Kimley-Horn and Associates, Inc.

Technical Memorandum

To: Mr. Josh Hartmann
NEXmetro Communities

From: Kimley-Horn and Associates, Inc.

Date: February 18, 2014

Re: NEXmetro Neighborhoods - Residential Parking Demand Study

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Introduction

The NEXmetro neighborhood concept is a hybrid housing option of high-end, single-story, detached and duplex rental residences in gated neighborhoods. Compared to traditional multifamily rental developments, the NEXmetro neighborhoods tend to attract an older, higher-income population. The traffic and parking demands of the NEXmetro residents may be closer to that of a mix of traditional single-family detached housing and age-restricted senior housing.

Municipalities have a variety of standards for parking supply minimums or maximums for land uses. Most of the standards would not contain an exact match for the NEXmetro residential neighborhood, so they risk providing too much or too little parking for efficient use of the site. This parking demand study will identify the actual parking demand in established NEXmetro neighborhoods in order to provide guidance for development of future neighborhoods.

NEXmetro Neighborhood Data Collection

The parking occupancy was recorded at the following NEXmetro neighborhoods by site staff or KHA data collectors:

- Avilla Marana One (4050 W. Aerie Drive, Marana, AZ)
- Avilla River (1000 W. River Road, Tucson, AZ)
- Avilla Preserve (2501 W. Orange Grove Road, Tucson, AZ)

Table 1 shows the units and bedroom counts for the neighborhoods at the times of the highest parking demand. The number of occupied units varied slightly through the data collection period, so all parking calculations are performed using the conditions during the highest observed parking demand.

The site staff made observations at 10 AM, 6 PM, 9 PM, and 4 AM on a weekday and a Saturday/Sunday. KHA observations were overnight occupancy counts for a weekday. The counts included visitor parking.

Table 1. NEXmetro Neighborhood Unit Makeup

NEXmetro Neighborhood	Occupied Units	1BR Units	2BR Units	3BR Units	Total Occupied Bedrooms	Garage Spaces Leased	Observation Dates
Marana One	157	31	73	53	336	26	1/15, 1/18, 2/5
River	50	16	17	17	101	6	1/15, 1/18, 2/5, 2/10
Preserve	43	11	17	15	90	12	1/15, 1/18, 2/5, 2/10
Totals:	**250**	58	107	85	**527**	**44**	

Each NEXmetro neighborhood includes covered garages which are available for rent separately from the basic unit rate. As reserved spaces which are not available to any user, these garage spaces are assumed to be occupied at all times. The number of leased garage spaces was provided for each site by the site staff, with a weighted average of 0.18 garage leases per unit, and 0.08 garage leases per bedroom. When garage spaces are not included in occupancy numbers, the resulting occupancy of the general spaces is called "surface" parking.

NEXmetro Neighborhood Time-of-Day Parking Observations

Exhibit 1 shows the surface parking occupancy counts at each location, and notes the number of additional garage spaces which are also considered occupied. This data is from the weekday and weekend counts with four observations per day.

The daytime data shows that the neighborhoods exhibit a typical residential parking occupancy trend, with low occupancy during the weekday daytime, rising occupancy throughout the evening, and an overnight peak between midnight and 6 AM. The weekend data is similar, with the Marana and River neighborhoods showing the expected higher occupancy during the Saturday morning count.

NEXmetro Neighborhood Parking Demand Calculations

Comparing the unit and bedroom count for each neighborhood with the parking occupancy data results in the demand calculations shown in **Table 2**. The maximum surface parking spaces occupied for each neighborhood is the highest individual observation from the data set.

The demand is calculated to find the surface space demand per unit and per bedroom. A second set of calculations shows the total demand (surface plus garage spaces) per unit and per bedroom.

A weighted average of parking demands across all the neighborhoods was also calculated.

Table 2. NEXmetro Neighborhood Parking Demand

NEXmetro Neighborhood	Occupied Units	Occupied Bedrooms	Maximum Observed Surface Parking Spaces Occupied (Date)	Garage Spaces Occupied	Surface + Garage Spaces Occupied	Surface Parking Space Demand Per Unit	Surface Parking Space Demand Per Bedroom	Surface + Garage Parking Space Demand Per Unit	Surface + Garage Parking Space Demand Per Bedroom
Marana One	157	336	229 (1/15)	26	255	1.46	0.68	1.62	0.76
River	50	101	63 (2/5)	6	69	1.26	0.62	1.38	0.68
Preserve	43	90	59 (2/10)	12	71	1.37	0.66	1.65	0.79
Totals / Weighted Avg:	**250**	**527**	**351**	**44**	**395**	**1.40**	**0.67**	**1.58**	**0.75**

The parking demand per bedroom is relatively consistent between the neighborhoods, with a weighted average demand of 0.67 surface spaces per bedroom, and 0.75 total spaces per bedroom.

