

## 2017 Bend Parking Demand Evaluation Summary

### Purpose

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For the past two and a half decades, with a few exceptions, Bend has been experiencing rapid and sustained growth – population, new development, real estate values, and traffic congestion. The City has managed growth with the tools available to them including parking development requirements. Over the years, Bend has revised those requirements several times by reviewing code language. However, the City has



not previously collected data or evaluated how parking supplies are being utilized during peak periods. Periodic recalibration is an effective tool to ensure parking is being supplied in a manner that reflects actual demand, resulting in more efficient land use patterns and 'right-sized' parking resources. As the community welcomes more employment and residents, it is important that the City is prepared for future growth by understanding development opportunities and setting expectations for future parking needs.

Rick Williams Consulting (RWC) was hired to assess parking demand for a select number of properties in the Bend study area. This effort is a separate analysis from a recent downtown parking study, which resulted in a comprehensive parking management plan for on and off-street parking in the City's downtown core. This parking assessment is focused on land uses citywide, and looks at existing parking requirements for new or redeveloped uses (minimum parking ratios), the number of built parking stalls, and the number of occupied stalls during each land uses' peak hour utilization.

The findings from this assessment can be used to adjust parking development ratios in the Bend Development Code. The intent is to allow the City to 'right-size' the parking supply by directing developers to build only the number of parking stalls needed to meet parking demand while maximizing the land use and building area devoted to commercial, industrial or residential use. If the analysis shows that the City's current parking requirements are higher than needed, then refinements to parking development ratios may be needed. Such refinements can help spur development by reducing the onus of building unnecessary and costly parking, while maximizing leasable building area, which can result in more compact developments and provides a more attractive, pedestrian-friendly environment for the City and patrons of Bend. If the parking requirements are lower than needed, then adjustments will reduce the strain on adjacent land uses or on-street parking.

## Methodology

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The City provided the consultant team with a number of select land uses to observe parking demand utilization. Twenty-one<sup>1</sup> sample sites were chosen to provide a cross section of representative land use types from around the City— office, industrial, hotel, mixed use, and multi-family residential. Each site’s parking supply was inventoried in advance of the demand analysis; quantifying the numbers of stalls serving each location (visitor and employee parking). Surveyors counted occupied parking stalls during peak periods for each property to determine the uses’ highest individual parking demand (‘peak’). In a few cases, vehicles parked on-street were also included as part of the demand counts if it was evident drivers were patronizing or employed at the sample property.

Parking development requirements are expressed as ratios of stalls per 1,000 square feet of building area or stalls per residential unit or hotel room. The analysis requires information specific to the total building square footage for each survey site. Bend staff provided commercial real estate information (building square footage, vacancy rates, number of units/rooms) to derive the most accurate information possible. During the data collection process, surveyors were careful to note any tenant vacancy observations that may not have been reflected in the information provided by the City. Calculating ‘true’ parking demand ratios required factoring out any tenant vacancies, so total parked cars were correlated only to occupied building square footage (or occupied units/rooms).

This is the same methodology employed by the Institute of Transportation Engineers (ITE) to calculate parking demand by land use category. The ITE manual is the de facto source of parking data for most jurisdictions. However, while the ITE information is a good starting point, it draws samples from across America, includes demand figures that date back as far as the 1980s, and contains data from extremely small samples. *The methodology used for this study exclusively utilizes Bend data gathered in June and August 2017 to provide the most accurate representation of local existing conditions.*



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<sup>1</sup> RWC added two additional hotel land uses to provide a broader sample size for this land use category. There are a total of 23 sample locations analyzed in the parking demand data collection.

## Glossary of Terms

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**Built Parking Ratio** – the number of stalls built/constructed for a specific building or property. A 15,000 square foot building built with 30 parking spaces would have a built parking ratio of 2.0. Ratios are shown as stalls per 1,000 square feet of building area.

**Code Minimum (Parking Requirement)** – the minimum amount of parking that must be built for a specific land use type as required by city code.

**Delta** – the difference between the built supply and the Market Calibrated Ratio.

**Demand Buffer** – is a flexibility 'cushion' typically added to True Demand to allow for the ebb and flow of parking activity for a land use over the course of the day. Traditional commercial buffers (for land uses with high turnover) are 15% - which is the basis for the 85% Rule for on-street parking. Providing a 15% buffer for mixed use, retail, and office land uses is considered ideal. Other land uses require smaller buffers – Industrial (10%) less parking turnover is needed, the primary use for parking is for the employee. Residential and Hotel (5%) there is virtually no turnover required for these uses, parking is specifically provided by the unit for these purposes

**Market Calibrated Ratio** – is True Demand plus the Demand Buffer – the true need for built parking based on measured 'real' parking demand (including supporting demand buffer).

