



COUNCIL SUBCOMMITTEE ON WATER ISSUES MEETING

REGULAR SUBCOMMITTEE MEETING AGENDA

TUESDAY, JANUARY 10, 2023, 9:30 AM

201 S Cortez Street
Prescott, AZ 86303
Council Chambers

Mayor Pro Tem Rusing - Chairperson
Councilman Montoya - Member
Councilman Sischka - Member

The following Agenda will be considered by the Prescott Council Subcommittee on Water Issues at Regular Subcommittee Meeting pursuant to the Prescott City Charter, Article II, Section 13. Notice of the meeting is given pursuant to Arizona Revised Statutes, Section 38-431.02. One or more members of the Council may be attending the meeting through the use of a technological device.

Viewing & Participation

This meeting may be viewed on Channel 64, Facebook Live or on the City's Website: [Live City of Prescott Videos](#)

Comments from the public may be submitted through the City website: [Public Comment Form](#)

1. CALL TO ORDER

2. ROLL CALL

3. PUBLIC COMMENT

Public comment will be accepted following each agenda item and are limited to three (3) minutes. Please complete a comment card and return it to the City Clerk, speakers will be called in the order received.

4. DISCUSSION & ACTION ITEMS

- A. Presentation and Discussion Regarding Monthly Update for PFAS Sampling at the City of Prescott's Water Production Wells.

Recommended Action: This item is for discussion only. No formal action will be taken.

- B. Approval of the December 6, 2022 Meeting Minutes.

Recommended Action: MOVE to approve the December 6, 2022 minutes as presented

- C. Water Service Application No. WSA22-026, Submitted by Stroh Architecture, on Behalf of Property Cirrus Industrial, LLC. Location: APNs 102-03-046, 102-03-047, 102-03-048, and 102-03-049, Comprising 4.01 Acres, in T15N, R02W, Section 25.

Recommended Action: MOVE to recommend forwarding WSA22-026 to Council for approval or denial

- D. Water Service Application No. WSA22-033, Submitted by Granite Basin Engineering, on Behalf of the Tanbic Company. Location: APN 103-20-596S, Comprising 13.9 Acres, in T14N, R01W, Section 31, SW ¼.

Recommended Action: MOVE to recommend forwarding WSA22-033 to Council for approval or denial

- E. Discussion & Review of the 2022 Water Management Policy for Residential & Non-Residential Water Budgets as Well as Projects Under Contract for the Period from July 1, 2022 to December 31, 2022.

Recommended Action: This item is for discussion only. No formal action will be taken.

5. GENERAL ANNOUNCEMENTS FROM STAFF

6. ADJOURNMENT

EXECUTIVE SESSION

Upon a public majority vote of a quorum of the City Council, the Council may hold an executive session, which will not be open to the public, regarding any item listed on the agenda but only for the following purposes:

- (1) Discussion or consideration of personnel matters (A.R.S. §38-431.03(A)(1));
- (2) Discussion or consideration of records exempt by law (A.R.S. §38-431.03(A)(2));
- (3) Discussion or consultation for legal advice with the city's attorneys (A.R.S. §38-431.03(A)(3));
- (4) Discussion or consultation with the city's attorneys regarding the city's position regarding contracts that are the subject of negotiations, in pending or contemplated litigation, or in settlement discussions conducted in order to avoid litigation (A.R.S. § 38-431.03(A)(4));
- (5) Discussion or consultation with designated representatives of the city to consider its position and instruct its representatives regarding negotiations with employee organizations (A.R.S. §38-431.03(A)(5));
- (6) Discussion, consultation or consideration for negotiations by the city or its designated representatives with members of a tribal council, or its designated representatives, of an Indian reservation located within or adjacent to the city (A.R.S. §38-431.03(A)(6));
- (7) Discussion or consultation with designated representatives of the city to consider its position and instruct its representatives regarding negotiations for the purchase, sale or lease of real property (A.R.S. §38-431.03(A)(7)).

THE CITY OF PRESCOTT ENDEAVORS TO MAKE ALL PUBLIC MEETINGS ACCESSIBLE TO PERSONS WITH DISABILITIES. With 72 hours advanced notice, special assistance can be provided for sight and/or hearing-impaired persons at this meeting. Reasonable accommodations will be made upon request for persons with disabilities or non-English speaking residents. Please call the City Clerk (928) 777-1272 to request an accommodation to participate in this public meeting. Prescott TDD number is (928) 445-6811. Additionally, free public relay service is available from Arizona Relay Service at 1-800-367-8939 and more information at www.azrelay.org

Confidentiality

Arizona statute precludes any person receiving executive session information from disclosing that information except as allowed by law. A.R.S. §38-431.03(F). Each violation of this statute is subject to a civil penalty not to exceed \$500, plus court costs and attorneys' fees. This penalty is assessed against the person who violates this statute or who knowingly aids, agrees to aid or attempts to aid another person in violating this article. The city is precluded from expending any public monies to employ or retain legal counsel to provide legal services or representation to the public body or any of its officers in any legal action commenced for violation of the statute unless City Council takes a legal action at a properly noticed open meeting to approve of such expenditures prior to incurring any such obligation or indebtedness. A.R.S. §38-431.07(A)(B).

CERTIFICATION OF POSTING OF NOTICE

The undersigned hereby certifies that a copy of the foregoing notice was duly posted at Prescott City Hall on _____ at _____ m. in accordance with the statement filed by the Prescott City Council with the City Clerk



Sarah M. Siep, City Clerk



COUNCIL AGENDA MEMO

MEETING TYPE/DATE: **REGULAR SUBCOMMITTEE MEETING** **01-10-23**

DEPARTMENT: **Public Works**

AGENDA ITEM: Presentation and Discussion Regarding Monthly Update for PFAS Sampling at the City of Prescott's Water Production Wells.

ITEM SUMMARY

PFAS sampling and operational mitigation continues as normal

Current sample results:

Source	PFOS ppb	PFOA ppb
Chino 1	ND	3.3
Chino 2	ND	3.2
Chino 3	ND	3.6
Chino 4	ND	ND
Chino 5	ND	3.1
Airport 2	ND	ND
Airport 3	ND	ND
Airport 5	9.5	12.9
EPDS 11 (chino wells)	ND	ND

ND=not detectable by laboratory method EPA 537.1

BACKGROUND

A proposed Maximum Contaminate Level (MCL) for the PFAS group has not been released by EPA. We were expecting an announcement on December 20, 2022, however there has been an unexplained delay. ADEQ has no new information as to when this proposed rule will be released for review.

No new sample results have been received by the City. Samples were collected mid-December so results are forthcoming. The current demand allows us to operate the wells to be able to reduce the PFAS concentration below detection limit at both the Chino and Airport entry points to the distribution

system (EPDS). We are beginning our operational planning to keep PFAS concentrations at a minimum level once demand starts to increase. Once, we reach approximately 6 MGD of demand, we will have to add additional sources. At this time, wells with higher concentrations of PFAS will need to be operated. We will follow-up at a later meeting with further details.

FINANCIAL IMPACT

N/A

Recommended Action: This item is for discussion only. No formal action will be taken.
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**COUNCIL AGENDA MEMO**

MEETING TYPE/DATE: **REGULAR SUBCOMMITTEE MEETING** **01-10-23**

DEPARTMENT: **City Clerk**

AGENDA ITEM: Approval of the December 6, 2022 Meeting Minutes.

ITEM SUMMARY

Attached for approval are the Council Subcommittee on Water Issues minutes for the December 6, 2022 meeting.

BACKGROUND

None

FINANCIAL IMPACT

N/A

Recommended Action: MOVE to approve the December 6, 2022 minutes as presented

ATTACHMENTS

1. [December 5, 2022 Water Issues Meeting Minutes.docx](#)



COUNCIL SUBCOMMITTEE ON WATER ISSUES MEETING

REGULAR SUBCOMMITTEE MEETING MINUTES

TUESDAY, DECEMBER 6, 2022, 9:30 a.m.

201 S Cortez Street
Prescott, AZ 86303
Council Chambers

Cathey Rusing, Mayor Pro Tem - Chairperson

Brandon Montoya, Councilman – Member Steve Sischka, Councilman - Member

MINUTES OF THE REGULAR SUBCOMMITTEE MEETING OF THE PRESCOTT COUNCIL SUBCOMMITTEE ON WATER ISSUES HELD ON DECEMBER 6, 2022, IN THE 201 S CORTEZ STREET PRESCOTT, AZ 86303 COUNCIL CHAMBERS.

1. CALL TO ORDER

Chairperson Rusing called the meeting to order at 9:30 a.m.

2. ROLL CALL

Cathey Rusing	Chairperson
Brandon Montoya	Member
Steve Sischka	Member

3. PUBLIC COMMENT

Public comment will be accepted following each agenda item and are limited to three (3) minutes. Please complete a comment card and return it to the City Clerk, speakers will be called in the order received.

4. WATER SERVICE APPLICATIONS

- A. Water Service Application No. WSA22-020, Submitted by Stroh Architecture, on Behalf of Property Owner US Veteran's Administration. Location: APN 114-01-001L, Comprising 91.56 Acres, in T14N, R02W, Section 34, NE 1/4.

Water Resource Project Manager Kay Sydow provided a presentation to the Subcommittee regarding WSA22-020, submitted by Stroh Architecture on behalf of the US Veterans Administration. This is a conversion project of six (6) existing historic homes on Veterans Administration (VA) property that will be turned into twenty-three (23) apartment units. Water and sewer service will be disconnected

from private service and transferred to the city. The previous water usage at this location is 1.02 acre-feet per year (AFY). Per the conversion factor of 0.12 AFY, water usage will come to 2.76 AFY, a net increase in demand of 1.74 AFY. The Planning and Zoning Commission approved this project for recommendation on November 10, 2022.

Chair Rusing asked if the units would be metered individually.

Public Works Supervisor Ben Easley replied that it is unknown, adding that there are no existing plans for piping at this time.

Chair Rusing commented that this is an exciting project and is honored to support and serve the veteran community and the VA hospital and invited the applicant, Doug Stroh, to comment on the project.

Applicant Doug Stroh addressed the Subcommittee stating that six (6) of the officer quarters houses will be converted, and the interiors will be minimally touched to keep historic features such as pocket doors. There will be no exterior improvements aside from adding a ramp to one home to make it compliant with ADA (American Disability Act). He feels these apartments will use less water than when fully utilized because fewer people will be living in them and because of upgrades such as shower heads and toilets. The plan is to have one water meter for the six (6) homes and zero landscaping.

MOTION BY MEMBER MONTOYA TO FORWARD ITEM 4.A. TO COUNCIL FOR APPROVAL; SECONDED BY MEMBER SISCHKA: PASSED [3 – 0].

- B. Water Service Application No. WSA22-031, Submitted by Kelly Wise Engineering, Inc., on Behalf of Property Owner Westridge Preserve, LLC. Location: Downer Trail Subdivision, Comprising 9.97 Acres, in T14N, R2W, Section 29, SW 1/4.

Ms. Sydow provided a presentation to the Subcommittee regarding WSA22-031, a request to approve a final plat for phase five of the Preserve at Prescott, a planned area subdivision. The goal is to rearrange some of the lots, re-size some, and add seven (7) lots to the overall development increasing the total from 144 to 151 lots. In addition, staff prepared a demand analysis using 0.17 AFY per parcel, increasing demand to 1.17 AFY. The Planning and Zoning Commission approved this project for recommendation on November 10, 2022

Member Sischka inquired about the conversion factor and asked if it had changed from 0.20 to 0.17.

Ms. Sydow stated that staff has used 0.17 for single-family (SF) dwellings for the last couple of years, adding that staff uses 0.12 for apartments and 0.17 for SF dwellings.

Chair Rusing commented that the maps are easier to read and thanked the staff for that. However, she is concerned about the lack of APN or plat numbers on the maps for this presentation, adding that she has counted eleven (11) lots on the map provided.

Community Planner Tammy Dewitt addressed the Subcommittee explaining that the overall development is adding seven (7) lots that have been reconfigured to make the lots more manageable.

Project Developer Tom Devereaux addressed the Subcommittee explaining that the lots were titled and recorded in 1988. However, roads were put in shortly after that, and the layout did not make sense. Because of this, it was necessary to replat to organize, losing lots along the way. He added that he has given 30-plus acres to open space, given up a lot for parking that he leased to the city for one dollar per year, and helped build the trail.

Chair Rusing asked if additional lots would be added later.

Member Sischka asked for confirmation that there were initially 144 lots that Mr. Devereaux kept rearranging to allow for more in the last phase, and now there are seven (7) lots over the 144.

Mr. Devereaux confirmed that he had water for 144 lots and is asking for approval for the overage of seven (7) lots.

Ms. Dewitt explained to the Subcommittee that they are looking at the overall project, not just this phase. This phase includes going from 144 to 151 lots.

Chair Rusing asked for confirmation that the Subcommittee is being asked to approve water for seven (7) lots.

Ms. Dewitt confirmed the request is for water approval for seven (7) additional lots for the overall master plan.

Member Montoya commented that he confirmed on the city website that the conversion factor is 0.17 for SF units, per the water policy adopted earlier this year.

MOTION BY MEMBER SISCHKA TO FORWARD ITEM 4.B. TO COUNCIL FOR APPROVAL; SECONDED BY MEMBER MONTOYA: PASSED [3 – 0].

- C. Water Service Application No. WSA22-038, Submitted by Land Development Consultants, LLC, on Behalf of Property Owner Weed Investments, Inc. Location: APN 106-21-008L, Comprising 0.89 Acres, in T14N, R02W, Section 16, NE 1/4.

Public Works Director Ashley Couch provided a presentation to the Subcommittee regarding WSA22-038, a proposal to raze an existing Circle K located at the intersection of College Heights and Willow Creek Road and then construct a new, larger store at the same location. The water demand analysis of 2.54 AFY is based on a similar project in Gila Bend. The current usage at the existing store is 1.08 AFY. Therefore, staff is requesting approval for the net increase of 1.46 AFY. The existing landscaping will remain. The Planning and Zoning Commission approved this project for recommendation on November 10, 2022.

Chair Rusing asked about the number of toilets and sinks.

Applicant Jill Keiser addressed the Subcommittee, stating that there will be six (6) toilets and a couple of sinks.

Chair Rusing thanked Ms. Keiser for investing in Prescott.

MOTION BY MEMBER MONTOYA TO FORWARD ITEM 4.C. TO COUNCIL FOR APPROVAL; SECONDED BY MEMBER SISCHKA: PASSED [3 – 0].

D. Water Service Application No. WSA22-042, Submitted by Stroh Architecture, on Behalf of Property Owner Espire AZ, LLC. Location: APN 103-20-598J, Comprising 9.97 Acres, in T14N, R01W, Section 31, SW 1/4.

Mr. Couch provided a presentation to the Subcommittee regarding WSA22-042. This project is for Espire Sports, located in the old Sears building, which has been reconfigured for indoor sports, mainly pickleball. In addition, the request includes water for a future restaurant and a bar. The water demand analysis is 2.68 AFY; deducting the prior use of 0.5 AFY, the net increase in demand is 2.18 AFY.

Chair Rusing stated that this area desperately needs revitalization and asked about the timing of the restaurant and bar.

Applicant Jim Thomas addressed the Subcommittee, stating that Espire Sports has been open for approximately six (6) months and has received six (6) water bills. Based on that, they will use about 0.5 AF per year instead of the projected 2.18 AF per year. Although International Building codes required them to install 39 fixtures, only five to six are used. They have removed all irrigation and installed low-flow toilets and urinals. They are looking for a restaurant partner and moving forward; however, it is taking longer than expected.

MOTION BY MEMBER SISCHKA TO FORWARD ITEM 4.D. TO COUNCIL FOR APPROVAL; SECONDED BY MEMBER MONTOYA: PASSED [3 – 0].

5. DISCUSSION & ACTION ITEMS

A. Approval of the November 1, 2022, Subcommittee on Water Issues Meeting Minutes

MOTION BY MEMBER MONTOYA TO APPROVE THE NOVEMBER 1, 2022 MEETING MINUTES; SECONDED BY MEMBER SISCHKA: PASSED [3 – 0].

B. Presentation and Discussion Regarding the January to June 2023 Residential & Non-Residential Water Budgets, in Accordance with the 2022 Water Management Policy, Policy No. 11.

Mr. Couch addressed the Subcommittee, stating that per the adopted water policy, the water budget will be presented to the Subcommittee every six months for a recommendation to establish a water budget for residential and non-residential projects for the next six months. Mr. Couch provided a review of past and future budget:

Residential – January to December 2022

Total Residential Approvals – 17

Total AF set aside - 25.92

Total Water Budget Remaining – 24.08 AF

Non-Residential - January to December 2022

Total Non-Residential Approvals – 38

Total AF set aside – 33.36

Total Water Budget Remaining – 16.64 AF

Mr. Couch continued the presentation by stating that staff is changing recommendations for the January to June of 2023 residential water budget to include an extra 20 AFY (a total of 53.5 AFY) based on what is in the cue for the next six months:

Proposed Residential – January to June 2023

Palmer Apartments – 29 AFY

32-Unit Apartment Complex on Sunset Ave. – 4.49 AFY

Unknown Administrative Reviews – 20 AFY

Total Water Budget January-June 2023 – 53.49 AFY

Member Sischka asked if a conversion factor of 0.12 is being used for the apartments.

Mr. Couch confirmed and continued with an overview of the estimated non-residential demand for January to June of 2023, stating that staff recommends perpetuating the 25 AFY non-residential .

Proposed Non-Residential – January to June 2023

Commercial Suites for Lease – 1.06 AFY

Willow Hills Baptist Church – 4.10 AFY

Training Building - unknown

Flight Training Center – unknown

New Warehouse – 0.89 AFY

New Office Building – 1.13 AFY

Unknown Administrative Reviews – 20 AFY

Total Water Budget January-June 2023 – 25 AFY

Member Montoya asked what would happen should the Subcommittee not recommend increasing the residential water budget to 53.49 AFY. He asked about the appeal process outlined in the water

policy and stated that adjusting the allotment for a one-off project seems worthy of discussion. He is concerned about future exceptions to the water budget.

Member Sischka stated that the exception depends on the project's value to the city. This Subcommittee is not being asked to approve the efficacy of the project; however, the value of this project and the revitalization of the mall says perhaps this Subcommittee needs to consider a one-off.

Member Montoya responded that a mechanism exists for that to happen; he is not saying to shut the door on it, but there needs to be a robust conversation and assurance that the city is going through the prescribed process.

Member Sischka replied that staff is not asking the Subcommittee to approve water today. Instead, staff is informing the Subcommittee that another 20 AFY is necessary for the next water budget cycle.

Member Montoya disagreed and stated that staff is asking the Subcommittee to increase the water budget for residential by more than half.

Chair Rusing asked the Subcommittee their opinion on the rollover of excess acre-feet from the previous year, which was considered when Council passed the water budget but never solidified. She added that she is pleased with the commercial water budget, as there was some concern that it would squelch the commercial community, but it has not had that effect. She commented that the Palmer project would blow the water budget and that increasing the water budget defeats the purpose of having a water budget; there needs to be a compelling reason to increase the water budget for a project. She would like to create a nexus between workforce housing and water. She suggested decreasing the number of units or establishing a certain percentage of workforce housing deed restrictions, such as 25% less market rent. She disapproves of increasing the water budget for another run-of-the-mill apartment complex.

Member Montoya responded that rollover is worthy of consideration, especially given the previous year's unused amount. He asked staff if the Mayor's Commission on Water Policy Review & Monitoring has considered this option yet. He added that one concern during the water budget adoption was that it would scare people away from undertaking developments like this one, and he hopes that is not the path the city is going down. Rather than a one-off adjustment to the water budget for the Palmer apartments, which sets a precedent, there needs to be a conversation amongst the seven Council members.

Member Sischka asked the Subcommittee members if rewording the recommended action to "forward to Council for consideration" is acceptable.

Chair Rusing stated that a nexus for workforce housing is important; if not, there will be no workforce housing. She added that staff needs to work with a private partner and asked if the Palmers are local. She hopes they are stakeholders who want to invest in Prescott and are amenable to negotiations.

Member Montoya replied that he approves of the reworded recommended action language, adding that a study session needs to be quickly scheduled so staff can move forward with the water budget. He said that there is market demand for these types of projects. He is not pushing back because he doesn't like the project; he only wants to ensure that the process established for these situations is utilized.

Mr. Couch commented that agreeing to continue with 25 AFY for the next six (6) months' water budget and handling the Palmer apartments project through an appeal process is reasonable. Another reasonable approach is to appropriate more water for the next six (6) months, knowing that it is in the queue. He added that an unintended consequence of the water policy as written is that when an appeal is granted, it is unclear whether that exception in and of itself increases the water budget.

Chair Rusing commented that a one-time exception should be allowed if it is compelling and benefits the community.

Mr. Couch responded that in this situation Council could interpret the water policy in two ways. One, Palmer apartments is first in the queue and is approved through the appeal process. Therefore, no other applicant will receive water until July 2023. Two, by approving the appeal, there is no impact on the water budget, leaving 25 AF available for other projects in that six (6) month period, which he feels is the more reasonable approach.

Chair Rusing stated that approving the extra water gives up negotiation leverage; the applicant needs to convince Council that this is a worthy project then maybe last year's excess can roll over to this project.

Member Montoya commented that when the appeals process was incorporated into the water policy, he thought its intent was the second option presented by Mr. Couch; the first option seems draconian and inappropriate. He feels that Council should discuss the appeals process and amend the water policy if needed to clarify the appeals process further. He hopes that the Mayor's Commission on Water Policy Review and Monitoring can be a vetting process for the Council to review these issues and encourages staff to address Council regarding the rollover of unused water from previous years' budgets.

Mr. Couch replied that he agrees that clarifying the appeals process is a worthy conversation for Council.

Chair Rusing commented that the purpose of the water budget and the water policy is to promote sustainable, reasonable growth that values the community. She does not recommend increasing the water budget and would prefer to keep it as is; however, if it is decided to increase the water budget in the future, conversation, negotiation, and leveraging need to occur.

MOTION BY CHAIR RUSING TO FORWARD THE RESIDENTIAL AND NON-RESIDENTIAL WATER BUDGET FOR JANUARY TO JUNE 2023 WITH NO CHANGES FROM LAST YEAR; MOTION FAILED DUE TO LACK OF A SECOND.

Member Montoya stated that he is more inclined to recommend moving forward in a capacity to have a discussion. He is not in favor of shutting the door on an increase. He would like to include the appeal process and the budget rollover and prefers the recommended action language that Member Sischka proposed.

Chair Rusing replied that there could be a discussion and that the door is still open to a worthy project.

MOTION BY MEMBER MONTOYA TO FORWARD THE PRESENTED RESIDENTIAL AND NON-RESIDENTIAL WATER BUDGET FOR JANUARY TO JUNE 2023 TO COUNCIL FOR CONSIDERATION; SECONDED BY MEMBER SISCHKA: PASSED [3 – 0].

C. Presentation and Discussion Regarding Monthly Update for PFAS Sampling at the City of Prescott's Water Production Wells.

Utilities Manager Steve Olfers provided the Subcommittee with the monthly update for PFAS at Prescott's water production wells stating that there have been no changes with the November samples. All samples are staying within a standard deviation and staying within expectations. Only operational wells were tested in November due to issues getting sample bottles. Chino well four (4) continues to be the primary well and reads as non-detect for PFAS. Chino well two (2) is used as a pickup for demand and is reading at 3.2 ppt (parts per trillion). Using these wells together, the combined average PFOS/PFOA is a non-detect.

Chair Rusing asked if the city is in a holding pattern until the MCL (maximum contaminant level) levels come out.

Mr. Olfers confirmed and continued stating that staff is moving to quarterly samples due to cost. Each sample costs about \$1,000 to run, and the cost was not budgeted as it is an unfunded mandate. Therefore, staff will collect samples in December and January before moving to quarterly samples unless the proposed MCL gives staff a different sampling method.

Member Montoya asked if there is a sense of what the MCL guidance will look like.

Mr. Olfers responded that it couldn't be .0004 ppt because that is undetectable. The word is that it will be close to the resolution limit, which may be four (4) or five (5) ppt.

Member Montoya asked if the city would have less of an issue if it came in at four (4) ppts.

Mr. Olfers responded that this is correct, adding that if it comes in at four (4) ppt, staff would have only one (1) well to treat.

Chair Rusing asked if he was referring to the airport well.

Mr. Olfers confirmed that it would be airport well five (5).

Member Montoya asked if the Utilities department would still recommend maintaining a blending schedule if the MCL comes in at four (4) or five (5) ppt.

Mr. Olfers responded that because the well fields are separate, staff would have to take a two-phased approach; the Chino wellfield would continue to be blended, and the airport would be treated at each individual site. If staff continues to develop wells in the airport area, there is a possibility of a centralized treatment system.

Member Montoya asked if that involves a centralized water system, providing a single-entry point into the city, which would then be treated.

Mr. Olfers confirmed, adding that there are options such as everything could be pumped into a tank at the airport level and blended from there. The problem is that the largest well has the highest concentration of PFOS contamination, so he is unsure if that well will serve as a good blending well.

Chair Rusing asked if there were plans to test the Big Chino Water Ranch wells.

Mr. Olfers replied that staff is hesitant to do so because it is unknown which aquifer will be pumped from in the future. Most likely, the agricultural wells drilled now are not related to the same aquifer from which the city's public water would come. He continued stating that staff is waiting for the EPA (Environmental Protection Agency) to come out with the proposed MCL, which will be out by December 20 and will be followed by a 90-day comment period which will hopefully begin after the holidays. Following that, they will take the recommendations and decide how to proceed. Finally, there will be a release of the permanent enforceable MCL, which will be given to the city sometime next year.

Chair Rusing asked about the status of State funding.

Mr. Olfers responded that staff has applied to the WIFA (Water Infrastructure Finance Authority) program, so the city is ahead of schedule by being in line. The next funding cycle is July of 2023, so staff will have a better idea as that date approaches. He added that the city would have a three-year compliance period once the MCL is proclaimed.

Chair Rusing thanked staff for being on top of things and stated that she is 100% confident that the city will have safe water.

This item was for discussion only, no formal action was taken

6. GENERAL ANNOUNCEMENTS FROM STAFF

Ms. Sydow provided the general announcements to the Subcommittee.

- In late October, staff received an announcement from the Arizona Department of Water Resources that the city's gallon per capita per day (GPCD) for 2021 is the lowest since 2006. The GPCD has come down from 112 to 104.

- The city's LNU (water system losses) number was also low in 2021 at 5.14%; the lowest it has been in the last 21 years.
- The city's Long Term Storage credits has been reconciled. As of December 31, 2021 the city has 39,411.06 long-term storage account credits, which equals 39,411.06 AF of water. In the Decision and Order (D&O), the city pledged 2,559 AF to cover AED North and South for 753 AF and Deep Well Ranch for 1,850 AF. A total of 255.9 AF each year is placed in the D&O, leaving a remainder of 13,818 AF usable for future development and supplies.

This item was for discussion only, no formal action was taken.

7. ADJOURNMENT

There being no further business to discuss, Chairperson Rusing adjourned the meeting at 11:06 a.m.

Cathey Rusing, Chairperson

ATTEST:

Jennifer Wiita, Deputy City Clerk

CERTIFICATION

I hereby certify that the foregoing minutes are a true and correct copy of the minutes of the Regular Subcommittee Meeting of the Council Subcommittee on Water Issues of the City of Prescott, Arizona, held on December 6, 2022. I further certify the meeting was duly called and held and that a quorum was present.

Dated this _____ day of _____, 2022.

AFFIX
CITY
SEAL

Jennifer Wiita, Deputy City Clerk



COUNCIL AGENDA MEMO

MEETING TYPE/DATE: **REGULAR SUBCOMMITTEE MEETING** **01-10-23**

DEPARTMENT: **Public Works**

AGENDA ITEM: Water Service Application No. WSA22-026, Submitted by Stroh Architecture, on Behalf of Property Cirrus Industrial, LLC. Location: APNs 102-03-046, 102-03-047, 102-03-048, and 102-03-049, Comprising 4.01 Acres, in T15N, R02W, Section 25.

ITEM SUMMARY

This water service application is for an 81,600 square-foot industrial building located in the Prescott Regional Airpark on Cirrus Drive. The building contains 19 leasable suites.

BACKGROUND

Per the newly adopted City of Prescott Water Policy, any application that requires a water service application also requires a Site Plan application to be reviewed by the Planning and Zoning Commission. The intent of the Site Plan review is to ensure that all developments have functional, well-designed, and user-oriented special requirements.

A water demand analysis was prepared by Sefton Engineering Consultants. A similar facility was used for comparison to estimate the project's annual water demands based on square footage of the building. The consultant calculated the usage as follows:

Similar Site: 242,403 gallons per year / 59,557 square-foot building = 4.07 gallons per year/square foot.