The parking demand per unit is less consistent across the neighborhoods, probably due to the difference in unit mix for each neighborhood. The River neighborhood has a noticeably lower parking demand per unit than the others, which seems to correspond with its higher percentage of 1-bedroom units.

Parking Demand Comparisons to Traditional Multifamily

Two published sources of national research on parking demand rates are *Shared Parking, 2nd Edition* by the Urban Land Institute (ULI) and *Parking Generation, 4th Edition* by the Institute of Transportation Engineers (ITE). **Table 3** shows the typical parking demand from each resource. For the ITE parking demand, the 85th-percentile of observed demands is often taken as a design value.

Table 3. Parking Demand Comparison

Land Use	Unit of Measure	Peak Parking Demand
ULI *Shared Parking* Residential, Rental	Unit	1.65
ULI *Shared Parking* Residential, Owned	Unit	1.85
ITE *Parking Generation* Low/Mid-Rise Apartment Suburban, Weekday	Unit	1.23 Average 1.94 85th-Percentile
NEXmetro Observed Weighted Average	Unit	1.40 Surface Spaces 1.58 Total Spaces
NEXmetro Observed Maximums at any site	Unit	1.46 Surface Spaces 1.65 Total Spaces

A comparison of the NEXmetro observations using per-unit demands shows that the NEXmetro neighborhoods have parking demands similar to or slightly less than the national reference data for multifamily uses.

NEXmetro Neighborhood Parking Supply Recommendation

Based on a conservative analysis of the parking demand data collected at established neighborhoods, future NEXmetro neighborhoods should have a minimum parking supply set using the following rates:

- **0.90 total parking spaces per bedroom** (surface spaces plus garage spaces, including visitors)

A typical division between surface and garage spaces would be the following minimums:

- **0.75 surface parking spaces per bedroom**
- **0.15 garage parking spaces per bedroom**

The recommended rates include an approximately 10% vacancy rate to improve perceived parking efficiency and quality of life factors within the site. The number of surface spaces needed per bedroom has very little variance between neighborhoods in the observation, showing it is the preferred accounting method for the parking supply. The garage leasing behavior may vary more significantly between sites based on climate and other factors.

If the parking supply is to be calculated per unit, the following minimum rates should be used:

- **1.85 total parking spaces per unit** (surface spaces plus garage spaces, including visitors), with the typical division being:
  - **1.55 surface parking spaces per unit**
  - **0.30 garage parking spaces per unit**