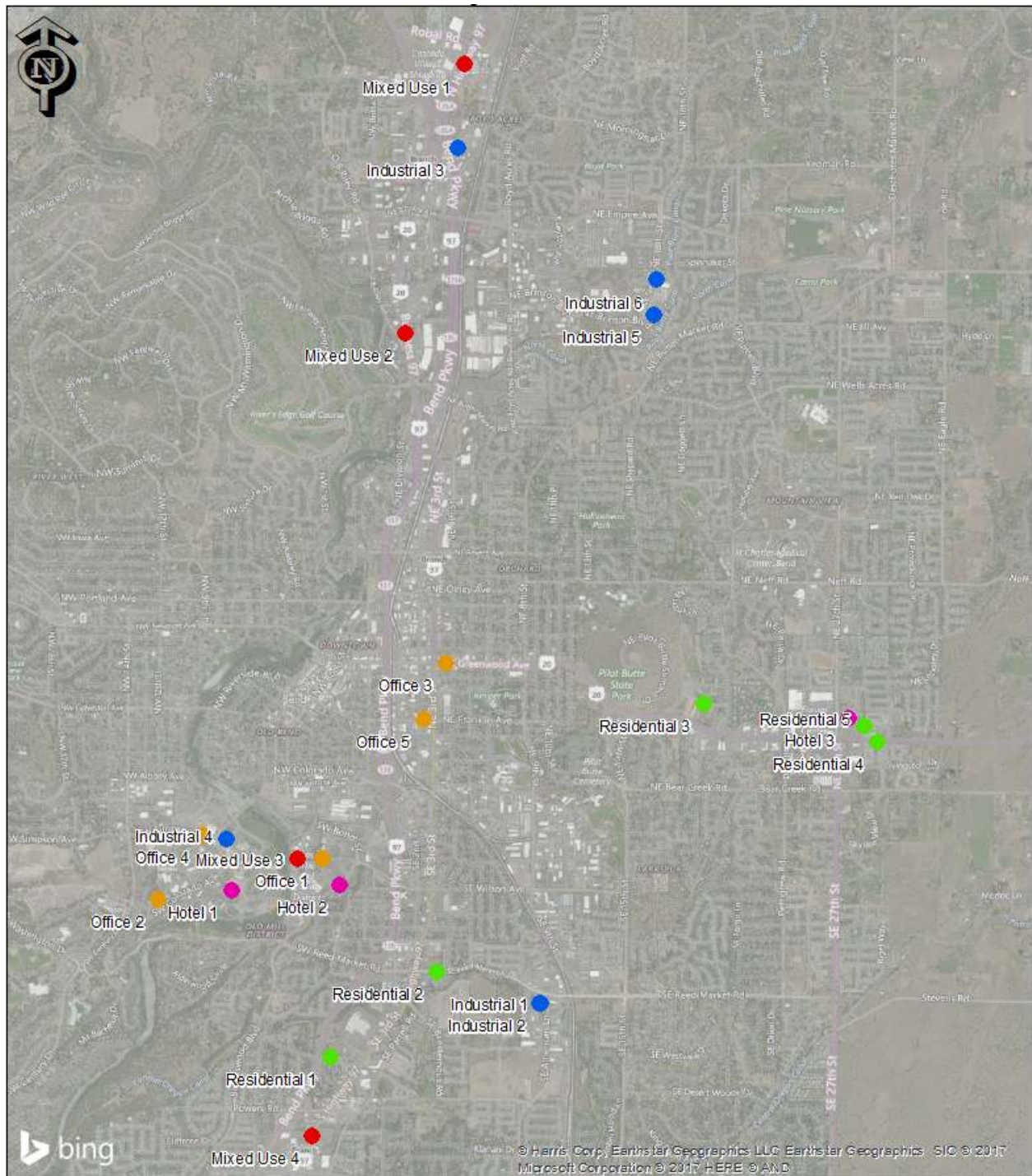
**Peak Hour** – the period of day when the highest number of vehicles are observed parking for a given land use.

**Parking Development Ratio** – the amount of parking provided for a given land use development. The ratio is usually shown as stalls per 1,000 square feet of building area (e.g., 2.5 stalls per 1,000 SF) or as stalls per unit or stalls per hotel room.

**True Demand** – the observed peak hour parking demand for a specific land use. This would include vehicles parked in the property's parking lot and could include vehicles parked on-street in proximity to the property. True Demand must be a measured of parking demand correlated to occupied building area. Ratios are expressed as stalls per 1,000 square feet.



## Study Sites

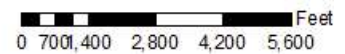


Phase 2 Data Collection

- Mixed Use
- Industrial
- Hotel
- Residential
- Office

2017

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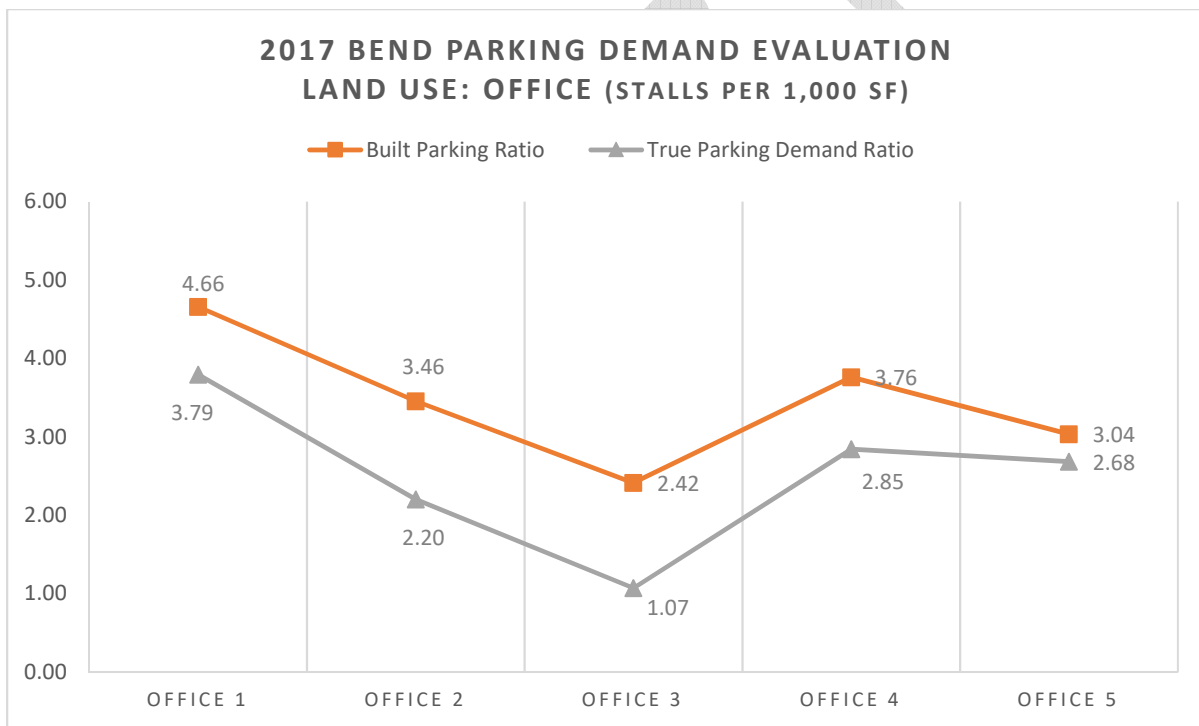
## Findings

