

The Financial Benefits of Early Acquisition of Transportation Right of Way

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Submitted July 27, 2005.
Revised version submitted November 15, 2005.

6,316 words + 3 tables = 7,066 word equivalent.

ABSTRACT

Right of way acquisition is a substantial element of the cost of many highway construction and expansion projects. Given land price appreciation on the one hand, and the opportunity cost of owning land on the other, there is potentially a great deal of money at stake in the question of whether right of way should be purchased well in advance of when construction is expected to take place. This paper develops a theoretical framework for thinking about this issue, and describes some results from an analysis at a fairly aggregate geographic level.

The general result is that early acquisition is not a good investment in the most general sense, given the average rate of land price increase and the cost of money as well as other costs associated with early acquisition. The one clear exception to this is land that is in imminent danger of development. However, a major limitation of this work is that it viewed land prices only in the aggregate, and did not specifically examine the immediate vicinity of right of way. The research did find some support for the notion that certain types of land in specific locations can appreciate in price much faster than the average. However, it is not clear that it is possible to predict these situations with sufficient accuracy to take advantage of the potential cost savings.

INTRODUCTION

Right of way acquisition is a substantial element of the cost of many highway construction and expansion projects. Given land price appreciation on the one hand, and the opportunity cost of owning land on the other, there is potentially a great deal of money at stake in the question of whether right of way should be purchased five to ten years, or even more, in advance of when construction is expected to take place. This paper develops a theoretical framework for thinking about this issue, and describes some results from an analysis at a fairly aggregate geographic level.

To place this issue in proper context it must be noted that there are many potential benefits to right of way preservation in a general sense, as well as many methods for preserving right of way (that is, preventing it from being developed) besides outright acquisition. These have been documented and discussed in a few sources (1, 2, 3). Because there are often somewhat complex legal and procedural issues involved, the literature on this subject tends to focus on these aspects of the problem (4). However, there has been little if any formal analysis of the financial considerations involved, even though saving money is one of the most-cited reasons for preservation activities (1).

To the extent that financial issues are examined, the discussion tends to be hypothetical (3), focusing for example on what might happen in a given situation with a certain set of assumptions. Professionals in the field tend to have their own intuition about the subject, which however seems in some cases to ignore the opportunity cost of money, and in others to focus *ex post* on cases with extreme price increases, rather than on the typical situation. Given the amount of money that could potentially be saved or lost by these decisions, it seems a worthwhile endeavor to attempt to develop a more formal framework for analyzing this problem.

This paper focuses specifically on the financial aspects of early right of way acquisition. The broader question of whether early acquisition is a good idea in general involves at least two additional issues. The first is the value of the potential non-financial benefits, of which many have been documented (1, 2). The second is the costs involved in other methods of preserving right of way, that is, other possible competing ways of achieving the same benefits. Even within the scope of financial analysis there will certainly be room for debate with regard to specific numbers, as well as local variations that may be important. A particularly important limitation is that this research examines land prices only at large geographic scales, rather than focusing on land in the immediate vicinity of right of way, which may show different price movements. Thus this research should be seen less as offering policy recommendations, and more as simply a first effort to create a formal analytical framework that could eventually serve as a basis for a more sophisticated decision-making tool.

There are three parts to the body of the paper. First is a theoretical discussion of the issues involved in right of way acquisition financial analysis. There are three main components to this. The first is simply enumerating the different types of situations in which the question of early acquisition could potentially arise; both the method of analysis and the results vary with different circumstances. The second is a discussion of

the costs of early acquisition, besides the obvious outlay of money to buy the land. The third is a description of some proposed criteria for evaluating the desirability of early purchase.

The second part of the paper is a very general overview of the relative rates of return of various assets that could be taken to represent the cost of money. This analysis in itself is of limited value aside from establishing a historical context, because there are considerable local variations in the rate of real estate price appreciation.

Thus the third part of the paper describes a more geographically focused analysis looking at housing and farmland across counties in Minnesota, as the research was sponsored by the Minnesota Department of Transportation (5). Within this limited area there are geographic variations, but with a few exceptions they are neither large enough nor predictable enough to change the basic result. This then points the way to a discussion in the conclusion of additional types of analysis that would help to further understanding of this issue.

ISSUES AND THEORETICAL FRAMEWORK

As a starting point, efficient market theory would indicate that land should not normally yield a higher return than any other investment, except in cases of avoided development (6). The return for a government purchaser will probably in fact be lower than for a private investor, since the government in many cases can't or won't receive income or services from the land. That is, the private-market price will be based on both income and price appreciation, while the government will only receive the latter. Since other investments such as bonds would provide the same return to both the government and private investors, it is likely that for governments land will provide a lower rate of return than alternative investments.

