Introduction

An earlier analysis of The Ohio State University’s proposal to lease parking operations developed a framework to analyze the potential value created through a lease arrangement with an external operator. That analysis focused on estimating possible bid amounts by potential third-party operators. It also compared estimated bids with an estimate of the present value that the University would obtain from its continued operation of the parking facilities. That analysis led to a conclusion that a lease “has the potential to create value for the University.” The analysis did not consider explicitly how the University would use cash flows from continued operation of the parking facilities or, alternatively, from the proceeds received by the University from an external operator. The present analysis examines estimated cash flows to address two questions:

- Would the University benefit more by continuing to manage its parking operations or by leasing its parking operations to an external operator?

- Would the amount of cash flows that the University intends to use annually to support Campus Area Bus Service (CABS), debt service, the academic core, or other activities affect the choice between management by the University or an external operator?

We examine both issues, using a spreadsheet that can be used to compare an investment arising from a one-time payment by an external operator (“external lease alternative”) with estimated cash flows arising from the University’s continued management of the parking operations (“internal operation alternative.”)² The cash flows that can be used to support Campus Area Bus Service (CABS), debt service, the academic core, or other University activities will be referred to as “non-parking” activities.

Scope of Analysis

This analysis examines the possible lease of University parking facilities including operation, maintenance and capital improvements. In examining the questions listed above, we structure
each alternative to create identical annual cash flows for non-parking activities. We then evaluate the value of an investment created under each alternative at the end of 50 years—the assumed ending date of the proposed lease. If annual cash flows for non-parking activities are equal for each alternative, then the alternative with the higher investment value at the end of 50 years would be more advantageous economically for the University.

The analysis also examines four different non-parking cash flow streams. This analysis demonstrates that the decision to select internal operations or an external lease is unaffected by the pattern of cash flows that will be used to support non-parking activities.

Analysis of external-lease vs. internal-operation alternatives

The external-lease alternative assumes that the University enters into a lease agreement with an external operator in exchange for a one-time payment, denoted B.\(^4\) This amount is assumed to be invested in the University’s long-term investment portfolio (LTIP)\(^5\). The LTIP is assumed to earn a return, denoted \(r_t\), that can vary over time. For simplicity, the spreadsheet maintains a constant return during each of ten five-year periods, but permits returns to vary across each of these ten five-year periods. Finally, assume that the University withdraws a fraction, denoted \(d_t\), of the start-of-year value of the LTIP at the end of each year to pay for non-parking activities.\(^6\)

The end-of-year balance in the LTIP can then be expressed as:

\[
\text{LTIP}_t = \text{Value of LTIP at time } t = \text{LTIP}_{t-1}(1 + r_t - d_t)
\]

where \(\text{LTIP}_0 = B\)

The internal-operation alternative assumes that the University continues to operate the parking facilities. Each year, the University receives revenues from parking operations and pays for operations and capital expenditures. Modeling these amounts begins with estimated amounts that the external operator would incur. For example, revenues are estimated to be $30,000,000 for the 2012-13 fiscal year. Revenue in subsequent years is assumed to increase at a rate that is constant during each of ten five-year periods; the increase can vary across each of these ten five-year periods. The University and the operator might follow different policies for generating revenues or for incurring operating expenses or capital expenditures. To accommodate differences, the spreadsheet includes parameters that can be set to model these differences. For example, the revenue generated if the University manages parking operations might be set to, e.g., 105 percent or 95 percent of the revenue generated by an external operator. The difference between revenues and operating expenses and capital expenditures is assumed to be used for two

\(^4\) This analysis assumes that the University receives only the bid amount, B, and not any amounts in later periods. The analysis also assumes that the University makes no payments to the operator. Finally, the analysis assumes that the lease agreement is not terminated prior to the end of the assumed 50-year lease term.

\(^5\) B should be reduced by any lease-related expenses paid by the University at lease inception.

\(^6\) To be consistent in modeling, the assumed intra-year cash flow distribution pattern should be consistent with cash flows from parking operations if OSU manages parking operations. In practice, the distribution pattern between the internal operation and external lease alternatives may be quite similar: If the University operates the parking facilities, cash inflows and outflows are likely to occur roughly evenly throughout the year. If the University leases the parking facilities, the income earned on the LTIP and expenditures made using LTIP distributions are likely to occur roughly evenly throughout the year.
purposes: (1) to pay for non-parking activities, and (2) to invest in the University’s LTIP. In order to design an apples-to-apples comparison, the amount that is assumed to pay for non-parking activities is set each year to be equal to the amount assumed to be distributed from the LTIP if the external-lease alternative is chosen.\(^7\) The remaining amount is invested in the LTIP that would be created under the internal-operation alternative.

