



IMPACT Center
WASHINGTON STATE UNIVERSITY

Pricing, Revenues and Participation Under Washington State Public Land Permit System Recommendations

A Report by Washington State University's IMPACT Center

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Preface

In July 2011, the Washington State Legislature authorized the Discover Pass Program,¹ which created a user fee for vehicle access to state lands. Since that time, the Discover Pass Program, after a challenging phase-in period, has become the fourth-highest revenue generating state park/recreation pass in the country, trailing only New York, California and Florida in annual revenue.

Though the program has been successful, it is struggling to keep pace with increased demands on the state's recreational lands and is not generating adequate revenue for maintaining the state's public lands without supplemental general tax support. This report discusses the economic and fiscal situation of the state's recreational lands and investigates methods for reducing costs to Washington citizens while increasing revenues for expenses such as facility preservation, trail maintenance, forest restoration and improvement.

In 2017, at the request of the Legislature, the William D. Ruckelshaus Center, in collaboration with the Washington State University Division of Governmental Studies and Services, surveyed state recreational land users and state citizens to determine the desirability and usefulness of revising the Discover Pass Program. The Ruckelshaus Center's 2017 report, "Recreation Fees in Washington State," proposed three options to revise the Discover Pass Program: 1) a pass-free option whereby a surcharge would be levied against all noncommercial passenger vehicles during vehicle registration; 2) A two-vehicle pass option that operates much like the current system but with a different pricing and exemption structure; and 3) A discounted single-vehicle pass option where the pass would be nontransferable between vehicles but have a lower price point.

Results presented here suggest reducing access fees to state lands while also increasing revenues is possible under the three recommended access options. The pass-free option would have the lowest price point (for residents) because the cost of maintaining state lands would be spread among all individuals and businesses with registered vehicles, thus lowering the price to each person individually. The revenues under this system have a much higher expected maximum because drivers are not overly price-sensitive to vehicle registration costs. Either of the vehicle pass options could increase revenues through price reductions and increase the financial accessibility of public lands to lower-income families who may have been financially constrained from purchasing state park access under the current system. The revenue under either of the pass-based options would likely increase as Washington's population grows.

¹ See RCW 79A.80.020

Executive Summary

Revenue from the Discover Pass Program in Washington state is not keeping pace with the increased demand and services placed on the various departments responsible for managing the state's public lands. In 2017, the Legislature requested research to investigate alternatives and revisions to the current system. Three alternatives were recommended for further consideration and additional investigation into their potential economic effects. The proposed revisions to the Discover Pass Program were: 1) a pass free option whereby a surcharge would be levied against all noncommercial passenger vehicles during vehicle registration; 2) a two-vehicle pass option that operates much like the current system but with a different pricing and exemption structure; and 3) a discounted one-vehicle pass option where the pass would be nontransferable between vehicles but have a lower price point.

Table E.1 summarizes the current Discover Pass and alternative pass options. The number of annual Discover Passes sold in 2017 was 648,842 with an average price of \$33.65. Total annual pass revenues in 2017 were \$21,833,533. Under the pass-free option and a more expansive exemption package 6,320,341 vehicles would be assessed a surcharge of \$4.68 at the time of registration. Assuming the same number of out-of-state visitors from 2017 were charged \$40 for a pass, total revenues would amount to \$30,000,000. With a less aggressive exemption package the surcharge could drop to just above \$4.00.

Table E.1: Summary of Annual Discover Pass and Pass Alternatives

	Unit	Annual Passes Sold	Annual Pass Price	Out-of-State Passes*	Total Annual Pass Revenue
		#	\$/pass	#	\$
Current Law		648,842	\$33.65		\$21,833,533
Pass-Free Access w/Exemption	Pass-Free Access- Exemption Pkg 1	6,320,341	\$4.68	9,860	\$30,000,000
	Pass-Free Access- Exemption Pkg 2	7,388,451	\$4.01	9,860	\$30,000,000
2-Vehicle Pass System	5% Revenue Increase	725,498	\$31.60		\$22,925,749
	10% Revenue Increase	815,414	\$29.45		\$24,013,932
	15% Revenue Increase	925,684	\$27.12		\$25,104,557
Single Vehicle Reduced Fee Pass	Required to Achieve Baseline Revenues - \$15	2,000,000	\$15.00		\$30,000,000
	Required to Achieve Baseline Revenues - \$20	1,500,000	\$20.00		\$30,000,000

*Out of state passes under this access structure are assumed to be \$40 apiece.

Under the two-vehicle pass option, revenue and annual pass purchases would increase if the average annual pass price were to fall. Reducing the average annual pass price to \$27.12 would cause the quantity of passes purchased to increase to approximately 925,680 and increase annual pass revenues to over \$25,000,000. A maximum annual pass revenue of \$27,388,646 would be obtained at just over \$18.00 per pass. Lastly, the single-vehicle pass option could generate a baseline revenue of \$30,000,000 at \$15 per pass if 2,000,000 passes were sold or at \$20 per pass if 1,500,000 were sold.

Increased visitations are expected under any of the proposed changes which will likely cause public land management costs to rise due to increased trail maintenance, increased customer service requests, and various other increases in implementation costs (e.g., updating the Department of Licensing DRIVE system).

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Chapter 1: Pass Products, Exemptions and Discounts

This chapter begins by discussing the purchase levels and exemptions offered under the current Discover Pass program. Subsequent sections discuss the proposed alternative pass products as well as who will be affected and at what level. This portion of the analysis primarily uses data collected by Washington State University's Division of Governmental Studies and Services

1.1: Current Conditions

The Discover Pass in Washington is required for motor vehicle access to sites managed by the Washington Department of Natural Resources, State Parks and the Washington Department of Fish and Wildlife. Purchases can be made through WDFW's Washington Interactive Licensing Database, or WILD system, at the Department of Licensing when renewing a vehicle registration, at many state parks (in person or automated pay stations, or at more than 600 retail and hunting and fishing license vendors. Approximately 30 percent of annual pass sales are generated during vehicle registration, 30 percent are sold through the WILD system and the remainder are purchased in person through retail outlets or park stations. The Northwest Forest Pass and the Interagency Passes also grant access to certain federal public lands in Washington.

Table 1.1.1 shows the distribution of revenues by source of sale.

Table 1.1.1: Annual Discover Pass Revenues by Source of Sale

Year	DOL	Parks	WDFW	Infractions	Total
2012	\$2,885,340	\$5,544,633	\$7,286,290		\$15,716,263
2013	\$5,084,470	\$5,487,783	\$6,077,780	\$479,153	\$17,129,187
2014	\$5,808,690	\$5,561,739	\$6,520,660	\$670,128	\$18,561,217
2015	\$6,109,086	\$6,951,103	\$7,605,800	\$657,828	\$21,323,817
2016	\$6,771,270	\$6,780,647	\$7,832,390	\$513,819	\$21,898,126
2017	\$7,476,180	\$7,281,681	\$8,091,319	\$436,268	\$23,285,448
2018*	\$8,321,568	\$7,455,705	\$7,523,507	\$480,220	\$23,780,999

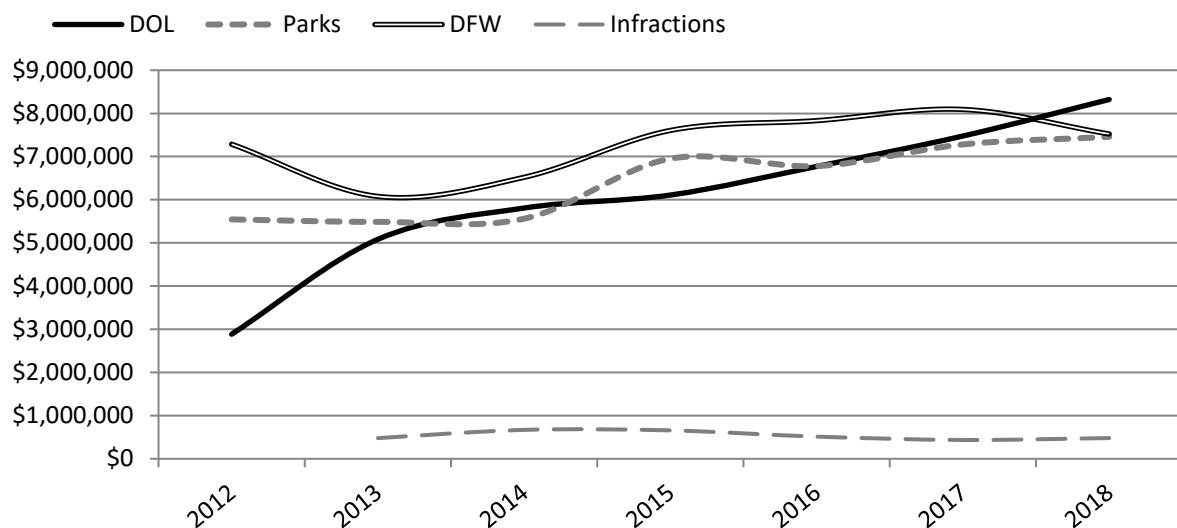
* Includes forecasted revenues for May and June.

Source: Washington State Parks and Recreation Commission

All 249,206 passes sold by the DOL in 2017 were annual passes. State Parks sold roughly 140,480 annual passes and 306,747 daily permits in 2017. WDFW sold 259,156 annual passes and 31,663 daily permits. In total, 648,842 annual passes and 338,410 daily permits were sold in 2017. The legislated price per annual pass is \$30, though it varies slightly based on transaction fees. One-day passes usually cost \$10 unless purchased online where they cost \$11.50.

Figure 1 displays historic revenues by source of sale.

Figure 1.1.1: Annual Discover Pass Revenues by Source of Sale



Source: Washington State Parks and Recreation Commission

Estimated Disability Pass exemptions totaled 56,073 in 2017. Disabled Veterans Lifetime Passes were estimated to be 18,565 in 2017. Roughly 37,000 households were estimated as having participated in the Low-Income Senior Pass program and roughly 452 households benefited from the Foster Home Camping Pass. Another 486 households received passes for volunteering on eligible public works projects. Approximately 112,600 households benefited from reduced costs or exemptions in 2017. Multiplying the number of households receiving exemptions and discounts by the Discover Pass base price of \$30 results in an upper-bound subsidy from the parks system to recipients of roughly \$3.4 million.² However, without such exemptions and discounts, many of the participants might not have purchased a pass. As such, true losses in revenue may be lower than the \$3.4 million subsidy.

1.2: Alternative Pass Options

There is some consistency across the proposed alternative pass options. All the scenarios assume current levels of General Fund support remain in place. State agencies are encouraged to interact with federal agencies to provide a common information portal and revenue-sharing agreements to allow future Discover Pass holders to access federal recreation lands in the state. State-managed recreation lands will have consistent pass free days. Fees for backcountry permits, hunting and fishing licenses, campgrounds and outdoor recreational vehicles tabs, as well as special use permits, will all remain in place. The majority of exemptions and discounts will be retained under all three options, though certain aspects vary between options (e.g., extension of discounts for veterans, elimination of camping reservation exemptions, etc.).

² This upper bound does not include camping pass exemptions or discounts.

Pass Free Access

The pass free alternative to the current Discover Pass program will require vehicles licensed in Washington to pay a surcharge of between \$7 and \$15, so any vehicle with Washington plates will be granted access to Washington's recreational lands. Non-Washington licensed vehicles will be required to pay entrance fees. The baseline revenue goal under this option is \$30 million per fiscal year to replace the funds that were traditionally collected through the sales of the Discover Pass.³

Potential exemptions for Washington state residents would include disabled veteran, Medal of Honor, POW, Purple Heart and Gold Star Veteran plates. Senior citizens with income less than \$40,000 a year or individuals who are eligible for property tax relief under Chapter 84.36.381 RCW⁴ would also be exempt. (A listing of vehicle exemptions is provided in Appendix 2.)