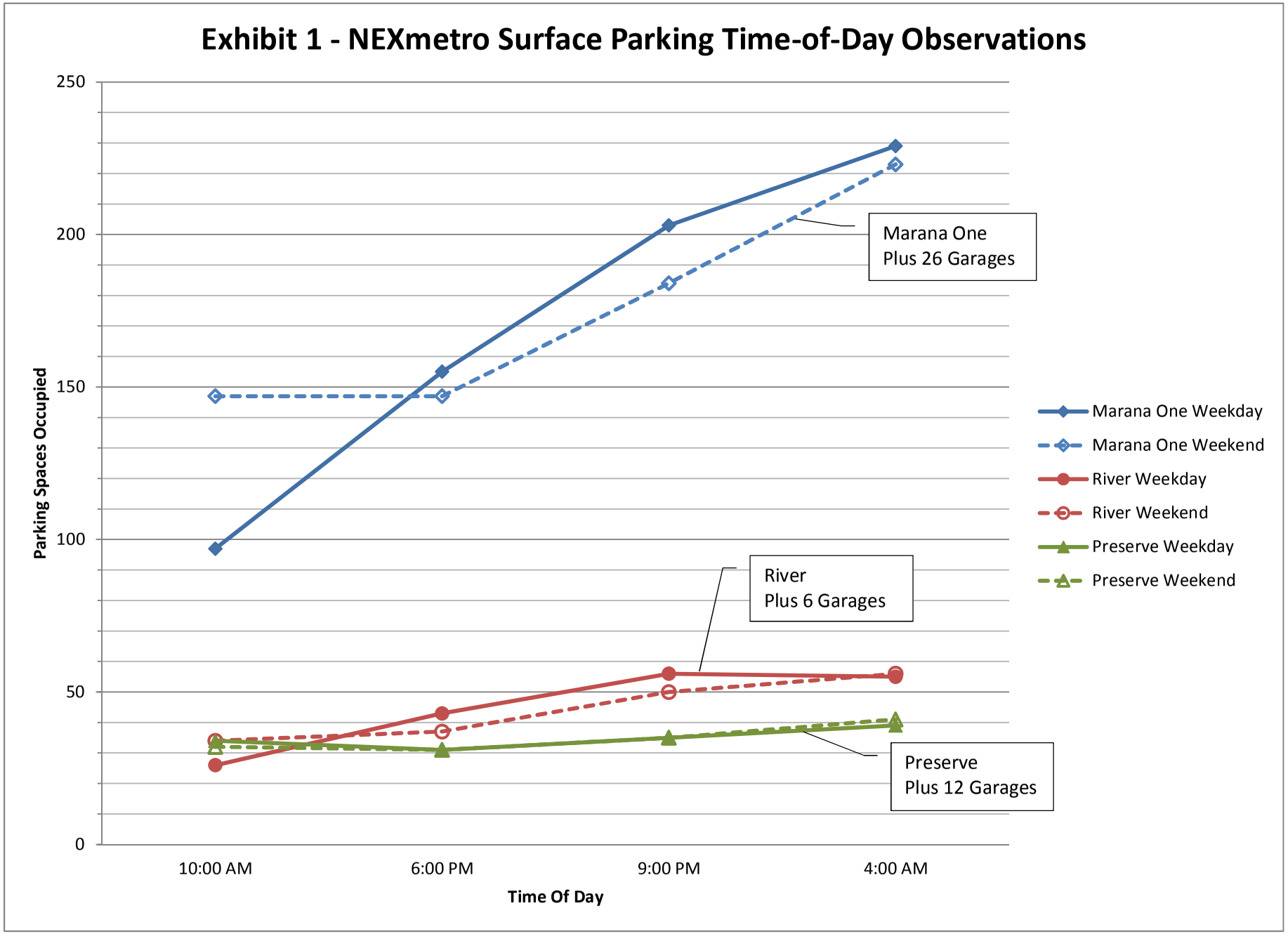
Due to the variability in unit mix at each site, the parking demand per unit is not as certain as using the per bedroom rates. However, the recommended rates per bedroom and per unit are internally consistent for the average 2.1 bedrooms per unit mix at the observed neighborhoods.

As other NEXmetro neighborhoods are completed, continued parking occupancy observations should be made in order to broaden the data set and refine the parking supply recommendations.

END

Attachments: Exhibit 1 - NEXmetro Surface Parking Time-of-Day Observations
NEXmetro Parking Occupancy Observations

Exhibit 1 - NEXmetro Surface Parking Time-of-Day Observations



Parking Occupancy Observations

Site Staff Observations:

Marana One

Date	Day	Time	# of cars
1/15/2014	Wed	10:00 AM	97
1/15/2014	Wed	6:00 PM	155
1/15/2014	Wed	9:00 PM	203
1/16/2014	Thurs	4:00 AM	229
1/18/2014	Sat	10:00 AM	147
1/18/2014	Sat	6:00 PM	147
1/18/2014	Sat	9:00 PM	184
1/19/2014	Sun	4:00 AM	223

Total of 166 units- 157 occupied

26 garages leased

River

Date	Day	Time	# of cars
1/15/2014	Wed	10:00 AM	26
1/15/2014	Wed	6:00 PM	43
1/15/2014	Wed	9:00 PM	56
1/16/2014	Thurs	4:00 AM	55
1/18/2014	Sat	10:00 AM	34
1/18/2014	Sat	6:00 PM	37
1/18/2014	Sat	9:00 PM	50
1/19/2014	Sun	4:00 AM	56

Total of 76 units- 50 occupied

6 garages leased

Preserve

Date	Day	Time	# of cars
1/15/2014	Wed	10:00 AM	34
1/15/2014	Wed	6:00 PM	31
1/15/2014	Wed	9:00 PM	35
1/16/2014	Thurs	4:00 AM	39
1/18/2014	Sat	10:00 AM	32
1/18/2014	Sat	6:00 PM	31
1/18/2014	Sat	9:00 PM	35
1/19/2014	Sun	4:00 AM	41

Total of 184 units (96 released)- 33 occupied

12 garages leased

KHA Observations:

Marana One

Date	Day	Time	# of cars
2/5/2014	Wed	Overnight	224

Total of 166 units- 157 occupied

River

Date	Day	Time	# of cars
2/5/2014	Wed	Overnight	63

Total of 76 units- 50 occupied

2/10/2014	Mon	Overnight	61

Total of 76 units- 50 occupied

Preserve

Date	Day	Time	# of cars
2/5/2014	Wed	Overnight	57

Total of 184 units - 41 occupied

2/10/2014	Mon	Overnight	59

Total of 184 units - 43 occupied