Proposed Building Space: 81,600 square feet x 4.07 gallons per year/square foot = 332,120 gallons per year = **1.02 acre-feet per year.**

Applicant has completed the following:

Pre-Application Conference: June 6, 2022

Application Received: July 19, 2022

Submitted All Documents: August 29, 2022

P&Z Commission Meeting: December 8, 2022

Water Issues Subcommittee Meeting: January 10, 2023

Council Meeting: January 24, 2023

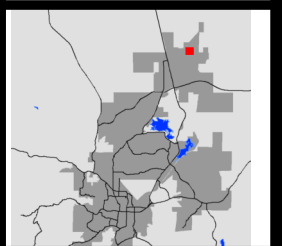
FINANCIAL IMPACT

N/A

Recommended Action: MOVE to recommend forwarding WSA22-026 to Council for approval or denial

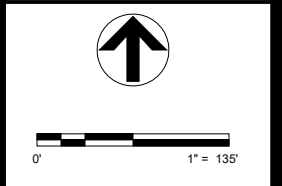
ATTACHMENTS

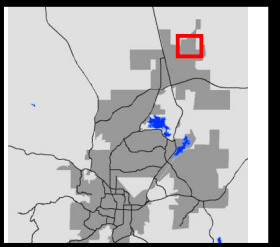
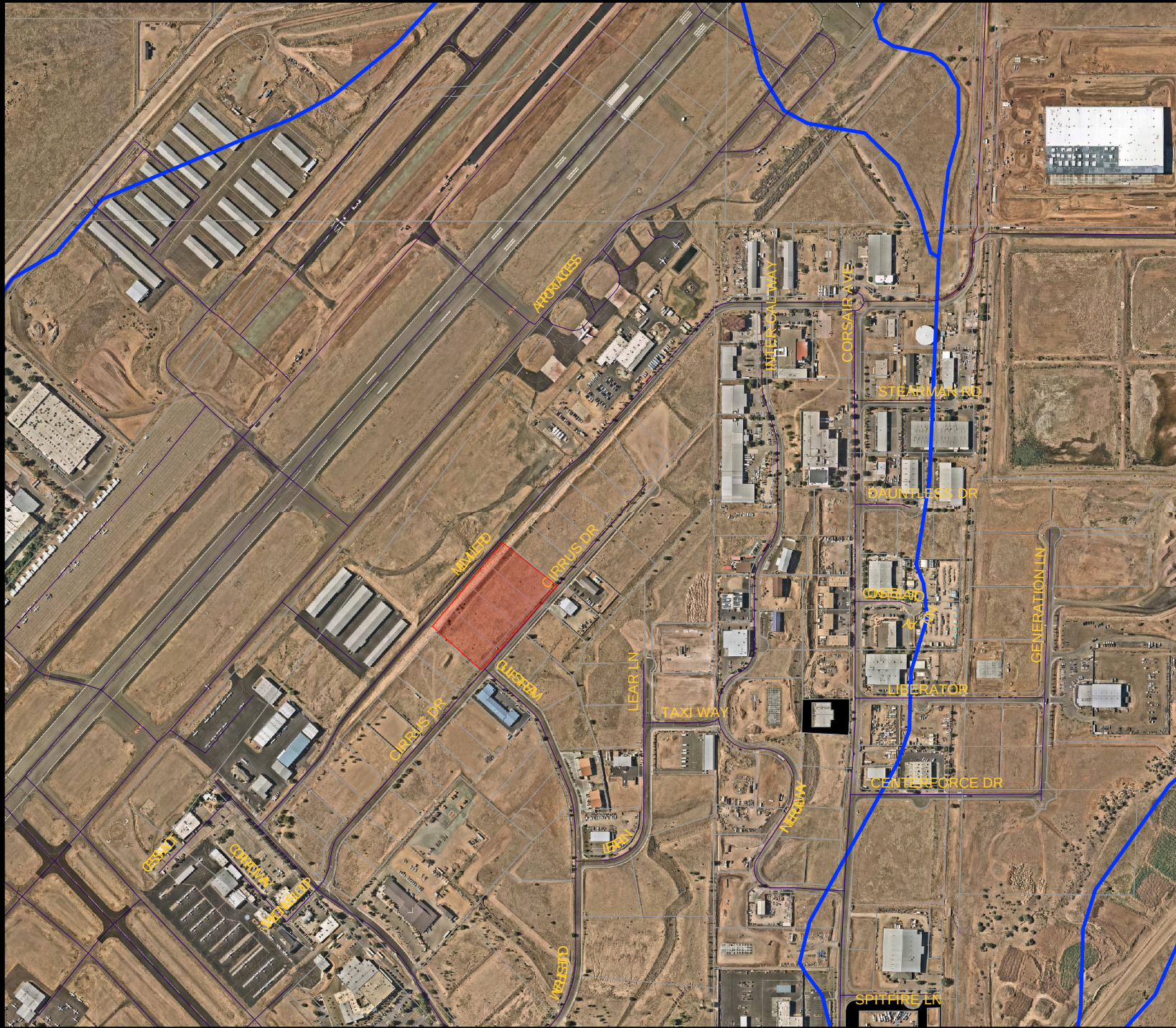
1. [Big Sky Map.pdf](#)
2. [Big Sky Development_Area Map.pdf](#)
3. [Big Sky Development Site Plan.pdf](#)



2218 Cirrus Drive
Big Sky Development
03-046, 102-03-047, 102-03-048, and 102-03-049
4.01 Acres

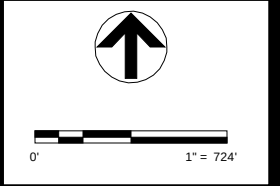
This map is a product of
The City of Prescott





2218 Cirrus Drive
Big Sky Development
4.01 Acres

This map is a product of
The City of Prescott



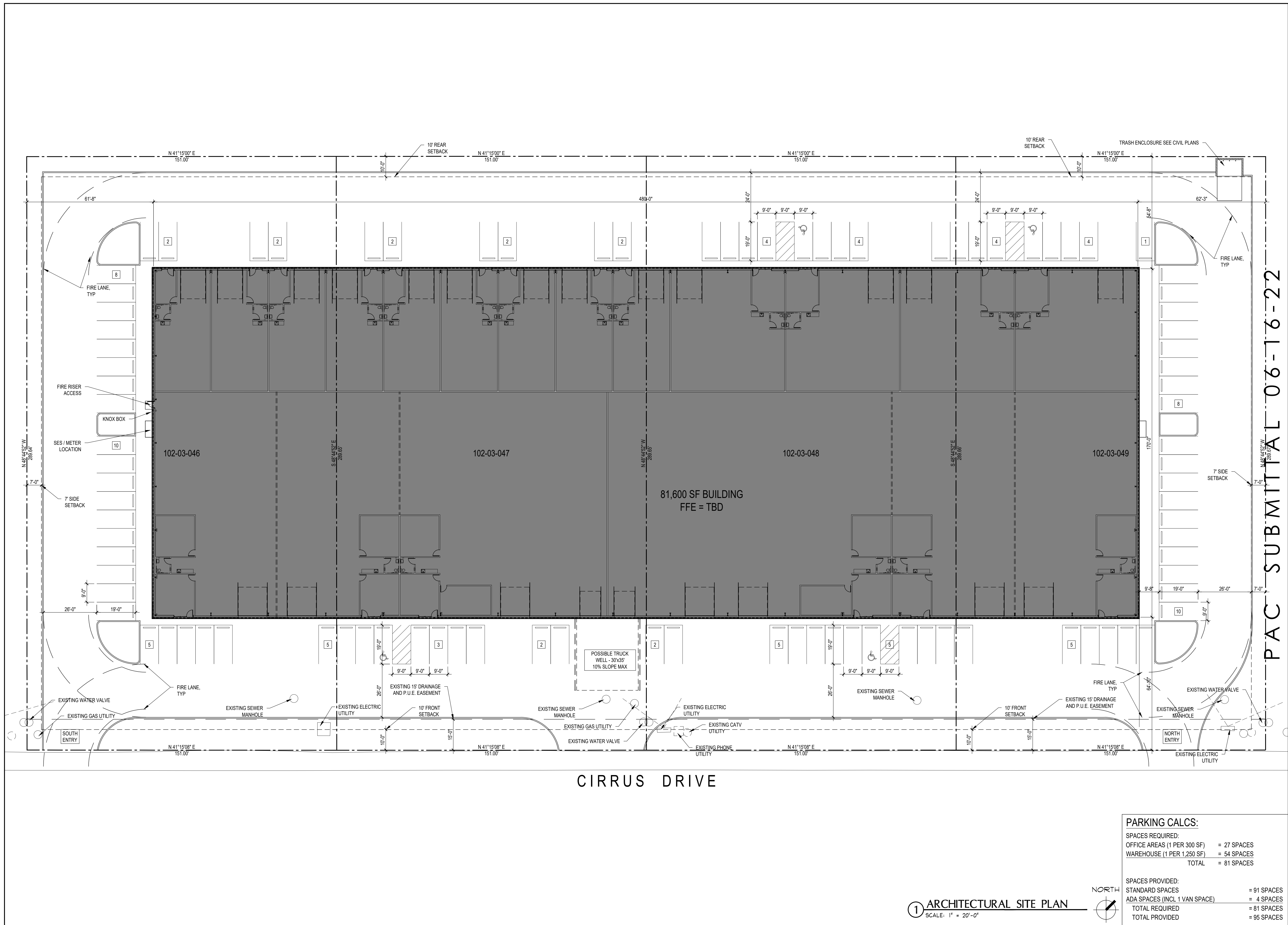
PRELIMINARY
NOT FOR
CONSTRUCTION

STROH ARCHITECTURE, INC. Suite B
1571 Plaza West Drive, AZ 86303
Prescott, AZ 86303
(928) 771-0548

NEW CONSTRUCTION
BIG SKY METAL BUILDING
PRESCOTT REGIONAL AIRPARK & COMMERCE CENTER
PRESCOTT, ARIZONA

REVISION

SHEET
ARCHITECTURAL
SITE PLAN
SD1.0
DRAWN BY: rK
CHECKED BY: DDS
DATE: JUNE 2022
JOB NO: 22009





COUNCIL AGENDA MEMO

MEETING TYPE/DATE: **REGULAR SUBCOMMITTEE MEETING** **01-10-23**

DEPARTMENT: **Public Works**

AGENDA ITEM: Water Service Application No. WSA22-033, Submitted by Granite Basin Engineering, on Behalf of the Tanbic Company. Location: APN 103-20-596S, Comprising 13.9 Acres, in T14N, R01W, Section 31, SW ¼.

ITEM SUMMARY

This water service application is for a multi-family residential apartment complex, comprised of 209 dwelling units, landscaping, pool and clubhouse. The project is located southwest of the Gateway Mall adjacent to Palmer Lane.

BACKGROUND

Per the newly adopted City of Prescott Water Policy, any application that requires a water service application also requires a Site Plan application to be reviewed by the Planning and Zoning Commission. The intent of the Site Plan review is to ensure that all developments have functional, well-designed, and user-oriented special requirements.

This project consists of 209 multi-family residential dwelling units. A water demand analysis prepared by Granite Basin Engineering, using City of Prescott water demand multipliers, calculated the water demands as follows:

209 MF units x 0.12 AFY = 25.08 AFY

2.0 acres of landscaping x 1.5 AFY = 3.00 AFY

Other amenities (pool, clubhouse, etc.) = 0.92 AFY

Total Water Demand = **29.0 Acre-feet/year.**

Per the 2022 Water Management Policy, Policy 14 states, "No single water service application will be approved for water usage estimates greater than 50% of the remaining semi-annual Water Budget. Projects that request more than 50% of the remaining semi-annual water budget may: 1. File a water service application to be considered when the next water budget is available OR 2. Appeal the 50%

rule. The applicant shall demonstrate the benefits to the City such as job creation, wages, sales tax, economic impacts, or other benefits to the City. All such requests shall be reviewed by the Water Issues Subcommittee and the Council.

On December 20, 2022 the City Council set the residential water budget at 25 AFY. This project exceeds the entirety of the water budget and as such has submitted the attached written appeal, outlining the benefits to the City. At the December 20th Council meeting, Council also provided clarification that projects that appeal the 50% rule shall not be included in the water budget if they are approved.

The Planning & Zoning Commission, at its December 8, 2022 meeting, voted unanimously to recommend Council approve this project.

Applicant has completed the following:

Pre-Application Conference: January 28, 2021

Application Received: September 8, 2022

Submitted All Documents: November 10, 2022

P&Z Commission Meeting: December 8, 2022

Water Issues Subcommittee Meeting: January 10, 2023

Council Meeting: January 24, 2023

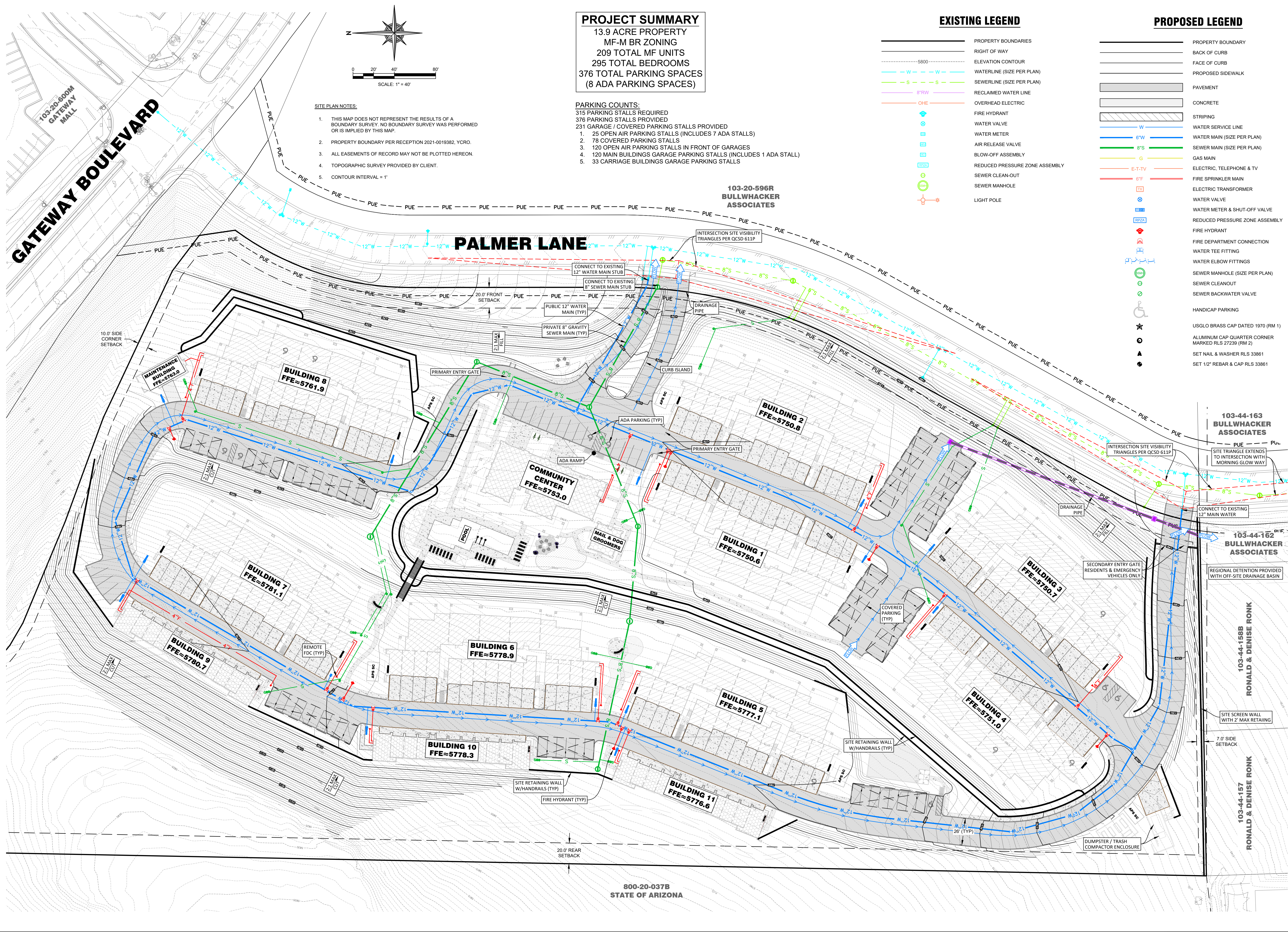
FINANCIAL IMPACT

N/A

Recommended Action: MOVE to recommend forwarding WSA22-033 to Council for approval or denial

ATTACHMENTS

1. [21106 Palmer Apartments Site Plan-2022-09-08.pdf](#)
2. [Palmer Apartments Map Revision.pdf](#)
3. [21106 Palmer Apartments_WSA Appeal_2022-11-10.pdf](#)



		REVISIONS			
		NO.	DESCRIPTION	DATE	BY
☒	FOR REVIEW ONLY				
☐	FOR BID ONLY				
☐	FOR APPROVAL ONLY				
☐	FOR RECORDING ONLY				
☐	FOR CONSTRUCTION ONLY				
☐	FOR AS-BUILT ONLY				



**GRANITE
BASIN**
ENGINEERING, INC.

1981 Commerce
Center Circle, Suite B
Prescott, AZ 86301
928.717.0771

THE TANBIC COMPANY
P.O. BOX 12787
SCOTTSDALE, ARIZONA 85267

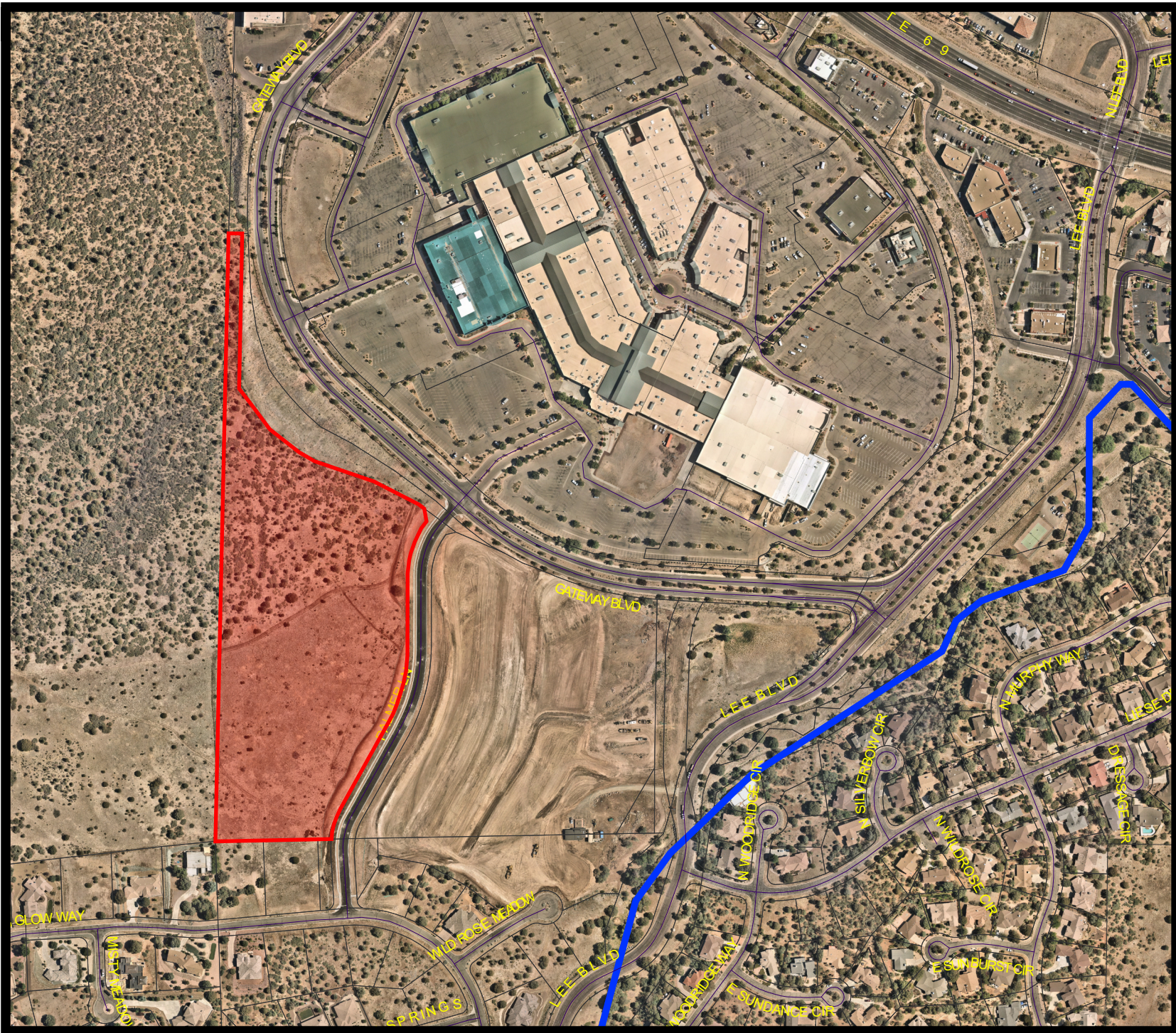
PALMER APARTMENTS
CIVIL IMPROVEMENT PLANS
PROJECT SUMMARY MAP

PRELIMINARY
NOT FOR
CONSTRUCTION

JOB:	21106
DATE:	SEPT 2022
SCALE:	AS SHOWN
DRAWN:	TS
DESIGNED:	TS
CHECKED:	DB

C1

SHEET 1 OF 1



Palmer Apartments
APN 103-20-596S
13.9 Acres

This map is a product of
The City of Prescott



November 10, 2022

City of Prescott
201 South Cortez Street
Prescott, Arizona 86303

Re: WSA Appeal – Palmer Apartments

At your request, we have prepared this appeal for the Water Service Agreement (WSA) required for the referenced project, in accordance with the City's 2022 Water Management Policy. According to the water demand analysis, the projected annual water demand for Palmer Apartments is 29-af. Based on the relative size and projected annual water demand for the project, an appeal is necessary since the WSA request is expected to be greater than 50% of the remaining semi-annual Water Budget. According to Water Budget: Policy 14, the 50% rule may be appealed, and "...the applicant shall demonstrate the benefits to the City such as job creation, wages, sales tax, economic impacts, or other benefits to the City."

Based on our estimates, this project offers tremendous benefit to local businesses and the City of Prescott, both during and after construction. Economic impacts of the project are summarized below.

City Impact Fee's Est.	836,000.00
Excise Tax (2.75%)	159,779.29
Est. Annual Property Tax	137,360.00
TOTAL	1,133,139.29
Recurring Tax at Stabalization	297,139.29
Average Net Worth (3-Mile)	962,964.00
Winfield Average Age	49
Winfield Average Income	108,000
If Palmer Average Income was	75,000
Total Yearly Income Living at Palmer	15,675,000
Potential Prescott Income Tax (4.2%)	658,350.00
Average Tax Bracket (24%)	3,762,000.00

Supporting documentation for the economic benefits created by Palmer Apartments, both construction and stabilized, are enclosed herewith.

Sincerely,

Davin Benner, P.E.

Enclosures: NHMC & Supporting Documentation (46 pages)

Arizona

Economic Impact of 209 New Apartment Homes.

Economic Impact

The combined contribution of apartment construction, renovation and repair, operations and resident spending to the metro economy.

Construction	\$57,121,876
Renovation & Repair	\$507,436
Operation Expenditures	\$1,368,810
Resident Spending	\$38,119,152

Total Economic Impact **\$97,117,274**

Impact from Tax Revenue

Operation Expenditures	\$254,680
Resident Spending	\$3,905,360
Total Impact from Tax Revenue	\$4,160,040

Employment Impact

The total number of jobs supported by apartment construction, operations, and resident spending within the metro economy.

Construction	289
Renovation & Repair	3
Operations	3
Resident Spending	219
Total Jobs Supported	514

Arizona

Economic Impact of 209 Existing Apartment Homes.

Economic Impact

The combined contribution of apartment construction, renovation and repair, operations and resident spending to the metro economy.

Renovation & Repair	\$507,436
Operation Expenditures	\$1,368,810
Resident Spending	\$38,119,152

Total Economic Impact	\$39,995,398
------------------------------	---------------------

Impact from Tax Revenue

Operation Expenditures	\$254,680
Resident Spending	\$3,905,360
Total Impact from Tax Revenue	\$4,160,040

Employment Impact

The total number of jobs supported by apartment construction, operations, and resident spending within the metro economy.

Renovation & Repair	3
Operations	3
Resident Spending	219
Total Jobs Supported	225

The Contribution of Multifamily Housing to the U.S. Economy



Prepared by:
Hoyt Advisory Services and Eigen10 Advisors, LLC

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EXECUTIVE SUMMARY

This report summarizes the methods and findings of a study that was conducted by Hoyt Advisory Services on behalf of the National Apartment Association (NAA) and the National Multifamily Housing Council (NMHC). The study explored the impact the apartment industry had on the US economy in 2013 and 2016.

Four different types of industry expenditure (activity) were identified and separately analyzed in order to fully capture industry impacts. They are:

- A. Construction of new rental units;
- B. Expansion, renovation and repair of existing properties;
- C. Property operations and maintenance activities; and
- D. Spending by renting households

Key Findings - US

The apartment industry has a large and growing impact on the US economy.

- In 2016, it generated over **\$3.4 trillion of national economic output and supported 17.5 million US jobs**. This represents almost **19% of total GDP** (in nominal dollars) **and 12% of the employment growth for that year**, up from 17% and 11% shares, respectively, in 2013.
- **Over 88% of total industry impacts** -- \$3.0 billion of economic activity and 16 million jobs -- **were generated by renter household spending** (Segment D). **Impacts directly attributable to the apartment industry** (Segments A through C) **totaled \$394 billion and 1.43 million jobs**.
- **All four industry segments posted very strong growth** over the 3 years studied, led by resurgent construction activity: the impacts from new apartment construction almost doubled between 2013 and 2016. In aggregate, economic impacts from all 4 segments expanded by 21% and employment impacts by 16%.
- **Six economic and demographic factors were important drivers of impact growth** across the 4 industry segments: population and employment growth, rental share of the total housing stock (tenure split), size and growth of the rental stock's 5+unit segment, renter household income gains, and average effective rent growth.

State and Metro Results

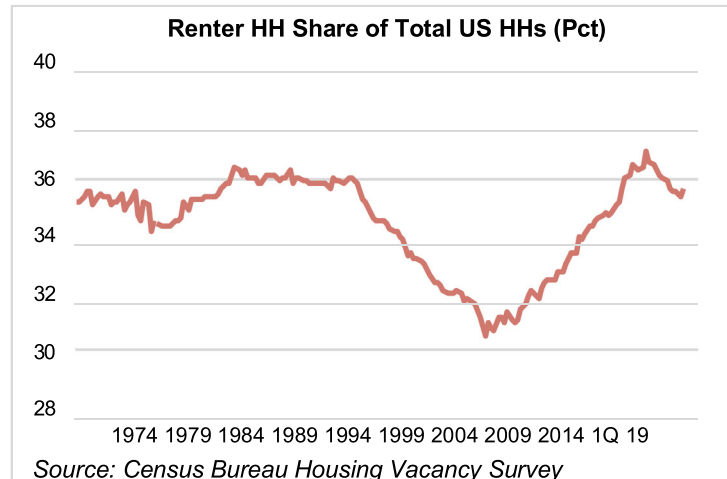
Subsequent rounds of analysis were conducted for the 50 states and the District of Columbia as well as for 50 major metropolitan areas. Results at each geographic level exhibited the same pattern, i.e., significant economic and job impacts with robust growth over the 3-year study period.

- In all, **the 50 states+DC (Sum of States, or SOS) generated \$2.95 trillion of economic impacts and 14.2 million jobs in 2016**. SOS impacts increased by 21% (\$518 billion in output) and 15% (1.86 million jobs) between 2013 and 2016.
- **Our 50-metro cohort contributed \$2.05 trillion and 9.2 million jobs in 2016** – up 19% (\$329 billion) and 12% (949 thousand jobs), respectively, from 2013. The sum of metro (SOM) totals represent **more than 60% of total US impacts** for both categories.
- The performance of individual states and metros was tied to the six impact growth drivers that we identified for the US as a whole. In general, the largest states and metros dominated impacts in absolute terms but – with a few exceptions – posted average or below-average growth relative to their peers. On a percentage growth basis, several mid-sized states and metros that have attracted an outsized share of post-recession population and economic gains top their group rankings.

A description of the study methodology and data sources is provided in the following pages, followed by a discussion of study findings at the national, state, and metro levels. The states and metros are also ranked for their performance in generating apartment industry impacts. Their performance is also analyzed in the context of the demographic and economic variables that drive industry impact growth.