Two-Vehicle Pass

The two-vehicle pass System retains some of the Discover Pass structure. However, there would be a single price point inclusive of transaction fees. The price point is estimated in the Ruckelshaus report to be between \$30 and \$35 and the pass would be transferable between two vehicles. It is unlikely that additional revenue would be generated under this framework as it recognizes the success of the Discover Pass Program and only slightly alters its framework. Out-of-state vehicles would be required to pay the same prices as residents.

Perhaps the largest deviations from the status quo and the two-vehicle pass system are the changes in the exemptions and discounts. Under this framework, all pass-free days to the parks would be consistent across all state public lands. Veteran's benefits to DNR and WDFW lands would be extended but the veteran's camping reservations exemption for state parks would be removed. Volunteer passes would be offered as under the current framework. Vehicles as exempt under 79A.80.010⁵ would remain exempt.

Reduced Fee One-Vehicle Pass

The third and final option has one major revision from the Discover Pass program in that it offers a one-vehicle pass at a highly discounted price, estimated to start at between \$15 and \$20 in the Ruckelshaus report. Passes would not be transferable between vehicles, but because of the lower price, it is expected that more families would be able to participate in recreation on state public lands. Buying the pass through the Department of Licensing during vehicle registration would be incentivized and become the primary mode of sale. A \$30 million revenue target would be the baseline, and prices would be indexed to account for inflation.

Under this option, a purchaser would receive either a window sticker or special license tab when registering a vehicle and differential prices would be charged for passenger, motorcycles or commercial vehicles. If window tags are not purchased at the time of vehicle registration, the prices

³ Watercraft, Motor home/ travel trailers may have an excise tax or fee assessed on them as well.

⁴ RCW 84.36.381 dealing with residence property tax exemptions may be found at <http://app.leg.wa.gov/rcw/default.aspx?cite=84.36.381>

⁵ Chapter 79A.80 RCW addressing access to recreational lands may be found at <http://app.leg.wa.gov/rcw/default.aspx?cite=79A.80>

would be higher to incentivize purchase at time of registration. Owners of out-of-state vehicles would be required to purchase day or annual use passes.

Pass-free days to the parks would be consistent across all state public lands. Veterans with disabled veteran, Medal of Honor, POW, Purple Heart or Gold Star plates would receive exemptions. Volunteer passes would be offered as under the current framework. Vehicles identified as exempt under 79A.80.010 would also remain exempt.

Chapter 2: Resident Survey and Historic Park Data

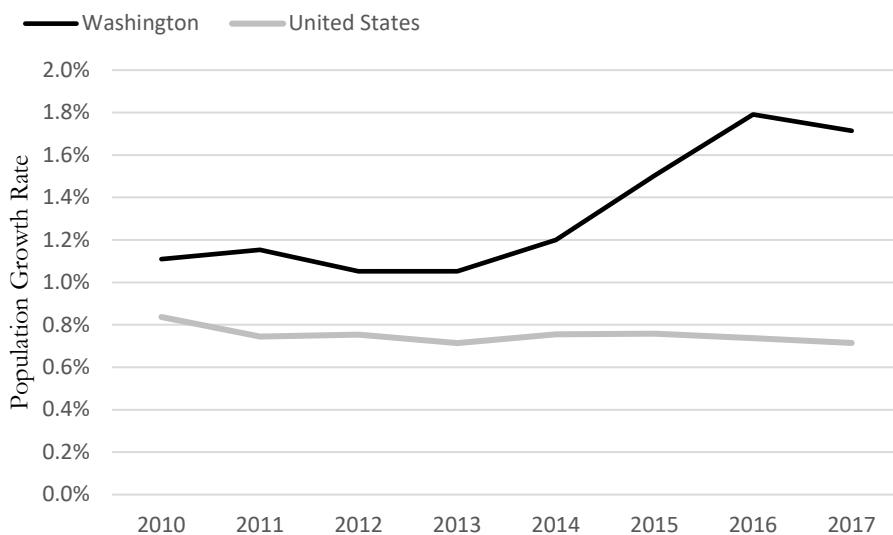
This chapter focuses on historic data on the Discover Pass Program and the survey data collected by the WSU DGSS. The historic data is used to estimate growth in demand for access to state lands and provides the background for forecasts of revenues and demand. The survey data reflects a contingent valuation approach and is the basis for estimating the level of demand for access to state lands and demand sensitivity to pass price.

2.1 Historic Data

Since 2010, Washington state's population has increased by 10 percent, from 6.7 million people to 7.4 million. This outpaced the U.S. growth rate of 5.3 percent. With such an aggressive growth rate, it is easy to see how this will lead to higher use and maintenance needs on state public lands.

However, the increased population also provides a growing market for the Discover Pass program. High population growth rates may bring problems of congestion and increased strain on state lands, but they also provide some relief to the financial constraints faced by the Washington Department of Natural Resources, the Washington State Parks and Recreation Commission and other stewards of the state's land resources.

Figure 2.1.1: Population Growth Rates in the U.S. and Washington state (2010–17)



Source: U.S. Census Bureau, Population Division

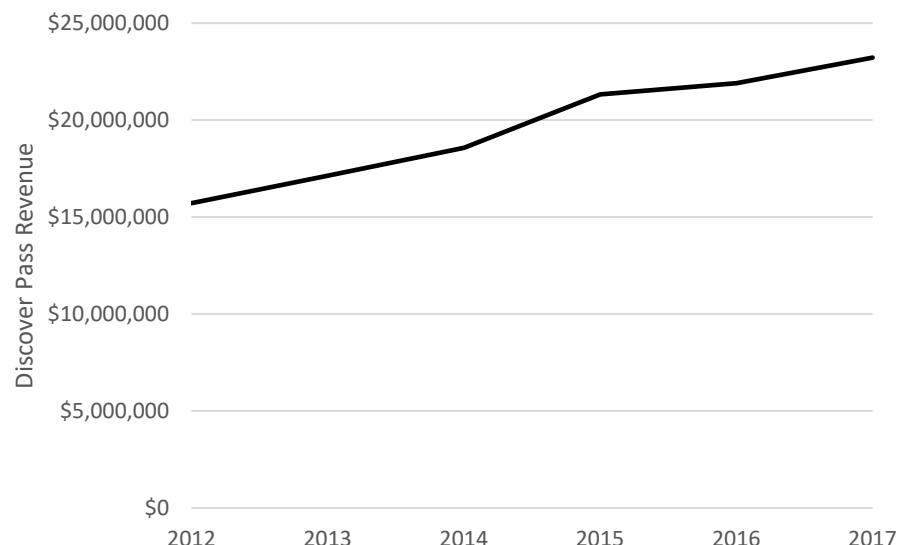
Average personal income in Washington grew at an average annual rate of five percent from 2010 to 2017. This compares to a national average rate of about four percent over the same time period. As income grows, the population is more likely to purchase access to state lands. The increase in

population coupled with increased per capita income results in an increase in the potential revenue that can be collected by the state for maintaining state recreational land access and amenities.

Figure 2.1.2 shows the growth in Discover Pass revenues from 2012 to 2017. Since 2012 the average annual increase in Discover Pass revenues has been 8.1 percent and over 47 percent in total.

Revenues have risen from \$15.7 million in FY 2012, to \$23.2 million in FY 2017. According to the early 2018 data this trend looks like it will continue in the near term.

Figure 2.1.2: *Discover Pass Revenues (FY 2012–17)*



Source: Washington State Parks and Recreation Commission

Table 2.1.1 provides the annual revenues from Discover Pass sales. The third column provides the 12-month trend in pass sales for each fiscal year, July to June. The 12-month trend data shows that the four warm months between May and August generate between 50 and 60 percent of total revenues each year.

Table 2.1.1: Pass Revenues and Monthly Revenue Trend

Year	Total Revenue	Annual Growth	12 Month Trend
FY 12	\$15,716,263		
FY 13	\$17,129,187	9.0%	
FY 14	\$18,561,217	8.4%	
FY 15	\$21,323,817	14.9%	
FY 16	\$21,898,126	2.7%	
FY 17	\$23,221,471	6.0%	

Source: Washington State Parks and Recreation Commission

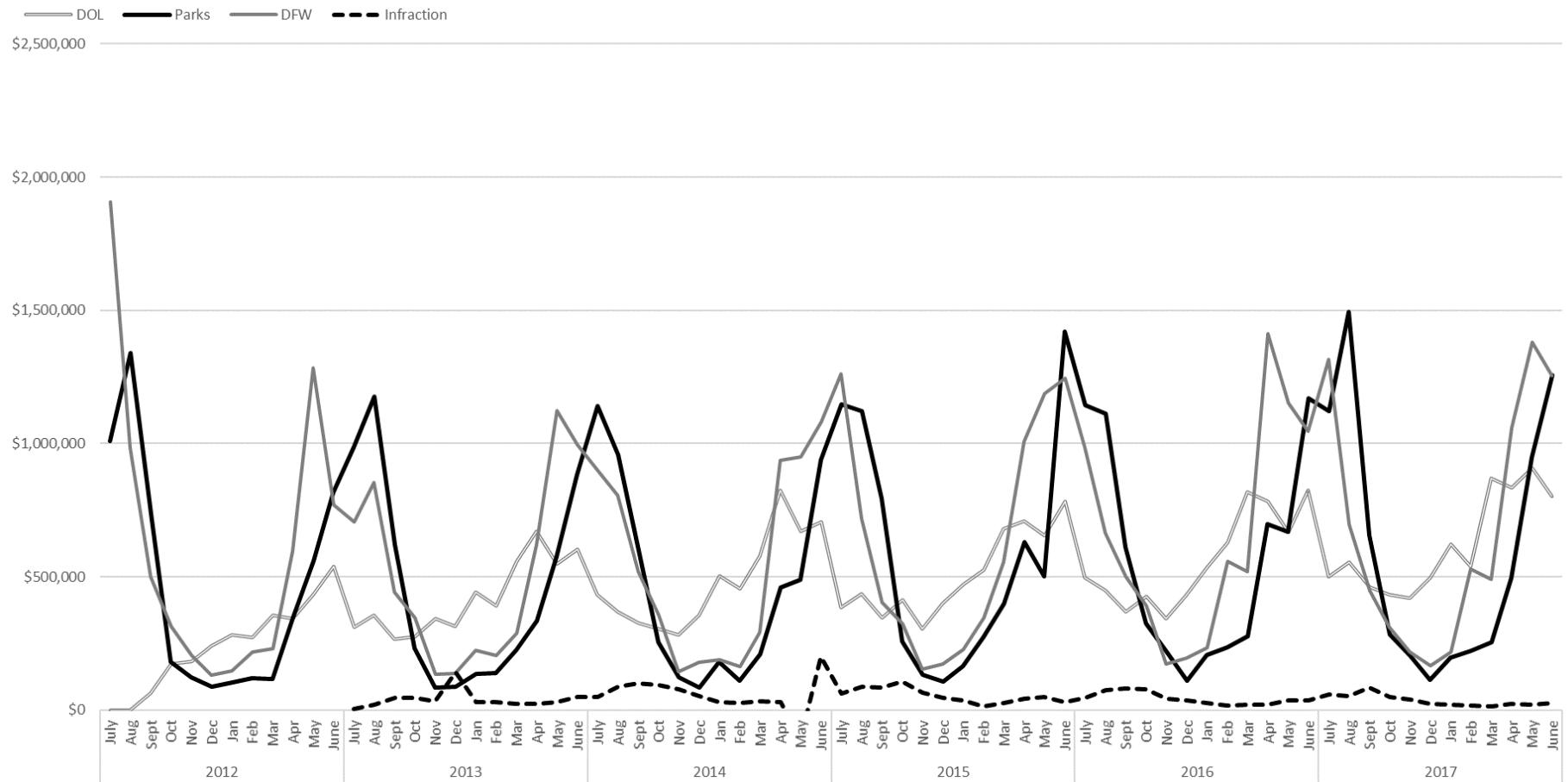
Figure 2.1.3 provides the monthly revenues by fiscal year and collection source. One of the important things that stands out from Figure 2.1.3 is that, even though the DOL doesn't provide the same volume of revenue as the other sources, it does provide a more stable monthly revenue stream and is growing at a slightly higher rate than other sources. Table 2.1.2 provides the data that shows revenue growth by source. The bottom half of the table shows what portion of the DOL revenue is generated in months when the other sources are at their minimum.

