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Thinking Outside the Park- National Park Fee Increases Effects on

Gateway Communities

Prepared by
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This study explored the potential regional economic effects of increased National Park entrance fees, using Yellowstone National Park as a case study.

Abstract

In 2017, the National Park Service proposed an entrance fee increase across 17 park units, including Yellowstone National Park. The fee increase is proposed to help offset substantial deferred maintenance costs currently experienced across park units. This paper assesses the potential effects felt by gateway communities surrounding the parks. We identify, using Yellowstone as a case study, that even though revenue to the park may increase, spending in local communities can be expected to decrease, all else being equal.

Executive summary

The National Park Service is facing a nearly $12 billion backlog due to deferred maintenance. To address this backlog, the US Department of the Interior recently announced plans to increase fees in 17 of the most visited national parks. As fees are a component of the travel cost necessary to enter the park, we consider the elasticity of demand for park entry based on changes to travel costs. We find demand to be inelastic. Even inelastic demand however results in a decrease in total visits. Using Yellowstone National Park as a case study, we estimate a $3.4 million annual loss in gateway community spending by visitors as a result of reduced visitation by those visitors who choose not to purchase a 7-day pass and travel to the park. The magnitude of visitor effects is proportionate to the necessary distance traveled by the visitor. Entrance fees comprise a smaller fraction of travel costs for international visitors compared to local visitors, thus changes induce a smaller effect on their decisions to travel to a US national park.

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Introduction

The National Park Service (NPS) of the United States (US) is facing a nearly $12 billion ($US) backlog due to deferred maintenance (NPS, 2017a). To address this backlog, the US Department of the Interior recently announced plans to increase fees in 17 of the most visited national parks in the US from about $30 for a 7-day pass for a vehicle to $70 (NPS, 2017b). The NPS suggests that implementing the new fees during the peak season of each of the 17 proposed parks will increase entrance fee revenues from $199.9M to $268.5M, annually. This represents a 34.3 percent increase over the 2016 fiscal year (NPS, 2017b). To explore the potential implication of increased fees, we employ a travel cost analysis to assess visitor spending effects on the communities that surround the parks.

Relating Visitation to Cost

As with most goods or services, an increase in price will reduce the amount demanded of that good, all else being equal. The total entrance fee revenue for the NPS is directly dependent on the number of entry fees paid, and the price of the entry fee. The NPS projects it will experience a revenue increase following their price hike. This implies a belief that demand for park visitation is inelastic. In other words, they believe that the percent increase in price is larger than the percent decrease in demand. This is largely an accepted notion and one backed up by studies that have directly estimated the effect of entrance fees (e.g. Stevens et al., 2014) or indirectly measured effects via proxies for price, such as travel or fuel cost (e.g. Poudyal et al., 2013; Stevens et al., 2014).

While for many visitors the proposed fee increase is small relative to the overall total costs, the magnitude of the effect on a potential visitor's decision to travel to a park is dependent upon the necessary travel distance to the park. A $40 increase on a $30 entrance fee is a large change for local visitors within an hour or two's drive to the park, yet rather small for an international traveler paying more than $1,000 per airline ticket. As such, a differing response should be observed between visitor segments.

It is likely a fair assumption on behalf of the NPS that the directional change of the revenue from entrance fees will be positive. However, revenue to the parks is only a portion of the economic picture. Nationwide, many gateway communities rely heavily on visitors to the parks as a major economic driver. In 2016, the National Park System recorded 331 million visits, yielding $18.4 billion in spending in gateway communities (Cullinane & Koontz, 2017). Visitors to most of these 17 parks contribute hundreds of millions in economic output to their regions. Economic contribution studies of visitor spending conducted by the NPS heavily rely on three major components to generate their estimates: 1) Volume of visitor groups attracted to the park; 2) Average length of stay of the visitors; and 3) Average daily expenditures of the visitors. Even with a highly inelastic demand, as expected here, economic theory suggests that there will be some decline in the number of visits to parks in which a price increase is implemented. This decline necessarily generates a negative economic effect on spending in the region and thus reduces the economic output.