INTRODUCTION

Nearly 40% of all US households live in rental units, which play a crucial role in the nation's residential infrastructure. After decades of relative stability, the rental share declined steadily between 1995 and 2004 as a rapidly expanding secondary mortgage market and aggressive lending produced a surge in homeownership. Rising delinquencies and higher mortgage rates began to stem this trend in the mid-2000's. The Great Financial Crisis brought declining ownership and increasing renter-ship which persisted until mid-2016. Most recently, the rental share has begun to decline again. Government, academics, and industry leaders are paying greater attention to the rental half of the housing market to understand whether a new national renter / owner equilibrium may be emerging.



This study was conducted on behalf of the National Apartment Association (NAA) and the National Multifamily Housing Council (NMHC) to better understand the role and the importance of the apartment industry in the United States. Specifically, ***the project was designed to identify the data sources and develop the tools and techniques that would permit a comprehensive quantitative estimate of the industry's impact on the US economy.*** Estimates of economic impacts were also prepared for the 50 states and District of Columbia and for 50 major metropolitan areas.

Our analysis estimates and compares industry impacts for two years, 2013 and 2016. The industry is defined for study purposes as rental properties containing 5 or more (5+) occupied units. As of 2016, this comprised approximately 20% of the total occupied US housing stock and 52% of all occupied US rental stock.

I. Study Methodology

We employed input: output analysis for the study to separately estimate the direct, indirect, and induced multipliers for four identified apartment industry segments. The resulting multipliers were then used to calculate the total economic and employment impacts of spending in each segment, or category, for the two study years. These four segments are:

- a. Construction
- b. Renovation & Repair
- c. Facilities Marketing & Operations/Management
- d. Renter Household Spending Calculation of Multipliers

Calculation of Multipliers

The input-output approach involves the construction of relatively detailed representations of the flows of goods and services among industries. It is particularly useful when estimating the importance to the economy of specific activities, as purchases made in the pursuit of these activities reverberate through all industries.

National input-output tables computed and published by the US Bureau of Economic Analysis (BEA) provided the data needed to compute multipliers for apartment sector activity. This “follow-the-money” approach offers a rich perspective on the total contribution a single industry provides to the US economy as a whole.

The starting point for input-output analysis is an estimate of the total “output” of an industry segment. These were generated separately for our 4 categories of activity in 2013 and 2016. For each category, or segment, we calculated an estimate of the purchases it makes from every industry listed in an input-output table. Once identified, computing the relevant estimate for the influence of the industry on the economy involves estimating three varieties of impacts: direct, indirect, and induced. The total economic multiplier for each segment is the sum of the direct, indirect and induced impacts from its annual expenditures

A final multiplier, the employment multiplier, converts the economic impact in dollar terms to an equivalent employment impact. Employment multipliers range widely (from less than 1 to over 80) depending on the contribution of labor to industry output and on the industry’s compensation per employee. The employment multiplier for the lodging sector, for example, is very large, reflecting that industry’s service orientation and its reliance on low-skill employees for housekeeping services. On the other hand, the financial services industry, with many high-skill and highly paid employees, has a low employment multiplier. After computing economic impacts by industry, we applied the individual industry employment multipliers and summed them to obtain the total employment impact multiplier for that industry.

Multipliers were then prepared for:

- All 50 states + the District of Columbia and
- 50 primary US metropolitan areas

Calculation of regional multipliers for the 50 states + DC and for 50 selected metro areas involved modifying the national BEA table for differences in the selected geography’s industry mix. Each state and metro multiplier is unique, reflecting its industry mix, local compensation rates, and the extent to which it fulfills local demand for goods and services internally or relies on imports. The national input-output models were adjusted for the 2013 and 2016 study years using a process modelled after BEA’s RIMSII system¹; these were then used to estimate individual state- and metro-level multipliers for each year.

¹Bureau of Economic Analysis, Regional Input-Output Modelling System: Estimation, Evaluation and Application of a Disaggregated Regional Impact Model – RIMS II, NTIS, April 1981.

Estimation of Impacts

The US government provides a wealth of detail about economic activity at the national level. Coverage of regional statistics is narrower, however, so one important change in the methodology for subnational work involves sourcing data inputs that permit development of impact estimates for each apartment industry segment. We conducted a search to identify data sources that (1) accurately captured revenues and expenditures for all four segments, (2) covered the desired time interval, and (3) included all of the desired geographies, with the additional caveat that all metro-level data used consistent definitions of each metro's geographic extent.

The data and analyses ultimately employed are outlined in Appendix C; Appendix D lists the study data sources more fully.

A Note on Tax Impact Calculations.

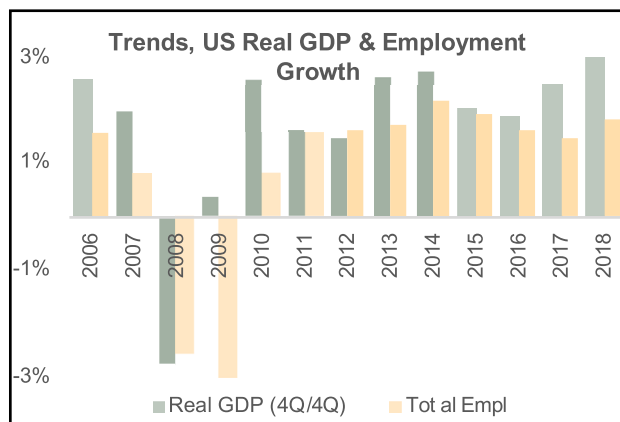
This study includes the use of direct, indirect and induced multipliers to estimate the impact of tax revenue from apartment operation and from renter spending. However, precise calculation of the appropriate multipliers would require estimates for the unique tax rates applicable to each of the 71 input-output industries used in multiplier calculation for every geography included in this study. Such an effort is beyond the scope of this work. Instead of developing tax multipliers at each geographic level, we assume that the tax rates applicable to the apartment industry that were derived from NAA survey responses (Category C) and from the BEA Consumer Expenditure Survey (Category D) are representative of the average tax rate paid by all industries and all residents within that geography (state or metro). We believe this assumption provides a better estimate of total tax revenue impacts arising from apartment operations and from renting households than would applying no multiplier at all.

II. Findings

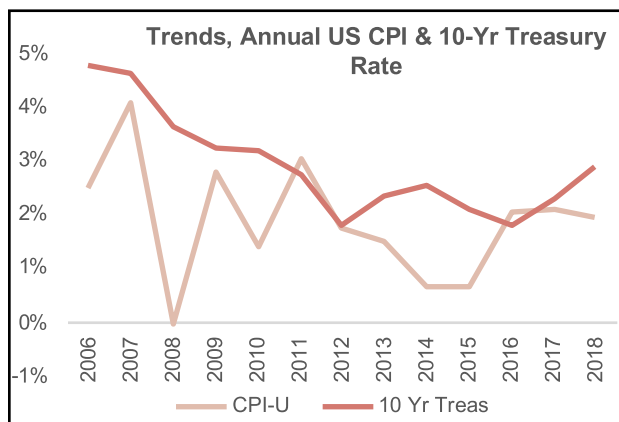
Economic Backdrop

The economic backdrop of our 3-year study period (2013-2016) provides an important context for understanding the results of our apartment impact analysis. The United States suffered a severe, housing-focused recession in 2008-09. Often called the Great Financial Crisis (or GFC), it was the country's worst downturn since the Great Depression of 1929. Unlike past recessions, all regions and all industries were affected. The global economy turned down as well.

In all, real GDP fell by -4.0% and the economy lost more than 8.6 million jobs. The Federal Reserve adopted a series of highly accommodative and in many cases unprecedented monetary policies in order to stabilize then restore growth. These included slashing the federal funds rate to zero and undertaking three rounds of quantitative easing.



Source: US BEA, US BLS



Source: US BLS, Federal Reserve

US GDP resumed growth in July 2009, but job growth did not turn positive until early 2010, exhibiting its typical pattern of lagging GDP trends by several months. Both have continued to expand over the intervening decade. If the recovery extends beyond June of this year, it will become the longest expansion in US history. Unlike the GFC, however, recovery has been unevenly distributed, with certain industries – primarily energy and tech – and regions leading the way.

The composition of this ~10-year upcycle has been unusual, combining

- Modest and uneven GDP growth, averaging only 2.3% per annum – about half the rate of the typical post-WWII recovery -- yet
- Strong, sustained employment gains exceeding 2.0 million new jobs per year.

The national unemployment rate has fallen from a recessionary peak of 10.0% to almost 3.5% today (a 50-year low), and employers have more openings than there are job seekers to fill them. Despite very strong labor market conditions, average wage growth has been moderate, inflation remains tame, and interest rates continue to be low.

Our analysis compares the contribution that the apartment industry made to the US, state, and 50 major metro economies in 2013 and 2016. 2013 was relatively early in the recovery, with some regions not yet registering improvement. By 2016, however, virtually all states and metros were participating in the expansion. Results for these two years reflect the shift in conditions that was taking place. Impact Drivers.

Impact Drivers

Our analysis has shown that several economic and demographic factors determine the size and drive the growth of apartment industry impacts.

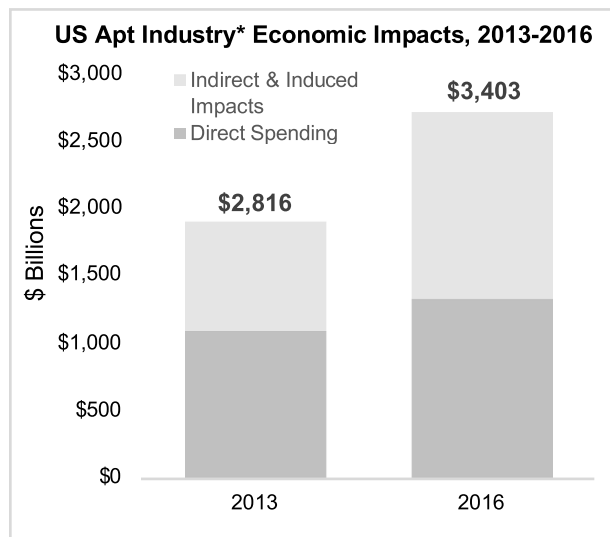
They include:

- Population size and growth
- Size and growth of the employment base
- Housing tenure split (owner/renter) and changes over time
- Size and growth of the 5+unit segment of the rental stock
- Level and growth of the median income of renting households
- Level and growth of average per unit effective rent for 5+unit properties

Although all of these factors contribute to the results, we found that some are more important than others for individual industry segments and/or geographies (i.e., state versus metro). These relationships may shift over the course of an economic cycle. The following discussion of findings for individual segments incorporates some perspectives on those variables which made key contributions over our 2013-2016 study period.

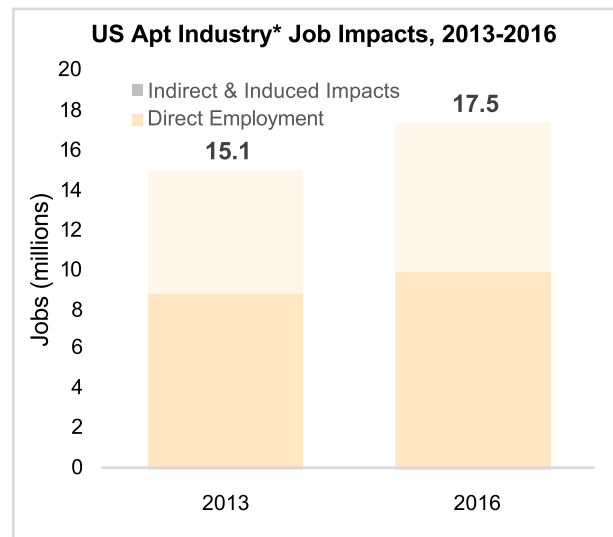
1. Impacts at the National Level

In 2016, the US apartment industry contributed a total of \$3.4 trillion to US GDP and generated 17.5 million jobs, gains of 21% and 16%, respectively, from 2013.



Source: HAS Estimates

* Occupied rental units in 5+ unit properties



Source: HAS Estimates

* Occupied rental units in 5+ unit properties

The industry contributed 18.6% of total GDP in 2016, up from a 16.6% share in 2013 (measured in nominal dollars). Its employment impacts comprised 11% of total US jobs in 2013, edging up to 12% by 2016.

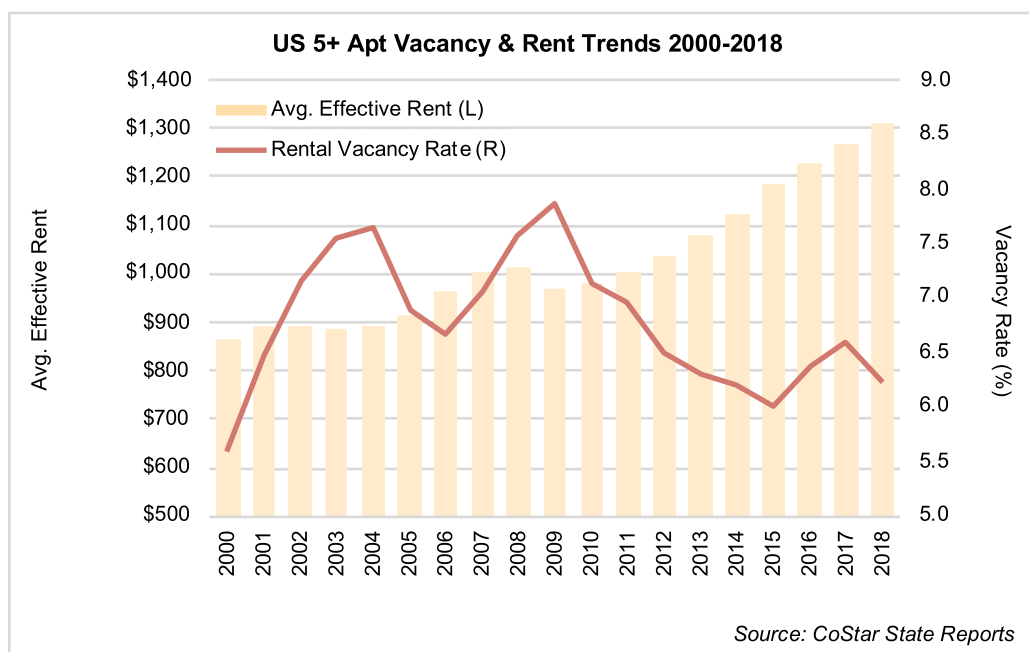
Because of robust 2013-2016 gains, the industry increased its share of both output and employment between 2013 and 2016, supporting 45% of US GDP growth and 29% of total job growth over this 3-year period.

Summary of Economic/Employment Impacts -- U.S.				
by Industry Segment/5+ Unit Apartment Properties				
2013 & 2016				
<u>SEGMENT IMPACT</u>	2013		2016	
Industry Segment	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)
a Construction	\$85.11	441,440	\$150.13	752,362
b Renovations & Repair (RAR)	\$44.06	223,270	\$54.19	267,708
Cap Ex, NAA Universe	\$48.46	245,535	\$83.47	412,342
Average of RAR, Cap Ex	\$46.26	234,403	\$68.83	340,025
c Op Ex, NAA Universe	\$142.55	291,459	\$175.23	340,986
a-c Sum of Impacts	\$273.92	967,302	\$394.20	1,433,372
d Renter Household Spending	\$2,542.33	14,147,746	\$3,008.75	16,046,312
TOTAL IMPACT, ALL SEGMENTS	\$2,816.25	15,115,048	\$3,402.94	17,479,684
c Tax Portion of Op Ex	\$42.51	86,918	\$58.04	112,943
% of Category Impact	29.8%	29.8%	33.1%	33.1%
d Tax Portion of Renter Spending	\$165.09	918,711	\$350.84	1,871,115
% of Category Impact	6.5%	6.5%	11.7%	11.7%

In both years, renter spending (Segment D) dominated the economic and employment impacts in absolute terms. Although much smaller, the new construction segment (A) posted the strongest 3-year rate of growth of the 4 segments analyzed.

US 2013 - 2016 trends for our 6 impact drivers are:

1. A 7.0 million total gain (+2.2%) in population, forming 2.6 million new households
2. Notably, employment growth exceeded population gains: the economy added almost 8.0 million new jobs, an increase of 5.8%, supporting new household formation and boosting rental demand
3. While total occupied rental stock posted only 3.3% growth between 2013 and 2016, the number of occupied 5+unit rentals rose 6.7% -- twice as fast -- over this period. This implies a market shift in favor of larger, professionally-managed rentals.
4. This 3-year gain of 1.45 million occupied 5+ unit rentals translates into a 70 basis-point increase (+0.7%) in the segment's market share, magnifying the impact of its growth.
5. Median annual income for all renting households in the US increased 8.4%, to \$35,200, during the 3-year study period, almost double the 4.3% growth reported for the "all household" median. This combination of above-average gains in the number and the incomes of 5+ unit renter households translated into 19% growth in their expenditures.
6. Average effective rent for 5+unit properties in the US appreciated by 13.6%, to \$15,168 per annum, underpinning healthy revenue growth for the industry in the wake of flat to declining rents during the GFC (2008-2009). Although rental gains were well above inflation once the recovery gained traction, average growth for the 10-year period ending in 2016 was a moderate 2.5% per annum.



The importance of the individual variables differs by industry segment, and provides a framework for understanding the patterns of growth for each segment over time. The national level statistics also provide benchmarks against which the performance of individual states can be measured. The market context for apartment construction approaching 2013 was rapid, steady recovery, while the context in 2016 was peak activity consistent with its high sensitivity to the economic cycle.

A New Construction

Our 3-year study period marks the early years of the current economic recovery. Prior to the Great Recession (1998 - 2006), annual starts of buildings with 5 or more (5+) units fluctuated narrowly between 293,000 and 315,000 units. Completions ranged between 263,000 and 305,000 units while the number of units under construction steadily increased. The recession prompted starts to drop to ~100,000 units in 2006 and 2007, and completions bottomed at 130,000 units in 2011. Spending on new multifamily construction plummeted, reaching a low of \$14.7 billion by 2010. In real (inflation-adjusted) dollars, construction activity fell by 75% between 2006 and 2010.

Activity stabilized in 2011, then accelerated rapidly over the next five years. It peaked in 2016 close to the elevated level that prevailed just before the GFC.

Construction of buildings with 5+ units intended for the rental market comprises the lion's share of multifamily activity. Our estimate, based on Census Bureau data, is that 5+rentals comprised an 88% and 89% share of total multifamily construction in 2013 and 2016¹. In real terms, the pace of activity by 2016 was 82% above 2013's early-recovery level. Multifamily construction has tapered slightly since then.

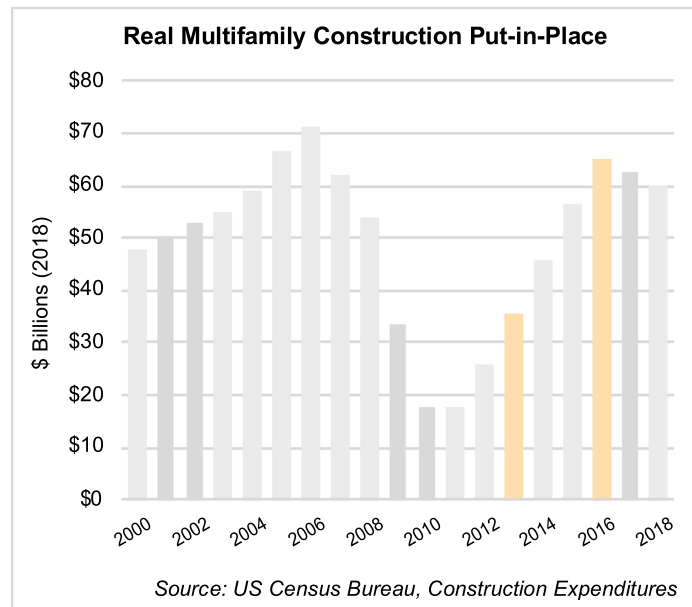
The economic impact calculated for the new construction segment grew by an outsized 104% between 2013 and 2016, to \$106 billion -- the strongest gain in percentage terms among the 4 industry segments. Despite its out-performance, new construction remains third largest of the 4 segments with a <5% share of total impacts.

The labor-intensive construction segment also posted the strongest growth in employment impacts. **The total number of jobs supported by spending on new rental construction rose from 0.26 million in 2013 to 0.50 million in 2016 – an outsized 94% gain.** Construction's contribution might have been even stronger; labor shortages have plagued the industry since early in the recovery, constraining its growth.

Most of the cyclical variation in spending traces to buildings with 20+ units that are intended to be rental properties. Direct spending in this subcategory doubled between 2013 and 2016, from \$19.3 billion to \$39.5 billion. Construction of smaller multifamily structures in buildings with 5 - 19 units rose by 42%, to \$22.5 billion.

Construction spending per unit has been relatively stable since 2012, at about \$8,500 per month, while the average project construction period has been 10 - 12 months over the past 5 years. Spending declined in the late 2000's, bottoming in 2010 at \$7,000 per unit per month. Many development projects slowed or suspended activity due to the recession, stretching the average construction period to 12 - 15 months. Relatively stable construction wages account for much of the variability in construction costs during this time. The lack of strong wage growth in the early years of the recovery figure importantly in this stability.

Three of the 6 impact drivers were most significant for the 3-year performance of the new construction segment. They are, in order of importance, growth in (1) employment and (2) effective rents for 5+ unit properties, followed by (3) population expansion.



¹ Housing completions: US Census Bureau, New Residential Construction, monthly. Rental proportion of the multifamily housing stock: US Census Bureau, American Housing Survey, bi-annually.

B. Renovations and Improvements / Capital Expenditures (cap ex)

Both the economic and employment impacts calculated for the renovations / cap ex segment grew by almost half between 2013 and 2016, to \$69 billion in output and 0.34 million jobs. With a 2% share of total industry impacts, B is the smallest of the four segments. Three major factors play a role in driving annual expenditures in this category:

growth in the number of 5+ rental units; prevailing vacancy and rent trends; and decisions to advance or delay major capital replacement spending. Our analysis of the expenditure patterns over our 3-year study period reflect the interplay between accelerating supply growth, growing absorption in response to economic expansion, rising rental income, and catch-up capital spending that had been postponed during the recession.

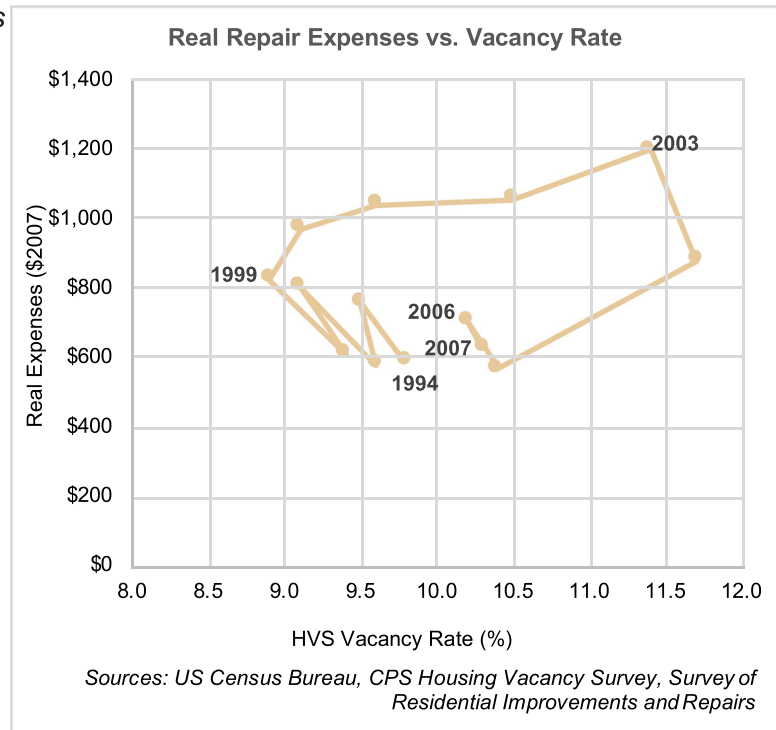
Rapid supply growth, especially in 2005 – 2007, led to rising vacancy across the US once the downturn began. Despite this fact, the vacancy rates in many individual markets remained below historic norms. Renovation and repair expenditures during our 3-year study period clearly reflect the impact of supply / demand dynamics. While strong job growth and rising confidence spurred rental demand, new supply continued to come on-line as projects that had broken ground before the recession came onto the market.

During this interval, about half of the state vacancy rates rose for units in buildings with 5 or more units and about half declined. The historical relationship between expenditures and vacancy rates is complex. It seemed to involve hysteresis effects (i.e., a different functional relationship during periods of rising vacancy rates than during periods of falling vacancy rates). We have incorporated this effect into our estimates. Intuitively, rising vacancy rates tend to trigger higher expenditures in this category as owners compete more strongly in local markets and tend to decline during periods of falling vacancy rates as competition for tenants' wanes. On average, the vacancy rate rose by 0.1 percentage points, contributing slightly to increased spending in this category at the aggregated state level (SOS, or Sum of States). We found considerable variation among states, with about half posting vacancy rate declines between 2013 and 2016 and half experiencing increases.

Although capital expenditure spending (**cap ex**) is included in NAA's annual Survey of Income & Expenses, it is a form of property renovation and repair; we therefore incorporate it into our Segment B impact calculations. **Cap ex escalated significantly between 2013 and 2016.** Residential housing renovation and repair multipliers (distinct from residential construction multipliers, but similar in action) are employed when calculating capital expenditure (cap ex) impacts, producing an outsized result despite the subcategory's comparatively modest size:

- **At \$58.5 billion, cap ex's 2016 economic impact was 68% above its 2013 level.**
- **The 0.26 million jobs it supported represents a 55% increase from 2013.**

No single measure stood out as a primary driver of growth for the industry's renovations / cap ex segment. However, 4 of the 6 variables demonstrated a moderate correlation with its 2013-2016 impact gains. Growth in 5+ unit inventory, bolstered by gains in the 5+ unit share of the rental market, was most influential, followed by increases in employment and in effective rents for 5+ unit properties.

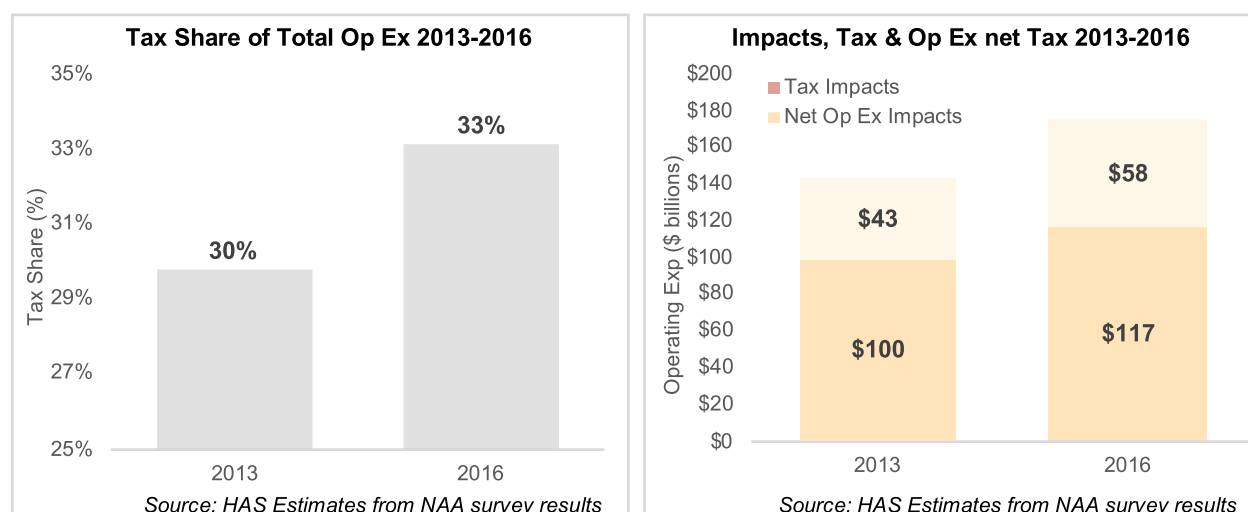


C. Industry Operating Expenditures (op ex)

Apartment property operating expenses (op ex) for the nation's 5+ unit market generated \$175 billion of economic activity and 0.34 million jobs in 2016 – up 23% and 17%, respectively, from their 2013 levels. Op ex is the second largest generator of economic impacts among the industry's four segments, but ranks third (behind new construction) for employment impacts because of its significantly smaller employment multipliers.

The growth drivers that underpinned the op ex segment's strong performance between 2013 and 2016 were -- in order of importance -- effective 5+ unit rent growth, employment gains, and increases in the number of occupied 5+ rental units and in the 5+ share of the overall rental market. As with Segment B, all of these variables' effect on op ex was moderate; there was no dominant driver of impact growth for Segment C.

