none"> • Provide traffic officers directing at major intersections and parking garage driveways. • Identify and install any temporary traffic control devices (e.g. cones, signs) needed along key ingress/egress routes. The traffic control plan could also request that the City implement temporary modifications to traffic signal timing for the event. • If pursuing a street closure permit, address access and circulation revisions as part of the traffic control plan.
Pedestrian / Bicycle	Typical Weekday	Low	Not required
	Weekday Night Market	Low	Not required
	Weekend Concert	<ul style="list-style-type: none"> • Pedestrian flows in excess of existing intersection crosswalk capacity. • Increased potential for unsafe jaywalking activities. • Event bicycle parking demand would exceed nearby supply. 	<ul style="list-style-type: none"> • Provide traffic officers at key signalized intersections crosswalks. • Provide temporary on-site bicycle parking corral or bicycle valet parking program. • Provide adequate wayfinding near event site. • Pursue street closure permits on nearby streets (such as 161st Avenue Northeast) to improve nonmotorized access and comfort.
Automobile Parking	Typical Weekday	Low	Not required
	Weekday Night Market	Low	Not required
	Weekend Concert	Event parking demand would exceed available public parking supplies.	<ul style="list-style-type: none"> • Enter into agreements with off-street parking supply operators to provide adequate parking supply. • Implement strategies to facilitate parking activities (e.g. website information, real-time updates, carpool matching, wayfinding, etc.). • Consider providing an event shuttle to serve major off-site parking supplies.

SUMMARY OF MITIGATIONS AND RECOMMENDATIONS

Impacts to traffic, pedestrian/bicycle access, and automobile parking would be low for the typical day and weekday night market scenarios, and, accordingly, no mitigations would be required. However, several recommendations were made that could facilitate access and prevent possible conflicts:

- Special event permits should be required for privately-sponsored events. Events should be required to provide an event management plan, including a traffic control plan. If the event requires a street closure permit, the traffic control plan should address any needed access and circulation revisions.
- The added trips for the weekday night market would not have a major impact on traffic operations since the trip distribution patterns are fairly dispersed throughout major downtown ingress and egress routes. However, the City should continue to monitor arrival and departure traffic patterns at similar events (such as the So Bazaar Night Market) to determine if specific transportation management strategies should be considered.
- Even though the bike parking supply is adequate for the weekday night market scenario, the City could consider the use of a temporary on-site bike parking corral for the day of the event. The bike corral could be an incentive for more attendees to bike to the event by providing guaranteed on-site parking in a secure location.
- There is adequate vehicle parking available to meet the weekday night market parking demands within a 10-minute walk of the Downtown Park. However, given the potential for off-street parking spillover, it is recommended that as the night market event grows, the City provide guidance to night market visitors about the availability of on-street and paid off-street parking options (in addition to encouraging walking, biking and taking transit).

Impacts were identified for the weekend concert scenario and could be addressed through several proposed mitigation measures. These weekend concert impacts and mitigations are listed below and summarized in **Table ES.3**.

- Special event permits should be required for privately-sponsored events. Events should be required to provide an event management plan, including a traffic control plan.
- The weekend concert is expected to generate a substantial number of vehicle trips both in the one hour before and after the concert, creating the potential for traffic impacts during the peak periods of event ingress and egress. These impacts could be mitigated by providing traffic control officers at major intersections and garage driveways and by implementing temporary traffic control along key routes. It is recommended that an event transportation management plan be developed once probable parking lot commitments are finalized.

- Traffic control officers and wayfinding signage may be necessary at key crossing points to accommodate the sharp spike in pedestrian crossing demand and discourage unsafe jaywalking activities. Because no current commitments between the City/event organizer and off-street parking owners have been made, key pedestrian egress routes that may need control officers and/or wayfinding have not yet been established. It is recommended that an event transportation management plan be developed by the event organizer once probable parking lot commitments are finalized.
- The proposed on-site and nearby bike parking would not be enough to serve the volume of attendees arriving by bike, and the event organizer should accommodate this demand on-site and ensure that bicycles are not parked inappropriately (e.g., blocking access, on private property, etc.). For example, the organizer could provide a temporary on-site bike parking corral or a bicycle valet parking program for the day of the event.
- The high parking demand for the weekend concert would exceed available City-owned supplies. The event organizer should pre-arrange agreements that would provide an adequate parking supply (1,455 total stalls available to attendees) and implement strategies to facilitate parking activities. Parking facilitation strategies could include the provision of information on an event website, real-time parking lot capacity updates, carpool matching services, and temporary wayfinding signage, among others. If proposed event parking supplies are located beyond the 10-minute walking buffer shown in **Figure ES.1**, the organizer should consider providing a shuttle to serve major off-site lots.

INTRODUCTION AND BACKGROUND

This report documents the results of a transportation impact analysis of the proposed development of the Downtown Park in Redmond. Potential traffic, parking, and pedestrian/bicycle impacts are discussed for three types of events in the park: typical weekday use, a weekday night market event, and a weekend midday concert. Potential mitigating measures and direction for more detailed study are also described to reduce the extent of potential impacts.

DOWNTOWN PARK BACKGROUND

The Redmond Downtown Park is a vital part of creating a livable community in a regional growth center that is experiencing a notable expansion of urban density. The two-acre "Downtown Park" is essential to ensuring a high quality of life in Downtown and will be a significant destination and landmark for the entire city.

The park will provide a critical new public open and green space that will serve as a daily gathering place for the neighborhood and an event and performance space for the entire community on special occasions. The master plan concept for the park is based on having areas suitable for accommodating both large events as well as smaller, more intimate gatherings. Development of the master plan included an extensive community input process that shaped the uses and layout planned for the park.

The site selected for the Downtown Park met the project requirements for an urban park, and addressed citizen input related to transportation in the following ways: it is close to transit centers; there are many opportunities for pedestrian access to the site; it is an easy walk to key downtown attractions including Redmond Town Center, the Redmond Central Connector and the Sammamish River Trail; street parking is available adjacent to the park; and it is in the middle of many high density mixed-use developments. Timing was ideal for site selection as multiple public projects in this area were coordinated, creating a well-orchestrated system of street, pedestrian and park improvements in the heart of the downtown urban center.

As an urban park there are certain expectations about how it will function that are different than a typical suburban park. For example, with the large number of residential units nearby it is expected that many visitors on a typical day will simply walk to the park. With an existing transit center close by, and a light rail station planned about one block away, access by transit will be possible for many visitors. Finally, as parking needs and demands change, there is an expectation that there will be more creative parking

arrangements between private land owners to allow shared parking, as well as arrangements by the City of Redmond and other event organizers to address parking needs during special events of certain sizes.

STUDY BACKGROUND

This transportation impact analysis is being prepared in conjunction with the development of design plans for the Downtown Park. The Downtown Park is located between Redmond Way and Cleveland Street east of 161st Avenue NE in Downtown Redmond.

As part of this initial analysis, Fehr & Peers has prepared the following evaluations:

- Multi-modal trip generation
- Vehicle Trip distribution
- Parking generation
- Parking distribution
- Discussion of potential impacts, mitigating measures, and directions for additional study

These evaluations were performed for the following scenarios, which are described in detail in the next section:

- Typical weekday use
- Weekday night market
- Weekend mid-day concert

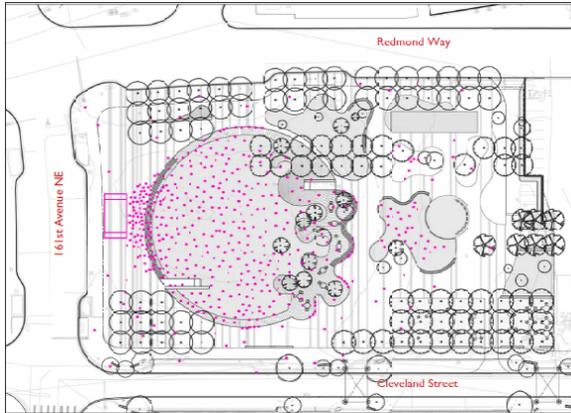
ANALYSIS SCENARIOS

The Redmond Downtown Park Master Plan defines six different event scenarios that could occur as part of the regular programming schedule for the Downtown Park. Event attendance figures for these scenarios include both those present due to the event and those coincidentally using the park at the time of the event.