There are, however, some potential complications that this section addresses. The first is that there are several different situations in which a government might purchase land for right of way, and the potential rate of return might differ across these. The second is that the government incurs costs by holding land that private investors do not. Finally, there is the question of how to evaluate the return on land. Ultimately the important point is not the rate of return on land as a generic entity, but the return on the specific land that the government might purchase.

Situations Of Interest

There are several distinct situations that are likely to have different outcomes in terms of the desirability of early acquisition:

- Land that is about to become developed.
- Land that is not developed but likely will be at some point.
- Land that is not developed and probably will not be.
- Land that is already developed.

Many early acquisition programs focus on the first situation. Clearly the price of a parcel of land can change significantly in a short time if value is explicitly added to it by the construction of a building. While there could be exceptions, in general it will almost always be better for the government to avoid the need to pay for an unwanted building, and better for the economy to avoid the wasted resources. Thus this paper does not discuss this situation further.

The second situation is probably the most interesting, but also the most difficult, in that it involves defining the phrases “likely will be” and “at some point.” That is, in the absence of filed development plans, how does the government determine which land is likely to become developed, or specifically to assign a probability to this outcome? And how imminent does the likely development have to be to justify purchasing the land now? While these are interesting and important questions, they are beyond the scope of this basic analysis, and so we leave them to future research to answer.

This research focuses on the last two situations. While these might be the least likely to arise in practice, there are three important reasons for studying them. First, there are, anecdotally at least, those who believe that any land that lies in a future right of way should be purchased if it comes up for sale, regardless of the expected timing of the improvement or even the probability that it will actually occur. There likely are many places where land of these types is being held by the government, and possibly for very long periods, and so it is worth trying to formally understand the implications of this.

The second reason for studying these situations is because they are good subjects for one of the first attempts to formally understand this issue. Real estate transactions can be tracked more easily for land that doesn’t change uses over time, so there is a wealth of data available for these situations; it is much harder to track price changes for land that is being developed, subdivided, and so forth. And because these situations are relatively simple, it is easier to develop a theoretical framework for analysis, since the number of issues is more limited. This framework can then later be adapted to study the more complex and interesting situations of land that is changing uses.

The third reason is that these situations represent the most general circumstance; a positive result here would obviate the need for analysis of the more detailed situations. If any land, regardless of location or use, can be shown to provide financial benefits when purchased early, then the question would be answered in the most general way. Thus this is a logical place to begin the analysis.

Opportunity Costs

There are a number of issues in understanding the opportunity costs of government land holdings. The most basic point is that it is not good enough simply that land prices rise faster than the rate of inflation, as some practitioners believe. Purchasing land means that money is being committed to that purpose. This money has a cost; for example it might be borrowed, it could have been invested in something other than land, it could even have been used to do projects that would have yielded immediate public benefits. Land must appreciate in value at least as much as the rate of return on comparable alternate uses for it to be a good idea from a financial standpoint.

A reasonable alternative investment to use for this purpose is government bonds. There is a direct link for the many governmental units that carry debt; if they have money tied up in land holdings then this will directly impact the amount that they need to borrow, and so the land has a direct cost in terms of the extra interest that is being paid. If the interest being paid on the bonds is higher than the price appreciation of the land, then the government could have done better financially by just waiting to buy the land later, even at a higher price.

There are also other costs to consider that make the necessary rate of return even higher than just the return on alternate investments. These are costs that a government would face but that a private purchaser would not.

First is that government purchase of land takes it off the property tax rolls. This is a cost to local governments, and ultimately to the citizens that they serve, who must make up the lost taxes in some other way, so it is appropriate to count this as part of the opportunity cost of holding land.

Yet another issue is the possible loss of value that could have been created by the properties. For example, farmland or commercial properties could produce crops or other products. Residential properties provide housing services that have value to the owner. The lost income or value may be replaced in some other location, but ultimately there is a net loss of productive capacity, since the original land or building capital has been lost. Governments, as agents of the public, should consider these costs.

Finally, a significant point is the possibility that land will be purchased and never used. One possibility is that the project is never done and that the land can't be resold without a loss. A more likely scenario is that because the land is purchased far before the finalization of the project design, more land is bought than is ultimately needed, and may be resold at a deep loss, if it can be resold at all.