Table 2.1.2: Revenue by Source and Monthly Revenue Trend

Year	DOL	Parks	WDFW	Infractions
2012	\$2,885,340	\$5,544,633	\$7,286,290	\$0
2013	\$5,084,470	\$5,487,783	\$6,077,780	\$479,153
2014	\$5,808,690	\$5,561,739	\$6,520,660	\$670,128
2015	\$6,109,086	\$6,951,103	\$7,605,800	\$657,828
2016	\$6,771,270	\$6,780,647	\$7,832,390	\$513,819
2017	\$7,446,330	\$7,247,554	\$8,091,319	\$436,268
Total	\$34,105,186	\$37,573,459	\$43,414,239	\$2,757,196
2012				
2013				
2014				
2015				
2016				
2017				

Source: Washington State Parks and Recreation Commission

Figure 2.1.3: Monthly Pass Revenue by Source



Source: Washington State Parks and Recreation Commission

Though Washington residents generate roughly 98 percent of pass purchases, out-of-state visitors should not be ignored. Oregon, Canada and Idaho are the three largest providers of out-of-state revenue and these dollars represent new monies to the state.⁶ It is important to note that these figures are not reflective of all passes sold since sales by state of residence is not available from booklet sales made by retailers. This data is not reflective of infractions and only partially captures daily pass sales. Total out-of-state revenues are higher and these sales figures should be viewed as a lower bound. Table 2.1.3 summarizes the available data by purchasers' state of residence.

Table 2.1.3: 12-Month Discover Pass Sales by State of Purchase

Summary by Sales Channel	PARKS*	WDFW**	ONLINE***	Total
Washington	308,103	174,708	45,735	528,546
Oregon	2,577		1,802	4,379
Idaho	436		407	843
Other states	1,810		1,899	3,709
Canada	676		230	906
Other countries	23			23
Total	313,625	174,708	50,073	538,406

* Discover Pass Sales by PARKS - by State - Fulfilled by DCG One; Sold through Department of Licensing or with Campsite Reservation; Most recent twelve months (June 2017 - May 2018)

** WDFW = sales at brick and mortar WILD retail dealers (Jul 2016 - Jun 2017)

*** Online through WDFW (Jul 2016 - June 2017)

Source: Washington State Parks and Recreation Commission

2.2 Survey Data

The data collected by the WSU DGSS was collected through two primary methods. The first was a non-probability sampling technique that covered recreational user groups exclusively. The second was a random sampling technique that was done in various modes (e.g., online, in person, phone, etc.). Within the random sampling responses only recreational land users were asked the contingent valuation questions required for our demand estimation. Thus, even though a random sampling method was used the data used for demand estimation was still focused on current recreational land users. The degree to which this biases the demand estimation is unclear. Pertinent results from the random sample surveys are discussed below. A more complete discussion of the survey findings, including a discussion on group comparisons, may be found in Appendix D of the Ruckelshaus Report.

Table 2.2.1 provides general descriptive statistics for the 1,464 random survey responses. Respondents were predominantly female, 60 percent and roughly 55 percent of respondents were over the age of 35. The mean income for respondents was between \$40,000 and \$70,000 annually

⁶ The money spent on passes by residents does not represent new monies to the state.

and the mean number of registered vehicles was two. English was the primary language of 92 percent of respondents.

Table 2.2.1: Descriptive Statistics

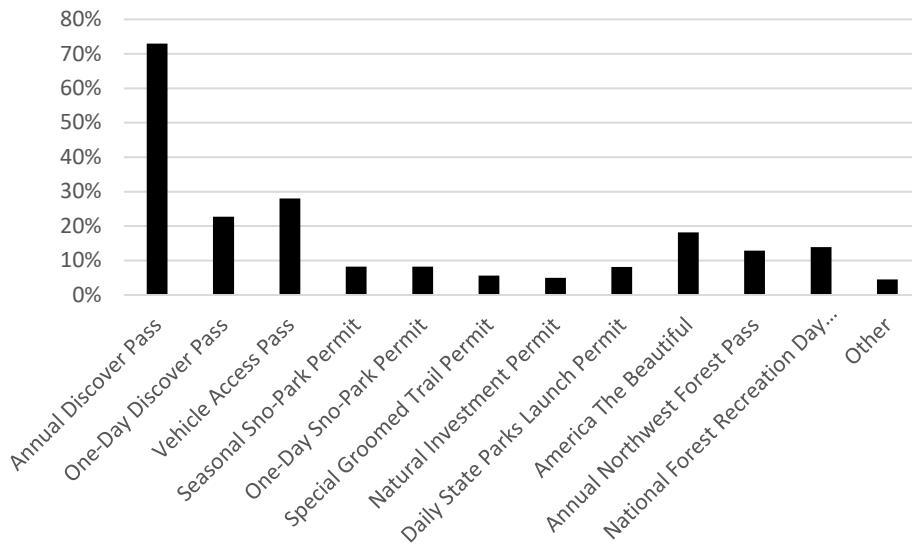
	Male	Female	Not Specified					
Gender	31%	63%	6%					
	<20	20-25	25-35	35-45	45-55	>55		
Age	0%	7%	21%	18%	16%	30%	6%	
	<\$10K	\$10k-\$40k	\$40k-\$70k	\$70k-\$100k	\$100k-\$120k	>\$120k		
Income	5%	20%	23%	17%	8%	18%	9%	
	1	2	3	4	5+			
Number of Registered Vehicles	30%	37%	16%	6%	3%	8%		
	English	Spanish	Other					
Primary Language	92%	1%	1%					

Source: WSU DGSS

Respondents were asked if they had purchased a pass in the past 12 months, and if so, what passes they purchased. Figure 2.2.1 synthesizes those results. Over 70 percent purchased an annual Discover Pass and 20 percent purchased one-day Discover Passes. Note that these figures are not mutually exclusive and that annual pass purchasers may have purchased day passes as well.⁷

⁷ Sometimes annual pass holders forget or have their pass in another vehicle, and buy a day pass even though they own an annual pass.

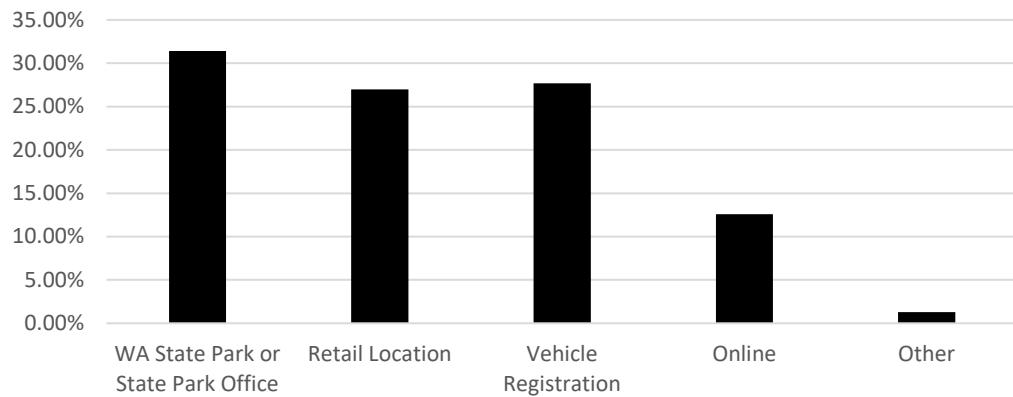
Figure 2.2.1: Types of passes purchased



Source: WSU DGSS

Figure 2.2.2 depicts sales by source as stated by the random sample of respondents. This data does not entirely reconcile with the revenue source data provided in Section 1.1. Vehicle Registration sales in Figure 2.2.2 represent 27.7 percent of sales while in Table 1.1.1 DOL sales represent 32.1 percent of sales in 2017. This discrepancy is likely a result of survey respondents not recalling the exact method they used for acquiring their Discover Pass.

Figure 2.2.2: Purchase Location

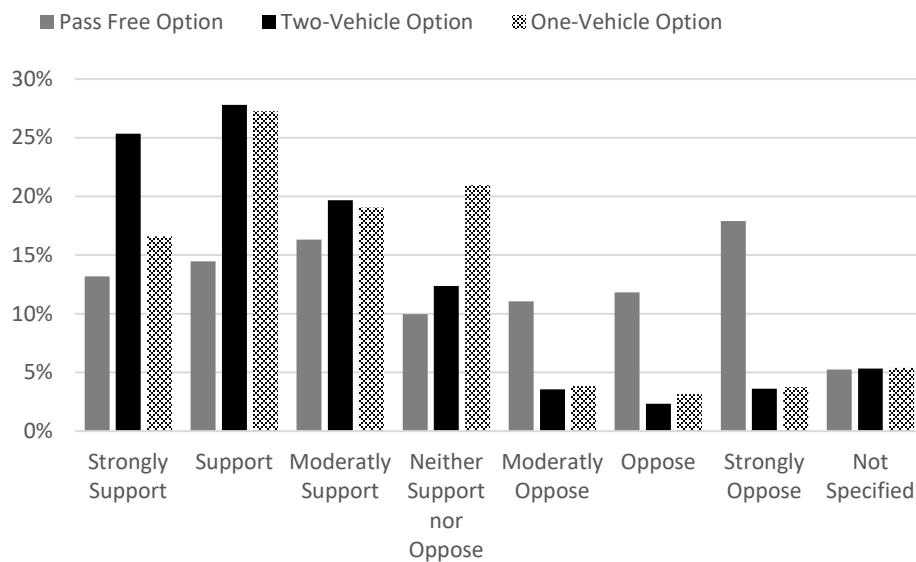


Source: WSU DGSS

Figure 2.2.3 displays the random sample results regarding the preferences of the pass options (pass free, two-vehicle and single-vehicle). Most support is given to the two-vehicle pass option with the pass free option being least preferred. This may not reflect the least cost approach or the most welfare enhancing option. There is a built-in preference for the status quo in most situations, what

economists refer to as anchoring. Total percentage support for the pass free option is 44 percent, with 15 percent of respondents being indifferent or unresponsive and the remaining 41 percent opposing the pass free option. The two-vehicle pass options generates 73 percent support, with only nine percent opposing and the remaining 18 percent being indifferent or unresponsive. The single-vehicle pass option demonstrates similar figures to the two-vehicle option with 63 percent supporting, 11 percent opposing and 26 percent indifferent or abstaining.

Figure 2.2.3: Pass Option Preferences



Source: WSU DGSS

Chapter 3: Analysis of Pass Options

3.1: Analyzing Pass Free Access

3.1.1: Reduced Cost for Residents

The number of annual passes sold in 2017 was 648,842 with an additional 338,410 day-passes sold. These sales accounted for \$23,285,448 in revenue. Though roughly two percent of these sales were to out-of-state visitors, total passes sold amounts to roughly 13 percent of total registered vehicles in the state. Table 3.1.1 outlines the historic vehicle registrations reported by the Washington Department of Licensing. Annual growth rates in registrations are provided in the final row of data.