The findings summarized below are shown as demand ratios for individual properties within a common land use group, both graphically (charts) and in tabular format (tables). At the end of the section, an aggregated table depicts average parking demand ratios by land use group.

### Office Land Uses

Five sites were selected to represent office land uses. **Figure A** summarizes findings for this land use category.

Figure A: Parking Demand Ratios - Office



**Table 1** below provides a comparative summary of findings for office land uses. Key findings include:

- *Built parking ratios* vary somewhat in the office category from as little as 2.42 stalls per 1,000 square feet (Office 3) to as much as 4.66 stalls per 1,000 square feet (Office 1).
- The average built parking ratio for office uses is 3.47 stalls per 1,000 square feet of building area.
- *True parking demand ratios* range from 3.79 vehicles per 1,000 square feet (Office 1) to 0.1.07 vehicles per 1,000 square feet (Office 3).

- The average true demand for parking for offices uses (all sites combined) is 2.52 stalls per 1,000 square feet of occupied building area.
- A 15% buffer was added to true demand numbers to allow for the ebb and flow of customers/visitors within the off-street parking supply.<sup>2</sup> This supports the concept of an 85% occupancy threshold (industry standard) for a customer or visitor parking supply. Adding a 15% buffer to the average true demand figure (2.52) results in a *market-calibrated* ratio of 2.90 stalls per 1,000 square feet of office space (i.e., average actual demand for parking).
- The *current code minimum requirement* is 2.86 stalls per 1,000 square feet of building area, which is very near the market-calibrated rate of 2.90.
- The recalibrated office parking demand ratio of 2.90 is 19% lower than the existing average built supply (3.47).
- Based on these findings, these developments oversupplied parking (built ratio) beyond their actual need, though this is not related to the code minimum requirement.

Table 1: 2017 Bend Parking Demand Evaluation – Office Land Use

Business Name	Building Square Footage	Built Off-Street Stalls	Built parking ratio	Code Minimum	True Demand (TD)	TD + buffer (15%)	Delta +/-	% Diff
Office 1	20,817	97	4.66	2.86	3.79	4.36	0.30	6%
Office 2	19,964	69	3.46	2.86	2.20	2.53	0.92	27%
Office 3	14,900	36	2.42	2.86	1.07	1.23	1.18	49%
Office 4 <sup>3</sup>	78,091	294	3.76	2.86	2.85	3.27	0.49	13%
Office 5	31,291	95	3.04	2.86	2.68	3.09	-0.05	-2%
<b>Average Parking Ratios</b>			<b>3.47</b>		<b>2.52</b>	<b>2.90</b>	<b>0.57</b>	<b>19%</b>

<sup>2</sup> For purposes of “market” calibration, buffers are frequently used to account for a range of possible variations and factors that could influence the true demand calculation data derived from a single survey day. This can include seasonality, employment growth, sample size and other factors affecting parking. For the most part, buffers provide a more conservative approach to true demand. Also, the size of the buffer generally varies from 5% to 15% based on the land use, with retail/office land uses (with higher customer traffic volumes) trending higher and more fully employment focused land uses (e.g., industrial), trending lower. In situations where data collection is more frequent, the use of buffers can be minimized. In the case of Bend, RWC uses buffers for all of the surveyed land uses to reflect a conservative approach to true demand.

<sup>3</sup> The Office 4 demand analysis included four buildings ranging in size from 11,520 to 38,876 square feet. The highest observed combined vehicle count for all four buildings (peak hour) was divided across the occupied building area to derive the True (parking) Demand.

## Industrial Land Uses

Six sites were selected to represent light industrial land uses. Figure B summarizes findings for this land use category.