The ultimate objective here is not to establish a single number to represent the necessary rate of return, since this would vary across times and places, but to discuss the range of issues involved. For purposes of the very general analysis in this paper, we simply assert that for land to be a good financial investment, it needs to appreciate in price at least a few percentage points faster than the interest rate on government bonds.

Evaluating Early Acquisition

While land prices need to rise at a certain rate for land to be a good investment, this rate of increase has to be understood within two important theoretical contexts.

First, the returns on land and competing assets must be evaluated over a long historical period. Early acquisition is by its nature a long-term proposition; thus it is appropriate to evaluate it based on long-term asset returns rather than overemphasizing the present situation, which is historically atypical. The U.S. is at this time several years into an era of rapid property price growth that apparently far exceeds anything that has happened in at least the last half-century if not longer. In such an environment there is a danger of drawing conclusions that would not have been supportable ten years ago. This research aims to take a long-term view; early acquisition is about how prices will change over a period of five or ten or more years.

Second, to the extent that only certain properties at certain times (based on locations or property characteristics or economic conditions) pay a sufficiently high rate of return, it must be possible to reliably predict those situations, not just to observe them after the fact. Land purchases could be limited to those that meet certain conditions, still, the average return on *all* the properties that meet those conditions is the relevant measure, not the rate of return on the fastest-appreciating properties.

That is, it is easy after the fact to point to a particular area and assert that it would have been a good idea to have bought land there 20 or 30 years ago. That such situations exist is undeniable, but is not a sufficient condition for concluding that early acquisition is warranted in general. The relevant questions are first, whether that particular area would have been identified 30 years ago as a target for early acquisition (and by what criteria), and second, what other areas would also have been identified and how much they have appreciated in value. The average appreciation of all those properties is the appropriate benchmark for evaluating the policy.

BASIC FINANCIAL ANALYSIS

This chapter examines the most basic question: Considered solely from a financial standpoint, is buying land in advance of when it will be needed a good investment in a general sense? This is a very simple discussion examining historical evidence on the return to land compared to other possible investments over a variety of time periods; this is intended to frame the issue in terms of the types of returns that could be expected over the long term.

As discussed in the previous section, the focus here is on the simple cases of land that is not changing uses; that is either already developed or is not likely to become developed. We use housing as a proxy for developed land in general; for undeveloped land we use farmland as a proxy. For bond prices, we use federal five-year bond rates, as this holding period seemed to be a reasonable representation of a conservative medium-term land acquisition strategy. We also show stock prices as another alternative investment; for these we use total returns on the Standard and Poor's 500.

For comparison of the different assets we show nominal returns (Table 1). The returns are the implicit annual average returns given by investing a sum of money in the asset at the beginning of the decade and selling it at the end, reinvesting any intermediate dividends.

TABLE 1 Historical Annual Returns on Housing and Other Assets

	1960s	1970s	1980s	1990s	Average
Nominal Minnesota house price increase	3.8%	8.3%	4.5%	6.7%	5.8%
Nominal US farm land	5.3%	14.2%	-0.8%	4.8%	5.7%
Nominal federal 5-year bond rates	5.1%	7.8%	10.7%	6.1%	7.4%
Nominal stock market total returns (S&P 500)	7.8%	6.2%	16.4%	18.4%	12.1%

Housing and farmland do better at different times, but over 40 years net out to about the same average rate of return, lower than risk-free bonds and much lower than the stock market. The average house price increase in Minnesota is about the same as the U.S. average (5.8% versus 5.9%). Only two states (Alaska at 7.2% and Washington at 6.9%) beat the U.S. average by as much as one percent; even these didn't beat the return on bonds. This indicates that while land might be a profitable investment at certain times, over the longer term it is not. And since early acquisition is by its nature a long-term proposition, this is an important point.

As a different way of viewing the question, we consider the returns on different assets over five-year holding periods; the shortest time frame that is probably relevant for right of way preservation. For this analysis we use annual house price data for Minnesota starting in 1984. From this point and for each year thereafter, we calculate the annual average rate of return that would have been attained by investing in each of the three assets and selling it five years later (Table 2).