Table 3.1.1: Past and Projected Vehicle and Vessel Registrations

	2013	2014	2015	2016	2017	2018
Vehicles	6,792,305	6,932,826	7,123,864	7,559,161	7,867,408	8,088,075
Annual Rate of Change		2%	3%	6%	4%	3%

*All registrations were taken as of a December 31st census date

Source: WA DOL

In 2017, if all registered vehicles were required to pay a surcharge for park access, the baseline revenue target of \$30 million could be met at \$3.76 per registration. This assumes no exemptions and that one-time registrations, such as vehicles with Purple Heart plates or government vehicles, would be required to pay the surcharge as well. This is impractical since one-time registrants would be required to voluntarily pay the surcharge. It also ignores the revenue generated from out-of-state pass sales. The \$3.76 price point provides a lowest bound estimate for generating the required baseline revenue target.

Two exemption packages are outlined in Appendix 2. Table 3.1.2 shows the required surcharge for meeting the baseline revenue target under both exemption packages. Under the first exemption package only 6,320,341 vehicles, based on 2017 data, would pay the surcharge, as opposed to the second exemption package where 7,388,451 would pay the surcharge. Given the number of vehicles required to pay the surcharge under each exemption package, the \$30 million bassline revenue could be met at between \$4.68 and \$4.01 per vehicle, for exemption packages 1 and 2 respectively.

Table 3.1.2: Registrations, Exemptions and Expected Surcharge

	Pkg #1	Pkg #2
	Exemptions	Exemptions
Vehicle Registrations	7,867,408	7,867,408
Registrations Less Exemptions	6,320,341	7,388,451
Out-of-State Passes*	9,860	9,860
Expected Surcharge	\$4.68	\$4.01

*Out of state passes under this pass system are \$40.

Source: WA DOL and author's calculations

The original surcharge recommendation by the Ruckelshaus Center was between \$7 and \$15. Given 2017 vehicle registrations, exemption package one would generate \$44,636,787 in revenue at \$7, and \$95,199,515 in revenue at \$15. Exemption package two would generate between \$52,113,557 and \$111,221,165 for the \$7 and \$15 surcharges. Building in additional revenue to cover the cost of increased visitation would be an important consideration in establishing a surcharge price under the pass-free scenario.

Non-Sale Revenues:

An important caveat needs to be made and carefully understood. The baseline revenue goal of \$30 million is a replacement of the Discover Pass *sales*. However, gifts and donations as well as infraction revenues are not addressed by the prices outlined above. It is reasonable to assume that most of the infraction revenue would be eliminated under the pass free system. It is unclear what the relationship between the pass free system and gifts and donations would be. During the original implementation of the Discover Pass program gifts and donations declined. A registration surcharge may result in lower donations as well, though the extent and magnitude is speculative at this point. Even though a surcharge of between \$4 and \$5 would generate the baseline revenue under the various exemption packages, a slightly higher price may be necessary to recover the lost donation and infraction incomes.

3.1.2: Estimated Increase in Park Visitations

Under this option the price of access would be greatly reduced, from the current \$30 price to between \$4 and \$5. It is likely that since virtually all Washington residents will have access to state lands that visitations or participation days would increase. Total participation days to state lands in 2013 were estimated at 49,095,000.⁸ It is uncertain how the increased access under the pass free system would affect participation days, but they would likely increase. The ratio of participation days to pass sales was 49.7 in 2013. Using that same ratio and applying it to the increase in vehicle pass access we estimate that participation days could increase to as much as 367.2 million participation days. It must be understood that increased access does not automatically result in increased use. Individuals may not be utilizing state public lands for several reasons, only one of which may be access. As such, this estimate of increased participation days should be seen as an upper bound with a low probability of being realized. Those individuals that highly value and utilize the state parks are likely already purchasing passes. New entrants into the market may value outdoor recreation but are likely to have much lower participation rates than current users.

3.2: Analyzing the Single-Vehicle and Two-Vehicle Pass Option

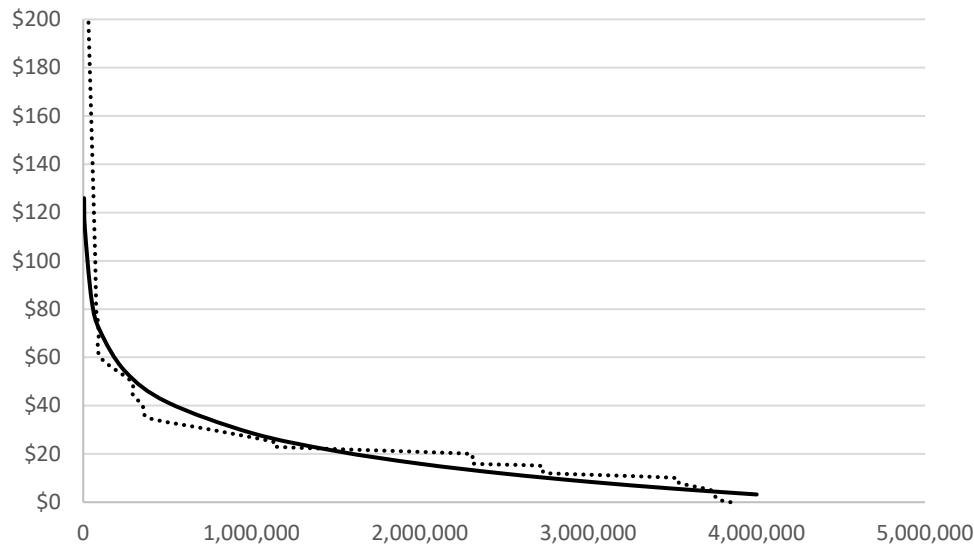
3.2.1: Price Elasticity of Demand

We estimate the sensitivity of the volume of annual passes purchased to their price by estimating a demand curve. We do this using the random sample data collected by the DGSS. As such, only the

⁸ Briceno, T., Schundler, G. 2015. Economic Analysis of Outdoor Recreation in Washington State. Earth Economics, Tacoma, WA. Data in this analysis came from the Statewide Comprehensive Outdoor Recreation Plan (SCORP) 2013.

1,464 random sample respondents were used in creating the demand curve. The model used was a stated preference model with open ended bids. Outlier observations were removed from the analysis.⁹ Figure 3.2.1 shows the willingness to pay for an annual pass on the y-axis while the number of Washington citizens willing to purchase at each price are shown on the x-axis. The figure overlays the stated preference data, the dotted line, with the estimated demand function.

Figure 3.2.1: Contingent Valuation Data and Estimated Demand



The demand curve above was estimated using a log linear model. The following relationship was identified:

$$P = -18.36 * \ln(Q) + 279.40 \quad (\text{adjusted } R^2 = .939)$$

Where P is the maximum price respondents were willing to pay and $\ln(Q)$ is the natural log of the quantity purchased at a specific price. The model explains roughly 94 percent of the variation in the data, which is an extremely good fit.¹⁰

⁹ Of the 1,464 observations in our sample, five stated a willingness to pay above \$200 for a pass with one respondent stating they would be willing to pay \$500. Respondents removed from the model estimation composed 0.34% of the total sample.

¹⁰ Modeling specifications are provided in the technical Appendix to this report.

Selection Bias:

Two issues may lead to a potential biasing of the demand estimation. In so far as the random sample data is not reflective of actual Washington state residents, the willingness to pay measures may be skewed. This is referred to as selection bias. By using the random sample data, we have tried to minimize any potential selection bias. Survey Sampling International administered the random sample survey and though their exact methodology is proprietary they reported to WSU DGSS that “The three random surveys provided sufficient responses to generalize to the respective populations with a 95% Confidence Interval and a 5% Margin of Error.”

Hypothetical Bias:

The second potential bias is pervasive in stated preference studies and is referred to as hypothetical bias. Loomis (2011) covers the topic extensively and suggests an ex ante approach to dealing with the potential bias through the survey design. If the survey is designed to generate incentive compatibility the bias is reduced. This technique appears to have been followed in the WSU DGSS survey since misstating preferences could have negative effects on a respondent (e.g., implementation of a price or pass system they did not prefer). Loomis (2011) acknowledges that the bias tends to overstate willingness to pay but stresses the lack of a “general theory for dealing with the bias.”

Table 3.2.1 provides the prices, quantities and associated elasticities from the above regression equation. The final column reflects the expected revenues given the price and quantities.

Table 3.2.1: Price Elasticity of Demand

Price	Quantity	Elasticity	Revenue
\$5.53	3,000,000	-0.136	16,591,412.27
\$8.88	2,500,000	-0.275	22,196,149.34
\$12.98	2,000,000	-0.433	25,952,134.16
\$18.26	1,500,000	-0.614	27,388,202.62
\$25.70	1,000,000	-0.817	25,704,398.07
\$38.43	500,000	-1.010	19,216,364.53
\$51.16	250,000	-1.510	12,790,265.01
\$67.99	100,000	-1.824	6,798,699.84
\$80.72	50,000	-2.671	4,035,766.47
\$110.27	10,000	-2.185	1,102,695.99
\$123.00	5,000	-4.332	614,989.65

From Table 3.2.1 we can see that as price increases, quantity of passes demanded will decrease. The elasticity column shows that low prices have low elasticity, meaning that people are less sensitive to prices and purchases are more elastic. As prices rise elasticity becomes more inelastic and consumers are more sensitive to price. At current prices the elasticity is just over unitary at -1.191, meaning that increasing price by one percent would result in a roughly 1.2 percent reduction in the number of

passes sold. Revenues are calculated as price times quantity, and are maximized at just over \$27 million, when prices are at roughly \$18.36 and passes sold are 1.49 million.

It is important to place the model findings shown in Table 3.2.1 in to the broader context of the number of households likely to purchase a pass. Washington is currently estimated to have 2.7 million households. It is unlikely that more passes would be sold than the number of households if the current two vehicles per pass system is retained. Demand for the pass is also driven by personal preference or circumstances such as age, disability, access to state outdoor recreation opportunities and the desire to recreate outdoors.

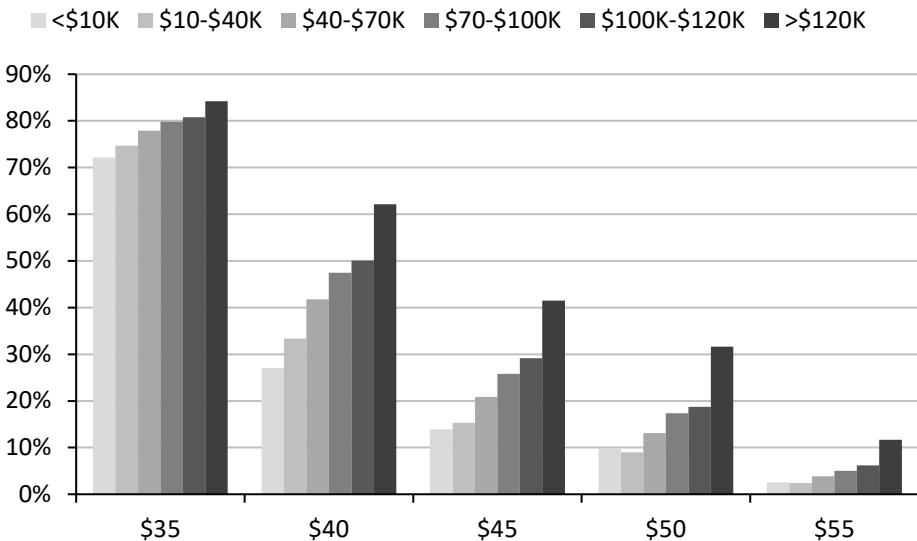
3.2.2: Income Elasticity of Demand

In this section we look at how an individual's purchasing decision is based on their income. If the volume of a good purchased, or the willingness to pay for a good, increases with an individual's income the good is considered normal.¹¹ Figures 3.2.2 and 3.2.3 below show that willingness to pay for a Discover Passes increases, generally speaking, as incomes rise, but decreases as prices increase. For any given discrete price, higher income respondents are more willing to purchase a Discover Pass.

