



MONTANA LEGISLATIVE BRANCH

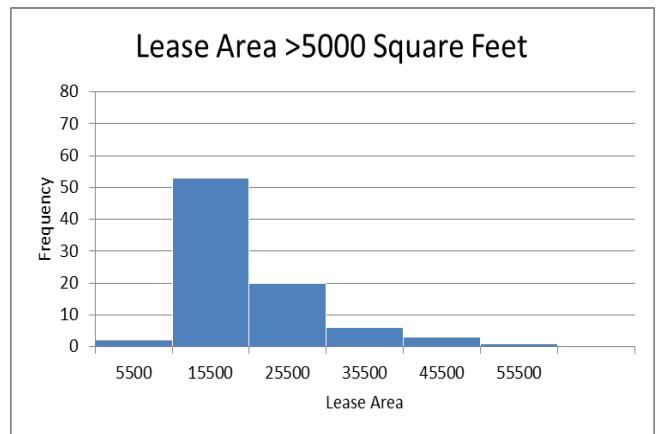
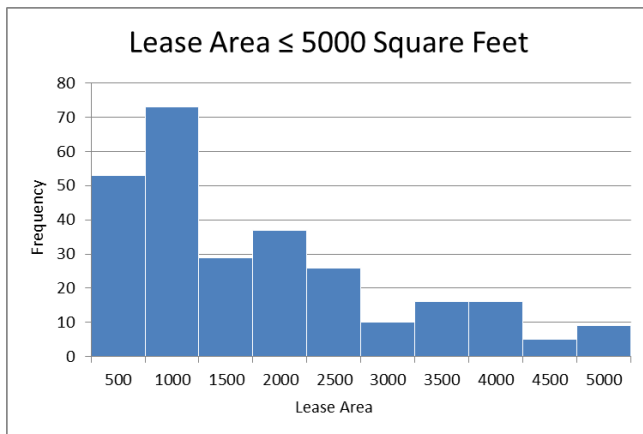
Legislative Fiscal Division

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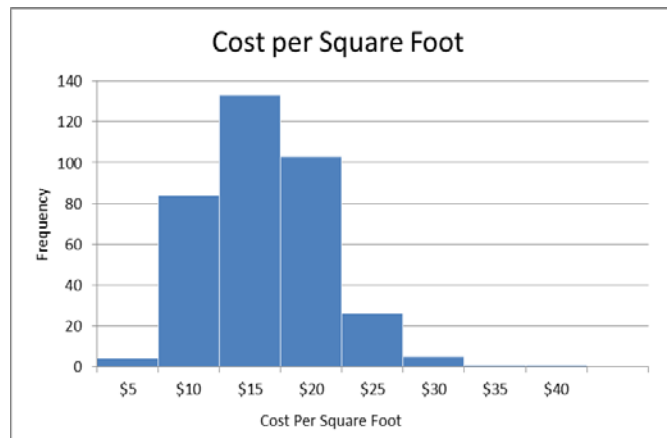
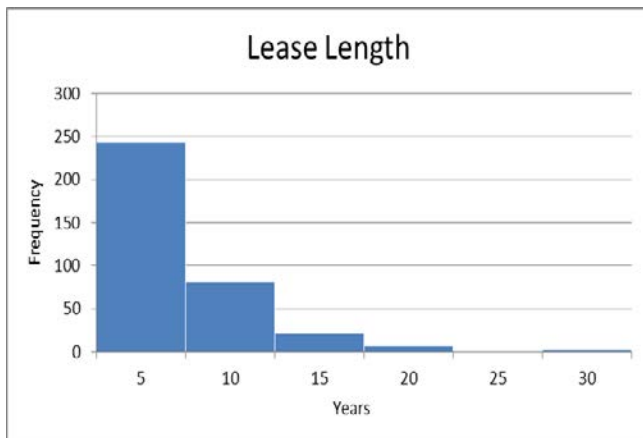
Director
AMY CARLSON

DATE: March 11, 2016
TO: Legislative Finance Committee
FROM: Sam Schaefer
RE: Build vs Lease Analysis

The purpose of this memo is to compare the cost of building and leasing under a variety of scenarios. The scenarios discussed in this report were chosen in part based on the state's current lease agreements. While the state leases space ranging from office space to storage space to hangars, this analysis focuses on office leases, which make up the majority of lease agreements. Of those office spaces currently leased, the size varies considerably from one building to another as seen below.