TABLE 2 Five Years Return on Various Assets

	Stocks	Bonds	Housing
1984-1989	16.6	12.3	2.5
1985-1990	16.1	10.1	3.1
1986-1991	19.2	7.3	3.2
1987-1992	13.8	7.9	3.3
1988-1993	13.9	8.5	3.9
1989-1994	15.9	8.5	3.7
1990-1995	14.6	8.4	4.2
1991-1996	10.2	7.4	4.7
1992-1997	17.4	6.2	4.8
1993-1998	16.5	5.1	6.1
1994-1999	20.5	6.7	8.2
1995-2000	24.5	6.4	9.1
1996-2001	28.1	6.2	9.9
1997-2002	19.2	6.2	10.9
1998-2003	11.5	5.2	9.9

Starting in about 1993 five-year housing investments started to outperform bonds due to a combination of interest rates declining to historically low levels, and an unusually large and persistent boom in housing prices. Over the last five years in particular (since the end of this table), housing has beaten both bonds and stocks, but from a longer perspective this is an extremely rare occurrence. Thus it would be appropriate to maintain some caution regarding expectations about how prices will evolve in the future.

From a financial standpoint, as a general rule land will not be a profitable investment, in the sense of recovering the cost of the invested money, unless it can be used to generate some income while it is being held. This can be hard for government landlords; it may be viable for some farmland, but developed properties have

maintenance and other management issues that are costly and generally outside of transportation agency expertise. However, it could be that land in specific locations, or at certain times, or of particular types, is a good investment even if land in general is not. The next section addresses this possibility.

LOCATION-SPECIFIC FINANCIAL ANALYSIS

The objective of this section is to analyze whether there are specific locations or property types for which the appreciation in land prices exceeds the average by enough to make them good investments even though land in general is not. To understand this issue requires answers to two main questions.

The first is whether there are places or property types that increase in price much faster than the average for extended periods. The second is whether it possible to predict when and where these increases will happen with sufficient reliability to secure the benefits. The possibility, or even certainty, that some areas will experience rapid price appreciation is not important if there is no way to predict which areas will fall into this category.

This analysis narrows the geographic focus only as far as counties, not to the level of individual properties. This is an important limitation. Generally, smaller areas will have greater potential for large price increases, as the impact of development or transportation improvements is largest in the immediate vicinity. A full understanding of the value of early right of way purchase would require a solid understanding of price movements at very detailed geographic levels. This is beyond the scope of this research, which takes the approach of moving from the general toward the specific. However, the two basic questions addressed here would apply in exactly the same way to such a geographically detailed analysis.

There are two sections to the analysis. The first examines housing prices across all Minnesota counties to determine if there are some counties where the average house price growth exceeds the state average for prolonged periods, and whether the high-growth counties could have been predicted. The second section examines agricultural property; as there are far fewer of these in the database, the analysis of these is somewhat more limited, although there are still interesting results. As before, we use housing to represent developed land in general, and use agricultural land to represent all undeveloped land.

There is a fundamental difference between developed and undeveloped land that indicates that the results of the analysis might be different. Even a high demand for housing in an area often does not drive up prices much because new housing (or commercial buildings) can be built to meet the demand, keeping supply and demand in relative balance at least over the longer term, barring other barriers to development. Agricultural, forest, and similar undeveloped land types, by contrast, are the opposite; increasing population and development pressure in an area decrease the available supply, leading to additional price increases. Thus it is reasonable to suppose that rapidly growing areas might show large increases in farm land values even if housing prices do not grow much.

The analysis in this section is derived from a Minnesota Department of Revenue database of all arm's length (that is, voluntary and market-value) housing and farmland transactions in the state from 1984 to 2003 excepting a few months in 1985-86, which were unavailable. This includes 1,083,936 total residential sales; all but 8 of 87 counties have at least 1,000 total sales during this span of time. It also included sales records for 32,773 sales of farmland of more than 35 acres (and the acreage of the parcel).

Housing Prices in Minnesota Counties

The analysis in this section follows from two assumptions. First is the conclusion that housing does not appreciate fast enough on average to be a good financial investment. Second is that periods of general rapid price appreciation cannot be predicted, and thus that the long-term average, rather than the current rate, should be taken as the baseline rate of return. If one accepts these two assumptions, then the only situations in which it would make sense financially to buy housing properties early would be if the rate of increase in specific geographic areas could reliably be predicted to beat the average for an extended period.

Thus the analysis described in this section examines aggregate housing prices in Minnesota counties to determine the answers to two questions. First, if the highest rates of house price appreciation were sufficiently large relative to the state average, and sufficiently prolonged, to make long-term ownership of housing in some locations a worthwhile investment even if housing on average was not. Second, if those locations and periods of high return could be reliably predicted; if not then their mere existence is not particularly useful for investment purposes.

