# Making a Choice

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## Introduction

A project can not begin until it is thoroughly analyzed and vetted. Part of this process includes an analysis of the project investment such as a payback analysis. The analysis is a methodology for ascertaining the payback period (Coker, 1995). A payback period measures the duration required to pay off the investment utilizing the revenue or cash flow from the project (Raikar & Adamson, 2020). In other words, the analysis finds when the project breaks even. A payback period grants us a number of benefits in project selection. The metric itself is simple to calculate and gives us a quick reference of financial liquidity for a project offer. Further, a payback period assesses the likelihood of monetary risk. Ultimately the metric enables a team to mitigate against losses, maximize revenue sooner, and make the process of deciding on a new venture much more lucrative.

## Metropolitan Area Network

Project: *Build a MAN network for the city. The project requires an investment of $10 million of capital. The city has recently passed legislation to allow your firm to install the MAN network. Based on the estimates for traffic passing over the MAN network, the monthlies would be around $500,000 a month after the second year. The city will be collecting all of the dues for the first year and half for the second.* The network will not exceed a negative net cash flow until after the third year. The expected payback period is 3.7 years.

## County Network

Project: *Set up computers and networks for the County school district. This project requires the investment of $1 million for the network and computer systems as*

*well as a few servers and an NAS. The city has passed legislation that would allow you to recover the costs of assembly with standard rates as well as a service contract to keep things running after deployment. This amounts to approximately $50,000 a month after the first year.* A positive net cash flow will be met by the third year. The payback period is approximately 2.7 years.

## Housing Network

Project: *Build a housing network. This project requires the investment of $10 million up front in building costs, including zoning and a city planning commission. This project will feature 12 single-family residences that will be put up for sale at around $450,000 per residence. Additionally, the project includes a multifamily unit complex featuring 110 units that will bring in a monthly income of $70,000 after the second year, given one year to build and an estimated year to sell and fill the new multifamily structure. Since the firm does not have $10 million in liquidity, the project would require either bringing in a partner or borrowing the funds at an interest rate of 10% per annum.* Given the single-family residences are sold within the first year and the project brings in a partner, the project will not break even until after 7 years. If a partner could not be secured, borrowing funds would increase the payback period.

## Selection

The option with the shortest payback period is the County Network. The longest period belongs to the Housing Network. Both the MAN and County networks do not require borrowed funds for the initial investment. However, the MAN network generates a higher cash flow return rate after five years at almost 33 percent per year. Although the MAN payback period is a year longer than the County, the project does not need to

prioritize repaying a lender as quickly as possible. Thus, it's shrewd to invest in the Metropolitan Area Network project.

## Conclusion

Project selection can not solely rely on meeting a need or responding to a vision (Siegel, 2019). Instead we need to employ quantitative analysis in order to make rational business decisions. This approach demands a choice on what to measure and how much data to collect. A payback analysis is one such financial measure but it has some disadvantages. For instance, since it only determines when a project will break even, it can only be described as a short-term investment metric. For longer term projects or projects that need to consider how the value of money fluctuates over time, the payback analysis is not well suited. Moreover, companies often need a combination of both short-term and long-term investments to maintain a positive net cash flow, thus requiring a variety of financial analyses. Metrics such as Net Present Value (calculated in terms of currency not time), ROI (calculates revenue generated from investment), and ARR (isolates the percentage returns from an investment) can be applied as appropriate in tandem with a payback analysis.

## References

Coker, A. K. (1995). Engineering Economics. In A. K. C. Editor, *Fortran Programs for Chemical Process Design, Analysis, and Simulation* (pp. 721-776). Gulf Professional Publishing.

Raikar, S. & Adamson, S. (2020). Modeling Project Cash Flows and Debt Service. In S. R. Editor & S. A. Editor (Eds.), *Renewable Energy Finance: Theory and Practice* (pp. 31-54). Academic Press.

Siegel, N. G. (2019). *Engineering Project Management.* John Wiley & Sons Ltd.