Table 1 shows projected amounts in the LTIP on June 30, 2062 under various parameterizations for the external-lease and the internal-operation alternatives. The table also shows the total amount of cash that would be distributed to support non-parking activities during the 50-year period. These amounts should be interpreted in recognition that 50 years is a very long time (!) and many prices are likely to change significantly over 50 years. For comparison, consider these price changes from 1962 to 2012:

<table>
<thead>
<tr>
<th>Item</th>
<th>1962 price</th>
<th>2012 price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example tuition(^8)</td>
<td>$290</td>
<td>$8,057</td>
</tr>
<tr>
<td>Example salary of professor(^9)</td>
<td>$12,192</td>
<td>$103,095</td>
</tr>
<tr>
<td>Annual faculty parking price(^10)</td>
<td>$0</td>
<td>$720</td>
</tr>
<tr>
<td>S&amp;P 500 index(^11)</td>
<td>$70</td>
<td>$1,317</td>
</tr>
</tbody>
</table>

Table 1 shows only a few of the many possible parameterizations. The parameterizations were selected to show how variations in certain parameters alter the projected outcomes.

Case A in Table 1 shows that, under the assumptions shown in the note at the bottom of the table, the ending value of the long-term investment portfolio would be $4,072 million with an external-lease alternative and $2,195 million with an internal-operation alternative. Under either alternative, the model shows that $3,285 million would be distributed for non-parking activities over the 50-year period. If the University’s objective were solely to maximize the expected financial benefit from parking, this example shows that, under the assumptions listed, the University would choose the external-lease alternative.

The examples in Table 1 illustrate several general characteristics. For example, if the external lease alternative is selected, the University’s financial condition improves as bid amounts increase (e.g. compare cases A and B or cases D and E). Conversely, if the external lease alternative is selected, the University’s financial condition worsens as the return on the long-term investment pool decreases (e.g., compare cases A, B and C with corresponding cases D, E, F and G). Cases E and F illustrate the obvious insight that a lower return on the long-term investment pool demands a larger initial bid if it is to generate similar amounts of distributable cash as would be available with internal operation. Perhaps less obviously, the lower rate of return also diminishes the total cash amount that can be distributed over the 50-year period. Conversely, case B illustrates that, for fixed other parameters, above a certain minimum bid amount the internal-operation alternative is unable to generate sufficient annual revenue to maintain the

\(^7\) See “Effect of Annual Cash Flow Patterns” below for analysis using different cash distribution patterns.
\(^8\) Tuition rates shown are for the University of Iowa, in-state tuition, for an academic year.
\(^9\) Salary shown is 9-month salary of a faculty member at the rank of professor at Ohio University.
\(^10\) Based on recollection of a senior faculty member at Ohio State.
\(^11\) The index excludes the effect of dividends.
same cash flow as in the external-lease scenario and still establish a positive balance in the LTIP at the end of 50 years. The reason is that the annual cash distributions under the external-lease alternative are greater for case B than case A because the initial investment for the external-lease alternative is greater for case B than for case A.

Table 1
Comparison of External-Lease and Internal-Operation Alternatives

<table>
<thead>
<tr>
<th>Case</th>
<th>Change from Base Assumptions</th>
<th>Ending LTIP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>External-lease (in $millions)</td>
</tr>
<tr>
<td>A</td>
<td>No changes</td>
<td>$4,072</td>
</tr>
<tr>
<td>B</td>
<td>B = $450 million</td>
<td>$4,581</td>
</tr>
<tr>
<td>C</td>
<td>University operating expenses = 105% of operator operating expenses for all years</td>
<td>$4,072</td>
</tr>
<tr>
<td>D</td>
<td>$r_t = 8% for all years</td>
<td>$2,520</td>
</tr>
<tr>
<td>E</td>
<td>B = $450 million</td>
<td>$2,835</td>
</tr>
<tr>
<td>F</td>
<td>B = $650 million</td>
<td>$1,548</td>
</tr>
<tr>
<td>G</td>
<td>$r_t = 8% for all years</td>
<td>$2,520</td>
</tr>
</tbody>
</table>