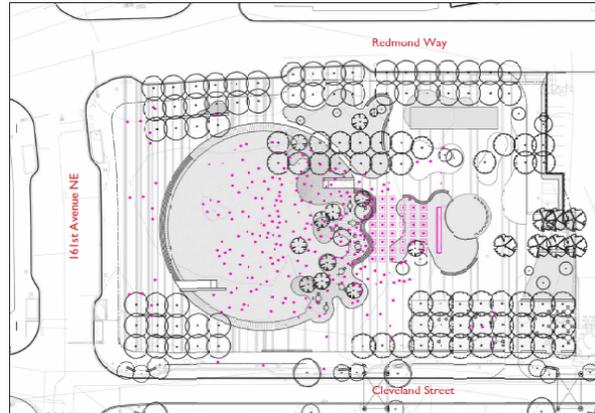
1. **Weekend Concert, standing crowd** – peak attendance of 2,700 people in late afternoon or early evening
2. **Weekend Concert, seated crowd** – peak attendance of 2,160 people in late afternoon or early evening
3. **Weekend Concert, with stage on 161st Avenue** – peak attendance of 3,200 people in late afternoon or early evening. Event would include the closure of 161st Avenue between Cleveland Street and Redmond Way as well as the possible closure of a portion of Cleveland Street east of 161st Street to create room for more event space and pedestrian movement.
4. **Weekday Night Market** – Up to 1,000 attendees at event peak time (7 – 8 PM) and as many as 3,000 total attendees during the course of the event. Event could include the closure of 161st Avenue between Cleveland Street and Redmond Way as well as Cleveland Street east of 161st Street.
5. **Weekend Christmas Market** – Up to 750 attendees at event peak time (7 – 8 PM) and as many as 2,000 total attendees during the course of the event. Event could include the closure of Cleveland Street east of 161st Street.
6. **A Weekday in the Park (Typical Weekday)** – Represents the typical summer weekday usage of the park. Approximately 200 total park users during the peak of activity.

These scenarios represent a range of activity in the park that would be expected throughout the year and illustrate the types of transportation impacts that can be expected for events of varying intensities. In general, the less intensive (i.e., lower attendance) activities will occur more frequently than the higher-intensity activities. Visual representations and anticipated characteristics of these scenarios are illustrated in **Figure 1**.

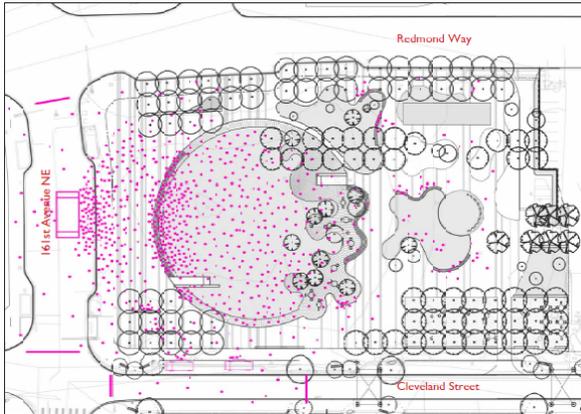
Figure 2 Programmed Event Scenarios



Weekend Standing Crowd - 2,700 people
 - 26,000sf within viewing area
 - 2,600people, 10sf per person in viewing area
 - 100 people outside viewing area



Weekend Seated Crowd - 2,160 people
 - 30,700sf, 13sf per person



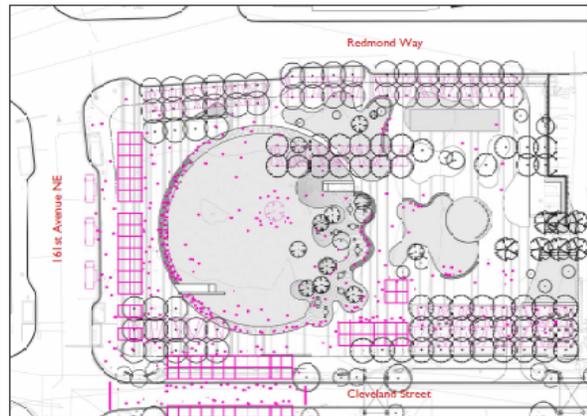
Weekend Concert Performance with Stage on 161st - 3,200 people
 - Stage 20'x16'
 - 31,000sf within viewing area
 - 3,100 people, 10sf per person in viewing area
 - 100 people outside viewing area



A Weekday in the Park - Approximately 200 people
 - 17,000sf lawn - 150sf per person = 113 people estimated
 - 2,800sf splash pad - 20-30 children estimated
 - 25 Tables with 50 chairs - 2/3 occupied = 33 people estimated



Weekday Night Market
 - 120 stalls, 10'x10' each
 - 3 food trucks, 24.4'x7.3' each
 - Up to 3,000 people through course of event
 - Up to 1,000 people at event peak time (7-8pm)



Weekend Christmas Market
 - 79 stalls, 10'x10' each
 - 3 food trucks, 24.4'x7.3' each
 - Up to 2,000 people through course of event
 - Up to 750 people at event peak time (7-8pm)

SIMILARITY OF EVENT SCENARIOS

Based on conversations with City of Redmond Staff and PFS Studio (the consultant firm designing the Downtown Park), it was determined that transportation conditions for certain event programs were similar enough that the total number necessary of scenarios for the transportation impact analysis could be reduced from six to three. The three weekend concert event scenarios would be fairly similar with regard to attendee arrival/departure patterns and background travel demand. For this reason, a single weekend concert event scenario was analyzed assuming the “worst-case” attendance estimate of 3,200 and the closure of 161st Avenue for event activities. Likewise, because the total attendance and weekday background traffic conditions would be more intensive for the weekday night market compared to the weekend Christmas market, only the night market was analyzed. The consolidation of the six event scenarios into the three “worst-case” analysis scenarios is summarized in **Table 1**.

TABLE 1: ANALYSIS SCENARIO CONSOLIDATION			
Event Scenario	Consolidated “Worst Case” Event Scenario for Analysis	“Worst-Case” Peak Attendance	“Worst-Case” Cumulative Attendance
Typical Weekday	Typical Weekday	200	n/a ^a
Weekday Night Market	Weekday Night Market	964	3,000
Weekend Christmas Market			
Weekend Concert, standing crowd	Weekend Concert, with stage on 161st Avenue	3,200	3,368
Weekend Concert, seated crowd			
Weekend Concert, with stage on 161st Avenue			
Notes: a Cumulative attendance not estimated.			

TYPICAL WEEKDAY

For much of the year, the Downtown Park will function as an “unprogrammed” space with no planned special events. Under these conditions, the park will serve as a space for residents, visitors, and employees in the area to gather and recreate. To understand the types of uses

Figure 3 Typical Weekday Scenario



A Weekday in the Park - Approximately 200 people
 - 17,000sf lawn - 150sf per person = 113 people estimated
 - 2,800sf splash pad - 20-30 children estimated
 - 25 Tables with 50 chairs - 2/3 occupied = 33 people estimated

that could occur on a typical day, a report that evaluated activity in Bellevue's Downtown Park was reviewed.² While Bellevue's Downtown Park is much larger (18.5 acres compared to 2 acres), both parks are located within relatively dense urban areas with a mix of employment, retail, and residential uses. Based on the Bellevue observations, the park attracts a mix of people participating in group activities (exercise classes, sports) and individual activities (resting, jogging, reading). According to the study, there are approximately 216 people in the Bellevue Downtown Park during a typical summer (June-August) PM peak hour. Note that the Redmond Downtown Park layout shown for this scenario in **Figure 2** identifies a peak usage of approximately 200 people under typical daily conditions, which is of similar scale to the observed summer usage of the much larger Bellevue Downtown Park. For this reason, the Redmond Downtown Park typical day peak hour usage estimate of 200 people can be considered conservative with respect to the assessment of transportation needs.

WEEKDAY NIGHT MARKET

In the summer of 2014, the Redmond Parks Department developed the "So Bazaar" event. This evening event blended an arts and crafts market, beer/wine garden, food trucks, and on-stage performances. Each night market drew about 1,500-1,800 people during the three weeks they were staged. An expanded version (with attendance of up to 3,000) of the weekday night market was selected as the most intensive event that would occur on a weekday for evaluation in this study, as shown in **Figure 3**. In terms of overall attendance expectations for buildout of the Downtown Park, this is a large-to-mid-sized event. It anticipated that the night market could be held once per week for several weeks during the summer. As part of the event, street closures could occur on 161st Avenue NE and/or Cleveland Street, resulting in a temporary loss of up to 24 on-street parking spaces.



Figure 4 Weekday Night Market Scenario



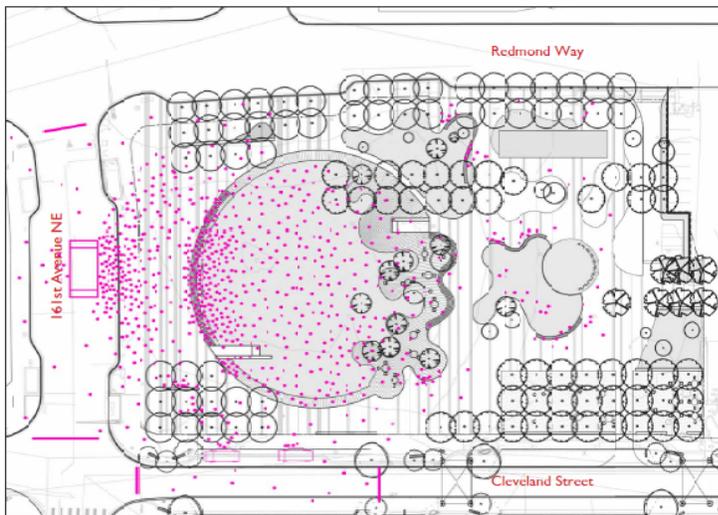
- Weekday Night Market**
- 120 stalls, 10'x10' each
 - 3 food trucks, 24.4'x7.3' each
 - Up to 3,000 people through course of event
 - Up to 1,000 people at event peak time (7-8pm)

² Bellevue Downtown Park Parking Study, Gibson Traffic Consultants, October 2013

WEEKEND CONCERT

The most intense use of the park evaluated is a concert event. Based on discussions with the Parks Department, large concerts would only be held on weekends, when more parking is available and less traffic is present in Downtown. For the purposes of this study, a midday concert was selected for evaluation since traffic counts collected by the Transportation Department indicate that weekend traffic peaks between noon and 2 PM, and observations performed in September 2015 suggest that Saturday parking availability (both on and off street) is lowest at 1 PM. The anticipated peak attendance of the concert is 3,200 people, as shown in **Figure 4**, and could be held 2-3 times a year. As part of the event, street closures could occur on 161st Avenue NE and/or Cleveland Street, resulting in a temporary loss of up to 24 on-street parking spaces.