The **tax expenditure** category within the op ex segment was evaluated separately as part of our analysis. **Taxes are by far the largest of NAA's 9 op ex categories, comprising 33% of 2016's \$348 billion spending total.**



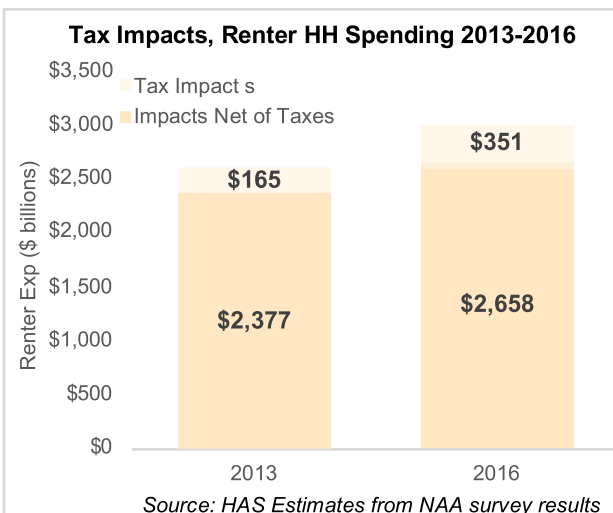
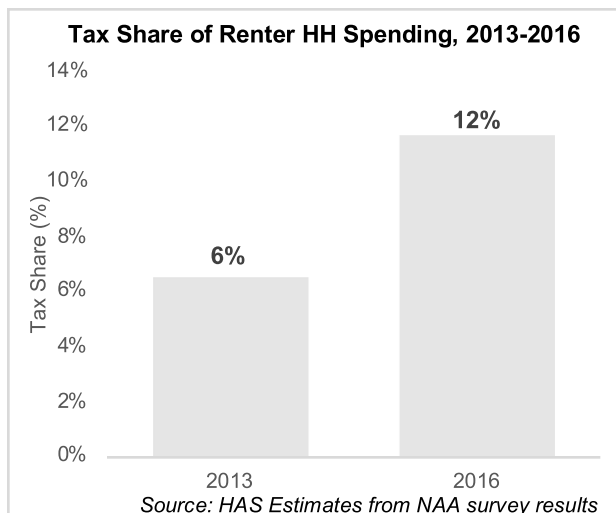
- Tax's share of total spending has risen 330 bps, from almost 30% to 33% of operating expenses, over the last 3 years – likely a reflection of the rapid run-up in apartment property values and the focus on constructing luxury product in city cores during this expansion.
 - **An estimated \$58 billion in total economic activity is attributable to the industry's 2016 tax payments – a 36.5% gain since 2013.**
 - **Industry tax payments also supported 0.113 million jobs in 2016, 30% more than in 2013.**

No other op ex category approached these rates of growth over our study period.

D. Renter Household Spending

Spending by US households living in 5+ unit apartment properties generated \$3.0 trillion of economic activity and 16.0 million jobs in 2016 – up 18% and 13%, respectively, from 2013. Of our four industry segments, renter spending generates by far the greatest economic and employment impacts, with a ~90% share of the all-segment totals.

Primary drivers for Segment D impacts are growth in occupied 5+unit rentals and in the 5+unit share of the overall rental market. These two variables exhibit strong correlations with segment impact gains, of 0.82 and 0.68 respectively. Growth in population and in renter household income are moderate influences. Although segment multipliers for both output and employment declined slightly between 2013 and 2016, an expanded 5+ unit renter pool coupled with robust across-the-board expenditure growth resulted in significantly higher economic impacts from this industry segment despite its large size.

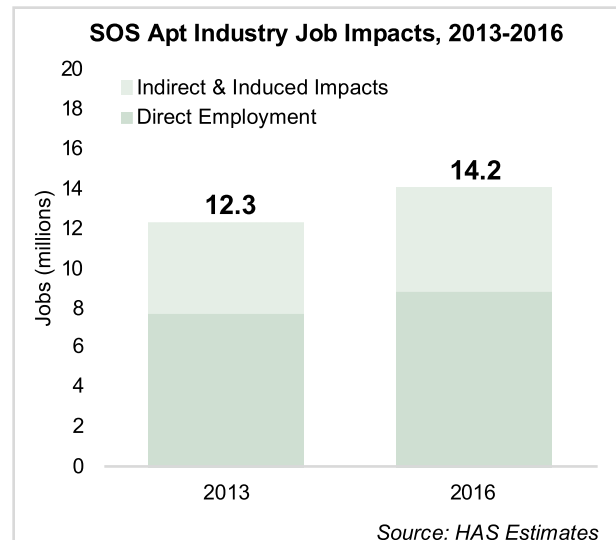
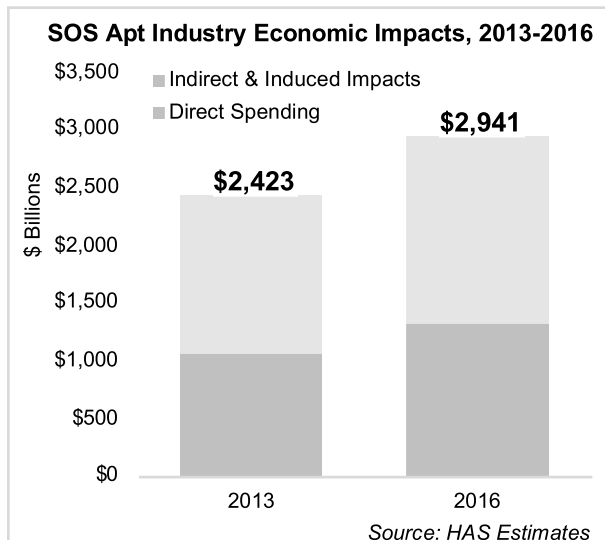


Four categories captured 75% of renter spending in 2016: housing (34%), transportation (16.5%), food (13%), and taxes (12%). Of these, transportation's share declined (from 17.5%) and taxes' share almost doubled (from 6.5%) between 2013 and 2016, while the share of household spending devoted to housing and food were unchanged. Notably, **\$350 billion in economic activity and 1.87 million jobs are attributable to our target population's 2016 federal, state, and local tax payments – more than double their 2013 totals (\$165 billion and 0.92 million jobs).**

The next section is devoted to a discussion of apartment industry impacts for the 50 states and District of Columbia. The analysis focuses on the total economic and employment impacts that have been estimated for each state in terms of absolute size and 3-year growth. Consideration is given to the differences in performance of individual states, relative to one another and when compared with the US benchmark, and reasons for these disparate outcomes are explored.

2 Economic/Employment Impacts, 50 States + District of Columbia

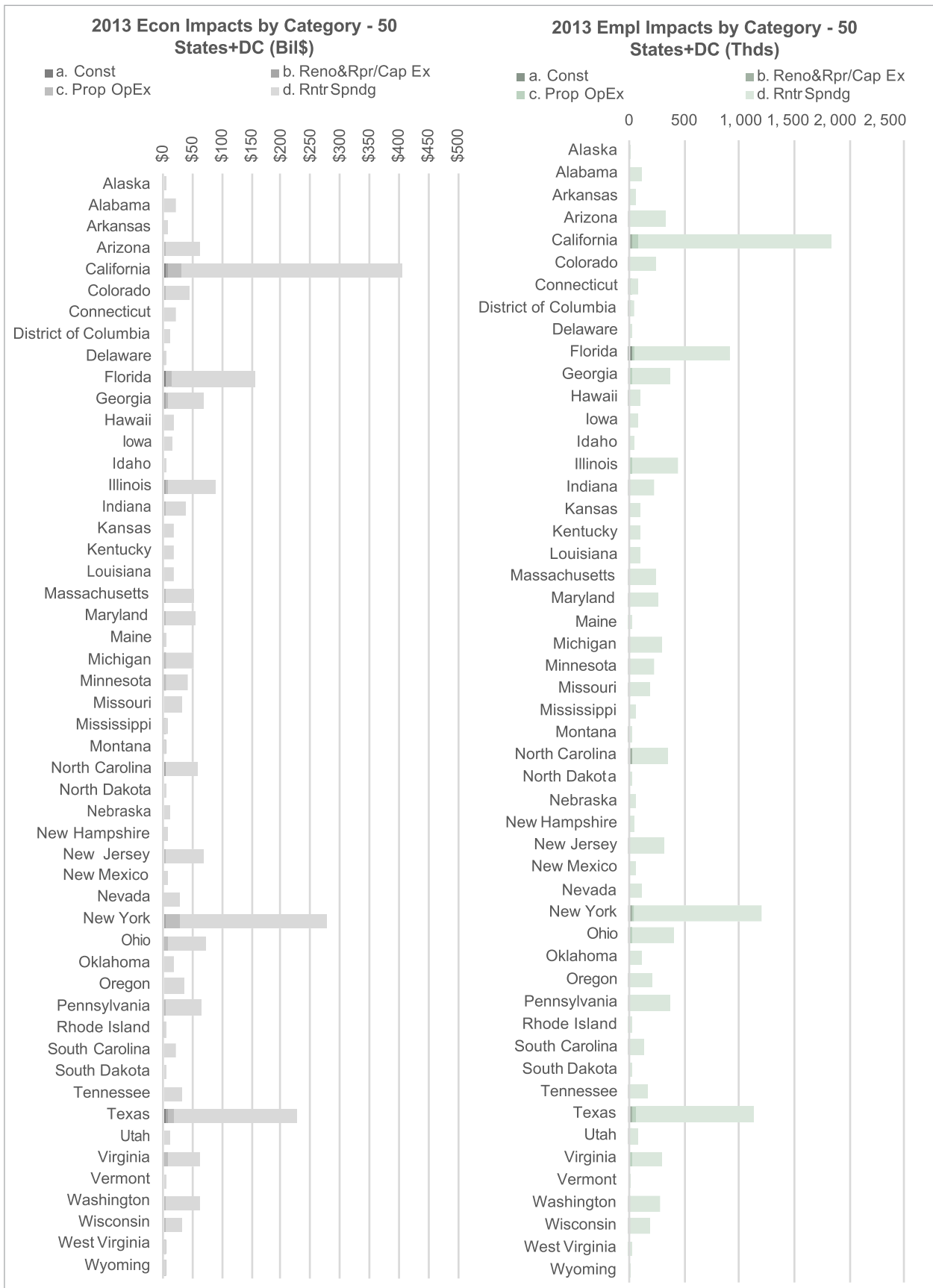
In 2016, the 50 states and District of Columbia (SOS, or Sum of States) generated \$2.94 trillion in output and 14.2 million jobs. These figures represent increases of 21.5% and 15.0%, respectively, from 2013 levels.

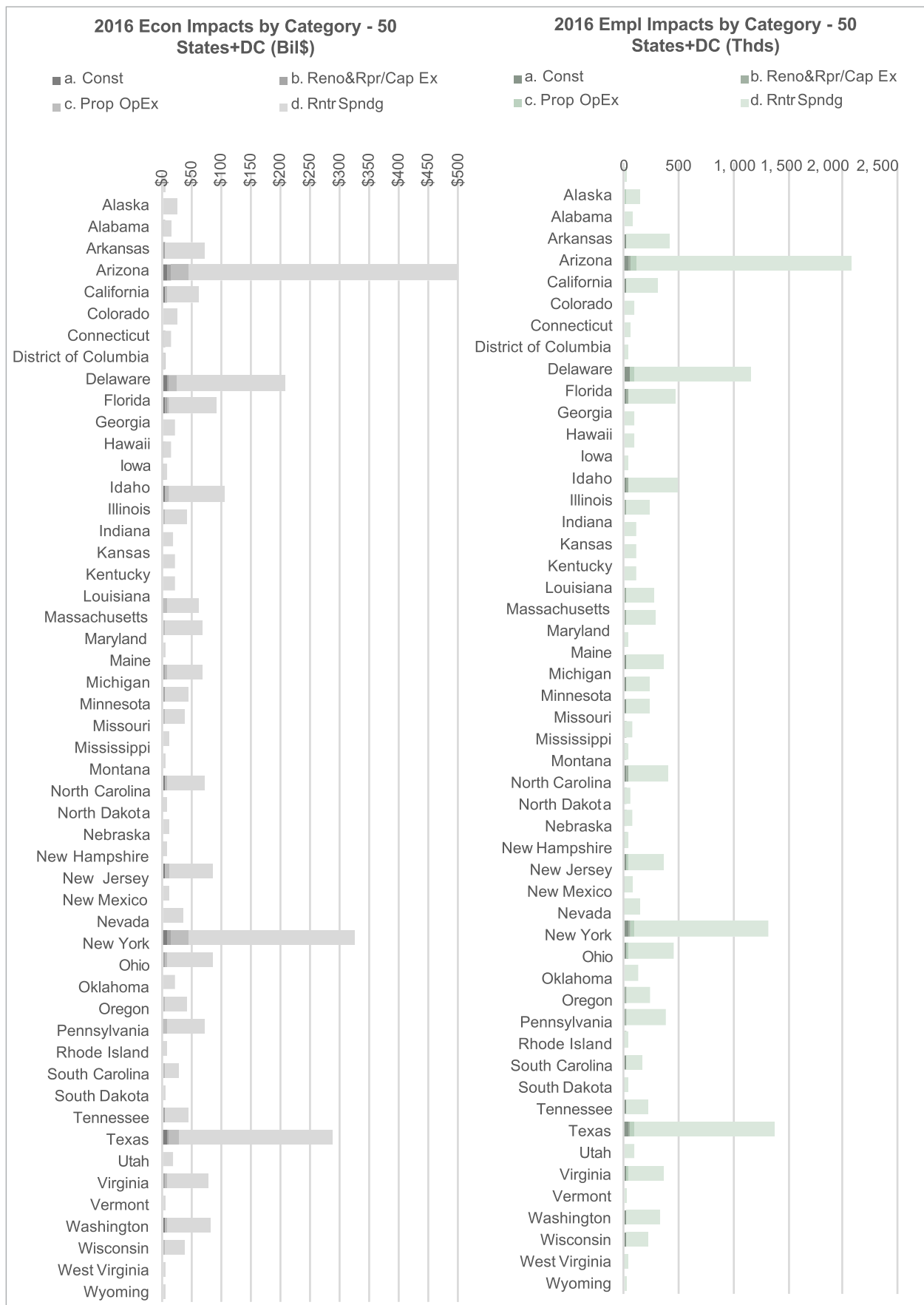


SOS impacts are slightly smaller than their US counterparts (by ~15-20%) because the US benefits from “interstate impacts” that are not allocable to individual states. Hence, US multipliers are slightly larger and calculated impacts higher than the comparable SOS totals.

Economic and employment impacts, by year and by state, are depicted graphically on the two pages that follow; the underlying impact figures are provided for all states plus the District of Columbia, by category and by year, in Appendix A.

Summary of Economic/Employment Impacts -- Sum of States				
by Industry Segment/5+ Unit Apartment Properties				
2013 & 2016				
<u>SEGMENT IMPACT</u>	2013		2016	
Industry Segment	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)
a Construction	\$52.20	257,850	\$106.71	500,792
b Renovations & Repair/Cap ex	\$35.88	169,197	\$52.27	236,222
c Op Ex	\$136.90	247,098	\$168.36	286,235
a-c Sum of Impacts	\$224.98	674,145	\$327.34	1,023,249
d Renter Household Spending	\$2,198.50	11,639,352	\$2,613.81	13,154,451
TOTAL IMPACT, ALL SEGMENTS	\$2,423.48	12,313,497	\$2,941.15	14,177,700
c Tax Portion of Op Ex	\$40.83	72,050	\$55.79	93,505
% of Category Impact	29.8%	29.2%	84.7%	259.8%
d Tax Portion of Renter Spending	\$142.65	743,567	\$304.31	1,484,749
% of Category Impact	6.5%	6.4%	11.6%	11.3%





The Multiplier Effect.

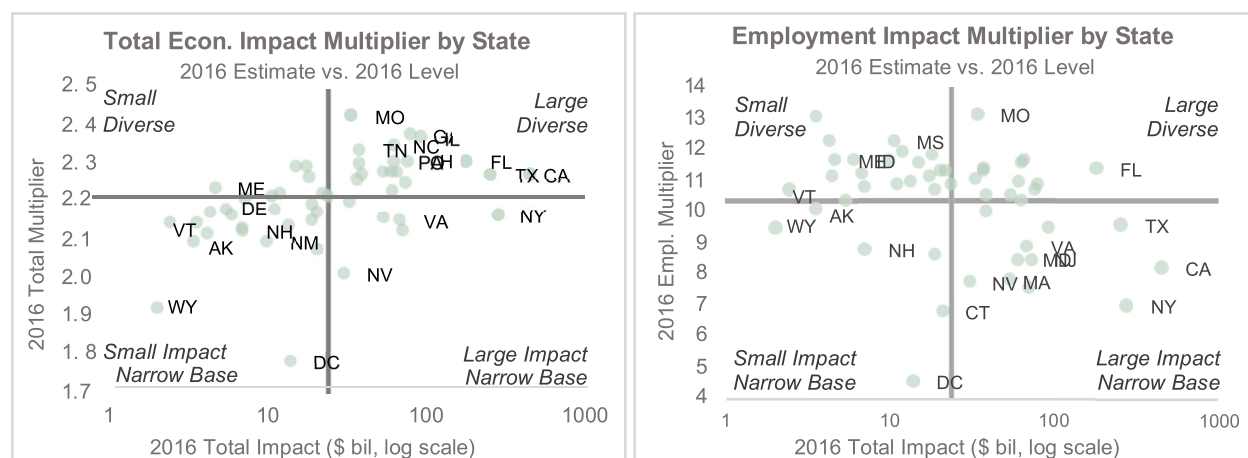
The economic multipliers calculated for each state capture the total impacts of direct spending by each of the four segments of the industry on all other industries and on households. They depend on many factors including the nature of direct purchases made by a segment, the degree of diversification in the state among all industries and the typical wage level by industry in the state. The combined effects of these factors create unique values for the multipliers.

As multipliers tend to reflect the organization of the entire state economy, they evolve slowly over time. Shifts, when they do occur, arise from changes in the relative prices of products and services, changes in the productive capacity of individual firms and industries within the state, and the entry and exit of establishments. These trends, in turn, depend on the size and depth of demand for local products and services, the price sensitivity of local establishments to local products and services compared with those offered by establishments outside of the state, and the evolution of tastes and preferences by local consumers.

The scatterplots below depict the distribution of implied total apartment industry multipliers for all of the states – i.e., the aggregate effect of each of the four industry segments on the state economy relative to the sum of the impacts generated by each segment.

In general terms, state multipliers and associated impacts differ in three major respects:

- 1) They vary enormously in scale. The total impacts by state for 2016 ranged from a high of \$499 billion in California to only \$2.2 billion in Wyoming. Hence, the impact of the apartment industry in California is more than 200 times larger than it is in Wyoming.
- 2) The state economies vary importantly in their degree of diversification across industries. States with highly diversified economies benefit relatively more from the impact created by local activity by supplying locally more of the input goods and services each industry must purchase. These states have larger impact multipliers. Industries and households in less diverse states must import relatively more goods and services because their local industries are insufficient to supply all of the local demand.
- 3) The relative wage level is important for employment multipliers. States with low wages relative to output or those with more labor-intensive industries (which often leads to lower wages per employee) tend to produce higher employment multipliers. A \$10 per hour wage rate employs twice as many workers as a \$20 per hour wage rate for the same total expenditure. Low wage rates therefore result in higher employment multipliers.



The above charts provide a comparison of the total dollar economic multipliers (aggregate of the four segments) and the employment multipliers for each state, plotted against their 2016 total dollar impacts. Within each chart, total estimated impacts increase from left to right along the x-axis, while the size of the states' multipliers rises along the y-axis, from bottom to top. Each chart is divided into quadrants with lines placed at the average SOS values for the total impacts (vertical line) and the multipliers (horizontal line).

In the Total Economic Impact Multiplier chart, most states fall in either the upper-right or the lower-left quadrant. This reflects the reality that ***as populations increase, economies can generally provide an increasing proportion of local demand for products and services, requiring fewer imports. These economies benefit most from apartment-industry spending because a larger share of local expenditures remain within the local economy, reverberating throughout its industries and passing along more economic demand locally.*** Smaller states, and those that are less diverse, benefit less from local apartment-industry expenditures as proportionally more of that spending goes to establishments outside of the region. This reduces the multiplier effect of local spending in smaller and less diverse states

States with the largest impacts and the largest multipliers appear in the upper right quadrant. Large states like California, New York, Texas and Florida, largely because of their size, enjoy well-diversified economies and are able to retain a greater share of apartment-industry spending within their borders. Some mid-sized states like Missouri, Georgia and Illinois also enjoy large impact multipliers. All three host important economic “centers” such as Chicago, Atlanta, and St. Louis; these centers support broad-based regional economies that extend beyond state borders. Some smaller states like Utah and Maine also benefit from geographic influences. Because of its remote location, Maine has a relatively self-sufficient economy and Utah, because it hosts the largest metropolitan area between the Sierra Mountains on the west and the inland Rocky Mountains on the east, functions as the regional center for that part of the country.

Very sparsely populated states like Wyoming, Alaska, Vermont and New Mexico rely relatively more than other states on imported goods and services. States that are geographically small but densely populated – examples are Connecticut and the District of Columbia -- lie within a much larger trading region. For such states, both imports and exports tend to be larger in absolute terms; as a result, consumer-focused local industries like the apartment industry tend to have lower multipliers.

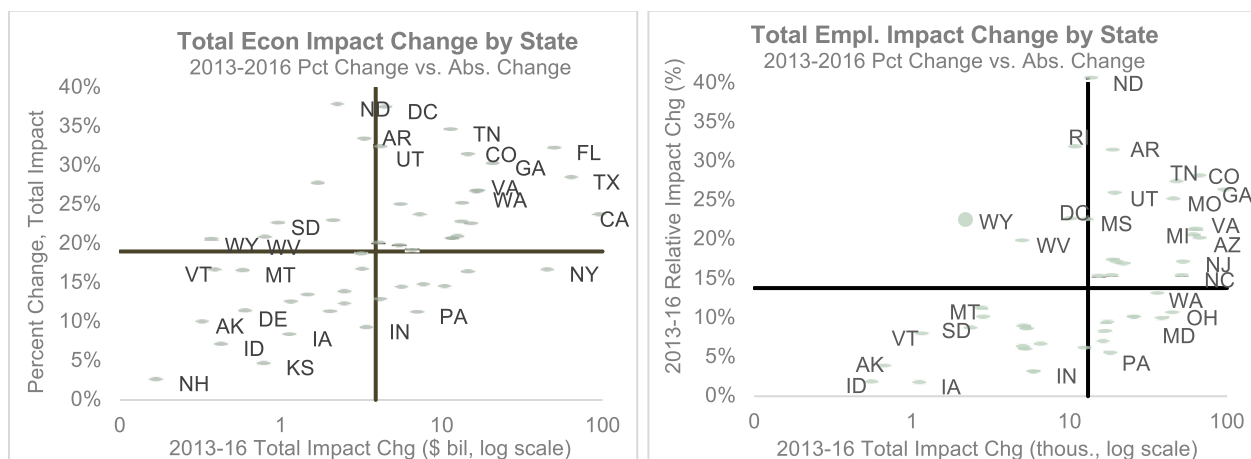
Finally, states with highly specialized economies like Nevada and Washington also tend to have low multipliers. Because a relatively large share of their local workforce focuses on providing exported goods and services (Nevada – lodging and amusements; Washington – aircraft manufacturing and high-tech industries), these economies import relatively more goods and services for their own consumption.

The chart of employment multipliers presents a mirror image of the economic impact chart, with states clustered in the upper left and lower right quadrants. The pattern differs due to variations in the level of compensation per employee in each state. States with high wages, like California and New York, tend to have somewhat lower employment multipliers, while those with low wages, such as West Virginia, Mississippi and Maine, tend to have high multipliers. Florida appears in the upper right in this chart because of its diversified economic base and its relatively low-wage status. Florida hosts several large consumer services industries (tourism, hospitality, and health care) which tends to increase the size of its low wage employment. States appearing in the lower left quadrant of this chart have narrow industry mixes (Hawaii, Wyoming, DC), high wage rates (Connecticut, Alaska), or both (New Hampshire, Delaware). DC’s low employment multiplier reflects the relative paucity of low-wage occupations inside District boundaries. Its high average wage rate, combined with its tendency to offer jobs to workers who reside outside of District boundaries, greatly reduces its employment multiplier. Of the states and metros evaluated in this study, DC is unique in having an employment base that exceeds its resident population – by a considerable 15%.

State Impact Analysis

We have ranked the 50 states + District of Columbia based on the absolute and percentage growth of their estimated apartment industry impacts. The following analysis focuses on results from the total (i.e. “All Segment”) impact rankings. The performances of individual states are assessed relative to their peers and to the US (= SOS), based on the economic and demographic variables we have identified as drivers of impact growth.

The largest states top the rankings for total economic and employment impacts in both 2013 and 2016. Taken together, California, Texas, New York, Florida, and Illinois represent ~50% of the US apartment industry’s total impact on the US economy, well above their 37% share of US population and employment. Over time, faster-growing states should rise in the rankings and begin to supplant large, slower-growing states that currently dominate. There is some evidence of this occurring even over our brief 3-year study period. Candidates for future advancement are more sizable states that outperform on four of the key measures that drive total impact growth.



Source: HAS Estimates

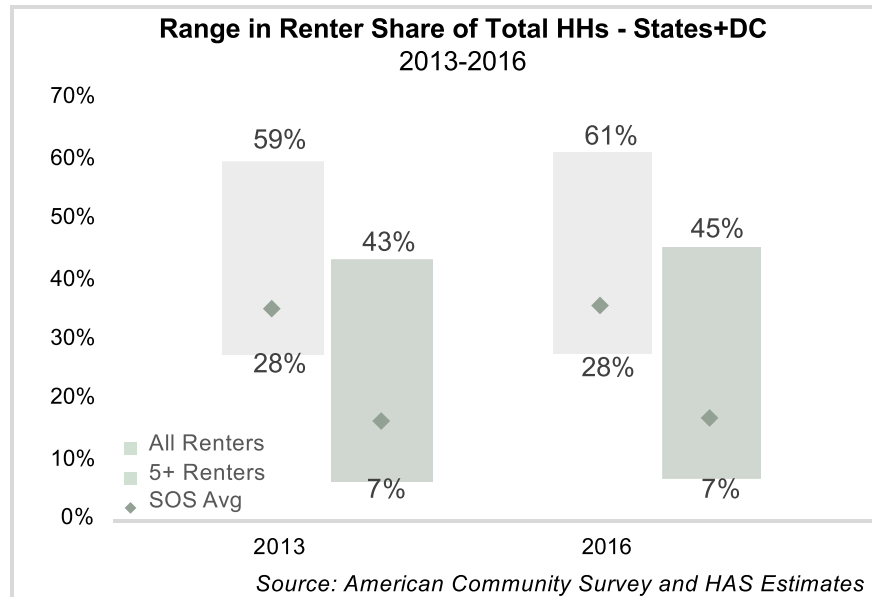
Note: Negative changes, not plotted - KS, ME, NH

These measures are, in order of importance:

- Growth rate of occupied 5+ rental units. Supply growth was greatest in large states and in high growth states. **Three states – California, Florida, and Texas – added ~200,000 occupied 5+ units each between 2013 and 2016; taken together, this exceeds 40% of the total US gain of 1.45 million.** There is a sizable gap between the top three and the next five states (New York, Washington, Georgia, Michigan, and Colorado), each of which gained only 50 - 70,000 units.

The number of occupied 5+ rental units increased by 6.7% nationwide during our study period. On a percentage growth basis, a few small, relatively stable states (Vermont, Rhode Island, Connecticut) ranked highly along with strong growth states like North Dakota, Idaho, Utah and Washington. Although 5+ rental inventories in Rhode Island, North Dakota, and Utah grew by 18 – 22% between 2013 and 2016, each of these states gained only a modest number of units (12 - 20,000). A focus on large out-performers yields Colorado, Florida, Washington, Michigan, and Texas, with 3-year growth ranging from Colorado's high of 14% to 9.5% in Texas. At the bottom of the list are a handful of states that registered slight net declines in their 5+unit stock due to removal and conversion activity. They are Mississippi, Kansas, Hawaii, Alaska, Nebraska, and Wyoming.