The analysis examined holding periods of five, seven, and ten years, and determined the average annual rate of return, by county, relative to the state average for the period under consideration. Given that the first available prices were in 1984 and the last in 2003, there were 14 different five-year periods, 12 seven-year periods, and 9 ten-year periods. Given the 87 counties in Minnesota, this provided a good sample of average rates of return from which a distribution could be calculated. We used two benchmarks to define "high returns;" more than 3% per year above the state average, and more than 5% per year above the state average.

The counties that beat the state average substantially tended to do so only for short periods, then reverted to the mean or sometimes lower. The seven-year holding period had far fewer cases showing excess returns; and the ten-year holding period was lower again (Table 3). As a general result, the longer the holding period, the less likely that returns in a given location will consistently beat the average by enough to make land a good investment relative to other alternatives.

TABLE 3 Number and Percent of Cells Showing Excess Returns

Holding period	Number of cells	> 3% per year	> 5% per year
5 years	1218	82 (6.7%)	33 (2.7%)
7 years	1044	49 (4.7%)	6 (0.6%)
10 years	783	29 (3.7%)	1 (0.1%)

While there are at least occasional local cases where house price increases were above the state average by reasonably large amounts and for somewhat extended periods of time, these cases seem essentially impossible to predict. We attempted to predict the five-year rate of house price increase by county, using as explanatory variables the rates of population, job, and wage increase in that county over the previous five years. We also examined other possibilities including current level of housing prices, past rates of house price increase, and housing prices relative to income levels. The best regression included only the past rates of population and job growth. The predicted impacts were very small relative to actual price movements; and the amount of variation in house prices that was explained by this regression was only about 3%.

Out of the 33 cases where the rate of return was above the average by more than 5% per year, only one was predicted by this regression to have a very high rate of return. The cases that were predicted by the model to have the highest returns did do slightly better than those that were predicted to have the lowest, but the differences were small. More importantly, given that the objective was to predict places that did in fact have rapid price increases, more than 5% per year above the average, then these locations were as likely to be predicted to have very low returns as very high ones.

Prices of Agricultural Land

It is hard as a statistical matter to determine the rate of price growth for agricultural land over short periods because the sample size is much smaller than for housing (7). At small geographic scales such as a county there might only be a handful of farm transactions in a year. Because of the small number of transactions, the mean and median prices show very large fluctuations from one year to the next; and the observed annual rate of growth over longer periods is somewhat dependent on the particular years that are chosen for endpoints.

We adopted a strategy of grouping all the sales in the first five and last five years of our data (1987-91, and 1999-2003) and treating them as having all occurred in 1989 and 2001 respectively. We then compared the implicit annual rate of growth between these two times across counties.

Here we finally observed some of the expected results. Counties where farmland was being converted to development at a rapid rate did in fact have very high rates of appreciation in farmland prices. Twenty-two of 87 counties had growth rates over 10% per year. Almost all of these other counties were Twin Cities metropolitan or collar counties, or areas of significant recreational appeal, exactly where high price growth rates would be expected.

Given these results, predicting farmland price increases was somewhat more viable. As described in the last section, all that was known about farmland prices were median prices by county at the beginning and end of the data period, centered on 1989 and 2001. We attempted to explain these price changes using population, job, and wage growth rates during the 1980s.

For farmland, only population growth was a good explainer of price changes. The best regression explained farmland price growth during this period as a base growth rate

(intercept) of 8.15% plus 1.53% times the average rate of population growth during the preceding decade. This explained about 35% of the variation in farmland price growth rates across counties.

A rule for purchasing farmland in counties with population growth greater than 2% per year would have captured only about one third of the counties with greater than 12% annual increases in farm prices, but perhaps more importantly, it would not have captured any counties with less than a 10% annual increase. The predictive ability of the model might be even better than this since it is based on county-wide population increases rather than in the local area under consideration (for example, farm prices grew rapidly in Hennepin County although the total population did not because it was already very large).

However, it is still worth maintaining a note of caution toward these results. First, the early period of the data started at the end of a very significant decline in farm prices, so land could have been undervalued during our baseline period. By contrast, the latter period of our data was during an unprecedented boom in housing prices, which could have the effect of making undeveloped land seem more valuable than it would in a more normal housing market. These two facts together could be making the growth rate during this time appear to be higher than it would have been if a different time frame had been studied. This was a period of rapid farm price increases in general, as indicated by the 8% intercept in the regression.