Figure 5 Weekend Concert Scenario



- Weekend Concert Performance with Stage on 161st - 3,200 people
- Stage 20'x16'
- 31,000sf within viewing area
- 3,100 people, 10sf per person in viewing area
- 100 people outside viewing area

TRIP GENERATION AND PARKING DEMAND

Given the distinct nature of the analysis scenarios, separate trip generation and parking demand calculations were performed for each. The trip generation analysis includes trips generated by vehicles (single-occupancy vehicles and high-occupancy/carpool vehicles) and other modes, such as walking, biking, and transit. The trip generation and parking demand assumptions and methodologies are described below.

TYPICAL WEEKDAY

To determine the number of daily and PM peak hour³ trips generated during typical weekday by an urban park like the proposed Downtown Redmond Park, several sources were considered:

- Institute of Transportation Engineers (ITE), *Trip Generation Manual*, 9th Edition
- San Diego Association of Governments, *Trip Generators*
- City of Bellevue, *Bellevue Downtown Park Parking Study*⁴
- Master Plan estimate of weekday usage, as shown in **Figure 2** (200 total persons)

After a thorough review, it was determined that the trip generation rates in the ITE and San Diego studies were not appropriate for an urban park since the unit of analysis either did not make sense (e.g., trips per picnic site, trips per employee). However, the summer day trip generation total for the existing Downtown Bellevue Park (3,500 trips) and acreage (18.5 acres) can be used to approximate a maximum daily vehicle trip generation rate of 189 trips per acre. Using this rate, a daily vehicle trip generation total of 378 can be estimated for the Redmond Downtown Park (2 acres).

While Bellevue has an estimate of daily park trips, the Bellevue study does not have an estimate of the number of trips during the PM peak hour of 5-6. To estimate the PM peak hour trip generation, observations from the Downtown Bellevue Park Parking Study were considered. As part of this study, PM peak hour park utilization was recorded (number of people observed in the park). Based on data in the Downtown Bellevue Park Parking study, during a typical summer (June-August) PM peak hour, there are approximately 216 people in the park. By comparison, the Redmond Downtown Park layout shown in **Figure 2** identifies a peak usage of approximately 200 people under typical daily conditions, which is of

³ Evening peak-hour (5-6 PM) trip generation was calculated since this time has the peak traffic generation.

⁴ Similar to the Redmond Downtown Park, the Bellevue Downtown Park is an urban park that serves as both a daily gathering and recreational space for the neighborhood and as a special events space for the entire community.

similar scale to the observed summer usage of the much larger Bellevue Downtown Park. For this reason, a typical day peak hour attendance of 200 people can be considered a reasonable but conservative estimate from which to calculate trip generation for the Redmond Downtown Park.

There is no data in common transportation information sources (ITE documents, travel surveys, PSRC documents) about the average amount of time a person spends in a park, so an assumption of 50 minutes was used for this analysis. A 50 minute duration results in a PM peak hour trip arrival rate of about 240 trips (200 attendees * (60 mins/50 mins)). Assuming an equal number of arrivals and departures, this translates into 480 total person trips generated in the PM peak hour.

To convert person trips into vehicle trips, the following factors were used:

- *Percent of people arriving by vehicle: 87%.⁵* The Redmond 2010 Travel Survey Analysis (p 13) indicated that 87% of home-based other trips (which is the trip-purpose category that covers most park trips) are made by vehicle.
- *Average vehicle occupancy: 2.2 persons per vehicle.* This vehicle occupancy is based on the National Household Travel Survey (NHTS) results for recreational trips. This means that on average, each vehicle arriving to the park contains 2.2 persons.
- *Bike mode share: 3%.* According to the Redmond 2010 Travel Survey Analysis (p 13), 1% of all daily trips in Redmond are made by bike. To account for the possibility that Downtown Park visitors will have a higher than average tendency to arrive by bike, we assumed that bike trips would comprise about 3% of all trips (23% of all non-automobile trips). This higher mode share assumption allows for a more conservative estimate of bike parking needs.

Based on these assumptions, **Table 2** summarizes the PM peak hour trip generation for the typical weekday scenario. The total arrivals by vehicle and bike also provide rough estimates of the maximum parking requirements for each mode.

TABLE 2: PM PEAK HOUR TRIP GENERATION FOR TYPICAL DAY SCENARIO			
Total Person Trips	Vehicle Trips (2.2 persons/vehicle trip)	Person Trips by Other Mode (Pedestrian, Bike, Transit)	Bike-Only Person Trips^a
480 : 240 arrivals and 240 departures	190 : 95 arrivals and 95 departures	62 : 31 arrivals and 31 departures	14 : 7 arrivals and 7 departures
a Approximately 3% of all trips.			

⁵ Given the large number of apartments and businesses that are within walking or bicycling distance of the downtown park, this estimate of the number of people that may arrive by car is likely a high estimate. However, to present a conservative (higher) estimate of the potential traffic generation from this event, the citywide average was used.

WEEKDAY NIGHT MARKET

The City of Redmond Parks Department provided Fehr & Peers with hourly attendance and crowd observations from the three night market events held during August 2014. We used this information, scaled up to reflect a larger event, to estimate trip generation for the night market scenario. In this section, we summarize both the hour-by-hour trip generation for the span of the event, including the commute traffic PM peak hour (5-6) and the peak event hour (7-8 PM).

Table 3 summarizes how person trip generation was estimated using observed headcount and attendance data:

TABLE 3: METHOD FOR ESTIMATING TRIP GENERATION FOR NIGHT MARKET USING OBSERVED DATA FROM AUGUST 2014					
Time Period	Attendance (cumulative)^a	Headcount at end of period^a	Arrivals^b	Departures^c	Total Estimated Person Trips
5-6 PM	200	185	200	15	215
6-7 PM	713	467	513	231	744
7-8 PM	1,249	502	536	501	1,037
8-9 PM	1,659	408	410	504	914
9-10 PM	1,692	0	33	441	474

Notes:
a Based on observations taken on August 14, 2014 at So Bazaar Night Market
b Based on cumulative attendance (net increase in attendance during each hour)
c Difference between the arrivals + prior period's headcount and the headcount at the end of the hour

Scaling the trip generation to the expected maximum cumulative attendance (3,000) and focusing on the PM peak and event peak hours results in the following:

TABLE 4: NIGHT MARKET SCENARIO PERSON TRIP GENERATION			
Time Period	Arrivals	Departures	Total Person Trips
5-6 PM – <i>PM Peak Hour</i>	355	27	382
6-7 PM	910	410	1,320
7-8 PM – <i>Peak Hour of Event</i>	950	888	1,838
8-9 PM	727	894	1,621
9-10 PM	59	782	841

To determine trip generation by mode, the assumptions below were applied. Results are summarized in **Table 5**.

- *Percent of people arriving by vehicle: 87%*. Based on the Redmond 2010 Travel Survey Analysis (p 13) results for home-based other trips.
- *Average vehicle occupancy: 2.2 persons per vehicle*. This vehicle occupancy is based on the National Household Travel Survey (NHTS) results for recreational trips. This means that on average, each vehicle arriving to the park contains 2.2 persons.
- *Bike mode share: 3%*. According to the Redmond 2010 Travel Survey Analysis (p 13), 1% of all daily trips in Redmond are made by bike. To account for the possibility that Night Market visitors will have a higher than average tendency to arrive by bike, we assumed that bike trips would comprise about 3% of all trips (23% of all non-automobile trips). This higher mode share assumption allows for a more conservative estimate of bike parking needs.

TABLE 5: TRIP GENERATION BY MODE FOR NIGHT MARKET SCENARIO			
Time Period	Total Person Trips	Vehicle Trips (2.2 persons/vehicle trip)	Person Trips by Other Modes (Pedestrian, Bike, Transit)
5-6 PM – <i>PM Peak Hour of Travel</i>	382	151 : 140 arrivals and 11 departures	50 : 46 arrivals and 4 departures
6-7 PM	1,320	522 : 360 arrivals and 162 departures	171 : 118 arrivals and 53 departures
7-8 PM – <i>Peak Hour of Event</i>	1,838	727 : 376 arrivals and 351 departures	239 : 124 arrivals and 115 departures
8-9 PM	1,621	641 : 287 arrivals and 354 departures	211 : 95 arrivals and 116 departures
9-10 PM	841	331 : 23 arrivals and 308 departures	110 : 8 arrivals and 102 departures

Using the arrival and departure estimates in **Table 5**, we calculated the total vehicle and bike parking that would be needed by attendees for each hour of the event. This was calculated as the total parking occupied by event attendees in the previous hour, plus the arrivals, and minus the departures. The highest parking-need total for any single hour during the event represents the total amount of available parking (vehicle or bike) required to accommodate event attendees. The maximum in-use parking total for the night market would occur between 7 and 8 PM, with a total of 352 vehicle parking stalls and 27 bike parking places needed for attendees. Results of this calculation are summarized in **Table 6**.