- Increase in the 5+unit share. **All else equal, a gain in the 5+unit share of the overall occupied rental stock magnifies the economic and employment impacts generated simply by 5+unit growth.** US/SOS 5+unit rental share grew from 50.7% to 52.4% between 2013 and 2016, a 1.7% increase. When ranked, half of the top ten states are small, with Utah's 5.8% gain earning it the #1 spot. Larger states that outperformed include Colorado (+4.8%), Washington (+4.4%), Arizona (+3.5%), and Florida (+3.3%). Michigan, New Jersey, and Massachusetts (with 3.5% - 2.7% gains) also performed well. Even California edged the US average despite its size and the many supply constraints in its coastal cities. Unlike other impact drivers, highly ranked states for 5+ share appear throughout the country. This is a reflection of the early post-recession return of healthy rental demand and subsequent spread of rental construction activity.
- Population growth. All of the top 10 states for population growth are in the West and South, with gains ranging from a low of 4.4% in Idaho to a high of 5.6% in DC. **Most significant for impact gains are the states that combine scale with outsized rates of population growth;** these include Texas, Florida, Washington, Arizona, and Colorado. All 5 expanded at least twice as fast as the nation overall (2.2%); Texas and Florida added more than 1.0 million new residents during our short study period.
- Growth of median renter household income. Median annual income for all renting households in the US increased 8.4%, to \$35,200, during the 3-year study period. States reporting above-average



2016 renter household income levels and strong income growth during the 3-year study period are Washington, Colorado, and California. Georgia, Tennessee, and South Carolina are Southern states with high median renter incomes that also rank well for recent income gains. North Dakota's appearance at or near the top of the rankings for all three of these measures is attributable to that state's rapidly-expanding, high-salary oil production industry.

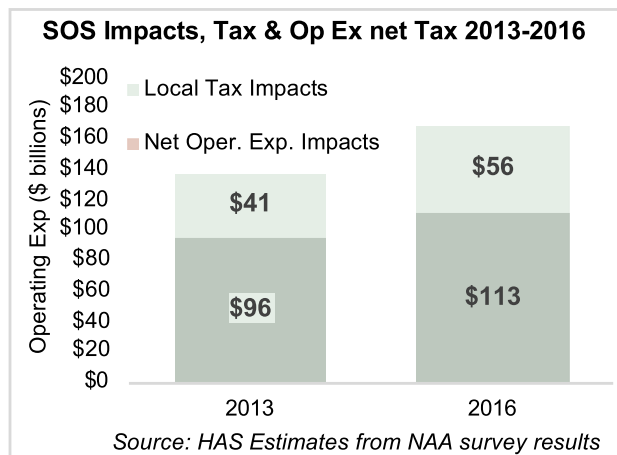
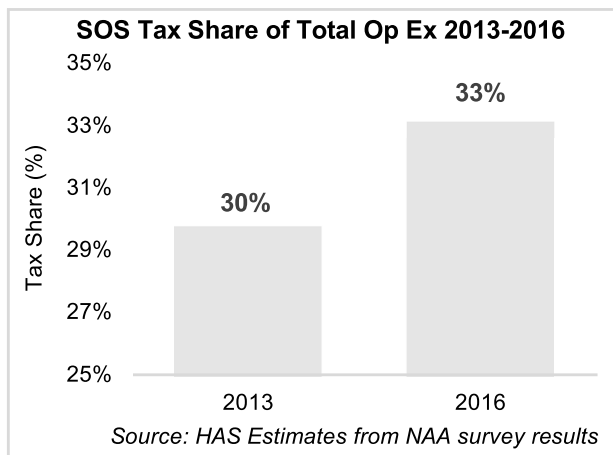
Important factors for the two segments that represent **apartment industry operations** (B and C) include 5+unit effective rent growth and employment expansion. For renovation and overall op ex spending, employment growth tops population as a driver of impact growth.

- **When ranked by effective rent growth, all of the top ten states are located in the West or South regions of the country.** Led by the Pacific Northwest (Washington and Oregon), these states posted robust rental gains ranging from 17.5% - 24%, well above the US/SOS average of 13.6%.
- The top 10 states for 2013-16 job creation are also clustered in the West and South. Employment growth for these states ranges from a low of 7.5% in Arizona to a high of 11% in Nevada, versus 5.8% for the nation as a whole. Most significant for impact gains are the states that combine large scale and outsized rates of job growth; these include California, Florida, Georgia, Washington, and Colorado.

SOS Tax Impacts

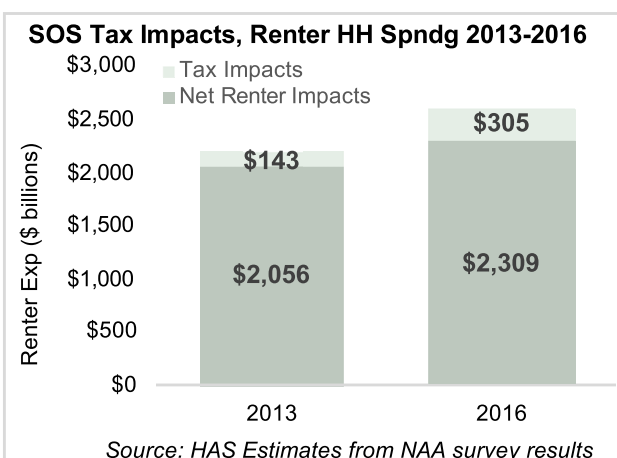
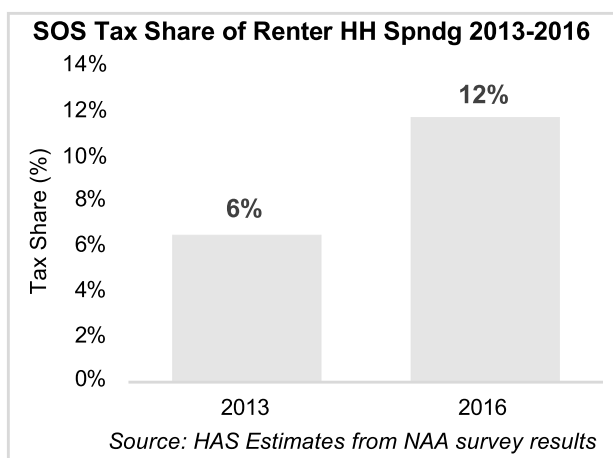
For the SOS, \$56 billion in economic activity and 0.094 million jobs are attributable to 2016 apartment industry tax payments (federal, state, and local) – up 37% and 30%, respectively, from 2013 levels (\$41 billion and 0.072 million jobs). Unsurprisingly, the top-ranked states for 2016 economic impact are the largest ones -- i.e. New York, Texas, California, Florida – plus New Jersey. Together, these 5 states claimed 68% of the economic and 60% of the employment impact totals. Southern states claim 4 of the top 5 spots when ranked by percentage growth. After top-ranked Nebraska (with a ~100% 3-year increase) are Oklahoma, Louisiana, Alabama, and Virginia, gains for which range from 89% to 65%. Larger out-performers within the top ten include Massachusetts, Georgia, Florida, and Texas, with impact gains of 60% - 51%. Top-ranked states for employment impacts are similar to the list of economic impact out-performers.

Seven states do not levy income tax and five lack a sales tax. We had expected that industry tax payments in these states would be elevated relative to their peers, as higher rates for other types of tax might be imposed to compensate for the lack of revenue from these sources. However, NAA op ex data does not show such a relationship at the state level, with the possible exception of Texas. In a similar vein, California's Proposition 13 property tax restrictions do not appear to translate into lower industry tax



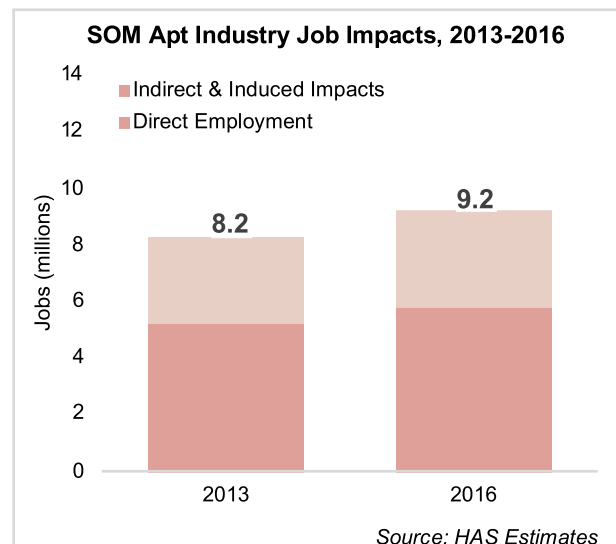
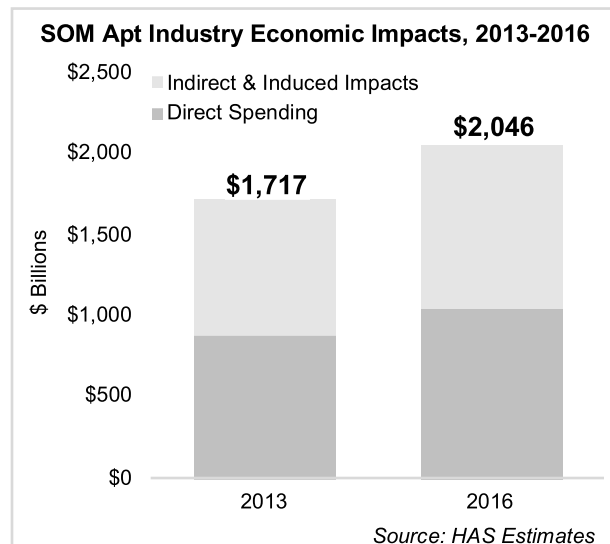
payments as a percentage of apartment revenues. It may be that the data is not sufficiently detailed to permit such a determination.

For the SOS, \$304 billion in economic activity and 1.48 million jobs are attributable to 2016 federal, state, and local tax payments by 5+ renter households – more than double their 2013 totals (\$143 billion and 0.74 million jobs). The top-ranked states for 2016 economic impact include California, New York, Texas, Florida, and New Jersey. Together, these 5 states claimed 56% of the SOS tax impact and >60% of the absolute increase in tax impacts between 2013 and 2016. Unusually, they dominate the state ranking for percentage growth as well. After #1 DC (with a 226% increase) come the tech-heavy states of California (+182%), Washington (+152%), and Virginia (+139%). Colorado, Texas, Florida, and Georgia, with impact gains of 135% - 122%, all fall within the top 10. Although the ranking order differs somewhat, the pattern for employment impacts is comparable.



3. Economic/Employment Impacts, 50 Major US Metros

Total economic and employment impacts generated in 2016 by the 50 major US metros covered in this study (SOM, or Sum of Metros) are \$2.05 trillion and 9.2 million jobs. These figures represent increases of 19.0% and 11.5%, respectively, from 2013.

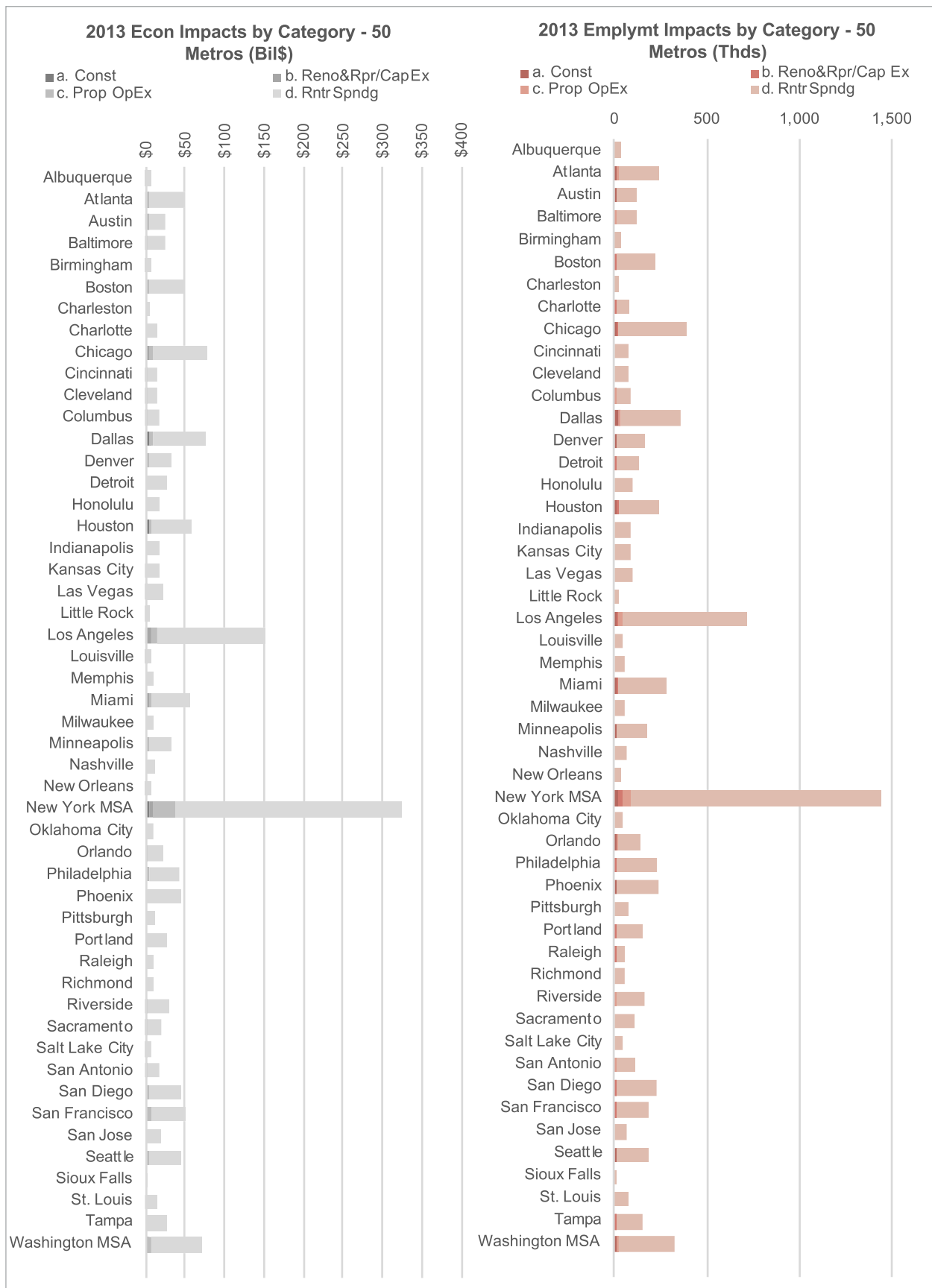


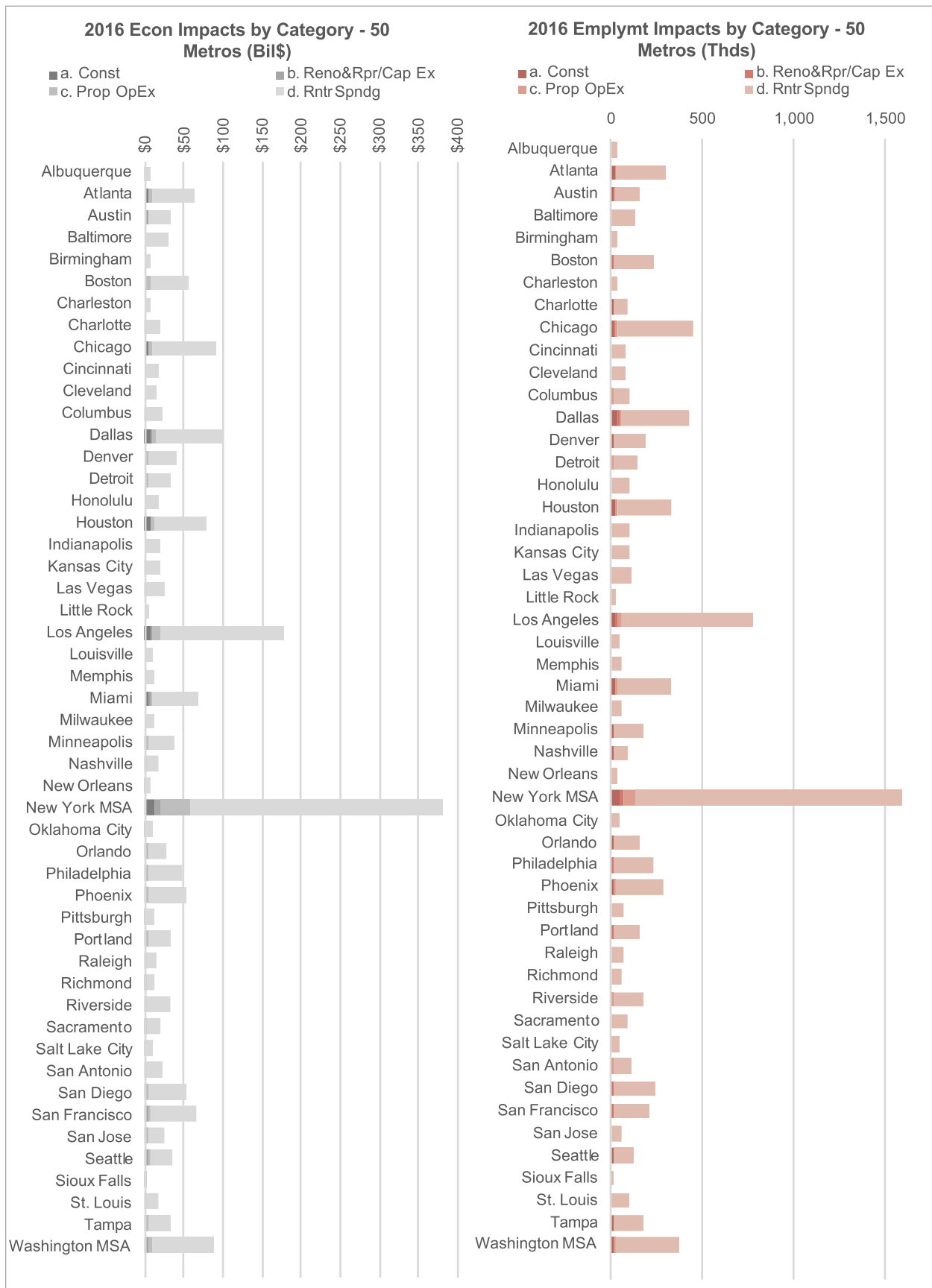
With ~55% of US population and employment, the SOM generated 60% of the economic and 53% of the employment impacts generated by the nation's apartment industry. Over the 3-year study period, growth of SOM impacts slightly lagged that of the US on the output side (by 160 bps), but was quite a bit lower on the employment side (by 420 bps).

Economic and employment impacts, by year and by metro, are depicted graphically on the two pages that follow; the underlying impact figures are provided for all metros, by category and by year, in Appendix A.

Summary of Economic/Employment Impacts -- Sum of Metros				
by Industry Segment/5+ Unit Apartment Properties				
2013 & 2016				
<u>SEGMENT IMPACT</u>	2013		2016	
Industry Segment	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)
a Construction	\$52.38	234,378	\$95.37	396,698
b Renovations & Repair/Cap ex	\$28.67	122,363	\$39.35	159,267
c Op Ex	\$104.70	175,346	\$130.09	204,200
a-c Sum of Impacts	\$185.76	532,087	\$264.81	760,166
d Renter Household Spending	\$1,531.27	7,705,468	\$1,781.42	8,426,643
TOTAL IMPACT, ALL SEGMENTS	\$1,717.03	8,237,555	\$2,046.23	9,186,809
c Tax Portion of Op Ex ¹	\$33.01	54,644	\$45.17	70,215
% of Category Impact	31.5%	31.2%	83.8%	266.5%
d Tax Portion of Renter Spending	\$109.07	544,269	\$240.63	1,107,265
% of Category Impact	7.1%	7.1%	13.5%	13.1%

¹ Tax portion of Op Ex figures for 2013 and 2016 are not entirely consistent, as 2013 totals lack data for Oklahoma City, Pittsburgh, and Sioux Falls. An "apples to apples" comparison of the two years should be made using \$44.89 Bil for economic and 69,680 for employment impacts in place of the 2016 figures in the table above. This adjustment was made for the percentage changes quoted in the text.





Metro-Level Multipliers

The explanation presented previously for the characteristic distribution of state multipliers also applies for the distribution of the metro area multipliers estimated for this study.

For total economic impacts, large metropolitan areas such as New York (NEY), Los Angeles, Chicago and Philadelphia (upper-right quadrant) tend to supply a relatively larger share of local demand for consumer-oriented products and services than do smaller metro areas such as Little Rock, Charleston (CHW) and Albuquerque (lower-left quadrant). For Sioux Falls (SIU), small size is offset by distance from other metropolitan areas, resulting in an average impact multiplier. Medium-sized metro areas like St. Louis, Louisville, and New Orleans also cluster near the SOS average.

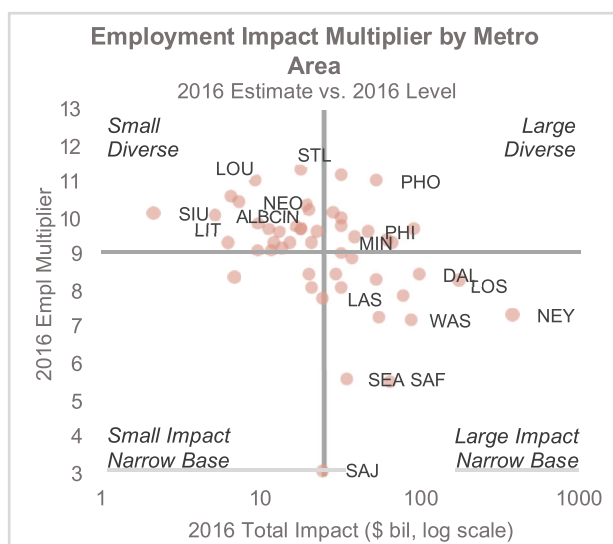
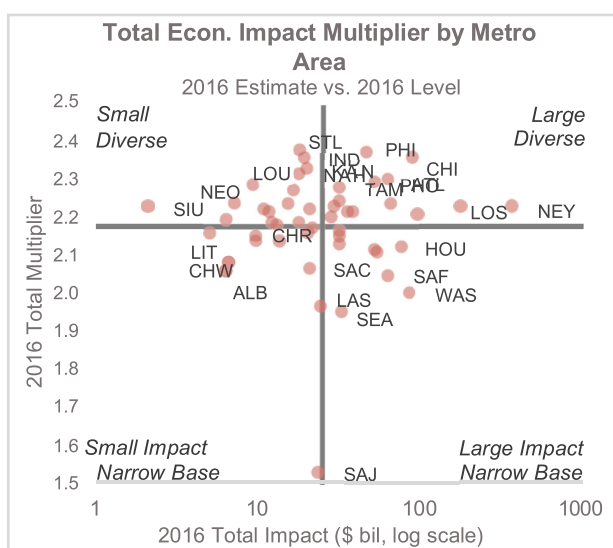
Specialized metropolitan economies tend to have lower impact multipliers. San Jose's extremely low economic multiplier reflects its strong tech industry concentration as well as the readily accessible products and services from the adjacent San Francisco/Oakland metro area. Other specialized metro areas like Las Vegas (tourism), Seattle (aerospace and tech), Washington DC (government and tech) and Houston (energy) generally exhibit below-average impact multipliers.

In the right-hand graph, **very high wage profiles** in San Jose, San Francisco and Seattle clearly **reduce the employment impact multipliers** for those metro areas. Even medium-sized metro areas can have relatively low employment multipliers for reasons specific to the metropolitan economy. For example, Sacramento has a relatively narrow employment base of skilled and high-income residents (consider all the attorneys, tax experts, and lobbyists who live and work there because it is the state capitol); this lowers its employment multiplier.

Chicago and Phoenix are examples of metro areas combining diverse economies and relatively average wages, producing relatively high employment multipliers and impacts. St. Louis has high economic and employment multipliers due to an unusual combination of factors: It serves as a business hub for much of the country's center (Kansas, Missouri, parts of Nebraska, Arkansas and Oklahoma), and also has a relatively low-wage profile.

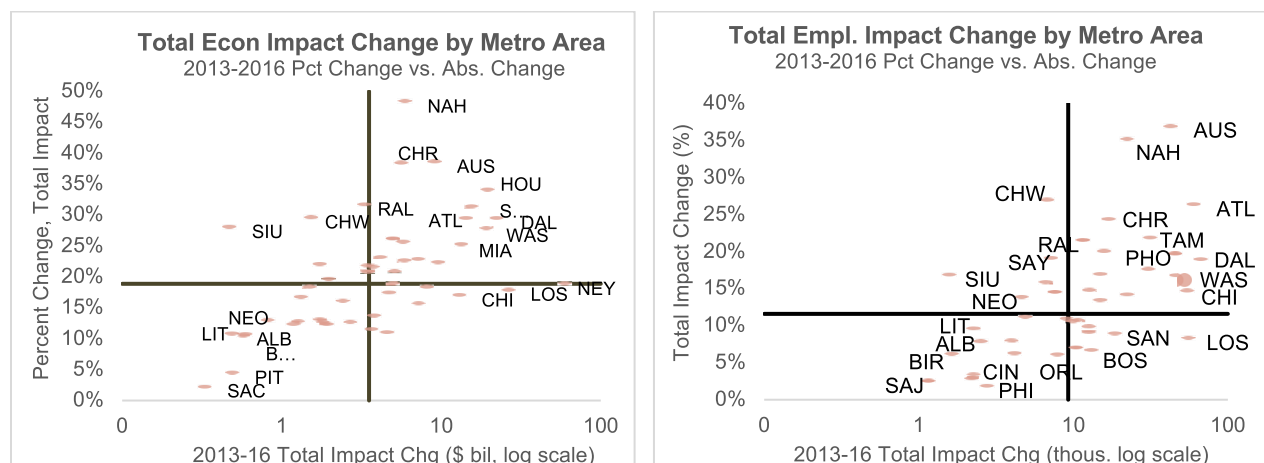
Because of their low-wage structure, several metros in the South (e.g., Louisville, New Orleans, and Little Rock) and the Midwest (Sioux Falls) rank higher for their employment multipliers than they do for their economic impact multipliers.

It is interesting that the distribution of employment impact multipliers appears more tightly clustered for the metro areas than it is for the states. The standard deviation of the metro multipliers is ~9% lower than the standard deviation of the state multipliers despite the relatively equal size of the two groups (50 states + DC and 50 metro areas). We interpret this as evidence that urban centers resemble one other more than do states, which can have greater variation in their mixes of urban and rural sub-regions.



Metro Impact Analysis

The largest metros top the rankings for economic and employment impacts in both 2013 and 2016. Taken together, **New York, Los Angeles, Dallas, Chicago, and Washington, DC represent ~40% of the US apartment industry's total impact on the US economy, well above their 32% share of US population and employment.**



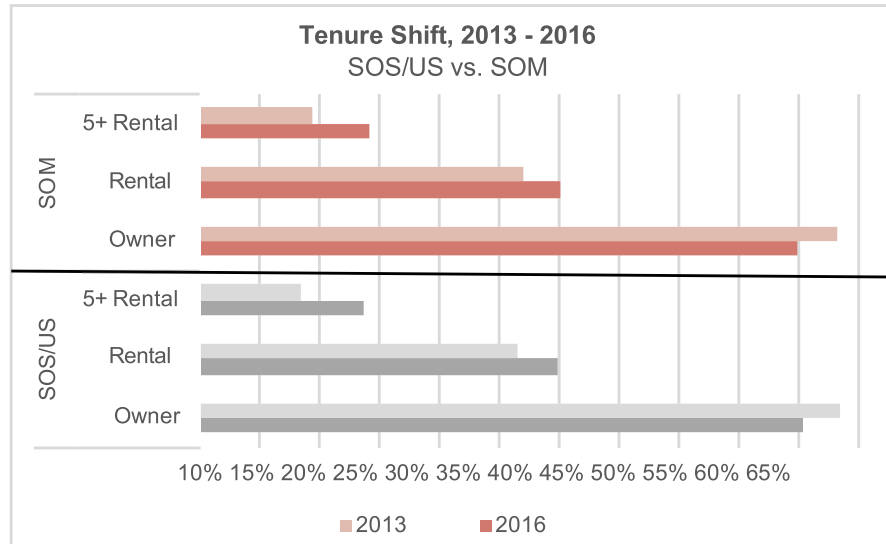
Source: HAS Estimates

As the period studied lengthens, faster-growing metros should rise in the rankings and begin to supplant large, slower-growing metros that currently dominate. There is some evidence of this occurring even over our brief 3-year study period. Near-term candidates for advancement are the larger metros that are migrating toward the upper right quadrant of the metro impact scatterplots. Over the longer term, mid-size metros that are able to sustain rapid rates of growth will increasingly come to the fore.