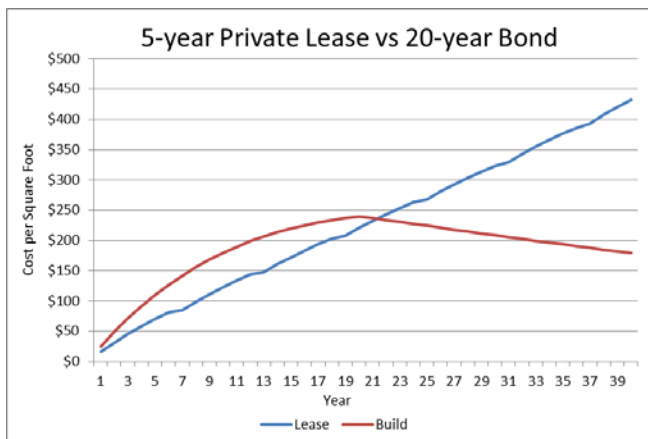
In addition to lease areas, the lease length and cost per square foot vary as well.



The model used for this analysis was the same model that was used in the Montana Capitol Complex Master Plan. The model allows the user to change up to 32 variables including but not limited to building size, cost per square foot, construction cost, and lease rates amongst others.

As noted above, the user has the ability to change 32 different variables. For this report the effects of changing a select few were analyzed. The first set of comparisons was created using the following assumptions:

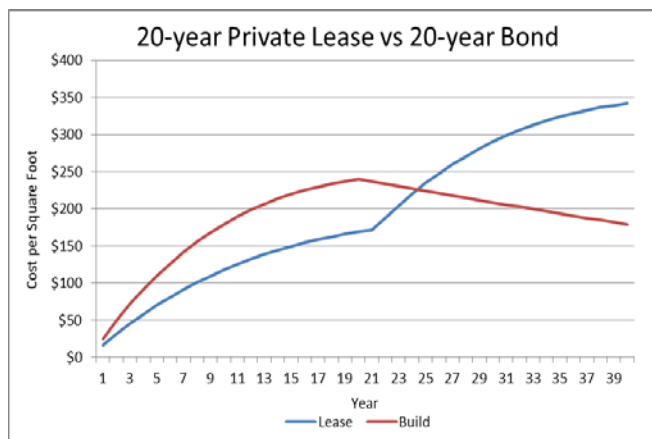
Variable	Build	Lease
Building Size (ft ²)	4,000	4,000
20-Year Bond Rate	3.00%	0.00%
Discount Factor	5.00%	5.00%
Construction Cost/ft ²	\$130	\$0
Cost/ft ²	\$9.10	\$14.00
Renewed Lease Increase	0.00%	7.70%
Annual Yearly Increase	3.00%	3.00%



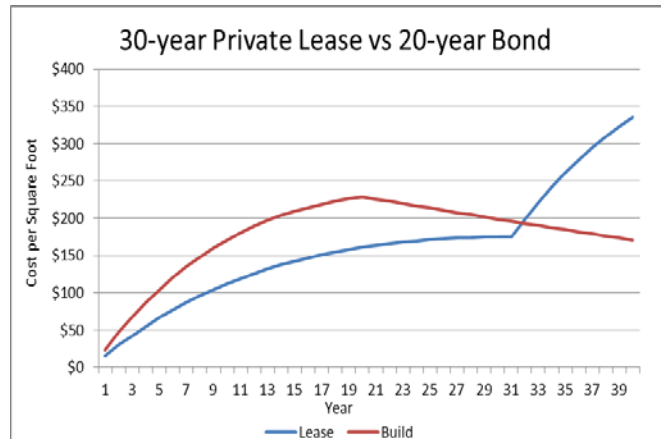
Cost per square foot of renewing a 5-year lease compared to a 20-year bond to build the space.