TABLE 6: NIGHT MARKET PARKING DEMAND

Time Period	Vehicle Trip and Parking Demand			Bike Trip and Parking Demand ^a		
	Arrivals	Departures	Parking needed by Attendees	Arrivals	Departures	Parking needed by Attendees
5-6 PM – PM Peak Hour of Travel	140	11	129	11	1	10
6-7 PM	360	162	327	27	12	25
7-8 PM – Peak Hour of Event	376	351	352	29	27	27
8-9 PM	287	354	285	22	27	22
9-10 PM	23	308	0	2	24	0

Notes:
Maximum event parking demand shown in **bold**, occurring between 7 and 8 PM.
a Approximately 3% of all trips.

WEEKEND CONCERT

A similar methodology to the night market analysis was used to estimate the trip generation of the weekend concert scenario. Concert arrival and departure patterns were based on a review of the Seattle Arena EIS and *Managing Travel for Planned Special Events* (FHWA, September 2003). The assumed arrival and departure rates are shown in **Table 7**.

TABLE 7: ASSUMED ARRIVAL AND DEPARTURE RATES FOR THE CONCERT SCENARIO

Time Period	Arrival Rate	Departure Rate
3 hours before start	8%	0%
2 hours before start	15%	0%
1 hour before start	50%	1%
At start	25%	3%
1 hour into show	2%	1%
2 hours into show	0%	10%
End of show (3rd hour)	0%	70%
1 hour after show	0%	10%
2 hours after show	0%	5%

Using the assumptions below, the trip generation rates by mode can be calculated, as shown in **Table 8**.

- *Percent of people arriving by vehicle: 87%*. Based on the Redmond 2010 Travel Survey Analysis (p 13) results for home-based other trips.
- *Average vehicle occupancy: 2.2 persons per vehicle*. This vehicle occupancy is based on the National Household Travel Survey (NHTS) results for recreational trips. This means that on average, each vehicle arriving to the park contains 2.2 persons.

- *Bike mode share: 3%.* According to the Redmond 2010 Travel Survey Analysis (p 13), 1% of all daily trips in Redmond are made by bike. To account for the possibility that concert attendees will have a higher than average tendency to arrive by bike, we assumed that bike trips would comprise about 3% of all trips (23% of all non-automobile trips). This higher mode share assumption allows for a more conservative estimate of bike parking needs.

TABLE 8: TRIP GENERATION BY MODE FOR CONCERT SCENARIO

Time Period	Total Person Trips	Vehicle Trips (2.2 persons/vehicle trip)	Person Trips by Other Modes (Pedestrian, Bike, Transit)
3 hours before start	269	107 : all arrivals	35 : all arrivals
2 hours before start	505	200 : all arrivals	66 : all arrivals
1 hour before start	1,718	679 : 666 arrivals, 13 departures	223 : 219 arrivals, 4 departures
At start	943	373 : 333 arrivals, 40 departures	123 : 109 arrivals, 13 departures
1 hour into show	101	40 : 27 arrivals, 13 departures	13 : 9 arrivals, 4 departures
2 hours into show	337	133 : all departures	44 : all departures
End of show (3rd hour)	2,358	932 : all departures	306 : all departures
1 hour after show	337	133 : all departures	44 : all departures
2 hours after show	168	67 : all departures	22 : all departures

Using the arrival and departure estimates in **Table 8**, we calculated the total vehicle and bike parking that would be needed by attendees for each hour of the event. This was calculated as the total parking occupied by event attendees in the previous hour, plus the arrivals, and minus the departures. The highest parking-need total for any single hour during the event represents the total amount of available parking (vehicle or bike) required to accommodate event attendees. The maximum in-use parking total would occur 1 hour into the concert, with a total of 1,265 vehicle parking stalls and 104 bike parking places occupied. Results of this calculation are summarized in **Table 9**.

TABLE 9: PARKING DEMAND

Time Period	Vehicle Trip and Parking Demand			Bike Trip and Parking Demand ^a		
	Arrivals	Departures	Parking needed by Attendees	Arrivals	Departures	Parking needed by Attendees
3 hours before start	107	0	107	9	0	9
2 hours before start	200	0	306	16	0	25
1 hour before start	666	13	959	55	1	79
At start	333	40	1252	27	3	103
1 hour into show	27	13	1,265	2	1	104
2 hours into show	0	133	1,132	0	11	93
End of show (3rd hour)	0	932	200	0	77	16
1 hour after show	0	133	67	0	11	5
2 hours after show	0	67	0	0	5	0

Notes:
Maximum event parking demand shown in **bold**, occurring 1 hour into the show.
a Approximately 3% of all trips.

TRIP GENERATION AND PARKING DEMAND SCENARIO SUMMARY

Table 10 summarizes the peak hour trip and parking generation results for all three analysis scenarios.

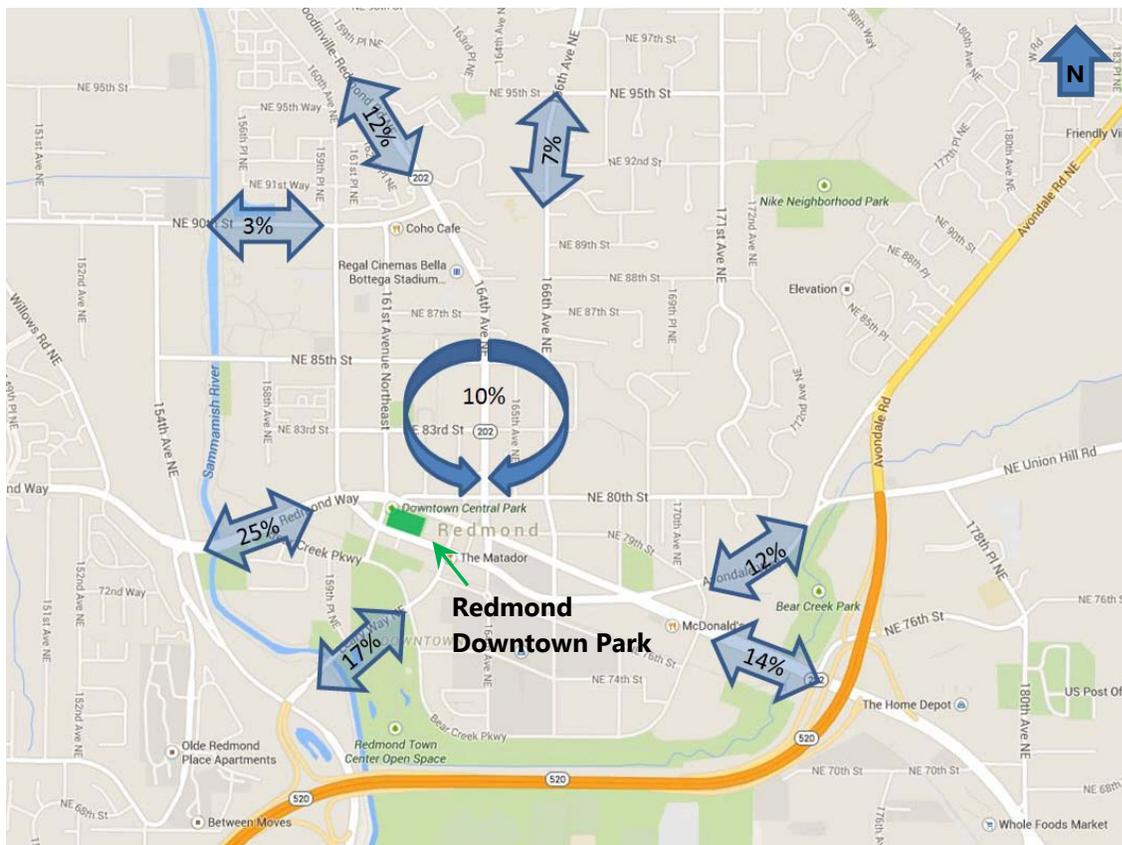
TABLE 10: PEAK HOUR TRIP GENERATION AND PARKING DEMAND FOR ALL SCENARIOS					
Scenario/Time Period	Total Person Trips	Vehicle Trips (2.2 persons/vehicle trip)	Person Trips by Other Modes (Pedestrian, Bike, Transit)	Total Parking Needed by Event Attendees	
				Vehicle	Bike
Typical Weekday/5-6 PM	480	190 : 95 arrivals and 95 departures	62 : 31 arrivals and 31 departures	95	7
Weekday Night Market/7-8 PM	1,839	727 : 376 arrivals and 351 departures	239 : 124 arrivals and 115 departures	352	27
Weekend Concert/1 Hour into Show ^a	101	40 : 27 arrivals and 13 departures	13 : 9 arrivals and 4 departures	1,265	104
Weekend Concert/End of Show ^a	2,358	932 : all departures	306 : all departures	200	16
a Maximum occupancy represents conditions 1 hour into the show, when the event is at peak attendance. The estimated total amount of parking occupied by concert attendees at the end of show (3rd hour of event) is lower due to early departures.					