Methods

Using Yellowstone National Park as a case study, we capture the magnitude of visitation change as a result of the proposed fee increase. We limit the analysis to only those potentially paying the 7-day fee for vehicle entry. We utilize monthly fuel prices as a proxy for travel cost to estimate an elasticity of demand for park visitation with respect to the cost incurred to enter the park. The calculated elasticities for YNP can then be used to derive an estimated change in visitation by each of three groups; 1) Local Visitors (those originating from MT, WY, and ID), 2) Nonlocal US and Canadian visitors, and 3) International visitors. Once an estimated change in visitation by each group is known, the resulting effects on visitor spending and thus economic contribution can also be calculated.

To identify demand elasticity, we utilize a common conceptualization of demand for national park visits (e.g. Poudyal et al., 2013b) in which monthly recreation visits to all national parks between 1991 and 2016 are regressed on monthly fuel prices, population, and consumer sentiment.

Number of monthly visits = f(travel cost, population, seasonality, consumer sentiment)

Monthly values allow for accounting of seasonal variation. Logged values of total recreation visits, fuel prices, population, and consumer sentiment are all used in the regression such that the rendered coefficients can be directly understood as the associated elasticities. The coefficient for fuel price is expected to be negative and less than one. Coefficients for population and consumer sentiment are expected to be positive, indicating that as either variable increases, so to do the expected visitation volumes.

Typically, elasticity of demand is calculated based on the price of the good or service provided, such as changes in demand for entry into a movie theater given a change in admission prices. However, the true price paid for entry into a national park is not only the admission costs, but also the often far more substantial transportation costs to arrive at the park; namely fuel for domestic traveler and airline tickets for international visitors (Field & Field, 2002). Additionally, national park admission prices are not market driven and thus not reflective of a typical supply and demand relationship (Eagles, 2002). Given these two observations, we utilize fuel costs as a proxy for price to determine elasticity of demand. In this sense, the entry fee may be considered similar to a toll cost to access the national parks and as such the combination of fuel costs and entry fees generates the whole transportation cost. Thus any increase in entrance fee is an increase in the transportation costs, or producing a similar effect as an increase in fuel prices.

Visitor surveys are routinely conducted by the NPS on a rotating basis across the park system. These survey results are used, among other purposes, to estimate the economic contribution of visitor spending in gateway communities (Kulesza et al., 2012). Information contained in these surveys and those collected in Montana to estimate nonresident visitor spending (Grau, 2017) provide sufficient detail to estimate visitor origins and thus average fuel costs. Based on these data and other reports (Nickerson, 2016), we assume that 10 percent of visitors are local. We consider local to be those visitors from states bordering YNP; Wyoming, Montana, and Idaho. Nonlocal visitors are broken into two groups. The remaining U.S. and Canadian visitors make up 81 percent of visits. The final nine percent of visits are by international travelers (Figure 1). U.S. and Canadian travelers are grouped together based on their ability to drive to the park.