Figure 3.2.2 uses the discrete choice and preference responses from the non-random sample data. It shows that as household incomes rise from less than \$10,000 per year to more than \$120,000, the probability of buying an annual pass rises. This is true at every discrete price point, with the exception of the \$50 price where there is a slight drop in probability of purchasing an annual pass from less than \$10,000 to between \$10,000 and \$40,000 in annual income. One of the most interesting effects seen from this figure is how much more quickly the probability of purchasing an annual pass falls as the price increases for low income families compared to higher income families. The probability that a family with an income below \$10,000 buys a pass falls 63 percent when the price increases from \$35 to \$40 per pass. That same price change results in only a 26 percent decline in probability of buying a pass for families with an income above \$120,000 per year.

¹¹ If the volume or willingness to pay for a good decrease as income increases, the good is called inferior. Inferior goods are usually items like boxed macaroni and cheese. Most people tend to buy less of it as their income increases.

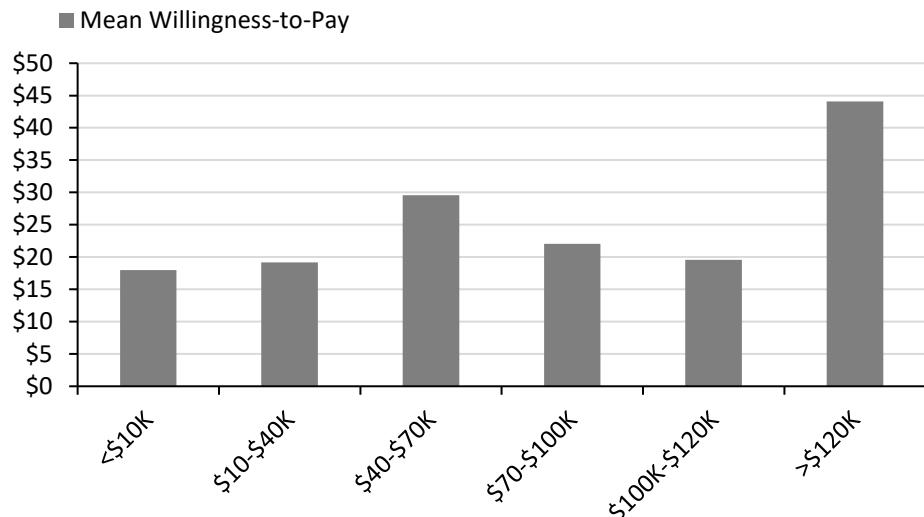
Figure 3.2.2: Willingness-to-Pay by Price and Income Category (non-random sample)



Source: WSU DGSS

Because the data in the previous figure was derived from current pass holders we wanted to see how income and willingness to pay were related for the random sample respondents that stated their willingness to pay. Figure 3.2.3 shows the weighted average willingness to pay associated with each income category. The percentage of respondents within each income category is also provided. There appears to be a drop in the weighted average willingness to pay when moving from the \$40,000-\$70,000 to the \$70,000-\$100,000 annual income and another drop when moving from the \$70,000-\$100,000 to the \$100,000-\$120,000 annual income categories. This may be the result of the smaller sample sizes for these income categories. The households with less-than-\$10,000 in annual income category only represented five percent of the random sample. Each of the categories \$10,000-\$40,000, \$40,000-\$70,000 and greater than \$120,000 all compose more than 20 percent of the random sample of respondents. The two anomalies in the data are for the \$70,000-\$100,000 and \$100,000-\$120,000, which represent 19 percent and nine percent of random respondents respectively.

Figure 3.2.3: Mean Willingness-to-Pay by Income Category (random sample)



Source: WSU DGSS

Based on these figures the average income elasticity of demand for the random-sample respondents was 1.31. This means that for a one percent increase in income, a respondent's willingness-to-buy a pass at a given price level increases 1.31 percent. This does not seem out of line with income elasticity measures reported in Benson et al. (2013) or Stevens et al. (2014).

3.2.3: Projected Revenue and Pass Purchases

Based on the estimated demand curve we can calculate total expected revenues at each price point. Figure 3.2.2 shows the expected revenues at each discreet price point and allows us to estimate the maximum revenue attainable for the given demand function. The revenue equation below was used to calculate the maximum revenue that could be generated for the estimated demand curve. The revenue maximizing price and quantity are \$18.36 and 1,491,504 annual passes, resulting in total revenues of approximately \$27.39 million.

$$\text{Revenue} = P * Q = (-18.36 * \ln(Q) + 279.40) * Q$$

Given the estimated demand curve and the current number of annual passes (648,842), the expected price is \$33.65, very close to the reported data in chapters 1 and 2. Total estimated revenues are \$21,832,010, slightly lower than the \$23,285,448 currently reported.

Figure 3.2.2 shows the relationship between the demand curve and total revenues. When the price for an annual pass is extremely high little to no demand exists. This can be seen in the first panel of the figure. At a price of \$120 there is no demand for Discover Passes. From the second panel in the figure we can see that at a quantity of zero no revenue is generated. As price falls and quantity sold increases. The first horizontal dashed line shows the \$33.65 price and the associated vertical line

shows the 648,842 annual passes sold. Tracing the vertical line down to the second panel we see that the revenues associated with this price and quantity are roughly \$22 million.

The second horizontal line in the first panel represents the \$18.36 price per annual pass. The associated vertical line identifies the 1.49 million annual passes expected to be sold at the \$18.36 price. Tracing the vertical line to the second panel we can see that the total revenue curve is maximized at that price and quantity. Maximal revenue for the given demand curve is shown at approximately \$27 million.

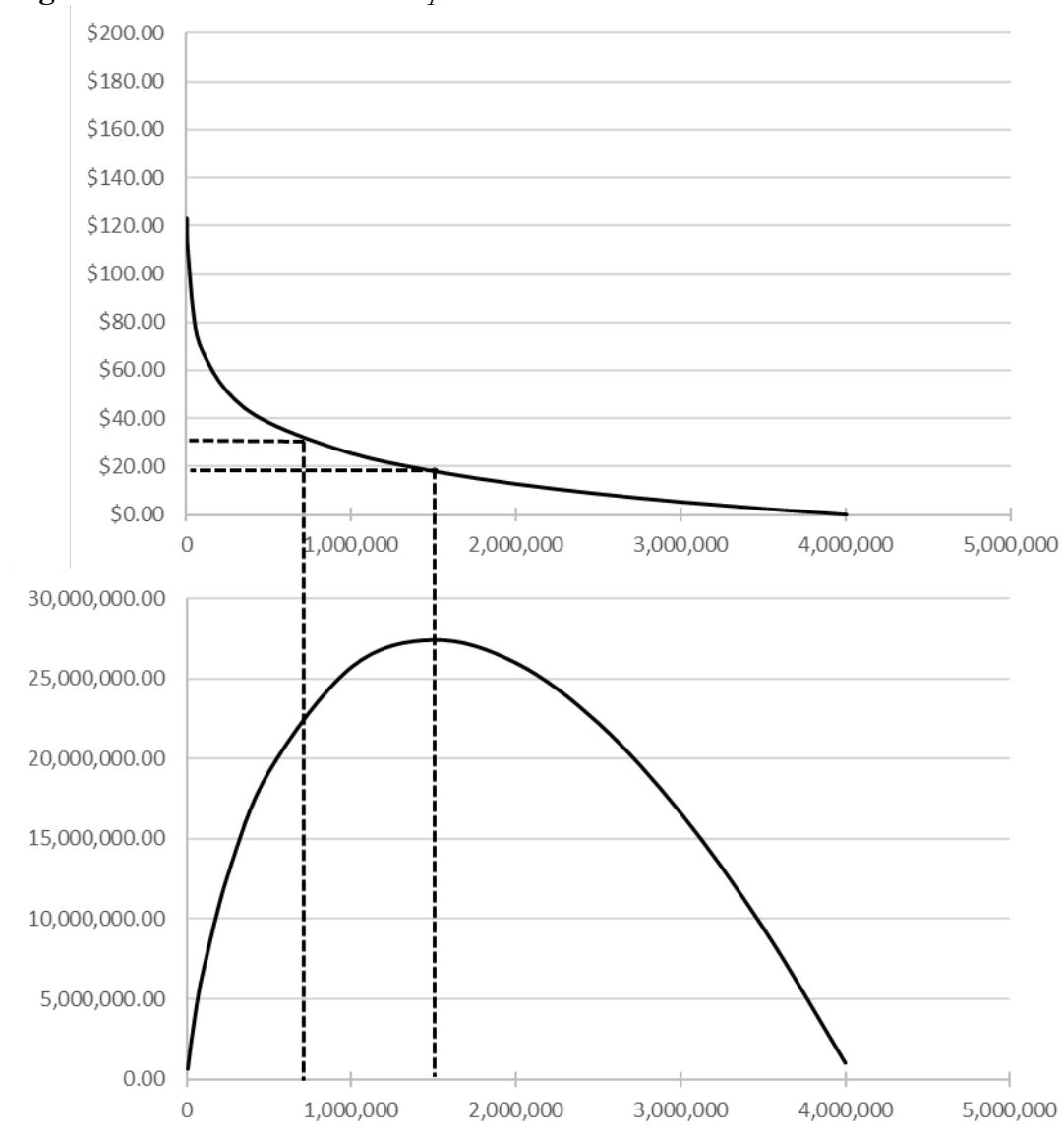
Reducing price below \$18.36 would result in lower than maximum revenue collections. Simply lowering price is not always a solution to generating revenue and the nature of the revenue curve must be understood in the context of its tipping point.

The total annual pass revenues under the current two-vehicle pass system were \$19.5 million. Based on the model total revenues were expected to be \$21.8 million. Increasing the annual pass revenues to their expected maximum of near \$27.4 million would result in a 41 percent increase in revenues. Meeting the revenue growth criteria of 5 percent, 10 percent and 15 percent is achievable by reducing prices and moving right along the total revenue curve. Table 3.2.3 provides the revenues, prices and quantities for achieving the requisite revenue gains. All prices, quantities and revenues in the table reflect the modeled predictions.

Table 3.2.3: Revenues, Prices and Quantities for Discrete Increases in Revenue

Percent Increase	Revenues	Price	Annual Passes Sold
0%	\$21,832,010	\$33.65	648,842
5%	\$22,923,610	\$31.60	725,498
10%	\$24,015,211	\$29.45	815,414
15%	\$25,106,811	\$27.12	925,684

Figure 3.2.2: Demand and Total Expected Revenue



3.2.4: Reduced Fee Single-Vehicle Pass

Under the reduced fee single-vehicle pass system prices are to be set between \$15 and \$20. As stated above, these prices are likely to increase total revenue. The difficulty under this framework is being able to determine what portion of the passes sold are the result of previous pass holders buying multiple passes or new buyers entering the market as a result of the reduced price. Invariably it will be a mix of both.

The single-vehicle pass option would still give annual access to pass purchasers and in that regard it is very similar to the two-vehicle pass option. Under a \$15 price point and assuming the same number of day-passes are sold, roughly 1.77 million single vehicle passes would need to be sold to

achieve a \$30 million revenue target. 1.33 million would need to be sold if the price point were \$20. This information is synthesized in Table 3.2.4.