As shown, the night market and weekend concert scenarios generate a substantial number of vehicle trips and trips by other modes at their peak times. The next section describes how the vehicle trips are expected to be distributed. A later section describes the potential for traffic and pedestrian/bicycle circulation impacts from these events.

VEHICLE TRIP DISTRIBUTION

This section summarizes where trips to and from the Downtown Park are expected to go. This pattern of trips is known as trip distribution and the distribution pattern is based on output from the Redmond Travel Demand Model.⁶ **Figure 5** summarizes the trip distribution pattern expected for the Downtown Park. As shown, trips are fairly evenly distributed to the major roads leading to/from the park with the highest proportions being on Redmond Way east and west of downtown, and Leary Way heading toward SR 520. It should be noted that these model distribution patterns take into account the Downtown Two-Way Street Conversion project, which will change Redmond Way and Cleveland Street from one-way to two-way operations and is expected to be complete in 2017 ahead of the Downtown Park opening. These traffic patterns could be used to inform any strategies for managing traffic for Downtown Park events with significant peaks in vehicle arrivals and departures, such as the weekend concert scenario.

Figure 6 Trip Distribution Patterns



⁶ The Redmond Travel Demand Model outputs vehicle trip distribution patterns. This pattern is reasonable for the Night Market and Concert scenarios. The Typical Weekday scenario, which has a higher assumed walk/bike mode share would have a higher proportion of trips from within downtown Redmond.

PARKING SUPPLY COMPARED TO DEMAND

In compliance with the Growth Management Act, the City is committed to creating a denser downtown that also meets the community's desire for great urban spaces. With a combination of distinctive elements and a focus on arts and cultural events, the Downtown Park will have a unique urban flavor unlike any other in Redmond. The adopted master plan for the park proposed no dedicated off-street parking within the compact two-acre site so that the maximum space can be devoted to creating a dynamic community asset.

This section summarizes the expected parking demand and available supply for the three Downtown Park scenarios. Parking demand was calculated in conjunction with trip generation by mode in the prior section. Parking supply and utilization data were obtained from the *Redmond Parking Strategies Study* (2014) and September 2015 observations of Redmond Downtown parking occupancy, both prepared by Rick Williams Consulting.

PARKING SUPPLY

The Downtown Park has been envisioned and designed as an urban public space and therefore has no dedicated off-street parking supply. A total of 900 public on-street stalls are located within a 10 minute walk of the park according to the 2014 *Redmond Parking Strategies Study*. On-street stalls have time restrictions that range from 1-3 hours (unless a vehicle has a permit); these time restrictions are enforced Monday through Friday from 9 AM to 5 PM, excluding holidays. For this study, the time limits on parking were not considered because the assumed duration of typical weekday park use was less than 1 hour and the night market and concert events occur outside of the hours when time limits are enforced.

Note that there are a number of off-street paid parking lots available in Downtown Redmond that can accommodate Downtown Park users, including the 92 stall Redmond Central Connector parking lot at the corner of Leary Way and Bear Creek Parkway⁷. Other privately-owned paid parking lots and garages are available to the public on nights and weekends only. A map of existing on-street and off-street parking supplies in downtown Redmond that would be available to Downtown Park visitors arriving by automobile is provided in **Appendix A**.

⁷ As of April 2016, the Redmond Central Connector parking lot operates as pay-to-park on Monday to Friday from 9 AM to 7 PM. During this time, it is free to park for up to 4 hours and \$5 to park for more than four hours. There is no charge on weekends.

In addition to the paid off-street lots, the Redmond Municipal Campus maintains a total of 608 parking stalls in one structure and multiple surface lots⁸. This supply is currently reserved at all times for Municipal Campus visitors, but the City could potentially extend parking privileges to the general public for major events at the Downtown Park (this is the current practice for major downtown events, including Derby Days and Redmond Lights). According to data collected in 2014, more than half of all Campus parking is vacant after 5 PM on weekdays, and over three-quarters after 7 PM, indicating that some amount of Campus parking could be readily allotted to Downtown Park events (*Redmond Parking Strategies Study*, 2014).

BACKGROUND PARKING UTILIZATION

The *Redmond Parking Strategies Study* evaluated on-street parking utilization during the course of the day, which allowed us to evaluate parking demand relative to the available (unused) on-street supply at different times of the day. **Figure 6** shows the on-street utilization patterns for a typical weekday. Downtown Redmond shows a common parking demand pattern for mixed-use areas with parking demand peaking in the midday, then dropping off with a small peak in the early evening associated with restaurants/bars. **Figure 7** shows comparative weekend utilization data for on-street parking, as collected between the hours of 11 AM and 2 PM in September 2015. These observations indicate that on-street parking in Downtown Redmond is more consistently occupied on weekends compared to weekdays, possibly because time limit and residential permit parking restrictions are lifted on Saturdays. At the same time, most public and private off-street lots are far less utilized on Saturday compared to the typical weekday. For this reason, city-owned parking lots, including the Redmond Central Connector and Municipal Campus lots, were included in the assessment of available event parking supply.

⁸ Parking supply total exclude spaces in lots reserved for visitors to the King County District Court and the Redmond Regional Library.

Figure 7 Downtown Weekday On-Street Parking Utilization Rates

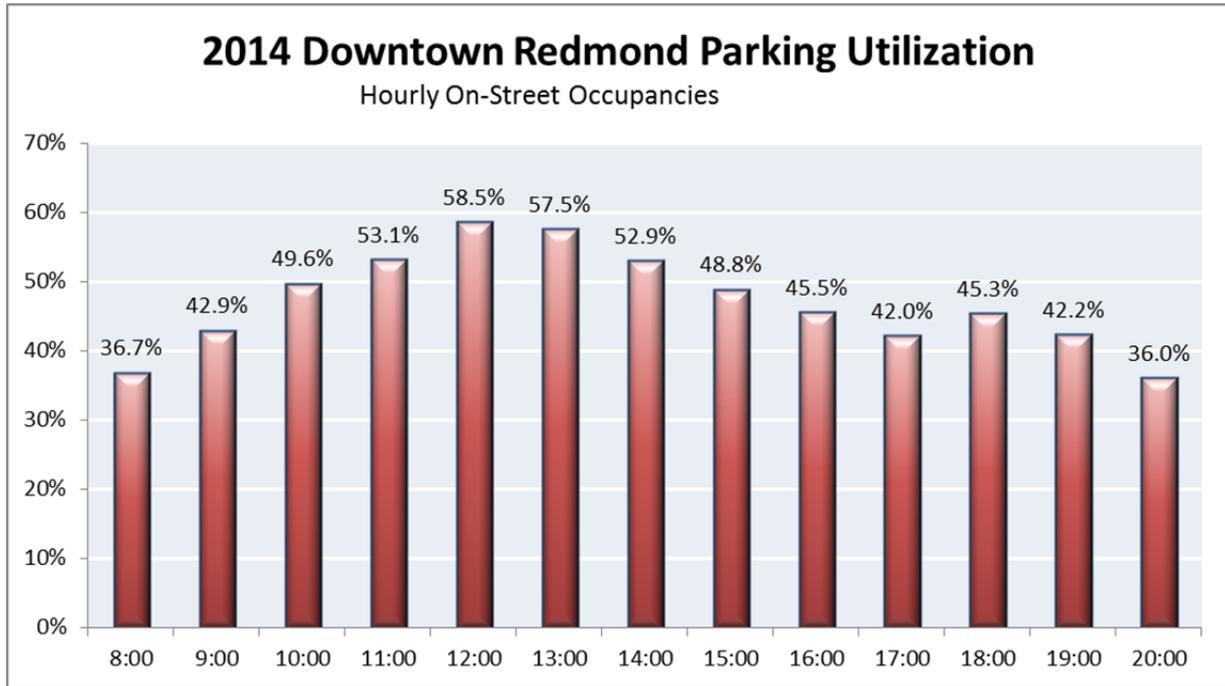
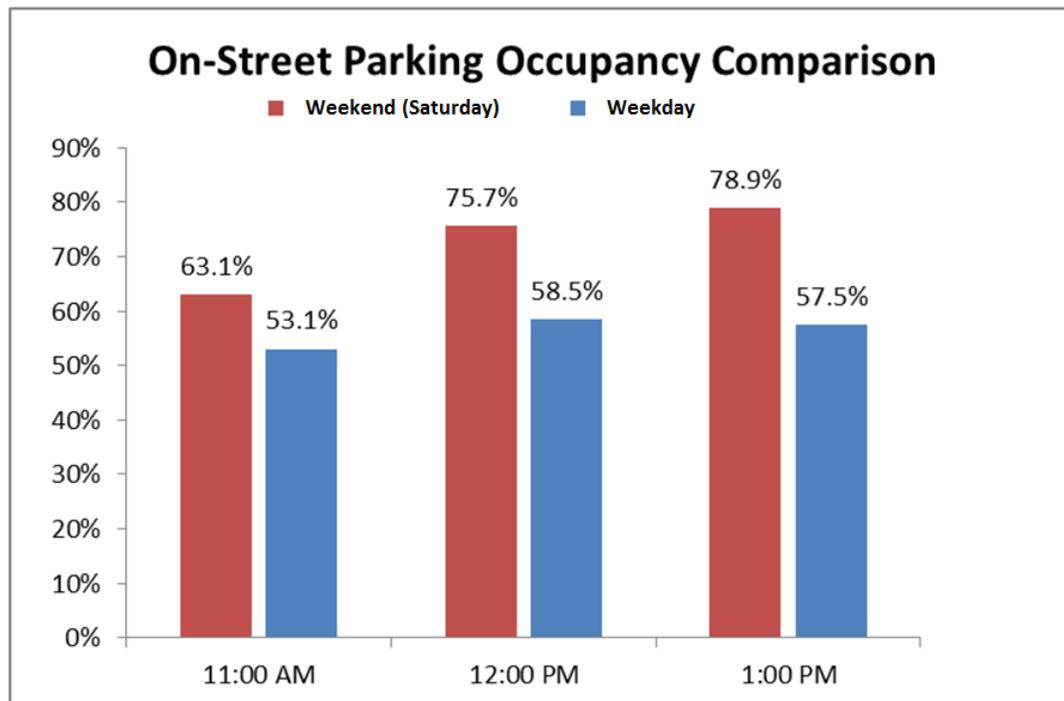