Figure B: Parking Demand Ratios - Industrial

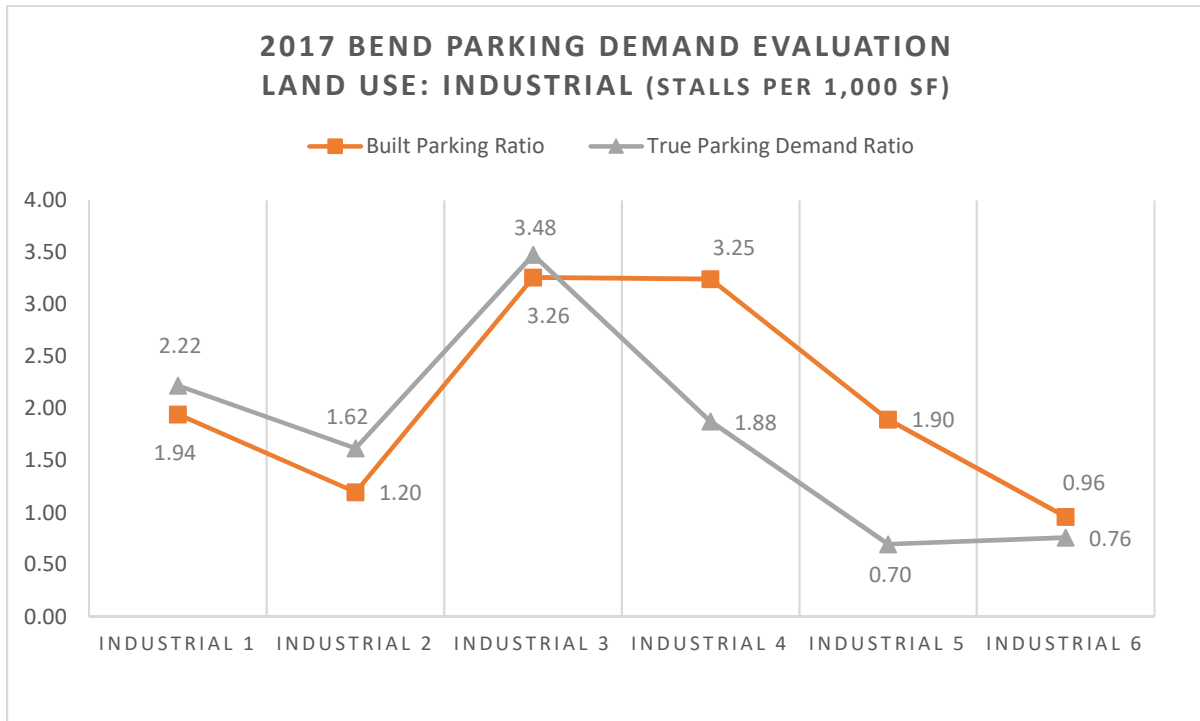


Table 2 below provides a comparative summary of findings for industrial uses. Key findings include:

- *Built parking ratios* vary widely in the industrial category from as little as 0.96 stalls per 1,000 square feet (Industrial 6) to as much as 3.26 stalls per 1,000 square feet (Industrial 3).
- The average built parking ratio for industrial uses is 2.08 stalls per 1,000 square feet of building area.
- *True parking demand* ratios range significantly from 0.70 vehicles per 1,000 square feet (Industrial 5) to 3.48 vehicles per 1,000 square feet (Industrial 3).
- The average true demand for parking for industrial uses (all sites combined) is 1.78 stalls per 1,000 square feet of occupied building area.
- A 10% buffer was added to the true demand numbers to allow for the ebb and flow of industrial users within the off-street parking supply. Adding a buffer to the average true demand figure

(1.78) results in a *market-calibrated* ratio of 1.95 stalls per 1,000 square feet of industrial building area.<sup>4</sup>

- The *current code minimum requirement* is 1.43 stalls per 1,000 square feet of building area, which is below the market-calibrated rate of 1.95.
- The recalibrated industrial parking demand ratio of 1.95 is 3% lower than the existing average built supply (2.08). This is somewhat deceiving in that two sites in particular (Industrial 4 and Industrial 5) are significantly overbuilt with parking (from 36% to 59%), which biases the combined average.
- Unlike office (above), industrial uses in the sample generally exceeded their built supply of parking (relying on on-street supply) or, as in the case of Industrial 6, are operating fairly efficiently.
- The current code minimum may not be adequate to actual demand, unless on-street parking within industrially zoned areas is considered a reasonable accommodation for supplementing industrial parking demand (which is not unusual in industrial settings with low visitor parking demand).<sup>5</sup>

Table 2: 2017 Bend Parking Demand Evaluation – Industrial Land Use

Business Name	Building Square Footage	Built Off-Street Stalls	Built parking ratio	Code Minimum <sup>6</sup>	True Demand (TD)	TD + buffer (10%)	Delta +/-	% Diff
Industrial 1	7,200	14	1.94	1.43	2.22	2.44	-0.50	-26%
Industrial 2	33,360	40	1.20	1.43	1.62	1.78	-0.58	-49%
Industrial 3	4,600	15	3.26	1.43	3.48	3.83	-0.57	-17%
Industrial 4	25,574	83	3.25	1.43	1.88	2.06	1.18	36%
Industrial 5	50,057	95	1.90	1.43	0.70	0.77	1.13	59%
Industrial 6	24,950	24	0.96	1.43	0.76	0.84	0.12	13%
<b>Average Parking Ratios</b>			<b>2.08</b>		<b>1.78</b>	<b>1.95</b>	<b>0.13</b>	<b>3%</b>

<sup>4</sup> A 10% buffer for industrial use was selected, as contrasted to 15% for office, because industrial uses attract less short-term customer traffic.

<sup>5</sup> An example of this is Portland’s Central Eastside Industrial District where areas zoned I (Industrial) prioritize on-street parking for uses supportive of industrial employment. As such, the policy in this case is to allow/favor uses of the on-street supply for industrial employees.