Cost per square foot of renewing a 10-year lease compared to a 20-year bond to build the space.



Cost per square foot of renewing a 20-year lease compared to a 20-year bond to build the space.



Cost per square foot of renewing a 30-year lease compared to a 20-year bond to build the space.

As the results show, the primary driver when comparing leasing vs building is the term of the lease. In the scenario involving a five-year lease the annual cost is cheaper to lease until year 22, whereas the 30-year lease is cheaper until year 32.

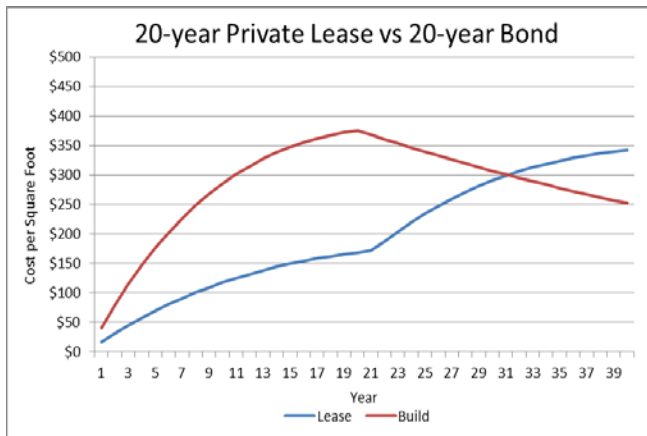
The previous analyses compared the cost of leasing a 4,000 ft² structure to building a similarly sized structure assuming a construction cost of \$130/ft². The model output after increasing the structure size to 25,000 ft² and the construction cost to \$300/ft² is shown below.



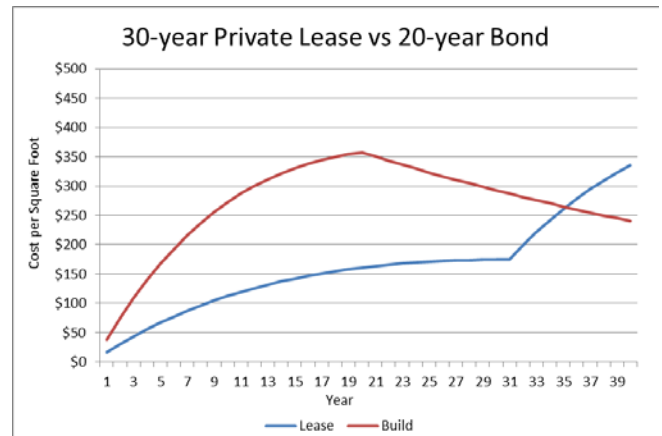
Cost per square foot of renewing a 5-year lease compared to a 20-year bond to build the space.



Cost per square foot of renewing a 10-year lease compared to a 20-year bond to build the space.



Cost per square foot of renewing a 20-year lease compared to a 20-year bond to build the space.



Cost per square foot of renewing a 30-year lease compared to a 20-year bond to build the space.

Increasing the size and construction cost of the structure lengthens the time until the annual cost is cheaper under the build option. In the first analysis, it took 22 years for the annual cost in the build scenario to be cheaper than the five-year lease. Here, it increased to 29 years. Under the assumption of the 30-year lease it increased from 32 to 36 years. In addition to increasing the time for the square footage cost to be lower under the build scenario, the payback period increases substantially as the structure and construction costs increase.