Figure 8 Downtown On-Street Parking Utilization Rates – Weekend Compared to Weekday



Source: Rick Williams Consulting, Downtown Park Parking Assessment Memorandum (September, 2015)

Table 11 summarizes the vehicle parking demand and availability for the three event scenarios. Parking demand is presented in terms of the maximum number of parking spaces that are required to accommodate event attendees at any point over the course of the event. A “turnover factor” is included because we only have parking demand/utilization data on an hourly basis and a parking arrival could occur before a parking departure during the hour. To account for the potentially asymmetrical distribution of event arrivals and departures over the course of an hour, parking demand was factored up by 15 percent to provide a conservative assessment of parking needs.

Parking demand for the typical weekday and night market scenarios are presented for the 6-7 PM period, since that period represents the highest afternoon/evening utilization for background parking demand. The night market scenario demand is also summarized for the 7-8 PM period, which represents the peak parking demand for the event. The peak parking demand for the concert scenario is presented for one hour into the show, after nearly all attendees would have arrived and before many would begin to leave. The peak concert parking demand is compared to weekend Downtown parking availability at 1 PM, the peak period for on-street occupancies. This presents a worst case scenario of the available weekend parking supply compared to demand. Depending on the scheduled concert start time, the actual available public parking supply could be higher.

Scenario/Time Period	Maximum Stalls Needed for Attendees (Demand) ^a	Within 5 Minute Walking Distance	Within 10 Minute Walking Distance ^b	
		On-Street and Connector Lot Stalls Available ^c (Excess/Deficit Based on Attendee Need)	On-Street and Connector Lot Stalls Available ^c (Excess/Deficit Based on Attendee Need)	Municipal Campus, On-Street, and Connector Lot Stalls Available ^c (Excess/Deficit Based on Attendee Need)
Typical Weekday (6-7 PM)	110	343 (+233)	583 (+473)	1,024 (+914)
Weekday Night Market (6-7 PM) ^d	405	343 (-62) ^f	583 (+178) ^f	1,024 (+619) ^f
Weekday Night Market (7-8 PM) ^e	405	354 (-51) ^f	608 (+203) ^f	1,093 (+688) ^f
Weekend Concert (1 hour into show)	1,455	135 (-1,320) ^f	228 (-1,227) ^f	728 (-727) ^f

Notes:

a Totals are 15% higher than the “Maximum Total Parking in Use by Event Attendees” reported in Table ES.1 to account for potential unevenness in the number of arrivals and departures (uneven parking turnover) through the course of the hour. This adjusted total provides a more conservative estimate of parking supply needs.

b Parking supply and availability within 10 minutes of the park includes the on-street stalls available within 5 minutes.

c Based on supply and observed occupancy at the time listed (i.e., Availability = Supply – Observed Occupancy)

d Peak hour for background parking demand.

e Peak hour for event parking demand.

f If event program includes street closures on 161st Avenue NE and/or Cleveland Street, available parking supply could be reduced by up to 24 on-street spaces.

- There is adequate parking supply within 10 minutes for the weekday night market scenario. However, given that parking demand exceeds supplies within 5 minutes by 62 parking stalls during the 6 to 7 PM event period, there may be the potential for spillover into adjacent private off-street lots and garages. Suggestions to mitigate the perceived lack of supply immediately near the park will be presented in the next section.
- Because the weekend concert scenario parking demands would exceed available supplies by nearly 730 stalls, additional dedicated off-street supplies will be needed to accommodate attendees. Recommendations for accommodating this parking demand are presented on page 36.

BICYCLE PARKING SUPPLY AND DEMAND

The Downtown Park design includes 11 inverted “U” bike racks that can be used to park 22 total bikes. The capacity to park an additional 37 bikes already exists within two blocks of the site at the following locations:

- West side of 161st Avenue NE, north of Cleveland Street – 2 racks, **4 bike capacity**
- West side of 161st Avenue NE, south of Cleveland Street – 2 racks, **4 bike capacity**
- South side Cleveland Street, east of 161st Avenue NE – 3 racks, **6 bike capacity**
- North side of Cleveland Street, east of Leary Way NE – 3 racks, **6 bike capacity**
- Redmond Central Connector, near Brown Street pedestrian way – 4 racks, **8 bike capacity**
- South side of Bear Creek Parkway, west of 161st Avenue NE – 1 rack, **2 bike capacity**
- South side of Redmond Way, adjacent to O’Leary Park – 1 rack, **5 bike capacity**
- North side of NE 80th Street, west of Leary Way NE – 1 rack, **2 bike capacity**



Bike racks along the Redmond Central Connector near Brown Street

Because bike parking occupancy data is not readily available, it was assumed that the total on-site supply would be available to Park visitors and that 50 percent of all nearby bike parking (19 spaces) would be occupied by visitors to other Downtown attractions. The remaining 50 percent could then be utilized by Park users and event attendees.

Table 12 summarizes the bike parking demand and availability for the three event scenarios. Parking demand is presented in terms of the maximum number of bike spaces that are required to accommodate event attendees at any point over the course of the event. A “turnover factor” is included for estimating bike parking demand. This factor is included because we only have parking demand data on an hourly basis and a parking arrival could occur before a parking departure during the hour. To account for the imperfect match between supply and demand, bike parking demand was factored up by 15 percent to provide a conservative assessment of parking.

TABLE 12: BIKE PARKING DEMAND AND SUPPLY				
Scenario	Time Period	Total Parking Stalls Needed for Attendees^a	On-Site Bike Parking Capacity (Excess/Deficit Based on Attendee Need)	Total Nearby Bike Parking Capacity^b (Excess/Deficit Based on Attendee Need)
Typical Weekday (PM Peak)	5 – 6 PM	8	22 (+16)	40 (+32)
Weekday Night Market	7 – 8 PM	31	22 (-9)	40 (+9)
Weekend Concert	1 hour into show	120	22 (-98)	40 (-80)
Notes: a Totals are 15% higher than the maximum total bike parking reported in Table 10 to account for potential unevenness in the number of bicyclist arrivals and departures (uneven parking turnover) through the course of the hour. This adjusted total provides a more conservative estimate of bike parking supply needs. b Includes the 22 on-site bike parking spaces and 50% of the existing spaces within two blocks of the Park.				

The available parking supply in **Table 12** is divided into the two categories previously discussed – on-site bike parking at Downtown Park and the total parking supply within two blocks of the park. According to this supply estimate, the bike parking demand under typical weekday and weekday night market conditions should be easily accommodated. However, bike parking demand for the weekend concert would be much higher than the available supply. To meet concert bike parking demand, the Parks Department and Transportation Department or concert promoter could consider installing temporary bike parking areas for the duration of the event. Potential impacts and mitigations are discussed in greater detail in the following section.

IMPACTS AND MITIGATIONS

This section describes potential transportation impacts of the three Downtown Redmond Park event scenarios. The impacts are grouped by type: traffic, pedestrian/bicycle, and parking. Recommendations for potential mitigating measures and additional evaluations are also provided.

TRAFFIC IMPACTS

As shown in the Trip Generation section of this report, the night market and weekend concert scenarios generate a substantial number of trips during their peak trip generation periods (7-8 PM, and after the end of the concert, respectively). The typical weekday scenario does not generate enough vehicle trips to noticeably impact Downtown Redmond traffic conditions.

WEEKDAY NIGHT MARKET

The night market scenario is forecast to generate 151 vehicle trips during the busy 5 – 6 PM period with 140 inbound and 11 outbound trips. These trips will not have a major impact on traffic operations since the trip distribution pattern shown on **Figure 5** is fairly dispersed. Additionally, visitors to the night market are likely to park in a variety of on-street (and potentially some off-street) parking areas, further reducing impacts on any particular intersection.