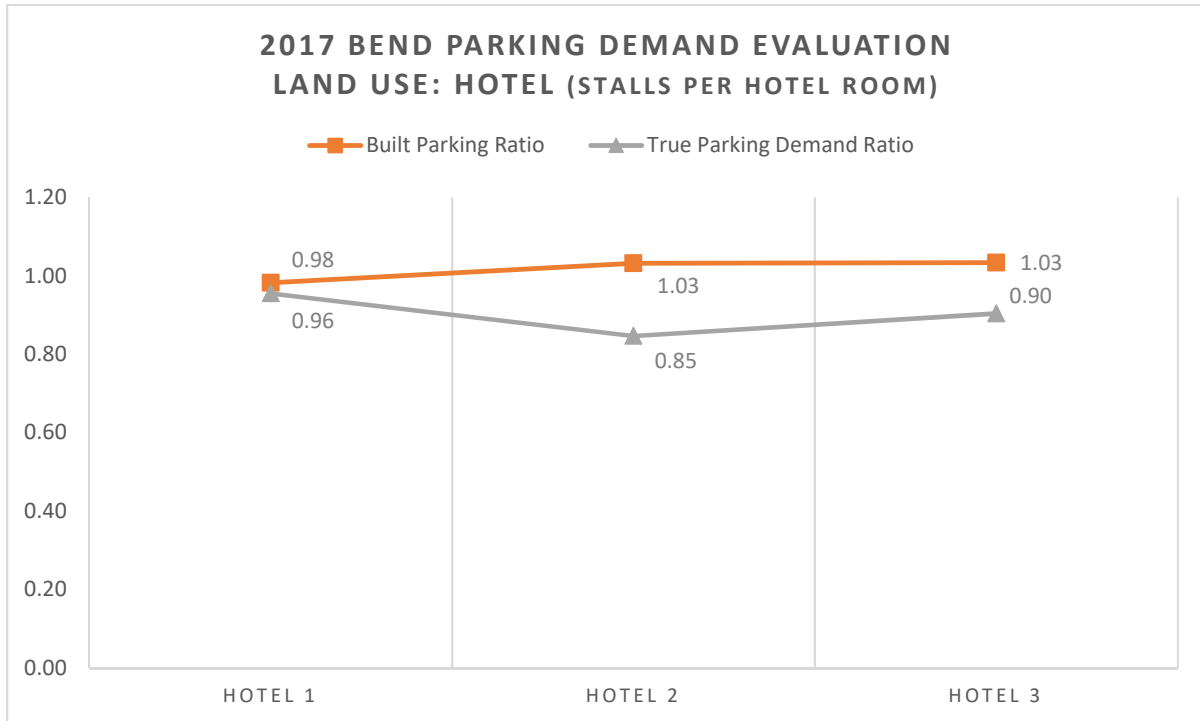
<sup>6</sup> Code minimum for Industrial uses include (in addition to 1.43 stalls per 1,000 square feet of building area) 1 stall per each company vehicle.



## Hotel Land Uses

Three sites were selected to represent hotel land uses. **Figure C** summarizes findings for this land use category.

Figure C: Parking Demand Ratios - Hotel



**Table 3** below provides a comparative summary of findings for hotel uses. Key findings include:

- *Built parking ratios* have very little variation in the hotel land use category, ranging from 0.98 stalls per 1,000 square feet (Hotel 1) to 1.03 stalls per 1,000 square feet (Hotel 2 & Hotel 3).
- The average built parking ratio for hotel uses average 1.02 stalls per hotel room.
- *True parking demand* ratios are very similar to the built supplies, ranging from 0.85 vehicles per occupied room (Hotel 2) to 0.96 vehicles per occupied room (Hotel 1).
- The average true demand for parking for hotel uses (all sites combined) is 0.90 stalls per occupied hotel room<sup>7</sup>.
- A 5% *buffer* was added to average true demand numbers to allow for the minor ebb and flow of hotel within the off-street parking supply.<sup>8</sup> Adding a buffer to the average true demand figure (0.90) results in a *market-calibrated* 0.95 stalls per hotel room.

<sup>7</sup> Hotel vacancy rates were assumed to be 90% given the time of year.

<sup>8</sup> A 5% buffer was added to hotel uses to reflect potential changes in seasonality that may not have been captured in this data collection effort.

- The *current code minimum requirement* is 1.00 stall per room, which is nearly identical to the market-calibrated rate of 0.95.
- For the most part, hotel demand is fully compatible with the code minimum.

Table 3: 2017 Bend Parking Demand Evaluation – Hotel Land Use

Business Name	Hotel Rooms	Built Off-Street Stalls	Built parking ratio	Code Minimum <sup>9</sup>	True Demand (TD)	TD + buffer (10%)	Delta +/-	% Diff
Hotel 1	114	112	0.98	1.0	0.96	1.00	-0.02	-2%
Hotel 2	63	65	1.03	1.0	0.85	0.89	0.14	14%
Hotel 3	59	61	1.03	1.0	0.90	0.95	0.08	8%
<b>Average Parking Ratios</b>			<b>1.02</b>		<b>0.90</b>	<b>0.95</b>	<b>0.07</b>	<b>7%</b>

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<sup>9</sup> Hotel uses require 1.0 stall per room plus an additional parking stall per hotel manager.

## Mixed Uses

Four sites were selected to represent mixed uses. Figure D summarizes findings for this land use category.