TABLE 3.2.4: *Annual-Passes Required to Achieve Baseline Revenue*

Baseline Revenue	\$30,000,000	\$30,000,000
Revenue from Day-Passes	\$3,384,100	\$3,384,100
Proposed Price Point	\$15	\$20
Number of Annual-Passes	1,774,393	1,330,795

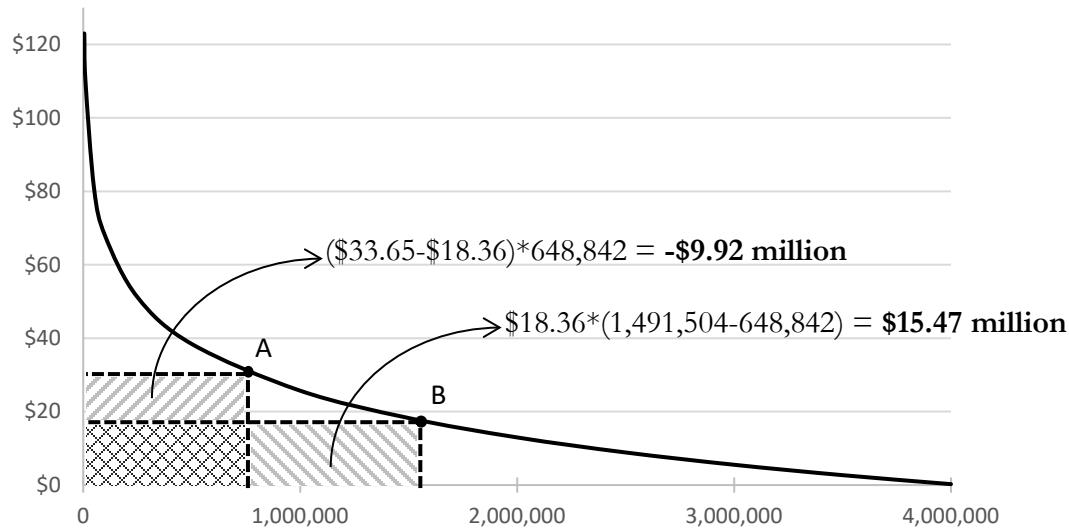
If the demand curve estimated above holds for the single vehicle pass system, which it may, then pricing below the \$18.36 price point would result in lower than maximal revenue. The two-vehicle pass option was preferred to the single-vehicle pass option, suggesting that consumers do value the transferability of the pass to more than one vehicle, but it is not clear how that function of the pass translates into pass purchases. Data on willingness to pay under a single vehicle pass option was not collected. So, the difference between the demand curves of a single-vehicle pass system and a two-vehicle pass system is unknown.

The single-vehicle pass option could be set up similar to an online streaming service or annual software subscription that provides a product to single user, but additional users can be added for a fee. If the single-vehicle system were adopted with an \$18 price point and additional vehicles could be added to the pass for a \$10-\$12 fee, it would allow price sensitive buyers to enter the market while continuing to offer the flexibility of the current system.

3.2.5: Price and Quantity Effects

This section outlines what revenues will be lost from the reduction in price and what revenues would be gained from an increase in the number of annual passes sold. Figure 3.2.4 again shows the demand curve with the current price and quantity labeled A and the revenue maximizing point labeled B.

Figure 3.2.4: Revenue Decomposition



The cross hatched area represents revenues that are received under both price points and represents the revenue received from selling 648,842 annual passes at \$18.36. The right hatched area (the upper rectangle) represents the revenues lost from the price reduction i.e., the current 648,842 annual pass holders will pay \$18.36 rather than the \$33.65 they are currently paying. That represents a loss of revenue of roughly \$9.92 million. The left hatched area (the right rectangle) represents the revenue gained from the increased number of passes sold. Rather than 648,842 annual passes sold there would now be approximately 1.49 million passes sold at \$18.36, representing a \$15.5 million increase in revenue. As long as the revenue from increasing the quantity sold is greater than the loss in revenue from decreasing the price, the net effect of a price reduction will be increased revenues. Table 3.2.5 synthesizes these results.

Table 3.2.5: Net Revenue Effect from a Price Reduction

Change in Revenue	
Price effect	-\$9,917,259
Quantity effect	\$15,473,896
Total effect	\$5,556,637

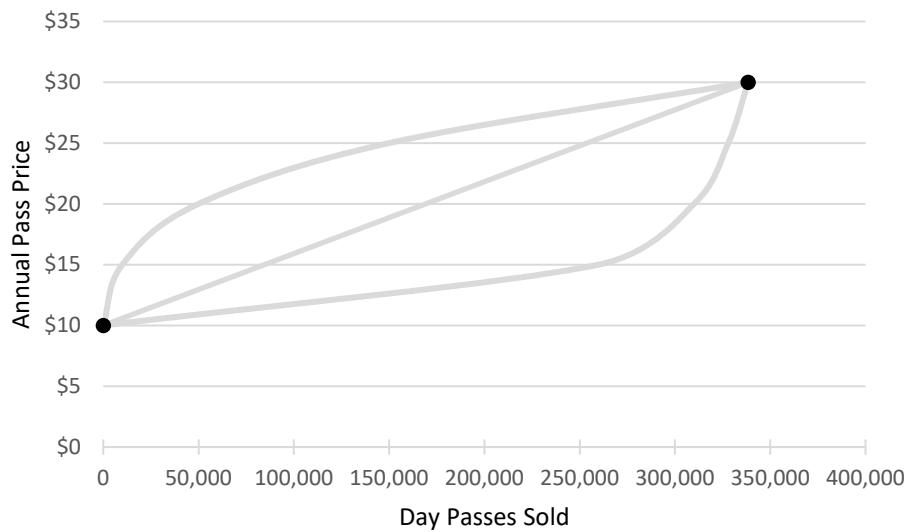
3.2.6: Annual and Daily Pass Interactions

This last section of the chapter addresses the potential impacts on total revenues from lowering the annual pass price. Particularly we focus on the interactions between day pass revenues and annual pass revenues. These two passes are in many ways substitutes for one another. If the price for the annual pass falls some individuals will opt out of buying day passes and prefer instead to purchase the annual pass. The interaction between these two pass products is not clear and has not been the focus of previous research, nor is it the objective of this report. However, it must be addressed in some degree since certain extremes interactions are possible.

If the price of the annual pass were to fall to \$10, the current price of a day pass, then visitors would universally prefer the annual pass since it is the same price as the day pass and provides more value. On the other hand, if the price of the annual pass were to increase to \$100 the number of day passes would likely expand since some current Discover Pass holders do not access public lands ten times in a year. Economists refer to products that operate in this way as substitutes. We can get a sense of how the annual-pass price influences day-pass quantities by referring to Figure 3.2.5.

The upper right point on the graph represents the current annual-pass price, \$30 and the number of day-passes sold, 338,410. The lower left point assumes day passes sold would be zero at the price of \$10, the price of the day passes. It is not clear what the cross-price relationship between the two pass types is. As such we cannot say how many day passes would be sold at \$10 if the price of the annual pass were reduced to \$18.36.

Figure 3.2.5: Annual-Pass Prices and Day-Pass Quantities



In order to say how total revenue will be influenced by reducing the annual pass price a relationship between the two products is necessary. However, such an analysis is outside the scope of the current project and data provided. We provide the range of potential total revenues collected in table 3.2.6. This table assumes the annual pass price is set at \$18.36 and day pass prices remain at \$10 per day. What is being adjusted is the expected number of day passes sold. Whether or not one of these extremes is realized depends on the assumed relationship between the two products.

Table 3.2.6: Potential Total Revenue Range

	Minimum	Maximum
Annual Pass Revenue	\$27,388,646	\$27,388,646
Day Pass Revenue	\$0	\$3,384,100
Total Revenues	\$27,388,646	\$30,772,746

3.3: Other Proposed Pass Changes

A key discussion point throughout the Ruckelshaus report was the idea of combining access to state and federal land in Washington with a single pass. The goal was that state agencies (State Parks, DNR and WDFW) would work with federal agencies to explore a revenue sharing arrangement such that a single pass would allow users to utilize both state and federal lands. It is unclear at present how such a relationship would operate. Without a clear statement of the revenue sharing arrangement and expected revenue generation, an economic analysis is impossible and economic outcomes would be purely speculative. However, the survey conducted by the DGSS did ask respondents to comment on their interest in combining state and federal pass access.

Of current pass holders roughly 90.5 percent were interested in a pass that combined access to all state and federal managed lands in Washington. 4.5 percent were indifferent and 5 percent had little to no interest in such a pass. The same respondents were asked about their interest in a single combined pass that gave them access to all state managed lands and all National Forests in Washington. In this case 85.4 percent of respondents were still interested, 7.1 percent were indifferent and 7.5 percent had little to no interest.

A pass of this type would represent an entirely different product than those discussed within this report and no pricing data was gathered by DGSS on such a product. If a combined pass were to be implemented a new survey and demand analysis would need to be performed. Such a pass would provide more value to pass purchasers by giving them access to more public lands in the state. Since revenue from pass sales would need to be dispersed to both state and federal agencies the price point for such a pass would, most likely, be higher than the proposed options above. In addition, the National Forest Service is currently exploring options to increase their recreational access fees in Oregon and Washington, adding another consideration to the creation of a combined pass system.

Chapter 4: Implementation and Logistics

This chapter reviews the current costs for administering the Discover Pass as it stands and discusses potential cost advantages and disadvantages from implementing each of the three proposed alternative pass options. Costs are broken down by primary pass providers.

4.1: Current Costs

Administrative and logistical costs for providing the Discover Pass were provided by the Department of Fish and Wildlife, the Department of Licensing and the Parks and Recreation Commission.¹² It is important to understand when looking at the expenses reported by these agencies that it is not inclusive of administrator's time and may not fully reflect employee expenses. Changing the Discover Pass system will not inherently remove or even reduce all of the reported expenses below. For example, moving to a pass free option may increase visitations and result in larger customer service and trail maintenance expenses.

Table 4.1.1 shows the 2016-2018 Discover Pass implementation costs incurred by the Washington Department of Fish and Wildlife. Table 4.1.2 shows how those costs are distributed among Parks, Department of Natural Resources and Department of Fish and Wildlife through their interagency agreement. Of the WDFW costs recorded under Discover Pass billing, Parks covers 84 percent, DNR covers eight percent and WDFW covers the remaining eight percent.

Table 4.1.1: WDFW Discover Pass Expenses by Expense Category (2016-18)

	2016	2017	2018
Calls Normal Business Hours	\$23,816	\$25,594	\$23,880
Calls After Normal Business Hours	\$27,493	\$39,882	\$18,490
Email Correspondence	\$2,744	\$860	\$545
Reissued Passes	\$216	\$95	\$175
New Booklet Dealers	\$144	\$90	\$36
Booklet Orders	\$1,590	\$1,392	\$1,158
Return Documents	\$8,042	\$3,596	\$1,251
Merchant Processing Fees	\$16,646	\$24,486	\$24,664
Additional Vendor Payments	\$3,600	-	-
Indirect Labor Costs	\$24,621	\$27,100	\$12,935
Total	\$108,913	\$123,095	\$83,134

These costs, recorded by WDFW, do not include the capital costs of the various machines stationed in retail outlets that sell passes. The machines cost roughly \$360 a piece, with a portion going to cover sales taxes and procurement services.

¹² Data from the Washington State Department of Natural Resources could not be obtained in time for this report.

Table 4.1.2: WDFW Discover Pass Expenses Covered by Interagency Agreement (2016-18)

	2016	2017	2018
Parks	\$91,487	\$103,400	\$69,833
DNR	\$8,298	\$9,848	\$6,651
WDFW	\$6,292	\$9,848	\$6,651
Total	\$108,913	\$123,095	\$83,134

Parks estimated that their costs of administering the Discover Pass program was \$2.4 million in FY 2016 and \$2.8 million in FY 2018.¹³ The majority of these expenses, between 65 percent and 75 percent, go to cover staff expense including the time spent on sales, marketing, advertising, enforcement and customer service. The remainder goes to cover direct expenses such as printing, credit card processing fees, fulfillment, etc.

The Department of Licensing has already implemented the automated process for capturing Discover Pass sales purchased at the time of vehicle registration. As such, there are no current direct costs, though a portion of DOL staff costs should be allocated to the Discover Pass program. Removing the Discover Pass program may not result in a reduced need of DOL staff but some staff time is currently allocated to Discover Pass order fulfillment. Total DNR expenses for supporting the current Discover Pass system are unknown, beyond what they currently cover through the interagency agreement.