Another possible source of bias is that the land being sold in the two periods might not be comparable. The stagnant housing market of the 1980s could have limited development so that most of the sales during the first period of our data were for farming purposes. However, more of the sales during the latter data period might have been for development due to the strong housing market at this time. So to a certain extent these possible shifts in the nature of the properties being sold in the two periods could lead to an impression that prices were rising more rapidly than perhaps they really were.

A final point is that even the highest rates of farm price increase were only slightly better than the bond market, when adjusted to account for lost tax revenues and other costs discussed earlier. And even these high rates of return still did worse than the stock market during this time. So the value of these purchases could still be open to question to some extent.

CONCLUSION

The objective of this research was to develop a theoretical framework for understanding and quantifying the financial benefits of early acquisition of transportation right of way, and to provide some basic analysis of its desirability.

Developing a theoretical framework involved three main steps. First, listing the different types of situations in which early acquisition might be applied. Second, outlining the various costs associated with early acquisition, and in particular the cost of the money used to do it. And finally, developing criteria for evaluating early acquisition as a policy. There were two key points to this. First, considering the rate of return on land in a longer-term context, consistent with the long-term nature of the policy; and second,

the need to evaluate the average rate of return on all the land that would be purchased early by whatever criteria is being used.

People informally point out large price increases that have taken place in a particular area, using this to justify the desirability of early purchase. That such situations exist is undeniable, but is not a sufficient condition for concluding that early acquisition is warranted in general. The relevant questions are first, whether that particular area would have been identified at the appropriate point in the past as a target for early acquisition (and by what criteria), and second, what other areas would also have been identified and how much they have appreciated in value. The average appreciation of all those properties is the appropriate benchmark for evaluating the policy.

The financial analysis of early acquisition involved two main questions. First, is the average rate of price increase for land high enough to justify early purchase as a general strategy, barring the special case in which the land would otherwise be developed? We conclude that it is not, when a longer-term perspective is considered and the very rapid price increases of the last few years are placed in a historical context. Over a period of the last 40 years, the average rates of price increase of both housing and farm land, which we use as proxies for developed and undeveloped land, have been considerably lower than the return on medium-term government bonds, which could be considered the cost of the money being invested.

Second, if the average rate of increase is not high enough to justify early purchase, are there specific locations or types of land that consistently beat the average by large amounts, so that they are good investments even if land in general is not? There are two parts to this question: How high are the highest rates of return, and can these areas be reliably predicted? Focusing on Minnesota, we conclude that with the possible exception of farm land and recreational areas around the Twin Cities, that periods of widespread rapid price increase are rare, that the rates of increase are not high enough to be important, and that the times and places of rapid price increases are essentially impossible to predict.

However, there are two key limitations to the scope of this analysis that constrain the degree to which policy conclusions can be drawn, and point to the need for additional research. First, a case could be made that this analysis did not reach a fine enough level of geographic detail. For example, land that is located near current or future major transportation corridors might increase in price more rapidly than land that is not near these corridors due to its greater development potential. This is the second of the four right of way acquisition situations discussed early in this paper, and one that this research did not address. The method employed here of examining average price increases over large areas such as counties might be missing more significant, and possibly more predictable, price movements in the specific locations of particular interest.

The second major limitation is that non-financial benefits are not addressed; including these could change the outcome in some cases. Although there are a wide variety of types of these benefits, many of the key ones revolve around reducing risk and uncertainty, both for the government and for residents and businesses along the corridor. An important example of this for the government is having the right of way secured at a known price. This can be especially significant in fast-growing areas where price

movements can be volatile, and where an imminent highway improvement can itself play a role in driving up the cost of right of way. Similarly, for residents and businesses there is value in having a credible commitment by the government in terms of exactly which land it intends to use for right of way. This makes it possible for private investments to accommodate future transportation system changes at much less cost, and with much more confidence that they will not be taken later.

There would be a considerable theoretical and empirical challenge in trying to define and measure the value of this risk reduction in different circumstances. A significant complicating factor is that there are other methods of preserving right of way other than outright purchase, and many of them can potentially create a similar set of non-financial benefits. An evaluation of these benefits would need to be done in the context of the relative costs of the different ways of achieving them.

Given these limitations, this research in this paper should be taken as a first step rather than a last word on the subject. The finding that early acquisition is not always a good idea financially does not imply that there are no cases in which it is justified. Continued expansion and refinement of the types of situations that are studied and the costs and benefits that are considered should lead to greater refinement of the conclusions regarding when early acquisition is and is not a good idea, and when other preservation methods might be preferable. Given the amount of money that is potentially at stake, and the ongoing investment in right of way preservation activities, an improved understanding of this issue seems of considerable importance.

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