Figure D: Parking Demand Ratios - Mixed Use

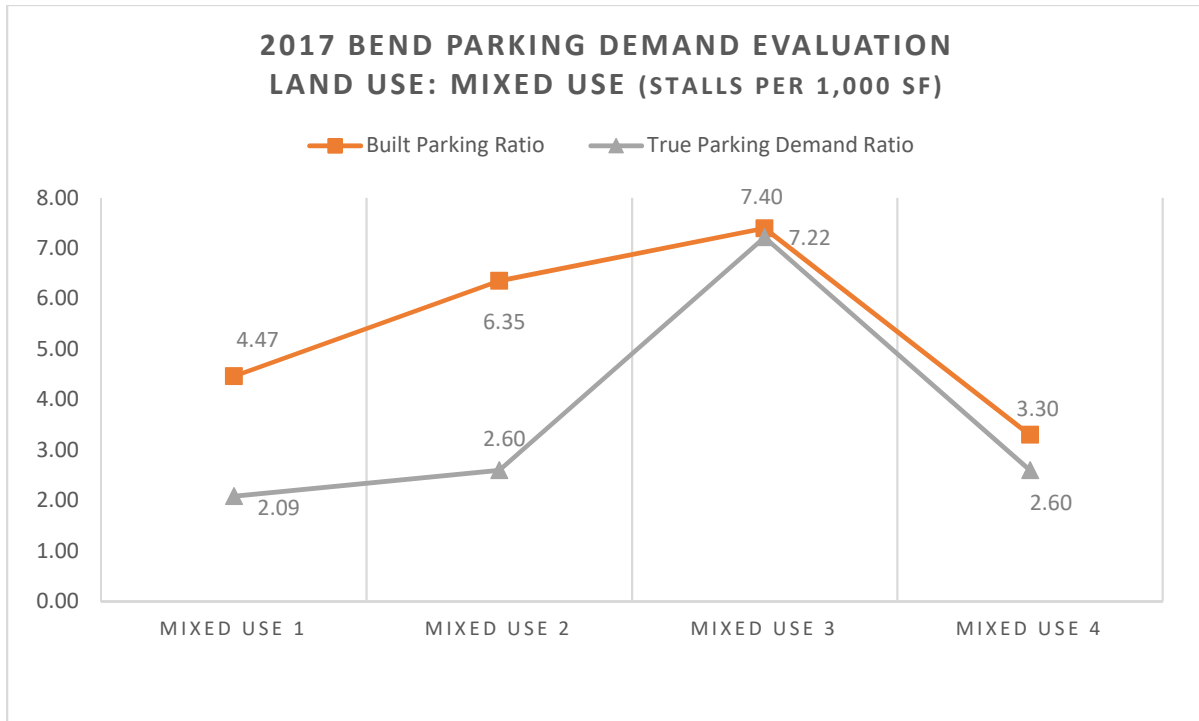


Table 4 below provides a comparative summary of findings for mixed uses. Key findings include:

- *Built parking ratios* range from 3.30 stalls per 1,000 square feet (Mixed Use 4) to as much as 7.40 stalls per 1,000 square feet (Mixed Use 3).
- The average built parking ratio for mixed uses is 5.38 stalls per 1,000 square feet of building area. The average is pushed higher by a single site (Mixed Use 3).
- *True parking demand* ratios range from 2.09 vehicles per 1,000 square feet (Mixed Use 1) to 7.22 vehicles per 1,000 square feet (Mixed Use 3).
- The average true demand for parking for mixed uses (all sites combined) is 3.63 stalls per 1,000 square feet of occupied building area.
- A 15% buffer was added to true demand numbers to allow for the ebb and flow of customers/visitors within the off-street parking supply. Adding a buffer to the true demand figure (3.63) results in a *market-calibrated* ratio of 4.17 stalls per 1,000 square feet of mixed use space.

- The *current code minimum requirement* is 2.86 stalls per 1,000 square feet of building area, is 46% lower than the market-calibrated rate of 4.17.
- Overall, the recalibrated mixed use parking demand ratio of 4.17 is 24% lower than the existing built supply (5.38). This suggests that developments in the Mixed Use land use classification are significantly overbuilding the parking supply necessary to meet peak hour demand. This results in underutilized parking and inefficient development patterns (not maximizing development potential). The reason for the over-build of parking supply is not the result of the code minimum.

Table 4: 2017 Bend Parking Demand Evaluation – Mixed Use

Business Name	Building Square Footage	Vacancy Rate <sup>10</sup>	Built Off-Street Stalls	Built parking ratio	Code Minimum	True Demand (TD)	TD + buffer (15%)	Delta +/-	% Diff
Mixed Use 1	353,174	10%	1,578	4.47	2.86	2.09	2.40	2.07	46%
Mixed Use 2	229,286	20%	1,457	6.35	2.86	2.60	2.99	3.36	53%
Mixed Use 3	156,766	5%	1,160	7.40	2.86	7.22 <sup>11</sup>	8.30	-0.90	-12%
Mixed Use 4	132,020	0%	436	3.30	2.86	2.60	2.99	0.31	10%
<b>Average Parking Ratios</b>				<b>5.38</b>		<b>3.63</b>	<b>4.17</b>	<b>1.21</b>	<b>24%</b>

<sup>10</sup> For the purposes of discussion RWC assumed the vacancy rates for several of the mixed use shopping centers (all, except for Mixed Use 4 which was provided by the City). In the meantime RWC will continue to work with the City to refine and verify true vacancy rates for these centers, which may result in a final adjustment to the numbers shown above.

<sup>11</sup> The elevated True Demand numbers for Mixed Use 3 may have been influenced by activities related to a large community event when peak parking demand counts were taken on August, 12, 2017. It is likely that some event attendees were parked in the facility's parking supply while attending the festival, which may artificially inflate parking demand numbers for the site.

## Multi-Family Residential

Five sites were selected to represent multi-family residential land uses. Figure E summarizes findings for this land use category.