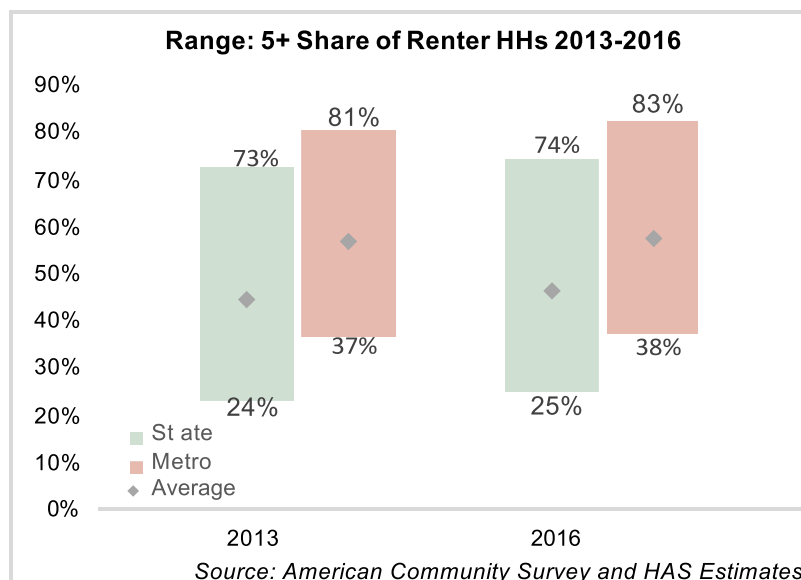
SOM benchmarks, and individual metro performance, for the six drivers of impact growth over the 3-year study period are:

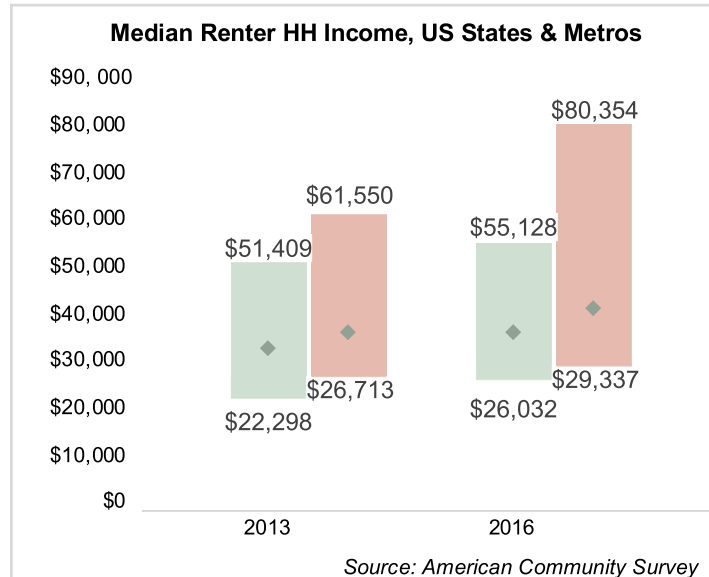
- **At 3.0%, average SOM population growth is well above the US/SOS increase of 2.2%.** Population growth statistics present a mixed picture among the metros that ranked highly for total economic impact. Although New York and Los Angeles added a large number of residents, their rates of growth were below-average. Chicago actually suffered a slight loss of population between 2013 and 2016. The balance of our top ten impact metros combined sizable absolute gains in population and above-average rates of growth, from Houston's robust 7.5% gain to the DC MSA at +3.2% -- all comfortably above average
- **Three-year employment growth for the US was 5.8% and average SOM growth was 7.2%.** Job gains among the top 10 impact metros reflect variations in the start date and the rate at which each recovered from the GFC. While Dallas's more diversified economy supported above-average job growth (+10.4%), energy industry turmoil that began in mid-2014 limited Houston's 3-year expansion to only 4.2%. DC also posted relatively weak job growth of 5.5%, below the US and SOM benchmarks. Both New York and LA added almost 1.0 million jobs between 2013 and 2016, but these sizable absolute gains translated into only moderate growth rates of 5.7% and 6.9%, respectively, due to their large size. The remaining 5 metros outperformed on both absolute and percentage employment gains. San Francisco's 235,000 increase in jobs – growth of 11% – was driven by its increasingly dominant tech industry.
- **The number of occupied 5+ rental units grew an average of 4.9% in our SOM between 2013 and 2016, well below US / SOS growth of 6.7%.** Los Angeles, New York, Miami, Houston and Dallas accounted for about one-third of the SOM's total 680,000-unit net increase in occupied 5+ units during this period. Strong out-performers for both absolute and percentage change in occupied 5+ stock include Austin, Seattle, and Orlando. Most metros that top the list for percentage growth are

rapidly expanding mid-sized metros in the South and West such as Charlotte, Nashville, and Denver. The 5+unit segment posted decreases in six metros, two of which saw material losses – Honolulu and Birmingham. Condo conversions played a significant role in both. The largest metro affected by a conversion surge was San Antonio, which registered a modest 0.1% decline in rental units over the three-year period.



- Between 2013 and 2016, the 5+ unit share of metro rental stock increased to 24% (+0.4%) across our SOM. **Mid- to high-rise product tends to generate higher revenues and operating expenses on a per unit basis, magnifying the impacts that such units generate.** New rental construction in the nation's metro areas generally favors these denser properties. Among our top ten impact metros, the gains in 5+share for DC (+1.2%) and New York (+1.0%) are sizable. The remaining 8 posted below-average growth of 0.1% - 0.3%. Houston offers a contrasting picture with a -0.9% decline in its 5+ rental share. Despite much-mooted downtown high-rise projects, its growth in rental occupancy has favored lower density product. Other high impact metros posting above-average gains are San Antonio, Denver, and Dallas.





- **Median annual income for all renting households in the US increased 8.4%, to \$35,200, between 2013 and 2016. The averaged SOM median for 2016 is \$41,227, up 14% from 2013.** Tech centers are among the top 10 metros for income gains. San Diego (biotech) and San Francisco lead with >30% growth. Austin and San Jose are also on the list, together with several rapid-growth, mid-sized metros (Denver, Charlotte, Portland) in the West and South. The only top 10 metro not from these two regions is Minneapolis at #5 with a 24.5% 3-year gain.
- **The nation's high tech/biotech centers claim 6 of the top 10 rankings for median renter income levels.** San Francisco is #1 with an \$80,000 median – almost twice the SOM average – and is joined by San Diego, DC, San Jose, Austin, and Boston. Other high-income metros include Tampa, San Antonio, and Denver. Little Rock is tenth with a median renter household income of \$46,600.
- **Weighted average effective rent for 5+ unit rentals increased 13.8% between 2013 and 2016 for the SOM, to \$17,818 per unit.** Although this growth rate is comparable to US / SOS growth of 13.6%, the average US / SOS rent for 2016 is considerably lower, at \$15,168 per unit. **Unlike the US overall, median renter household income growth exceeded effective rent growth (slightly) in the SOM over the study period.**

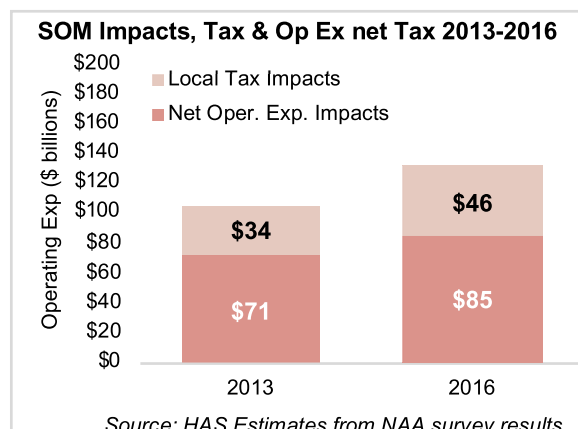
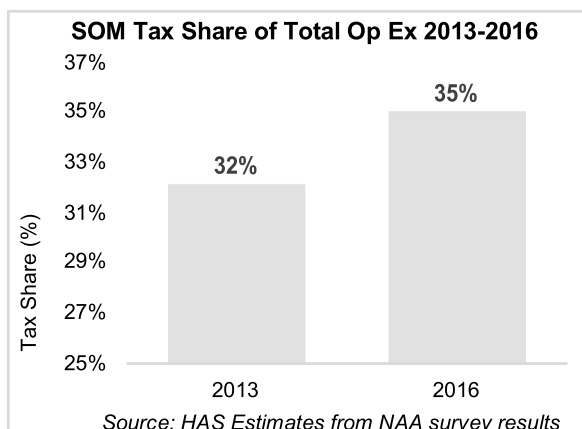
Although tech markets are well-represented on the top 10 list for high rent levels, only Seattle also appears among the top 10 for recent rent growth.

San Francisco has the highest effective rent for 2016 at \$32,315, well above New York's 2016 average of \$29,065 (although New York rent statistics are skewed by its longstanding rent control system). San Jose, Boston, DC, San Diego, and Seattle report average rents of \$28,700 to \$18,050. Supply-constrained Honolulu, Los Angeles, and Miami round out the top 10.

The top metros for 2013-2016 rent growth are more mixed. Atlanta and Dallas are the only very large metros in the top 10, with >20% growth. Most other top performers are small and mid-sized metros benefiting from strong in-migration and job creation (Sacramento, Charleston, Nashville, Portland, Salt Lake City, and Las Vegas). The average 3-year rent growth for these metros ranged from 26.5% - 21%.

SOM Tax Impacts

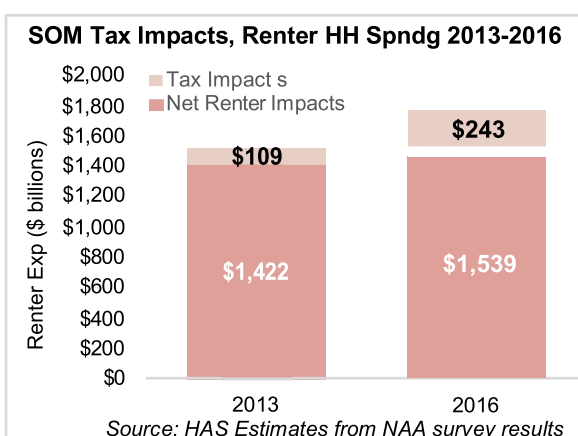
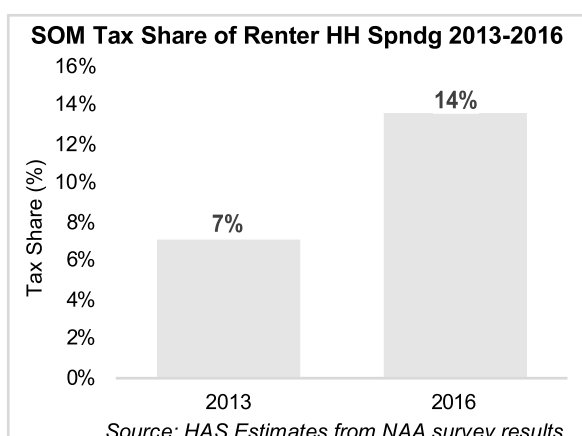
For the SOM (less Honolulu, for which we lack data), \$45.2 billion in economic activity and 0.070 million jobs are attributable to 2016 apartment industry tax payments (federal, state, and local). These figures represent 3-year growth of 36% and 27.5%, respectively. With 63% of US 5+unit rental stock, the SOM contributed 80% of the economic and 75% of the employment impacts attributable to industry tax payments in 2016. Unsurprisingly, ranking the metros by the size of their 2016 economic impact tends to yield the largest ones, with New York, Los Angeles, Chicago, Dallas,



Houston, Atlanta, and DC among the top ten. Although smaller in size, San Francisco is among this group for the large size of its contribution; however, it lagged the SOM's average 3-year growth rate. Other tech metros also ranked highly on this measure, claiming the 11th through 14th positions despite significant disparities in their population size.

Metros that dominate the rankings for percentage growth are the mid-sized MSAs that have outperformed in many rankings of this type. Raleigh and New Orleans top the list, both having doubled their tax impacts over our brief study period. Other strong performers include Richmond (+85%), Orlando and Nashville (+57% for both). Two tech metros, Austin and Boston, posted 50 - 60% gains, as did Dallas and Atlanta. While 7 of the top 10 are from the South, no Western metro appears in the ranking until Salt Lake City at #22, with a 39.4% gain.

For the SOM, \$240 billion in economic activity and 1.1 million jobs are attributable to 2016 federal, state, and local tax payments by 5+ renter households – more than double their 2013 totals (\$109 billion and 0.54 million jobs). The top-ranked metros for 2016 economic impact are New York, Los Angeles, San Francisco, and the DC MSA. Together, these 4 metros claimed 43% of the SOM tax impact and 46% of the absolute increase in tax impacts between 2013 and 2016. New York dominates the ranking with a \$53 billion contribution; at \$24 billion, Los Angeles was a distant second. Other strong performers include Dallas, Chicago, Boston, and Seattle.



Unusually, 3 of the top 4 metros for absolute size of impact also score well for percentage growth. **San Francisco and San Jose hold a sizable lead, with 300% and 275% impact growth, respectively, between 2013 and 2016.** The remaining metros within the top 10 are a mix of large metros (DC, Houston, Los Angeles) that are enjoying solid growth, tech metros (Austin, Seattle), and mid-sized, rapidly expanding Southern metros (Nashville, Raleigh, Charlotte). Growth for this last group ranged from 175% to 145%, comfortably above the 120% SOM average for the period. Although the ranking order differs somewhat, the pattern for employment impacts is comparable. No Northeastern or Midwestern metros earned an above-average ranking for the percentage growth of their economic or employment impacts.

III. Conclusions

This study explored the impacts of the apartment industry on the US economy in 2013 and 2016. Our analysis revealed a significant contribution, with the industry generating almost 19% of total GDP (in nominal dollars) and 12% of total employment growth in 2016.

All four industry segments saw very strong growth over the 3 years studied, led by resurgent construction activity: the impacts from new apartment construction almost doubled between 2013 and 2016. In aggregate, economic and employment impacts from the 4 segments posted robust 15 - 20% gains during this time.

Impact analysis for the 50 states and 50 major metropolitan areas exhibited the same pattern, i.e., significant economic and job impacts with double-digit growth over the 3-year study period. We found that performance at all geographic levels was linked to growth trends in six economic and demographic variables.

These results provide a “snapshot” of industry impacts which capture a short period in the current economic cycle. However, the economy’s performance has been atypical in many respects as it recovered from the most severe downturn in generations. Readers should be cautious in projecting comparably strong performance for the future. Although study results are instructive, they do not provide a complete understanding of how economic and employment impacts from apartment industry activity may change over the course of a full economic cycle.

APPENDIX A

Summary of Economic/Employment Impacts - 50 US States + District of Columbia
by Industry Segment/G+ Unit Occupied Apartment Properties
2013 & 2016

2013				2014										2015										2016									
Census Region	NAA 2013 Region	State	a. Construction		b. Renov & Repair/Cap Ex		c. Property Op Ex		d. Renter Hs/Ind Spending		STATE TOTALS		Tax Portion of Op Ex		Renter Spending - Taxes																		
			Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Total Econ Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Total Econ Impact (Bil of US\$)	Employment Impact (No. of Jobs)																	
W	6	Alaska	\$0.04	178	\$0.05	190	\$0.15	258	\$3.20	19,088	\$3.44	19,714	\$0.04	65	\$0.26	1,524																	
S	2	Alabama	\$0.64	3,512	\$0.32	1,722	\$0.86	1,826	\$18.91	112,133	\$20.73	119,193	\$0.18	388	\$0.86	5,086																	
S	4	Arkansas	\$0.45	2,536	\$0.20	1,070	\$0.39	807	\$9.02	56,342	\$10.06	60,755	\$0.08	168	\$0.35	2,159																	
W	6	Arizona	\$1.20	6,082	\$0.75	3,701	\$2.23	4,749	\$56.65	326,547	\$60.84	341,079	\$0.40	847	\$3.35	19,303																	
W	6	California	\$4.09	16,781	\$5.20	20,845	\$23.48	36,927	\$372.37	1,758,350	\$405.15	1,832,901	\$60.90	9,570	\$25.93	122,425																	
W	5	Colorado	\$1.63	7,702	\$0.73	3,360	\$1.83	3,578	\$42.35	228,738	\$46.54	243,378	\$0.38	738	\$2.64	14,257																	
NE	1	Connecticut	\$0.45	1,801	\$0.30	1,195	\$1.41	1,936	\$18.88	81,798	\$21.04	86,730	\$0.39	540	\$1.45	6,298																	
S	1	District of Columbia	\$0.51	1,266	\$0.18	461	\$1.04	1,010	\$10.25	42,731	\$11.98	45,469	\$0.26	253	\$0.79	3,294																	
S	1	Delaware	\$0.19	901	\$0.07	350	\$0.29	560	\$4.95	27,621	\$5.50	29,432	\$0.04	77	\$0.31	1,724																	
S	2	Florida	\$4.08	21,217	\$2.40	12,224	\$8.73	20,056	\$141.74	856,235	\$156.93	909,732	\$2.77	6,371	\$7.87	47,558																	
S	2	Georgia	\$2.35	11,913	\$0.99	4,975	\$3.38	6,348	\$62.67	351,009	\$69.39	374,245	\$0.90	1,689	\$3.30	18,493																	
W	6	Hawaii	\$0.32	1,326	\$0.29	1,169	\$1.16	1,977	\$16.84	90,325	\$18.61	94,797	\$0.29	495	\$1.34	7,184																	
MW	5	Iowa	\$0.68	4,114	\$0.25	1,485	\$1.07	2,462	\$12.37	80,477	\$14.38	88,539	\$0.24	548	\$0.74	4,798																	
W	6	Idaho	\$0.15	908	\$0.07	411	\$0.32	710	\$5.87	38,733	\$6.41	40,762	\$0.08	182	\$0.28	1,850																	
MW	3	Illinois	\$2.35	10,880	\$1.74	7,824	\$4.87	8,312	\$81.20	412,834	\$90.17	439,851	\$1.66	2,826	\$5.62	28,581																	
MW	3	Indiana	\$1.09	6,302	\$0.86	4,854	\$1.95	4,259	\$35.00	213,225	\$38.90	228,640	\$0.47	1,025	\$1.92	11,692																	
MW	5	Kansas	\$0.52	2,797	\$0.32	1,681	\$0.88	1,936	\$17.19	100,992	\$18.91	107,406	\$0.16	363	\$1.04	6,082																	
S	2	Kentucky	\$0.48	2,761	\$0.29	1,623	\$0.71	1,544	\$15.86	97,071	\$17.34	102,998	\$0.13	287	\$0.70	4,259																	
S	4	Louisiana	\$0.33	1,716	\$0.26	1,323	\$0.85	1,770	\$17.14	101,322	\$18.58	106,131	\$0.11	236	\$0.84	4,978																	
NE	1	Massachusetts	\$0.87	3,647	\$0.78	3,256	\$3.74	6,084	\$48.32	238,897	\$53.71	251,884	\$0.80	1,297	\$3.96	19,563																	
S	1	Maryland	\$1.08	4,388	\$0.79	3,160	\$3.03	5,519	\$52.03	254,115	\$56.93	267,183	\$0.69	1,267	\$3.85	18,821																	
NE	1	Maine	\$0.06	343	\$0.08	472	\$0.28	699	\$4.80	31,865	\$5.22	33,379	\$0.11	277	\$0.27	1,806																	
MW	3	Michigan	\$1.08	5,827	\$1.16	6,139	\$2.58	5,104	\$48.86	285,673	\$53.68	302,743	\$0.65	1,285	\$2.75	16,098																	
MW	3	Minnesota	\$1.82	9,570	\$0.83	4,218	\$2.14	4,267	\$35.61	202,355	\$40.39	220,410	\$0.64	1,276	\$2.42	13,769																	
MW	5	Missouri	\$0.90	5,221	\$0.66	3,773	\$1.46	3,248	\$28.14	172,859	\$31.15	185,101	\$0.27	611	\$1.61	9,887																	
S	2	Mississippi	\$0.18	1,047	\$0.16	889	\$0.40	878	\$8.64	55,293	\$9.38	58,107	\$0.09	204	\$0.37	2,366																	
W	6	Montana	\$0.20	1,255	\$0.05	288	\$0.15	370	\$3.19	23,504	\$3.59	25,417	\$0.04	93	\$0.15	1,115																	
S	2	North Carolina	\$2.70	15,198	\$1.00	5,559	\$2.64	5,571	\$52.65	320,851	\$58.99	347,180	\$0.57	1,208	\$2.57	15,652																	
MW	5	North Dakota	\$0.71	3,795	\$0.11	592	\$0.33	679	\$4.86	28,913	\$6.02	33,979	\$0.09	176	\$0.31	1,841																	
MW	5	Nebraska	\$0.44	2,604	\$0.19	1,052	\$0.72	1,618	\$9.91	60,303	\$11.26	65,577	\$0.14	305	\$0.59	3,564																	
NE	1	New Hampshire	\$0.10	547	\$0.10	534	\$0.39	701	\$7.27	39,258	\$7.86	41,040	\$0.17	303	\$0.58	3,117																	
NE	1	New Jersey	\$1.54	6,570	\$0.82	3,360	\$3.68	6,047	\$62.68	299,551	\$68.72	315,527	\$1.67	2,739	\$5.32	25,433																	
W	5	New Mexico	\$0.14	744	\$0.14	745	\$0.36	816	\$8.88	57,944	\$9.52	60,249	\$0.06	133	\$0.44	2,900																	
W	6	Nevada	\$0.51	2,178	\$0.32	1,323	\$1.05	1,620	\$26.31	118,322	\$28.19	123,443	\$0.18	276	\$1.70	7,653																	
NE	1	New York	\$2.60	10,438	\$2.84	11,117	\$21.83	31,577	\$251.33	1,140,216	\$278.59	1,193,348	\$8.89	14,304	\$20.45	92,793																	
MW	3	Ohio	\$1.82	9,704	\$1.46	7,669	\$3.65	7,066	\$67.03	385,831	\$73.97	410,269	\$0.92	1,781	\$3.74	21,501																	
S	4	Oklahoma	\$0.44	2,387	\$0.33	1,722	\$0.91	1,926	\$17.88	105,360	\$19.58	111,395	\$0.12	247	\$0.87	5,154																	
W	6	Oregon	\$0.90	5,190	\$0.51	2,917	\$1.38	3,085	\$32.12	204,578	\$34.91	215,771	\$0.43	962	\$1.79	11,404																	
NE	1	Pennsylvania	\$0.81	4,483	\$1.01	5,430	\$3.95	8,268	\$59.35	346,004	\$65.12	364,186	\$0.88	1,838	\$3.92	22,846																	
NE	1	Rhode Island	\$0.04	200	\$0.08	434	\$0.34	672	\$5.74	33,274	\$6.20	34,580	\$0.12	237	\$0.39	2,288																	
S	2	South Carolina	\$0.91	5,042	\$0.33	1,774	\$1.12	2,435	\$20.21	124,723	\$22.56	133,974	\$0.30	655	\$0.98	6,032																	
MW	5	South Dakota	\$0.25	1,513	\$0.09	517	\$0.23	528	\$3.75	25,888	\$4.32	28,446	\$0.06	137	\$0.19	1,296																	
S	2	Tennessee	\$1.19	6,467	\$0.51	2,675	\$1.58	3,190	\$29.90	165,190	\$33.18	177,522	\$0.41	829	\$1.38	7,615																	
S	4	Texas	\$3.77	17,545	\$3.28	14,767	\$12.75	24,391	\$205.77	1,073,399	\$225.58	1,130,102	\$4.61	8,812	\$12.12	63,207																	
W	5	Utah	\$0.46	2,551	\$0.20	1,041	\$0.47	971	\$11.87	71,397	\$13.00	75,960	\$0.08	169	\$0.73	4,399																	
S	1	Virginia	\$1.74	8,164	\$1.07	5,008	\$4.11	7,686	\$55.09	283,386	\$62.01	304,245	\$0.66	1,230	\$3.82	19,658																	
NE	1	Vermont	\$0.05	313	\$0.04	258	\$0.14	337	\$2.20	14,431	\$2.43	15,339	\$0.06	134	\$0.15	957																	
W	6	Washington	\$1.84	7,708	\$0.89	3,633	\$3.10	4,843	\$57.65	270,169	\$63.49	286,353	\$0.88	1,378	\$3.77	17,644																	
MW	3	Wisconsin	\$1.40	7,976	\$0.67	3,802	\$2.48	5,265	\$28.77	176,568	\$33.32	193,611	\$0.50	1,073	\$1.64	10,051																	
S	2	West Virginia	\$0.04	237	\$0.08	482	\$0.20	442	\$3.58	24,575	\$3.90	25,736	\$0.06	123	\$0.15	1,043																	
W	5	Wyoming	\$0.06	303	\$0.03	125	\$0.10	172	\$1.65	9,088	\$1.84	9,688	\$0.01	24	\$0.10	547																	

Sources: National Apartment Association; CoStar; US Bureau of Economic Analysis; US Bureau of Labor Statistics; US Census Bureau; "US Apartment Demand: A Forward Look" HAS/Whitegate/Dinn May 2017

Summary of Economic/Employment Impacts - 50 US States + District of Columbia

by Industry Segment/5+ Unit Occupied Apartment Properties

2013 & 2016

2016												
Census Region	NAA 2016 Region	State	a. Construction		b. Renov & Repair/Cap Ex		c. Property Op Ex		d. Renter Hshld Spending		STATE TOTALS	
			Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)
W	7	Alaska	\$0.07	276	\$0.06	227	\$0.14	226	\$3.51	19,645	\$3.77	20,374
S	9	Alabama	\$1.16	6,232	\$0.49	2,584	\$1.06	2,217	\$22.07	127,920	\$24.78	138,953
S	6	Arkansas	\$0.78	4,291	\$0.32	1,709	\$0.48	960	\$11.79	72,487	\$13.36	79,447
W	7	Arizona	\$2.75	13,926	\$0.99	4,884	\$2.67	5,587	\$66.83	383,392	\$73.23	407,790
W	10	California	\$9.34	35,356	\$7.21	27,015	\$27.08	39,398	\$455.43	1,982,704	\$499.06	2,084,474
W	8	Colorado	\$3.32	15,178	\$1.13	5,092	\$2.51	4,740	\$53.97	285,388	\$60.93	310,399
NE	2	Connecticut	\$0.69	2,622	\$0.39	1,489	\$1.65	2,163	\$20.79	85,465	\$23.51	91,739
S	1	District of Columbia	\$0.99	2,203	\$0.28	653	\$1.27	1,106	\$13.87	51,545	\$16.41	55,508
S	1	Delaware	\$0.30	1,479	\$0.12	566	\$0.25	464	\$5.42	29,733	\$6.09	32,242
S	9	Florida	\$9.16	46,899	\$3.37	17,063	\$11.50	25,097	\$182.60	1,061,730	\$206.63	1,150,788
S	4	Georgia	\$4.94	24,500	\$1.82	8,896	\$4.13	7,419	\$79.13	429,728	\$90.02	470,543
W	10	Hawaii	\$0.60	2,339	\$0.37	1,420	\$1.23	1,921	\$18.90	94,296	\$21.09	99,977
MW	5	Iowa	\$1.15	6,367	\$0.31	1,698	\$0.85	1,797	\$13.21	79,773	\$15.51	89,635
W	7	Idaho	\$0.38	2,114	\$0.09	488	\$0.33	699	\$6.04	38,007	\$6.83	41,308
MW	3	Illinois	\$4.22	18,795	\$2.14	9,354	\$5.77	9,521	\$92.39	446,870	\$104.53	484,541
MW	3	Indiana	\$1.66	9,079	\$0.83	4,459	\$2.08	4,203	\$37.73	216,792	\$42.30	234,533
MW	5	Kansas	\$0.75	3,841	\$0.37	1,847	\$0.86	1,792	\$17.72	97,431	\$19.69	104,911
S	4	Kentucky	\$0.92	5,290	\$0.49	2,792	\$0.80	1,667	\$18.27	108,500	\$20.49	118,250
S	9	Louisiana	\$0.51	2,641	\$0.40	1,954	\$0.94	1,808	\$18.74	106,255	\$20.59	112,657
NE	2	Massachusetts	\$1.83	7,237	\$1.05	4,148	\$4.54	6,962	\$53.95	249,838	\$61.36	268,184
S	1	Maryland	\$1.65	6,176	\$1.37	5,101	\$3.55	5,755	\$61.82	275,691	\$68.39	292,724
NE	2	Maine	\$0.12	685	\$0.12	676	\$0.34	785	\$4.64	29,388	\$5.21	31,534
MW	3	Michigan	\$2.41	12,593	\$1.66	8,578	\$2.96	5,552	\$59.90	336,666	\$66.93	363,389
MW	3	Minnesota	\$2.97	15,181	\$0.90	4,456	\$2.68	5,027	\$39.46	208,206	\$46.02	232,870
MW	5	Missouri	\$1.88	11,019	\$0.71	4,104	\$1.65	3,776	\$34.14	211,712	\$38.38	230,612
S	9	Mississippi	\$0.22	1,258	\$0.27	1,510	\$0.46	989	\$10.52	67,130	\$11.48	70,888
W	8	Montana	\$0.30	1,780	\$0.07	424	\$0.17	415	\$3.62	25,527	\$4.16	28,145
S	4	North Carolina	\$5.01	27,289	\$1.38	7,391	\$3.23	6,475	\$62.51	357,558	\$72.13	398,713
MW	8	North Dakota	\$0.89	4,852	\$0.14	755	\$0.34	726	\$6.89	41,214	\$8.26	47,547
MW	5	Nebraska	\$0.72	3,983	\$0.27	1,435	\$0.72	1,640	\$11.01	63,827	\$12.72	70,885
NE	2	New Hampshire	\$0.24	1,228	\$0.15	758	\$0.60	1,056	\$7.04	36,733	\$8.03	39,775
NE	1	New Jersey	\$3.89	16,138	\$1.43	5,778	\$5.64	9,090	\$72.87	336,913	\$83.83	367,918
W	6	New Mexico	\$0.14	718	\$0.16	797	\$0.41	863	\$9.97	62,940	\$10.67	65,318
W	7	Nevada	\$1.25	5,215	\$0.54	2,148	\$1.43	2,190	\$30.39	132,196	\$33.61	141,749
NE	2	New York	\$7.78	29,252	\$5.63	21,039	\$30.18	41,891	\$280.02	1,222,898	\$323.61	1,315,080
MW	3	Ohio	\$2.59	13,459	\$1.62	8,236	\$4.28	7,786	\$75.84	419,228	\$84.33	448,710
S	5	Oklahoma	\$0.72	3,865	\$0.43	2,261	\$0.94	2,027	\$20.65	121,968	\$22.75	130,121
W	7	Oregon	\$1.82	9,828	\$0.87	4,632	\$1.73	3,447	\$36.97	214,581	\$41.39	232,488
NE	1	Pennsylvania	\$1.67	8,790	\$1.59	8,228	\$4.93	9,580	\$63.92	355,596	\$72.11	382,194
S	4	South Carolina	\$0.03	194	\$0.16	912	\$0.52	1,037	\$7.17	43,236	\$7.89	45,379
S	4	South Dakota	\$1.93	10,128	\$0.68	3,507	\$1.42	2,857	\$24.06	139,350	\$28.09	155,843
MW	8	Tennessee	\$0.41	2,278	\$0.13	702	\$0.29	610	\$4.44	27,171	\$5.28	30,762
S	4	Texas	\$3.16	15,942	\$1.04	5,182	\$1.97	3,636	\$38.32	200,380	\$44.48	225,140
S	6	Texas	\$8.31	37,685	\$4.88	21,598	\$16.31	29,701	\$259.02	1,289,885	\$288.51	1,378,869
W	8	Utah	\$1.26	6,753	\$0.26	1,373	\$0.63	1,243	\$14.99	85,817	\$17.14	95,185
S	1	Virginia	\$3.12	13,941	\$1.49	6,671	\$4.64	8,209	\$68.98	338,529	\$78.24	367,350
NE	2	Vermont	\$0.10	601	\$0.07	392	\$0.21	464	\$2.44	15,021	\$2.82	16,477
W	7	Washington	\$4.22	16,323	\$1.13	4,296	\$3.94	5,544	\$70.82	296,127	\$80.11	322,291
MW	3	Wisconsin	\$2.23	12,132	\$0.76	4,144	\$1.74	3,497	\$32.71	191,147	\$37.44	210,921
S	4	West Virginia	\$0.10	619	\$0.10	625	\$0.22	487	\$4.27	28,971	\$4.70	30,703
W	8	Wyoming	\$0.05	219	\$0.04	176	\$0.07	132	\$2.05	11,344	\$2.21	11,871