If we assume that the interagency agreement is reflective of the actual share of Discover Pass administration expenses and we include the additional expenses incurred by the DOL, total Discover Pass expenses would be between \$3.5 and \$4 million annually. Indirect expenses probably cause that figure to be higher in actuality.

4.2: Cost Revisions under Alternative Pass Options

While a discussion of the potential changes to the cost structures of the agencies under the different pass options involves some conjecture, the cost of alterations considered appear reasonable in light of the proposed changes.

Pass Free Option

The pass free option is the largest departure from the current Discover Pass system and represents significant changes in expected expenditure patterns for the various departments. Changes in the DOL costs are primarily one-time expenses related to reprogramming of their billing system. They estimate the cost for revising their DRIVES system, adding new revenue accounts, coding for exempt vehicles and testing collection and operating systems will be \$16,900. Indirect and ongoing costs are expected as well. Transaction times and wait times are expected to increase as DOL personal will need to explain the new pass system and new charge to individuals registering their vehicles. They will also need to modify their vehicle registration notification system to account for

¹³ These figures are inclusive of the interagency agreement with WDFW.

vehicles that register prior to the new pass implementation. Registration notifications are sent out 60 days in advance of registration deadlines.

Under this pass option a larger burden will be placed on DOL Staff and up-staffing may be necessary, even if only temporarily. Additional expenses may be needed for outreach and advertising aspects of the new system to the general public. Customer education is a primary concern for the DOL.

WDFW, DNR and Parks will likely see some costs to implement the Discover Pass to be reduced or eliminated. Enforcement costs are likely to decrease since only out of state vehicles will need to be monitored for day or annual passes. Similarly, printing and fulfillment costs will decline since passes will only need to be purchased by out-of-state visitors. Merchant processing fees and retail machine costs will decline. However, net total costs are likely to increase largely due to increased staff and labor costs associated with customer service and park preservation and infrastructure expenses driven by increased attendance. None of the proposed revisions are likely to reduce overall agency staff expenses and will most likely increase them.

Two-Vehicle Pass Option

Because this option is so similar to the current framework, the implementation costs are less than the Pass free option. DOL will need to alter some exemptions and pricing codes in their DRIVES system and they estimate additional implementation costs of \$12,800. However, DOL has no outstanding concerns at this point about implementing this pass option from their end. Depending on the price revisions, printing and fulfillment costs, including reissued passes, will need to increase to meet additional demand. Similarly, expanded budgets for enforcement, customer service, maintenance and infrastructure may need to grow to account for increased usage of the public lands.

A primary concern under this option, especially under a price reduction, is transition time. The new pricing scheme will need to be explained to the public and increased demand may not occur immediately. This may result in some increased expenses without a corresponding and immediate increase in revenues. Just as when the Discover Pass was initially implemented, there will be a learning curve for the public and the rate at which the new equilibrium is achieved is uncertain. That said, in the long run, fiscal stability can be achieved since the expected increase in revenues, between roughly \$1 million and \$5 million per year, will more than compensate for the increased expenses.

One-Vehicle Pass Option

This pass option is not unlike the two-vehicle pass option in terms of implementation cost. The DOL will need to have two different pricing codes since those purchasing a pass during vehicle registration will pay a slightly lower rate than buying at other times. Because this pass option has a unique license plate tag or window decal, printing costs will be dependent on the tag design. Printing costs will likely increase and an additional margin of error should be accounted for since the tag

design is uncertain. Again, the DOL DRIVES system will need to be updated. One-time costs are higher, \$75,200, under this option because revisions will be more extensive as outlined below.

- 1) Adding new revenue account code to DRIVES.
- 2) Adding new fund for collection of fees.
- 3) Revising Fee.
- 4) Revision of Exemptions.
- 5) Modification to notification and renewal systems.
- 6) Modifications to online renewal e-services.
- 7) Program system for a unique trackable decal number.
- 8) Adding a restocking code for inventory.
- 9) Establishing a new set of reports for WDFW and Parks to track revenues and decal numbers.

DOL also expects to purchase additional passes in the first year to account for uncertainty in volume. Approximately 400,000 passes will be acquired in the first year of implementation and revisions in the following years will be made based on past number of passes purchased. Production costs of the license plate tabs or decals are estimated at between \$156,000 and \$200,000.

Implementation time and communication of the new system is of primary importance to DOL. Awareness of the new decal and restrictions are critical. This raises the workload of DOL subagents and requires DOL and subagent representatives to work closely to address concerns and processing ideas.

Cost revisions to WDFW, DNR and Parks are similar to those in the two-vehicle pass option. Enforcement, customer service, reprinting fees, etc. are expected to grow given the increased number of vehicles and public land usage. Increasing staff may be required to handle the additional workload including land management, trail maintenance, and facility expansions and upkeep.

Expected Implementation and Logistic costs

Current annual costs to implement the Discover Pass are between \$3.5 million and \$4 million annually. Agencies would incur additional one-time costs, averaging a few hundred thousand dollars to implement the proposed options. However, due to increased attendance all agencies are expecting costs to grow under all the proposed alternatives. Implementation costs are likely to rise to between \$5 million and \$6 million though these estimates cannot be substantiated without a detailed budget analysis. The uncertainty in how the overall agency cost structures of the various departments will be altered under each pass alternative is substantial. What is certain is that under the pass free option, or a reduced-price option (two-vehicle or one-vehicle), quantity of passes demanded will increase. This increased quantity of pass holders and public land visitations will require additional staff for the departments managing those lands.

Chapter 5: State Park Access and Management in Other States¹⁴

5.1 Background

Purchasing access to state parks and other state managed lands varies significantly by state. At one extreme are states that charge no user fees for state park use (Oklahoma and Hawaii, for example), while other states have an entire portfolio of access permits depending on both the individual park being visited and the visitor's activity. For example, Alabama generally issues annual and day passes on a park by park basis (a different permit for each park), but also maintains some parks where entry is free. Fees for individual parks vary significantly across parks. California does not issue annual passes on a park-by-park basis, but does have regional annual passes that give access to parks in a specific geographical area, but not parks outside the area. They also have two different statewide park access permits that vary based on when access is allowed.

There are several factors that contribute to heterogeneity in managing public access across states including management structure (number and composition of state agencies responsible for land management), recreation activities (hiking, skiing, golf, lodge stays, camping, etc.), population and financial resources including both allocations through state general funds and park specific revenue programs (day passes, annual passes, etc.).

The 2017 Ruckelshaus Center report looked in some detail at several states' public access schemes, including Oregon, Idaho and Montana with close proximity to Washington, as well as Colorado, Michigan and Pennsylvania. They described the challenges currently faced relative to state land management and management strategies currently being utilized by state. They considered not just state parks, but also management of state forest and wildlife management areas. In general, all the states they considered used revenue from hunting and fishing licenses as a revenue source for land management, as well as some percentage of revenues accruing to the states from resource extraction. Oregon and Colorado also used lottery revenue to support state land management and Pennsylvania allocated a part of their realty transfer tax to state land management.

In this discussion we take a slightly broader look at the specific issues facing state land managers nationally, and then look at several states' management of state park land access and sources of revenue captured to support overall park infrastructure and facility management.

According to the National Association of State Park Directors, there are 8,565 state parks distributed across the country, totaling 18.7 million acres. In addition, most states have public lands they manage, including for recreation, that are not officially part of their state parks system. For example, the largest state protected area in the lower 48 states is Adirondack Park in northern New

¹⁴ Similar to Washington, several states are looking at changes in either their state park access options and/or funding models for their state park systems. The information provided here is based on conditions in late summer, 2018 and may have changed in the interim.

York. It includes about 6 million acres in total, half of which is owned by the State of New York, yet it is technically not a state park. There are no access fees for Adirondack Park lands, but there are for New York state parks.

In FY 2017 there were 807 million visitors to state parks across the United States. More than 90 percent of the visits were for day use, but there were 66.7 million overnight users as well. Most of the overnight use was camping (57.4 million campers) utilizing 19.2 million campsite nights. These occurred on 221.4 thousand separate campsites that ranged from primitive to complete electrical and water hookups for RVs and travel trailers. In addition, state parks across the U.S. include over 8,900 cabins and cottages available for overnight use and 156 lodges scattered across 27 states.

The National Association of State Park Directors estimates that total operating expenditures in FY 2017 for state park management totaled over \$2.6 billion nationally, with less than 50 percent of those funds coming from state general funds; in other words, over 50 percent of the expenditures were raised through some type of user fee program. About \$756 million of the total were dedicated to capital expenses. On average, state park expenditures represented about 0.16 percent of state budgets.

5.2 Specific State Programs

This section considers several states' access programs. They include some of the most streamlined access options involving no user fees and others with the most variation in access options. We also discuss a couple of states that have significant funding models outside of user fees.

Table 5.2.1 is replicated from Appendix G in the Ruckelshaus Center study. It shows access pass options for several states that also manage multiple type land holdings. In some cases, the states have a single land management agency for all state lands (Michigan), while state lands in others are managed by multiple agencies. As noted in the Ruckelshaus report, Washington is the only state among those compared that has a single interagency state land access pass.

All states looked at in the Ruckelshaus study charge fees for state park access. However, several states do not charge an access or user fee to visit state parks (they may still charge for specific activities, like camping for example). One western state example is Hawaii. Hawaii is home to 50 state parks, but charges no direct user fees for state park access for Hawaiian residents. Several parks do charge daily fees for nonresidents that appear to range from \$1 for pedestrians to \$10 per day for vehicles.¹⁵

Hawaii finances its state park management costs through a series of directed tax revenue and general fund allocations that are not a direct function of user intensity or daily visits by Hawaiian residents (Table 5.2.2).

¹⁵ Other states not charging access fees include Kentucky, Pennsylvania, Tennessee, West Virginia and most parks in North Carolina.

Table 5.2.1: Pass Systems Across Ruckelshaus Case Study States

	Washington	Oregon	Idaho	Colorado	Michigan	Montana	Pennsylvania
Daily pass cost	\$10-\$12.50	\$5.00	N/A	\$3-\$9	\$9 (non-resident)	\$6 (non-resident)	Free to everyone
Annual pass cost	\$30 - \$35	\$30.00	\$10 (residents) \$40 (non-resident)	\$70.00	\$11 (resident)	\$6 (resident) \$35 (non-resident)	Free to everyone
Pass revenue	\$21,898,126	\$3,900,403	\$3,016,700	\$14,435,536	\$19,240,900	\$791,269	N/A
Pass revenue per capita	\$3.00	\$0.95	\$1.79	\$2.61	\$1.94	\$0.76	N/A
Pass revenue per household	\$8.20	\$2.54	\$5.12	\$7.13	\$7.61	\$1.93	N/A
Participating households	Further Research Necessary						
Pass format	Hang tag	Hang tag	Outside windshield sticker	Inside windshield cling	License Plate	License Plate	Free to everyone
Pass Transferability	Two vehicles	Transferable among vehicles	One vehicle	One vehicle	One vehicle	One vehicle	N/A

Arizona has a tiered annual pass program. They have an annual pass that allows access to all state parks, but limits access to some parks on weekends and holidays. The standard annual pass is \$75 plus a \$7 handling fee and allows the pass holder and three additional adults in the same vehicle state park access. The pass is not tied to a specific vehicle. There is an annual pass available for disabled veterans for no charge.

For a significantly higher fee (\$200 annually plus a \$7 handling fee), Arizona residents can purchase a Premium Pass, that also allows the holder and three additional adults in the same vehicle state park access, but eliminates the holiday and weekend restrictions of the standard pass.

In addition to annual passes, Arizona also offers day passes. Day pass expenses in Arizona vary by park, but can be up to \$30/day.