NOTE: Unless otherwise noted, the results are based on the following base assumptions:
- One-time payment from external operator (B) = $400 million
- $r_t = 9% for all years
- $d_t = 4.25% for all years
- Year 1 revenue from parking operations = $30 million
- Parking revenues (from all sources) increase by 5.5% for years 1-10; 4% thereafter and are the same for the University and the operator
- Year 1 operating expenses = $9 million
- University operating expenses = 100% of operator operating expenses for all years
- Capital expenditures are the same for the University and the operator
- Inflation = 3.3% per year

The effect of differential operating costs between the operator and the University can be inferred by comparing case A with case C or case D with case G. Cases C and G assume that the University’s operating costs, if it operates the parking facilities, are higher relative to cases A and D. The effect of the higher operating costs is seen by comparing the projected 50-year out value of the LTIP. Under University operation, the LTIP would be $500 million less if operating
expenses are 5 percent higher (case A and C) with a 9% return on the LTIP, or $369 million less (case D and G) with an 8% return.

Note that the examples shown in Table 1 are intended only to show how differences in parameters would affect the financial projections. They are not intended to translate into a “rule” indicating the conditions that would imply when to accept or reject a bid. Instead, the examples show how bids can be evaluated using the spreadsheet to compare the effects of leasing vs. operating the parking facilities.

Effect of Annual Cash Flow Patterns

The University is expected to use some or all of the cash flows generated by parking to pay for activities other than parking operations and related capital expenditures. These activities might include Campus Area Bus Service (CABS), debt service, the academic core, or other activities. Table 1 shows the results when annual cash flows for non-parking activities are calculated as 4.25% of the amount invested in the LTIP assuming the external-operator alternative is selected.

The analysis summarized in Table 2 demonstrates that implications of the analysis presented above are unaffected by changes in the amounts and timing of cash flows to support other activities.

<table>
<thead>
<tr>
<th>Case</th>
<th>Change from Base Assumptions</th>
<th>Ending LTIP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>External-lease (in $millions)</td>
</tr>
<tr>
<td>H</td>
<td>Distribution = 5% of LTIP</td>
<td>$2,843</td>
</tr>
<tr>
<td>I</td>
<td>Distribution = All cash generated by internal operation</td>
<td>$1,674</td>
</tr>
<tr>
<td>J</td>
<td>Distribution = Amount available in Year 1 with growth at rate of inflation</td>
<td>$13,549</td>
</tr>
</tbody>
</table>

NOTE: Unless otherwise noted, the results are based on the following base assumptions:
- One-time payment from external operator (B) = $400 million
- \( r_t = 9\% \) for all years
- \( d_t = 4.25\% \) for all years
- Year 1 revenue from parking operations = $30 million
- Parking revenues (from all sources) increase by 5.5% for years 1-10; 4% thereafter
- Year 1 operating expenses = $9 million
- University operating expenses = 100% of operator operating expenses for all years
- Capital expenditures are the same for the University and the operator
- Inflation = 3.3% per year

Case H is based on a distribution rate of 5% per year. Relative to Case A presented in Table 1, the University would increase the amount of cash distributed from $17 million to $20 million in
By increasing the distribution rate, the University can vary the non-parking cash to support other activities. Note, however, that increasing cash distributions reduces the value of the LTIP at the end of 50 years by $1,229 million ($2,843 instead of $4,072). In addition, the total cash distributed over 50 years is reduced by $232 million ($3,053 instead of $3,285). Cases I and J present qualitatively similar results. In case I, the amount of cash distributed each year is the amount of cash that would be generated if the University manages parking operations. In case J, the amount of cash distributed each year is the amount paid for non-parking activities in year 1 increased annually at the inflation rate. Any additional amounts of cash generated are assumed to be invested in the University’s LTIP. Note that, while the amounts of the ending LTIP vary across these examples, the ordering of ending LTIP value, and therefore the alternative that would provide greater financial benefits for the University, is unchanged. Of course, while the examples in table 2 indicate that the external lease alternative is preferred, different parameters can lead to an opposite implication. But for any parameterization, the implied alternative to select will be consistent across possible cash distribution patterns.

Conclusion

The decision to lease the University’s parking facilities to an external operator or to operate the parking facilities internally is complex because there are many factors to consider. One measure that can be used to compare the financial impact of the leasing decision to the University is the balance in the long-term investment portfolio at the end of 50 years. By holding annual cash flows for non-parking activities constant across the external-lease and internal-operation alternatives, the alternative with a larger balance in the long-term investment portfolio at the end of 50 years provides more financial benefits to the University. This result is unaffected by the amount of cash that the University uses for non-parking activities. While this analysis does not consider other factors such as performance metrics that also bear on the decision, it provides an appropriate framework to discuss financial considerations of the proposal to lease parking operations to an external operator.