Sources: National Apartment Association; CoStar; US Bureau of Economic Analysis; US Bureau of Labor Statistics; US Census Bureau; "US Apartment Demand: A Forward Look" HAS/Whitegate/Dinn May 2017

APPENDIX B

Summary of Economic and Employment Impacts - 50 Major US Metros

by Industry Segment/5+ Unit Occupied Apartment Properties

2013 & 2016

2013		2013										2016									
Census Region	NAA 2013 Region	State	Metro Area	a. Construction		b. Renov & Repair/Cap Ex		c. Property Op Ex		d. Renter Hshld Spending		METRO TOTALS		Tax Portion of OpEx*		Total Econ Impact (Bil of US \$)		Total Econ Impact (Bil of US \$)		Total Econ Impact (No. Jobs)	
				Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Total Econ Impact (Bil of US\$)	Total Econ Impact (No. Jobs)	Total Econ Impact (Bil of US\$)	Total Econ Impact (No. Jobs)	Total Econ Impact (Bil of US\$)	Total Econ Impact (No. Jobs)	Total Econ Impact (Bil of US\$)	Total Econ Impact (No. Jobs)
W	5	NM	Albuquerque	\$0.10	497	\$0.10	499	\$0.23	454	\$5.52	32,932	\$5.94	34,382	\$0.04	74	\$0.28	1,696	\$0.04	74	\$0.28	1,696
S	2	GA	Atlanta	\$2.24	9,931	\$0.70	3,003	\$2.40	3,886	\$44.01	216,376	\$49.35	233,196	\$0.66	1,061	\$2.61	12,832	\$0.66	1,061	\$2.61	12,832
S	4	TX	Austin	\$2.20	9,994	\$0.35	1,555	\$1.40	1,787	\$19.95	103,489	\$23.90	117,535	\$0.60	1,066	\$2.61	12,832	\$0.60	1,066	\$2.61	12,832
S	1	MD	Baltimore	\$0.57	2,247	\$0.41	1,585	\$1.32	2,183	\$22.82	109,684	\$25.12	115,699	\$0.30	501	\$1.61	7,726	\$0.30	501	\$1.61	7,726
S	2	AL	Birmingham	\$0.25	1,190	\$0.10	481	\$0.25	456	\$5.26	27,118	\$5.86	29,245	\$0.06	101	\$0.27	1,409	\$0.06	101	\$0.27	1,409
NE	1	MA	Boston	\$0.80	3,451	\$0.80	3,093	\$3.47	5,562	\$42.54	203,667	\$47.71	215,773	\$0.74	1,186	\$3.75	17,951	\$0.74	1,186	\$3.75	17,951
S	2	SC	Charleston	\$0.26	1,148	\$0.09	377	\$0.29	461	\$4.68	23,598	\$5.32	25,584	\$0.07	114	\$0.27	1,370	\$0.07	114	\$0.27	1,370
S	2	NC	Charlotte	\$1.03	5,072	\$0.27	1,311	\$0.68	1,195	\$12.77	63,585	\$14.75	71,163	\$0.16	291	\$0.71	3,518	\$0.16	291	\$0.71	3,518
MW	3	IL	Chicago	\$2.54	11,539	\$1.58	6,951	\$4.31	7,418	\$70.67	362,994	\$15.27	388,901	\$1.47	2,527	\$5.24	26,935	\$1.47	2,527	\$5.24	26,935
MW	3	OH	Cincinnati	\$0.42	2,104	\$0.28	1,376	\$0.65	1,226	\$13.92	76,502	\$15.27	81,208	\$0.14	261	\$0.87	4,774	\$0.14	261	\$0.87	4,774
MW	3	OH	Cleveland	\$0.11	536	\$0.28	1,373	\$0.91	1,650	\$12.54	69,926	\$13.84	73,484	\$0.20	358	\$0.68	3,811	\$0.20	358	\$0.68	3,811
MW	3	OH	Columbus	\$0.77	3,792	\$0.36	1,703	\$0.80	1,358	\$15.94	83,924	\$17.86	90,777	\$0.28	470	\$1.03	5,426	\$0.28	470	\$1.03	5,426
S	4	TX	Dallas	\$3.90	17,564	\$1.25	5,464	\$4.15	7,452	\$67.19	331,742	\$76.49	362,221	\$1.48	2,653	\$4.27	21,103	\$1.48	2,653	\$4.27	21,103
W	5	CO	Denver	\$1.60	7,316	\$0.51	2,248	\$1.27	2,384	\$28.55	152,101	\$31.92	164,051	\$0.29	542	\$1.86	9,891	\$0.29	542	\$1.86	9,891
MW	3	MI	Detroit	\$0.63	2,810	\$0.70	3,085	\$1.86	2,946	\$24.72	126,407	\$27.90	135,248	\$0.46	736	\$1.54	7,877	\$0.46	736	\$1.54	7,877
W	6	HI	Honolulu	\$0.28	1,286	\$0.77	1,208	\$0.98	1,805	\$14.87	91,259	\$16.41	95,559	\$1.22	1,666	\$3.09	13,173	\$1.22	1,666	\$3.09	13,173
S	4	TX	Houston	\$3.74	13,890	\$0.77	2,758	\$3.35	4,580	\$50.09	213,680	\$67.95	234,907	\$0.19	393	\$0.86	4,877	\$0.19	393	\$0.86	4,877
MW	3	IN	Indianapolis	\$0.43	2,271	\$0.30	1,543	\$0.81	1,633	\$14.63	82,862	\$16.16	88,310	\$0.15	286	\$1.04	5,628	\$0.15	286	\$1.04	5,628
MW	5	KS	Kansas City	\$0.31	2,439	\$0.26	1,259	\$0.79	1,502	\$15.52	83,805	\$17.31	89,006	\$0.14	219	\$1.36	6,239	\$0.14	219	\$1.36	6,239
W	6	NV	Las Vegas	\$0.43	1,823	\$0.26	1,020	\$0.82	1,284	\$20.81	95,335	\$22.09	99,462	\$0.04	73	\$0.21	1,119	\$0.04	73	\$0.21	1,119
S	4	AR	Little Rock	\$0.21	1,047	\$0.09	426	\$0.19	352	\$4.29	23,220	\$4.78	25,045	\$0.06	130	\$0.36	2,059	\$0.06	130	\$0.36	2,059
W	6	CA	Los Angeles	\$3.19	13,495	\$2.77	11,577	\$8.37	13,674	\$137.94	678,545	\$152.27	717,291	\$1.96	3,195	\$9.60	47,217	\$1.96	3,195	\$9.60	47,217
S	2	KY	Louisville	\$0.22	1,221	\$0.15	816	\$0.32	681	\$7.52	43,164	\$8.21	45,882	\$0.12	226	\$0.48	2,619	\$0.12	226	\$0.48	2,619
S	2	TN	Memphis	\$0.25	1,228	\$0.17	778	\$0.49	880	\$9.25	50,563	\$10.15	53,449	\$0.16	237	\$0.57	2,819	\$0.16	237	\$0.57	2,819
S	2	FL	Miami	\$2.69	12,585	\$0.84	3,889	\$3.61	6,798	\$46.92	262,919	\$54.06	286,190	\$1.26	2,376	\$2.67	14,955	\$1.26	2,376	\$2.67	14,955
MW	3	WI	Milwaukee	\$0.30	1,443	\$0.21	1,013	\$0.59	1,041	\$9.28	50,498	\$10.38	53,994	\$0.19	340	\$0.55	3,006	\$0.19	340	\$0.55	3,006
MW	3	MN	Minneapolis	\$1.88	9,248	\$0.66	3,166	\$1.69	3,175	\$29.21	157,224	\$33.44	172,813	\$0.51	949	\$2.19	11,787	\$0.51	949	\$2.19	11,787
S	2	LA	Nashville	\$0.61	3,068	\$0.19	901	\$0.57	1,030	\$11.04	59,065	\$12.41	64,063	\$0.15	278	\$0.58	3,127	\$0.15	278	\$0.58	3,127
S	4	TN	New Orleans	\$0.04	197	\$0.06	283	\$0.31	560	\$6.18	33,742	\$6.60	34,781	\$0.04	75	\$0.32	1,773	\$0.04	75	\$0.32	1,773
NE	1	NY	New York MSA	\$4.30	16,841	\$5.87	22,609	\$26.94	43,409	\$285.88	1,358,657	\$322.99	1,441,515	\$12.20	19,663	\$24.86	118,169	\$12.20	19,663	\$24.86	118,169
S	4	OK	Oklahoma City	\$0.21	1,030	\$0.13	602	\$0.37	647	\$7.71	41,411	\$8.42	43,690	\$0.31	767	\$0.39	2,101	\$0.31	767	\$0.39	2,101
S	2	FL	Orlando	\$1.47	11,650	\$0.40	2,619	\$1.20	2,922	\$19.94	125,937	\$23.00	143,128	\$0.59	1,145	\$2.95	15,911	\$0.59	1,145	\$2.95	15,911
NE	1	PA	Philadelphia	\$0.83	3,879	\$0.79	3,575	\$2.67	5,152	\$39.49	213,058	\$43.79	225,664	\$0.27	526	\$2.55	14,153	\$0.27	526	\$2.55	14,153
W	6	AZ	Phoenix	\$1.14	5,647	\$0.53	2,528	\$1.60	3,141	\$41.00	227,427	\$44.26	238,742	\$0.34	650	\$1.61	8,998	\$0.34	650	\$1.61	8,998
NE	1	PA	Pittsburgh	\$0.14	765	\$0.23	1,160	\$0.67	1,317	\$11.90	68,927	\$12.94	72,169	\$0.09	153	\$0.58	3,141	\$0.09	153	\$0.58	3,141
W	6	OR	Portland	\$0.78	4,007	\$0.40	2,035	\$1.08	2,085	\$24.96	139,381	\$27.23	147,509	\$0.24	440	\$1.22	6,665	\$0.24	440	\$1.22	6,665
S	2	NC	Raleigh	\$0.98	4,799	\$0.21	1,003	\$0.44	827	\$8.97	48,604	\$10.61	55,232	\$0.38	701	\$1.65	9,521	\$0.38	701	\$1.65	9,521
S	1	VA	Richmond	\$0.30	1,479	\$0.18	894	\$0.56	1,088	\$9.51	51,372	\$10.55	54,834	\$0.08	153	\$0.58	3,141	\$0.08	153	\$0.58	3,141
W	6	CA	Riverside	\$0.58	3,105	\$0.44	2,316	\$1.55	2,833	\$26.47	153,136	\$29.04	161,390	\$0.38	701	\$1.65	9,521	\$0.38	701	\$1.65	9,521
W	6	CA	Sacramento	\$0.28	1,339	\$0.26	1,238	\$1.00	1,857	\$19.18	104,418	\$20.72	108,852	\$0.24	440	\$1.22	6,665	\$0.24	440	\$1.22	6,665
W	5	UT	Salt Lake City	\$0.20	945	\$0.14	670	\$0.31	549	\$7.46	36,576	\$8.11	38,740	\$0.05	96	\$0.49	2,393	\$0.05	96	\$0.49	2,393
S	4	TX	San Antonio	\$0.76	3,805	\$0.28	1,378	\$1.00	1,985	\$16.34	98,071	\$18.38	105,239	\$0.35	699	\$0.96	5,754	\$0.35	699	\$0.96	5,754
W	6	CA	San Diego	\$0.87	3,582	\$0.60	2,472	\$2.44	4,085	\$41.96	213,104	\$45.87	223,243	\$0.74	1,240	\$3.02	15,357	\$0.74	1,240	\$3.02	15,357
W	6	CA	San Francisco	\$1.46	4,346	\$0.68	1,962	\$2.46	6,579	\$50.78	166,902	\$50.28	179,790	\$1.21	1,576	\$3.48	13,469	\$1.21	1,576	\$3.48	13,469
W	6	CA	San Jose	\$0.77	2,325	\$0.35	1,011	\$1.75	1,555	\$16.55	54,967	\$19.42	59,857	\$0.72	920	\$2.92	12,284	\$0.72	920	\$2.92	12,284
W	6	WA	Seattle	\$1.56	5,844	\$0.60	2,155	\$2.34	3,234	\$40.01	168,339	\$44.51	179,573	\$0.67	920	\$2.92	12,284	\$0.67	920	\$2.92	12,284
MW	3	SD	Sioux Falls	\$0.14	729	\$0.03	149	\$0.07	149	\$1.48	8,601	\$1.72	9,628	\$0.15	282	\$0.89	4,779	\$0.15	282	\$0.89	4,779
MW	5	MO	St. Louis	\$0.42	2,043	\$0.29	1,366	\$0.74	1,420	\$14.15	75,778	\$15.60	80,607	\$0.40	800	\$1.36	7,865	\$0.40	800	\$1.36	7,865
S	2	FL	Tampa	\$0.90	4,374	\$0.37	1,805	\$1.35	2,722	\$24.10	139,441	\$26.72	148,342	\$0.24	500	\$1.36	7,865	\$0.24	500	\$1.36	7,865
S	1	DC	Washington MSA	\$2.00	7,413	\$1.11	4,078	\$4.67	7,665	\$62.52	301,437	\$70.30	320,593	\$1.24	2,034	\$5.29	25,483	\$1.24	2,034	\$5.29	25,483

* There are missing values in the "Tax Portion of OpEx" columns for metros not covered in that year's NAA survey. In 2013, those metros are Honolulu, Oklahoma City, Pittsburgh, and Sioux Falls (SD). Because this subcategory largely reflects locally-set property taxes which can vary considerably, both by place and over time, applying the regional average in such instances was not feasible.

Summary of Economic and Employment Impacts - 50 Major US Metros

by Industry Segment/5+ Unit Occupied Apartment Properties

2013 & 2016

2016										2013									
Census Region	NAA 2013 Region	State	Metro Area	a. Construction		b. Renov & Repair/Cap Ex		c. Property Op Ex		d. Renter Hshld Spending		METRO TOTALS		Total Econ Impact (Bil of US\$)		Total Econ Impact (No. of Jobs)		Tax Portion of OpEx*	
				Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Economic Impact (Bil of US\$)	Employment Impact (No. of Jobs)	Total Econ Impact (Bil of US\$)	Total Econ Impact (No. of Jobs)	Total Econ Impact (Bil of US\$)	Total Econ Impact (No. of Jobs)	Total Econ Impact (Bil of US\$)	Total Econ Impact (No. of Jobs)
W	5	NM	Albuquerque	\$0.09	440	\$0.10	464	\$0.25	502	\$6.09	35,499	\$6.53	36,906	\$0.44	85	\$0.44	85	\$0.44	85
S	2	GA	Atlanta	\$4.41	19,072	\$1.30	5,511	\$2.96	4,954	\$54.87	263,774	\$63.54	293,312	\$5.98	1,673	\$5.98	1,673	\$5.98	1,673
S	4	TX	Austin	\$3.12	13,700	\$0.62	2,683	\$2.96	4,954	\$27.32	140,707	\$27.32	160,303	\$3.50	1,623	\$3.50	1,623	\$3.50	1,623
S	1	MD	Baltimore	\$0.63	2,388	\$0.59	2,211	\$1.52	2,360	\$27.44	123,621	\$30.19	130,580	\$3.66	628	\$3.66	628	\$3.66	628
S	2	AL	Birmingham	\$0.42	1,972	\$0.13	598	\$0.30	520	\$5.59	27,794	\$6.44	30,884	\$0.42	166	\$0.42	166	\$0.42	166
NE	1	MA	Boston	\$1.78	6,482	\$0.92	3,350	\$4.15	6,075	\$48.01	212,994	\$54.85	228,901	\$7.66	1,709	\$7.66	1,709	\$7.66	1,709
S	2	SC	Charleston	\$0.97	2,237	\$0.15	609	\$0.37	323	\$5.81	28,923	\$6.85	32,338	\$0.10	146	\$0.10	146	\$0.10	146
S	2	NC	Charlotte	\$1.95	8,957	\$0.36	1,614	\$0.90	1,456	\$17.09	76,105	\$20.31	88,132	\$1.76	388	\$1.76	388	\$1.76	388
W	3	IL	Chicago	\$3.74	16,766	\$2.02	8,917	\$5.20	8,815	\$81.04	409,257	\$92.00	443,755	\$15.4	2,604	\$15.4	2,604	\$15.4	2,604
MW	3	OH	Cincinnati	\$0.62	2,820	\$0.34	1,499	\$0.77	1,306	\$15.38	77,849	\$17.10	83,474	\$0.20	348	\$0.20	348	\$0.20	348
MW	3	OH	Cleveland	\$0.13	625	\$0.31	1,432	\$0.95	1,565	\$14.17	74,033	\$15.56	77,656	\$0.25	418	\$0.25	418	\$0.25	418
MW	3	OH	Columbus	\$0.98	4,696	\$0.46	2,115	\$1.12	1,822	\$19.02	97,046	\$21.59	105,679	\$0.48	781	\$0.48	781	\$0.48	781
S	4	TX	Dallas	\$8.40	36,089	\$1.73	7,252	\$5.35	8,506	\$83.04	377,066	\$98.53	428,912	\$9.64	3,537	\$9.64	3,537	\$9.64	3,537
W	5	CO	Denver	\$2.46	10,245	\$0.72	2,909	\$1.63	2,780	\$34.20	170,420	\$39.00	186,353	\$2.23	633	\$2.23	633	\$2.23	633
MW	3	MI	Detroit	\$0.82	3,459	\$0.90	3,757	\$2.11	3,172	\$28.74	137,399	\$32.57	147,788	\$0.49	731	\$0.49	731	\$0.49	731
W	6	HI	Honolulu	\$0.53	2,234	\$0.32	1,342	\$1.06	1,777	\$16.41	92,412	\$18.32	97,765	\$1.73	2,500	\$1.73	2,500	\$1.73	2,500
S	4	TX	Houston	\$6.08	23,869	\$1.44	5,535	\$4.13	5,970	\$65.64	295,421	\$77.28	330,795	\$7.85	35,321	\$7.85	35,321	\$7.85	35,321
MW	3	IN	Indianapolis	\$0.78	3,789	\$0.38	1,784	\$0.95	1,779	\$17.46	90,101	\$19.57	97,453	\$1.35	426	\$1.35	426	\$1.35	426
MW	5	KS	Kansas City	\$0.97	4,598	\$0.36	1,653	\$0.93	93,744	\$18.26	93,744	\$20.53	101,676	\$1.61	428	\$1.61	428	\$1.61	428
W	6	NV	Las Vegas	\$1.06	4,249	\$0.35	1,371	\$1.09	1,722	\$22.50	102,029	\$25.00	109,372	\$2.30	266	\$2.30	266	\$2.30	266
S	4	AR	Little Rock	\$0.31	1,452	\$0.11	503	\$0.20	346	\$4.65	25,008	\$5.27	27,310	\$0.05	82	\$0.05	82	\$0.05	82
W	6	CA	Los Angeles	\$6.38	24,842	\$3.56	13,897	\$10.03	15,208	\$158.49	718,912	\$178.46	772,859	\$2.71	4,104	\$2.71	4,104	\$2.71	4,104
S	2	KY	Louisville	\$0.40	2,109	\$0.19	1,018	\$0.36	693	\$8.58	46,941	\$9.52	50,760	\$0.08	162	\$0.08	162	\$0.08	162
S	2	TN	Memphis	\$0.40	1,849	\$0.22	976	\$0.50	804	\$10.21	53,788	\$11.34	57,416	\$0.15	242	\$0.15	242	\$0.15	242
S	2	FL	Miami	\$4.50	19,974	\$1.42	6,247	\$4.52	8,115	\$56.88	298,285	\$67.31	332,620	\$1.82	3,260	\$1.82	3,260	\$1.82	3,260
MW	3	WI	Milwaukee	\$0.51	2,345	\$0.27	1,250	\$0.68	1,141	\$10.88	56,822	\$12.34	61,558	\$0.14	228	\$0.14	228	\$0.14	228
MW	3	MN	Minneapolis	\$2.22	10,400	\$0.82	3,743	\$2.18	3,627	\$31.85	154,360	\$37.08	172,130	\$0.75	1,253	\$0.75	1,253	\$0.75	1,253
S	2	TN	Nashville	\$2.08	9,306	\$0.37	1,617	\$0.78	1,293	\$15.09	74,047	\$18.32	86,262	\$0.24	403	\$0.24	403	\$0.24	403
S	4	LA	New Orleans	\$0.08	372	\$0.07	328	\$0.35	656	\$6.91	38,052	\$7.41	39,409	\$0.09	161	\$0.09	161	\$0.09	161
NE	1	NY	New York MSA	\$11.21	41,629	\$8.22	30,292	\$37.60	56,934	\$324.63	1,461,268	\$381.66	1,590,123	\$16.67	25,246	\$16.67	25,246	\$16.67	25,246
S	4	OK	Oklahoma City	\$0.35	1,672	\$0.18	821	\$0.41	785	\$8.97	47,064	\$9.91	50,342	\$0.10	185	\$0.10	185	\$0.10	185
S	2	FL	Orlando	\$2.64	12,786	\$0.42	1,994	\$1.47	2,730	\$24.21	133,509	\$28.74	151,020	\$0.50	923	\$0.50	923	\$0.50	923
NE	1	PA	Philadelphia	\$1.58	6,909	\$0.98	4,207	\$3.18	5,783	\$42.59	211,533	\$48.32	228,432	\$0.64	1,159	\$0.64	1,159	\$0.64	1,159
W	6	AZ	Phoenix	\$2.46	12,017	\$0.77	3,670	\$1.94	3,763	\$48.64	264,951	\$53.81	284,400	\$0.36	696	\$0.36	696	\$0.36	696
NE	1	PA	Pittsburgh	\$0.26	1,299	\$0.30	1,448	\$0.88	1,616	\$11.99	65,297	\$13.43	69,660	\$0.17	305	\$0.17	305	\$0.17	305
W	6	OR	Portland	\$1.56	7,520	\$0.63	2,993	\$1.37	2,416	\$28.62	147,187	\$32.18	160,116	\$0.42	740	\$0.42	740	\$0.42	740
S	2	NC	Raleigh	\$1.15	5,246	\$0.24	1,081	\$0.62	1,049	\$11.89	59,455	\$13.90	66,831	\$0.18	310	\$0.18	310	\$0.18	310
S	1	VA	Richmond	\$0.40	1,748	\$0.24	924	\$0.58	1,002	\$10.63	51,142	\$11.83	54,817	\$0.15	251	\$0.15	251	\$0.15	251
W	6	CA	Riverside	\$0.82	4,234	\$0.60	3,053	\$1.69	2,952	\$29.73	161,527	\$32.83	171,766	\$0.46	801	\$0.46	801	\$0.46	801
W	6	CA	Sacramento	\$0.35	1,375	\$0.33	1,280	\$0.98	1,456	\$19.38	89,019	\$21.05	93,130	\$0.32	476	\$0.32	476	\$0.32	476
W	5	UT	Salt Lake City	\$0.68	3,144	\$0.40	1,668	\$0.40	670	\$8.62	41,443	\$9.84	45,926	\$0.08	128	\$0.08	128	\$0.08	128
W	5	TX	San Antonio	\$0.99	4,573	\$0.42	1,892	\$1.33	2,432	\$19.77	107,035	\$22.51	115,932	\$0.55	1,002	\$0.55	1,002	\$0.55	1,002
S	4	TX	San Diego	\$1.58	5,978	\$0.78	3,007	\$2.65	4,127	\$48.94	228,763	\$53.96	241,875	\$0.84	1,304	\$0.84	1,304	\$0.84	1,304
W	6	CA	San Francisco	\$2.45	6,504	\$1.02	2,657	\$4.93	5,711	\$57.27	195,557	\$65.67	210,429	\$1.61	1,863	\$1.61	1,863	\$1.61	1,863
W	6	CA	San Jose	\$1.17	2,807	\$0.42	996	\$1.96	1,364	\$20.81	55,840	\$24.37	61,008	\$0.80	558	\$0.80	558	\$0.80	558
W	6	WA	Seattle	\$3.30	11,035	\$0.69	2,237	\$2.87	3,559	\$27.52	101,763	\$34.38	118,594	\$0.89	1,100	\$0.89	1,100	\$0.89	1,100
W	3	SD	Sioux Falls	\$0.26	1,262	\$0.04	189	\$0.10	190	\$1.78	9,557	\$2.19	11,198	\$0.02	40	\$0.02	40	\$0.02	40
MW	5	MO	St. Louis	\$0.81	4,037	\$0.32	1,559	\$0.78	1,523	\$16.09	89,239	\$18.00	96,358	\$0.12	238	\$0.12	238	\$0.12	238
S	2	FL	Tampa	\$1.68	8,259	\$0.62	3,060	\$1.62	3,437	\$28.65	165,174	\$32.57	179,930	\$0.55	1,174	\$0.55	1,174	\$0.55	1,174
S	1	DC	Washington MSA	\$3.30	11,329	\$1.48	5,052	\$5.51	8,274	\$79.04	347,912	\$89.33	372,566	\$1.82	2,733	\$1.82	2,733	\$1.82	2,733

* There are missing values in the "Tax Portion of OpEx" columns for metros not covered in that year's NAA survey. For 2016, only Honolulu lacks coverage. Because this subcategory largely reflects locally-set property taxes which can vary considerably, both by place and over time, applying the regional average in such instances was not feasible.