Figure 1. Visitor origin proportions.
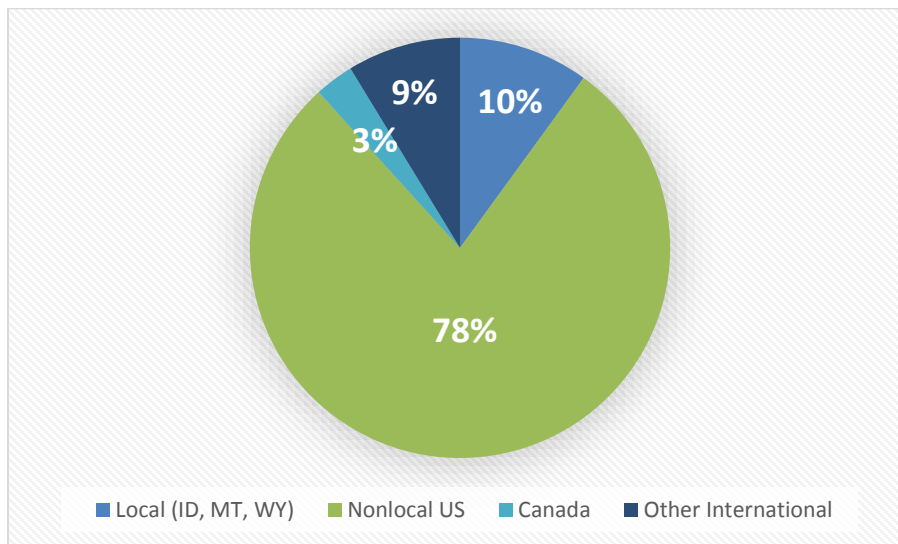
Source: Kulesza et al. (2012)

Expected change in visitation by each group is compared against the visitation recorded by YNP in 2016. Fuel costs are estimated based on average national fuel prices in the first week of July, 2016. Using the proportions of travel modes reported by driving visitors, car/truck or RV/trailer, to Montana and YNP, an average fuel efficiency of 21.4 mpg is utilized. Transportation costs are then calculated for each visitor group and includes fuel costs and the costs of a vehicle entry, $30. The calculated transportation costs represent the expected costs faced by visitors in 2016 and are compared against the cost of a price increase generated by an entrance fee increase. The proposed fee is $70 per vehicle during the peak season months only. A 2015 survey in YNP found that 29 percent of visitors purchased a standard 7-day noncommercial vehicle pass (Jorgenson & Nickerson, 2016). Given no price changes in annual fees are proposed, we assume only those purchasing the 7-day passes are impacted by the price change. Once the change in price is known, the effective change in demand can be generated based on the estimated elasticity.

Results

In line with expectations, visitation to Yellowstone National Park declines as costs to get to the park increase. Specifically, a one percent increase in transportation costs will result in a 0.27 percent decrease in monthly visits, all else being equal (Table 1). Further, assumptions of total revenue increases by the NPS as a result of their proposed price increases are supported by the findings of an inelastic demand; fuel price coefficient is less than one in absolute value. However, the analysis here does not contain enough information to support or reject the magnitude of revenue increase suggested by the NPS.

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Table 1. Regression estimates for monthly visits to Yellowstone National Park.

Variables	Visits to Yellowstone NP(Ln)
Intercept	-6.36329 (-1.527)
Fuel Price (Ln)	-0.27398 (-3.496***)
Population (Ln)	0.847049 (3.923***)
Consumer Sentiment (Ln)	-0.00391 (-0.042)
January	0.431023 (7.303***)
February	0.626427 (10.612***)
March	0.061847 (1.045)
April	0.402524 (6.766***)
May	2.522831 (42.152***)
June	3.43462 (57.299***)
July	3.761982 (63.09***)
August	3.639606 (61.104***)
September	3.179472 (53.418***)
October	2.001933 (33.789***)
November	-0.48819 (-8.267***)
Adj-R square	0.9821

Note: Shown values are regression coefficients. For fuel price, population, and consumer sentiment, a positive coefficient indicates that as the variable increases, so too do visits. A negative coefficient indicates the opposite. The monthly variables are compared against December visits. Positive values indicate higher visitation, negative values indicate lower visitation. Numbers in parenthesis indicate t-values; *** indicates parameter significance at 0.001.   Adj-R square value indicates that the model explains 98% of the variability of visitation to Yellowstone.

The proposed 7-day pass fee increases yield travel cost (fuel plus entry fee) increases of 37.6, 13.9, and 0.9 percent for local visitors, nonlocal U.S. and Canadian visitors, and International visitors respectively (Table 2). Based on previous work by Jorgenson and Nickerson (2016), we assume only 29 percent of visitors to Yellowstone pay for the 7-day pass. All others have some form of annual pass. The price changes induce a reduction in visits to the park by 3.0, 1.1, and 0.07 percent respectively for our three group types (Table 3).