In the above analysis both the size and construction cost were increased from the original analysis. To study the cost effect by itself an assumed structure size of 20,000 ft² was used as well as the original set of assumptions. Then the construction cost was increased from \$150/ft²

to \$350/ft² in increments of \$25/ft². The time required for the build option to provide a lower annual cost was then recorded for the various construction costs.

Cost/Square Foot	5-Year Lease (years)	10-Year Lease (years)	20-Year Lease (years)	30-Year Lease (years)
\$150	23	24	26	33
\$175	24	25	27	33
\$200	26	26	28	34
\$225	27	27	29	34
\$250	28	28	30	35
\$275	29	29	31	35
\$300	29	30	32	36
\$325	30	31	33	36
\$350	32	32	34	37

The table above shows the effect of increasing the cost per square in increments of \$25/ft². Note that this does not necessarily mean this is always the case, as changing other variables may alter the results.

In the preceding analysis it was assumed that there was an annual increase of 3.00% for both owned and leased buildings. However it may make more sense to assume that there is no annual increases on the leased structures, as only 40 out of the 360 leased office spaces have an inflation clause. If it is assumed that the lease agreements have no yearly increase, it is likely that there is a renewal rate higher than the 7.70% used above. The following assumptions were used to compare the build and lease costs over a variety of renewal rates.

Variable	Build	Lease
Building Size (ft ²)	15,000	15,000
20-Year Bond Rate	3.00%	0.00%
Discount Factor	5.00%	5.00%
Construction Cost/ft ²	\$200	\$0
Cost/ft ²	\$9.10	\$14.00
Renewed Lease Increase	0.00%	Variable
Annual Yearly Increase	3.00%	0.00%

The length of times it takes for a constructed building to become cheaper than a leased building was compared using these assumptions for the renewal rates shown in the table below.

Lease Renewal Rate	5-Year Lease (years)	10-Year Lease (years)	20-Year Lease (years)	30-Year Lease (years)
5.00%	38	40	Greater than 40	Greater than 40
7.50%	28	28	32	37
10.00%	22	24	26	33
12.50%	18	20	24	32
15.00%	15	16	23	32

As with the previous analysis, the longer the lease term, the longer it takes for the build option to become cheaper. In addition, increasing the renewal rate has a more profound impact on the cost comparison for the shorter termed leases.

In addition to size, construction cost, and lease rates, the effect of varying bond rates were analyzed using the following assumptions.

Variable	Build	Lease
Building Size (ft ²)	15,000	15,000
20-Year Bond Rate	Variable	0.00%
Discount Factor	5.00%	5.00%
Construction Cost/ft ²	\$200	\$0
Cost/ft ²	\$9.10	\$14.00
Renewed Lease Increase	0.00%	7.70%
Annual Yearly Increase	3.00%	0.00%

The effects of varying the 20-year bond rate on the cost comparison between constructing and leasing a space is shown below.

Bond Rate	5-Year Lease (years)	10-Year Lease (years)	20-Year Lease (years)	30-Year Lease (years)
1.00%	25	26	30	36
2.00%	26	27	30	36
3.00%	26	28	31	36
4.00%	27	28	32	36
5.00%	28	29	33	37

The results show that increasing the bond rate has a small effect on the amount of time required for the built space to yield a cheaper cost per square foot than the leased space.

The analyses here compared the times at which the constructed space became cheaper than a leased space on an annual basis. This point was represented in the graphs at the point where the build line cost intersects the lease cost. This point does not represent the payback time, which varies considerably based on the size and cost of the building, ranging anywhere from 30 years to over 40 years for larger structures.

There is no concrete answer on whether it is better to build or lease. There are many variables that need to be considered on a case-by-case basis. This report merely begins to explore the effects some of these variables may have on the decision-making process. Ultimately, for any new space a number of factors, financial and other, must be taken into consideration to determine whether building or leasing is a better course of action.