APPENDIX C

Methodology for Calculation of Impacts by Industry Segment

The approaches used to estimate the impacts of the apartment industry's four industry segments at the state and metro levels broadly followed the methodologies we developed at the national level; however, different data sources and modifications to our US analytical processes were required. The data and analyses ultimately employed are outlined below, by segment.

A. New Construction

The key statistic available for construction activity at the local level comes from the US Census Building Permits Survey. On a more aggregate basis, the US Census also provides data on construction starts, construction completions, and units under construction, as well as estimates of construction spending on a monthly basis for the US as a whole and for the four Census regions.

Using the Census data, we estimated the proportion of the total new multifamily residential construction that involved new structures containing 5 or more units and were destined for the rental market. For sub-US geographies, a first step involved estimating starts based on permit authorizations. These estimates were then adjusted for the pace of net project abandonments, the pattern of construction over time, and local construction costs to produce estimates of 5+unit rental completions. With this information, we prepared new construction output estimates for the 50 states + DC and the 50 selected metros.

B. Apartment Renovation and Repair / Capital Expenditures (cap ex)

The estimates for this segment average the results of two independent methods for deriving renovation and repair expenditures: 1) calculation of estimates from published statistics on construction put-in-place, and 2) estimates computed from the NAA survey results on reported capital expenditures. A summary description of the methodology based on published statistics appears here. The discussion of the estimate using capital expenditures appears in section C, Industry operating expenditures (op ex), below.

Currently, no statistical source reports residential repair and alterations expenditures. We developed overall expenditure estimates by combining two sources of data, both from the US Census:

- Survey of Residential Improvements and Repairs – SORAR (Annual, 1993 to 2007; discontinued). The spending patterns of rental property owners over this period provided a guide to the pace of relative spending in subsequent years.
- Value of Construction Put in Place Survey – VIP (Monthly since 1964)

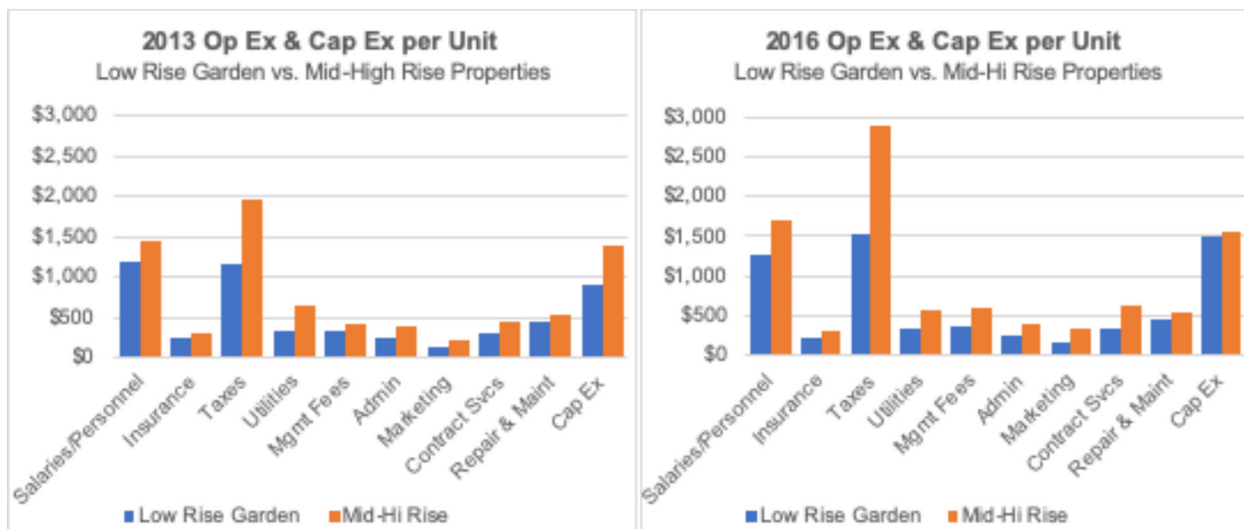
The principal current data source for construction spending on existing properties is the Construction Expenditure, also a Census Bureau publication. This provides estimates of total private residential construction spending, with a breakout for new residential structures by subtype. Improvement and repairs expenditures are not published directly but are calculated as the residual of total residential spending net of expenditures for new single family and multifamily structures.

Using the strong statistical relationship between the VIP reports of implied improvements and repairs spending on existing private structures and total expenditures from the SORAR survey, we estimated SORAR-like expenditures on existing rental properties for 2013 and 2016. A simple model of real expenditures per unit in 5+ structures for 1993-2007 interval was constructed and unique model coefficients were estimated for each Census region. Local expenditures by state / MSA and year were then calculated using Census region coefficients, local vacancy rates, the local number of rental units in structures with 5+ units, and national price changes. These estimates allow for changes in construction costs and in market vacancy rates.

C. Industry operating expenditures (opex)

The Segment C. analysis relied upon the annual NAA Survey of Income and Expenses for 2013 and 2016, CoStar apartment inventory and rent data, and several public sources.

NAA's annual surveys capture detailed revenue and op ex data for a comparatively small share of the



US and individual metro markets. The results are dominated by low-rise garden style product; although it is growing, survey coverage of mid- to high-rise product (which encompasses properties with four or more stories) is limited. When evaluated separately, the national level survey data for these two product types reveal that mid-high rise properties on average have significantly higher per unit revenues and expenses than their low-rise counterparts. Mid-high rise property statistics also posted much stronger growth between 2013 and 2016, as shown in the above graphs. Using NAA data alone as the basis for calculating industry revenues and expenditures at any geographic level would therefore result in significant underestimates.

The solution was a hybrid approach that used completer and more representative 5+unit rental inventory and revenue data from Costar together with NAA survey results on operating and capital expenditures. Total dollar estimates for apartment industry operating expenditures were generated by applying per-unit expenditure estimates to annual effective revenue per unit.

The NAA surveys have no state-level data, but do report on a large and growing number of metro areas. For each metro, op ex and cap ex spending totals were calculated, then adjusted to reflect the size of the metro's 5+ unit apartment inventory. State-level data was estimated by aggregating total collected revenues, op ex and cap ex expenditures for all NAA-reported metros within each state, then adjusting the figures to reflect the size of that state's 5+ unit apartment inventory.

For the handful of states (e.g., Alaska, Hawaii, Maine, West Virginia) and the single metro (Honolulu) with no NAA survey coverage, we developed reasonable estimates for op ex and cap ex expenditure by using effective revenue figures for these geographies together with the appropriate state- or regional-level expenditure rates that were calculated for these categories.

The NAA's cap ex line item undoubtedly overlaps materially with Segment B's renovation and repair expenditures; however, we had no basis for estimating the degree to which this is true. Therefore, cap ex expenditures were separated from the op ex totals (Segment C) and impacts were calculated using the appropriate (i.e., residential maintenance and repair segment) multipliers. As a final step, the impacts calculated for renovations and repair and for cap ex were averaged to generate an estimate of impacts in this category.

D. Renter household spending

The analysis uses publicly available data from the Bureau of Labor Statistics and the Census Bureau. BLS's annual Consumer Expenditure Survey (CES) provides household expenditures by housing tenure. BLS's total US renter figures from the 2013 and 2016 surveys were adjusted to reflect spending only by renting households in 5+ unit apartment properties using annual American Community Survey (ACS) data.

For state and metro level calculations,

- BEA spending estimates were assembled for each Census region by category of expenditure, according to household tenure and a range of household income levels
- Per-household estimates were generated for renting households by income level
- Expenditures were then allocated across each region's states and metro areas using the estimated number of households by income in each of these geographies
- Finally, figures were adjusted to reflect the number of renting households occupying 5+ unit properties in each state and each metro.

This approach produces a more granular and accurate assessment of expenditure patterns for renting households in individual states and metro areas. However, it implicitly assumes that renting households in 5+ unit properties mirror the overall US renter population surveyed for the CES, in terms of demographic and income characteristics as well as spending patterns. We were unable to locate a data source that would permit us to verify the appropriateness of this assumption.

APPENDIX D

Study Data Sources

1. Multipliers

United States, States+DC, Metropolitan Statistical Areas, and Counties

- US Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)
 - Average Annual Wages and Average Annual Employment by Industry
- US Bureau of Economic Analysis, Regional Data (GDP)
 - Components of Regional GDP, Income and Output by Industry

United States and States+DC

- US Bureau of Economic Analysis, Regional Consumption Data (PCE)
- Components of Regional Household Consumption by Industry

United States Only

- US Bureau of Economic Analysis, Input-Output Accounts (I-O)
 - Direct requirements tables: 2007 detailed and annual for 71 industries
 - I-O Use Table 2007
- US Bureau of Labor Statistics, Producer Price Indexes (PPI)
 - Selected index series to update 2007 detail to target year

2. Construction Impacts

States, Metropolitan Statistical Areas, and Counties

- US Census Bureau, Building Permits Survey (Permits)
 - Permits by Units in Property (monthly)
- US Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW)
 - Average weekly wage for construction workers

Four Census Regions

- US Census Bureau, New Residential Construction (Starts)
 - Units Started, Units Under Construction, Units Completed for all MF Properties (monthly)
- US Census Bureau, Length of Time, Authorization to Start, Start to Completion (monthly)
 - Time in months by Contractor-built and Units in Property
- US Census Bureau, Quarterly Completions by Intent and Design (Completions)
 - Units built with rental intent by units in property, average size of unit

United States

- US Census Bureau, American Housing Survey, 2013 and 2015 (AHS)
 - New Units by Tenure (owner, renter) and units in structure
- US Census Bureau, Construction Expenditures (VIP)
 - Construction put in place on new private multifamily residential structures

3. Apartment Renovation and Repair Impacts

United States, States, Major Metropolitan Statistical Areas

- CoStar
 - Rental Vacancy Rate, Structures with 5+ units (US Detail, States, 75 Major MSAs)
- Hoyt Advisory Services, U.S. Apartment Demand Study 2017
 - Occupied Rental Units in Structures with 5+ Units, from 2005

United States, 4 Census Regions

- US Census Bureau, Survey of Residential Improvements and Repairs (SORAR)
 - Expenditures by Tenure and Units in Structure, through 2007
 - Expenditures by Type of Job, Rental Structures, through 2007
- US Census Bureau, Decennial Census of Population and Housing (Census)
 - 1990, 2000. Baseline for Housing Units by Units in Structure for 1994-2004 interval

United States Only

- US Census Bureau, Value of Construction Put in Place Survey (monthly)
 - Expenditures on New Construction and on Improvements
- US Bureau of Labor Statistics, Producer Price Indexes (PPI)
 - PPI Commodity data for Net Inputs to Residential Construction
- US Bureau of Labor Statistics, Consumer Expenditure Survey (CES)
 - Maintenance and Repair Expenditures by Owners (netted from put-in-place figures)

4. Impacts of Apartment Property Operating Expenditure

United States, Major Metropolitan Statistical Areas

- National Apartment Association's (NAA) annual surveys
 - Actual collected revenue (rent + other)
 - Reported operating expenses (op ex) by category
 - Reported capital expenditure (cap ex) by category
- US Census Bureau, American Community Surveys (ACS)
 - Occupied rental inventory by product size and type

- 2017 NAA/NMHC US Apartment Demand study
 - Renter households by property size
- Costar, Inc.
 - Actual revenue per unit, 5+ unit rental properties

5. Impacts of Renter Household Spending

United States and 4 Census Regions

- US Bureau of Labor Statistics, Consumer Expenditure Survey
 - Household spending by housing tenure, household income level, and expenditure category

Census Regions, States, and Metropolitan Areas

- US Census Bureau, American Community Survey
 - At each geographic level, the number of households according to income category, tenure, and number of units in structure

This report was prepared for the National Multifamily Housing Council and the National Apartment Association by Hoyt Advisory Services and Eigen10 Advisors, LLC.

Hoyt Advisory Services (HAS) is subsidiary of the Homer Hoyt Institute (HHI), an independent, non-profit research and educational foundation established in 1967 to improve the quality of public and private real estate decisions by expanding and disseminating the real estate body of knowledge, stimulating innovation in the discipline of real estate and land economics, building bridges among academia, industry, and government, and developing innovative approaches to the solution of real estate problems.

Research supported by HHI must meet the highest standards of scholarship, and it must further the improvement of decision making in the real estate industry. That is, it must combine rigor with relevance. HAS is able to engage PhDs from leading universities along with practitioners with proven, appropriate real estate expertise for the project, in this case partnering with Eigen10 Advisors and Dr. Hess.

Eigen10 Advisors, LLC provides real estate consulting services in the areas of investment analysis, portfolio structuring, capital formation strategies, market analysis, econometric modeling and forecasting, reporting and asset management.

Authors for this paper each have more than 30 years of experience in the real estate industry, and are frequent speakers and publishers in both academic and practitioner journals and meetings:



Dr. Robert Hess, CFA®

Robert Hess Ph.D. CFA® has more than 30 years' experience as a research analyst and strategist in real estate investing, regional economic forecasting and impact analysis. He retired in March 2010 from Prudential Real Estate Investors (now PGIM Real Estate) as a Principal with more than 16 years providing fund strategy development and review, portfolio attribution analysis, and market analysis and targeting. Subsequently, he held a part time position as a research managing director with Grosvenor Fund Management US from 2012 to 2015, assisting in the preparation of fund investment strategies and providing analysis of US economic conditions and trends to the Grosvenor global investment team. An active participant in the institutional real estate industry, he served as Chair of the NCREIF Research Committee from 2007 to 2009, and served on the NCREIF-PREA Reporting Standards Council from 2011 to 2016.

Prior to joining PREI (1993), Dr. Hess was Senior Vice President and Director of Real Estate and Regional Financial Services at the WEFA Group (now IHS Global Insight). His professional experience also includes eight years in the banking industry, as Senior Vice President and Corporate Economist for Great American Bank, a large thrift institution based in San Diego, California; and as Vice President in the Residential Mortgage Banking Group at Bank of America. He has also held staff positions at Chase Econometrics Associates and the State of California.

Dr. Hess received his Ph.D. in Economics from the University of Colorado in 1978. He completed his undergraduate studies in physics at the Colorado School of Mines (1969). He holds an M.S. degree in Aerospace Engineering Sciences from the University of Colorado (1971). He became a Chartered Financial Analyst (CFA) charter holder in November 2000.



Eileen Marrinan, CRE®

Eileen Marrinan has more than 25 years of experience in real estate investment strategy, economic research, and market analysis. Over the course of her career, she has alternated between consulting work and increasingly senior positions with institutional investment and/or development firms. Consulting clients have included The RREEF Funds (now Deutsche Asset Management), Vulcan Real Estate, CalSTRS, Glenborough, LLC and Granite Peak Partners. She has served as the Director of Research at Grosvenor Americas, Vice President and Development Manager for Lennar Corporation's Urban Division, and Senior Vice President for ING Clarion Partners and for GIC Real Estate, Inc. She has master's degrees in city planning and in business administration from UC Berkeley. A frequent speaker and publisher, she has served in leadership positions at the Counselors of Real Estate and is a member of Lambda Alpha, PREA, and the Urban Land Institute. eemarrinan@eigen10.com

Reasonable efforts have been made to ensure that the data contained in this study reflect accurate and reliable information and are based on information that to our knowledge was current as of the date of this report. This study is based on estimates, assumptions, and other information developed from independent research efforts, models and general industry knowledge. No responsibility is assumed for inaccuracies in reporting by any data source used in preparing or presenting this study. This report represents a view of reasonable expectations as of the time the report was written, but such information, estimates, or opinions are not offered as predictions or assurances that particular results or events will occur. Actual results may vary from those described in this report, and the variations may be material. Therefore, no warranty or representation is made that any of the data, projected forecasts or results contained in this study will be achieved.



Prepared by:
Hoyt Advisory Services and Eigen10 Advisors, LLC

**COUNCIL AGENDA MEMO**

MEETING TYPE/DATE: REGULAR SUBCOMMITTEE MEETING 01-10-23

DEPARTMENT: Public Works

AGENDA ITEM: Discussion & Review of the 2022 Water Management Policy for Residential & Non-Residential Water Budgets as Well as Projects Under Contract for the Period from July 1, 2022 to December 31, 2022.

ITEM SUMMARY

Review of Residential & Non-residential Water Budgets as well as Projects Under Contract for the period from July 1, 2022 to December 31, 2022.

BACKGROUND

The 2022 Water Policy, Policy 11-13, established a semi-annual water budget for residential and non-residential projects. The budget set for July 1, 2022 through December 31, 2022 for residential projects was 25 acre-ft/year and the budget set for non-residential projects was also 25 acre-ft/year.

There were 6 residential projects approved during this budget period, totaling 16.21 acre-ft/year. Three projects exceeded the administrative approval threshold and were subsequently reviewed and approved by the Water Issues Subcommittee and City Council. The total remaining residential budget is 8.79 acre-ft/year. (Attachment 1)

A total of 21 non-residential projects were approved during this budget period. This equated to 22.09 acre-ft/year. Of those 21 non-residential projects, 5 exceeded the administrative approval threshold and were subsequently reviewed and approved by the Water Issues Subcommittee and City Council. The total remaining non-residential budget is 2.91 acre-ft/year. (Attachment 1)

The 2022 Water Management Policy, Policy 9 states, "Any property that holds a water Contract within the City limits to receive water, will be required to submit a Water Service Application. These requests will be reviewed and tracked administratively. All such requests shall be presented to the Water Issues Subcommittee and the Council semi-annually in January and July as a discussion/information item and shall not be included in the Water Budget.

Per Policy 9, a total of 41 projects were approved under existing contracts. Thirty-five of these are new single-family homes located primarily within Groundwater Subdivisions. Additionally, there were three subdivision plats and one multifamily complex approved under existing contracts. One subdivision plat utilized existing water within the Chino Valley Irrigation District (CVID) and also brought extinguishment credits to the City for their project, which was approved by City Council. One multifamily development was within Prescott Lakes. The other two subdivisions were in Deep Well Ranch. The total number of residential dwelling units approved under existing contracts was 687, totaling 120.51 acre-ft/year. There were also two commercial projects approved under existing contract as part of Deep Well Ranch/Chamberlain, totaling 5.29 acre-ft/year. (Attachment 2)

FINANCIAL IMPACT

N/A

Recommended Action: This item is for discussion only. No formal action will be taken.
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ATTACHMENTS

- 1.[Attachment 1_Residential and Non-Residential Projects_July-Dec_2022.pdf](#)
- 2.[Approved Projects_Under Existing Contract_July1-December31_2022.pdf](#)

WATER POLICY TRACKING TABLE
APPROVED PROJECTS

	RESIDENTIAL PROJECTS									
	PERMIT NUMBER	PROJECT TYPE	DESCRIPTION	TOTAL AFY AVAILABLE	50% AFY AVAILABLE	AFY REQUESTED	REMAINING AFY	EXCEEDS 50% AVAILABLE	DATE APPROVED	APPROVAL TYPE
1	SITE22-001	MULTIFAMILY	NEW - 82 APARTMENT UNITS	25.00	12.50	11.10	13.90	NO	7/26/2022	CC - City Council - Multifamily
2	B2203-131	SINGLE FAMILY	INFILL SFR IN CITY LIMITS	13.90	6.95	0.17	13.73	NO	9/19/2022	ADMIN - Single Family Residential
3	LSC22-009	LANDSPLIT 3 SFR	NEW - LANDSPLIT - 3 SFR	13.90	6.95	0.51	13.39	NO	9/19/2022	ADMIN - Single Family Residential
4	REZ22-001	REZONE	SF-9 TO MF-M	13.73	6.87	0.48	13.25	NO	9/19/2022	ADMIN - Single Family Residential
5	RVP22-008	REVISION OF PLAT	7 UNIT SUBDIVISION	13.39	6.70	1.19	12.20	NO	12/20/2022	CC - City Council - Subdivision
6	WSA22-020	MULTIFAMILY	OFFICER'S QUARTERS BUILDING AT V.A.	13.25	6.63	2.76	10.49	NO	12/20/2022	

TOTAL BUDGETED (AFY)	25.00
TOTAL APPROVED (AFY)	16.21
TOTAL REMAINING (AFY)	8.79
50% OF THE TOTAL REMAINING (AFY)	4.40

Please see Page 2 for Non-Residential Projects

WATER POLICY TRACKING TABLE
APPROVED PROJECTS

	NON-RESIDENTIAL PROJECTS									
	PERMIT NUMBER	PROJECT TYPE	DESCRIPTION	TOTAL AFY AVAILABLE	50% AFY AVAILABLE	AFY REQUESTED	REMAINING AFY	EXCEEDS 50% AVAILABLE	DATE APPROVED	APPROVAL TYPE
1	B2206-159	NON-RESIDENTIAL	TI - MIXED USE - WAREHOUSE, CHURCH, RETAIL	25.00	12.50	0.95	24.05	NO	7/12/2022	ADMIN - Commercial Under 1 AFY
2	B2206-010	NON-RESIDENTIAL	TI - CHURCH ADDITION	24.05	12.03	0.24	23.81	NO	7/20/2022	ADMIN - Commercial Under 1 AFY
3	B2205-074	NON-RESIDENTIAL	NEW - MANUFACTURING	23.81	11.91	0.80	23.01	NO	8/15/2022	ADMIN - Commercial Under 1 AFY
4	B2202-068	NON-RESIDENTIAL	NEW - RETAIL	23.01	11.51	0.14	22.87	NO	8/16/2022	ADMIN - Commercial Under 1 AFY
5	ENG2202-021	NON-RESIDENTIAL	NEW - HOSPITAL	22.87	11.44	4.16	18.71	NO	8/23/2022	CC - City Council - Commercial
6	B2205-180	NON-RESIDENTIAL	NEW - MEDICAL CLINIC	18.71	9.36	1.44	17.27	NO	8/23/2022	CC - City Council - Commercial
7	ENG2111-019	NON-RESIDENTIAL	NEW - HOTEL/MOTEL	17.27	8.64	2.60	14.67	NO	8/23/2022	CC - City Council - Commercial
8	ENG2011-012	NON-RESIDENTIAL	NEW - RESTURANT - CV IGA	14.67	7.34	0.81	13.86	NO	9/6/2022	ADMIN - Commercial Under 1 AFY
9	B2208-207	NON-RESIDENTIAL	NEW - AMPITHEATRE	13.86	6.93	0.60	13.26	NO	9/6/2022	ADMIN - Commercial Under 1 AFY
10	WSA22-037	NON-RESIDENTIAL	NEW - CAR DEALERSHIP	13.26	6.63	0.71	12.55	NO	9/26/2022	ADMIN - Commercial Under 1 AFY
11	B2207-038	NON-RESIDENTIAL	TI - GROCERY & SMOOTHIE BAR	12.55	6.28	0.80	11.75	NO	9/26/2022	ADMIN - Commercial Under 1 AFY
12	B2209-180	NON-RESIDENTIAL	TI - OFFICE, CHURCH	11.75	5.88	0.95	10.80	NO	10/11/2022	ADMIN - Commercial Under 1 AFY
13	B2210-032	NON-RESIDENTIAL	NEW - CITY OF PRESCOTT SNOW FACILITY	10.80	5.40	0.47	10.33	NO	10/13/2022	ADMIN - Commercial Under 1 AFY
14	WSA22-047	NON-RESIDENTIAL	FLIGHT TRAINING CENTER	10.33	5.17	0.91	9.42	NO	10/13/2022	ADMIN - Commercial Under 1 AFY
15	WSA-22-045	NON-RESIDENTIAL	TRAINING CENTER	9.42	4.71	0.33	9.09	NO	11/17/2022	ADMIN - Commercial Under 1 AFY
16	WSA22-049	NON-RESIDENTIAL	WAREHOUSE	9.09	4.55	0.89	8.20	NO	11/23/2022	ADMIN - Commercial Under 1 AFY
17	WSA22-050	NON-RESIDENTIAL	COMMERCIAL BUILDING	8.20	4.10	0.71	7.49	NO	12/1/2022	ADMIN - Commercial Under 1 AFY
18	WSA22-051	NON-RESIDENTIAL	CHURCH	7.49	3.75	0.18	7.31	NO	12/1/2022	ADMIN - Commercial Under 1 AFY
19	WSA22-052	NON-RESIDENTIAL	DOG BOARDING FACILITY	7.31	3.66	0.76	6.55	NO	12/1/2022	ADMIN - Commercial Under 1 AFY
20	WSA22-038	NON-RESIDENTIAL	CONVENIENCE STORE / GAS STATION	6.55	3.28	1.46	5.09	NO	12/20/2022	CC - City Council - Commercial
21	WSA22-042	NON-RESIDENTIAL	RESTAURANT AND BAR	5.09	2.55	2.18	2.91	NO	12/20/2022	CC - City Council - Commercial

TOTAL BUDGETED (AFY)	25.00
TOTAL APPROVED (AFY)	22.09
TOTAL REMAINING (AFY)	2.91
50% OF THE TOTAL REMAINING (AFY)	1.46

Please see Page 1 for Residential Projects

WATER POLICY TRACKING TABLE

APPROVED PROJECTS - UNDER EXISTING CONTRACTS

PERMIT TYPE	PERMIT NUMBER	# OF RES UNITS	AFY	APPROVAL TYPE	EXISTING ENTITLEMENT*	DATE APPROVED	DEMAND METHOD
RESIDENTIAL/SINGLE FAMILY	B2206-021	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	07/07/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	ENG2206-015	1	0.17	N/A - Existing Contract/Agreement	Highland Pines Contract	07/08/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2205-062	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	07/13/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2205-207	1	0.17	N/A - Existing Contract/Agreement	Estancia De Prescott Contract	07/14/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2206-077	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	07/22/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2206-016	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	07/27/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2206-172	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	07/28/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2206-072	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	08/08/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	ENG2208-004	1	0.25	N/A - Existing Contract/Agreement	Wagon Wheel Ranch Contract	08/22/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2206-048	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	08/25/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2207-116	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	08/26/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2205-146	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	08/30/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2207-136	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	09/02/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2206-060	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	09/12/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2208-054	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	09/15/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2207-156	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	09/16/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2205-209	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	09/19/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2206-073	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	09/26/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2209-030	1	0.17	N/A - Existing Contract/Agreement	WSA06-022 (JOSEPH VINCENT)	10/07/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2209-035	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	10/11/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2209-095	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	10/17/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2210-001	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	10/25/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	ENG2210-001	1	0.25	N/A - Existing Contract/Agreement	Mountain Club	10/31/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B210-119	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	11/03/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2206-126	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	11/03/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2210-112	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	11/07/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2211-109	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	11/22/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2211-136	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	11/28/2022	WRMM Multiplier

WATER POLICY TRACKING TABLE **APPROVED PROJECTS - UNDER EXISTING CONTRACTS**

RESIDENTIAL/SINGLE FAMILY	ENG2212-002	1	0.25	N/A - Existing Contract/Agreement	High Valley Ranch	12/01/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	ENG2212-001	1	0.25	N/A - Existing Contract/Agreement	High Valley Ranch	12/01/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2211-144	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	12/05/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2212-016	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	12/08/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2212-071	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	12/19/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2212-109	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	12/28/2022	WRMM Multiplier
RESIDENTIAL/SINGLE FAMILY	B2212-113	1	0.17	N/A - Existing Contract/Agreement	Groundwater Subdivision	12/29/2022	WRMM Multiplier
RESIDENTIAL/MULTIFAMILY	WSA22-022	22	3.54	N/A - Existing Contract/Agreement	Prescott Lakes Contract	07/11/2022	WRMM Multiplier & EOR Demand Calc
RESIDENTIAL/SUBDIVISION	WSA22-013	45	11.25	N/A - Existing Contract/Agreement	CVID & Extinguishment Credits	08/23/2022	WRMM Multiplier
RESIDENTIAL/SUBDIVISION	PLN21-007	383	65.11	N/A - Existing Contract/Agreement	Deep Well Ranch Contract	10/11/2022	WRMM Multiplier
RESIDENTIAL/SUBDIVISION	PLN21-002	202	34.34	N/A - Existing Contract/Agreement	Deep Well Ranch Contract	10/21/2022	WRMM Multiplier

COMMERCIAL	WSA22-039		4.10	N/A - Existing Contract/Agreement	Deep Well Ranch Contract/Chamberlain	12/02/2022	EOR DEMAND CALC
COMMERCIAL	WSA22-036		1.19	N/A - Existing Contract/Agreement	Deep Well Ranch Contract/Chamberlain	12/06/2022	BILLING RECORDS

	Number of Projects	Res Units	AF
TOTAL RESIDENTIAL	39	687	120.51
TOTAL NON-RESIDENTIAL	2	-	5.29

***Existing Entitlement for water can be in the following forms:**

Groundwater Subdivision - Committed demand to platted areas as of 1998

Contract - Recorded agreement with the City for an allocated amount of water for a project or project area