Event-related traffic would be much higher during the 7 – 8 PM attendance peak hour, including 376 inbound and 351 outbound vehicle trips. However, based on hourly traffic data from major arterials in the Puget Sound Region, the background traffic during the 7 – 8 PM period plus the event traffic would likely be less than the weekday PM commute totals (5 – 6 PM) at intersections within a short distance of the Downtown Park.

It should be noted that not much event-related traffic congestion was observed at the August 20, 2015, So Bazaar Night Market event during the 7 – 8 PM timeframe. The City should continue to monitor arrival and departure traffic patterns at this event to determine if specific transportation management strategies should be considered for similar events.

WEEKEND CONCERT

As shown in **Table 8**, the weekend concert is expected to generate a substantial number of vehicle trips both in the one hour before and after the concert, creating the potential for traffic impacts during the

peak periods of event ingress and egress. While weekend traffic is less heavy than weekday traffic, the concert trips combined with the need to have visitors park in a set of off-street lots may lead to traffic impacts at intersections accessing the major parking facilities. These impacts could be mitigated by providing traffic control officers at major intersections and garage driveways and by implementing temporary traffic control along key routes. While potential off-street parking facilities to accommodate the weekend concert are discussed later in this document, no commitments between the City/event organizer and the parking lot owners have been made, given the preliminary nature of this document. It is recommended that a traffic control plan be developed as part of the event management plan once probable parking lot commitments are finalized. The traffic control plan could also request that the City implement temporary modifications to traffic signal timing for the event.

STREET CLOSURES

Both the night market and weekend concert events could include closures of adjacent streets to create more activity space (e.g. food truck area, stage set-up, etc.) and to allow for safe pedestrian crossings onto adjoining city blocks. The segments of 161st Avenue NE between Cleveland Street and Redmond Way and Cleveland Street east of 161st Avenue NE could be included in these closures (see diagrams to the right). The Downtown Two-Way Street Conversion project, which will change Redmond Way and Cleveland Street from one-way to two-way operations, is expected to be complete in 2017, ahead of the Downtown Park opening. Taking this two-way couplet conversion into account, the potential event street closures should not significantly affect automobile circulation or east-west travel in Downtown Redmond. Any street closure on Cleveland Street would terminate west of Brown Street, maintaining access to the residential parking facilities for the developments on the Park's southern perimeter.



Weekend Concert Performance with Stage on 161st - 3,200 people



Weekday Night Market



PEDESTRIAN AND BICYCLE IMPACTS

As with the prior section, the level of park use during the typical weekday scenario will not generate enough pedestrian or bicycle trips to result in any impacts to pedestrian/bicycle flow, safety, or bicycle parking needs. The proposed on-site bike parking (22 spaces) should more than adequately accommodate demands on a typical weekday. Potential impacts for the other scenarios are described below.

WEEKDAY NIGHT MARKET

As described in the Traffic Impacts section, night market trip generation is relatively low during the 5-6 PM peak hour and no pedestrian or bicycle impacts are expected. However, during the peak period of 7 – 8, there will be a substantial amount of pedestrian trips coming and going to the site, approximately 1,000 per hour. This includes both people who use non-auto modes to access the night market (walkers, transit riders, and off-site bike parkers) and the people walking to and from their cars. Research indicates that the average delay of pedestrians at signalized intersection crossings is not constrained by capacity parameters (i.e. crosswalk width or signal “walk” time), even when pedestrian flow rates reach 5,000 pedestrians per hour (Highway Capacity Manual 2000, p 18-7). On average, crosswalk demands would be lower than 20 pedestrians per signal cycle during the 7 – 8 PM peak activity period⁹. This amount of demand would be easily accommodated within the existing crosswalk widths of the intersections surrounding the Downtown Park site.

As shown in **Table 12**, the peak demand for bicycle parking (31 bicyclists) should be adequately accommodated by the proposed on-site bike parking and the existing bike parking within two blocks of the sites (40 spaces). Even though the bike parking supply is adequate for the night market scenario, the City could consider the use of a temporary on-site bike parking corral for the day of



Bike parking corral at Redmond So Bazaar, August 2015

⁹ Assumes signal cycle length at intersections adjacent to the Park would be 120 seconds following the Downtown Two-Way Street Conversion project. This cycle length equates to 30 cycles per hour. During the peak hour of night market trip generation (7-8 PM), the 30 cycles would need to serve 1,839 individuals accessing the park, an average crosswalk demand of 61 pedestrians per cycle. This demand total would be distributed among the multiple crosswalks at the perimeter of the park, so it is unlikely that any single intersection would experience demands of more than 20 pedestrian per cycle. If signal cycle lengths were increased, pedestrian demands per cycle would also increase slightly.

the event. The bike corral could be an incentive for more attendees to bike to the event by providing guaranteed on-site parking in a secure location.

WEEKEND CONCERT

There is a potential for heavy pedestrian flows upon the conclusion of the concert that could exceed the capacity of existing Downtown crosswalks, particularly at the signalized intersections adjacent to the Park. Approximately 2,400 pedestrians would try to disperse from the Park in the hour following the end of the show (See **Table 8**), including people who used non-auto modes to access the event (walkers, transit riders, and off-site bike parkers) and people walking back to their cars. Much of this egress demand would likely occur only a few minutes after the end of the show, and the signalized crossings along Redmond Way and Cleveland Street could significantly impede efficient crowd dispersal. Traffic control officers and wayfinding signage may be necessary at key crossing points to accommodate the sharp spike in pedestrian crossing demand and discourage unsafe jaywalking activities. Because no commitments between the City/event organizer and off-street parking owners have been made, key pedestrian egress routes that may need control officers and/or wayfinding have not yet been established. Therefore, it is recommended that an event management plan be developed by the event organizer once probable parking lot commitments are finalized.

As indicated in **Table 12**, the proposed on-site and nearby bike parking (40 spaces) would not be enough to serve the volume of attendees arriving by bike (120 bicyclists). To accommodate this demand on-site and ensure that bicycles are not parked inappropriately (e.g., blocking access, on private property, etc.), the event organizer could provide a temporary on-site bike parking corral or a bicycle valet parking program for the day of the event.

AUTOMOBILE PARKING IMPACTS

The typical weekday event would not result in a substantial increase in parking demand within a five-minute walk of the park. Additionally, the weekday night market parking demand could be accommodated in available on-street (and Central Connector lot) spaces within a 10-minute walk of the park; however, given the desire of visitors to park as close as possible to the destination, there could be spillover into adjacent private off-street lots. Parking demand for the weekend concert scenario would exceed publicly available on- and off-street supplies and would require off-street parking agreements with one or more nearby property owners and/or a shuttle service to avoid parking impacts.

WEEKDAY NIGHT MARKET

Through the combination of City-owned on- and off-street parking stalls, there is adequate parking available to meet the night market parking demands within a 10-minute walk of the Park. Given the potential for off-street parking spillover, it is recommended that as the night market event grows, the City provide guidance to night market visitors about the availability of on-street and paid off-street parking options (in addition to encouraging walking, biking and taking transit). Adjacent parking lot owners may need to manage parking at their properties to discourage night market parking if they perceive this to be a problem. However, the City cannot manage parking on private properties.

WEEKEND CONCERT

The high parking demand for the weekend concert would exceed available City-owned supplies and require the event organizer to enter into agreements with nearby private parking lot owners or provide another suitable option to arriving attendees. Nearby lots with substantial weekend capacity include the parking lots/garages at Redmond Town Center, the Opportunity Building, and the King County Metro Park-and-Ride lot. In addition, there are lots and garages on many other properties Downtown that could be considered for partnership. If and when a weekend concert at Downtown Park is held, the event organizer should pre-arrange agreements that would provide an adequate parking supply (1,455 total stalls available to attendees) and implement strategies to facilitate parking activities. Parking facilitation strategies could include the provision of information on an event website, real-time parking lot capacity updates, carpool matching services, and temporary wayfinding signage, among others. If proposed event parking supplies are located beyond the 10-minute walking buffer shown in **Figure 8**, the organizer should consider providing a shuttle to serve major off-site lots. Given the relatively large supply of parking at off-street facilities in Downtown Redmond and the City's successful track-record with events like Derby Days and Redmond Lights, these arrangements would reduce the parking impact to a less-than-significant level.

SUMMARY OF IMPACTS AND MITIGATIONS

Table 13 summarizes the scenario findings documented in the previous sections, including identified transportation impacts, measures that could mitigate the impacts to less-than-significant levels, and recommendations for additional studies that would refine and finalize the specific mitigation measures. Overall, the greatest impacts were identified for the weekend concert scenario. The impacts can be addressed through the proposed mitigation measures shown on **Table 13**.