The combined total spending loss to the gateway communities of Yellowstone National Park as a result of entry price increase is $3.4 million. This loss represents a 0.6 percent loss in annual spending, based on 2016 estimates. The gateway communities of the remaining 16 parks are expected to experience similar losses as those of Yellowstone, all else being equal.

Table 2. Change in travel costs with fee increase.

	Current average travel cost	Travel cost with proposed change	Change in travel costs
Local (ID, MT, WY)	$106.48	$146.48	37.6%
Nonlocal (US/CA)	$287.92	$327.92	13.9%
International	$4,483.54	$4,523.54	0.9%

Table 3. Visitation change with increased fees.

	2016 Visitation estimates	Expected visits under fee change	Change in visits
Local (ID, MT, WY)	382,167	370,760	-2.98%
Nonlocal (US/CA)	3,095,551	3,061,381	-1.10%
International	343,950	343,706	-0.07%
Total	**3,821,668**	**3,775,847**	**-1.20%**

Conclusions & Recommendations

In the fall of 2017, the Department of Interior and the National Park Service introduced a proposal to increase the peak season entrance fees at 17 of its park units. This proposed fee increase is anticipated to raise entrance fee revenue by 34.3 percent, or $68.6 million annually (NPS, 2017b). Based on our results, annual visitation across groups from locals to international visitors will decrease. Yellowstone National Park's gateway communities alone stand to lose nearly $3.4 million annually from those paying the 7-day pass. Other visitors or potential visitors are likely to be impacted as well. In addition to an increase on the per vehicle 7-day passes, park-specific annual passes are set to increase across the 17 parks. In Yellowstone, this is an increase from $60 to $75 dollars. Motorcycle fees are proposed to double from $25 to $50, and per person (foot or bike) are set to climb from $15 to $30 during the peak season. If the remaining parks are similar to Yellowstone, the total spending loss in these communities could exceed the revenue gains to the park.

Aside from the direct impact to the gateway communities from visitor spending, the entire nature of a $70 per vehicle entry fee should be carefully considered. At $70, concerns may be legitimately raised that many families are being priced out of visiting the major national parks in the US. As such, the rationale behind the increased revenue strategy should be questioned.

Countries throughout the world operate their own sets of National Parks. In an examination of the pricing strategies employed by these countries, we found a wide diversity of price structures. Common among many, is differential pricing based on whether the visitor is a citizen or resident of the country as compared to an international visitor. For example, Kilimanjaro National Park in Tanzania charges their citizens the U.S. dollar equivalent of $4.45 per person per day, while their international visitors pay the equivalent of $70 per person per day (Tanzania Parks, 2016). Despite this drastic difference in fees, international visitors to the park made up 93 percent of the visits in 2012-2013. Parks from South Africa to Ecuador frequently enlist differentiated pricing. We examined parks across more than 50 countries

where pricing information was readily available, and found that nearly three quarters of parks had varying prices between domestic and international visitors.

Similar to American National Parks, parks throughout the world are increasingly being tasked with providing more and more of their budgets from visitor fees. Many have seemingly recognized similar effects to that shown in this paper; namely, entrance fees are a small portion of the international traveler's travel costs and as such they are less responsive to increases in prices. Opposingly, fee increases generate a potentially significant hardship on domestic visitors, particularly lower income families. We suggest through our results that this hardship leads to non-trivial levels of reduced visitation, which in turn can create reduced spending in gateway communities to National Parks. These findings lend support to suggestions that the U.S. Department of Interior and the National Park Service reconsider the proposed fee increases until such time as a thorough investigation of the total magnitude of effects can be incorporated into the decision making process. Alternative fee structures should also be considered that permit the NPS to achieve its stated revenue goals without disadvantaging the American taxpayer.

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