Prior to 2017, the Arizona State Parks Board received a small allocation from the state general fund to help support park activities, but in the last two years state park funding has come exclusively from the State Parks Revenue Fund.¹⁶ It appears, at least among western states, that Arizona is the only

¹⁶ Arizona State Parks Board, <https://www.azleg.gov/jlbc/18AR/spb.pdf>

state that fully funds state park budgets through user fees. In FY 2017 Arizona State Parks brought in a record amount of revenue from state park user fees, with steady revenue growth over the last five years.¹⁷

California has one of the more intricate state park access programs. There is a general annual pass available for \$195/year that provides access to most state parks, but not off-highway motor vehicle recreation sites. The pass is a hangtag style that can be moved to any vehicle.

In addition to the statewide annual pass, California sells regional annual passes that provide access to state parks in a specific geographical area, but not statewide access. They have an annual park pass for the redwoods region (northern California) that also includes access to most state reservoirs for \$125/year. For \$75 per year residents can buy an annual pass for state parks in the Tahoe region. A separate annual pass for off-highway motor vehicle recreation sites is also available for \$50/year. All of these are hangtags.

A unique pass just for state historic parks is available as a wallet card for \$75/year. In addition, most California parks also sell day passes. Prices vary up to \$15 per day.

In addition to user fees and general fund allocations, several states have programs that allow interested citizens to make donations to the state park system, or buy special license plates that then spin off a part of the license registration fee to the parks system. Washington currently has such a program. Minnesota just implemented a new program that allows residents to purchase a license plate for \$70, of which \$10 is for the plate itself and the remaining \$60 goes toward state park support. The license plate can be used to replace the traditional annual parks pass and is renewable for \$60 per year. The plate provides access to all 75 Minnesota state parks and replaces the \$35 annual pass needed by visitors without the state park license plate. Owners of the plate can then also purchase a reduced price annual pass for additional vehicles they may own.

New Hampshire has a similar program. Residents can buy an annual park pass for \$60 per year that allows a single person access to most (but not all) state parks, or a family pass for two adults and four dependents for \$105 per year. Alternatively, they can purchase a New Hampshire State Parks license plate that provides access for the licensed vehicle and all passengers access to the state parks.

¹⁷ Azcentral, <https://www.azcentral.com/story/news/local/arizona-investigations/2017/08/18/arizona-state-parks-revenue-visitation-and-some-staff-pay-rise-under-director-sue-black/574797001/>

Table 5.2.2: Selected State Park Access Programs

STATE	DESCRIPTION	COST
Arizona	Annual Pass for day use covers all state parks - access for buyer and up to three more people each day. No Access to a few parks on weekends or holidays	\$82*
	Premium Pass - access for buyer and up to three more people each day. Includes weekend and holiday access at all parks	\$207*
	Day Pass - varies by park	<=\$30
* includes \$7 handling fee		
California	Annual Pass for day use at most state parks - hangtag does not include access to off-highway motor vehicle recreation sites	\$195
	Annual Pass for Redwood region and most state reservoirs - hangtag	\$125
	Annual Pass for the Tahoe region - hangtag	\$75
	Annual Pass for off-highway motor vehicle recreation sites – hangtag	\$50
	Annual Pass state historic parks - wallet card	\$50
	Oversized vehicle pass- in addition to annual pass. For vehicles over 25 feet in length or 9 feet wide	\$75
Day Pass - varies by park		<=\$15
Hawaii	No entrance fees for any state park for state residents	\$0

Chapter 6: Conclusions

Annual Discover Passes sold in 2017 totaled 648,842 and revenue generated by them was \$19.9 million. Day passes sold were 338,410 and generated an additional \$3.38 million. Including these and other revenues (such as fines), total Discover Pass revenue in 2017 was \$23.3 million. Three proposed revisions to the Discover Pass were recommended in the 2017 “Recreation Fees in Washington State” report prepared by the William D. Ruckelshaus Center. They were as follows:

Pass Free Option:

This option is the preferred recommendation of the voting members of the leadership team. This option replaces the Discover Pass with a simple vehicle registration surcharge. It provides broad support for public land management as well as a stable and equitable revenue source.

Two-Vehicle Pass Option:

This pass option builds on the success of the Discover Pass program and identifies ways to simplify the pass system, and standardize the exemptions and discounts offered. This pass option would also unify the pass free days among all WDFW, DNR and Parks managed lands. A mechanism to adjust for inflation would be included.

One-Vehicle Pass Option

This pass system is designed to reduce fees and enable more households to participate in the Discover Pass program and recreate on state-managed lands. In order to encourage participation at the time of vehicle registration, individuals would be given a discounted price during registration. A mechanism to adjust for inflation would be included.

Implementation of the pass-free option will spread the costs of managing the state’s public lands across all Washington citizens and potentially provide additional revenue to the departments that manage those lands. Reaching a target revenue goal of \$30 million can be achieved by setting a vehicle registration surcharge of between \$4 and \$5 depending on which vehicle exemptions are allowed. This does not account for any reductions in gifts and donations that may occur.

Under the two-vehicle pass option annual pass revenues can be increased from their current levels by 5 percent, 10 percent and 15 percent by reducing the Discover Pass price from roughly \$34 currently,¹⁸ to \$31.60, \$29.45 and \$27.12 respectively. Annual pass revenue is expected to be maximized at roughly \$27.4 million with a price of \$18.36 and 1,491,504 annual passes sold. This analysis does not account for how annual pass sales influence day pass sales. Because that relationship is not well defined and not investigated here, we can only say that expected revenue will still be increased even if all \$3.38 million in day pass revenue were lost. If day passes were uninfluenced by the reduction in annual pass price, total revenue would be expected to reach \$30.77 million. It is important to note that quantity demanded may take time to reach a new equilibrium

¹⁸ Even though the Discover Pass price is currently set at \$30, retail vendors and web based sales charge a transaction fee such that the average pass price is \$33.65.

since the public is not likely to respond immediately to the reduced price. Revenue increases may lag at the beginning if this policy choice is adopted.

The single-vehicle pass option is assumed to have a similar demand curve to that under the two-vehicle pass option. This pass option offers an alternative to the current system by encouraging price sensitive citizens to buy a Discover Pass. Those current users that value having multiple vehicle access to public lands can achieve that goal by purchasing a second or third pass. This option allows for increased citizen participation while preserving the flexibility of the current system.

While costs to implement the alternative pass options are likely to decrease, overall agency costs are expected to rise under any of the alternative pass options. These increased costs are primarily driven by increased attendance and the needs for additional staff by public land management agencies for expenses such as additional customer support, enforcement, and trail and facility maintenance. Cost increases will be a function of how quickly demand responds to reduced prices.

Appendix 1: References

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Appendix 2: Glossary of Terms

Contingent valuation – A survey-based economic technique for the valuation of non-market resources.

Demand – A graphical representation of the relationship between quantity demanded and price.

Hypothetical bias – Bias introduced when a respondent reports a willingness to pay in a hypothetical situation that differs from their willingness to pay in an actual payment situation.

Incentive compatibility – A survey is considered incentive compatible if respondents are incentivized to tell the truth because misstatement of their position would have a negative effect on them.

Income elasticity of demand – The percentage change in quantity demand of a good divided by a percentage change in the consumer's income. The sensitivity of quantity demanded to consumer income.

Price elasticity of demand – The percentage change in quantity demanded for a percentage change in the good's price. Sometimes referred to as the slope of a demand curve at a given price.

Price effect – The change in revenue that would occur if quantity were fixed at the original level and price was altered.

Quantity demanded – The actual amount of a good or service consumers are willing to buy at a given price.

Quantity effect – The change in revenue that would occur if the price were fixed at the new level and quantity was altered.

Random sample – A method of selecting a sample from a population in such a way that the sample is an unbiased representation of the entire population.

Revealed preference – The actual price paid or action taken by a consumer.

Selection bias – Bias introduced through the selection of individuals or groups that do not fully represent the population intended to be analyzed.

Stated preference – The preference for a particular price or action reported by a survey respondent

Total effect – The total change in revenue that occurs when both price and quantity are altered along the demand curve.

Appendix 3: Data and Technical Appendix

Table A3.1 provides the standard deviations by revenue source. DOL has been more stable month to month than the other revenue sources. The DOL revenue volume has been climbing steadily and has a higher growth rate than the other sources, as shown in Table A3.2. These tables are best understood in the context of Figure 2.1.3.

Table A3.1: *Standard Deviation by Revenue Source and FY*

FY	DOL	Parks	WDFW
2012	\$167,164	\$425,848	\$548,139
2013	\$138,062	\$383,817	\$345,633
2014	\$175,647	\$372,336	\$365,061
2015	\$158,550	\$448,216	\$433,399
2016	\$175,292	\$397,060	\$407,226
2017	\$182,296	\$482,431	\$457,882
Average	\$166,169	\$418,285	\$426,223

Source: Washington State Parks and Recreation Commission

Table A3.2: *Revenue Growth Rates by Source and FY*

FY	DOL	Parks	WDFW
2012	-	-	-
2013	76%	-1%	-17%
2014	14%	1%	7%
2015	5%	25%	17%
2016	11%	-2%	3%
2017	10%	7%	3%
Average	23%	6%	3%

Source: Washington State Parks and Recreation Commission

The regression results from the demand estimations are captured in the analysis of variation table (ANOVA) provided in Table A3.3 along with the 95 percent confidence intervals.

Table A3.3: ANOVA from Logged Contingent Valuation Model

Residuals:

Min	1Q	Median	3Q	Max
-11.26	-3.33	-1.40	2.77	22.92

Coefficients:

	Estimate	Std. Error	t-value	Pr(> t)
(Intercept)	279.40	12.93	21.61	<2.00e-16 ***
log(q)	-18.36	0.95	-19.38	9.57e-16 ***

Signif. codes: ‘***’ 0.001, ‘**’ 0.01, ‘*’ 0.05

Confidence Interval:

	2.50%	Estimate	97.50%
(Intercept)	252.660	279.404	306.150
log(q)	-20.323	-18.363	-16.403

Residual standard error: 6.868 on 23 degrees of freedom

Multiple R-squared: 0.9423, Adjusted R-squared: 0.9398

F-statistic: 375.7 on 1 and 23 DF, p-value: 9.566e-16

Source: Author's calculations

In addition to the model used in the report we wanted to assess other potential models of the demand curve using alternative pricing questions from the DGSS survey. This appendix offers a discussion of the alternative model specifications and technical discussions surrounding the models and data along with the reasons these models were not preferred to the one used.

There is always a tradeoff in the choice of econometric models between bias and efficiency. A model that uses an efficient statistic can operate more accurately even when the number of observations is low. A less efficient estimator needs more observations to achieve adequate performance levels (i.e., lower variance). On the other hand a statistic is biased if it is analytically different from the population parameter being estimated. In times when the number of observations is low it is common to accept some level of bias in order to increase the efficiency of the model.

In the model above only 1,464 random observations were available. This is a relatively small sample when compared to the 7.4 million people in the Washington state population. Efficiency became a primary concern. It would have been possible to use a model that was less efficient by using the non-random sample of survey respondents, where we had 22,864 observations. The problem in using such a model was that the sample was reflective of only current Discover Pass holders and would not have represented the entire state population. This model would have been biased because of the sample selection rather than because of the model design.

The way the non-random survey was designed is still captured under the contingent valuation design but is known as iterated bidding. This survey design was developed largely by Randall et al. (1974) and elicits willingness to pay by successively increasing the bid price until the respondent is no longer willing to purchase. This contingent valuation method has been found to generate biased results (Desvouges et al. (1983), Boyle et al. (1985), Mitchell and Carson (1989), Bateman et al (2001)) and does not follow the National Oceanic and Atmospheric Administration's Blue Ribbon Panel's guidelines for value elicitation surveys (NOAA 1993).