TABLE 13: TRANSPORTATION IMPACTS AND MITIGATIONS SUMMARY

Impact Type	Event Scenario	Impacts	Mitigations <i>For Downtown Park events, organizer should develop an event management plan that includes parking agreements, defines a traffic control plan, and details the implementation of all mitigations listed below.</i>
Traffic	Typical Weekday	Low	Not required
	Weekday Night Market	Low	If pursuing a street closure permit, address access and circulation revisions as part of the traffic control plan
	Weekend Concert	Traffic congestion during peak periods of attendee ingress/egress	<ul style="list-style-type: none"> • Provide traffic officers directing at major intersections and parking garage driveways • Identify and install any temporary traffic control devices (e.g. cones, signs) needed along key ingress/egress routes. The traffic control plan could also request that the City implement temporary modifications to traffic signal timing for the event. • If pursuing a street closure permit, address access and circulation revisions as part of the traffic control plan
Pedestrian / Bicycle	Typical Weekday	Low	Not required
	Weekday Night Market	Low	Not required
	Weekend Concert	<ul style="list-style-type: none"> • Pedestrian flows in excess of existing intersection crosswalk capacity • Increased potential for unsafe jaywalking activities • Event bicycle parking demand would exceed nearby supply 	<ul style="list-style-type: none"> • Provide traffic officers at key signalized intersections crosswalks • Provide temporary on-site bicycle parking corral or bicycle valet parking program • Provide adequate wayfinding near event site • Pursue street closure permits on nearby streets (such as 161st Avenue Northeast) to improve nonmotorized access and comfort
Automobile Parking	Typical Weekday	Low	Not required
	Weekday Night Market	Low	Not required
	Weekend Concert	Event parking demand would exceed available public parking supplies	<ul style="list-style-type: none"> • Enter into agreements with off-street parking supply operators to provide adequate parking supply • Implement strategies to facilitate parking activities (e.g. website information, real-time updates, carpool matching, wayfinding, etc.) • Consider providing an event shuttle to serve major off-site parking supplies

SUMMARY OF MITIGATIONS AND RECOMMENDATIONS

Impacts to traffic, pedestrian/bicycle access, and automobile parking would be low for the typical day and weekday night market scenarios, and, accordingly, no mitigations would be required. However, several recommendations were made that could facilitate access and prevent possible conflicts:

- Special event permits should be required for privately-sponsored events. Events should be required to provide an event management plan, including a traffic control plan. If the event requires a street closure permit, the traffic control plan should address any needed access and circulation revisions.
- The added trips for the weekday night market would not have a major impact on traffic operations since the trip distribution patterns are fairly dispersed throughout major downtown ingress and egress routes. However, the City should continue to monitor arrival and departure traffic patterns at similar events (such as the So Bazaar Night Market) to determine if specific transportation management strategies should be considered.
- Even though the bike parking supply is adequate for the weekday night market scenario, the City could consider the use of a temporary on-site bike parking corral for the day of the event. The bike corral could be an incentive for more attendees to bike to the event by providing guaranteed on-site parking in a secure location.
- There is adequate vehicle parking available to meet the weekday night market parking demands within a 10-minute walk of the Downtown Park. However, given the potential for off-street parking spillover, it is recommended that as the night market event grows, the City provide guidance to night market visitors about the availability of on-street and paid off-street parking options (in addition to encouraging walking, biking and taking transit).

Impacts were identified for the weekend concert scenario and could be addressed through several proposed mitigation measures. These weekend concert impacts and mitigations are listed below and summarized in **Table 13**.

- Special event permits should be required for privately-sponsored events. Events should be required to provide an event management plan, including a traffic control plan.
- The weekend concert is expected to generate a substantial number of vehicle trips both in the one hour before and after the concert, creating the potential for traffic impacts during the peak periods of event ingress and egress. These impacts could be mitigated by providing traffic control officers at major intersections and garage driveways and by implementing temporary traffic

control along key routes. It is recommended that an event transportation management plan be developed once probable parking lot commitments are finalized.

- Traffic control officers and wayfinding signage may be necessary at key crossing points to accommodate the sharp spike in pedestrian crossing demand and discourage unsafe jaywalking activities. Because no current commitments between the City/event organizer and off-street parking owners have been made, key pedestrian egress routes that may need control officers and/or wayfinding have not yet been established. It is recommended that an event transportation management plan be developed by the event organizer once probable parking lot commitments are finalized.
- The proposed on-site and nearby bike parking would not be enough to serve the volume of attendees arriving by bike, and the event organizer should accommodate this demand on-site and ensure that bicycles are not parked inappropriately (e.g., blocking access, on private property, etc.). For example, the organizer could provide a temporary on-site bike parking corral or a bicycle valet parking program for the day of the event.
- The high parking demand for the weekend concert would exceed available City-owned supplies. The event organizer should pre-arrange agreements that would provide an adequate parking supply (1,455 total stalls available to attendees) and implement strategies to facilitate parking activities. Parking facilitation strategies could include the provision of information on an event website, real-time parking lot capacity updates, carpool matching services, and temporary wayfinding signage, among others. If proposed event parking supplies are located beyond the 10-minute walking buffer shown in **Figure 8**, the organizer should consider providing a shuttle to serve major off-site lots.

APPENDIX A: DOWNTOWN PARKING SUPPLY MAP





DOWNTOWN REDMOND PARKING

- EP3** 3 hour Parking or Extended Parking by Permit
- EP2** 2 hour Parking or Extended Parking by Permit
- 1hr** 1 hour Parking (9am - 5pm Mon-Fri)
- 2hr** 2 hour Parking (9am - 5pm Mon-Fri)
- 3hr** 3 hour Parking (9am - 5pm Mon-Fri)

Downtown Time-Limited Enforcement Zone

PAY PARKING LOTS

- P1** Redmond Central Connector Parking
- P2** Chase Bank - Nights & Weekends
- P3** Key Bank - Nights & Weekends

HOW TO PURCHASE A DOWNTOWN REDMOND PARKING PERMIT (\$50/month)

A limited number of paid parking permits, allowing on-street all-day parking in designated areas, are available for sale on a monthly basis.

- 1) Call 425.556.2433
- 2) Press 1 to be connected with Diamond Parking to purchase the parking permit.

City of Redmond
WASHINGTON



APPENDIX B: PARKING OCCUPANCY DATA



Table A1. Parking Supply and Occupancies for Redmond Municipal Campus

Description	Stalls	8:00 AM	9:00 AM	10:00 AM	11:00 AM	12:00 PM	1:00 PM	2:00 PM	3:00 PM	4:00 PM	5:00 PM	6:00 PM	7:00 PM	8:00 PM
Surface lot East of Structure	119	61.3%	97.5%	97.5%	96.6%	94.1%	94.1%	95.0%	89.9%	79.8%	70.6%	45.4%	15.1%	9.2%
Structure	399	49.4%	57.9%	59.9%	60.2%	61.7%	62.4%	63.2%	60.4%	52.1%	33.8%	24.8%	21.6%	10.8%
Street parking in-front of structure	19	5.3%	21.1%	31.6%	21.1%	31.6%	21.1%	10.5%	21.1%	10.5%	15.8%	5.3%	21.1%	5.3%
City Hall Lot (85th St)	71	54.9%	78.9%	83.1%	93.0%	83.1%	81.7%	81.7%	77.5%	67.6%	40.8%	18.3%	21.1%	15.5%
Total Stalls	608	298	201	188	183	185	185	183	201	255	357	441	485	542
Total Percent Available	100%	49.0%	33.1%	30.9%	30.1%	30.4%	30.4%	30.1%	33.1%	41.9%	58.7%	72.5%	79.8%	89.1%

Source: *Redmond Parking Strategies Study*, October 2014

Table A2. Weekday Parking Availability Analysis

On-street stalls within 5 minutes	461
On-street stalls within 10 minutes	900
Municipal campus total	608
Central Connector Total	92

Time (PM)		12	1	2	3	4	5	6	7	8
Redmond Central Connector	Occupied stalls	16.0%	16.0%	16.0%	13.8%	8.5%	5.3%	1.1%	4.3%	4.3%
	Connector Used	15	15	15	13	8	5	1	4	4
	Connector Available	77	77	77	79	84	87	91	88	88
On-Street Stalls	Occupied stalls	58.5%	57.5%	52.9%	48.8%	45.5%	42.0%	45.3%	42.2%	36.0%
	Spots used within 5 Mins	269	265	244	225	210	193	209	194	166
	Spots used within 10 Mins	527	518	476	439	410	378	408	380	324
Municipal Campus	Spots Used	423	423	425	407	353	251	167	123	66
	Spots Available	185	185	183	201	255	357	441	485	542
Spots open within 5 Mins		268	273	294	315	335	354	343	354	383
Spots open within 10 Mins		451	460	501	540	575	609	583	608	664
Open within 10 plus Muni Campus		636	645	684	741	830	966	1024	1093	1206

Source: *Redmond Parking Strategies Study*, October 2014

Table A3. Weekend Parking Availability Analysis (Saturday)

On-street stalls within 5 min	461
On-street within 10 min	900
Municipal campus total	608
Connector Total	92

		Time	11 AM	12 PM	1 PM
Redmond Central Connector	Occupied stalls		47.0%	50.0%	59.0%
	Connector Used		43	46	54
	Connector Available		49	46	38
On-Street Stalls	Occupied stalls		63.1%	75.7%	78.9%
	Spots used within 5 Mins		291	349	363
	Spots used within 10 Mins		568	681	710
Municipal Campus	Occupied stalls		18.5%	17.8%	17.8%
	Spots Used		112	108	108
	Spots Available		496	500	500
Spots open within 5 Mins			219	158	135
Spots open within 10 Mins			381	265	228
Open within 10 plus Muni Campus			877	765	728

Source: *Downtown Redmond Parking Assessment*, September 2015