Figure E: Parking Demand Ratios - Residential Use

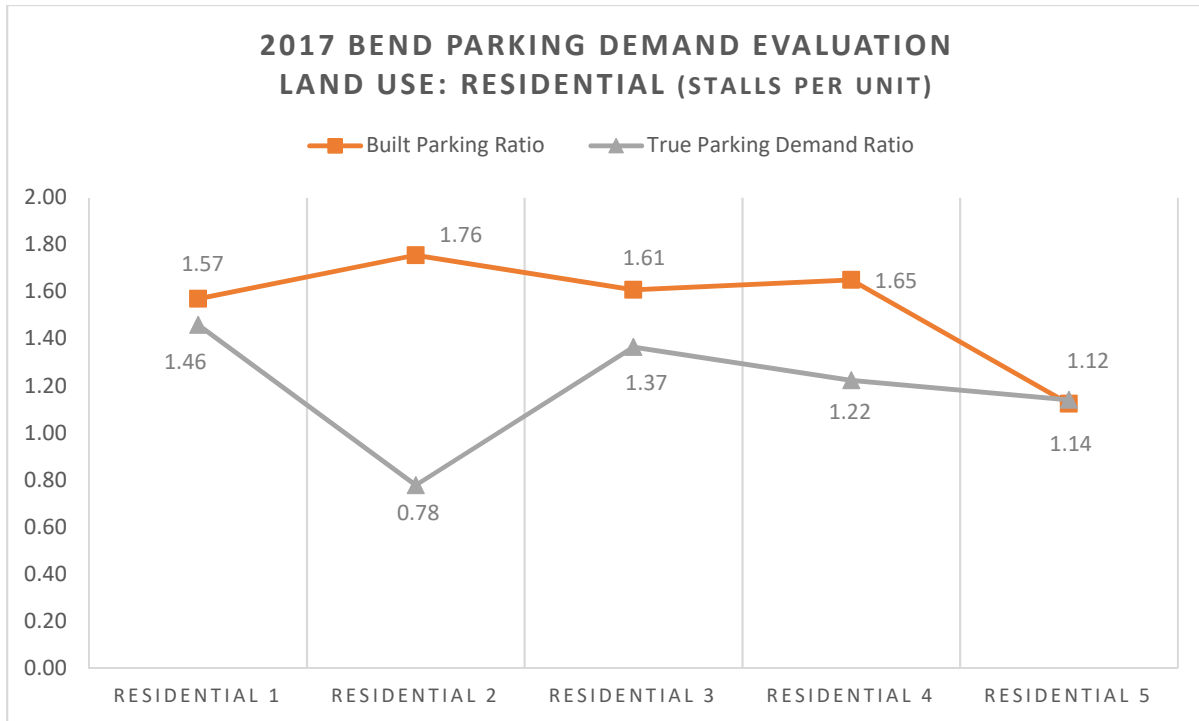


Table 5 below provides a comparative summary of findings for residential uses. Key findings include:

- *Built parking ratios* range from 1.12 stalls per unit (Residential 5) to as much as 1.76 stalls per unit (Residential 2).
- The average built parking ratio for (multi-family) residential uses is 1.54 stalls per unit.
- *True parking demand* ratios range from 0.78 vehicles per unit (Residential 2) to 1.46 vehicles per unit (Residential 1).
- The average true demand for parking for multi-family residential uses (all sites combined) is 1.19 stalls per housing unit.
- A 5% *buffer* was added to true demand numbers to allow for the ebb and flow of residential users within the off-street parking supply. Adding a buffer to the true demand figure (1.19) results in a *market-calibrated* ratio of 1.25 stalls per residential unit.
- The *current code minimum requirement* is 1.00 stall per residential unit, which is below the market-calibrated rate of 1.25.



- The recalibrated residential parking demand ratio of 1.25 is 16% lower than the existing built supply (1.54).
- For the most part, residential uses are supplying parking at a rate greater than actual demand. However, the over-build is not driven by the code minimum.

Table 5: 2017 Bend Parking Demand Evaluation – Residential Use

Business Name	Housing Units	Vacancy Rate	Built Off-Street Stalls	Built parking ratio	Code Minimum <sup>12</sup>	True Demand (TD)	TD + buffer (5%)	Delta +/-	% Diff
Residential 1	135	0%	212	1.57	1.0	1.46	1.53	0.04	2%
Residential 2	45	0%	79	1.76	1.0	0.78	0.82	0.94	53%
Residential 3	204	0%	328	1.61	1.0	1.37	1.43	0.17	11%
Residential 4	192	0%	317	1.65	1.0	1.22	1.29	0.37	22%
Residential 5	153	0%	172	1.12	1.0	1.14	1.20	-0.07	-7%
<b>Average Parking Ratios</b>				<b>1.54</b>		<b>1.19</b>	<b>1.25</b>	<b>0.29</b>	<b>16%</b>

<sup>12</sup> Residential minimum parking code requires 1 stall per unit for up to a 3 bedroom unit, but in the case of a 4 or 5 bedroom unit would require 2 stalls per unit.

## Land Use Category Comparison – Summary and Considerations

- Figure F provides a comparative summary of parking demand between land use categories.

Table 6 contrasts 2016 data findings to existing code minimum and maximum parking requirements.

Figure F: Parking Demand Ratios - Land Use Category Comparison

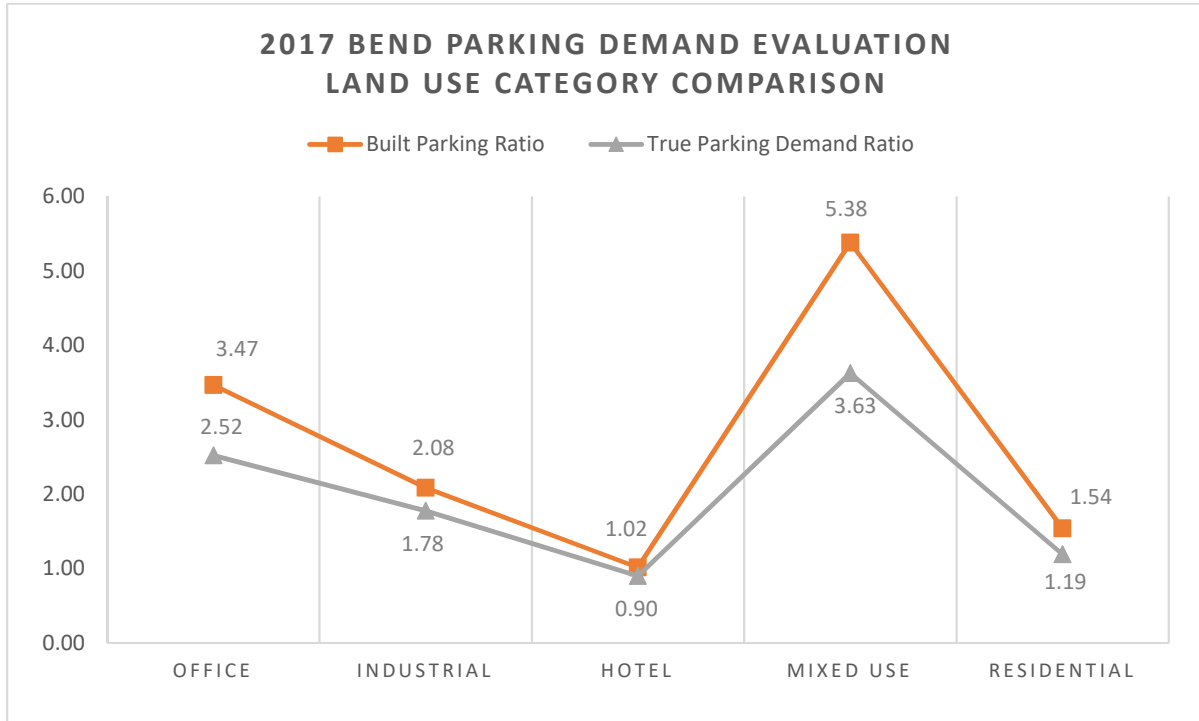


Table 6 below provides a comparative summary of findings by land use category.

- Office uses are generally over supplying parking by a combined average of 19%. However, code minimum requirements (2.86) and calibrated market demand (2.90) track very closely. Though parking is being over-built, this is not a factor of the minimum requirement. **No change in current minimum requirements is recommended.**
- In some cases, industrial land uses are undersupplying parking, which may be the result of the code minimum of 1.43 stalls per 1,000 square feet of building area. The market calibrated demand of 1.86 has created situations where parking demand is spilling off sites into the on-street supply. This may or may not be an issue; if the City clarifies its policy related to priority uses of on-street parking in areas zoned Industrial. **It is recommended that the City consider revisions to its policies related to the use of on-street parking in industrial areas.**
- Hotel developments are being built with parking supplies that most closely represent true demand – on average they are overbuilt by only 2 percent. **No change in current minimum requirements is recommended.**

- Mixed Use developments have the most over-built parking supplies of any land use category analyzed, with 24% of stalls in excess of peak hour demands. However, market demand (3.63) is within 27% of the required code minimum (2.86). Though parking is being over-built, this is not a factor of the minimum requirement. **No change in current minimum requirements is recommended.**
- As with office uses, residential parking is being built at rates in excess of actual demand (about 16%). However, the code minimum (1.0) is below calibrated market demand (1.25), suggesting the over-build of parking is not a factor of the minimum parking requirement. **No change in current minimum requirements is recommended.**

Table 6: 2017 Bend Parking Demand Evaluation – Land Use Category Comparison

Land Use Category	Average Built parking ratio	Average Code Minimum <sup>13</sup> (current)	Averaged True Demand (observed)	TD + buffer	Average Delta +/-	Average % Difference	Recommended Parking Minimum <sup>14</sup>
Office	3.47	2.86	2.52	2.90	0.57	19%	2.86
Industrial	2.08	1.43 <sup>15</sup> + 1 / per company vehicle	1.78	1.86	0.22	7%	1.43 + 1 / per company vehicle
Hotel	1.02	1.0 / room + 1 / per manager	0.90	0.99	0.02	2%	1.0 / room + 1 / per manager
Mixed Use	5.38	2.86	3.63	4.17	1.21	24%	2.86
Residential	1.54	1.0 / unit	1.19	1.25	0.29	16%	1.0 / unit

## Summary

Findings from the data analysis of local sampled sites indicates that current code minimums are well-calibrated, tracking closely to actual demand for parking in all land use categories observed. In the case of industrial uses, an undersupply of parking is occurring in some circumstances, which suggests a review of policies related to the on-street supply in industrial zones.

<sup>13</sup> Expressed as stalls per 1,000 square feet of building area unless otherwise specified.

<sup>14</sup> Recommended Parking Minimums reflect suggested changes to the Average Code Minimum (current) shown in Table 6 based on the parking demand analysis conducted as part of this study.

<sup>15</sup> 1 space/2 employees on the largest shift or for each 700 sf of gross floor area, + 1 space/company vehicle

However, the built parking supply for many existing uses, particularly mixed use, are being oversupplied creating surpluses of unused parking. The City's current parking code minimums allow for prospective developments to be built with "right-sized" parking supplies that more accurately reflect true demand. Continued data collection efforts, coupled with educating developers on the relationship of built supply to true or calibrated market demand may be required to reduce the tendency to oversupply of parking within developments. Based on the findings in this report, the City's code minimums are not contributing to parking surpluses.



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